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Synthèse du parcours scientifique

Matthias Thiemann

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Institut d'études politiques de Paris

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Synthèse du parcours scientifique

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⁽¹⁾ ou à défaut fonction

⁽²⁾ dans la langue d'origine

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Synthèse du parcours scientifique

“Die Philosophen haben die Welt nur verschieden interpretiert, es koemmt aber darauf an, sie zu veraendern”. (11th Feuerbach thesis, Karl Marx 1845)¹

The famous 11th hypothesis on Feuerbach by Karl Marx has been on my mind since the beginning of my studies. Placed at the entrance of Humboldt University in Berlin, my original Alma Mater, it poses questions to the practice of social science I was beginning to acquaint myself with. What is the role of social scientists and social science? When do social scientists differing assessments of the world do make a difference to the world, rather than remaining mere second-order observations (Luhmann 1984), observing how other social systems observe? The statement by Marx can be read in many ways, a naïve one being that the young Marx simply wished to do away with philosophy and enter immediate action. A more sophisticated reading of the statement sees a different interpretation of the world as a necessary, but insufficient condition for change. Developing a different world view is necessary to change the world, but it is simply insufficient. Instead, to make this vision of the world performative, the philosopher might be asked to enrol allies and forge a coalition strong enough to overcome the forces that keep the “old world” in place. If anything, the history of Marxism and Communism teaches us that these allies might well replace or change the program of action in the process of overturning this “world of yesterday” (Zweig 1943).

Being placed at Humboldt University in the entrance hall of course has a certain irony in this respect. Humboldt University was the main center of knowledge production of the Democratic Republic of Germany, where thousands of students were schooled in the doctrine of Leninism-Marxism up until the demise of the system in 1990, being taught as the one true vision of the world. At the same time, empirical social scientific research, which was practiced in this country and at

¹ “Philosophers have only differently interpreted the world, what matters however is to change it”

this university in the 1980s showed that workers neither thought nor acted in the way the doctrine predicted. The fate of this research was to end up in “poison cabinets”², never to be disclosed to the public or published in journal articles. Instead, its producers were relegated to second rank positions in the university system after the short flirtation of socialism with sociology ended in the GDR. The power of these findings that made visible the desires and political opinions of a populace, starkly differing from what it was imagined to be was deemed so dangerous by the regime that its circulation had to be under all circumstances forbidden.

Taught by these historical experiences, I embraced a less radical political course of action, but yet the question of the impact of social scientific thinking about the world remained to me. Its most evident outlay today is the impact it can or might have on government policy in a wide array of activities which were hardly regulated in Marx’s time, for example welfare policies (Breslau 1997b), the regulation of carcinogen products (Jasanoff 1990) or financial regulation (Seabrooke and Tsingou 2009). The impact of social scientific research on these issues for government action seems graspable, albeit under which conditions and through which exact pathways is still subject to discussion (Streeck 2009, Hirschmann and Popp-Berman 2014). In this realm, the impact of economics, arguably one of the most self-referential of all social sciences (Fourcade et al 2015), is undeniably strong, possibly the strongest of all social sciences (Fourcade-Gourinchas 2001, 397). It is not by coincidence that the mature Marx engaged in a critique of economics in his present day format of political economy, which in its vulgar version supported the powerful, the capitalist class with seemingly scientific arguments and in its pure form shied away from spelling out the full implications of its economic analysis, namely the unjustified appropriation of surplus value by the capitalist class based upon the ownership of the means of production, a fact which in his view transformed capital from a thing into a social relationship.

² Literally Giftschränk in German, this metaphor is taken from pharmacies, where poison is kept under tight control.

Since then, the “dismal” science has indeed reinterpreted the world in many different ways and has decisively moved from a political economy approach to the economy, which emphasized the interplay between distributive dynamics within the economic system and its impact on economic dynamics to a highly abstract view on the economy as the interplay of market forces of supply and demand and price level dynamics (Breslau 2003), even if recent interventions seem to rediscover questions of distribution and its impact on economic dynamics (Piketty 2014). In this view, labor is just one other factor of productivity that is compensated at its marginal contribution, like capital.³ Having transformed class conflicts into technocratic questions of welfare optimization for the population as a whole, based on Paretos initial interventions, economics came to produce technocratic answers to the problems the economy posed in the 20th century, be it the optimal planning of production in warfare (Mirowski 2002), the management of an unstable and crisis-prone economy subject to bouts of financial instability and sudden drops of aggregate demand that required government stabilization (Hall 1989a) to an economics seeking to explain the failure of the latter in the 1970s, the decade of “stagflation” (Hall 1993).

In these different circumstances, economics has always been reinventing and adapting itself to unfolding events and the demands by the political system for guidance (Fourcade 2009), albeit in a non-linear way partially influenced by its institutional embeddedness in national regimes of knowledge production (Fourcade-Gourinchas 2001). The discipline, albeit its setbacks and its collective failures of imagination, as most recently expressed in its collective failure to anticipate the financial crisis has been able to maintain its position as *primus inter pares* with respect to governmental advice, economists being placed in ministries, central banks and international

³ This first reinvention of economics after political economy is called the marginal revolution and occurred from the 1870s going forward. This view gained supremacy in the field of economics for also by borrowing legitimating metaphors and equations from 19th century physics, enshrining the description of the economy as a system in general equilibrium in mathematical formulas (s. Mirowski 1989).

organizations. How is it that this profession has garnered such a beneficial position in the interstitial space between academic discourse and policy making and how has it maintained it? Wherein resides its jurisdictional power over this space and how does it maintain it? The recent sociology of economics (Fourcade 2003) has pointed to the performative role economists play in formatting and shaping the economy (Callon 1998a, 2), disentangling and framing a space that is amenable to simple calculations and government interventions. One of the crucial elements in these activities are those seeking to permit the observation and measurement of certain economic phenomena, constructing them in the process of disentanglement (Callon 1998a).

Taking such a social constructivist view of the relationship between economics and the economy, one can argue that the political power of economics resides in its capacity to shape the representations of the economy as they persist in policy circles (Breslau 1997b, Christophers 2011). Functioning as the ideational infrastructure based upon which policymakers and technocrats develop policy tools and interventions, it exerts an indirect but powerful effect. Observing this effect in the context of the re-regulation of finance post-crisis in terms of macroprudential regulation is the objective of this treatise. To observe it, I adopt the perspective of a second-order observer, observing how policy makers and economists observe the financial crisis and the financial system and then asking what difference the different interpretations of the financial system made to the regulation of the financial system after the financial crisis. In that sense, this work is deeply inspired by Luhmann's social systems theory and the problems it seeks to address (Luhmann 1984), although it largely avoids the technical jargon of that same theory, which to my understanding is not necessary to treat these problems adequately.⁴

⁴ In Luhmannian terms, I am concerned with the problem of self-reference and other reference in social scientific discourse with respect to the question of how events outside of economic discourse itself, namely the financial crisis are processed within this discourse on the economy and how this relates to the structural coupling of this discourse with political decisions made within the competent authorities which have to enact prophylactic measures to prevent its repetitions (mostly central banks). In this context, the most interesting finding of this study is the role of applied economists, economists in central banks in generating the economic discourse that is deemed both part of economic discourse and serves as a guide to action, it is in other words actionable knowledge. This actionable knowledge materializes in policy devices, systems of measurement and models which seek to specify under which conditions and

Engaging in such an exercise implies to put the first-order observation of the crisis and its normative implications for action on hold, something which is very hard to achieve. A true view from nowhere on these issues is probably, even with the greatest exercise of restraint by the researcher impossible, an issue aggravated when the issue is directly affecting the life of the observer and refers to an event the observer himself has experienced. In order to account for this undeniable bias of the second-order observer that guides this analysis and how his categories of observation might have been shaped and impacted by his intellectual upbringing, the following part traces this formation, clarifying that the first order observer position can be characterized as sympathetic with a perception of financial markets as cyclical and potentially destructive and hence a role for state intervention. Awareness of this fact hopefully allows me to gain further distance from the object studied and the reader to gain a critical distance from my analysis, by taking this bias into account.

The Chaos of disciplines

“What is universal about social science knowledge is the project of getting there and of mutually decoding our routes. This project is all the more complicated once we recognize that, as the concept of fractal cycles implies, most of us have been wondering in the city for long enough to have lost any sense of where we started.” (Abbott 2001, page 32f)

This statement by Abbott in the “chaos of disciplines” is an apt description of my academic journey. Beginning my studies in 2000 with a focus on theatre, French and sociology, which gave me an appreciation of Diderot and Foucault’s regime of truth in “Discipline and punish”, I then in 2002 decided to study social sciences at the Humboldt University, a degree which combined political science and sociology, where a thorough education in research design and statistics was combined with classes on political theory and international politics. As I advanced in this course of research, I engaged more thoroughly with Marxian political economy and the sociology of networks, which

how policymakers should optimally intervene in the economy. Giving pride of place to material devices and the agents which construct them, this habilitation moves beyond the solely discursive focus of systems theory and into a system-network perspective (Hilgartner 1992) in which devices have agentic power (Callon 2007).

were first two separate foci of my research (the latter leading to my first publication on social networks in a primary school and its impact on school results, s. Chroust et al 2006), but soon were joined in my interest for economic sociology. The more I studied the economy as an object of social-scientific inquiry, the more I actually became interested in the representation of the latter in the discourse of economics itself, which is why I started to attend not only classes on economic sociology (such as the excellent class by Claus Offe in 2003/2004), but also economics classes itself, where I was first stunned by some of the epistemological and ontological simplicity of what was presented to students beginning to study economics. I vividly recall a certain Professor Blankart speaking at such an introductory lecture of the magic of markets not in an ironic tone, but with full conviction.

At that moment in 2003, the Hartz reforms in Germany were debated and the changes in the tax and labor market regime then instituted would prove to be regime changing, setting in motion a rise of social inequality which to this day continues unabated. In these discussions, I first discovered the political economy of economic discourse, when inviting the chief economist of the trade union movement in Germany to our university to give a presentation about these reforms. Remarkably, he did not only cast into doubt the claims for improved efficiency to be gained by these reforms, but he furthermore pointed to the crucial omissions of that discourse. Particularly he showed how the tax reforms would advantage the 1% in a way that was just omitted from any presentations by the government. This experience showed to me the political economy of the representation of economic reforms and their justifications by economic discourse. From that moment in time I had become convinced that something that might seem as dry and hard to understand as economic argumentations actually contains beneath the surface crucial questions of social justice and political economy, and that it was hence a grave error to exclude this discourse and the concepts it uses from scrutiny and analysis. Hence, through that experience I was drawn to the power of economic discourse to shape and legitimize economic reforms.

At the same time, the work by heterodox economists, such as Michel Aglietta and the regulation school more generally proved very inspiring reading to me, in particular their suggestion for the emergence of a Post-Fordist growth regime based on financialization and the accumulation of wealth in financial markets, and so I set out to better understand the mechanisms that undergird this growth regime and its particular vulnerabilities. For that I used the opportunity of a class taught by Sophie Muetzel, then a recent PhD-graduate from Columbia University which taught a state of the art economic sociology class, including work by White, Podolny, but also the work by Callon on the formatting role of economics and the subsequent work by MacKenzie and Millo on the performativity hypothesis of financial models, based upon the history of the Black Scholes formula. I was intrigued by both what seemed a lack of political economy considerations in much of that work, but also the possibility to grapple with the economic phenomena of the day from a different perspective. My work in this class then sought to better understand the first crash of this century, namely the dot-com bubble, which had followed a pattern of a boom-bust cycle. The latter has become ever more common to Western economies since the 1970s, notably with a first peak with the Latin American debt crises of the 1980s, and which has become particularly virulent since the end of the cold war, with crises in Mexico, East Asia and Russia in the 1990s.

The dot-com bubble amazed me not only because of all the apparent short-term creation of wealth and its immediate destruction later on, but also the persistent upward trend of stock markets which was already evident at that time, demonstrated by the fact that by 2004 the Dow-Jones had already reached again the heights of 2001. The work I undertook suggested to locate these dynamics within the practices of the network of investment banks, which observed each other through the prisms of their business activities (Podolny 2001, White 1981). This limited relational space, which sat at the centre of valuation dynamics in turn blocked the reputational dynamics which according to mainstream economics was supposed to prevent the exploitation of information asymmetries.

Instead of valuing their reputation for honesty above anything else and hence providing unbiased evaluation of stocks, competitors were observing each other and hence assessed reputational value relationally (s. also Coffee 2003). Hence the possibility for the spread of illegitimate behaviour: as everybody is giving biased information, nobody's reputation with respect to its competitors will be harnished. This relational understanding of reputation and the value of connectedness inherent in the central position of investment banks within financial markets, which promised clients outstanding long-run returns even if short-term losses had to be accepted were the underlying basis of this deviation of investment bank behaviour from economic theory.⁵

Due to my interest in this new form of financialized capitalism and its vulnerabilities, I decided in 2005 to accept a fellowship by the German Academic Exchange Service for the sociology department at the New School in New York, the epicentre of financialized capitalism. Going to New York, I hoped would permit me to study these social networks that make up financial markets up close and would also permit me to personally encounter some of the sociologists I most admired, such as Harrison White at Columbia University. When I arrived at the New School, the sociology department there was in complete disarray⁶, which confirmed my decision to attend classes in the economics department on the history of political economy as well as an introductory class on financial engineering. There, I studied Smith, Ricardo, Marx and Mills as well as the most recent pricing techniques for financial derivatives, including the Black-Scholes formula. In many ways, the economics department at the New School was the perfect place for my interests. On the one hand, it offered an array of heterodox economic theories, such as Marxist or Post-Keynesian theories of capitalism, which directly spoke to my interests to better understand the inner workings of the capitalist economy and its vulnerabilities in a time of financialization.

⁵ Later, Steven Mandis, a former Goldman Sachs banker himself and a colleague of mine at Columbia University Graduate School of Sociology would confirm this hypothesis (s. Mandis 2013).

⁶ In particular, the fact that Loic Wacquant decided not to return that fall to New York, but instead to take up once more his position at Berkeley was creating chaos.

I used these classes, which were largely non-mathematical but focused on the foundational texts of economists to study the three volumes of capital by Marx, but also Ricardo and Smith, thereby better understanding his theoretical foundations and his differences with his predecessor. However, in particular the study of the unfinished third volume by Marx clarified to me the extensive role the provision of credit played in the crisis dynamics which were at the center of Marx's depiction of capitalism and the fact that Marx had a hard time integrating these developments into his framework of the labour theory of value. Here, the teaching of Post-Keynesian economics to me was central, as it allowed me to fill that theoretical hole. These teachings combined insights by both Keynes and Schumpeter to emphasize the inherent and persistent instability of capitalism due to the centrality of finance and credit relationships. At its core, Post-Keynesian theory posited that the debt relationships, which combine legally enforceable claims with uncertain returns on assets is at the center of capitalism's instability (Minsky 1970, 1978). This view was not reconcilable with an equilibrium view of the economy so prevalent in mainstream economics. Instead, it posited that the system is non-ergodic and disequilibrating.⁷⁸

At the same time, I got acquainted with the intricacies of modern financial markets, attending classes on the pricing of financial derivatives by Salih Neftci.⁹ I thereby not only got an impression of the fast changing environment in the financial derivatives area, where even the professor was puzzled by the rapid growth of the swaps market, but also encountered the techniques that claimed to make risks governable for individual firms, providing hedging techniques against exposures of

⁷ Non-ergodicity implies that past statistical information is not a reliable guide to future developments. It basically contradicts the capacity of financial markets to properly price risks in the future (s. e.g. Skidelsky 2010, 84)

⁸ As Minsky famously put it, financial stability leads to increased risk-taking, bringing about boom-bust dynamics. As expected future cash flows from assets increase, a positive feedback loop to debt creation ensues. The boom thus created will at some point exhaust itself and set into motion a negative feedback loop that ends in a bust (s. Minsky 1978).

⁹ His teaching style, using an intuitive method of geometrical representation of cash flows rather than immediately starting with equations was an invaluable gift and his humour and relaxed attitude were exactly the encouragement I needed to tackle a subject which at the outset can appear monstrously complex.

all kinds (a claim very much in opposition to Post-Keynesian thinking). Calculating these formulas and seeing how they operated allowed me to appreciate the underlying assumptions even more.¹⁰ For example: the only way in which the Black Scholes model is capable of generating a unique price for an option is by replicating synthetically a portfolio of off-setting claims for that option. However, to be able to generate that unique price it needs to assume zero transaction costs as well as ever-persistent liquidity in the underlying markets. These assumptions at that point in time were of course not true in some marginal sense, but were soon to be proven disastrously wrong during the financial crisis that was about to ensue (for an excellent treatment of the pricing of derivatives pre-crisis and its effects during the crisis, s. Esposito 2011). Attracted by these classes, I made the decision to pursue a degree in global political economy at the New School instead of returning home, financing my studies with becoming a TA in the economics department at the New School, the political science department at NYU, as well as a researcher in the Global Clearing House, a UN financed project that evaluated and stored IMF and World Bank publications.

At the same time that I pursued economics, including micro- and macroeconomic classes, econometrics as well as math for economists, I used the fact that the New School was in a consortium with Columbia University to attend a class by Harrison White on his book, *Identity and Control*. I in fact had already attended some lectures by his brilliant student Eiko Ikegami in the sociology department at the New School the year before, who has probably written the most accessible introduction to Harrison White's work, which further aroused my interest. Attending the class, I soon understood it to be a workshop to rewrite Harrison's *Identity and Control*. Over the course of the next 12 month, I would not only re-read the manuscript many times, but engage with other students in a substantial revision of several of its parts.¹¹ In particular, Harrison encouraged me to deepen my knowledge of Niklas Luhmann's theory and to seek to bring it together with

¹⁰ This focus on the underlying assumptions was a common feature of all classes in the economics department at the New School.

¹¹ Chapters 5 and 6, for which I am a designated co-author in White (2008)

network analysis. The opposition to methodological individualism (Elster 1982) inherent in White's thinking, that is the opposition to understand individuals' preference and rationalities as the prime movers of societal developments (what Jon Elster has defined as methodological individualism, but instead to understand them as the outcome of network configurations deeply appealed to my thinking, both as a Marxist political economist at that time, as well as a becoming Luhmannian theorist of communication systems.

Based on this experience, I decided to apply for Columbia University's PhD department in January 2007 and was accepted in spring, which brought me to a very difficult decision-making moment. On the one hand, I had become an enthusiastic student of economics, fascinated by models and their implications, and was attracted to the idea to pursue my PhD studies in this field. At the same time, I also noticed the high importance of mathematics for career advancement in the economics profession and the job insecurity of the heterodox economists which were educated at the New School, which were marginalized in their profession and had very limited career options. On the other hand, I had an offer to gain a PhD in sociology at Columbia University and a secured five-year funding agreement. I hence decided to pursue a degree in economic sociology at Columbia University, seeking to stay as close as possible to my economic interests, including the dynamics within the financial system and its impact on the broader macro-economy. This decision was taken before the summer of 2007 proved the Post-Keynesian views on the inherent fragility of a capitalist system based on expanding financial markets was proven correct. However, and as surprising as this may be, this fact did not change the fate of the Post-Keynesian economists who continue to be marginalized, while some of their main ideas are integrated into the economic mainstream.¹²

¹² While their themes, the fragility of financial systems, the financial instability hypothesis which is the idea that financial stability breeds instability as well as the linkage between the risk-taking attitude of individual members of the financial system and the overall boom bust behaviour of the system proved correct and are now integrated in a new ascending view on the economy (Nagel and Thiemann 2019), the professional standing of Post-Keynesian economists has by no means improved (Kaltwasser 2016).

My decision to attend Columbia University was sweetened by my acceptance into the Inter-disciplinary Graduate Education Research Training Program on Globalization and International Development. This interdisciplinary research group was led by Professor Joseph Stiglitz, a Nobel prize winning New Keynesian economist who has not only strongly advanced the research on information asymmetries, but also had a life-long focus on credit-markets, the intertemporal nature of credit contracts, which make credit markets behave differently from other markets and the need for regulation.¹³ As such, Stiglitz was very close to the Post-Keynesian view on financial markets and had for a long time been a policy advocate for a more interventionist program of financial regulation (s. e.g. Griffith-Jones et al 2010) at the same time that he was attacking the IMF and other international bodies pushing for financial deregulation (Stiglitz 2002). In this group, a frank and open exchange between economists, sociologists and political scientists was fostered and the outstanding quality of seminars and interventions by Stiglitz were remarkable experiences, especially his capacity to question the main assumptions of highly reputable economists.¹⁴

At the same time, what was very impressive was his persistent direct engagement in policy debates, seeking to shape policy decisions on the issues of the day¹⁵. What I hence experienced first-hand in these exchanges was on the one hand the fight within economics, where on the one hand certain Keynesian economists held that government interventions were necessary and beneficial to correct market failures and neoclassical economists focused inversely on the need to prevent government failures and possibly even allow markets to discipline such governmental shortcomings (for a

¹³ Most notably, credit markets do not clear where supply and demand meet, as that would mean to grant credit to borrowers who are not creditworthy and would likely default on their loans (Stiglitz and Weiss 1981). Stiglitz himself in the 1970s was very close to the Post-Keynesian position (Stiglitz 1974), but then increasingly moved into the mainstream, by accepting the neoclassical model, but relaxing one crucial assumption (full information).

¹⁴ For example, Stiglitz once asked during a presentation whether the socializing of risks under certain conditions could not be beneficial to a society, which left the prestigious Japanese economist presenting on financial markets speechless, as his entire neoclassical approach made such a suggestion unthinkable.

¹⁵ Stiglitz surely acted as a public intellectual, but he also acted as a former policy advisor, as the former chief economist of the World Bank, but also as a former member of the Council of Economic Advisors to President Bill Clinton. In that sense, Stiglitz was a boundary walker between policy advise and highly abstract economic theory building, very much like the economists which form the focus of my habilitation (s. below).

similar depiction, s. Skidelsky 2010).¹⁶ In other words, I experienced the policy debate driven by this pole of opposing views, with what seemed to be the Keynesian position gaining lost ground immediately after the crisis, with its insistence on stimulus and financial market regulation. However, I also noted the scepticism of Stiglitz and others about the course of economic policies embraced by the Obama Administration and the limited paradigm change it implied.

In my own work at the department of sociology at the time, I continued the collaboration with Harrison White, which led to an article that combined Luhmannian systems theory and network analysis, pointing to the conditioning effect network constellations have on the dynamics of communication systems (the focus of Luhmann's systems theory, s. White et al 2007, White et al 2014¹⁷). My own independent work on the professional careers of Freelance web-designers in New York City and their work-life balance strategies then empirically documented such effects. I found their labor market to be characterized by the importance of communication networks which led to a bifurcation between on the one hand an impersonal market, dominated by mere price dynamics and a relational market, characterized by personal work that would allow freelancers to capture a much higher prize for their work. In addition, I found that some of these freelancers adopted strategies to create a particular identity in the market for web-design by emitting signals of trustworthiness within these networks that would prove to be fundamental to the expansion of their client network and hence their escape from precariousness (Thiemann 2010, 2011). In this way, the study showed empirically how network constraints shape communication strategies in markets, allowing certain actors to gain control over their living.

¹⁶ As Backhaus (2010, 138f) and Harnay and Scialom (2016) point out, there has been a marked shift in the prevalence of these two opposing views in the economics profession. Whereas in the 1950s and up until the 1960s, a focus on market failures prevailed, this shifted subsequently to a focus on government failures.

¹⁷ In particular, we pointed out with Goffman that communication systems are conditioned by third parties which are not directly involved in the communication, but could be so through social networks.

These first empirical works were concerned with both depicting the market as a communication system with its own dynamics influenced by network constellations as opposed to a simplistic understanding of markets as non-personal spaces which function simply according to the laws of supply and demand. This insight would continue to influence my work as I would return to the theme of financial markets and financial crises. In 2009, I completed my MPhil under the supervision of Saskia Sassen with a manuscript upon the role of FNMA and Freddie Mac in the run-up to the crisis. There I argued that the US government had used the ambiguity regarding the status of the debt of these entities to provide a reduction in costs of mortgage credit to their citizens. The de facto state guarantee of the debt issued and/or guaranteed by these housing agencies had raised its place in the hierarchy of money close to government debt, making the thus issued debt obligations attractive to foreign buyers.

I also showed how the private-public alliance that used securitization as a technique to serve both private and public goals led to a privatization of gains and a socialization of losses, with the shares of FNMA and Freddie Mac beating the Dow Jones average persistently for the 20 years pre-crisis.¹⁸ This work, while unpublished¹⁹, sensitized me to the dangers of off-balance sheet liabilities that are used by states to finance policies, and the question if and in how far similar structures existed in Europe, paving the way for future publications on the network of public development banks in Europe (s. inter-alia Moslehner et al 2018, Mertens and Thiemann 2018, 2019, Mertens, Thiemann and Volberding forthcoming).²⁰ This MPhil work would also serve as preparatory work for my dissertation, as it familiarized me with the techniques and the infrastructure of securitization, which were central to the general pre-crisis expansion of debt in financial markets. In particular, the use of

¹⁸ A notably underappreciated fact in the literature at that time was that the implicit debt guarantee had also led to an expansion strategy of the portfolio of these former state agencies which further reduced the interest rates on mortgages for homebuyers. This expanded portfolio enabled the record profits of FNMA and Freddie Mac pre-crisis and also their losses post-crisis.

¹⁹ It was rejected after a 5 months review period by the Socio-Economic Review.

²⁰ This interest would also pave the way for consultancy work for the United Nations (2011, 2018), Bread for the World (2016) and the Foundation for European Progressive Studies (2016, 2019) (s. CV below)!

special purpose entities to keep debt off-balance sheet, very much similar to the use of FNMA by the US government were crucial for these dynamics.

I then began the preparation for my dissertation, based upon a simple, but extremely productive question by my PhD supervisor Tom DiPrete²¹: Why was the financial crisis so much worse in Germany than in France, if both have large banks and both are subject to the same EU rules? In the next year, as I embarked upon my PhD work, the sensitivity to the issue of securitization was crucial as I was trying to understand the different impact of the crisis upon EU countries, most notably France and Germany. A review of the by-then emerging economics literature on the crisis taught me that the differential size of off-balance sheet liabilities of banks in the shadow banking system was a crucial variable for this difference (cf. Acharya et al 2010). Whereas French and Spanish banks had limited to no exposure, German and Dutch banks had the highest exposure on the European continent. I spend the next two years, during my stays at Sciences Po in France, at the Max Planck Institute in Cologne and the University of Amsterdam unearthing the institutional reasons for these developments, which led to my first single authored peer-reviewed publication (Thiemann 2012).²²

I first drew upon intense primary and secondary document analysis to establish the turning points in the regulation of off-balance sheet exposures of banks and compared it to industry data from Moody's on the evolution of the engagement of banks from these countries with off-balance sheet financing practices, allowing me to establish a direct link between these decisions and bank behavior. I then undertook more than 60 expert interviews with agents involved in developing these

²¹ Professor DiPrete always showed a fondness for trespassing into discussions in other fields of social sciences, such as economics that strongly impressed me. In a social constructivist matter, he told me: "Sociology is what you do and what you then get published in sociology journals, not what the discipline tells you", an insight very much in line with the social studies of science (Gieryn 1995). It has to be said though that the discipline nevertheless fights back and seeks to assert its perceived boundaries.

²² Engaging in comparative research, I used for the first time the method of process tracing (George and Bennett 2005) to understand the evolution of that institutional framework that specified the conditions under which banks could engage in shadow-banking activity.

rules and enforcing their interpretation in these three different countries. In this work, I continued to approach markets as communication systems, but I now added the regulator/supervisor as a decisive agent structuring this communication (s. Abolafia 2001 for a similar conceptualization). In this context, I noted the tendency of private financial market agents to employ compliance agents to comply with the rules in a way that is in line with the letter, but not the spirit of the law. They were using the malleability of law (Fleischer 2010) to achieve their ends. As the regulation of banks was based upon governance at a distance through numbers (Miller and Rose 1990, Vollmer 2007), the banks used legal and accounting advisors to shape their transactions in such a way that they would not be recorded on the banks' balance sheet, thereby not triggering capital requirements on the one hand and not informing regulators directly regarding the build-up of exposure.

In a first step, I asked myself how was it that such behaviour could go unnoticed in what was arguably one of the most regulated market in the world? I soon discovered that it had actually not gone unnoticed (s. BCBS 1986), but instead that the set-up of global competition for banks, based upon fixed global rules that were implemented nationally in a fractured global law making system meant that most regulators decided to not infringe upon the capacity of their banks to compete in the global wholesale market. They hence decided to exempt their banks from capital requirements which would have impeded their capacity to compete (Thiemann 2014a). What I then also showed was that the presence or absence of regulators and supervisors within the networks that determine the meaning of rules and the compliance of particular financial products with them had a substantial impact upon what kind of engagement with capital markets through financial innovations these networks of communication would produce (as shown in Thiemann and Lepoutre 2017, an article published in the *American Journal of Sociology*²³). This work sought to contextualize regulatory action as part of a regulatory dialectical unity, where those regulated and the regulator cannot exist

²³ This work was based on earlier insights by Abolafia (2001), who had identified regulatory cycles in markets on Wall Street and Millo (2007), who had pointed to a decentred analysis of the evolution of regulation (ibid, 212).

without the other (implying a certain unity of interests in profitability of the banking sector), however which also had latent conflict due to diverging interests (short-term profitability vs. financial stability). These two actors come together in what has been described as “governance at a distance” (Vollmer 2007), where numbers are used to steer the behaviour of the regulated.

I argued that the evolution of this regulatory dialectic was an outcome of the local embeddedness of regulators within the communication networks that decided over the compliance of products in financial markets and of political-economic constraints imposed upon regulators due to processes of financial market integration in general (Thiemann 2014a) and in the European Union in particular (Thiemann 2018). Furthermore, I showed how processes of transnationalization of accounting and banking rules disturbed national specific configurations that had installed precautions for the accounting for bank balance sheets (Thiemann 2014b). These trends broke up specific national constellations that had placed precaution at the center of the accounting for banks’ balance sheets, which as Schumpeter and Minsky teach us, are the crucial balance sheets in capitalism. Bank balance sheets are crucial as they are the source for the production of credit (Schumpeter 1934, Werner 2014) and the sudden impairment of these balance sheets can provoke long-lasting balance sheet recessions (Koo 2009) and the opening of the market for banking as well as the transnationalization of accounting rules had severely limited the capacity of banking regulators to control the risk taking of these balance sheets, in particular through the generation of implicit contingent liabilities with respect to the shadow banking sector²⁴.

Nevertheless, my research showed that systems in which regulators had maintained some degree of control over banking competition and where they had shown ingenuity in reinventing their roles for accounting rules had maintained capacity to prevent this loosening of control (ibid, s. also

²⁴ Minsky interestingly traces the expansion of the shadow banking sector to the moment in 1970, when Commercial Papers issued by companies became the implicit contingent liabilities of the banks that helped issue them (s. Minsky 1986).

Thiemann 2012). Upon the insistence of the editor of my book at Cambridge University Press, I included the US in my study, conducting interviews and literature research during my stay as a visiting scholar at the University of Pennsylvania in 2016. This expansion allowed me to establish a related, but not similar structuring dynamic in the US that had persistently biased regulatory action towards light touch regulation, namely the incapacity of bank regulators to constrain the actions of quasi-banks acting in capital markets under a much lighter regulatory regime. This lack of “prudential market regulation” (Tarullo 2015c) had implied a bias to inaction by banking regulators, who did not want to harm the banks they regulated in the face of increasing competition from money market mutual funds and mutual funds (for a discussion regarding the need for “prudential market regulation” in the post-crisis EU environment, s. Thiemann and Troeger forthcoming). Instead, they opted to allow the fusion of these two in what later was described as market-based banking (Hardie and Howarth 2013), while seeking to carefully react to the financial innovations devised to circumvent regulation (Thiemann 2018).

At this point in time, I felt I had understood several of the institutional, political and sociological factors that could help to explain the rise of the shadow banking system pre-crisis (Thiemann 2018). And yet, one thing I had been intrigued by was the institutionalized incapacity of the regulatory apparatus, its measurement devices and models to see possible problems emerging from this sector, which stood in sharp contrast to the capacity of some individual regulators I had interviewed. I found out that the models that underlay Basel II and Basel III were built on Robert Merton’s work, which used similar assumptions like the Black-Scholes formula, e.g. ever-liquid financial markets to calculate the risk exposure of banks. But it was exactly this liquidity which had broken down during the financial crisis (Gorton 2009, Shin 2011, Langley 2014) and which had provoked the impact of the shadow banking system upon the banking system (s. Pozsar et al 2011). It was the fact that liquidity had become an unquestioned “iconic” element of financial markets, which had fostered the lax attitudes of financial market regulators towards the shadow banking system.

By then I had sufficiently familiarized myself with the post-crisis research on shadow banking and financial instability that emerged by economists such as Acharya, Adrian, Brunnermeier, Pozsar and Shin that had problematized this assumption of ever-persistent liquidity and had placed actual balance sheet dynamics within financial markets centre-stage. In other words, these research findings focused upon dynamics like those that Minsky had focused upon, albeit possibly in a different language. I hence asked myself which impact this research, which explained the financial crisis as a build-up of endogenous risks which then were amplified in the financial system might have upon the regulation of that system going forward? I was particularly interested in the impact these models and the risk metrics they proposed would have on regulatory change. Was there going to be institutionalized change which would allow regulators to detect the build-up of imbalances and systemic risks, as they had occurred before the last crisis? (for a similar question, s. Black 2013) These new questions came to occupy me as I moved to Frankfurt to become an Assistant Professor of the Sociology of money, banking and finance in the fall of 2013. And indeed, Frankfurt, home to the ECB, but also the Bundesbank and the European Systemic Risk Board was the perfect research site to explore these kinds of questions.

I was particularly lucky to become affiliated from 2013 onwards with the LOEWE Research Center SAFE (Sustainable Architecture for Finance in Europe), which was an interdisciplinary center with an emphasis on law and finance in its expertise. This center, located in the “House of Finance” and directly linked to the Center for Financial Studies, its forerunner, was a place of exchange between central bankers and economists on exactly these questions. It held policy lectures by leading central bankers, organized conferences both by financial economists, but also by central bank researchers and thereby facilitated an exchange on these issues, that I could both observe and participate. Furthermore, SAFE provided me with the possibility to observe, interact and directly collaborate with leading researchers on the topic of the measurement of systemic risks (such as Economics

Professor Lorian Pelizzon), on shadow banks and regulatory arbitrage (Law Professor Tobias Troeger) and on the manipulation of capital requirements by banks pre-crisis (Economics Professor Rainer Haselmann). These researchers would involve me in research projects financed either by SAFE itself or the Volkswagen foundation, which would provide me with the research funds to hire graduate students and post-docs to pursue my own sociological and political science work on these issues.

This setting encouraged me to think about ways which could shed light on how economics as a science might have fed into the understanding of financial market regulation pre-crisis and how the changing understanding of financial systems might feed into their re-regulation post-crisis. Here I assumed that the role of models and devices did not only structure financial markets directly, as shown by the research of MacKenzie and Millo(2003) and others in the tradition of SSF, but also that it structured the interventions of regulators which in line with Abolafia (2001,2012) and Millo (2007) I had come to see as crucial for the understanding of market evolution. After reviewing the literature on this question, I came to realize the limited extent to which this issue was treated. The literature on the influence of economic expertise and on regulatory market devices derived from that expertise on regulation of finance pre-crisis was but for very few interventions (de Goede 2004, 2005, Millo 2007, Millo and Mackenzie 2009, Seabrooke and Tsingou 2009, Power 2007) largely inexistant.²⁵ In fact, this object of inquiry was largely proposed post-crisis, particularly in the year 2014 by two independent academic interventions.

²⁵ Millo (2007) proposes a decentered perspective on financial regulation, that gives space to material artifacts. Millo and MacKenzie, following up on their earlier work on the Black-Scholes formula observed that the use of financial risk management models ultimately depended on “their communicative and organizational usefulness and less to the accuracy of the results they produced” (Millo and Mackenzie 2009, 638), with the SEC following market practices in the 1990s. However, the SEC had no stability mandate at the time, which is why the fact that the financial risk management models did not portray risks accurately in stress situations was not of their concern (ibid, 650). Seabrooke and Tsingou (2009) add an interesting angle from the sociology of professions to this widespread adoption of financial risk management in regulatory circles for banking regulation by arguing that knowledge regarding these Value-at-risk models was widespread and seen as valuable as a skill set in regulatory as well as private finance circles. Power (2007) also focused on how professional claim making to the control over certain risks shifted the power of professional groups, once such risks had become a point of concern for the regulatory community.

On the one hand, Dan Hirschman and Elizabeth Pop-Berman in a review essay on the power of economic expertise to shape policies pointed to cognitive infrastructures economic expertise provides, such as styles of reasoning and “policy devices” as one locus of such power. With the concept of “policy devices” they meant the socio-technical tools that help policymakers see and make decisions about the world in economic ways (Hirschman and Pop-Berman 2014, 782). On the other hand, Langley, in his book pointed out how the crisis caught SSF somewhat off guard, as it had focused on processes of market making, rather than processes of governance of markets (Langley 2014, 3). In his account of how the crisis came to be compartmentalized and governed as a discrete set of events, he points to the concept and ordering devices that characterize economics as the craft of administrative ordering (Langley 2014, 9). While the crisis has been a disaster for economics as a science, the crisis response all to the contrary was wrought with economic concepts and terms and the quantitative indicators to understand the problem at hand (ibid), allowing to impose order and to craft solutions with the help of already existing cognitive tools.

This dialectical understanding of economics as science and economics as an (administrative) practice, an understanding which in large part can be derived from the sociology of economics (cf. Fourcade 2009) impressed me and allowed me to conceptualize within the realm of economics both the practically driven insights by the central bankers and their pragmatic analyses of risks that I had encountered during my prior interviews as well as the rigid theoretical explanations of the functioning of the economy within a deductively coherent logical framework based on axioms and shared premises that academic models worked with. But the question to which this literature gave little answer was how these two interacted. While Langley suggests a path dependency from the measures which were used to administer the crisis to the new dispositive which is used to govern the post-crisis financial reality (ibid, 180), he at no point theorizes or observes the potential frictions between economics as a science and the practice of economics as a governing practice of administration and the results it might engender. However, having read Fourcade (2009)

thoroughly, I came to think that it is exactly within this field of tension that the strength of the dialectics of economics as theory and practice resides.

As Fourcade (2009; p. 116) shows in her seminal work on the evolution of the discipline of economics since about 1750, government action seeking to govern the economy and scientific innovation in economics are heavily intertwined.²⁶ As economists, placed within or without governments²⁷ were asked to solve problems for the state, the solutions they found would in turn enter the realm of economics as a science and change it in turn. ²⁸ To better grasp this tension between the insights of practical economists on the one hand and academic theorizing of the financial system on the other hand, I set out with co-authors to investigate the evolution of the academic economic discourse on banking regulation since the late 1980s, contrasting it with the literature on systemic risk as the concept that undergirds macro-prudential regulation after the crisis. Using google scholar citation counts as the criterion to select the most prominent articles on these two topics since 1985, we selected a sample of 114 texts, which we on the one hand subjected to close qualitative discourse analysis regarding the styles of reasoning employed and the approach to the subject matter with respect to the nature of the financial system, the evidence adduced to make these points and the conclusions derived from it (Aldegwy and Thiemann 2014). This qualitative research was subsequently complemented with citation network analysis and expert interviews with leading economists detected in the discourse (Thiemann et al 2018b).

²⁶ Fourcade also postulates such a feedback loop for business and economics as a science (ibid, 117), but this feedback loop is not our present concern.

²⁷ Fourcade links this placement of economists within or without the state to the historical evolution of the predominant place of economic expertise and its links to economic governance (Fourcade 2009)

²⁸ In other words, economics as a science has often advanced through solving practical problems posed by society (Fourcade 2009, p. 261), which means that much of economics' intellectual development has been driven by economic practice: solving an operational problem or reform or modernize society or make inert data speak through technology. A saying in academic economics reflects this fact: "Economics is the science that proves in theory what works in practice" (Economics Prof. Wachtel from NYU, personal conversation).

The analysis brought to light large differences between these discourses, including different styles of economic reasoning prevalent in them associated with different professional affiliations. Whereas actual central bankers and those economists working in international organizations were at ease speaking of financial instability, cycles and contagion effects, much as Minsky²⁹ or Kindleberger had done in the 1970s and 1980s, the academic discourse since the 1980s was structured by equilibrium assumptions and static partial equilibrium analysis. It was thereby capable of modelling short-term shocks to individual agents (s. e.g. the work by Bernanke, Gilchrist and Gertler 1990 on the financial accelerator), which in turn could explain short-term credit constraints, but had no capacity or ambition to envision larger systemic dynamics. At the end of the investigated period, we found an inversion in the two discourses, with the discourse on banking regulation largely questioning itself and abandoning the constraining language of mathematical models, the systemic risk discourse suddenly engaged in models of welfare economics and sought to engage in the language of optimization.

While these first findings were very encouraging, they were also puzzling. Was the discourse on systemic risk about to become as academic as banking regulation before, thereby excluding the everyday pragmatic assertion of financial instability for the sake of mathematical clarity? On the other hand, was banking regulation about to enter an experimental phase? I decided that to better analyse these mechanisms through which economic expertise feeds into policy making I needed to employ the entire range of my method skill set, including comparative analysis of different jurisdictions based on process tracing, using document analysis and expert interviews, but also to engage in a deeper way with the swelling economic text corpus on different systemic risks that required regulation, using quantitative text analysis tools, as well as citation network analysis and co-citation analysis. In this overall endeavour I was interested whose economic expertise flowed

²⁹ Minsky himself had all his life interacted closely with the Federal Reserve, for which he also wrote analyses and proposals early in his career. This work arguably gave him strong insights into the balance sheet dynamics of banks, which he deemed as central for the overall dynamics of (s.e

into these different policy devices and under which conditions they came into use. Frankfurt as a location and SAFE as an institutional affiliation proved to be a perfect research site for these questions, as it offered me the unique opportunity to observe the interface and the frictions and productive interactions between applied central bank economists on the one hand and academic economists on the other.

In Frankfurt, it was easily possible for me to attend more than a dozen conferences between 2012 and 2018 organized on the question of financial stability and systemic risks³⁰. I therefore attended several conferences at the ECB (5), those organized by and at the Bundesbank (4), and those at the House of Finance itself, such as the Central Bankers Research Association's global conference in 2018, the International Research Network of Central Banks in 2015 or "The ECB meets its watchers" conference in 2017³¹, conferences which almost all involved the possibility to mingle with conference attendants during lunch breaks or dinners. This allowed me to directly observe the interaction of central bank and academic economists around these topics. I thereby could also observe the interface of these two forms of knowledge, the practical one that is familiar with the functioning of central banks and financial markets and the politically possible on the one hand and academic researchers' abstract notions of equilibria and financial market dynamics on the other. Leading professors in financial and macro-economics, in particular from the US would attend these conferences and present their work on financial crises and the way to best mitigate them³². These researchers would also be invited to give presentations at the House of Finance in a purely academic environment, allowing me to observe them also in that context.

³⁰ Attendance was made possible also in part due to the connections provided by the researchers at SAFE

³¹ This latter conference allowed me to attend presentations by Mario Draghi, who would come to Goethe University to give presentations to the financial and academic community on the course the ECB chartered.

³² Including leading scholars such as Princeton Professor Brunnermeier, NYU Professor Acharya or Professor Raghuram Rajan from the Chicago Booth School of Business, but also Professor Moritz Schularick and Professor Martin Hellwig, both from Bonn.

Being located in Frankfurt and affiliated to SAFE, a leading research centre on issues of financial stability which is well recognized in the community of academic and applied economists on the issue of finance I was interested in, it was easy for me to observe and myself participate in this conversation between central bank economists and academics. Furthermore, being thus located substantially facilitated the generation of expert interviews with leading economists both within central banks, but also in academia. Access to the field was further facilitated by the permanent interaction with the researchers at SAFE, which would allow me to test my hypotheses, understand the concerns of the academic community and observe their mode of interaction with the central banking community, be it in terms of data access, the issue of politically sensitive research and their interaction with the central banking community to convince³³ them of the relevance of their work³³. I hence could observe the negotiation dynamics over the policy relevance of academic knowledge and the academic correctness of policy devices in-vivo and exchange both with central bankers and academics on these issues. As a partially co-incidental development, also some of my colleagues and academic acquaintances became central bank economists themselves, allowing me to get a better understanding from the inside of central banks as well.³⁴

While access to the field of economists was thus secured and generated many insights, I wanted to place my analysis of the post-crisis change in economic discourse on financial stability and systemic risks on a level that was more representative and would extend beyond the impressions I gained from these conferences and conversations. Seeking to generate more representative and reliable findings posed the question of how to increase the sample size of texts to increase the

³³ In this respect, I vividly recall how Professor Haselmann presented his research in the Bundesbank in 2016, which showed how banks had (ab-)used the internal ratings based methods to lower their regulatory capital requirement after Basel II came into force and how he had to face repeated epistemological questioning as to whether his results really showed that. It was an intense interaction, whereby the interface between academic research and practical consequences became vividly evident, also including the question of

³⁴ E.g. a former doctoral student at Goethe University, with whom I had closely collaborated before became a Bundesbank employee. More co-incidentally, a former co-student at the New School became also a Bundesbank employee. Due to the physical proximity of Goethe University and the Bundesbank, there was the possibility for not only repeated exchange over lunch, but also to have several of my students write their MA theses on topics of financial stability within the Bundesbank and financed by the Bundesbank.

validity of the findings and yet at the same time to be able to maintain the capacity for more fine-grained analysis. The challenge seemed particularly stark, given the exponential growth of the economic discourse on systemic risk and macroprudential regulation after the crisis. I hence decided to explore the alternative options to collect a text corpus as large as possible and to pursue a more systematic analysis of the evolving text corpus post-crisis. This work was facilitated by my first research grant at SAFE in 2014, which allowed me to hire two research assistants. It quickly became clear that neither google scholar nor Web of Science were possible venues, the first due to its repelling of web scraping algorithms, the latter due to its exclusion of the important grey literature produced by central bank economists and economists in international organizations, published as working papers, discussion papers or staff papers.

Yet, Web of Science did permit an analysis of reference lists by papers and thus allowed not only a first network citation analysis, but also a co-citation analysis, allowing us to pinpoint different important core sources which inspired different schools of thought in the discourse. A second grant, provided by SAFE in 2016 and seconded by a grant on the evolution of shadow banking financed by the Institute for New Economic Thinking in that same year allowed me to intensify the research efforts and expand the research team, now including 4 research assistants. We identified RePeC, a repository for Research Papers in Economics as the optimal database, which allowed us to include the grey literature, while also obtaining enough metadata to undertake citation network analysis and co-citation analysis and so we decided to request all papers from the 1980s onwards on systemic risk, on macroprudential regulation, as well as papers related to credit cycles, financial cycles and leverage cycles, obtaining a dataset of a total of more than 4200 papers, after cleaning out duplicates.

Given the quantity of papers, I ruled out a pure qualitative discourse analysis and started to investigate the different options of automated quantitative text analysis. As a research team, we

settled upon structural topic modelling, a machine-based learning algorithm that had just begun to be used in the social scientific community (s. Fligstein et al 2017, DiMaggio et al 2013). Structural Topic modelling uses a pattern matching algorithm and applies to large swaths of texts to detect common patterns of words used, described as topics. The algorithm allocates texts to these different topics and topics to different texts, which allows for a first understanding of dominant themes in the literature. Importantly, however, it is not a fully automatic quantitative data analysis, instead it involves a serious amount of qualitative judgment on behalf of the topic modellers, as to what the optimal number of topics for a given text corpus is as well as what these topics actually stand for. In other words, while these methods reduce the amount of qualitative document analysis necessary, it does not eliminate it. Instead, it is the task of the research team to jointly establish the meaning of these topics as well as deciding the optimal number of topics.³⁵

As I was particularly interested in whose expertise was prevalent in these different topics, my research team and I decided to use Author-Topic Modelling, a variation of Topic modelling in order to obtain better information on this question. Author-topic modelling not only assigns texts to topics, but also authors. This involved a large coding exercise to assign a professional affiliation to all the authors in the data set, a task which would have been impossible to accomplish without the generous funding of SAFE, the research centre in Frankfurt and the industrious work of the research assistants that were employed for coding these entries. The result, used in chapter 4 and chapter 6 of this habilitation allowed us to identify topics which are of sole interest to applied economist in central banks, those which were of interest to academics only and then those topics where both of these populations of economists work together. Establishing these zones of overlap and those where one or the other group was working on in isolation was important to validate or question

³⁵ In this respect, the topic modellers face a trade-off between parsimony and completeness. On the one hand, one wishes to capture all meaningful topics in the corpus, while at the same time increasing the amount of topics leads to the generation of non-sensical topics by the algorithm which can be seen as products of pure chance, with no substantial meaning. In practice, this means that the researcher is engaging in setting the numbers of topics iteratively until the optimal trade-off between garbage topics and fine-grained differentiation of meaningful topics is achieved.

observations during conferences and to inform interviews. For example, it showed that thinking about the financial cycle is largely confined to the community of central bank economists, with very few academic economists engaging in the topic, allowing me to follow up on this observation during interviews.

However, these findings of the economic discourse alone are insufficient to understand how and when the changed economic discourse on financial markets and the risks that emanate therefrom influenced policy settings and the instalment of particular policy tools. Given that a broad array of regulatory tools was labelled “macroprudential” by the regulatory community after the crisis to project activity,³⁶ I was well advised to select the cases carefully. On the one hand, I selected macroprudential measures targeting the shadow banking system and here in particular the repo-markets. This choice was driven by the fact that these markets were identified as an amplifying factor that had caused large scale damage during the financial crisis (cf. Gorton 2009, Adrian and Shin 2008). In addition, I chose counter-cyclical measures for core capital requirements, as they were singled out by the literature as one of the most contentious measures due to the political economy of counter-cyclical interventions (Baker 2013a, b, 2017, Goodhart 2015, Thiemann 2018).³⁷ Lastly, I focused on G-SIFIs as one successful installation of a structural measure to increase the resilience of the system. This latter measure can be seen as a most likely case of influence, as it has been the least contentious in the economic discourse, with chapter 4 and 6 finding substantial collaboration between academic and applied economists on this issue.

Completing this habilitation completes a journey of 20 years. It (hopefully) establishes an identity in academia after a long and arduous struggle through precarity and uncertainty. But it is also a new

³⁶ One of my first interviewees in 2014 was making fun about that fact, using the German expression that “every pig is run through the village as a macroprudential tool”. In other words, banking regulators sought to project activity by labelling many already existing tools as macroprudential.

³⁷ Admittedly, Loan to Value Ratios or Debt to Income Ratios for mortgage debt are more contentious. However, these were not introduced in the US and several other jurisdictions, thereby making the comparison largely impossible.

beginning, as the findings established in this study provide the basis for more work on the patterns of collaboration between the scientific community and policy makers and how it affects changes to policy paradigms. It also raises questions in how far economics as an academic discipline is affected by this work of the boundary walkers of “regulatory science” this study focuses on. This work is currently undertaken based on a research grant by the English Scientific Research Council (ESRC), seeking to establish in how far the new perception of financial markets as cyclical and hence as a potential threat to the macroeconomy that undergirds macroprudential regulation itself is affecting the wider academic discourse or whether it remains rather ephemeral. In other words, in how far does economics as the bureaucratic craft of ordering the economy and making it amenable to state intervention influence economics as an academic discourse?

I have been particularly lucky to be able to conduct this research in the context of the Centre des études européennes at Sciences Po where I am based since fall 2017, a center which is welcoming, warm and collaborative, as well as interdisciplinary. As such, nagging questions of disciplinary boundaries, repeatedly asked in Frankfurt could be placed in the background, the focus instead being placed on the precision of the argument and the validity of the methods used to support it. This intense intellectual exchange coupled with a great degree of collegiality and support has been very helpful in pursuing these questions that straddle disciplinary boundaries.

CV Matthias Thiemann, PhD

Assistant Professor for European Public Policy Sciences Po Paris

Employment

September 2017- present	Assistant Professor, European Public Policy, Sciences Po Centre des Etudes Européennes
June 2013 – August 2017	Juniorprofessor (assistant professor) for the Sociology of Banking, Money and Finance, Goethe Universitaet Frankfurt/Main
2012 – 2013	Post-Doc Center for Capitalism, Globalization and Governance, ESSEC Business School France (accepted) European University Institute Florence, Italy (declined)

Education

2007 – October 2012:	Ph.D. in Sociology , <i>Columbia University</i> , New York, USA Title: “Out of the Shadow – Accounting for Special Purpose Entities in European Banking Systems” (Committee: Tom DiPrete, David Stark, Joshua Whitford, Joseph Stiglitz, Katharina Pistor) <ul style="list-style-type: none">• Ph.D. candidacy obtained in Spring 2010, MPhil awarded in Fall 2009, M.A. awarded in Spring 2009• IGERT-fellow International Development and Globalization Program
Summer 2009:	Diplom in Social Sciences , <i>Humboldt Universität</i> , Berlin, Germany (Diplom thesis handed in in Fall 2008. Final Grade: 1.4 / very good)
2005 – 2007:	M.A. in Global Political Economy and Finance , <i>The New School for Social Research</i> , New York, USA (GPA: 3.91)
2002 – 2004:	Vordiplom for Social Sciences , <i>Humboldt Universität</i> , Berlin, Germany. Final grade: 1.0 (equivalent to A+)

Publications

Books

Mertens, D., M. Thiemann and P. Volberding (eds). (Forthcoming). The Reinvention of Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field. Oxford: Oxford University Press

Thiemann, M. (2018). The Growth of Shadow Banking: A Comparative Institutional Analysis. Cambridge, UK: Cambridge University Press

Peer-reviewed articles

- Birk, M. and M. Thiemann. (2019). Open for Business- Entrepreneurial Central Banks and the Cultivation of Market Liquidity. *New Political Economy* i-print, pp.1-18
- Mertens, D. and M. Thiemann (2019). Building an investment state? The European Investment Bank, national development banks and European economic governance. *Journal of European Public Policy*, 26:1, 23-43
- Thiemann, M. (2019). Is resilience enough? The macro-prudential reform agenda and the lacking smoothing of the cycle. *Public Administration*, 97 (3):561–575
- Endrejat, V. and M. Thiemann (2019). Balancing Market Liquidity: Bank Structural Reform between Growth and Stability *Journal of Economic Policy Reform*, 22 (3), pp. 226-241
- Thiemann, M., Birk, M. and J. Friedrich. 2018. Much ado about nothing? The regulation of repo-markets post-crisis. *Koelner Zeitschrift fuer Soziologie and Sozialforschung* 70 (1):259–286
- Huetten, M. and Maman, D. and Rosenhek, Z. and M. Thiemann. (2018). Critical financial literacy: an agenda. *The International Journal of Pluralism and Economics Education*, 9 (3), 274-291
- Mertens, D. and M. Thiemann. (2018). Market-based, but state-led. The role of public development banks in shaping market-based finance in the European Union. *Competition and Change* 22 (2) pp. 184–204
- Thiemann, M., Aldegwy, M. and E. Ibrocevic. (2018) Understanding the Shift from Micro to Macro- Prudential Regulation: A Discourse Analysis. *Cambridge Journal of Economics* 2018, 42, 935–961
- Thiemann, M. and J. Lepoutre. (2017). Stitched on the edge: Rule Evasion, Regulatory Embeddedness, and the Evolution of Markets. *American Journal of Sociology Volume 122 Number 6 (May 2017): 1775–1821*
- Buettner, T. and M. Thiemann. (2017). Breaking regime stability? The Politicization of Expertise in the OECD/G20 process on BEPS and the potential transformation of international taxation. *Accounting, Economics and the Law* 7 (1), pp.757-782
- Godart, F., Caravetta, F. and M. Thiemann. (2016). Task Complexity and Value Orientation: Exploring the Moderators of a Social Dilemma in Social Networks. *Industrial and Corporate Change. Vol. 25 (5), p739-756*
- Thiemann, M. (2014). In the Shadow of Basel: How Competitive Politics Bred the Crisis. *Review of International Political Economy*. Volume 21, issue 6, pp. 1203-1239.
- Thiemann, M. (2014). The impact of meta-standardization upon standards convergence: The

case of the international accounting standard for off-balance sheet financing. *Business and Politics*, Volume 16 (Issue 1), pp. 79-112

Thiemann, M. (2012). Out of the shadow? Accounting for Special Purpose Entities in European banking systems. *Competition and Change*. Vol. 16, No. 1, pp. 37-55.

White, H., Fuhse, J., Thiemann, M., and L. Buchholz. (2008). Networks and Meaning: Styles and Switchings. *Soziale Systeme*, 13 (2007), Heft 1+2, pp. 543-555.

Reprinted in *Replika* (Hungarian Social Science Journal, thematic issue on the work of Harrison White)

Translated into Spanish:

White, H., Fuhse, J., Thiemann M. and L. Buchholz. 2011. *Redes y sentido. Estilos e intercambios*. In Ignacio Farías and José Ossandón (eds.) *Comunicaciones, semánticas y redes, usos y desviaciones de la sociología de Niklas Luhmann* Universidad Iberoamericana: Huixquilucan, Estado de México.

Weber, C. and M. Thiemann. (2007). Questioning Development Orthodoxy. *New School Economic Review*, 2 (Spring 2007), pp. 5-21

Articles and manuscripts under review

Endrejat, V. and M. Thiemann. forthcoming. Reviving the shadow banking chain in Europe. Regulatory Agency, Technical complexity and the Dynamics of Co-habitation. Conditionally accepted at *Competition and Change*

Thiemann, M., Raquel-Melches, C. and E. Ibrocevic. Measuring and mitigating systemic risks: How new Alliances of central bank and academic economists forge the transnational macroprudential agenda. Revise and Resubmit at *Review of International Political Economy*

Thiemann, M. and T. Troeger. Regulating Tail Risks. *Accounting, Economics and Law*, minor revisions

Book chapters

Mertens, D., M. Thiemann and P. Volberding. (forthcoming) Introduction: The Making of the European Field of Development Banking. In Mertens, D., M. Thiemann and P. Volberding (eds). *The Reinvention of Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field*. Oxford: Oxford University Press

Rubio, E. and M. Thiemann. (forthcoming) United in diversity? Interests, preferences and patterns of engagement of public development banks in the implementation of the EU budget. In Mertens, D., M. Thiemann and P. Volberding (eds). *The Reinvention of Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field*. Oxford: Oxford University Press

M. Thiemann and P. Volberding (forthcoming). The Rise of Bpifrance: The Rebirth of a Dirigiste State?. In Mertens, D., M. Thiemann and P. Volberding (eds). *The Reinvention of*

Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field. Oxford: Oxford University Press

- Mertens, D., M. Thiemann and P. Volberding. (forthcoming) Conclusion: Development banking and the future of European capitalism. In Mertens, D., M. Thiemann and P. Volberding (eds). *The Reinvention of Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field.* Oxford: Oxford University Press
- Benoit, C. and M. Thiemann. Forthcoming. Regulation. In Seabrooke, L. (editor). *Oxford Handbook of International Political Economy.* Oxford: Oxford University Press
- M. Thiemann. (2020). Is resilience enough? Why macroprudential regulation eschews the Regulation of the cycle. In Mader, P., Mertens, D. and N. van der Zwan (eds). *Handbook of Financialization.* Routledge: London
- M. Nagel and M. Thiemann. (2019). Shifting frames of the expert debate: Quantitative Easing, international Macro-finance and the potential impact of Post-Keynesian Scholarship. Forthcoming. In Rochon, L.P. (ed). *Advances in Post-Keynesian Economic Thought.* Edward Elgar: London. Pp. 235-356
- Ulf Moslehner, Matthias Thiemann and Peter Volberding. (2018). National Development Banks as Active Financiers: The Case of KfW. In Griffith-Jones, S. and J.A. Ocampo (eds). *The Future of National Development Banks.* Oxford: Oxford University Press; pp. 63-85
- Huetten, M. and M. Thiemann (2018). Moneys at the Margins – From political experiment to cashless societies. In M. Campbell-Verduyn (editor). *Bitcoin and Beyond.* Palgrave: London, pp. 25 - 47
- Aldegwy, M. and M. Thiemann. (2016). Zum Verständnis der Verschiebung von mikro- zu makroprudenzieller Regulierung: eine Diskursanalyse. In Hanno Pahl et al (Hg.). *Die Innenwelt der Ökonomie. Wissen, Macht und Performativität in der Wirtschaftswissenschaft.* Springer VS Verlag.
- Griffith-Jones, S. and M. Thiemann. (2015). Limiting financial crises: Demands upon the new financial architecture. In Friedl, W. and A. Kammel (eds.). *The changing landscape of global financial governance.* Brill Publisher: Amsterdam
- Thiemann, M. 2014. Securitization Revisited (1): Inside the shadow banking system. In L. Dobusch, P. Mader and S. Quack (eds). *Governance across borders. Transnational fields and transversal themes.* Epubli: Berlin
- Thiemann, M. 2011. Die Interaktionskultur freiberuflich tätiger Web-Designer in New York City - Unsicherheit, Verletzlichkeit und der bekannte Dritte. In C. Stegbauer and J. Fuhse (eds.) *Kultur und mediale Kommunikation in sozialen Netzwerken.* VS Verlag Hamburg, pp. 167-185
- Thiemann, M. (2010). The role of trust in interactive hightech work – The case of Freelance Web-Designers in NYC.” In Gerbasi, A. and Latusek, D. (eds). *Trust and Technology in a Ubiquitous Modern Environment.* Hershey, PA: IGI Global Publisher, pp. 107-122.
- White, H., Godart, F. and M. Thiemann (2010). Les bifurcations sont la règle et non l’exception

: perspective sur les différentes formes d'incertitude." In M. Bessin, C. Bidart and M. Grossetti (eds.) *L'enquête sur les bifurcations. Les sciences sociales face aux ruptures et à l'événement*. Paris: La Découverte. 2010. Pp. 291-307

Published in revised and extended form as:

White, H., Godart, F. and M. Thiemann 2014. Turning Points and the Space of Possibles: A Relational Perspective on the Different Forms of Uncertainty. In F. Depelteau and C. Powell (eds.). *Relational Sociology: From Project to Paradigm* Vol. 1. Palgrave: London

Designated contributor to chapters 5 and 6 in White, Harrison C. 2008. *Identity and Control: How Social Formations Emerge*. Princeton, N.J.: Princeton University Press, pp. 171-278

Chroust, J., Gaschler, U., Huber, W., Priester, S. and M. Thiemann 2006. Gesamtnetzwerkanalyse einer Grundschulklasse. In M. Hennig (ed.). *Angewandte Netzwerktheorie*, (Applied Network-Theory). Verlag Hamburg 2006, pp. 275-302

Review Articles and Book reviews

Thiemann, M. 2019. On the constitutive effects of contingent associations. Book review of Martijn Konings. *Capital and Time. Finance and Society*, 2018, 4(2): 193-98

Thiemann, M. (2017). Book reviewed: Marion Fourcade. 2009. *Economists and Societies*. Princeton: Princeton University Press. In *Schlüsselwerken der neueren Wirtschaftssoziologie*. Springer VS-Verlag

Thiemann Matthias, 2016. "The Power of Inaction or Elite Failure? A Comment on Woll' "The Power of Inaction", " *Accounting, Economics, and Law: A Convivium*, De Gruyter, vol. 6(1), pages 31-45

Thiemann, M. 2013. Book reviewed: B. Clift and C. Woll (Eds.). 2012. *Economic Patriotism in Open Economies*. London: Routledge, 2012. In *Accounting, Economy and the Law* (3), vol. 3, pp. 1-6.

Thiemann, M. 2012: Book reviewed: C. Bessy, T. Delpuch and Jérôme Pélisse. 2011. *Droit et régulations des activités économiques: perspectives sociologiques et institutionnalistes*. In *European Economic Sociology Newsletter* 13 (vol. 4), pp. 51-53

Thiemann, M. and P. Mader. 2012. The End of Financialization? Review of Krippner's (2011). *Capitalizing on Crisis*" and Amato and Fantacci's (2012). *The End of Finance*. In *European Economic Sociology Newsletter* Vol. 13, Number 3, pp. 36-39.

Thiemann, M. 2009. Is the whole more than the sum of its parts? Review of *Netzwerkanalyse und Netzwerktheorie – Ein neues Paradigma in den Sozialwissenschaften*, VS Verlag fuer Sozialwissenschaften, Wiesbaden 2008. In *Proto-Sociology*, vol. 26/2009, pp. 262-271.

Non-peer reviewed articles and Working Papers

Endrejat, V. and M. Thiemann. 2018. Reviving the shadow banking chain in Europe.

Regulatory Agency, Technical complexity and the Dynamics of Co-habitation. SAFE Working Paper No. 222

- Ibrocevic, E. and M. Thiemann. 2018. All Economic Ideas are Equal, but Some are more Equal than Others: A Differentiated Perspective on Macroprudential Ideas and Their Implementation. SAFE Working Paper 214
- Thiemann, M. and M. Nagel. 2018. Mobilising Private Investment: Development Banks and the Promotion of Public-Private Partnerships. Bread for the World Working Paper
- Friedrich, Jan and Matthias Thiemann. Capital Markets Union: the need for common laws and common supervision. Vierteljahrshefte zur Wirtschaftsforschung volume 86 (3), pp. 5–20
- Thiemann, M. and P. Volberding. 2017. Mobilising Private Investment: Development Banks and the Promotion of Public-Private Partnerships. Bread for the World Working Paper
- Thiemann, M. 2016. Capital markets union and the threat of regulatory competition Foundation for European Progressive Studies, September 2016
- Thiemann, M. and J. Friedrich. 2016. Drawing the line: The Political Economy of Off-balance sheet financing. European Economic Sociology Newsletter. Vol. 17, Iss. 2, pp. 7-16
- Aldegwy , M. and M. Thiemann. 2015. Stuck in Pseudo Optimization? The shift to macroprudential regulation and the dangers of pseudo-optimization. *Papers in Evolutionary Political Economy*. Peer-reviewed Working Paper Series, p. 1-39
- Thiemann, M. and M. Birk. 2015. The Regulation of Repo Markets: Incorporating Public Interest through a Stronger Role of Civil Society. *Sustainable Architecture for Finance in Europe White Paper* No. 25
- Thiemann, M. and S. Griffith-Jones. 2014. Limiting financial crises: Demands upon the new financial architecture. *Bread for the World Analyse* 47.
- Godart, F., F. Caravetta and M. Thiemann. 2013. Task Complexity and value orientation: Exploring the Moderators of a social dilemma in social networks. *Academy of Management Best Paper Proceedings*
- Thiemann, M. 2013. In the Shadow of Basel: How Competitive Politics Bred the Crisis. *FEPS Working Paper*, pp. 1-43
- Griffith-Jones, S., S. Spiegel and M. Thiemann. 2011. Recent developments in regulation in light of the global financial crisis: implications for developing countries. *IPD Working Paper*
- Thiemann, M. 2011. Regulating the off-balance sheet exposure of banks pre- and post crisis. *FEPS Working Paper*, pp. 1-43.
- Griffith-Jones, S., Silvers, D. and M. Thiemann. 2011. Turning the financial sector from a bad master to a good servant; the role of regulation and taxation. *Fondations Européennes Progressiste Queries* No 1 (4)/2011, pp. 16-38.

Griffith-Jones, S., Thiemann, M. and L. Seabrooke. 2010. Taming Finance by Empowering Regulators-A Survey of Policies, Politics and Possibilities. *Discussion Paper UNDP-Poverty Reduction Programme*, pp. 1-35.

Professional Service

Associate Editor of the journal Accounting, Economics and Law (September 2017 onwards)

Ad-hoc Reviewer for: American Journal of Sociology; American Sociological Review, Socio-Economic Review; Review of International Political Economy; Journal of European Public Policy; Journal of Common Market Studies, Regulation and Governance, Journal of Public Policy, Journal of Institutional Economics; Leviathan; Accounting, Economics and Law; Competition and Change, Max Planck Working Papers

Organization of Workshops and Conference Panels

Organizer of Session on National Development Banks in Europe, together with Olga Mikheeva, European Association for Evolutionary Political Economy, Warsaw, September 2019

Organizer Special Session on Regulatory Arbitrage. SASE New York 2019 Network Accounting, Economics and Law

Co-Organizer of two Workshops on the Rise of National Development Banks in Europe post-crisis, October 2018 Sciences Po Paris; May 2019 Bruxelles

Co-Chair ECPR Standing Group EU Conference, Sciences Po Paris, 13-15th of June 2018, Called “Contradictions – Whither the Political, Economic and Social Integration of Europe? “ Section 9: The Political Economy of the Euro Area and its Future (with Waltraud Schelkle and Hans-Helmut Kotz)

International Workshop on Macprudential Regulation after the Crisis. Institute for Advanced Studies, Paris. September 2017

Co-Organizer of a SASE Mini-Conference on “The Stock-Exchange as a crumbling institution of capitalism”, Chicago 2014, together with Marie Laure Djelic, Paul Lagneau Ymonet and Angelo Riva

Administrative Services

Responsable pour l'axe Economie Politique, CEE	01/09/2018 -onwards
Deputy Managing Director of the Institute for Sociology, Goethe University Frankfurt	10/2014-09/2015

Awards, Grants and Fellowships

May 2019-November 2020 Who is leading the change? Changes In Economic Discourse on finance post-crisis, ESRC Grant	75000 Pounds
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April 2018-June 2019: The rise of national development banks in Europe post-crisis: Potential and Pitfalls (FEPS)	35000 Euros
February 2017-June 2017 Marie Curie Fellow at the Institute for Advanced Studies Paris	25000 Euros
January 2017-December 2018 Regulatory Competition and the Increasing Fragility of CCPs, SAFE Center Research Grant	80.000 Euro
January 2016 December 2018, Member of the Research Project “Quantitative Easing and Financial (In)Stability” Volkswagen Foundation	770.000 Euro (45.000 Euro for my project)
January 2016-December 2018 Co-PI for the project: Systemic risk and network connectivity SAFE Center Research Grant	300.000 Euro, (114.000 Euro for my project)
February-March 2016: DAAD Stipend Visiting Fellow, University of Pennsylvania, Political Science Department;	
December 2015-November 2016 Institute for New Economic Thinking, “Shadow Banking with a government Put”	35.000 Dollars
July 2014-August 2015 Young Researcher Support Grant, Goethe University	2.400 Euro
June 2014-December 2015 SAFE Center Research Grant, “Do Basel III and the Dodd-Frank Act Reflect the Academic Debate on Macro-prudential Regulation?”	54.000Euro
July 2014-December 2015 SAFE Center Research Grant, “The adaptation of off-balance sheet financing techniques in leasing after the financial crisis”	12.800 Euro
August 2013: Best Paper Proceedings for the Paper Task Complexity and Value Orientation. Academy of Management Conference	
October 2012: International Sociological Association RC02 / European Sociological Association Graduate Paper Award for “Accounting for the Financial Crisis”	500 Dollar
September – December 2011: Columbia University Travel Fellowship	
May – September 2011: Visiting doctoral student, Max Planck, Cologne, Germany and June – September 2010	
September 2010 – May 2011: Science Po-Columbia University Exchange Fellowship, Paris, France	

- 2007 – 2012: Paul Lazarsfeld Scholarship Columbia University,
New York, USA
- 2005 – 2006: DAAD Fellowship 1-year Exchange with the New School
University, New York, USA
- 2004 – 2007: Graduate Student Stipend Rosa Luxemburg Foundation
for Outstanding Studies

External Research experience

December 2018	Consultancy for the UNDESA regarding the role of Development Banks in achieving Sustainable Development Goals
January 2016- December 2016	Consultancy for Bread for the World on the role of Development Banks in Capital Markets
January 2015- December 2015	Consultancy for Foundation for European Progressive Studies regarding the Capital Markets Union project of the European Commission
October 2013- October 2014	Consultancy for Bread for the World on regulatory initiatives in financial markets post-crisis
August – September 2011:	UN Consultancy for the conference “Managing the Capital Account and Regulating the Financial Sector: A developing country perspective”, August 23-24, 2011 Rio de Janeiro, Brazil, Preparation of a background note and preparation of final report (together with Prof. Stephany Griffith-Jones)

Teaching Experience

As Professor

B.A.: Varieties of Regulatory Capitalisms

BA: *Money and Values*.

M.A.: Governance and Accountability of Finance in an Era of Globalization

MA.: Business and Society (lecture class, jointly with Marie Laure Djelic)

M.A.: Introduction into the Sociology of Money, Banking and Finance,

MA: The Social Construction of the Economy

MA: Central Questions of Classical Economic Sociology,

MA: Recent Developments in Economic Sociology

MA: Regulation of financial markets: Input from political economy and sociology

As Teaching Assistant (teaching weekly seminars)

Multidisciplinary Approaches to Development (Columbia University)

Organizing Innovation (Columbia University)

Evaluation of Evidence (Columbia University)

Historical Foundations of Political Economy (New School for Social Research)

Reasons for American Supremacy (New York University)

Invited Presentations

- 27.01.2020 Taming the Cycles of Finance? Warwick Critical Finance Association; International Political Economy Department
- 08.01.2020 Taming the Cycles of Finance? Max Planck Institut for the Studies of Societies, Cologne
- 07.01.2020 Taming the cycles of finance? Forum for international Science, Bonn
- 09.09.2019 Regulatory Arbitrage in shadow banking. LSE Financial Markets Working Group presentation
- 14.02.2019 The untenable independence of Central Banks. Oxford University Nuffield College, Symposium on the Politics Central Banks Do
- 12.12.2018 The regulation of Shadow Banking in Europe post-crisis. Princeton University
- 09.12.2018 The regulation of Shadow Banking in Europe post-crisis. Columbia University
- 06.12.2018 The Role of National Development Banks in Europe. UNDP New York
- 12.10.2018 The Role of National Development Banks in Europe. OECD Paris
- 08.08.2018 The Role of National Development Banks in Europe. Romanian National Central Bank
- 06.11.2017 And nevertheless it moves: Spill-overs of unconventional monetary policies and their internalization within the transnational discourse on central banking. Friedrich Ebert Foundation Shanghai
- 23.06.2017 Is resilience enough? Workshop on Central Banks post-crisis. Scuola Normale Superiore di Pisa, Firenze
- 17.01.2017 Open for Business-Entrepreneurial Central Banks and the Cultivation of Market Liquidity. Edinburgh Sociology Department
- 11.02.2016 Stitched on the Edge. London School of Economics, Sociology Department
- 27.01.2016 Regulatory Competition and the Impact of the Crisis on Europe. Sciences Po Paris
- 04.09.2015 Shadow Banking: What is it, why does it matter and how is it reformed? Meeting of NGO initiatives to lobby the G20, Ankara
- 04.05.2015 Reforming Finance? The Capital Markets Union Project, FEPS Brussels
- 06.02.2015 Light and Shade of the Banking Union and the New European Financial Architecture, Rome, Foundation for European Progressive Studies
- 20.10.2014 United Nations Financing For Development Conference, New York
- 08.09.2014 Copenhagen Business School
- 17.06.2014 Bread for the World Conference on Global Financial Regulation
- 01.10.2012 Max Planck Institute for Collective Goods, Bonn, Germany
- 10.02.2012 London School of Economics, Center for the Analysis of Risk and Regulation
- 22.12.2011 Goethe University Frankfurt/Main Sociology Department
- 06.12.2011 Boston University Department of International Relations

Presentations (selection)

- 2019 SASE, New York, presentation on Attitudes towards financial regulation post-crisis
- 2019 Council of European Studies Madrid, Presentation on national development banks in the EU
- 2018 ECPR summer conference Sciences Po. Reconstructing the Shadow Banking Chain (with V. Endrejat)
- 2018 And nevertheless it moves: Spill-overs of unconventional monetary policies and their internalization within the transnational discourse on central banking. Waseda University Tokyo
- 2017 SASE Lyon: Open for Business: Entrepreneurial Central Banks and the Cultivation of Market Liquidity
- 2015: A Macroprudential paradigm shift? The evolution of the concept of systemic risk. Genoa, European Association for Evolutionary Political Economy
- 2015: The Evolution of the Macroprudential regulatory paradigm: cosmetic changes or paradigm shift? (Siegen University, Workshop on Reconsidering Economics)

- 2015: The Evolution of the German Leasing Market: A field level perspective (. Society for the Advancement of Socio-Economics Annual Conference London)
- 2014: From Micro- to Macroprudential Regulation. Jena Conference on the Sociology of Economics (with Mohamed Aldegwy)
- 2014: Shadow Banking and the Tragedy of the Commons. Society for the Advancement of Socio-Economics Annual Conference Chicago
- 2013: Accounting for the Financial Crisis. The struggle over accounting standards for banks in Germany, France and the Netherlands. American Sociological Association Official Session
- 2012: Accounting for the Financial Crisis. The struggle over accounting standards for banks in Germany, France and the Netherlands. Conference at the Higher School of Economics Moscow, titled: Embeddedness and Beyond: Do Sociological Theories meet Economic Realities
- 2012: “The national regulation of global markets - the case of Asset-Backed Commercial Paper”. Dublin Workshops on Financialization, Consumption and Social Welfare University College Dublin, May 24th-25th
- 2011: “Does new international regulation help crisis prevention? Implications for Middle Income Countries” UNDESA conference “Managing the Capital Account and Regulating the Financial Sector: A developing country perspective”, August 23-24, 2011, Rio de Janeiro, Brazil, together with Prof. Stephany Griffith-Jones and Shari Spiegel
- 2011: “Accounting for Risk”, Bringing Organizations Back In: Bridging Economic Sociology and Political Economy, *Sixth Max Planck Summer Conference*, Schloss Ringberg, Tegernsee, Germany
- 2009: “Rethinking the State-Finance Nexus: The Pursuit of Domestic Policies Through International Finance”, *Re-Thinking Marxism* conference, Amherst, MA

Languages

German	Native
English	Functionally native proficiency
French	Functionally native proficiency
Romanian	Working proficiency
Spanish	Elementary proficiency
Russian	Elementary proficiency

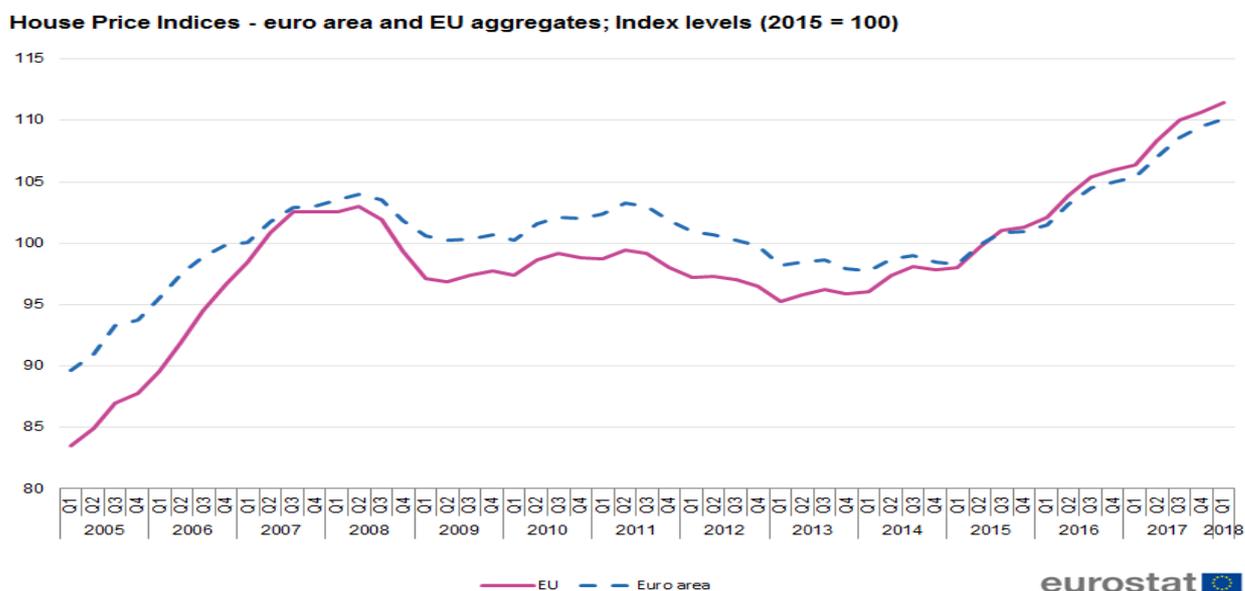
Taming the Cycles of Finance: Ideational change after the financial crisis and its impact on financial regulation

Abstract

Financial crises over the last decade have shaken the Western world to its core. And yet, prevailing wisdom suggests that these have been status quo crises in terms of the regulation of finance, evoking only incremental if any change. This work contradicts these conclusions and claims that they are premature and ignore the different temporalities that underlie paradigmatic change, moving from a new vision of finance to its transformation into policy devices to their final use in applied policy making. Opening up the blackbox of ideational change, this habilitation argues that fundamental changes in the economic analysis of finance have occurred during the last decade, feeding into the construction of policy devices. They allow regulators to measure and regulate systemic risks, and just recently have come into use. This work therefore seeks to better understand this longer-term trajectory of change in economic ideas, their translation into policy devices and the political-institutional factors conditioning their use. Innovatively combining micro-level research on regulatory science and the sociology of economics with historical and discursive institutionalists' analyses of institutional change on the macro-level, this habilitation examines the pathways of these regulatory ideas from economics into bureaucratic space into politics. To do so, it employs expert interviews, document analysis, machine-based learning quantitative text analytical tools, bibliometric and citation network analysis. Focusing on the role of economists and economics in policy paradigm shifts, the proposed multi-dimensional approach advances research in political economy and public policy studies.

Chapter 1: Introduction

How have financial reforms after the 2008 financial crisis transformed the financial system and its impact on capitalist economies? In particular, in how far have post-crisis reforms affected the procyclical character of the financial system, which has been characterized as a system of compounding bubbles, moving from boom to bust to the next boom (Blyth 2008)? As the frequency and severity of financial booms and busts have increased over the last four decades (Borio 2012) in accord with the secular expansion of financial activities called financialization (Foster and Magdoff 2009), few if any questions are more pertinent to our time. The great recession has severely shaken the capacity of democratic societies to deal with any future financial crises stemming from asset price appreciation. At the same time, ongoing processes of asset price appreciation, in particular with respect to real estate breaching pre-crisis levels in the EU (s. graph 1 below), increase inequality (Turner 2015). In this context, the fate of macroprudential regulation is of great importance given that it constitutes the technocratic attempt to limit the crisis proneness of the financial system as well as its cyclical character (Crockett 2000).



Graph 1.1 (House Price Indices Eurostat)³⁸

³⁸ Available at http://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_price_statistics_-_house_price_index. For a similar, albeit less extreme finding on the global level, s. <http://www.imf.org/external/research/housing/>

Developing largely outside of the mainstream of Western regulatory thinking before the crisis (Borio 2003b), macro-prudential thinking experienced a sudden and unexpected rise after the failure of Lehman and the ensuing recession (Baker 2013a). Rhetorically embraced by the G20 at the 2009 summit as the political answer to the crisis (Lombardi and Moschella 2017), it aims at complementing the focus on individual institutions of the micro-prudential approach. Employing a systemic view, it seeks to increase the resilience of the system as a whole and to lean against the wind as credit booms accelerate (Baker 2013a, b, 2014).⁴

Macro-prudential Regulation: The rise of a new paradigm as a consequence of the crisis

The macro-prudential approach made a first appearance on the international regulatory scene due to a speech by the Chairman of the Financial Stability Forum³⁹, Andrew Crockett in 2000 (Crockett 2000), where he put macro-prudential regulation on the policy agenda (Tarullo 2013b). Spelling out the principles of macro-prudential regulation, he explicitly introduced the concept of the financial cycle as the focal point of macro-prudential regulatory action. Described as wasteful in the upswing (when surging asset prices feed and are fed by credit expansion) and painful in the downswing, the problem with financial cycles is that they are evident only ex-post to micro-prudential risk management systems of banks (Crockett 2000, 6). Individual market agents, he argued could only evaluate differential, but not overall risks related to the financial cycle, providing the basis for a clear mandate for macro-prudential regulators to mitigate the financial cycle. As Crockett put it,

In terms of the measurement and mitigation of risk over time, **the key challenge is to take better account of the financial cycle that underlies financial instability**. If risk increases in upswings and materialises in recessions, it stands **to reason that defences should be built up in upswings so as to be relied upon when the rough times arrive**. This would strengthen institutions' ability to weather deteriorating economic conditions, when access to external financing becomes more costly and constrained. **Moreover, by leaning against the wind, it could reduce the amplitude of the financial cycle, thereby limiting the risk of financial distress in the first place**. (Crockett 2000: 6, emphasis mine)

³⁹ The Financial Stability Forum was an international forum established in 1999 after the Asian Financial Crisis to facilitate central bank coordination. In the aftermath of the

In this quote, the two intermediate objectives of macro-prudential regulation with respect to the financial cycle already come to the fore. On the one hand, its goal is to increase the resilience of financial institutions to accumulating risks in the boom. On the other hand, its goal is to temper these risks themselves by leaning against the wind. It is in this context, that the more ambitious part of macro-prudential regulation lies, maybe best formulated by Persaud (2014), “[t]he critical task of the macro-prudential central banker is as a risk manager to the financial system” as a whole (ibid, 161).

In the years following the speech by Crockett in 2000, economists at the Bank for International Settlement (BIS) were seeking to measure and operationalize the notion of the financial cycle (Borio 2000, Borio 2003a), suggesting indicators for it as well as potential mitigating policy tools (Borio and Lowe 2002). In their quest, they sought to develop an encompassing policy framework to mitigate systemic risks, pointing to interventions both in the cross-sectional dimension of systemic risk and the time dimension. While their advocacy on Basel II remained unheard and their analysis largely ignored, with much of the criticized pro-cyclical reliance on private risk management systems becoming a central part of Basel II, their work helped to build a rather coherent framework that included the development of first indicators of the financial cycle (such as the credit to GDP gap, Borio and Lowe 2002). Hence, when at the height of the crisis, the leaders assembled in the newly founded G20 were looking for a novel policy framework to demonstrate their willingness to act decisively, they could turn to the macro-prudential framework (G20 2009). The adoption of the macro-prudential paradigm, at least its rhetoric was an answer by policy makers to the public outrage generated by the financial crisis (Baker 2013b, Helleiner 2014, Lombardi and Moschella 2017).

One decade after the financial crisis the question arises: has there been **substantial change** to regulation that it finally can **tame the cycles of finance**? Rarely, if ever have the conditions for policy change been more favorable than after the complete **failure of the pre-crisis policy paradigm** governing financial markets (s. e.g. Turner report 2009). The huge costs of bail-outs and recessions

caused by the crisis (Woll 2014) spurred a radical rhetoric by policy makers and politicians at the global level. Diagnosing the need for **radical change** to financial regulation, they were pledging to install a **new macroprudential paradigm** to tame the financial cycles shaking the world economy (Moschella and Lombardi 2017). And yet, despite the evident failure of the reigning policy paradigm (Langley 2014) and its subsequent disavowal by policy makers, the political science literature comes to a **sobering assessment**: rather than radical transformation some had hoped for or expected (Baker 2013a, b), the regulatory developments post-crisis are largely seen as **incremental**, engaging in **paradigm repair rather than fundamental change** (Eichengreen 2013, Muegge 2013, Mirowski 2013, Moschella and Tsingou 2013, Helleiner 2014, Baker 2018, Gabor 2015, 2016a, for an outlier, s. Wilf 2016).⁴⁰

In line with this assessment, macroprudential policies, the only real innovation in financial regulation after the crisis have been identified as an **incremental project**, which while challenging the epistemic authority of the market, stays far behind initial expectations (Underhill 2015, Stellinga and Muegge 2017, Baker 2018). It points out that this new approach to regulation, in particular its anti-cyclical dimension has been facing severe challenges, both internally in the policy community as well as externally. Internally, institutional capability to limit the financial cycle had to be generated that extended beyond the already given. New policy settings had to be set up against the interests and ideas of entrenched micro-prudential regulators within central banks and financial regulators (Moschella and Tsingou 2013), while new instruments needed to be developed and calibrated. Externally, as Baker points out, the political economy of such macro-prudential regulation added further challenges, as constraining the financial cycle in the upswing requires unpopular measures such as credit-rationing for non-credit worthy borrowers, thereby limiting economic growth in the short-term (Baker 2015). Most pessimistic observers see it even diminished to a small, almost

⁴⁰ While there has been a significant **expansion of public authority** over markets, the **content and purpose** of public interventions are seen to **remain in line with the pre-crisis paradigm** (Pagliari 2012, 61).

powerless movement inside of technocratic circles due to a lack of capacity to relate and engage the wider public on issues of financial stability (Baker 2018).

This habilitation takes issue with this assessment and argues that this expectation of quick paradigmatic change betrays a **simplistic understanding** of the **scientific basis of policy action on behalf of political scientists operating in the framework of policy paradigm change** (Hall 1993, Baker 2013a; for a similar critique for the case of the IMF post-crisis, s. Clift 2018, p. 50). It thereby ignores the **different temporalities** inherent in the maturation process of new regulatory frameworks (cf. Braun 2014), **from ideas to new policy devices to policy frameworks in action**. The central dynamics of this process remain hidden to date, as existing scholarship only focused on the discursive commitments to the new macro-prudential approach at the top of the political and technocratic levels (Baker 2013a, b, 2015, Stellinga and Muegge 2017, Stellinga 2019). However, it has neglected the substantiation of these promises through the practical work of applied economists over time.

By largely **blackboxing** the work that it takes to transform ideas into a viable policy paradigm, the current approach thereby deprives itself of the possibility to observe the longer-term changes in the ideational infrastructure undergirding policy makers' actions and its **potential for policy change**. Ignoring the process of translation of economic ideas into policy devices (Hirschman and Popp Berman 2014) that **shape how regulators see, know and regulate finance** (Black 2013, Fligstein et al 2017), it is condemned to a **dichotomous view** on paradigm shifts, without any coherent theory of the build up towards a paradigm change.

In summary, I maintain that in its current form, the study of policy paradigm change in political science suffers from:

1. Insufficient attention of the work that goes into the production of the ideational infrastructure that underlie policy paradigms
2. neglect of economic ideas, models and “facts”, their processes of generation and translation into policy devices and how that opens up the possibility for policy change

3. A binary set-up of paradigm change or no paradigm change which lacks a coherent theory of the build up towards a paradigm change

This shortcoming stems from a general weakness of the political science approach to paradigm change, which resides in its increasingly narrow concentration on the realm of the political (Braun 2014 52, 69⁴¹). Zooming in on the dynamics within the realm of politics and (technocratic) policy making, this literature pays insufficient attention to the professional preconditions for economic ideas to gain prominence and the pathways for their translation into the bureaucratic and political space (Mudge and Vauchez 2012). This work takes issue with this “blackbox” view of paradigm change, in which it seems reasonable to assume that policy makers only need to recant from old paradigms and embrace new policy goals to bring about paradigmatic change, as it ignores that the strength of policy paradigms resides in the **socio-technical policy devices** that policy makers use to perceive of the issues they want to govern, and which help them choose their preferred way of action (Hirschman and Popp-Berman 2014). It is these **models, systems of risk measurements and their metrics** (such as early warning systems) – embedded in the routine of policy making – that are at the **center of the power of policy paradigms**. These tools integrate a vision of how finance works and interacts with the economy, a formalization/ objectification of these links and a measurement system that allows policy makers to anticipate the risks that emanate from finance and make deliberate ex ante choices of intervention. Changing the official discourse on finance without a change in these policy devices, I argue, means little.

Previous work on macroprudential regulation as a possible paradigm change for financial regulation, by largely **blackboxing** the work that it takes to transform ideas into a viable policy paradigm, has deprived itself of the possibility for advances in explaining the conditions for policy change. It ignores the **process of translation of economic ideas into an actionable policy framework**, which is of

⁴¹ Braun, citing Watson speaks of an “econophobia” in political science analysis (Braun 2014, 52). He writes: “when political scientists talk about macroeconomics, they usually focus on the translation of economic ideas into ‘policy paradigms’ – a process in which political interests are typically granted precedence over the arcane nuances of macroeconomic discourse.” (ibid, 69)

utmost importance, as it is the materialization of these ideas in material artifacts that shapes how these ideas impact markets. The transformative power of new ideas resides exactly in the changes to risk models and metrics that are embedded in the routine of policymaking (Hirschman and Berman Popp 2014)⁴². Overlooking these artifacts, the mainstream assessment thereby ignores the substantial **empowerment** of the macroprudential paradigm that stems from the work of applied economists in central banks and international organizations over the course of the last decade. Tasked to operationalize this initially very vague new approach to financial regulation, they had to **generate measures of financial cycles and systemic risk** as well as **models portraying the trade-offs** involved in policy interventions, all of which stood very much in contrast to the pre-crisis views.

This habilitation argues that it is only today, more than 10 years after the crisis that this **translation process from ideas into policy devices** has come to a (preliminary) conclusion and can be fully analysed by researchers for its impact on public policies. Prior investigations have noted an absence of tools and policy devices (Baker 2013a,b, Baker 2015), but have seen this rather as a surprise rather than the inevitable outcome of a catch-up process from rhetorics driven by the need to present a political reaction to the public to a way of implementing this new approach (in a similar vein, s. Lombardi and Moschella 2017). The macroprudential rhetoric, while to a certain degree providing a coherent vision of financial markets as cyclical (s. Crockett 2000, Borio 2003b), had little to nothing to offer in terms of policy devices and furthermore a very limited underpinning in terms of mainstream economics. To study this process of translating **ideational change** into actual new risk metrics and models of financial markets and its **effects on policymaking**, this habilitation proposes an innovative **interdisciplinary approach**.

It combines recent advances in the sociology of knowledge (Shwed and Bearman 2010, Fourcade et al 2015, Fligstein et al 2017)- which provide us with the tools to study the emergence of these models and systems of measurement- with the political scientists' focus on the **institutional**

⁴² For a general statement on the importance of such market devices in the functioning of financial markets, s. MacKenzie 2009, Callon et al 2007

preconditions for the political power of economic ideas (Hall 1989a). Such a novel approach allows an encompassing, cumulative view on policy paradigm change that connects the immense academic and bureaucratic work flowing into the **ideational infrastructure** of policy frameworks with the **administrative** and **political viability** of these ideas. This multi-dimensional view pays attention to the **professional preconditions for economic ideas to gain prominence** and the **pathways for their translation into the bureaucratic and political space**. It permits both a better cumulative account of when and where paradigm shifts do occur and a more nuanced understanding of where change is now and possibly at which level it is stuck. By focusing on the role of economists and economics in paradigm shifts, this richer, more complex approach, will advance research in political economy and public policy studies.

Based on this analytical framework, this project **unravels the blackbox by tracing the creation, stabilization and use of new policy devices** post-crisis. Those devices were developed by economists, both within and without central banks, seeking to identify and govern the risks emanating from finance in a way that **made sense of the crisis and sought to prevent its repeat**⁴³. Such changes required an enormous effort in economics proper, in the sense of theorizing, modelling and measuring, to overcome the old view of efficient markets and replacing it with a vision that brings into view the fragilities and excesses inherent to the financial systems. In turn, this vision needed to be translated into **statistical devices to make these risks measurable** and models to reveal the trade-offs policy makers face. To understand which tools have been implemented and how they change the regulation of finance, I will combine micro-level research on regulatory science and the sociology of economics with historical and discursive institutionalists' analyses of institutional change on the meso- and macro-level. By comparing the **variance in** the processes of **translation of ideas into tools**, of **tools into policy frameworks** and of **policy frameworks into policy action in the US, UK**

⁴³ For the crucial role that crisis interpretations play in setting a path for crisis response, s. Blyth 2002, 2013, Widmaier et al 2007

and within the Eurozone, this habilitations allows us to get a much more nuanced, bottom up understanding of the changes in the post-crisis governance of finance.

The objective of the project is to **unfold the different levels** involved in changes in policy paradigms and analyze their **multi-dimensional character** hidden by the blackbox approach. It sets out to explore the sequencing and feedback loops between three different fields: 1. the field of transnational economics, 2. the national administrative field in its interaction with relevant transnational organizations, as well as 3. the field of domestic Politics. This more complex approach is needed because it is in the **field of economics**, where the devices for measuring and mitigating systemic risks have been developed, bestowing upon them **economic viability**. But it is in the **administrative field**, where they are calibrated and transformed into actual policy instruments, gaining **administrative viability**. And it is further in the **political field**, where final decisions are taken on how to constrain financial activities, proving the **political viability of these ideas**.

With respect to the unfolding of the paradigm, it is important to emphasize that there are evident feedback loops between the three dimensions, which occur between adjacent fields. The project therefore investigates the links between **economics as a regulatory science** and **bureaucratic interventions**, between economists in academia and in bureaucracies engaging in both **scientific contributions** as well as constructing the **policy devices** needed to see and contain the cyclical systemic risks emanating from finance. Lastly, it focuses on the use of these devices by technocrats and political actors, when they engage with the policy recommendation emanating from this new policy paradigm. Exploiting the variance in the processes of the **translation of ideas into tools, of tools into policy frameworks and of policy frameworks into policy action**, this project will allow us to get a more nuanced understanding regarding the changes to the governance of finance that have taken place post-crisis.

Outline of Habilitation

The question this habilitation seeks to answer is **how this new vision of finance** as fragile and cyclical **impacts** the way policies regarding financial markets are formulated. To trace the effect of these ideas on the regulation of finance, the book combines the micro-sociological analysis of the **construction of economic models and their use in practice** (the actual creation of the macroprudential governability paradigm) with the historical institutionalist emphasis on the **viability of economic ideas** in the administrative and political realm. As the literature on the political power of economic ideas tells us, the presence and prominence of economic ideas is a necessary, but not a sufficient condition for these ideas to become capable of influencing policy action. I will first study the evolution of economic discourses that see **finance as endogenously instable** and that focus on its **interplay with macro-economic variables** from pre- to post-crisis (chapter 3 and 4 and 5). I will then combine the findings regarding the **evolution and prevalence of these new ideas** with an analysis of their **translation into policy frameworks** in the institutional sphere of the state institutions charged with implementing them (chapter 6 and 7), as well as the interaction of the global and the national level (chapter 8, 9). Doing so, this habilitation seeks to capture which economic ideas became politically powerful, how and why.

Based on an analysis of the available datasets on macroprudential policy frameworks (Edge and Liang 2019, Cerrutti et al 2017), I engage in a comparative case study, using a most diverse case study design to increase the representativeness of my findings (Seawright and Gering 2008). I focus on three substantially different cases, the Eurozone (including a focus on the interaction between the ECB as the new center of macroprudential regulation and Germany over the shape of national macroprudential regulation), the US, and the UK. These cases have a high centrality in the realm of financial markets and all of them are Western economies. Hence, they were all, albeit to different degrees directly involved in the transatlantic crisis of 2007-2008 (Bell and Hindmoore 2015) and they all took part in the subsequent diffusion of macroprudential frameworks over the last decade.⁴⁴

⁴⁴ Economies in developing countries have had had exposures to financial crises more often and before 2008, which is why for these countries macroprudential regulations are more common and widespread (Cerrutti et al 2017).

Yet, they have substantially different governance traditions and very different institutionalized frameworks for macroprudential policies (centralized vs decentralized, politicians involved vs. mere technocratic decision making). In these case studies, I focus on the translation of the transnational discourse on systemic risks and macroprudential regulation into local requirements. I hypothesize that different institutional structures of financial systems and financial system supervision and the problems of urgency and feasibility which originate therefrom will have an impact on this translation, as will political considerations of administrative leaders. As table 1 below shows, these worksteps represent the logical relationship of precondition for the creation, stabilization and use of policy devices.

	Economic Viability	Administrative Viability	Political Viability
Creation of Policy Devices (Tracing Ideas and the Thought Collective)	pre-condition for	Feedback loop to economic viability	
Stabilization of Policy Devices (Installation of Policy Framework, Organizational, Meso-Level Analysis)		precondition for	Feedback loop to administrative viability
Use of Policy Devices			WP3

Table 1.1: Tracing the Creation, Stabilization and Use of Policy Devices

Tracing the **creation, stabilization and use of these policy devices**, I am in particular interested in exploring the zones of overlap, that is to say how do changes in economics and the creation of regulatory devices interact, how does the ascendance of technocrats linked to the creation and stabilization of policy devices affect the interaction of technocrats and politicians. To do so, I employ a **mixed methods approach**, using both quantitative tools, including topic modeling, sequence analysis for careers and qualitative tools, such as expert interviews and qualitative discourse analysis. Their exact application will be explained below.

Work Stream 1: Tracing the ideational origins of macroprudential governance/ the macroprudential paradigm

The focal point of chapters 3, 4 and 5 are the **ideational origins** of the macroprudential governability paradigm which underlie the implemented policy devices. A comparison between the pre- and post-crisis discourses about appropriate macroprudential tools allows me to outline those ideas which maintain or newly gain prominence post-crisis, then to establish in a second step how they relate to macroprudential policy frameworks. Questions to which answers are sought at this stage are who in terms of occupation (Academics or International Organizations or central banks) is working on models of systemic risk? With whom do they publish and whom do they cite? What are the central concepts which keep this new vision of how the financial systems operate together? Who pushes for the inclusion of these considerations of systemic risk and the variables of credit, finance and financial instability in macro-economic models? Where do they publish in terms of journals? What is the reputation of their home institution in economics?

To detect the different “thought collectives” (Fleck 1935) as well as the bundle of conceptual ideas and empirical links that they push forward I will combine **Author Topic Modelling** (Rosen-Zvi et al 2004, 2009, Wolfram 2016), **Structural Topic Modelling** (Blei et al 2003, Blei and Lafferty 2007, Roberts et al 2014), **bibliometric analyses**, such as co-citation patterns with citation network analysis. Author Topic Modelling is one of the latest developments in algorithmic text analysis based on machine learning, which not only detects common topics in large corpi of texts, but also the authors which are affiliated with these topics. Co-citation analysis allows to detect which network cliques of authors are cited jointly, whereas citation-network analysis allows for the detection of central authors⁴⁵, network cliques of co-authors that cluster around topics as well as those cliques which remain rather isolated. The analysis will be based on a compilation of different databases on the topic

⁴⁵ Both central because they connect different cliques of authors/topics as well as due to the sheer amount of citations

of systemic risks emanating from finance, such as the open source RePeC database, which permits the use of extensive meta-data as well as EBSCO HOST database for academic economic papers. Given that Google Scholar refuses the use of crawlers, these databases are best suited for the task at hand. While they are mostly in English, this problem is mitigated by my case selection of Western countries as well as the fact that the dominant language in economics is English. The database will be complemented with data on authors' occupation and their career patterns (sociographic data).

Based on these methods, I can **identify the cliques in the citation network** that are coherently pushing for specific ideas of the important fragilities in financial systems and their measurement. This allows for an orientation in the ideational space on financial fragilities. Thanks to the metadata in the databases, I can complement these analyses with an analysis of the **characteristics of these networks**, including **where these authors are employed**, how their careers looked like in terms of career patterns as well as what their reputation in the field of intellectual production is. I conceptualize **economics as an intellectual field** in which academic economists are increasingly challenged in their epistemic authority by economists working in central banks and International organizations (Whitley 2000, Marcussen 2006, 2009, Ibrocevic and Thiemann 2018). The ongoing **scientization of central banks** means that much of ideational work is today done in central banks. These actors have gained an increasingly large footprint in the field of discourse on finance, banking and money (Mirowski 2013, 193, Mudge and Vauchez 2016). First research results show that for the advance of this problematization, economists operating in linked ecologies (Abbott 1988) between bureaucracies and academia (called boundary walkers, Ibrocevic and Thiemann 2018) are crucial (s. also Thiemann et al 2018b). Establishing which agents intervene in the economic discourse on financial fragilities allows to establish in how far and on which topics applied economists in central banks interacted with academics, and where they were largely on their own.

Against this backdrop a sample of experts for interviews (Weiss 1995) was selected which were used to both test the results of quantitative analysis and to gain a more fine-grained understanding of the establishment of regulatory science and how it became accepted in central banks. The focus is placed on the **modes of interaction between academic economists and economists in central banks**. At the same time these interviews offered a unique understanding of how subjective experience influences which academic insights are included in central bank discourses and which not, thus drawing a clear picture of the establishment of regulatory science. These insights will be used for further analysis of the set-up of macroprudential policy networks in central banks as well as their interaction with the monetary policy frameworks.

Work Stream 2: The production of domestic and regional macroprudential regulatory devices to measure and mitigate systemic risks

Transforming economic ideas into regulatory devices for seeing, measuring and intervening in financial markets, has been a transition which allowed central banks to develop policy frameworks to address what they perceive to be systemic risks emanating from financial markets. In this respect, the chapters 6, 7, 8 and 9 focuses on the **appropriation of economic models that include financial fragilities** and can detect and measure the build-up and evolution of systemic risks in central banks and other regulatory bodies and their translation into coherent policy frameworks for the counter-cyclical capital buffers (chapter 7) and for the repo-markets (chapter 8) and the shadow banking system as a whole (chapter 9). Which factors shaped the translation of ideas into new policy arrangements in different institutional contexts (institutional filters)? To answer this question, I hence focus on the **transformation of economic ideas and models into policy devices** in nationally or regionally specific (EU) contexts as well as its interaction with initiatives at the global level (BCBS, IMF). Here the retention of ideas and their diffusion into official monitoring frameworks, structuring the policy decisions of central banks and international institutions is central. In addition, the

restructuring of central banks to execute this analytical work and make it interact with the other tasks of the organization will be of special interest.

In a first step, I use the publicly available data as well as secondary sources to **reconstruct the generation of the domestic macroprudential policy frameworks**. Here, a **diachronic analysis** of the construction and changes to the macroprudential frameworks based on document analysis is undertaken (including legal texts, parliamentary and central bank documentary, if available, as well as public media). Research, which compares **governance structures** to implement macroprudential policies to promote financial stability that central banks are often not the only agents responsible for financial stability measures domestically (Lombardi and Siklos 2016, Lim et al 2013, Masciandaro and Volpicella 2016, Edge and Liang 2017). This **dispersion of macroprudential powers**, often an outcome of the regulatory traditions and hence **path-dependent**, crucially shapes the reputational calculus of bureaucratic leaders (Hood 2011, Busuioc and Lodge 2017), which might deem macroprudential policies as dangerous for the independence of their organization. These considerations strongly influence their pursuit of these policies, e.g. by not having any buy-in regarding the macroprudential policy frameworks, as these are seen as largely unfeasible.⁴⁶ An important aspect of this work then is to understand how this **institutional setting** influenced the **strategies of macroprudential change agents** to shape their macroprudential policy framework.

Secondly, these chapters are not only interested in which ideas are adopted in policy frameworks, but also asks **what administrative capacity is built up to effectively integrate the knowledge** thus generated into the decision-making of these organizations. Crucial questions in this respect are: how are the **intellectual capabilities and the decision-making powers** distributed between the different agents which are involved in the decision making? How did this in turn shape the buildup of

⁴⁶ The Financial Stability Oversight Council in the US is identified as an unwieldy institutional architecture for macroprudential regulation (Edge and Liang 2017), as is the framework in the EU (Lombardi and Moschella 2017).

capacities? How are macroprudential policy instruments institutionalized within central banks? How do respective central banks **envision the interaction of the monetary policy framework** with the new goals regarding financial stability? These questions are reflected in the internal restructuring of central banks, to resolve the practical organizational issues of how monetary policy divisions interact with financial stability divisions. Hence, the concrete focus is on the **organizational work** that has occurred in different central banks over the course of at least the last ten years to develop their systemic risk measuring frameworks and how these are integrated in the financial stability frameworks.

To better understand the evolution of these frameworks, these chapters employ insights of **discursive institutionalism** (Schmidt 2008, 2011), which points to the importance of the evolving discourse of technocrats on new policy questions, which they use to coordinate on these issues (“coordinative discourse) for the final frameworks adopted. These chapters therefore draw upon a set of speeches of macroprudential change agents tasked with installing macroprudential policy frameworks (including BIS and IMF officials), and perform a **qualitative discourse analysis**. I subject the speeches of technocratic agents from the selected countries to qualitative discourse analysis to discern the reasons given for the stance on different macroprudential measures selected by these change agents (e.g. anti-cyclical interventions in housing markets). These textual analyses of the speeches of technocrats, revealing their different positions on intermediate objectives are complemented with an analysis of the exchanges among technocrats in conferences, which are often recorded or have been obtained by observation through conference attendance. The insights thus gained about the different positions of agents then informed the selection of policy makers for expert interviews. Seeking to understand **what has driven the evolution of these frameworks**, in these interviews I probed for the crucial turning points in the evolution of macroprudential frameworks and how the legal and political contexts shaped the final macroprudential framework.

This workstream then uses the insights gained in workstream 1 to identify **economists** employed in **central banks** and the **IMF** and the **BIS**, which have worked on the **generation of policy devices** for macroprudential policies and in the spreading of these devices to national macroprudential authorities. I engaged these **experts in interviews**, seeking to understand the interaction of the development of policy devices on the one hand and their implementation in national frameworks on the other. The focus hereby resides on the **lived experience of issue professionals** (Seabrooke and Henriksen 2018), which were involved in the production of policy devices and sought **to gain epistemic authority** by having their devices adopted. The interviews probe how they experienced the crucial turning points in the evolution of these frameworks. In interviews with BIS and IMF officials, the focus was on how the respective international organizations sought to push for a particular design of macroprudential policy frameworks and the national reaction it elicited.

Finally, the focus then is on the **ongoing attempts to implement anti-cyclical measures as well as measures to address the fragilities of finance** related to interconnectedness, arguably the two main elements of the new macroprudential thinking in financial regulation. The focus resides both on the **national/regional initiatives** as well as global initiatives, which are also considered to understand the context condition of the action of these policy makers. Studying this third element, the **transformation of policy recommendations into policy action** will involve an analysis of the interaction between policy-makers, politicians and technocrats in different national and regional contexts, where I am interested in the **adaptation of technocratic strategies** to local requirements, including their relationship to political power. The main question of interest is how the institutional infrastructures of the state apparatus analyzed in WP2 interact with policy makers and their political goals.

The empirical approach adopted in this habilitation traces these processes by using an innovative methodology, triangulating findings from cutting edge **quantitative methods** with more traditional **qualitative methods** for process tracing. It uses quantitative methods for **large scale textual analysis**

(**structural and author topic modelling**) to identify the new themes in economic discourse regarding the dangers of finance and bibliometric techniques (co-citation and citation network analysis) to uncover the social structure of collaborative networks these texts reveal. With the help of **sociographic methods**, it then traces the professional career lines of the thought collective that has developed the new vision of “fragile finance”. It then uses the data thus generated to sample **expert interviews** with the leading economists both in central banks and academia on these themes. These interviews are used to understand the process of transformation of these ideas into policy devices and how they have been integrated into central banks’ policy frameworks. **Document analysis** helps to establish how exactly these new institutional frameworks to govern finance were set-up and what the motivations of technocratic policy makers were. Lastly, exploiting the variance in the use of the policy recommendations for policy action, it traces the **institutional and political obstacles** it might face for its implementation.

In addition to qualitative and quantitative document analysis, I have conducted 50 expert interviews between the summer of 2014 and January 2020 with 55 persons, between 20 minutes (2 interviews) and 2 hours, most of the time lasting about 45 to 60 minutes, often recorded, with central bank economists, regulators and academics working on the topic of financial instability (table below displays the categories (s. appendix for list of interviews)).

Kind of economist	ECB/ ESRB	Bundesbank/ BaFin	Other European central bank	BIS	IMF	Fed	Bank of England/ FSA	Private	Aca- demics
Number of interviews	9	11	3	2	2	2	6	4	11

Table 1.2 Number of interviews according to different categories of interviewees

Expression of the deeply interconnected space of knowledge production I am studying, most of the interviewed academic economists also had experience collaborating with or working in central banks.

Furthermore, the IMF economists worked before at the Fed, several ECB economists at the Bundesbank, and those of the Bundesbank at the ECB. Some of the interviewees were also seconded from their home institution to other central banks, allowing me to draw on their lived experience to learn more about the differences in these institutions.

In addition to those interviews, I attended several conferences in central banks, among which four conferences at the ECB (one on macroprudential regulation and its interplay with the CMU in April 2016, two on macroprudential regulation in fall 2016 and one on the interplay between monetary policy and macroprudential regulation in 2019). I furthermore attended several conferences at the Bundesbank (such as a conference on monetary and macroprudential policy in fall 2019, but also joint conferences of the Bundesbank and SAFE at the Goethe University about similar topics, e.g. in August 2018) as well as numerous conferences at the Center for Sustainable Architecture of Finance in Europe SAFE and Goethe University (such as the conference on macroprudential regulation by the International Group of central bankers in 2015). These conferences, as well as the academic conferences on the regulation of finance at SAFE, which often brought together central bank economists and academic economists allowed me to participate in and observe the interaction between these two communities over questions of validity of assumptions and presumed effects of these measures.

Chapter 2 The changing regulation of finance after the crisis: State of the art and beyond

Arguably, the financial crisis of 2007-2009 and the ensuing Euro-zone crisis have been **major crises** of the **policy paradigm** that saw in the increasing **self-regulation of financial markets** a guarantee for the optimal allocation of capital (Skidelsky 2010, Kotz 2014). This paradigm emerged through the interplay of market actors, academics and policymakers (Tsingou 2004, Seabrooke and Tsingou 2009, Krippner 2011; Konings 2011). It was based on a new statecraft after Keynesian interventionism, where **states increasingly retreated** from intervening in economic activity directly and instead chose to engage in market making regulatory policies (Vogel 1996, Majone 1997, Levi-Faur 2005). It was undergirded in macroeconomics by the **rational expectations' revolution** in the 1970s (Lucas 1972, Kydtland and Prescott 1977, Helgadottir 2018) and the connected Lucas critique, which implied that all direct state interventions in economic life, such as stimulus programs, were futile as rational agents would anticipate future tax hikes (Lucas and Sargent 1979).

Embedded in this **ideology of the futility of direct state intervention**, financial economics in general and the **efficient financial market hypothesis** in particular have been the boundary object which brought together technocrats, academics and market participants in the construction of the regulatory paradigm of financial markets pre-crisis (Whitley 1986; MacKenzie 2006, Seabrooke and Tsingou 2009). As a positive theory it has influenced much of policy making since the 1970s, striving for **ever-more complete markets** that in its underlying model permit the realization of welfare gains (Whitley 1986). These views of the world were engrained in **devices** (such as the Black-Scholes formula and its calculation spread sheets, MacKenzie 2006), which have allowed the increased trading on derivatives markets, making the future subject to calculated, hedged speculation (Esposito 2011). In these models, financial markets are assumed to be always liquid and to price risks correctly, leading to “market discipline” that punishes excessive risk taking and leads to an efficient allocation of capital. Based on the belief in financial markets to be able to efficiently price risks, policy makers **delegated the evaluation of risk taking to the internal risk management systems of banks**

themselves (Tsingou 2004), which in turn depoliticized the risk taking of these institutions (Lockwood 2015).

The financial crisis shook this intellectual edifice, which underlay the policy paradigm in its foundations (Langley 2014). The efficient allocation of capital had not been achieved, irrational herd behavior on markets seemed pervasive and liquidity could quickly vanish (Shin 2011). It made plainly evident that financial market participants are not able to properly price risks, in particular those that have come to be known as **systemic risk, cyclical risks which extend beyond risk taking of individual institutions and regard risk taking of the financial system as a whole** (Crockett 2000, Persaud 2010). And yet, despite these failures of the reigning policy paradigm and the ensuing rhetoric of policy makers about the need for radical change, **there was no immediate fundamental break** with this pre-crisis mode of regulation, neither in politics (Muegge 2013, Moschella and Tsingou 2013, Underhill 2015) nor in financial economics (Mirowski 2013).⁴⁷ Instead, the **large-scale attempt to re-regulate finance** that has been initiated by the G20 in 2009 can be better analyzed as an act of “**symbolic politics**”, seeking to assure the general public that answers to the glaring policy failures that were revealed by the financial crisis would be found (Lombardi and Moschella 2017).

Pointing to the vague project of macroprudential policies to secure financial stability (Hellwig 2014), it delegated the work to technocratic circles in the newly formed Financial Stability Board (FSB) and the Basel Committee for Banking Supervision (Baker 2013a, Lombardi and Moschella 2017). Technocrats in these bodies were tasked not only to **increase the resilience of the system**, e.g. through increasing the capital buffers of large institutions, but also to **intervene in the cyclical build-up of booms** that turn into busts (Baker 2013 a,b, 2014). Central to their work on macroprudential policies, its concerns over financial fragilities and its impact on the macroeconomy was the rise of the **notion of systemic risk**. It was to go beyond the aggregated individual risks of

⁴⁷ The ambiguity in the field of economics was on full display at the Nobel Prize of 2013, granted to both Fama, a staunch defender of the Efficient Financial Market Hypothesis, and Shiller, pointing to irrational exuberance in financial markets.

financial institutions (fallacy of composition), but also to include the **risks of common exposures and interconnectedness** (often mediated through markets and market risks). Their task was to complement individual risk management systems of banks with regulatory metrics of systemic risk, that would allow them to **see, know and regulate systemic risks** (Black 2013, for the failure of pre-crisis cognitive schemes inherent in central bank models, s. Fligstein et al 2017). In its most ambitious version, **regulators were to become the systemic risk managers** of the financial system as a whole (Persaud 2014), **reversing the pre-crisis delegation of risk management to market actors**, with all the attendant uncertainties for regulators (Stellinga and Muegge 2017).

In this endeavor, there was both little in terms of mainstream academic work that they could draw upon and little in terms of support by private actors which had been so consequential in the development of private individual risk management systems (Adrian 2018). Analyzing the ensuing changes to the regulation of financial markets post-crisis, the political science literature comes to a sobering assessment (for an outlier, s. Wilf 2016): rather than radical change some had expected post-crisis, following the third order ideational shift to macroprudential regulation (Baker 2013a⁴⁸), the regulatory changes post-crisis are largely seen as incremental (Moschella and Tsingou 2013). While there has been a significant expansion of public authority over markets, the **content and purpose of public interventions are seen to remain constant**, in line with the pre-crisis paradigm (Pagliari 2012, 61). In this analysis, neoliberal ideas, that is the faith in markets' self-disciplining capacities, have not been rebuked but have merely seen an **ordoliberal amendment** and regulatory activity after the crisis is driven by the insight that beneficial markets do not emerge naturally but need to be harnessed through regulatory intervention (Biebricher 2012), leading regulators to adjust markets to make them function as they ideally should (Birk and Thiemann, 2019). These interventions are therefore interpreted as **paradigm repair**, leading Helleiner to call it a "**status quo crisis**" (Helleiner 2014).

⁴⁸ Baker describes it, using Kuhnian language as a "Gestaltswitch", whereby regulators after the crisis had come to see financial markets and the risks which emanate from it as completely different from the way they saw it pre-crisis.

This revisionist, rather than radical approach to policy change has been explained by the **lack of alternative economic ideas** (Muegge 2013, Mirowski 2013), in particular in the USA (Helleiner 2014) and the **ensuing difficulties of international coordination** (ibid). One identified factor is the inclusion of private financial actors in the rule making process, which block alternative idea sets such as macroprudential regulation (Underhill 2015). Another one is the success of central bankers in limiting the worst fall-out from the crisis due to aggressive interventions. Having learned the lessons from the Great Depression (Eichengreen 2013), they were **hesitant to introduce drastic new measures**, fearing the unknown consequences of these interventions (Stellinga and Muegge 2017, Stellinga 2019). For these reasons, **macroprudential policies, one of the very few real innovations** in financial market regulation in Western countries after the crisis⁴⁹ has been identified as an incremental project, which while challenging the epistemic authority of the market, **stays far behind initial expectations** (Underhill 2015, Baker 2018). At its worst, it is merely seen as a continuation of neoliberalism, due to its focus on increasing the resilience of the system (Casey 2015, Cooper and Walker 2011, Konings 2016).

While this picture correctly depicts the often-timid attempts at re-regulation in the immediate aftermath of the financial crisis, in particular with respect to shadow banking (s. Thiemann 2018, Thiemann et al 2018b, Endrejat and Thiemann forthcoming, 2019), it **risks missing a bigger, subliminal yet largely invisible change**. This change has occurred in the translation of a changed general outlook on financial markets into new metrics and models of systemic risk which have been developed over the last 10 years in technocratic and economic circles and which only currently unfold their full potential in terms of the regulation of finance. In this respect, it is important to emphasize the speed by which judgement was cast by political scientists upon regulatory initiatives. Muegge's

⁴⁹ The other one arguably is the mandatory clearing of OTC derivatives through Central Counterparties (CCPs), a shift which led to an unprecedented growth of these entities post-crisis. However, as Pagliari points out (2012) and as subsequent research confirmed (Lockwood 2018), the actual regulation of risk by these entities is still set by private risk-management systems which now are much more closely supervised. The content of regulation hence is still set by private initiative. Alternative considerations, such as transforming these CCPs into public entities, which had been shortly discussed right after the crisis, e.g. by the Bank of England in 2010 were cast aside as too radical by the regulatory community. Arguably one can subsume mandatory clearing within the macroprudential regulatory reform, as it sought to decrease the opacity and complexity of the financial system, thereby increasing its resilience.

insightful essay on the lack of alternative idea sets, challenging neoliberal ideas was written in 2012, as was Mirowski's intervention. Helleiner's book, giving a verdict on the effects of the crisis was written in 2013 (for a related critique, s. Tooze 2018, 20).⁵⁰

In the **short time span of five years**, it was arguably difficult for economists to **work with this new idea set, to operationalize it** and get it accepted in either the mainstream of academic and regulatory opinion, such that it could inform regulatory activity. But this was arguably the task for economists in central banks and academia, if they wanted to enact truly novel "macroprudential" regulation, which would not only seek to increase the cross-sectional resilience of the financial systems to shocks through raising capital requirements for different financial institutions, but also seek to mitigate the boom-bust cycles of finance. As Muegge rightly points out, the former is completely justifiable within the pre-crisis approach, whereby agents are just practically facing difficulties in assessing their mutual exposures and the notion of Too-Big-Too fail leading to excessive risk taking. "Thus derived, the need for macroprudential regulation can be directly derived from an orthodox approach to financial markets and it complements, rather than challenges, a neoliberal take on financial governance. » (Muegge 2013, p. 215) In contrast, the idea of governments intervening during excessive booms in financial markets, seeking to mitigate the latter's propensity for boom-bust cycles was arguably new and radically different.⁵¹

To do that, macroeconomic change agents needed to convince their fellow regulators that they had the capacity to detect these excesses and the tools to mitigate them, and while economists at the BIS had done some work on these issues (Baker 2013a), it was by no means a consensus that government agencies had the capacity to do so (s. e.g. Tarullo 2013a, b). Reaching that consensus was especially difficult after "thirty years of spectacular returns and pseudo-stability (...) had

⁵⁰ In all fairness, Helleiner points out that a proper assessment of macroprudential regulation will only be possible after about 10 years.

⁵¹ Unfortunately, both Muegge and his student Stellinga commit a serious misreading of Minsky, claiming that the latter had no suggestions for how to operationalize this approach. As Muegge puts it, "for all of its merits, the fundamental criticism of neoliberal thought that has resurfaced after the crisis has not proposed wholesale regulatory alternatives but rather suggested that the hope of taming instability through government intervention might be in vain" (Muegge 2013, 212f, s. also Stellinga and Muegge 2017). However, much of Minskys writing, in particular his book "Stabilizing an Unstable Economy" (Minsky 1986) is devoted exactly to these issues.

convinced every recognized authority, from the Organisation of Economic Co-operation and Development to the ECB, (...) from the Swedish Riksbank to the U.S. Federal Reserve, that markets were rational, prices were right, and their policies were optimal (Blyth 2013, 210). This expectation of quick policy change after a big financial crisis or the assessment of the lack of such change, seemingly precluding any change in the future hence **ignores the different temporality inherent in the maturation process of new regulatory frameworks**, from ideas to new policy devices to overall frameworks (cf. Braun 2014).

This expectation of rapid paradigm changes has been created in the political science literature through the importation of the concept of a paradigm shift by Kuhn into policy arenas. This import was achieved in two seminal articles of Hall (1992, 1993), which can be seen at the beginning of this trend, focalizing analysts' attention on processes within the state apparatus. The ensuing literature unfortunately has come to locate the factors responsible for such a shift almost exclusively within the arena of policy making itself, largely excluding developments in other fields, such as economics from the analysis. By foregrounding discursive shifts and power struggles in the political and technocratic realm itself to explain these shifts, changes in economic reasoning itself have been placed into the background, which is ironic given Hall's much more nuanced earlier work on the the different factors that account for the variegated rise of Keynesianism in different national political economies post-WWII (Hall 1989a, b), including the acceptance or not of Keynesianism by leading economists. The following analysis will hence seek to unearth from this literature the importance of economics itself and hence the need for a multi-level analysis, all the while being attentive to the important conceptual distinctions that literature has developed.

The literature on Policy Paradigm Change after Hall: Losing economics from sight

In his classic 1993 article, Peter Hall uses the case of the ascendancy of monetarism in the UK in the 1980s, after its failure to do so in the 1970s to theorize how such new policy paradigms can come about. To do so, he combines the analytical framework which the historian of Science Kuhn

had developed for paradigm changes in the natural sciences with Hecllo's notion of policymaking as social learning, a mixture of puzzling and powering to explain what he terms shifts in policy paradigms. These policy paradigms are defined by Hall as

a framework of ideas and standards that specifies not only the goals of policy and the kind of instruments that can be used to attain them, but also the very nature of the problems they are meant to be addressing. Like a Gestalt, this framework is embedded in the very terminology through which policymakers communicate about their work, and it is influential precisely because so much of it is taken for granted and unamenable to scrutiny as a whole. (Hall 1993, 279)

This definition gave pride of place to the discursive universe of ideas within which policymakers operate, often in an unreflected manner, much like in the famous statement by Keynes at the end of the general theory which states that practical men, such as policymakers are often the "slaves of some defunct economist" (Keynes 1936, 383). It observed the change from Keynesianism to Monetarism as a sudden shift in 1980, which was preceded by gradual, incremental change on the level of instruments and tools by the Bank of England in their fight with the anomaly of stagflation in the 1970s (what Hall called first and second order change). This gradual change in the 1970s prepared the ground for the abrupt shift to monetarism with the ascension to power by Thatcher, which he analyses as a third order ideational shift, a "Gestaltswitch", which repurposed these changed policy tools and policy settings based on a completely different and new understanding of the economy, with new goals for policy interventions.

Through his intervention, Hall sought not only to condense the new state-centric approach in political science, but also to provide an analytical conception of how changes in policy making occur as an outcome of variables inside of the state apparatus (Berman 2013, 219f). In his historical narrative, he therefore points out, how the anomaly of stagflation severely damaged both the epistemic authority of Keynesianism as a policy paradigm and the treasury as its institutional carrier (Hall 1993, 287), which repeatedly had emitted wrong forecasts and taken ineffective policy actions. Unable to explain stagflation, the Treasury was not only forced to reveal the intricacies of its models, thereby making itself and the model subject to more critique, but also lost increasingly authority over policy-making

decisions to the Bank of England, which positioned itself increasingly as the bulwark against the problem of inflation. As Hall insists in his analytical summary, “such shifts are likely to be more sociological than scientific, because while there are different opinions among experts, the choice of paradigms can rarely be made based on scientific grounds alone.” Instead, it is driven by a set of judgments “more political in tone, and the outcome will depend, not only on arguments of competing factions, but on their positional advantages within a broader institutional framework, on ancillary resources and on external circumstances” (Hall 1993, 281).

Despite the occasional reference to the coherence of an economic paradigm as an important causal factor, the focus of this approach has been on the institutional configurations within the technocratic and bureaucratic realm that shape how idea sets get adopted into policy. Social learning is squarely placed within the realm of policy-making and technocratic organizations, largely excluding changes in economic paradigms itself from the focus of their analysis. His emphasis on developments within the state apparatus led to a reduced emphasis on developments within the economic field and its interaction with policy changes.⁵² However, Hall’s historical analysis of the policy paradigm shift towards monetarism had included the comparison between the conservative leader Heath in the early 1970s vs. Thatcher in the early 1980s and had pointed out that while Heath had a jerrybuilt structure of arguments to push for the fight against inflation, Thatcher could draw on a much more fully elaborated monetarist paradigm (s. Hall 1992, 97f, 1993, 290). This is analyzed as an instance of the power of a coherent paradigm, which grants the capacity to resist some societal demands, while giving in to others. Crucially, without such a paradigm, Prime Minister Heath, while pursuing the same goals as Thatcher had to fall back upon Keynesianism when the first negative consequences of his policies materialized. He simply lacked an alternative coherent narrative that he could point to in order to face his opponents.

⁵² In this spirit, Hall for example acknowledges the importance of the carriers of new economic ideas among civil servants (Hall 1993, 291), then at the same time to deemphasize it as a necessary but not a sufficient condition for policy change.

The literature that ensued on shifts in policy paradigms after these major contributions by Hall has been very good at analyzing the factors that affect policy shifts internal to the field of politics and policy-making, pointing to the emergence of consensus among policy elites as an important factor (e.g. McNamara 1999), but has been largely silent on the *boundary-crossing activities of economic ideas into administrations and into politics* (Mudge and Vauchez 2012). Instead, the Kuhnian concept of paradigm shifts has been applied to policy makers, who when confronted with enough anomalies that cannot be explained by the dominant analytical frame question the latter, and experiment with competing policy paradigms (Hay 2001)⁵³. Zooming in on the dynamics of social learning within the realm of (technocratic) policy making, the focus is on the contest between carriers of certain idea sets, whose jockeying for power is juxtaposed to **shifting institutional configurations of authority** (e.g. Chwieroth 2010, Mandelkern and Shalev 2010). However, this literature did not pay as much attention to the professional preconditions for economic ideas to gain prominence and the dynamic pathways for their translation into the bureaucratic and political space (Mudge and Vauchez 2012) through the formation of policy devices (Hirschmann and Popp-Berman 2014). It is this blackboxing of the process of creation of new models and their translation into policy devices that this habilitation is seeking to address.

More recent social-constructivist scholarship has refined this analysis, yet it still largely remains within the realm of politics and policy making, **blackboxing the realm of economics proper and its interaction with policymaking**. Processes of persuasion inside of policy networks are at the center of this analysis, which involves the struggle over the appropriate diagnosis of the crisis and the necessary steps that follow from it (Widmaier et al 2007, Blyth 2002, 2013, Chwieroth 2010, Baker 2013a). This strand has hence emphasized the importance of the narrative framing of these crises to

⁵³ Hay thereby presumes that alternative idea sets are simply out there and that policy makers are free to choose from them, ignoring the possibility that this might not be the case, or the temporal processes which might be involved in the generation of such alternative idea sets in the realm of economic discourse, s. below)

explain when a series of anomalies comes to be perceived as a problem and what the likely responses will be (Hay 2001) as well as pointing to the sequential role of ideas in reducing the uncertainty in those moments of crisis (Blyth 2002). It has furthermore challenged the view of policymakers as dogmatic actors, which cling to internalized idea sets. Instead, it points to their creative efforts to amalgamate new policy proposals from a set of pre-existing ideas (Carstensen 2011a). It has focused on the activities of policy entrepreneurs, creative change agents that recombine ideas in a manner comparable to “bricolage” (Carstensen 2011b, Carstensen and Schmidt 2016) to strategically outmaneuver their opponents and gain acceptance of their ideas (Blyth 2013).

Discursive institutionalists have furthermore pointed out that new policy paradigms are co-constructed by politicians crafting communicative discourses to the public as well as by technocrats engaging in the search for a new discourse to coordinate among themselves (Schmidt 2008). Whereas in communicative discourses the simplicity of ideas, their fit with overarching economic paradigms and with public sentiment are important elements (Campbell 1998), coordinative discourse is characterized by a focus on evidence-based propositions and an attempt to avoid politicization (Schmidt 2008, 2011). Differentiating policy statements in terms of their level of abstraction, it points out that very general philosophical statements and more concrete programmatic statements of what goals a policy program should pursue are more present in communicative discourse, whereas concrete policy proposals, based on evidence are more likely to occur in technocratic discourse. This literature thereby establishes that the way that ideas are presented, in which form and in which context can be as important as the content of these ideas themselves.

In this context, social learning is now understood as a communicative process riveted by power structures more than by Bayesian updating, powering rather than puzzling (Blyth 2013), with an ongoing contestation over the scientific legitimacy of ideas (or epistemic authority) and battles for reputation of their authors (Blyth 2013, Ban 2015). One implication of this stance is that the **professional standing, the prominence and positioning of carriers of these new ideas** within state apparatuses (Hall 1989a, Chwioroth 2010, Baker 2013a) are seen to be very influential for shifts in

policy. Yet, while very insightful to understand the institutional context within the state apparatus in which economic ideas can thrive, this research still largely ignores the **process of production of new economic ideas and the preconditions for these new economic idea sets to become viable** in the **economic field** in the first place, a precondition which bestows highly prized “objectivity” on these idea sets (for a similar critique, cf Braun 2014, but s. Clift 2018).

As Mudge and Vauchez put it eloquently, this “non-differentiation of ideas and inattention to their scholarly and professional origins” has caused “difficulty moving beyond the basic proposition that “ideas matter” to an understanding of the interconnected processes by which ideas are produced, imported into political and bureaucratic spaces, and translated into categories of perception and programs of action” (Mudge and Vauchez 2012, 454). The neglect of these questions is at full display in the recent scholarship on post-crisis regulatory change in the realm of macroprudential regulation. If this scholarship has focused on ideational change, it has mostly looked at discursive changes at the top of the political and technocratic levels, commitments to a new macro-prudential approach to the regulation of finance, but only little has it studied the substantiation of these promises through the practical work of economists. However, to understand the final shape of the macroprudential paradigm, it is at the level of interaction between politics, policymaking and the world of applied economics that analytical attention needs to be placed. It is this deficit of the current literature this habilitation is seeking to address.

This deficit in the treatment of idea sets as causal factors is evident in the work of Baker (2013a,b, 2015, 2018), whose interventions based on an “agent centred constructivist approach” (Baker 2013a, 113) have been among the most influential in putting the introduction of macroprudential regulation after the crisis on the research agenda. Analyzing the swift rise of macroprudential regulation from a marginal position in regulatory discourse pre-crisis to its endorsement by the G20 summit in London in 2009 , Baker explains this as the outcome of the repositioning of early proponents of this idea set in regulatory circles following the crisis, which bestowed higher professional esteem upon these idea carriers (ibid, 114). Being present as a voice of

precaution regarding the prevalent microprudential regulatory ideas based on the efficient market hypothesis, but largely ignored pre-crisis, these carriers of ideas used their new gained standing to engage in an active campaign of promotion and persuasion of crucial policy makers, bringing about an “inside coup d’etat” (ibid, 127) Their capacity to persuade, in his account, was based on the increased plausibility of their ideas by the crisis, the increased professional esteem for the idea carriers and the capacity to generate credible proposals for policy measures (ibid, 127f).

Baker characterizes this return of classical Keynesian ideas on finance in the public discourse by technocrats and policymakers on macroprudential regulation as a third order ideational shift in the terms of Hall (1992). This, he suggests might translate into new policy instruments and new policy settings, inverting the traditional order of Hall’s transition from tools and settings to ideational shift. To the disappointment of Baker (2018), this embrace instead led to the establishment of a macroprudential research programme, seeking to generate accepted empirical results guiding such macroprudential activities (Baker 2018)⁵⁴. However, seen from within the logic of evidence-based policy, this development becomes comprehensible (Thiemann et al 2018a). The new, alternative idea sets that focus on the fragilities of finance and its impact on the macro-economy needed time to be substantiated through studies using recognized techniques, allowing it to gain professional standing in economic discourse before they could become an accepted part of regulatory science, that is to say, before regulators could actively draw on them as a source of secure knowledge, on which regulation can be based (Jasanoff 2012).

Whereas macroprudential ideas were formulated at the Bank for International Settlement (BIS) and by some academics pre-crisis, these views were **far from being the mainstream view** at the time (Baker 2013a, Lombardi and Siklo 2016), indeed the lack of use of mathematical models and advanced econometric techniques largely placed it outside of it (interview former Bundesbank

⁵⁴ Baker himself links this turn of events, which in the first place leads to research rather than action to the incapacity of the idea carriers to enter the communicative discourse of policy-makers and formulate a vision of social purpose that would allow macroprudential concerns to extend beyond the realm of technocratic deliberations and enter into political discourse directly (Baker 2018, 293).

economist, 19/08/2014). This effectively meant that the format within which they were expressed was not meeting the epistemic requirements of academic economic discourse. Since the crisis, economists in central banks and international organizations, tasked with developing systemic risk frameworks have spent a large amount of time and energy formalizing these ideas about the causes and mechanisms of financial cycles and other fragilities, making them live up to these standards. Jointly with some academics, they have been able to propose metrics and overarching frameworks for monitoring systemic risks which only recently have come into full use by central banks and international organizations (Ibrocevic and Thiemann 2018), a fact that has largely escaped the post-crisis literature (but s. Coombs and Morris 2018). It is this work and its performative effects which only unfold over a substantial amount of time.

Towards a more differentiated, multi-level multi-temporal understanding of institutional change

Recent scholarship in the tradition of constructivist institutionalism (Clift 2018, 2019, Kaya and Reay 2019) has been a welcome improvement in how it treats ideas and their potential for impacting policymaking, as it places emphasis on the form in which these ideas need to be expressed to exert influence. Clift in his work on the rediscovery of Keynesian themes by the IMF post-crisis with respect to both financial markets and fiscal policies identifies four mechanisms that are at play as technocratic organizations interact with a broad array of what is deemed acceptable mainstream economic ideas to react to crises (Clift 2018, s.also Ban 2015)⁵⁵. In order to become part of the tool kit of such an organization, these new ideas need to be corroborated with evidence, reconciled with old thinking by the organization that embraces it⁵⁶, they have to be operationalized into metrics for actual policy making and require the authoritative endorsement of academic authorities. Leaning on historical institutionalist insights about processes of incremental change, these mechanisms imply the

⁵⁵ In this line of work, what is economic mainstream is assumed to be both historically contingent and socially constructed.

⁵⁶ These institutions also can abandon old policies, however, they can only do so rarely in order not to lose epistemic authority (Clift 2018, citing chief economist Blanchard).

distinct possibility that large crises can lead to only incremental policy changes (Clift 2018, 7, 32; s. also Wilder and Howlett 2014, 2015).

In contrast to historical institutionalists, however, Clift emphasizes the “contingent and open-ended nature of institutional change and the crucial role of its ideational mediation” (Clift 2018, 32), where the “packaging and framing of new thinking in light of salient cognitive filters is the stuff of, as well as major terrain for, the politics of economic ideas” (ibid, 41). This openness to either radical or incremental change after a crisis points to the role of applied economists within technocratic organizations that act as reflexive agents which seek to shift “the legitimate policy space”, mindful of the “conditions their ideas need to fulfill to bring about change” (ibid, p. 54)⁵⁷. While the “economic mainstream” is historically contingent and socially constructed within the technocratic organizations that seek to define the “policy space”, it nevertheless imposes upon change agents the need to live up to epistemic standards and robustness tests established by academic economic discourse.

These new insights can be integrated in recent theorizing of policy-change as fragmented, “whereby a crisis may induce rapid change in one specific dimension of a paradigm ... at some point, while another dimension develops slowly in response to cumulative gradual pressures” (Kaya and Reay 2019, 392). As Kaya and Reay emphasize, “when analysing shifts in a major ideational framework over an extended period of time, fragmented change cautions against looking exclusively for either rapid or gradual change, via a single dominant institutional route” (ibid, 386). In contrast to the dichotomy of radical and abrupt shifts on the one hand and slow, gradual change on the other, they argue that “fragmented change offers a distinct possibility for institutional and ideational alterations in that it cannot be reduced to either type of change.” (ibid, p. 403). Change does not have to occur

⁵⁷ Clift mentions the increasing trend for IMF economists to publish academic papers, corroborating their new approach (2018, 59), but he does not pursue this approach any further.

in a hierarchical manner but can occur more in a “diffused manner, given that radical change is not the final culmination, but rather a component of varied types of change.”

This attention to the required characteristics of ideas to become performative and the concept of fragmented change, of radical change at one level but not at others can be linked to the incremental change Baker and others are observing regarding macroprudential regulation after the crisis, where technocrats needed to be convinced of the merits of the new approach internally to central banks (Baker 2013b, 2014, Moschella and Tsingou 2013, Thiemann et al 2018). It also fits very well with the analysis of macroprudential regulation as a broad ideational shift without operational consensus (Baker 2013a) as these new ideas needed to be reconciled with existing and acknowledged methods and thinking. Because the concept of fragmented change no longer operates in the dichotomy of radical or incremental change, but instead is able to perceive of these two occurring jointly in different dimensions, we can thereby perceive of the possibility of continued development of the macroprudential agenda rather than seeing it as stuck in the thicket of evidence-based technocracies (Baker 2018).

Instead, macroprudential thinking can be seen to open a space for policy experimentation for central bankers (Moschella 2015). It also allows us to consider the possibility that old techniques are repurposed and suddenly come to serve new functions.⁵⁸ Exemplarily, the work of Langley points to the repurposing techniques of existing economic concepts to make the crisis governable, such as stress tests, which are now used for macroprudential purposes (Langley 2013, 2014). Processes of incremental bricolage to govern the crisis can then exert a path-shaping influence on the new governance framework that will govern financial stability.

The path-shaping power of technocratic economists: creating robust policy devices

⁵⁸ For example, the work of Langley points to the techniques of stress tests, which are now used for macroprudential purposes (Langley 2013, 2014).

This habilitation follows up on these accounts by focussing on the **(largely invisible) work of technocratic economists within central banks to establish the validity of new ideas** and their translation into new policy devices which prepares the ground for the changes in the policy apparatus. In a bureaucratic environment characterized by scientization, these new ideas had to be operationalized, reconciled with existing thinking and models and corroborated by evidence (Clift 2018, 39f), before they could serve as the foundation for regulatory devices that allow regulators to visualize systemic risk and justify measures to contain it (Hirschman and Popp-Berman 2014). However, it adds an important element, namely that these economists themselves, together with academic economists or on their own can be creative and generate new ideas, new models, and new ways of answering to the new tasks which have been imposed upon the organization they serve, in my case macroprudential regulation. I argue that it is these technocratic economists, who in alliance with academic economists well-disposed towards the project generate the metrics and models that can establish macroprudential risks as “risk objects” (Hilgartner 1992) in economic discourse with clearly identified linkages to harm, and whose work thereby establishes not only the need to act against these risks, but also provides the policy devices, to control these risks (ibid, 50f)⁵⁹. These agents can thereby deliver the decisive input for macroprudential policy frameworks which structure the action of policy makers.

Their work has been to “organize uncertainty” over systemic dangers that can build up in the financial systems into the notion of systemic risk, seeking “to produce decidability and actionability. Knightian uncertainties become risks when they enter into management systems for their identification, assessment and mitigation.” (Power 2007, p. 5⁶⁰). They hence engaged in the construction of systemic risk as a “risk object” which can be subjugated to a “management process” (ibid, p. 8). As Power

⁵⁹ In Hilgartner’s language, these policy devices are placed in the network of control for these risks. Hilgartner’s crucial contribution has been to point social scientists to the work of these technical experts as crucial agents driving the construction of “risk objects” and their linkage to harm (s. ibid, p. 52f)

⁶⁰ Prior ideational scholarship in political economy has pointed to the role of ideas in organizing such uncertainty (cf. Blyth 2002, 44f), but it has failed to specify the locus and the agents of this work, namely applied economists in central banks.

points out in his study on operational risk, such uncertainties do not exist *sui generis* „but must of necessity be organized, ordered, rendered thinkable, and made amenable to processes and practice of intervention“.(*ibid*) The work of these economists is then guiding the attention of their employers, central banks to what they perceive to be the most crucial elements in the build-up of these risks. At the same time, these economists are engaging in establishing the optimal tools to react to these threats, seeking to establish trade-offs between positive and negative events, but also making the macroprudential governance framework itself auditable and transparent, allowing the interested public to follow and evaluate the macroprudential policy decisions taken.

By focusing on the work of these economists, we can take into view the „catalytic role of ideas and new descriptive categories in changing conceptions of practice and risk management in particular“ (Power 2007, 6). Doing research on this kind of boundary work between regulation and science requires focusing less on the spokespersons/promoters of certain economic and regulatory paradigms (people such as Krugman or for the case of this study Claudio Borio) and more on model builders or those generating statistical evidence that support such a shift (Eyal and Buchholz 2010, 131). It also requires us to look at the development of new economic theories and the statistical techniques jointly (s. Desrosieres 2003, 2015), because one without the other fails to convince the economics profession (Morgan 1990, Backhouse 2010, 163), that has settled on an econometric research program (for the power of statistics in hardwiring certain normative valuations of finance into our outlook on the world, s. Christophers 2011, 2013). In other words, it requires more attention to “economists in the wild” (Callon 2007), that is economists in bureaucratic settings and how they interact with academic research and researchers to combine theory, methods of measurement and data to frame the negative externalities that require regulatory intervention (Callon 1998b).

In their efforts of translation of abstract concepts into actionable indicators and models that can guide policymaking (Callon et al 2007), economists in technocratic bureaucracies enroll academic allies (Callon 1986, for the case of central banks, s. Marcussen 2006, 2009, 2013) and engage in “regulatory

science”: a process of negotiation over the stock of scientific knowledge deemed sufficiently objective to provide the basis for regulatory action (Jasanoff 1990, Jasanoff 2011a, 2012)⁶¹. Regulatory science is a negotiated boundary work over where science ends and politics begins (Gieryn 1983, 1995, Weingart 1999), seeking to establish what science can state with certainty and what is subject to political decision making, due to lack of conclusive evidence (Jasanoff 1990, 14, 237). It is the iterative boundary work that occurs between these two groups in this process that establishes the knowledge base of regulatory tools. However, due to politically perceived needs for action and time pressure, technocratic economists might operate on epistemic standards of proof which deviate from academic standards of definite proof, but rather follow the principle of precaution (Jasanoff 1990, 250; 2012, 109).⁶² As experts it is they

who govern the production and evaluation of policy-relevant science. And unlike scientists, whose primary mission is fact-making, experts are by definition boundary-crossers whose job it is to link scientific knowledge to matters of social significance: they are the diagnosticians of public problems, the explorers of solutions and the providers of remedies (Jasanoff 2011b, 24).

It is this process of translation of (new) economic ideas into an actionable policy framework, which is of utmost importance for an actual policy paradigm shift to occur (Hirschmann and Popp-Berman 2014). This work transforms an idea into a socio-technical device, an “agencement” of regulators which both reshapes their vision of the economy and the capacity to intervene in it (ibid, 782, Callon 1998b, Callon et al 2007). These regulatory devices for detecting risks are linked to possible remedies, which in turn are subjected to attempted analysis of trade-offs in terms of costs and benefits to frame the discussion over the desirability of public intervention (ibid, 261f). Adopting such measures in the end then co-constitutes on the one hand the assumed nature of the object to be regulated, but also the assumed responsibilities and capabilities of the regulating subject, knowledge objects and social

⁶¹ The current era of evidence-based policy (Strasheimer 2015) can in general be characterized as an era of regulatory science, where policy makers seek to avoid personal judgment and instead seek to base themselves on hard-won scientific objectivity.

⁶² Jasanoff’s early work on the regulation of carcinogenic elements by the FDA and the EPA (Jasanoff 1990) shows well why this is the case. The principle of precaution led these agencies to forbid certain chemical elements, even if the proof of their carcinogenic effect was not yet fully established.

orders are co-produced (Jasanoff 2004, 275f, 2005, 92 Hilgartner 1992, 47). As Luhmann put it, framing uncertainties in terms of risk implies calculability and hence allocates responsibility for the (regulating) actor that can know and react to these calculable risks (as cited in Power 2007, 6).⁶³ **It is only today**, 10 years after the crisis that this translation process from ideas into measurement devices and policy recommendations, embedded in macroprudential policy frameworks has come to a (preliminary) conclusion and can be fully analyzed by researchers in its impact on public policies.

Lessons from history

These linkages between economics as a scientific discourse and economics as a bureaucratic practice raise the question of **when, how and under which conditions** changes in the intellectual field of economics lead to changes in policy making and under which conditions changes in policy making impact the intellectual field of economics. Which ideas are institutionalized and lead to changes in practice and which ideas are discarded? Which new scientific objects subsumed under the risks to be regulated are accepted and what are the implications in terms of regulation? To answer these questions, we need to observe changes in economic discourse emanating from the intellectual field, including both applied and academic economists, and changes in political discourse **jointly and sequentially**, postulating that changes in economics facilitate shifts in policies (s. Braun 2014, 52, for the shift from Keynesianism to neoliberalism) and that changes in policies facilitate shift in economics (Hall 1989a).⁶⁴ Such thinking in sequences means in no way that the relationship is unidirectional, indeed, it might better be **conceptualized as cycles**, whereby demands emanating from politics after crises are answered by the economic discourse⁶⁵ and in turn can transform policy and politics (Fourcade 2009). Following this perspective established by Fourcade's work (2001,

⁶³ We find a similar formulation in Lascoumes and Le Gales (2004, 13): « Un instrument d'action publique constitue un dispositif à la fois technique et social qui organise des rapports sociaux spécifiques entre la puissance publique et ses destinataires en fonction des représentations et des significations dont il est porteur. »

⁶⁴ E.g. the installation of a policy device based on a change in politics can generate the data/evidence needed to change the economic view on things.

⁶⁵ Langley's reference to economics as the administrative art of establishing order through concepts which make governance possible (Langley 2014, 9) is most apt here.

2009), the call for macroprudential policies in 2008/2009 is interpreted in this book as a demand by politics to economics to provide answers as to how finance could be better regulated to prevent a reoccurrence of the events of the financial crisis, which as in the past set in motion a process of re-envisioning the economy (Mitchell 2005).

Such an emphasis on the work of applied economists and the policy devices they produce is borne out by a comparison with prior paradigm shifts in policy making after crises which acted as watershed moments. Before its ascendance to dominance as a policy paradigm, Keynesianism required the installation of extensive statistics and the invention of econometric techniques by Tinbergen and others to generate a representation of the economy which policy makers felt they could use to legitimately intervene in (Mitchell 2002, Breslau 2003), that is **actionable knowledge**.⁶⁶ The new macroeconomic consensus on limited fiscal policy and focus on monetary policy (Clift 2018,79) linked to the rational expectations revolution gained its full policy influence only when it was included in the workhorse models for economic forecasting of all major central banks in the 1990s (Helgadottir 2018:1), a model called today “Dynamic Stochastic General Equilibrium model” (DSGE).⁶⁷

These prior historical experiences also point to the fact that with regards to fundamental shifts in economic policy paradigms, there are different temporalities at play in the realm of economics, administrative activities and political action regarding the gestation, the transfer and the embrace of these ideas (s. Hall 1989b, Blyth 2002, Helleiner 2010). When we look at the history of the evolution of macroeconomic governance paradigms, such as Keynesianism or the rational expectations revolution of the 1970s, which undergirds current neoliberalism, we find a **pattern of sequential co-**

⁶⁶ Tinbergen and his econometric work arguably was as important to Keynesianism as was Keynes (Braun 2014, 57f). He produced the powerful indicators (Muegge 2016), that Keynesianism was based upon.

⁶⁷ Its proclaimed “scientificity” was one of the main elements that undergirded the claim to central bank independence, which underlay the rising power of both the Fed and the ECB in the decade before the crisis (McNamara 2002).

evolution, whereby policy experimentation and economic theory co-evolve.⁶⁸ There is hence a need to focus on the interaction of these different fields and their different temporalities to understand the emergence and implementation of new policy paradigms (Mudge 2008, 707, Vauchez and Mudge 2012, Mudge 2018).

To better capture these dynamics, I suggest to return in a first step to the original analytical framework developed by Hall (1989) to explain the rise of Keynesianism post-WWII, which was more open to the interplay between developments in different fields, seen as loosely coupled. In this framework the political power of proposed ideas is a function of their **economic, administrative and political viability** (Hall 1989b).⁶⁹ This framework emphasizes that economic ideas need to be deemed: First, viable or at least acceptable by the economics profession and need to be viable within the economy within which they are employed.⁷⁰ Second, they need to be deemed feasible by administrative staff and desirable in terms of their implications for these administrative bodies. Third, they need to be deemed politically beneficial or at least not detrimental by politicians carrying them forward. As Hall points out, **no single factor** among these is decisive on its own, and ideational change can generate policy change even if one of these dimensions is not overly favorable (Hall 1989b: 371f). However,

⁶⁸ Keynes' General Theory was published in 1936, seven years after beginning of the Great Depression and became influential as a blueprint for policy action on a global scale only after 1945, with prior experimental engagements in aggregate demand management in Western Europe and the US in the late 1930s. And even then, Keynesianism at no point was a universally shared paradigm, instead the openness of the policy apparatus to the new Keynesian ideas as well as prevalent political coalitions shaped variegated Keynesianisms around the Western World (Weir 1989, Hall 1986). Even more long-term is the history of the ascendance of neoliberalism, which began in the 1930s, coagulated as an organized group in the late 40s and became influential in the 1980s (Mirowski and Plehwe 2013, Slobodian 2018). The degree to which different political economies converged towards the neoliberal model of independent central banks, anti-inflationary policies, a structural deregulation of financial markets and very limited public aggregate demand management differed based on administrative capacity, state traditions (Levy 2006) and the translation of neoliberal ideas into local contexts by technocratic and political agents (Kjaer and Pedersen 2001, Ban 2016).

⁶⁹ It is remarkable that for almost three decades, there has been little direct follow-up on this analytical framework that emerged from the excellent collective work assembled in Hall (1989a), which specifies different variables such as the permeability of the state administrative apparatus to new ideas as decisive (s. e.g. Weir 1989). Instead, Hall's 1993 contribution, centred solely on developments within the state apparatus seems to have crowded out the attention of social scientists.

⁷⁰ E.g. a country solely relying on coal for its electricity consumption can hardly embrace economic ideas that proclaim the urgent and immediate need for an energy transition towards renewable energy, the case of Poland in 2019 can serve as an example here.

too much opposition in these three dimensions will prove detrimental to the implementation of these policy ideas and hence to a paradigm shift.

With respect to the administrative dimension, it is important to emphasize that macroprudential policies extend beyond the boundaries of depoliticized central bank activities, forcing these actors to recalibrate their activities and their relationship to the political as they include this new scope of duties (Tucker 2018). This implies a heightened need for scientific objectivity upon which central bankers could base themselves to justify their interventions. The prophylactic character of these measures, in contrast to measures of quantitative easing, which were a response to the urgency of financial crises, made this need for scientific underpinning even more necessary, in particular in countries where legal system provide strong protections for business from arbitrary infringements into their business activities (as is the case in the US, with its administrative rule making procedures or Germany, where based upon the Nazi experience strong individual rights were guaranteed in the constitution, applying also to the pursuit of private business activities (s. Thiemann and Lepoutre 2017). This caution also extends to politicians, who in current financialized economies will fear the opposition of voters to measures that limit access to mortgage credit to acquire housing (Baker 2013a, 2018), the main element of Western financialized economies today. On the other hand, both politicians and technocrats fear the fall out from another financial crisis and the blame that will be attributed to them.

The construction of legitimate risk objects

Given this ambiguity in the administrative and political realm, the constitution of macroprudential concerns as legitimate risk objects (Hilgartner 1992, Power 2007) is crucial to help overcome these concerns in the political and administrative realm. Therefore, I complement this general institutional framework with insights from the sociology of economics (Breslau 2003, Fourcade 2001, 2003, 2006, 2009) and those of the sociology of the economics profession (Reay 2012, Whitley [1984]2000) to focus on the conditions of production of **new economic idea sets in the intellectual/academic** field and their constitution as legitimate risk objects in the field of

regulatory science (Hilgartner 1992, Power 2007). Using insights from actor network theory (Callon 1986, 1998a, b, Latour and Woolgar 1986) as well as the work in science and technology studies on regulatory science (Jasanoff 1990, 2004, 2011, 2012, Weingart 1999), I focus on the constitution of scientific objects and the work of these translation of economic ideas into actual policy devices, which makes them suitable for policy practice. Such devices, jointly with the economists that push for their inclusion are crucial elements in the construction of networks of control seeking to contain these specified risks.

To trace the origin of these devices and their insertion in economic discourse, I draw upon Whitley's conceptualization of economics as an intellectual field (2000), which is broader than the academic field alone and encompasses the entire social space within which economic knowledge is produced. This allows me to get into view the contribution of applied economists in central banks, international organizations or think tanks to economics to economics.⁷¹ As he points out, economists within these latter organizations labor under very different task requirements and incentive regimes, where it is less the advancement of academic discourse and the building of novel models and the testing of the latest methods, but rather the solving of policy problems that are posed to them in their employment as applied economists (Reay 2012). They seek to provide actionable solutions based upon (new) economic ideas and thus are important agents in the production of policy devices.⁷² In other words, they mediate between economics as an administrative craft to make the economy amenable to economic intervention on the one hand (Langley 2014, 9) and the abstract "scientific" discourse on the economy on the other hand. In other words, they stood and stand at the frontlines between on the one hand our understanding of the economy, and on the other hand the perceived need to intervene in them to improve economic outcomes. In that sense, their work represents a

⁷¹ On the conceptualization of the latter as an interstitial field, situated between the field of power and the field of production of expertise, s. Medvetz (2012)

⁷² This implies, importantly, that if formulated according to the rules of academic economics, these interventions in turn can change the academic economic discourse.

contradictory unity of economics as a science and economics as an administrative craft. This dialectical unity itself is a motor of the advancement of both (Fourcade 2009)

Transferring the historical insights into the present day, we can see certain similarities: just as in the 1930s and the 1970s, we are finding ourselves in the wake of a crisis both of the economy in the Western world and in current economics (s. e.g. Romer 2016, Mirowski 2013), where the economic profession seeks to identify ways to understand and incorporate the lessons of the crisis. At the forefront of these developments are applied economists within international organizations such as the IMF or central banks, seeking to incorporate finance and its potential for negative feedback loops with the real economy in their models of the macro-economy (s. e.g. IMF chief economist Blanchard, as cited in Clift 2018, 81). The question is whether and how this work of applied economists in seeking to adapt their (macro-) economic models leads to changes in the policy paradigm of financial market regulation and central bank action (Braun 2014, Henriksen 2013)? Does a view that sees the role of finance as much less benign and in need of constraint translate into actual policy actions through the translation of these concerns into metrics of risks that are posed to the real economy by the financial system? The installation of such a paradigm, which intervenes in the evolution of booms and busts in financial markets would be a fundamental shift to the pre-crisis paradigm. To understand the dynamics of the construction of such a new paradigm, one can once again draw upon work on such paradigm evolution in the past.

In a seminal article, Braun distinguishes three phases in the generation of a “**macro-economic governability**” paradigm⁷³: first, formulating a **new vision** of the economy⁷⁴, second a formalization

⁷³ It is important to point out that Braun analyses macroeconomic governability paradigms of which macroprudential regulation can only be seen as one part. In addition, a completely new governability paradigm would require to include considerations of financial stability in monetary policy, an issue central bankers have been alluding to, but which to date is not integrated or specified in any formal rules yet (Johnson et al 2019).

⁷⁴ He and other social constructivist authors employ a statement made by Schumpeter in his History of Economic Analysis to great effect. There, he stated “[I]n order to be able to posit to ourselves any problems at all, we should first have to visualize a distinct set of coherent phenomena as a worthwhile object of our analytic effort. In other words, analytic effort is of necessity preceded by a pre-analytic cognitive act that supplies the raw material for the analytic effort. In this book, this pre-analytic cognitive act will be called Vision.” (Schumpeter, 1986, p. 38-39) This vision is understood as ideological in nature, axiomatic assumptions are made about the economy, which cannot be proven or disproven by data.

and operationalization of this vision in model economies and third seeking for ways to measure, estimate and predict the associated variables in these models (Braun 2014, 50, s. also Widmaier 2016). The different visions of the economy, which are ideological in nature posit axiomatically different behaviors of the economy. They contain fundamental concepts, such as the cyclical nature of financial markets or the assumptions that they operate efficiently. These concepts give rise to economic models formulated according to the rules of academia, which function “as artificial economic systems that can serve as laboratories” (Lucas, 1980, p. 696, as cited in Braun 2014, 54), which serve to produce forecasts and act as narrative devices to explain what is going on in the economy (ibid).

Once such inherently coherent models of the economy are produced, they then need to be able to “fit the data”, reproduce data patterns from the past and correctly predict future developments. It is at this point, where the development of governability paradigms is “inextricably bound up with developments in econometrics. Problems such as aggregation from micro-data, identification and measurement of variables, model calibration, and model uncertainty all fall under this third requirement of empirical fit.” (ibid). Once these three phases are concluded, this work can give rise to a governability paradigm, a clear and relatively coherent framework, which based on reliably identified causal relationships proscribes certain policy actions, such as was the case for Keynesian models of aggregate demand in post-WWII, which crystallized in hydraulic models of the economy or the New Keynesian synthesis of the 1980s which focused almost exclusively on the setting of monetary policy and crystallized in Dynamic Stochastic General Equilibrium models (DSGE).⁷⁵

The intellectual challenges posed for the construction of a macro-prudential framework that could be part of such a new governability paradigm were stark in 2008. The new vision, as formulated by Crockett (2000) and Borio (2003), among others maintained that finance is

⁷⁵ As Braun points out, there are weakening effects of these policy apparatuses once installed and used over time. He suggests that their success might generate a certain overconfidence in identified relationships that would lead to an undermining of the capacity of such macro-paradigm to generate the desired results, as problems outside of the framework accumulate (s. also Widmaier 2016). However, these issues are not yet a concern to a macroprudential governability paradigm in the making, as this apparatus first has to become operational.

endogenously instable and operates in cycles, in turn threatening economic growth (Borio 2012). Such a view was diametrically opposed to the pre-crisis vision, which based on the Efficient Market Hypothesis and the Rational Expectations framework advocated for a structural deregulation of finance (Mirowski 2013, Braun 2014). Based on an uncritical acceptance of efficient market assumption, macro-economic models had no banking systems (Clift 2018, 72) and financial variables, such as short-term credit flows were largely outside of the mainstream analytical focus (cf. Mirowski 2013, Braun 2014). Table 1 details in an ideal-typical fashion the fundamental departure which the vision of financial markets that underlies macroprudential regulation represents with respect to the pre-crisis vision, based on the efficient market hypothesis, which was central in the way regulators envisioned financial markets (FSA 2009: 11, s. also Baker 2013a, 118).⁷⁶

Vision of finance	Macroprudential Vision	Pre-crisis: Efficient Market Hypothesis
Nature of finance	Finance is cyclical	Finance follows a random walk
Capital allocation	Misallocation due to manias	Optimal capital allocation
Epistemic Authority	Regulators/state officials	Markets
Policy Devices for seeing and knowing risks	Public Systemic risk measurements; top down assessment by regulators	Bottom up, Private risk management systems integrated into public risk management
Policy tools for interventions to alleviate risks	Discretionary, ex ante intervention by regulators in markets and institutions	Rules based; interventions only in case of individual failures, interventions regarding individual

⁷⁶ It is important to emphasize that by 2007, the economics profession was no longer totally committed to the efficient market hypothesis (Fox 2009). Serious doubts, sown by the exuberance of financial markets in the 2000s, had led to the blossoming of behavioural finance and other challengers to the efficient market hypothesis (Jovanovic 2012). However, as one interviewee put it, behavioural finance cannot seamlessly function as a guide for policy, because it involves an epistemic stance that claims superiority for the outside observer, untangled by the market frenzy. Policymakers were reluctant to take such a stance, asking how this claim could be justified. Here, the New Keynesian view of frictions that led to coordination problems of otherwise rational agents offered a much smoother justification for policy action. Policymakers no longer needed to claim intellectual superiority, but instead pointed to market failures to justify policy interventions (interview American economist 19th of January 2018).

	based on public systemic risk measurements	risk management systems, “benchmarking”
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Table 2.1: The different visions of finance and the different policy devices attached to it, for a related table, s. Baker 2013a, 117

The fundamental difference in the vision of these two approaches lies in the assumed nature of finance. It is either seen as subject to boom and bust cycles, which are sufficiently predictable to allow forecasts and hence policy actions. Or it is seen to follow a random walk, where all available information is already priced in. This would make a prediction of future developments by an agent external to the market impossible, as future information will arrive randomly. From this different conception of the nature of finance, a different understanding of the effects for capital allocation follow, which in the case of frantic markets might well lead to a misallocation of capital, whereas capital allocation is deemed optimal in efficient markets. Hence, this different vision implies, in its extremes a very different allocation of epistemic authority with respect to financial market dynamics, including investment decisions.

Assuming cyclical financial markets, there is a role for regulators/state officials to assess developments in markets with respect to their tendencies to become self-reflexive, either in the boom phase, when speculation drives prices upwards or in the bust-phase, when expectations of gloom worsen price dynamics today (Orlean 2011) and to intervene before these dynamics unfold. On the other hand, assuming that financial markets themselves are optimal at processing information implies the exact opposite for the role of regulators. Instead of intervening in financial markets, they should seek to extricate themselves from the market in order not to distort its capacity to amalgamate information. Furthermore they should seek to reduce transaction costs, allowing trading on all possible kinds of financial contracts in order to maximize the information processing power of financial markets.⁷⁷ These different visions also require different policy devices for seeing and

⁷⁷ De Goede notes this implication of the Black-Scholes formula for derivatives pricing, which made the theory highly appealing to practitioners, who were all in favour of more trading (De Goede 2005, 130f). The implications of this

knowing risks, as well as for different policy tools to intervene in those markets and secure financial stability.

Whereas a view that ascribes epistemic authority to markets could content itself with copying the most up to date risk management systems of private institutions , namely Value-at-Risk systems (for how VaR became integrated in Basel II, s. Tsingou 2004, Seabrooke and Tsingou 2009, for an extended critique of the risk-management tool and its depoliticizing effect, s. de Goede 2004, Lockwood 2015), this was not an option for a view which sees private agents as prone to succumb to the underpricing of risks in the boom times and overpricing of risks in the bust times (Crockett 2000, Borio 2003b). Such a view required new policy devices to track the build up of systemic risks from a regulatory perspective and the mechanisms to discretionarily intervene when imbalances were building up before the boom.

As this book seeks to show, this new vision of financial markets as posing a repeated, cyclical threat to economic growth that can be predicted based on developments within financial markets has been established in economic discourse post-crisis, and while not uncontested, the formalization and operationalization of this vision can currently be observed both in the most prestigious academic journals (s. e.g. Adrian and Brunnermeier 2016, Adrian et al 2019) and in recent publications by the International Monetary Fund (IMF), the BIS and central banks.⁷⁸ Due to the **ongoing “scientization” of central banks** (Marcussen, 2009, Mudge and Vauchez 2016), based on a decades long investment in economic expertise in in-house research departments, central banks are at the center of this re-orientation, which (re-) perceives finance as fragile and which hence sees the need for inclusion of credit and finance in models of the economy, using these insights to inform policy making. In this role, **central bank economists have become central producers of knowledge** about the issues

theory and its capacity to place derivatives trading in the realm of productive speculation rather than gambling has been that this is what made the

⁷⁸ These new works published in the most prestigious economic journals, including the flagship American Economic Review, emphasize the linkages between finance and the macro-economy both on the global as well as the national level (Rey 2013, Miranda-Aggripino and Rey 2015, Mian and Sufi 2018, Adrian et al forthcoming, Jorda et al 2015, 2017; Knoll et al 2017, Mian and Sufi 2011, Mian et al 2017, Brunnermeier and Sannikov 2014, Schularick and Taylor 2012).

pertaining to money, banking and credit (Mirowski 2013, 193, Mudge and Vauchez 2016, Jacobs and King 2016). For this reason, this book pays special attention to analytical debates of economists working in central banks, as these are operating at the intersection of economics as a research endeavor and policy action.

Their **interaction both with academic economists as well as economists in international organizations**, such as the BIS or IMF on these issues is seen as crucial, as it shapes the **technocratic coordinative discourse** on which policy programs to adopt to answer perceived policy challenges. It is in these discussions that the appropriate answers to the regulatory challenges is determined, including the validity of their quasi-scientific underpinnings.⁷⁹ As in prior policy shifts (Fourcade-Gourinchas and Babb 2002, Fourcade 2006, Babb 2013), the **development of ideas and policy blueprints** at the transnational level has been crucial in this reorientation (Grabel 2018, Muegge and Perry 2014). The reason for this centrality of this transnational debate is on the one hand that **international organizations**, such as the IMF, the OECD or the BIS **compete in generating ideas** to meet policy challenges and promoting policy blueprints they deem desirable to their constituents.⁸⁰ On the other hand, economists employed in national technocratic institutions, most prominently central banks are actively participating in these transnational debates (inter alia Haas 1992, Marcussen 2009b, Johnson 2016), where they enter their input to justify their domestic choices as well as draw inspiration for the development of new policy programs domestically (Clift 2018, Thiemann 2019). To date, the existence of prominent challenger discourses in the technocratic discourses, which advocate to constrain and limit the role of financial markets globally (for an analysis of these debates, s. Nagel and Thiemann 2019) and domestically (Baker 2018) represent a moment of discursive openness (De Goede 2004), of productive incoherence (Grabel 2018) in which the path of the future

⁷⁹ I use “quasi-scientific” to clarify that regulatory science operates to standards close to, but not equivalent with academic research.

⁸⁰ Sometimes described as think tanks (Westemeier 2018), one of their main activities is to establish the epistemic authority of their institution by providing policy proposals that are widely accepted and/or by providing warnings on impending dangers which subsequently materialize.

policy paradigm is forged (for first effects on the IMF, s. Gallagher 2015). As we currently witness the formalization and testing of this new paradigm, it is simultaneously entering the implementation phase, which differs from jurisdiction to jurisdiction (s. Lombardi and Moschella 2017; Thiemann 2019, Hungin and James 2019). What we therefore observe post-crisis is the **organizational and institutional work** of implementing these ideas by reconfiguring state society-relations (Hall 1986). Due to the emasculation of ministries of finance after Keynesianism and the resultant centrality of independent central banks in the current governance architecture of finance (McNamara 2002, Watson 2002), this work crystallizes mostly in central banks tasked with macroprudential regulation. Crucial questions in these debates are **how macroprudential policy is institutionalized** in central banks and **how the monetary policy framework should interact** with the new goals regarding financial stability.

The next chapters seek to elucidate these debates and their consequences in terms of implementation, starting by first analyzing the evolution of economic discourse on these issues of systemic risk and macroprudential regulation pre- (chapter 3) and post-crisis (chapter 4), consequently moving from there into the realm of the interaction between these scientific discourses and the set-up of macroprudential frameworks and tools both globally and domestically with respect to the banking system (chapter 5, 6 and 7) and the fate of global reform efforts regarding the shadow banking system (chapter 8 and 9).

Chapter 3 Understanding the shift from micro- to macro-prudential thinking: a discursive network analysis

With Mohamed Aldegwy and Edin Ibrocevic⁸¹

Abstract

Macro-prudential thinking and its emphasis on endogenously created systemic risks, marginal in the banking regulation discourse until the mid-2000s, has become central post-crisis. This paper analyzes this intellectual shift by using discourse and citation-network analysis of the most-cited scholarly works on banking regulation and systemic risk from 1985 to 2014 and six in-depth interviews with central scholars. It demonstrates that the predominance of formalism, particularly partial equilibrium analysis, in studies on banking regulation pre-crisis impeded economists' engagement with the endogenous sources of systemic risks discussed in the systemic risk sample. These studies excluded observed phenomena that could not be accommodated in mathematical models, largely ignoring contributions based on historical and practitioners' styles of reasoning. Post-crisis, while informal analyses gain prominence in studies on banking regulation, attempts to conceptualize systemic risk as a negative externality indicate the persistence of formalism and equilibrium thinking and its concomitant epistemological limitations that stymie theoretical progress.

1 Introduction

Since the outbreak of the financial crisis in 2007, the macro-prudential policy paradigm has gained increasing prominence (Bank of England, 2009; Bernanke, 2011; Bisias et al., 2012; Baker, 2013a, 2015). The pre-crisis consensus of focusing solely on the risk management of individual banks, based on the idea that 'for the financial system to be sound it is necessary and sufficient that each individual institution is sound' (Borio, 2009, p. 33; Crockett, 2000), has been discredited. Instead, driven by the ruptures of the global financial crisis, policymakers have increasingly adopted the macro-prudential approach which focuses on the systemic risks generated endogenously within the financial system by the collective behavior of financial institutions (Crockett, 2000, p. 3) and attempts to maintain the stability of the financial system as a whole through controlling these risks (Hanson et al., 2011; Bisias et al., 2012). While some literature has

⁸¹ This chapter is the outcome of joint work and was initially published as Matthias Thiemann, Mohamed Aldegwy and Edin Ibrocevic.(2018). Understanding the shift from micro- to macro-prudential thinking: a discursive network analysis. Cambridge Journal of Economics, Volume 42, Issue 4, July 2018, Pages 935–962

acknowledged the difficulties of measuring systemic (tail) risks, which are often hidden from sight (Danielsson et al., 2012; SRC, 2015, p. 21), many new measures and models are being currently developed to deal with the risks emanating from contagion and the financial cycle (Smaga, 2014; Bisias et al., 2012). The trend towards macro-prudential policy interventions seems irreversible (Baker, 2015); however, it is not definite that a fully formed, coherent and effective variety of macro-prudential policy will become a common basis for the activity of central banks and regulators. In particular, this shift in the outlook on financial regulation has not been accompanied yet by a consensus on the appropriate measures and policy instruments (Baker, 2013b; Claessens and Kodres, 2014).

Despite the importance of this micro- to macro-prudential regulatory shift, the dynamics of the intellectual shift that underlies it and the reasons that prevented this shift to take place prior to the crisis in the academic economic discourse have not been addressed systematically. Prior work has shown how the shift in economic theory from public to private interest regulation since the late 1960s has undergirded the decline of macro- and the growth of micro-prudential regulation in the following decades (Harnay and Scialom, 2016). Our work carries this research forward by focusing on the evolution of the economic discourse on banking regulation since the late 1980s, contrasting it with the literature on systemic risk as the concept that undergirds macro-prudential regulation (Bisias et al., 2012). Investigating the intellectual reasons that impeded the shift from micro to macro-prudential regulation, we identify the epistemological barriers that prevented the economic discourse on banking regulation to adopt a macro-prudential regulatory perspective pre-crisis. Investigating the micro-macro shift also allows us to point to the persistence of these reasons in the current conjuncture post-crisis.

The production of economic knowledge in academia influences policymaking in financial regulation, particularly, due to the ongoing technocratization of the latter (Goodhart, 2011; Marcussen, 2013). By focusing on the failures of the economic discourse that has fed into the policy sphere, our study complements prior studies that focused on the policy sphere alone (Baker, 2013a,b, 2015; Seabrooke and Tsingou, 2009, 2014). While these studies point to the importance of groups that act as carriers of ideas, their institutional standing as well as the alliances they enter into, they rather ignore the dynamics in the sphere of knowledge production itself. In this paper, to give these studies a better grounding in their discursive context, we investigate the sphere of economic discourse, i.e. the place where the cognitive models with which regulators were seeking to optimize regulation originated (Black, 2013; Gigliobianci and Giordano, 2012). We therefore

analyze the most prominent writings of economists before the crisis on banking regulation, as they provided the intellectual input for the interpretative framework, the ‘policy paradigm’ (Hall, 1993, p. 279) in which regulatory policy was to be enacted. Our analysis thus seeks to contribute to a better understanding of the role of economics in pre-crisis regulatory failures. The structure of this paper is as follows: Section 2 describes our method and samples. In Section 3, we conduct the discourse and network analysis of our samples and complement it with findings from six expert interviews conducted with scholars central for the evolution of the systemic risk discourse pre- and post-crisis. Section 4 reflects on our findings and concludes.

2. Method and data description

We analyze the evolution of economic thinking about banking regulation and systemic risk in a longitudinal perspective through content and citation network analysis for the period from 1985 to 2014. We collect the 10 top-cited scholarly works per five-year period on banking regulation. To understand whether and if so why this discourse has failed to take into account systemic risk prior to the crisis, we also trace the economic discourse on systemic risk for the same period, using a similar procedure. We consider the highest-cited papers to be a good representative of the most influential and well-established ideas in the economic discourse on banking regulation in the years following their publication, during which these top-cited articles have attracted most of their citations. Using the date of publications of these scholarly works, we divided the sample into six periods (1985–1989, 1990–1994, 1995–1999, 2000–2004, 2005–2009 and 2010–2014).

To collect the top-cited works in each period, we used Google Scholar⁸² and searched for the following search terms in the ‘title’ search: Banking Regulation, Bank Regulation, Financial Regulation, Microprudential Regulation, Micro-Prudential Regulation, Microprudential, Macroprudential Regulation, Macro-Prudential Regulation, Macroprudential and Banking Law. We have also used the following search terms in the whole article search in Google Scholar: Banking Regulation and Bank Regulation. For the systemic risk sample, we searched for titles in Google Scholar that include any of these terms: Systemic Risk, Financial Contagion, Bank Contagion, Banking Contagion, Banking Crisis, Financial Crisis, Bank Crisis, Financial Stability and Financial Fragility. In the whole article search function, we searched for Systemic Risk, Financial Contagion,

⁸² We decided to use Google Scholar rather than Web of Science to avoid a selection bias caused by the focus on academic articles published in peer-reviewed academic journals. Thereby we could also include books and papers published by practitioners.

Financial Crisis and Banking Crisis. In order to make sure that we did not miss any of the top-cited scholarly works, we replicated the search above using the Web of Science database.

The above search resulted in a generic sample of the top-cited scholarly works that touch upon banking regulation and/or systemic risk, which we then refined by excluding the works that do not address banking regulation or systemic risk directly as being their key theme. However, we have not excluded the review articles that reached the top-cited scholarly works in our banking regulation sample because they function as excellent proxies for the contemporary economic discourse on banking regulation; they reflect the economic discourse at the time of their publication and have influenced future research on banking regulation in the period following their publications. The final aggregate sample on systemic risk and banking regulation has 114 resources because six resources appear in both samples, as these resources address directly both banking regulation and systemic risk.

The number of citations functions as a good proxy for the established ideas in the economic discourse unless some of the scholarly works are highly cited because their advocated ideas are rejected. Investigation of the banking regulation sample confirmed that the top-cited works in each period share the same ideas. This qualitative finding is further confirmed by the hubs of the banking regulation network we identified using citation network analysis (see fig. 1 below).

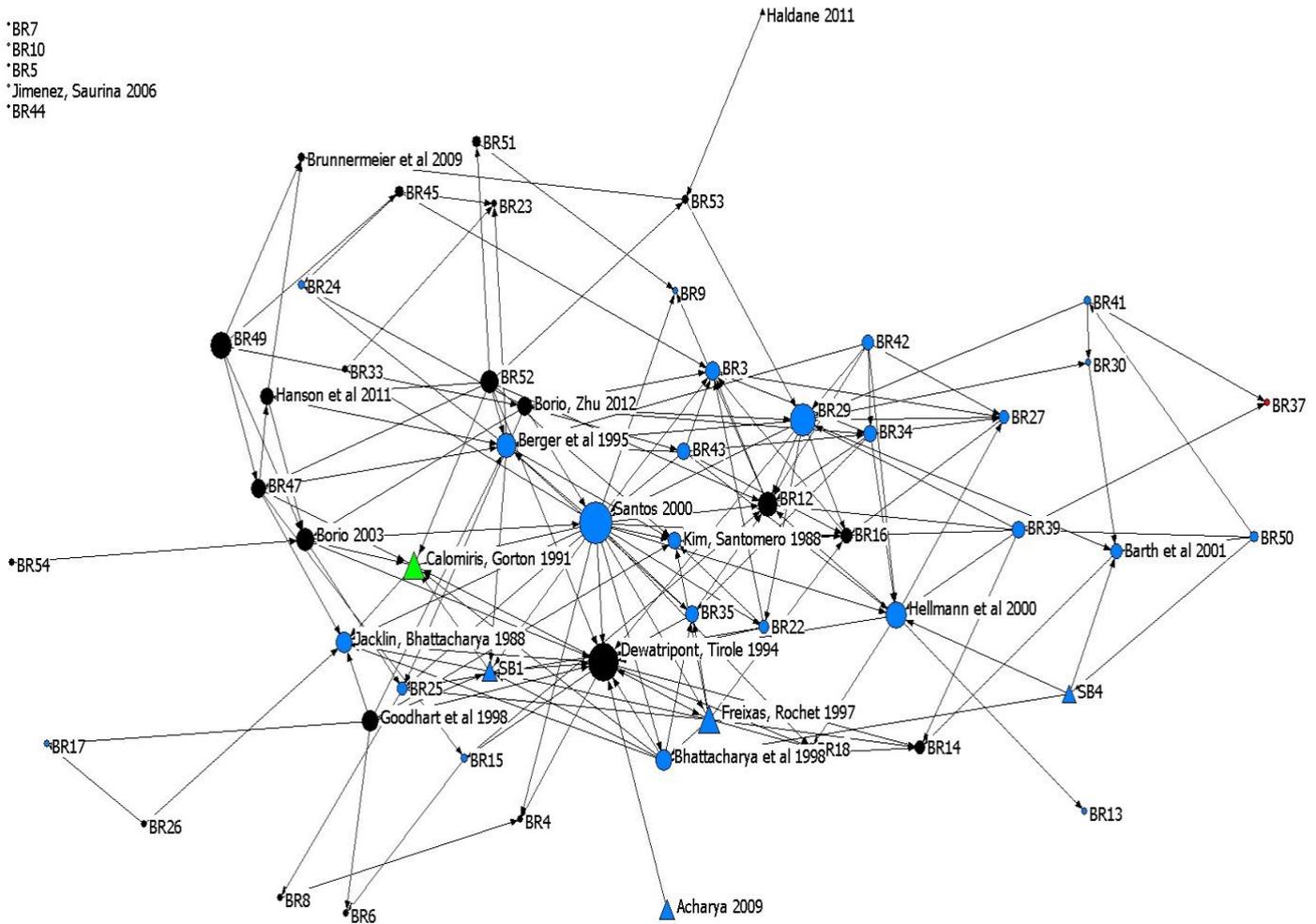


Figure 3.1. Banking Regulation Sample Network. Colours correspond to the colours in the Tables 1 and 2. Banking regulation sources are depicted as circles. Sources common to both samples are depicted as triangles. In this figure and the following, academic papers cited within the discourse analysis are depicted by author name; the others are depicted by their place in the table.

The only outliers prior to the crisis were the articles of Borio (2003) and Jimenez and Saurina (2006), and these articles received most of their citations post-crisis (see below). In the systemic risk sample, ideas are more dispersed; however, contestation only plays a limited role, as there is only very limited cross-citation in the systemic risk sample (see below).

Once we compiled the data, we used qualitative discourse analysis (Mayring, 2010) of the top five cited papers per period in each sample (30 resources per sample) to analyze the styles of reasoning, and the treatment of systemic risk in both samples. We focused on the origins of disturbances and chains of contagion in our analysis, the sources and propagation mechanisms of systemic risk. For the purpose of our discourse analysis, we distinguished between three sources of systemic risk that we

distilled from the literature (Smaga, 2014): bank runs, contagion and financial cycle. Individual bank runs caused by exogenous shocks are seen as the predominant source of systemic risk in the traditional neoclassical literature starting from Diamond and Dybvig (1983). Contagion/propagation risk, while exogenously generated, already has an endogenous element as contagion channels endogenously amplify the shock across the financial system (Smaga, 2014). Finally, the financial/credit cycle is endogenously generated through the process of risk accumulation over time. The type of systemic risk underlying banking regulation is the crucial difference between the micro- and macro-prudential approach (cf. Crockett, 2000), and it thus allows us to pinpoint which kind of understanding of systemic risk dominated each period of our samples. Furthermore, in our discourse analysis we focused on the particular styles of economic reasoning/methods underlying each scholarly work in our samples (for an indicative list of these styles, see Crombie [1994]).

Based on the in-depth discourse analysis, we also coded the remaining 54 sources in terms of their discursive style and then applied citation network analysis to the aggregate sample of 114 sources. Network analysis is used to corroborate the findings of the discourse analysis, analyze the interrelations among both samples and identify the central and authoritative papers in both samples. Here we draw on the distinction between hub measures and authority measures in citation network analysis.⁸³ Considering that citation network analysis as well as discourse analysis of scientific writings cannot reveal the way economists interact with the rules of discourse that structure the observed patterns nor reflect the institutional context within which they occur, we have also interviewed six leading economists, four of which are authors of some of the most-cited papers in our samples,⁸⁴ to corroborate and explain further the findings of discourse and network analysis. In the following, we present our findings: first those common to both samples, then findings relevant to the banking regulation sample, findings relevant to the systemic risk sample, and finally, findings relevant to the relation between both samples.

3. Discourse and citation network analysis of our two samples: findings

⁸³ Scholarly works obtain a high hub value if they cite a lot of highly cited papers in the sample, whereas authorities are those scholarly works that are highly cited by other important papers. These measures reflect the importance of a paper in the network as the number of the out- and in-going ties are weighted with the importance of the paper to which a reference is made (Kleinberg, 1999). Publications with high hub values can be analysed as synthesizing the current state of research, which is confirmed by the fact that most of the publications with high hub values in our sample are literature reviews (DeBandt and Hartmann, 2000; Bhattacharya et al., 1998; Santos, 2000). The authorities are considered as experts by the authors that form part of the network itself, usually because they contain novel, fundamental concepts for the literature on the topic.

⁸⁴ Two of the authors are not among the top 10, but we have included them as early and persistent voices of macroprudential concerns since the early 2000s, as corroborated by scholarly works from the time.

3.1 Findings common to both samples

Our discourse analysis shows that some styles of reasoning in social sciences such as mixed methods and computational agent-based modelling are not adopted in both samples. The styles we observe in our samples can be categorized under two broad styles of reasoning: informal and formal analysis. We distinguish informal analysis further into three types: historically, theoretically and practically inspired discourses. With the exception of practitioners' style of reasoning, the styles of reasoning we observe in our samples (reported in Table 3 below) are well established and sufficiently distinct styles of reasoning in social sciences (Morgan, 2012). Practitioners' style of reasoning, however, does not easily fit into this well-established list. Rather, it seems akin to an engineering style of reasoning; it formulates its research question as a policy problem, and it uses a combination of empirics, informal and formal models, insights from historical cases, intuitions and judgments pragmatically for addressing this policy problem.⁸⁵

These different discourses display a particular relationship to the conception of systemic risk and its analysis, as we will document below.

3.1.1 Practitioners.

For practitioners, there is a non-problematic relationship to systemic risk. It is their major concern; concepts such as contagion represent an empirical reality they have to deal with, even allowing them to overstep the legal boundaries of their mandate (Brimmer, 1989). Practitioners' ease with the concepts of systemic risk and contagion also was an important source of legitimacy in the literature on systemic risk. Especially in the early literature (e.g. in the second period), one finds references by academics to practitioners to justify their theoretical work (e.g. on contagion, see Kaufman [1994]; also Bernanke and Gertler [1990]). The style of practitioners, as found for example in the work of Kaminsky and Reinhart (1999, 2000), is to attempt to observe patterns in the data and to develop better forecasting of future events with its help. The practitioners' approach has been well summarized by John B. Taylor (2009): 'Following an approach to policy advocated by David Dodge [the former Governor of the Bank of Canada] throughout his distinguished career in public service, I try to use empirical evidence to the maximum extent possible and explain the

⁸⁵ For a defence of this style of reasoning as a guiding principle to economic policymaking, see Colander (2004).

analysis in the simplest possible terms, including by using a series of illustrative graphs' (p. 3, emphasis ours).

3.1.2 Historical discourse

Scholars using historical reasoning/discourse operate inductively based on the patterns they find in the historical data. Kindleberger (1988), for example, seeks to develop models that fit these patterns. Other sources, such as Calomiris and Gorton (1991), focus on the historical origins of banking panics in the USA (that is, multiple bank runs and contagion effects) and discriminate between different theoretical models using this data. They thereby represent an old style of economics which was eclipsed by the rise of formal economic model building (cf. Kindleberger, 1988). Remarkable in these sources is the use of simple flow charts, comparing countries over long periods of time as points of departure for theoretical reasoning.

1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014
BR1 Kim, Santomero. 1988. Risk in Banking and Capital Regulation (733)	BR11 Dewatripont, Tirole. 1994. The Prudential Regulation of Banks (1394)	SB3 Freixas, Rochet. 1997. Microeconomics of Banking (2520)	BR28 Hellmann, Murdock, Stiglitz. 2000. Liberalization, Moral Hazard in Banking(1317)	BR37 Barth, Caprio, Levine. 2006. Rethinking Bank Regulation (843)	BR46 Borio, and Zhu. 2012. Capital Regulation, Risk-taking and Monetary Policy (470)
BR2 Jacklin, Bhattacharya. 1988. Distinguishing Panics and Information-based Bank Run (599)	BR12 Keeley. 1990. Deposit Insurance, R	BR19 Berger, Herring, Szegö. 1995.The Role of Capital in Financial Institutions (701)	BR29 Barth, Caprio, Levine. 2004. Bank Regulation and Supervision (1250)	BR38 Brunnermeier, Crocket, Goodhart, Hellwig, Persuad, Shin. 2009. The Fundamental Principles of Financial Regulation (805)	BR47 Admati, , DeMarzo, , Hellwig, and Pfleiderer.2011. Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation(399)
BR3 Furlong, Keeley. 1989. Capital Regulation and Bank Risk-taking (461)	BR13Stiglitz. 1993. The Role of the State in Financial Markets (1313)	BR20 Goodhart. 1998. Financial Regulation (520)	SB4 Demirgüç-Kunt, Detragiache. 2002. Does Deposit Insurance Increase Banking System Stability? (1214)	BR39 Laeven, Levine. 2009. Bank Governance, Regulation and Risk Taking (717)	BR48 Hanson, Kashyap, and Stein. 2011. A Macroprudential Approach to Financial Regulation (369)
BR4 Diamond, Dybvig. 1986. Banking Theory, Deposit Insurance and Banking Regulation (171)	SB1 Bhattacharya, Thakor. 1994. Contemporary Banking Theory (1061)	BR21 Bhattacharya, Boot, Thakor. 1998. The Economics of Bank Regulation (177)	BR30 Barth, Caprio, Levine. 2001. The Regulation and Supervision of Banks Around the World (748)	SB5 Acharya. 2009. A Theory of Systemic Risk of Prudential Regulation (451)	SB6 Haldane, May. 2011. Systemic Risk in Banking Ecosystems(322)
BR5 Spong. 1985. Banking Regulation: Its Purpose, Implementation and Effects (164)	SB2 Calomiris, Gorton. 1991. The Origins of Banking Panics (616)	BR22 Blum. 1999. Do Capital Adequacy Requirements Reduce Risks in Banking? (391)	BR31 Borio. 2003. Towards a Macroprudential Framework for Financial Supervision and Regulation? (570)	BR40 Jimenez, Saurina. 2006.Credit Cycles, Credit Risk and Prudential Regulation (269)	BR49 Galati, Moessner. 2012. Macroprudential Policy(237)
BR6 Benston, Kaufman. 1988. Risk and Solvency Regulation of Depository Institutions (163)	BR14 Korszner, Rajan. 1994. Is the Glass-Steagall Act Justified? (504)	BR23 Merton. 1995.Financial Innovation and the Management and Regulation of Financial Institutions (323)	BR32 Santos.2000. Bank capital Regulation in Contemporary Banking Theory (451)	BR41Barth, Caprio, Levine. 2008. Bank Regulations are Changing (239)	BR50Beltratti, Stulz. 2012. The credit Crisis Around the Globe(181)
BR7 Fischel. 1989. The Regulation of Banks(155)	BR15 White. 1991. The S&L Debacle (352)	BR24 Peek, Rosengreen. 1995. Bank Regulation and the Credit Crunch (308)	BR33 Jones. 2000. Emerging Problems with the Basel Capital Accord (421)	BR42 Allen, Carletti, Marquez. 2009. Credit Market Competition and Capital	BR51 Gorton, Metrick, Shleifer. 2010. Regulating the Shadow Banking System (177)
BR8 Baltensperger. 1987. Banking deregulation in Europe (107)	BR16 Keeley, Furlong. 1990. A Reexamination of Mean-Variance Analysis of Bank Capital Regulation (317)	BR25 Blum, Hellwig. 1995. The Macroeconomic Implications of Capital Adequacy (300)	BR34 Repullo. 2004. Capital Requirements,Market Power and Risk-taking(386)	BR43 VanHoose. 2007. Theories of Bank Behavior under Capital Regulation (180)	BR52 Admati, Hellwig. 2014. The Bankers New Clothes (161)
BR9 Keeley. 1988. Bank Capital Regulation in the 1980s (82)	BR17Herring, Litan. 1994. Financial Regulation in the Global Economy (311)	BR26 Llwellyn. 1999. The Economic Rationale for Financial Regulation (255)	BR35 Matutes, Vives. 2000.Imperfection Competition, Risk Taking, and Regulation in	BR44 Gonzalez. 2005. Bank Regulation and Risk-taking	BR53 Haldane. 2010. A \$100 Billion Question? (139)

BR10 Pyle. 1986. Capital regulation and Deposit Insurance (79)	BR18 Giammarino, Lewis. 1993 An Incentive Approach to Banking Regulation (166)	BR27 Besanko, Kanatas. 1996. The Regulation of Bank Capital: (229)	BR36 Barth, Caprio, Levine. 2001. Banking Systems Around the Globe (369)	BR45 Borio, Shin. 2007. What can(macro-)prudentialPolicy do toSupport Monetary Policy?	BR54 Clement. 2010. The Term "macroprudential": Origins and Evolutions (122)
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Table 3.1 Banking Regulation Sample Both samples were collected in May 2014. In both samples, we refer to each resource by using the authors' family name, date of publication and the first few words from the title. The number in brackets beside each resource refers to the citations received by the relevant resource as collected in May 2014. Scholarly works using the historical approach are highlighted in green, those using practitioners' discourse are highlighted in red and those using informal theoretical analysis are highlighted in black. Finally, scholarly works using quantitative/formal methods, whether theoretical or empirical, are highlighted in blue.

1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014
SR1 Mankiw. 1986. The Allocation of Credit (423)	SB1 Bhattacharya, Thakor. 1994. Contemporary Banking Theory (1061)	SR19 Kaminsky, Reinhart. 1999. The Twin Crises (4323)	SR28 Allen, Gale. 2000. Financial Contagion (2114)	SR37 Brunnermeier. 2008. Deciphering the Liquidity and Credit Crunch 2007-08 (1992)	SR46 Adrian, Brunnermeier. 2011. CoVaR (986)
SR2 Schwartz. 1987. Real and Pseudo-Financial Crises (278)	SR11 Bernanke, Gertler. 1990. Financial Fragility (849)	SR20 Radelet, Sachs. 1998. The Onset of the East Asian Financial Crisis. (2738)	SB4 Demirgüç-Kunt, Detragiache. 2002. Does Deposit Insurance Increase Banking System Stability? (1214)	SR38 Reinhart, Rogoff. 2008. Is the 2007 US Sub-prime Financial Crisis so Different? (793)	SR47 Gorton, Metrick. 2012. Securitized Banking and the Run on Repo (655)
SR3 Taylor, O'Connell. 1985. A Minsky Crisis	SR12 Minsky. 1992. The Financial Instability Hypothesis (702)	SB3 Freixas, Rochet. 1997. Microeconomics of Banking (2515)	SR29 Borio, Lowe. 2002. Asset Prices, Financial and Monetary Stability (1190)	SR39 Taylor. 2009. The Financial Crisis and the Policy Responses (779)	SR48 Acharya, Pedersen, Philippon Richardson. 2010.
SR4 Gorton, Mullineux. 1987. The joint production of confidence. (173)	SB2 Calomiris, Gorton. 1991. The Origins of Banking Panics (614)	SR21 Berger, Demsetz, Strahan. 1999. The Consolidation of the Financial Services Industry (1324)	SR30 Caprio, Klingebiel. 2002. Episodes of Systemic and Borderline Banking Crises(1067)	SR40 Corsetti, Pericoli, Sbracia. 2005. Some Contagion, Some Interdependence (516)	SR49 Gai, Kapadia. 2010. Contagion in Financial Networks (332)
SR5 Eichengreen and Portes. 1987. An Anatomy of Financial Crises (149)	SR13 Kaufman. 1994. Bank Contagion (400)	SR22 Demirgüç-Kunt, Detragiache. 1998a. The Determinants of Banking Crises (1078)	SR31 Kaminsky, Reinhart. 2000. On Crises, Contagion, and Confusion (1049)	SR41 Beck, Demirgüç-Kunt, Levine. 2006. Bank Concentration, Competition and Systemic Risk (1474)	SR50 Mendoza. 2010. Sudden Stops, Financial Crises, and Systemic Risk (1000)
SR6 Schwartz. 1988. Financial Stability (100)	SR14 Bernanke. 1990. The Gold Standard, Deflation and Financial Crisis in the Great Depression (335)	SR23 Demirgüç-Kunt, Detragiache. 1998b. Financial Liberalization and Financial Fragility (1191)	SR32 Bordo, Eichengreen, Klingebiel. 2001. Is the Crisis Problem Growing More Severe? (865)	SR42 Schwarcz. 2008. Systemic Risk. (462)	SB6 Haldane, May. 2011. Systemic Risk in Banking Ecosystems(322)

SR7 Kindleberger. 1988. The International Economic Order - Essays on Financial Crisis (89)	SR15 Sundarajan, Balino. 1991. Banking Crises (191)	SR24 Diamond, Rajan. 1999. Liquidity Risk, Liquidity Creation and Financial Fragility (1062)	SR33 Borio, Furfine, Lowe, Procyclicality of the Financial System (791)	SB5 Acharya. 2009. Theory of Systemic (451)	SR51 Laeven, Valencia. 2013. Systemic Banking Crises Database (268)
SR8 Brimmer. Central Banking and Systemic Risks in Capital Markets	SR16 Calomiris. 1993. Financial factors in the Great Depression (164)	SR25 Goldstein. 1998. The Asian Financial Crisis (751)	SR34 Allen, Gale. 2000. Bubbles and Crisis (788)	SR43 Taylor, Williams. 2008. A black Swan in the Money Market (435)	SR52 Shleifer, Vishny. 2010. Unstable Banking (255)
SR9 Tobin. 1986. Financial innovation (81)	SR17 Mishkin. 1994. Preventing Financial Crisis (113)	SR26 Caprio, Klingebiel. 1996. Bank Insolvency (627)	SR35 Freixas, Parigi, Rochet. 2000. Systemic Risk (680)	SR44 Crotty. 2009. Structural Causes of the Global Financial Crisis (433)	SR53 Brownless, Engle. 2012. Volatility, Correlations and Tails for Systemic Risk
SR10 Balino. 1987. The Argentine Banking Crisis of 1980 (78)	SR18 Park. 1991. Bank Failure Contagion in Historical Perspective (96)	SR27 Rochet, Tirole. 1996. Interbank Lending and Systemic Risk (611)	SR36 De Bandt, Hartmann. 2000. Systemic Risk (663)	SR45 Acharya, Richardson. 2009. Restoring Financial Stability (397)	SR54 Battiston, Gatti, Gallegatti, Greenwald and Stiglitz. 2012. Liaisons dangereuses: Increasing connectivity, risk sharing, and systemic risk (218)

Table 3.2 Systemic Risk Sample

3.1.3 Informal analysts

Informal analysts such as Borio (2003) and his group at the Bank of International Settlement (BIS), Brunnermeier (e.g. 2008) or Minsky⁸⁶ (1992) seek to informally develop disequilibrium and endogenous risk models without being constrained by mathematical models. While they subject themselves to the rigor of mathematics where possible, they can work out the implications of financial cycle, and propagation risk without being constrained by formal models. It allows them to deal with more complex theoretical assumptions and thus to develop a broader picture of financial market developments. Informal analysts (such as Minsky) and historians (such as Kindleberger) relate to longer-term empirical facts, which allow them to acknowledge the existence of repeating cycles.

3.1.4 Formal analysis.

In contrast, formal analysts rely primarily on mathematical models. That means that concepts only exist if they can be modeled. In the first four periods of both samples, mathematical modeling uses comparative statics based on partial equilibrium. Formal analysts seek to explain financial fragility itself, but not how it can work over a cycle, basing themselves on exogenous shocks rather than endogenous build-up of risk (e.g. Bernanke and Gertler, 1990). Models are made simple in order to keep them mathematically tractable. We observe a shift in methods and modeling techniques over the six periods covered, from partial equilibrium analysis to general equilibrium analysis and network analysis, both of which are better suited for thinking about systemic risk.⁸⁷ This shift occurs around 2000 in the systemic risk sample, exemplified by the central work of Allen and Gale (2000). There is also a shift from comparative static analysis to dynamic analysis, as the time dimension of risk is included when analyzing systemic risk (Borio, 2003). These shifts in the modeling techniques towards network analysis and dynamic analysis are the preconditions for the fundamental post-crisis shift. It allows for a broadening of real-world phenomena that can be studied, such that mathematical modellers can more directly engage with

⁸⁶ Similar to Borio (2003), Minsky's piece from 1992 titled 'The financial instability hypothesis' enters our top-cited articles in the second period of systemic risk sample only when we include the citations it receives post-financial crisis. If not, this piece cannot reach our top-cited articles. This piece shares the informal discourse with the pieces of Borio, Brunnermeier and Kindleberger.

⁸⁷ The analysis of banking regulation within DSGE models has become more pronounced post-financial crisis (Levieuge, 2009). Although this in principle presents progress, as financial markets are now explicitly included in models of the economy, it still bears all the problems associated with equilibrium analysis: the neglect of evolutionary change and the presumption of rational actors with full or incomplete information (Arthur, 2013). In a sense, the literature risks to move from one unrealistic, mathematically constrained view on financial markets to a different one.

systemic risk-related concepts, such as contagion.

Style of Reasoning	Research Question	Method
Informal Analysis: Historical	To test theories with the help of history and to develop theories from historical observations	-Descriptive statistics and informal modeling - inductive
Informal Analysis: Practitioners/technocrats	Find a solution to a policy concern	Descriptive statistics, informal theoretical analysis (eclectic)
Informal Analysis: Theoreticians	To explain and predict system behavior	Informal theoretical analysis: develop and engage critically with economic concepts and theories without models, apply to regulation
Formal Analysis: Quantitative Approach	To explain and predict system behavior	Mathematical modeling and econometrics

Table 3.3 *Different styles of reasoning/discourses observed in our samples*

3.1.5 The distribution of the different styles in both samples.

When looking at the distribution of formal/informal discourses in the two samples, distinct differences emerge. Formal analysis dominates the banking regulation sample with a share of 61.64%. Conversely, the informal discourses dominate the systemic risk sample with a share of 68.26% (see Table 4).

Banking regulation Sample	Formal (Theoretical and (econometrical) empirical)	Informal Theoretical	Historical	Practitioners' discourse
1985-1989	7	3	0	0
1990-1994	5	4	1	0
1995-1999	8	2	0	0
2000-2004	8	2	0	0
2005-2009	7	2	0	1
2010-2014	2	8	0	0
Total	37	21	1	1
%share	61,64%	35%	1,68%	1,68%
Systemic Risk Sample	Formal (Theoretical/econometrical) empirical	Informal Theoretical	Historical	Practitioners' discourse
1985-1989	2	1	5	2
1990-1994	2	4	2	2
1995-1999	3	2	1	4

2000-2004	3	6	0	1
2005-2009	3	3	2	2
2010-2014	6	3	1	0
Total	19	19	11	11
%share	31,6%	31,6%	18,33%	18,33%

Table 3.4 *Distribution of styles of reasoning in both samples*

In particular, there is a strong difference in the importance of the practitioners' and the historical styles in both samples. With a share of 1.68% for each style of the sample, receiving a total of 7 citations (historical) and 2 citations (practitioners) from the other sources, these styles are virtually absent in the banking regulation sample. In contrast, both have a share of 18.33% in the systemic risk sample and 26 and 31 citations, respectively, showing that these sources with these two styles have a considerable influence in the systemic risk sample (see Table 5).

Style/Sample	Banking Regulation Sample	Systemic Risk Regulation Sample:
Historical	7	26
Informal	55	12
Practitioner	2	31
Formal	131	41

Table 3.5 *Number of citations per style per sample*

This difference in the importance of the practitioners' and historical style of reasoning becomes even more visible when one analyses density distribution of citations, that is, the likelihood that the sources in each period of our both samples would cite sources that use these particular styles of reasoning in the aggregate sample (see Table 3.6 below).

Period/Classification Banking regulation Sample.	Formal	Informal- theoretical	Historical	Practitioners' Style
1985-1989	0	0,017	0	0
1990-1994	0,077	0,046	0,038	0
1995-1999	0,109	0,076	0,022	0,056
2000-2004	0,106	0,116	0,03	0,095
2005-2009	0,054	0,024	0,008	0,017
2010-2014	0,055	0,071	0,033	0,017
Total	0,0668	0,058	0,0218	0,031

Period/Classification Systemic risk Sample	Formal	Informal- theoretical	Historical	Practitioners' Style
1985-1989	0	0	0	0
1990-1994	0,038	0,015	0,087	0,075
1995-1999	0,045	0,047	0,022	0,067
2000-2004	0,058	0,03	0,045	0,178
2005-2009	0,029	0,014	0,038	0,05
2010-2014	0,016	0,008	0,02	0,008
Total	0,031	0,019	0,035	0,063

Table 3.6 *Density distribution between Periods and Classifications for the banking regulation and the systemic risk sample. Density goes from periods towards classification*

Whereas sources using formal and informal theoretical analysis are most likely to be cited in the banking regulation sample, it is sources using practitioners or historical style that are most likely to be cited in the systemic risk sample. The overall likelihood of citing a practitioners' source is twice as high in the systemic risk sample as in the banking regulation sample. In contrast, the overall likelihood of a formal source being cited is more than twice as high in the banking regulation sample as in the systemic risk sample. These differences in the distribution and the references to the different styles of discourse had a profound impact on the evolution of thinking about financial crises and systemic risk in the two samples, as we will show below.

3.2 Findings relevant to the banking regulation sample

As stated above, the banking regulation sample is dominated by formal reasoning, following mostly a partial equilibrium approach from 1985 to 2005. Starting from period five in the banking regulation sample, network analysis starts to appear as a style of reasoning. Scholarly works in the first period of the banking regulation sample (1985–1990) emphasized bank runs as the source of systemic risk and insolvency risk as the economic rationale for banking regulation. For addressing these regulatory problems, these scholarly works emphasized deposit insurance and capital requirements as the main banking regulatory instruments. They discussed the desirability of risk-sensitive capital regulation, as non-risk-related capital ratios may induce excessive risk-taking by changing the composition of the asset side of the balance sheet. There was almost consensus that deposit insurance is almost the only solution for bank runs except in the case of money demand shocks, where lender of last resort

or interbank markets can be appropriate alternatives. In this period, the term ‘systemic risk’ has almost never been mentioned, and the contagion and financial cycle forms of systemic risk were not identified as key regulatory problems.

The works of the second and third periods of our banking regulation sample (1990–2000) are a natural extension of the works in the first period. The main new issue in the third period is debate regarding risk-based capital regulation, how to calculate it and its effects on the risk-taking incentives of banks. In line with this finding, papers with high hub values in the banking regulation sample (Bhattacharya et al., 1998; Goodhart et al., 1998; Santos, 2000; Barth et al., 2004) focus on the regulation of single institutions (with some minor exception by Goodhart et al. [1998]). Systemic risks are usually derived from the financial systems’ vulnerability to suffer bank runs, based on information asymmetries (cf. Bhattacharya et al., 1998), which in turn justifies deposit insurance, but only few sources engage multiple bank runs, that is panics (cf. Calomiris and Gorton, 1991). In sum, the three first periods in the banking regulation sample (1985–2000) that were dominated by formal analysis witnessed very little theoretical developments.

In the fourth period, authors question the previous consensus on deposit insurance as the optimal tool for addressing bank runs and panics (the only form of systemic risk tackled in banking regulation sample until this period), pointing to implicit deposit insurance as a more efficient risk management instrument. In addition, they controversially debate the effects of banking liberalization and banking deregulation. Finally, we observe the emergence of macro-prudential regulation in the fourth period of our sample (Borio, 2003). However, this article has attracted most of its citations during the financial crisis years (143 citations from 2003 until 2007, with an average of 28.6 citations per year; 542 citations from 2008 until September 2015, with an average of 67.75 citations per year).

The fifth period (2005–2009) of our sample is the period in which the shift from micro- to macro-prudential regulation occurs. In this period, three of the top-cited articles explicitly tackle issues related to macro-prudential regulation (Acharya, 2009; Jimenez and Saurina, 2006; Brunnermeier et al., 2009). The one study pre-crisis (Jimenez and Saurina, 2006) is written by two practitioners from the Bank of Spain and shows that credit growth in booms leads to increase of credit risk and higher percentage of non-performing loans. While the paper first appeared in January 2005, it received most of its citations post-crisis (27 citations over the three years preceding the crisis, with an average of 9 citations per year, and received 357 citations from 2008 until September 2015, with an average of 44.6 citations per year). This confirms that the shift to macro-prudential regulation took place post-

crisis (a finding confirmed in our expert interviews). Pre-crisis, such thinking was largely confined to a few marginal groups and was largely irrelevant to central banks. As one interviewee, a prominent British economist, stated:

the central bank governors and the majority of academics thought that the system was self-equilibrating because of EMH and all of that. And that remained the case until the sky fell in in 2007–08, when they realized it wasn't. (interview academic economist, UK, 17th of August 2016)

An American economist stated: 'It was quite a small group that really worked on these things in the early 2000s and I don't think ... with the exception of the Scandinavian central banks, so in particular the Norwegians and especially the Swedes, these things weren't ... of that much interest. ... I mean it was on the radar screen because of problems in Scandinavia and, you know, the Asian crisis, but it wasn't ... it wasn't mainstream ... in most central banks, the thought was this was something that was relevant for emerging economies more than advanced economies.' (interview US economist, April 29 2016)

The works in the fifth period exemplify an important shift from the micro-prudential approach of the previous four periods (1985–2005). Research on banking regulation in this period has shifted from focusing on protection of investors to protection of markets, from focusing on analysis of individual banks to the analysis of interaction of multiple banks, and from static analysis, mainly taking the form of comparative statics, to a dynamic analysis of risk and credit/financial cycles. Further, banking regulation research has shifted from partial equilibrium analysis and representative-bank models to network analysis and general equilibrium models. Most importantly, it has further shifted from the understanding of systemic risk based on bank runs to emphasize contagion and financial cycle sources of systemic risk.

The sixth period of our sample (2010–2014) is an exploratory phase of the macroprudential regulatory paradigm. The top five cited articles in this period relate to macroprudential regulatory questions. Scholars begin to use the cognitive perspective of the macro-prudential paradigm to pose new questions and to provide new answers to old questions. Substantively, the top-cited articles began to provide a rationale for old regulatory instruments such as capital and liquidity ratios based on the contagion and financial cycle conceptions of systemic risk. As a result, they have made proposals for the amendment of these regulatory instruments to fit the macro-prudential perspective, through *inter alia*, counter-cyclical capital ratios, high-quality capital and higher capital ratios. The economic

rationale of macro-prudential banking regulation in this period relies on credit cycles, transmission channel of risk-taking and the contribution of the financial institutions to credit crunch and fire sales. Methodologically, scholars began to advocate a movement from partial equilibrium to a more focus on general equilibrium and network analysis.

Despite these important changes on the methodological and substantive fronts, these changes have been formulated in the standard neoclassical language of market failures, where systemic risk itself has been conceptualized as a negative externality, to which individual banks contribute. The works of this period indicate that the endogenous model of systemic risk, which has been Minsky's initial idea (1992) and emphasized later by Borio (2003), seems to be the most challenging concept to model in comparison to systemic risk as a propagation risk (Galati and Moessner, 2013). As scholars began to take macro-prudential regulation seriously, the common trait of studies at this period is that these studies are exploratory (Borio and Zhu, 2012; Haldane and May, 2011; Hanson et al., 2011) or of a review nature (Galati and Moessner, 2013). It is astonishing to find that the top five cited articles in the area of banking regulation are informal, given the highly formalized nature of the economic literature beforehand. As the new regulatory paradigm is unfolding, these papers explore new territory and set the stage for future research.

The exploratory informal nature of this period shows that informality may be required, particularly at exploratory phases of research. The financial crisis was required in order to lower the formalism barrier in economics with informal works being highly cited, setting the stage for more formal works to come, while illustrating the failures of existing formal models. As such, informal thinking indicates to the temporary limitations of formalism. Formal theoretical works of our sample prior to the crisis were not able to engage with financial cycle source of systemic risk and thus failed to discuss or recommend any macro-prudential regulatory interventions.

This internal closure is confirmed when looking at the banking regulation sample from a citation network analysis (see fig. 1 below). It has a density of 0,048 and is thereby almost twice as dense as the entire network and the systemic risk sample, indicating a rather visible community of banking regulation scholars. The fact that scholars who were organized around a clear paradigm, cross-citing each other, can be seen from the fact that of the 60 sources of the banking regulation sample, it has only five papers which are not cited within the sample and only one source that is cited only once. Its biggest hubs are the scholarly works of Santos (2000) and Freixas and Rochet (1997), which are mathematical in nature. The five biggest authorities in the aggregate sample (Dewatripont and Tirole,

1994; Berger et al., 1995; Keeley, 1990; Jacklin and Bhattacharya, 1988; and Kim and Santomero, 1988) are from the banking regulation sample, four of which are formal, and all share the focus on micro-prudential regulation. Dewatripont and Tirole, while being informal in style, are rather conventional in content as they only engage with bank runs as the causes of systemic risk and focus on the corporate governance principal-agent analysis for rationalizing banking regulation.

But why were formal models prior to the crisis ignoring the financial cycle as a source of systemic risk? One reason provided by the interviews is that economists and policymakers were operating on a belief system represented by a dominant paradigm whose main theoretical elements were rational expectations, the efficient capital markets hypothesis and self-equilibrating markets (interview with British Academic, formerly BoE 17.08.2016, ECB economist 21.04.2016). This academic thinking had a strong impact on the way that central bankers approached the issue of bubbles and liquidity problems. As the American economist explained:

There's a very famous paper by Goodfriend and King, who argued in the early 80s that in modern efficient markets liquidity wouldn't be a problem because you can always borrow against good assets ... people had very much this attitude, so liquidity just wasn't a problem. (interview academic, April 29th 2016)

The ECB economist⁸⁸ gives another very strong example:

[An example is] rational bubbles literature ... Bubbles are actually the practical jargon for this endogenous build-up and unravelling of widespread imbalances ... in the rational bubbles literature, in macromodels, there is a friction that ensures that the bubbles are optimal; the welfare is increased by the existence of bubbles ... And of course in a world where this is the only academically recognized theory on bubbles... yes and now there are umpteen papers, which then say: yeah, yeah, yeah, yeah, all the practitioners always talk about bubbles and how bad financial crises are, but there is no scientific foundation for that ... this is incredible ... if you just imagine, before the crisis this was the dominant literature about bubbles. (interview ECB economist, April 21st 2016)

According to this paradigm, credit cycles do not exist, and if they exist, they would be efficient responses to exogenous shocks. As he went on to explain, central bankers would abstain from building early warning systems and measurement for bubbles not only because of measurement

⁸⁸ The interview of an ECB economist was conducted in German. All the quotes from this interview are therefore translated into English from German.

problems but also because bubbles were regarded as an economically unsound concept. Our discourse analysis gives further important examples that corroborate the existence of this dominant paradigm. For example, the deregulation debate in the third period of the banking regulation sample and the belief in the stabilizing effects of inter-financial institutions connections (e.g. inter-bank markets) arose indirectly out of a belief in the efficient markets hypothesis. In addition, pre-crisis, the discourse analysis reveals the absence of behavioural finance; our banking regulation sample reflects a strong commitment to rationality assumption. This dominant framework then contributed to the failure of the theoretical formal banking regulation discourse to engage with the endogenous financial cycle type of systemic risk in our systemic risk sample.

3.3 Findings relevant to the systemic risk sample

In contrast to the banking regulation sample, there is less thematic cohesion in the systemic risk sample. In the first period of our sample, systemic risk is discussed in historical terms in relation to the Great Depression and its lessons for potential deregulation in the present, where monetarists (Schwartz, 1987) point to price-level instability as the appropriate focus of regulatory action and Minskian scholars such as Kindleberger (1988) to fads in financial markets. The outliers to this debate are the formal analysis of Mankiw (1986) and Taylor and O'Connell (1985). A focus on contagion is also present in practitioners' discourses (Brimmer, 1989), justifying Fed interventions in markets through concerns over possible contagion effects. In the first two sample periods, systemic risk is used as an intuitive concept related to financial crises. However, it does not receive a systematic definition until 1996 (Rochet and Tirole, 1996, p. 733), and only after the crisis does it crystallize into a measurable format (e.g. Acharya, 2009). Overall, the contagion effects of individual bank runs that cause banking panics are seen as a main component of systemic risk in all the sources (e.g. Bhattacharya and Thakor, 1993, p. 26; Kaufman, 1994), which leads to a strong coupling of the understanding of systemic risk and problems of liquidity (e.g. Freixas and Rochet, 1997; Allen and Gale, 2000).

While the notion of contagion is the centrally shared concept in the entire sample, Kaufman (1994) in the mid-1990s complains of a dearth of empirical studies, replaced by 'casual empiricism', or just-so stories (see also Rochet and Tirole, 1996, p. 734). This dearth of empirical work in our sample is only overcome with Kaminsky and Reinhart (1999), who study the interrelationship between banking and foreign exchange crises empirically. A major analytical step forward is taken by Allen and Gale (2000), as they demonstrate the capability for using network analysis as a conceptual and analytical

tool to take into account the interbank deposit market. They are thus able to point to the structural factors which can turn a liquidity shock into a financial crisis, questions which are further developed in the coming 14 years (see, e.g. Gai and Kapadia, 2010). Once the linkages of banks in terms of assets and liabilities are included in models, the problem of contagion can be modelled (Kaufman, 1994; Allen and Gale, 2000). This allows for models of networks of banks linked via common exposure to assets with the danger of joint overexposure, where systemic risk can be conceptualized as growing endogenously (Acharya, 2009).

De Bandt and Hartmann's review of the work on systemic risk (2000) reflects this partial endogenization of systemic risk rather well. By focusing on the characteristics of the financial system as a whole that make it more vulnerable to systemic risk than other sectors, the interconnection of financial institutions is emphasized and contagion is placed at the heart of the concept of systemic risk (p. 8). In this way, they develop a broad concept of systemic risk that integrates systemic events in banking and financial markets as well as the payment and settlement system. At this point, the literature then mostly relates to the triggers and amplifying mechanisms operating during financial crises, but not to their causes. Around 2000, the question of whether systemic risk is growing endogenously or exogenously is rather answered in favour of the latter, while at the same time modelling internal amplifying mechanisms. The endogenous position, which is strongly connected to the notion of financial cycles, booms and busts that are driven by self-reinforcing euphorias and panics (e.g. Kindleberger, 1988; Calomiris and Gorton, 1991; Minsky, 1992; Kaminsky and Reinhart, 1999; Borio and Lowe, 2002), only gains the upper hand after the financial crisis (Bisias et al., 2012). The reason for that is given by the ECB economist:

And that (financial cycles), that was already in our old survey, but it was underexposed, since the literature was not there yet. The only ones who understood [systemic risk] actually used an empirical and a historical perspective. ... There was no real quantitative literature on that and that is why it was underexposed in academia. If you don't have models, empirical or theoretical, which really deal with it, then those will not be recognized as relevant by the academic literature.

Our interview with a prominent US economist working on systemic risk confirms both that the scholars who employed the informal historical approach were able to see a credit cycle and systemic risk as a historical regularity of capitalism, but at the same time were largely ignored:

Financial crises started out as something people historians were very interested in ... my colleague

... Gary Gorton ... started out with many papers on the history of crises and so on and his work is tremendously important and yet until fairly late it was not [recognized] ... (interview US economist, 29th of April 2016)

On the other hand, mathematical modellers up until 2007 remain agnostic on this issue, as they undertake a simple comparative statics analysis using asymmetric information (e.g. Bernanke and Gertler, 1990) or a structural comparison of network structures (Allen and Gale, 2000) rather than a long-run cyclical analysis to analyse financial fragility. This does not mean that these sources did not take their inspirations from historical sources. As a mathematical American economist put it,

... One of the things which we try to stress is that small shocks can have enormous effects and this is a theme that goes back to Kindleberger's work. It is historical. (interview US economist, 29th of April 2016)

The difference then rather relates to method and the constraints that stem therefrom. This different relationship to cycles between formal and informal analysis can very well be observed in the contribution by Bernanke and Gertler (1990), in which they seek to define the term 'financial fragility'. They develop a mathematical theory of how sudden credit squeezes can occur in the economy, based on an unexpected shock to the system. Using exogenous shocks to vary the leverage of borrowers and including moral hazard concerns allows them to generate more or less financial fragility in their model. Compared to the contributions of Minsky, Brimmer and Kindleberger of this period, what is remarkable is the different scope of the papers. Whereas the latter speak of cycles and longer-term regularities, Bernanke and Gertler can only provide a mechanism of an economic shift in a snapshot style.

Questions of the financial cycles, of booms and busts, are instead placed centre stage by informal analysts such as Kindleberger (1988) or Borio and Lowe (2002), but only received an empirical investigation starting with Reinhart and Rogoff (2008), who undertook simple historical analyses of the run-up to financial crises using charts and simple descriptive statistics. Given the simplicity of the analysis, this prior empirical gap in the literature on financial cycles can thus not be explained with mathematical difficulties. Rather, it can be accounted for by the devaluation of historical approaches in the field of financial economics, as detailed above. Whereas the style of the sources in the sample is predominantly informal in nature, this changes abruptly in the final period, when six of the 10 sources are pursuing formal mathematical analysis to provide analytical measures for systemic risk. Overall, there is a certain lack of thematic cohesion in the systemic risk sample, evidence of

which is provided by the low density of the citation network for systemic risk (0.026 vs. 0.048 for banking regulation, Fig. 2 below), signalling a fragmented sub-area of research on systemic risk and the lack of a visible well-connected sub-community of scholars.

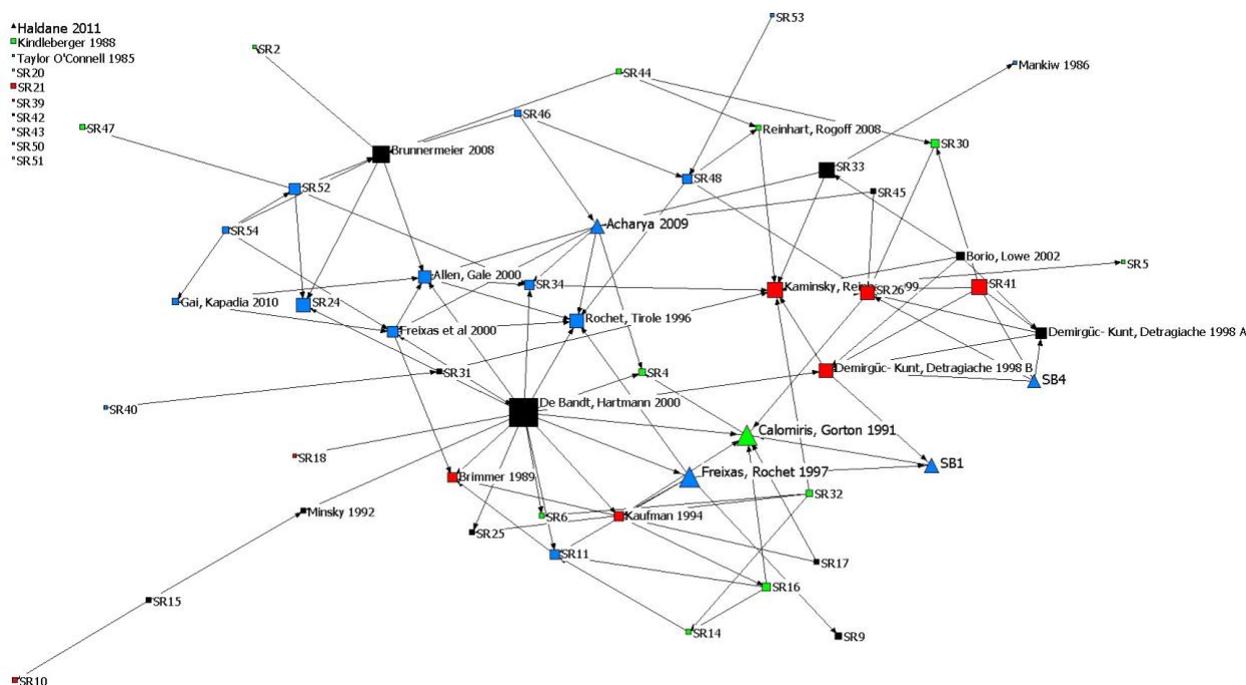


Fig. 3.2. Systemic Risk Sample Network. Colors correspond to the colors in Tables 1 and 2. Systemic risk sources are depicted as squares, while sources common to both samples are depicted as triangles.

The only hub of the systemic risk sample network is De Bandt and Hartmann (2000), connected to the three authorities in the systemic risk sample (Allen and Gale, 2000; Rochet and Tirole, 1996; and Freixas et al., 2000), Minsky 1992, which are all formal. There are ten papers which receive no citation within the sample and six sources which only receive one citation.

3.4 Findings relevant to the relation between both samples

We have observed a strong disjunction between the systemic risk sample and the banking regulation sample prior to the crisis. Although some of the important ideas regarding contagion and the financial cycle as sources of systemic risk underlying the macroprudential regulation were discussed starting from the first period in the systemic risk sample (e.g. Kindleberger, 1988), these issues have only appeared, peripherally, in the fourth period of the banking regulation sample (2000–2004), and taken hold starting from the shift from micro- to macro-prudential regulation period (2005–2009). Precrisis,

scholars in the banking regulation sample simply did not engage with the informal discourse on systemic risk, citing it only to justify their own work. In order to corroborate the thematic disjunction between the two samples, we analyzed the overall network formed by the two samples. Overall, the number of citations linking the two samples is 60. Citations primarily go from the banking regulation sample to the systemic risk sample (42 vs. 18). The density between the samples is 0.016, compared to the overall density of the network of 0.026, indicating a lower connectivity between the two samples than in the overall network and inside the two samples. A closer look at the incoming citations received by the works in the systemic risk sample from the banking regulation sample shows the pre-crisis disjunction in more detail.

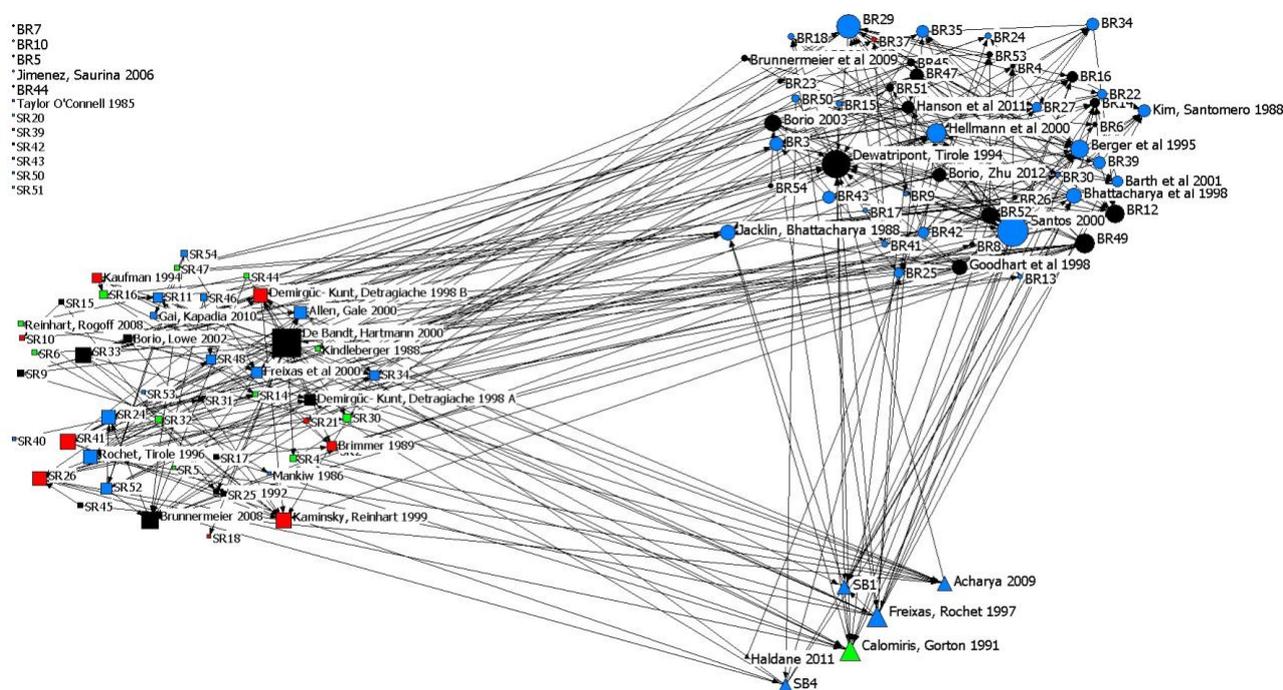


Fig. 3.3. Citations from the banking regulation sample to the systemic risk sample pre-crisis

§ These sources occur after the East Asian Financial Crisis, and point to the increasing relevance this event bestowed upon such analyses.

Out of the 42 citations, 23 appeared from 2008 onwards (after the paradigm shift) with an average citation of 2.875 per year, leaving 19 before the crisis with average citations of 0.826 per year. Four citations are made by Borio (2003), a macro-prudentially oriented paper that is included in the banking regulation sample due to its post-crisis popularity. An analysis of the 15 genuine citations by 10 sources (portrayed on the righthand side of Fig. 3 above) showed that the only case in which a concept/result from the systemic risk sample was adopted by the banking regulation sample was by Hellmann et al. (2000), when quoting both works by Demirguc-Kunt and Detragiache (1998A, 1998B) which show an increasing frequency of financial crises in the past decades. The paper by

Hellmann et al. (2000) then seeks to provide a rationale for this occurrence, linking it to capital market liberalization.⁸⁹ The other 13 citations are either in literature reviews, cited in passing or as historic evidence of past crises.

This disjunction can be linked to the fact that the endogenous sources of systemic risk, although discussed more seriously in the systemic risk sample, have not been well conceptualized or quantified in the early three periods. The formal nature of banking regulation research at that time then might explain why due to its lack of formalization these ideas were not taken up. This mismatch between the predominant styles in the two discourses is confirmed by the dominance of informal theoretical analysis in the last period of the banking regulation sample, at the same time that the formal analysis in the systemic risk sample becomes predominant. The macro-prudential analytical framework cannot be included in the formalized discourse on banking regulation without an underlying formalization and quantification of systemic risk.

This drive for formalism and quantification can on the one hand be explained by the need for academics to propose models in order to gain status and recognition, as pointed out both by the ECB economist and the American economist. But it can further be explained by the fact that academics cannot convince policymakers about any policy changes without formal models and quantification (interview with a British economist working on systemic risk). This reliance of politicians and policymakers on unequivocal policy advice based on models is deeply enshrined in the convictions held among practically oriented economists, expressed in commonplaces such as that ‘one cannot manage what one does not measure’ (Bisias et al., 2012, p. 1). Particularly, models-based policies enhance the legitimacy in the face of policymakers (interview with FED economist).⁹⁰

Given the absence of such formalization, scholars try to develop it, while texts in the banking regulation sample informally explore macro-regulatory issues, awaiting such formalization. In this sense, the recent developments in both samples signal a rapprochement of the two discourses. However, the use of mathematical models may well continue to be a problem, caused by the incremental nature of many of the mathematical economists’ contributions. This can be seen from a

⁸⁹ These sources occur after the East Asian Financial Crisis, and point to the increasing relevance this event bestowed upon such analyses

⁹⁰ However, even in such a mind-set, the degree of belief involved in such posturing must not be overlooked, a fact a BIS economist highlights when referring to the ontological status of the financial cycle: ‘both business cycle and financial cycle are difficult to measure. If you don’t believe in one, then you should not believe in the other’ (emphasis added).

comparison of formal and informal analysts. Informal analysts could think about and discuss propagation/contagion and financial cycle as sources of systemic risk, whereas quantitative scholars could not establish a conversation without a model, and thus were much more reluctant to include these concepts in their discourse. In this sense, mathematical models constituted epistemological barriers and constrained theoretical progress, by excluding observed phenomena, which could not yet be accommodated in mathematical models.

3. 4 Conclusion

This chapter traced the evolution of the economic discourses on systemic risk and banking regulation to better understand the shift from micro- to macro-prudential banking regulation. Our samples show that the informal-theoretical, historical and practitioners' subsets of the economic discourse on systemic risk were able to discuss the contagion and financial cycle forms of systemic risk whereas the formal theoretical subset of the economic discourse, particularly of the banking regulation sample, overlooked these types of systemic risk almost completely pre-crisis.

One evident reason was the rather late conceptualization, measurement and operationalization of systemic risk, which did not make it amenable to the predominantly formal analysis in the banking regulation sample. A second one is the impact of the initial model of bank runs operating with one representative bank (Rochet and Tirole, 1996, pp. 733ff). This model made the analysis of contagion channels other than the informational channel by definition impossible, as the tractability of the Diamond/Dybvig model from 1983 was achieved by mathematical simplification.

Unfortunately, Kindleberger's remark that 'it is not evident that the historical record should be set aside in favour of easier mathematics' was ignored (1988, p. 91). This communicative closure in mathematical economics, where concepts only exist if they can be included in a mathematical model (a trade-off between rigor and relevance extensively discussed in the economic methodology literature; see, e.g. Backhouse, 1998; Blaug, 2009), then partially explains our finding regarding the relation between both samples.

But the failure of the discourse on banking regulation to engage with these sources of systemic risk pre-crisis cannot solely be attributed to being locked into formalism, as the literature was locked into a specific form of modeling, mainly non-structural partial equilibrium analysis. Formal

network analysts were able to pinpoint endogenous sources of systemic risk prior to the crisis using mathematical means (most prominently Allen and Gale, 2000). Formalism in economic discourse becomes particularly constraining when it only includes specific and very limited number of approaches. Our analysis thus substantiates the failure of equilibrium thinking of neoclassical economics in capturing disequilibrium processes, particularly crises (cf. Arthur, 2013). Moreover, as the interviews demonstrate, this failure was also due to the fact that the dominant paradigm in financial economics was based on rational expectations, the efficient market hypothesis and self-equilibrating markets. This paradigm produced a literature declaring bubbles to be rational and therefore devalued their examination. This devaluation was also linked to the non-mathematical, historical research on cycles.

This brings us to explore why practitioners' and historical approaches were able to engage with contagion and financial cycles as sources of systemic risk. We suggest that these discourses enable scholars to gain forms of knowledge that the formal theoretical approaches may fail to produce. Being guided by empirical data, historical and practitioners' approaches do not interpret the data by using the theoretical lens of partial or general equilibrium analysis. Rather, once they perceive the system to be repeatedly in disequilibrium as revealed in the regularities in the data, they begin to think eclectically about the sources of this risk, how it accumulates and how it could be addressed. These informal approaches, being empirically oriented, allow scholars to see what theoreticians of equilibrium models can hardly see. Freed from the neoclassical theoretical assumptions and the dominant paradigm in pre-crisis financial economics, scholars can proceed on the basis of hypotheses that are inconsistent with neoclassical theories (such as endogenous risk) to address these anomalies. This is the major strength of these approaches over formal theoretical approaches, particularly when they either cannot see or accommodate these anomalies into their models. On the other hand, as our citation network analysis indicates, the informal approach seems to impede consecutive, mutually oriented research that operates in the puzzle-solving (incremental) mode of normal science (Kuhn, 1962) that we could observe by using network analysis in the banking regulation sample. A further reason for the difficulties of integrating the notion of systemic risk in banking regulation studies is that it postulates a level that extends beyond the individual, where risks may accumulate independent of or maybe even because of rational action of actors at the micro-level (Baker, 2013a), often because it is not directly observable (SRC, 2015, p. 21). This contradicts the neoclassical paradigm that assumes macrolevel order based on rational action at the micro-level (Harnay and Scialom, 2016).

The concept of systemic risk therefore is hardly reconcilable with the neoclassical theoretical frame. This explanation is consistent with the theorization of systemic risk as a negative externality in the fifth and sixth phase of the banking regulation sample, which tries to subsume the concept of systemic risk within the neoclassical market failure paradigm and measures it (Acharya et al., 2010), rather than rethinking the concept as an emergent property of the processes of the financial system (Haldane and May, 2011). This is particularly dangerous when modelling and quantification gives a misleading sense of certainty to regulators, while endogenous, hidden risks accumulate (interview with prominent British economist working on systemic risk, in SRC, 2015).

In this respect, the Post-Keynesian approach to financial markets that endorses ‘a behavioral view of financial actors’ in contrast to ‘rational expectations’, and embraces ‘radical uncertainty’ in contrast to ‘measurable and quantifiable risk’ (Argitis, 2013; Asensio, 2013), can function as an important antidote. Challenging such notions of measurability and exclusive reliance on formal equilibrium modelling techniques is vital if the macro-prudential project is not to become too narrowly conceived. There will always be a genuine level of uncertainty rather than probability distribution ‘risk’, which is a challenge to model. Proprietary information, regulatory arbitrage and the evolution of new practices in shadow-banking make the reality one that requires a precautionary principle. Yet, this will not suffice. As the Post-Keynesian scholarship points out, the increasing financialization of the economy increases both the contagion and financial cycle sources of systemic risk (Gabor, 2016a,c).

This suggests that definancialization might be a necessary complement to or component of macro-prudential regulation; this deserves close attention in future research. In conclusion, our discourse analysis and the in-depth interviews have shown that formal theoretical analysis, coupled with the exclusion of practitioners’ and historical approaches from banking regulatory studies, have impeded the evolution of macro-prudential thinking in the dominant literature on banking regulation prior to the crisis. The economic discourse on banking regulation pre-crisis, dominated by formalism, was driven by problems that could be modelled given the predominant formal methods, rather than being concerned with the problems practitioners face. The fact that the post-crisis samples on banking regulation have been exploratory and informal in nature shows that informalism was needed for developing macro-prudential thinking. Certain forms of formalism, particularly non-structural partial equilibrium analysis, intensified the obstacles to the evolution of a macro-prudential paradigm prior to the crisis. The sharp rise of formal studies in the last period of our systemic risk sample signals a shift to formalism at the cost of informal styles of reasoning. The

danger is that scholars, not cognizant of the methodological limitations that prevented them from engaging with the financial cycle in the first place, now reproduce these limitations when tackling them post-crisis.

This chapter investigated the dominant economic discourse, as represented by published scholarly work, but has not fully captured the way it interacts with the actual processes of policymaking itself, the organizational routines and policy paradigms which drive it. Future research is needed to investigate the degree of correlation of both discourse and policymaking and their interrelations, particularly the channels through which (academic) economic discourse influences policymaking. Here, our interview material already provides important hints as to the (de-)legitimizing function of academia in the pursuit of regulatory projects (such as early warning systems). Future research is also needed to better understand the drive for formalism in the economic discourse which, as briefly highlighted in this paper, is based on the need to provide unequivocal numbers to policymakers. This interaction of particular forms of knowledge production with policymaking spheres is then the next step in the research agenda to understand what impacts the regulatory outlook on financial markets.

Chapter 4 Are they all macroprudentialists now?

With Edin Ibrocevic⁹¹

Abstract

In this study we investigate which economic ideas were prevalent in the macroprudential discourse pre-crisis and their fate post-crisis in order to understand the selective implementation of macroprudential ideas. We base our analysis on new findings in the field of ideational shifts and regulatory science that posit that change-agents engage with new ideas pragmatically and strategically in their effort to have their economic ideas institutionalized. In these epistemic battles over new regulation, scientific backing by academia is a key resource determining the outcome. We show that the present reforms implemented internationally follow this pattern. Using Borio's distinctions of new vs old systemic risk thinking in the cross-sectional vs intertemporal dimension and an exhaustive dataset of pre- and post-crisis economic discourse on macroprudential regulation, we provide evidence for the lacking support of new macroprudential thinking within academia and argue that this partially accounts for the lack of anti-cyclical macroprudential regulation. We find that topics focusing on cross-sectional measures increasing the resilience of the financial system have been analyzed by academic economists pre- and post-crisis, but not themes regarding the booms and bust of the financial system. Furthermore, the financial cycle is largely absent in the academic discourse even after the crisis and is only tacitly assumed instead of fully fledged out in technocratic discourses, pointing to the hindrances to anti-cyclical measures in the future.

Introduction- An overview of post-crisis regulatory changes

The rise of macroprudential thinking to the heights of the regulatory agenda in the immediate aftermath of the crisis of 2007-2009 was as sudden as it was unexpected (Baker 2013a, Helleiner 2014). Having largely developed outside of, and often in direct opposition to mainstream academic thinking, macroprudential regulation was to be the regulatory answer to the glaring regulatory shortcomings revealed by the crisis.⁹² Rather than focusing on individual institutions, it was to install a system wide top down perspective that sought to limit the chain reactions and feedback loops which had brought the financial system to a standstill in 2008. Macroprudential thinking was to be transferred from broad based proposals into concrete regulatory tools, pursuing the two goals macroprudential regulation had set out for itself: raising the resilience of the financial system as well

⁹¹ This chapter is a substantially revised and expanded version of a working paper with Edin Ibrocevic (Edin Ibrocevic and Matthias Thiemann 2018. "All economic ideas are equal, but some are more equal than others: A differentiated perspective on macroprudential ideas and their implementation". SAFE Working Paper 214, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3195910

⁹² The term "macroprudential" has been around since 1979 (Maes 2009) but the framework as it is understood today was properly developed in the early 2000s (Baker 2013a: 114).

as reducing its cyclical character by intervening in the upswing and releasing capital in the downswing (Crockett 2000, Borio 2003b). So confident was Claudio Borio, then Head of the Monetary and Economic Department, Bank for International Settlements and of the main proponents of macroprudential thinking pre-crisis, that in April 2009, paraphrasing Milton Friedman, he stated that “we are all macroprudentialists now”.⁹³

However, looking at the macroprudential regulatory changes installed at the international level in the ensuing decade casts doubt on this wholehearted embrace of macroprudential thinking. Most of the measures installed can be characterized as increasing the resilience of the international financial system, while not addressing its cyclical tendencies (Tucker 2016). All of the measures introduced in the Basel III accord and by the FSB in the early 2010s, be it the capital surcharge for globally systemically important financial institutions (G-SIFIs), the Leverage Ratio (LR), the Net Stable Funding Ratio (NSFR) or the Liquidity Coverage ratio (LCR), have in common that they have no explicit anti-cyclical element (Claessens and Kondres 2014), but only address cross-sectional fragilities of the financial system that stem from the risk of contagion in an interconnected financial system and from maturity mismatches in banks’ balance sheets (LCR, NSFR). Even the counter-cyclical capital buffer, the poster-child of macroprudential reforms (Baker 2013a) primarily seeks to increase the resilience of the system, its anti-cyclical impact a potential add-on to its primary aim of strengthening resilience (BCBS 2018, <https://www.bis.org/bcbs/ccyb/>). This stands in strong contrast to the emphasis of Borio himself on the anti-cyclical time dimension of the macroprudential reform agenda (Borio 2003, 2009, 2012).

Instead, structural measures that seek to tackle the potential for negative externalities of Too Big to fail banks (through bank recovery and resolution, core capital requirements for G-SIFI, TLAC and MREL) have been prominent throughout the reform process, as have been measures that seek to reduce interconnectedness, opacity and the threat of contagion in financial markets, e.g. through the mandatory clearing of standard derivatives through CCPs (Tucker 2014b, 3).⁹⁴ In the same vein, the Liquidity Coverage Ratio and the Net Stable Funding Ratio (NSFR) which seek to limit the danger of maturity mismatches inherent in the funding positions of banks can be identified as structural measures with no explicit anti-cyclical element. On the other hand, regulatory measures that seek to intervene in financial markets to counter the cyclical character of the financial system, be it in

⁹³ <https://voxeu.org/article/we-are-all-macroprudentialists-now>

⁹⁴ The mandatory clearing of OTC derivatives through CCPs, an idea first voiced at the G20 in Pittsburgh in 2009 and transformed into policy in the US in 2010 and in Europe in 2012 sought to address the risks of opacity and complexity that can bring about contagion among banks. It was driven by the concern over interconnectedness and the relatively robust performance of CCPs in the aftermath of Lehman’s default.

central financial markets, such as the repo market⁹⁵, or in the banking system have largely not been forthcoming (Edge and Liang 2017, Thiemann et al 2018b).⁹⁶ In broad strokes, one can hence argue that the initiatives labeled as macroprudential that were implemented globally post-crisis seek to increase the resilience of the system, but do not install measures to deal with its cyclical character (Tucker 2016, Thiemann et al 2018b, Thiemann 2019).

As somewhat disillusioned experts by the IMF put it in 2014: “despite some decent progress in a few areas, the sad news is that the general approach to reforms is largely still based on an outmoded and by now largely repudiated conceptual framework of regulations, which does not start from the “system-wide” characteristics of risks and often misses key risks. Systemic risk in modern financial systems arises endogenously and cannot just be captured by individual institutions’ balance sheets, or specific market or asset price-based measures alone, especially when these metrics are static or backward looking.” (Claessens and Kodres 2014, p. 5) These one-sided reform efforts that cling to an outdated microprudential logics stand in contradiction with the initial observations on reform efforts by political scientists that placed the anti-cyclical dimension of macroprudential reform efforts, focusing on endogenous risks at the heart of the expected policy paradigm shift (Baker 2013a).

What can explain this selectivity and one-sidedness of reform measures? Is it the reflexive restraint of technocrats fearing over-reach that would threaten the independence of their agencies (Tucker 2016)? Is it the difficulty of pushing through new macroprudential measures against the resistance of private interests (Underhill 2015) or the resistance of critical microprudential regulators (Baker 2014, Moschella and Tsingou 2013), who largely resist the claims for new turf for their macroprudential colleagues within regulatory agencies? This paper will explore a related but different explanatory factor, namely the scientific standing of different regulatory concepts in the regulatory-scientific discourse during and immediately after the financial crisis. It will suggest that it is the selective backing of regulatory measures by the academic mainstream before and during the financial crisis that has had a large effect on the measures pursued by regulators; those topics where academics and regulators agreed were pursued in terms of the creation of regulatory measures,

⁹⁵ With respect to macroprudential interventions in capital markets, we hence find the same prevalence of structural measures that seek to increase the resilience of the system, whereas initially envisioned anti-cyclical measures, such as the anti-cyclical margin haircuts for repo-markets did not materialize (s. chapter 8).

⁹⁶ One might argue that such anti-cyclical measures are to be found on the national rather than the global level, yet here again Edge and Liang find similar results on the national level (2017). Analysing 54 financial stability frameworks around the world, Edge and Liang find only 18 of them to have anti-cyclical policies at all, and only 2 of them (France and UK) are set up in a way that favors action (ibid).

whereas those pushed solely by regulators and economists within regulatory agencies were largely ignored. In this study we hence do not focus on what happens to ideas once they go through institutional processes and are transformed into regulation. Rather, we try to provide a framework to analyze which ideas are more likely to be considered as potential candidates for this process in the first place.

To do so, we analyze which ideas are discussed when in various parts of the economics discourse on systemic risk and macroprudential regulation. Based on a dataset of almost 4000 papers written on systemic risk and macroprudential regulation pre- and post-crisis, we conduct a quantitative content analysis, using topic modelling and simple numerical analysis on a sample of the entire macroprudential and systemic risk discourse, seeking to understand the way policy makers in central banks interacted with academic economists in the construction of the macroprudential regulatory reform agenda. This allows us to argue that the concept of the financial cycle, while endorsed by central bankers and economists in international organizations, has been largely shunned by academic economists pre-crisis, and even post-crisis we detect only very limited engagement from their side with this topic. This stands in contrast to research on interbank contagion, systemic risk contribution by banks or counterparty risks in derivatives markets, which have been treated more extensively by all three of these economists already pre-crisis and due to their more established nature in regulatory as well as scientific discourse had an advantage in generating regulatory consensus to be implemented by the regulatory community.

To make this point, this paper proceeds as follows: it first reviews the political science literature on the rise of macroprudential policy after the crisis and its subsequent implementation, which is characterized on the one hand by an emphasis on the large-scale ideational shift, which occurred in regulatory circles post-crisis and on the other hand by accounts of largely minimal, ineffectual regulatory changes this ideational shift has brought about. We trace this somewhat paradoxical finding to an overemphasis on statements by the proponents of the ideational shift and an underappreciation of the necessities of the backing of regulatory science for regulatory measures to come into effect. To overcome these shortcomings of prior studies, we present our own theoretical approach based on the literature on regulatory science and introduce our dataset and the method of analysis we employ. We then present the initial proposal of macroprudential regulation by Borio in 2003, with its distinction of old and new systemic risk thinking as well as his differentiation of cross-sectional measures, seeking to limit the contemporaneous dangers inherent in the structure of the financial system and the intertemporal dimension of addressing boom and bust dynamics of the

financial cycle. We then present our results, which document the differential engagement of academia with cross-sectional vs. cyclical themes and a persistence of old systemic risk thinking, strongly suggesting a limited scientific backing for anti-cyclical regulatory changes.

Literature review

Early work on the macroprudential shift (Baker 2013a, 2013b) indicates that a complete ideational shift within the technocratic community from micro- towards a macroprudential vision of the financial system has occurred during and immediately after the financial crises (Baker 2013a, 114). During this time the macroprudential shift was, according to Baker (2013a), mainly advanced by a small group of economists surrounding Claudio Borio and William White at the BIS. These economists acted as change agents and managed to persuade technocrats, mainly in central banks and other international organizations of the macroprudential idea set, including the Keynesian ideas of “the fallacy of composition, herding, pro-cyclicality and complex externalities”(ibid, 130), and position themselves as members of key policy making commissions in the post crises regulatory process. From there they were able to insert their views on the risks stemming from the financial system to influence policy processes and further convince other economists, creating a rapid ideational shift, an “insiders’ coup d’etat”, in which the previous microprudential paradigm was replaced as the vision of perceiving the threats emanating from financial markets.

The stifled one-sided implementation of macroprudential regulation, however calls into question the initial account given by Baker (2013a). If the ideational shift was as all-encompassing as Baker describes, then how come the most central macroprudential idea identified by Borio (2003), the financial cycle had such a limited, if any impact on financial regulation (Thiemann et al 2018, Thiemann 2019), at least in the first years following the crisis? One answer in the literature is that while the ideational shift was rapid and largely successful, a multitude of institutional impediments prohibited macroprudential ideas to be fully translated into regulation (Blyth 2013, Baker 2013b, Moschella and Tsingou 2013, Baker 2015, Underhill 2015, Lombardi and Moschella 2017, Baker 2018). Some analysts point to the difficulty of pushing through new macroprudential measures against the resistance of private interests (Underhill 2015) or the resistance of critical microprudential regulators (Baker 2013b, 2014, Moschella and Tsingou 2013), who largely resist the claims for new turf for their macroprudential colleagues within the regulatory agencies. Here the untested nature of new macroprudential tools as well as the lacking evidence to justify them have been identified as main constraints (Thiemann et al 2018).

In relation to this lacking evidence, some analysts have pointed to the reflexive self-restraint of technocrats fearing over-reach that would threaten the independence of their agencies (Tucker 2016, s. chapter 6). This is linked to the lack of political backing for macroprudential initiatives, whereby politics, in selecting macroprudential regulation as the way forward largely engaged in an act of “symbolic politics” (Lombardi and Moschella 2017), without committing to follow through on the measures this approach entailed. In that moment of lacking political back-up (Helleiner 2014), it is technocratic agency leaders, unable to engage the public in a larger discussion on the social purpose of finance and financial regulation (Baker 2018) that decide to abstain from anti-cyclical measures and the political uproar they might produce (Thiemann 2019). And yet, the evidence gathered thus far points to an additional reason, which might best be captured as the contested scientific status of the concept of the financial cycle. This is in line with an early intervention of Muegge (2013), who had identified the insufficient ideational replacement of neoliberal ideas as the underlying reason for the very moot regulatory change post-crisis⁹⁷.

Theory

Following up on Muegge’s suggestion of immature ideational change, we submit that much of the shortcomings of the initial conceptualization of the ideational shift to macroprudential regulation is due to a limited conceptualization of the role ideas play in the installation of new regulation, in particular with respect to their scientific status. In the initial account, regulatory actors were implicitly conceptualized as either convinced of a regulatory paradigm or not at all; they had no way to select ideas or interact with them strategically (for a critical view of such a conceptualization, s. Carstensen 2011). This complete acceptance by the regulatory community of all parts of the macroprudential idea-set without any contestation seems highly unlikely and is not backed by the empirical data (Thiemann et al 2018b). Related to that conceptualization of either wholesale acceptance of all macroprudential ideas by regulatory actors or their rejection is the assumption that all

⁹⁷ A first valuable insight pointing in this direction comes from a speech by the then Governor of the Federal Reserve Bank of the United States of America, Daniel Tarullo, responsible for banking regulation, who in 2013 expressed serious doubts about the scientific status of the financial cycle. He stated “adoption of consistent terminology does not itself resolve questions of whether, for example, increases in systemic risk are endogenous to the financial system and thus follow a somewhat regular cyclical pattern, or are instead somewhat randomized, albeit repeated, phenomena.” (Tarullo 2013b, emphasis ours) It expresses a general attitude in especially the US (Goodhart 2015), whereby the “science” on which macroprudential regulation was based was seen as “dodgy” (ibid), relegating these ideas outside of the realm of science. Hence, it seems the “science” backing up the concept of the financial cycle, at least initially, was too premature to be implemented by some actors, such as the US banking regulator (s. chapter 6).

macroprudential ideas are equally likely to hold the same epistemic status as scientifically sound, in other words that they are equally accepted by all types of economists, which due to their legitimizing effect arguably form an important institutional context for regulatory action (Jasanoff 2011b, 1990).

In other words, both, the conceptualization of actors and of ideas, have been underdeveloped in the analysis of the ideational shift towards macroprudential regulation. In addition to that, previous studies have only focused on macroprudential ideas as a monolithic idea set instead of dealing with macroprudential ideas as a more heterogeneous set of ideas. These factors are largely responsible for the perceived paradox in the study of ideational shifts. On the one hand the ideational shift is seen to have been successful, an assessment based on the official political pronouncements of the G20 in 2009 and 2010 and proponents of the macroprudential shift, such as Borio or Andy Haldane, then the Bank of England's Executive Director of Financial Stability (Baker 2013a, for a more differentiated view on Haldane's intervention s. Erturk et al 2011), a shift which is seen undergirded by some macroprudential regulations which have been implemented. On the other hand, no major shifts within the regulatory set up towards macroprudential regulation have occurred. To clear up this confusion, we will introduce the concept of the bricoleur (Carstensen 2011), who is capable of interacting strategically with ideas and further theorize on why certain ideas could become more important than others in their fight for regulation.

The chances of any economic idea to be adopted by the policymakers acting as bricoleurs rises when these ideas can gain traction in both realms, the policy realm and the scientific realm. This process of mutual adjustment of the politically desirable and the scientifically defendable is a process called epistemic boundary work (Gieryn 1995, Gieryn 1983, Jasanoff 1987, 1990). This means, that for the bricoleur to engage with these ideas in his policy-field, ideas must find a certain amount of resonance in in the field of economics (Callon 1984). To be more precise, economic ideas have to establish scientific "risk objects" (Hilgartner 1992) and to model the economy in such a fashion as to allow the policy maker to legitimately and effectively intervene in the economy (Langley 2014, 9). These ideas have to also fit the political and administrative options available to the bricoleur (Kranke and Yarrow 2019), while at the same time insulating him from blame (Hood 2011). These scientific objects are what bridge the border between scientific/unscientific knowledge and the border between scientific knowledge and knowledge used for policy makers in an era of evidence-based public policy (Strasheim 2015, Quack 2016).

Research on regulatory science indicates that not all economic ideas are perceived as equally valid in policy making circles (Hall 1989b, Jasanoff 2012, Clift 2018). In particular their placement within

economic theory (mainstream vs. heterodox) and the capacity to adduce evidence that gives credibility to the postulated effects according to epistemic standards that are accepted by the economic profession are identified as crucial (Clift 2018). The fact that macroprudential thinking, as proposed and promulgated by Borio pre-crisis developed outside of the mainstream and actually in partial contradiction to main tenets of that mainstream (Borio 2003b, Baker 2013a), we argue is especially important in this respect. Given the partially orthogonal position of macroprudential thinking to the paradigm of rational agents-based macro-economics, emblematically embedded in DSGE models and the Lucas critique which underlies it, one is left to wonder whether political scientists proclaiming an ideational shift in regulatory circles (Baker 2013a, b) are not employing a model of regulatory paradigmatic change, which underestimates the opposition of leading academic economists to the concept of the financial cycle and its consequences. This is problematic, because as leading analysts of regulatory culture in modernity have pointed out (Jasanoff 1990, 2011, 2012, Porter 1995) a key component for policy making is the status of “objectivity” of the knowledge on which policies are based.

In other words, the perceived objectivity of ideas is an important resource in the legitimation of new regulation, since it allows the policy maker to base the intervention into the economy on norm-free objective knowledge and thereby insulate themselves from claims of arbitrariness, value-laden decisions and blame (Porter 1995, Jasanoff 2011a, Hood 2009, Krippner 2011). Regulation in this way “partakes of the neutrality and impartiality of science itself, and demonstrations of objectivity can insulate the claimant against charges of arbitrariness or self-interest” (Jasanoff 2011a, p. 308). As Jasanoff points out, objectivity is a resource with which epistemic claims can be supported, but at the same time objectivity is “culturally situated, contested, and enacted at multiple sites and organizational level” (Jasanoff 2011a, p.308). As she points out, different regulatory cultures have distinct ways of producing objectivity, which implies the question in which context macroprudential concepts were evaluated and accepted as objective and thus as legitimate, or not, justifying the large scale interventions into private business transactions required by the macroprudential agenda. to justify the large-scale interventions required by the macroprudential agenda.

In our case, the social construction of “objectivity” according to the terms of economic discourse can be seen as particularly necessary because the organizational and cultural context for macroprudential regulation are central banks and central banking. The latter has been subject to “scientization” over the courses of the last four decades (Marcussen 2006, 2009a, 2011, 2013), whereby the policy field increasingly bases itself explicitly on economics as the base for policy making (Holmes 2011, Walter

and Wansleben 2019), and hires economists to address the problems encountered by central banks in a scientific way. Economists endorsements is hence likely to be an important condition that macroprudential ideas face to be chosen for implementation. In the case of macroprudential regulation then, the rule-makers as bricoleurs found themselves at the border between scientific knowledge produced by economics and the institutional set up they were embedded in. Here, epistemic backing by the epistemic standards of economics became a key factor for economic ideas to become viable for regulation and the role of academic economists' expertise in providing legitimation for these new measures is at least an important element to weigh in these debates.⁹⁸

The context of scientifically oriented central banks, that played an even larger role in financial regulation after the crisis leads to the conclusion that epistemic backing by (academic) economics as outlined above, is an important quality of ideas, influencing which ideas are even selected at the beginning of a regulatory process (a process called authoritative endorsement by academia by Clift 2018). Ideas backed by academic economic discourse have a higher likelihood of being accepted and used for regulation. In the least, if not embraced directly by academia, these ideas need to have at least a high degree of corroboration via scientific methods that are currently in use in academia.⁹⁹ To understand the difficulties such bricoleurs faced with respect to different macroprudential ideas, as they strived to construct a viable macroprudential framework, we will now shortly outline the epistemic challenge macroprudential thinking in the 2000s posed to the academic mainstream, then to analyze the evolution of the economic discourse on these themes post-crisis.

The macroprudential approach as proposed by Borio

To emphasize the differences between mainstream economic thinking about systemic risk and regulation and the macroprudential approach, we rely on a seminal text by Claudio Borio from 2003, in which Borio distinguishes his new vision of systemic risk from the old, established systemic risk thinking, prevalent in mainstream academia at the time. Old systemic risk thinking, which was mostly cross-sectional and had only a very limited inter-temporal dimension focused on the impact of exogenous shocks on the system and its reverberations. This static conception led to a focus on the resilience of individual firms to withstand short-term shocks and a

⁹⁸ As we will show their endorsement in no way is unequivocally positive regarding the new macroprudential world-view.

⁹⁹ It is important to note that economic ideas as contemplated are not directly translated into regulation. Instead, in the process of implementation, these ideas are themselves be adjusted to fit the institutional context (Kranke and Yarrow 2019).

willingness to reduce second round effects by limiting interconnectedness and contagion (Borio 2003b, 5). In contrast, new systemic risk thinking perceives systemic risk to be endogenous to the financial system, building up over the cycle through the “common exposures to macroeconomic risk factors across institutions” (Borio 2003b: 6) which in and of themselves are co-produced by the financial system. Looking at the measures enumerated above, it is remarkable that almost all of the measures implemented on the level of the G20 as well as the European level can be grouped into the old systemic risk thinking that Borio sought to overcome.

The Cross-Sectional and the Time Dimension

In order to clarify the differences between his “new approach” to systemic risk thinking and the then prevalent “old” way of seeing systemic risks, Borio introduces the two dimensions of the “cross-sectional dimension of risk” (across industries and financial institutions) and the “time dimension of risk” (e.g. amplification mechanisms, cyclical elements based on the endogeneity of risk). Borio describes the old approach to systemic risk and financial regulation as largely micro-prudential. This vision of the world leaves the users of this model with a static view of instability which paints “the financial system [...] as initially vulnerable; suddenly, a shock occurs” (Borio 2003b:5) that puts sudden, unexpected and mostly unseen pressure on the system from the outside. This connects to the location of systemic risk, which is endogenous only insofar as it is amplified through the financial system, but it always has an external initial shock as a cause. The result is an understanding of risk in which it is always the failure of an individual institution, deriving from their subpar portfolios, which spreads through a variety of contagion mechanisms to the system level and it is “[i]nterlinkages through balance sheets and overreactions driven by imperfect information [which] are seen as key channels” (ibid). Risk is evaluated not on an aggregate genuinely systemic level but on the level of the relative riskiness of individual borrowers or instruments. The ontology of economics inherent in this view, which is completely rooted in economics micro-foundations; it puts the individual actor at its analytical and theoretical starting point.

The new way of looking at systemic risk according to Borio takes a fundamentally different vantage point. Stemming from Minsky's “Financial Instability Hypothesis” (Minsky 2011), systemic risk is endogenous to the financial system and develops and grows over time. Instability or the system’s vulnerabilities seen on a longer time scale, then, become far less static and turn from something external to a variable that builds-up over time. Systemic risk thereby becomes an inevitable feature of the system that grows as the system develops, a genuinely endogenous element of the financial system – “[t]he boom sows the seeds of the subsequent bust” (Borio 2003: 7). Rather than focusing

on structurally illiquid portfolios, the focus of the new framework is on “instances...where systemic risk arises primarily through common exposures to macroeconomic risk factors across institutions” (ibid, p. 6, italics in original). These exposures are “associated with asset prices, sectoral, regional or macroeconomic developments” (ibid, p. 4), making the source of systemic risk endogenous to the financial system, located on the asset side of balance sheets, as this is where the risks are actually building up. The focus is not on individual institutions, but the system as a whole.

Figure 4.1 below depicts these different understandings of systemic risk in these two dimensions, which shows the emphasis of Borio on the centrality of the time dimension. It is this understanding of the relevance of time and, ultimately, cyclicity where Borio’s new “macroprudential perspective comes into its own” (ibid, p. 11). The concept of a financial cycle directly and fundamentally opposed the then dominant microfoundational regulatory paradigm in that it urged regulators to move away from a micro-level approach and towards the premise that there are effects on the system-level, the macro-level, that warrant a different approach to regulation.

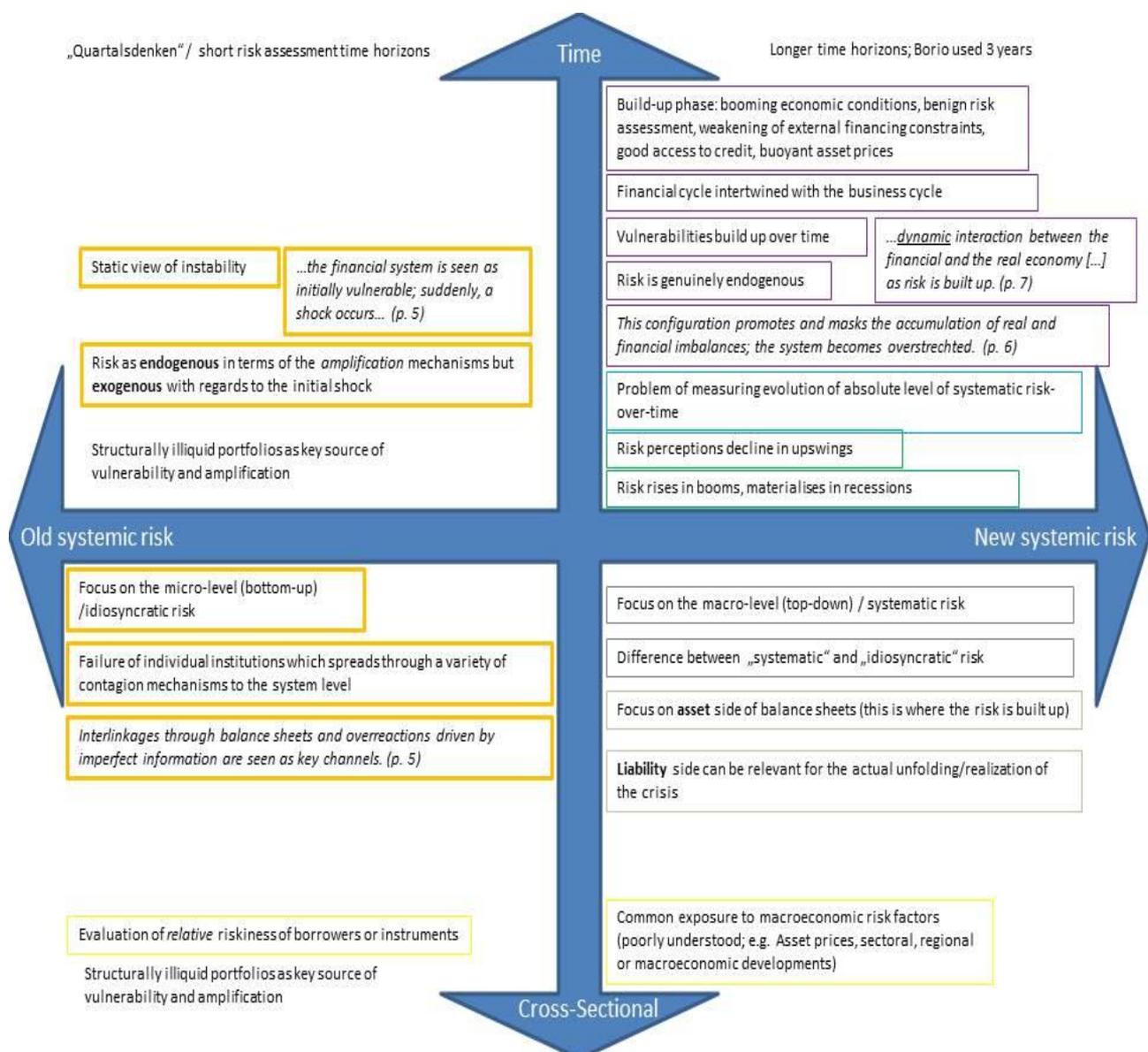


Figure 4.1: Borio's dimensions as a coordinate system. Graph taken from Ploner (2017), permission granted by author

Vulnerabilities and risks were seen to continuously build up over time as the cycle progresses. Borio's insistence on the cycle and the prevalence of the time dimension of risk contrasts starkly with the old understanding of systemic risk. Instruments that try to deal with this time-dependent systemic risk, therefore, differ fundamentally in their functioning and their objectives. The old microprudential perspective wants to "limit distress of individual institutions" (ibid, p. 2) and tries to keep contagion in check. Time is barely relevant with a static view of instability and an exogenous understanding of risk. The financial cycle-based macroprudential perspective on the other hand, puts time centre stage and accepts the existence of system-wide risks that increase over time. The question that arises is if and in how far this topic and the other issues Borio enumerates were adopted and worked upon by economists before and after the financial crisis to transform it into a viable scientific concept to become acceptable for regulation. To answer this question, we built an extensive data set, subjecting

it to text mining techniques, both of which we present in the next section.

Data and method

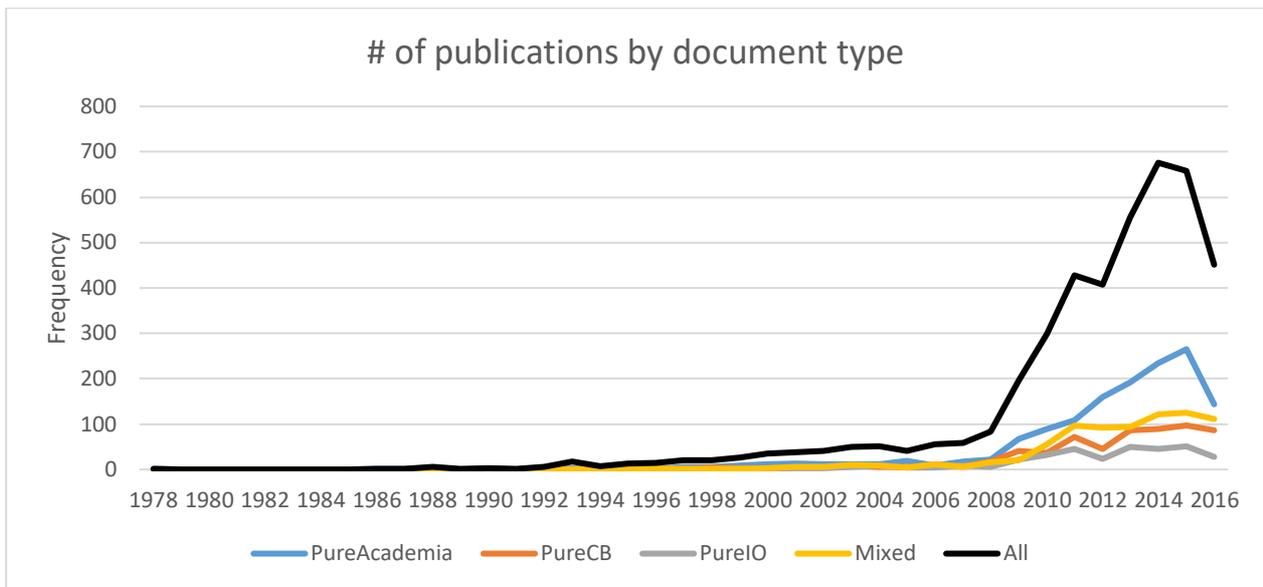
The data for this study was collected via the RePEc¹⁰⁰ (**R**esearch **P**apers in **E**conomics) database, which is the largest collection of economic publications of all types (beyond academic publications, it also includes publications of institutions like central banks, BIS, IMF, think tanks and financial institutions). The RePEc database was used to find every publication, which as either the terms “systemic risk” or “macro-prudential”¹⁰¹ in either keyword, title or abstract in March 2017. This process yielded 5732 publications. Beyond the Title, Abstract and Keywords, RePEc also provided relevant meta-data like the author information for each publication. After the elimination of all duplicates the dataset still has 3716 entries in the time period from 1988 until 2017. Of these 3716, 2397 documents were downloaded and are available for full-text analysis via STM, whereas for the other documents only the abstract and titles were used for analysis.

After the dataset was downloaded every author within the dataset was coded based on his/her institutional affiliation as given in the document itself. The possible categories for authors are BIS (Bank of International Settlement), IMF (International Monetary Fund), academics, central bankers, private finance, mixed¹⁰² and others. The author affiliation data was then further used to determine document type in a similar fashion. Documents were coded as purely academic, central banking, international organization, if all the authors belonged to either category. The mixed category includes publications, which are either written by multiple authors with differing affiliations or one author that by himself is mixed. Graph 4.1 shows the distribution of documents over time. As expected the number of overall documents increases drastically after the financial crises. The number of academic publications show the strongest increase of all categories, although the number of publications for purely central banking and international organizations work also increases rapidly (especially in the run-up to Basel III). Another interesting observation comes from the delayed engagement of cooperation between different groups of authors. Mixed documents seem to increase two years later than other types of documents and, in contrast to pure CB and IO documents, seem to keep increasing.

¹⁰⁰ <http://www.repec.org/>

¹⁰¹ Variations of the terms were also used for the search

¹⁰² Mixed authors have either more than one affiliations within one document or have different affiliations in two different documents.



Graph 4.1: Publication distribution over time

The first result from our descriptive statistic was, that there is surprisingly little overlap between publications that have systemic risk in their keywords, abstracts or titles and the ones that have macroprudential. Out of the 3716 documents, our search found 2119 publications that only deal with systemic risk, while 1193 deal with macroprudential regulation. The remaining 404 documents have both search terms in either keywords, title or abstract. This is surprising, since it is commonly assumed in the literature that macroprudential regulation is the regulation of systemic risk, yet, if only 10,8% of all documents on the topic of systemic risk and macroprudential regulation deal with both issues at once, this seems unlikely. Due to the relatively small overlap between systemic risk and macroprudential, we chose to split our sample in three subsamples: systemic risk, macroprudential regulation and the overlap between the two. Descriptive statistics regarding the authors affiliated with publications in these samples confirm this decision, as table 4.1 below displays.

	Pure Academia	Pure Central Bank	Pure International Organization	Pure Other (including private finance)	Academia/Central Banker	Academia/Other	CB-IO	misc
Systemic risk sample	51,22%	17,57%	6,20%	5,85%	10,39%	3,90%	1,40%	3,48%
Macroprudential	27,53%	29,99%	14,18%	6,41%	12,54%	2,12%	1,83%	4,68%
overlap	30,80%	24,23%	14,58%	8,42%	12,32%	1,85%	2,26%	4,72%

Overall	40.7%	22.7%	9.85%	6.6%	11.34%	3.1%	1.6%	4.0 %
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TABLE 4.1: author affiliations for the publications in the different samples

Whereas the systemic risk sample is dominated by academics (51%), their presence is much lower in the other two samples. In the macroprudential sample, pure central bankers dominate with almost 30%, with 45% of papers written with at least one author being employed in a central bank. The overlap sample, which arguably is the one that brings systemic risk thinking and its implementation in macroprudential regulation is situated between the two in terms of distribution of academic or central bank authors, but is much closer to the macroprudential sample in terms of its distribution. These two also have a markedly higher percentage of papers written by central bank economists and economists employed solely in international organizations (predominantly the BIS and the IMF), an observation which makes sense given that these organizations follow an applied technocratic approach to economic discourse (Clift 2018, 63f).

This uneven distribution of authors of different employment status is replicated when looking at the development of our three subsamples over time. The systemic risk sample includes a small, but non-negligible amount of publications even before the crises, much more so than the other subsamples. All topics in the systemic risk sample but one (network effects) contain publications before the crisis, whereas there are no entries in the overlap sample pre-2008 and only 14 documents in the macroprudential sample, distributed over 5 topics (s. publication distributions for topics in appendix 2 for this chapter). Furthermore, the systemic risk sample is the only sample in which academics are present as authors prior to the crisis. Post-crisis all groups engage heavily in publishing on systemic risk, but the interest of most groups except for academics stagnates around 2010.¹⁰³ The high number of documents available for content analysis suggests a research approach based on quantitative content analysis algorithms. In recent years topic models and more specifically Latent Dirichlet Allocation has established itself as a useful tool for such an analysis (Blei et al 2013, DiMaggio et al 2013). The next section will shortly introduce the main advantages of topic models and specifically Structural Topic Modelling (Roberts et al 2014), that is used for our analysis.

Method

In this study we employ topic models and more specifically Structural Topic Modelling as a quantitative content analysis tool. Topic modelling in its basic form assumes that every document is

¹⁰³ This is in line with prior findings on the macroprudential ideational shift that notes an immediate engagement post-crisis of central bankers with theories of systemic risk (s. chapter 3).

a distribution over topics and every topic is a distribution over all words within the text corpora. This assumption is backed up by what is called the “bag-of-words” assumption, which assumes that the order of words is unimportant for the analysis of the document content. This allows LDA to use a two-step generative process to produce its result. First, every topic and every document is allocated a random distribution over words and topics (Blei et al 2012; Rosen-Zvi et al 2004). These distributions are then filled in a generative process, which is given the number of topics and the frequency of words in each document as an input. To fit the random distributions of topics to the observed dataset Gibbs Sampling is usually employed (Blei 2012). The Gibbs sampling algorithm "estimates the probability of assigning the current word token to each topic, conditioned on the topic of assignment to all other word tokens" (Stein and Griffiths 2007, p. 8). The result of the algorithm is that every document is a distribution over the number of topics and every topic can be represented by its most common words.

Structural Topic Modelling (STM) (Roberts et al 2014) in turn is based on an early extension of LDA named Correlated Topic Modelling (CTM) (Lafferty and Blei 2006). STM extends LDA since it assumes that topics, which appear frequently with each other are closely correlated with each other. This property is used by STM to allow the inclusion of meta-data into the modelling process. Using this feature and others STM allows for the inclusion of meta-data to influence the prevalence of topics and their correlation with each other. Furthermore, STM includes upgraded statistical tools, which make the algorithm less parameter dependent and produces the same results for every text corpora on one machine. One additional benefit of STM is that it does not only provide the most common words for each topic, but also the most exclusive ones (Bischof and Airolti 2012; Roberts et al. 2013), thereby vastly improving the interpretability of the respective models.

In a first step we run STM with an increasing number of topics for each of the three subsamples. Although, some quantitative measures exist to determine the number of topics, we chose to increase the number of topics in each subsample and determine the number of topics qualitatively.¹⁰⁴ Before we employed STM, we cleaned the documents with standard text pre-processing procedures.¹⁰⁵ The resulting topic models are then used to perform two types of analysis. First, a description of all the

¹⁰⁴ The choice for qualitative checking is mainly due to two factors: First, quantitative measures generally overestimate the number of topics and thus tend to produce topics which are not interpretable by humans. Second, the number of topics generally depends on the research question at hand. In our case we choose topics in the midrange, not too many topics to reduce interpretability by humans, but not too many to disregard important topics.

¹⁰⁵ Words were de-capitalized, all numbers, punctuations and non-Latin letters were removed. Furthermore, a standard stopword list was used to remove the most common words. Afterwards a soft word stemmer was applied to account for conjugation of words. STM also produces word lists of the most exclusive words, hence we removed words that only appeared in 50 documents or less.

topics and their evolution over time is conducted. The description stems from qualitatively checking the topics and their content and will only be spelt out for the topics deemed relevant to this study. The second step involves an analysis over time. Here we take the average topic distribution for each type of document per year. This will allow us to analyze how topics evolved over time and more importantly what kind of economists were engaged in the topic.

Results of the empirical analysis - Topic modelling results

The topic modelling on all three subsamples yielded 13 substantial topics for the systemic risk sample, 18 for the macroprudential sample and 9 for the overlap between the two.¹⁰⁶ Using the most parsimonious approach did not generate any cyclical topic, which is why in a second step we increased the number of topics generated a cyclical topic, which occurred at the number of 20 topics, now including 3 garbage topics. Table 4.2 below displays the different topics for the three subsamples, displaying the extended topic list for the Systemic risk sample.¹⁰⁷

Topic	Extended Systemic Risk Sample	Macroprudential Sample	Overlap
1	Networks	Historical accounts of central banking/macroprudential regulation	Macroprudential Concepts/Tools
2	Garbage topic	Growth and Macroeconomic development in Asia and Latin America	Evaluation of macroprudential tools/Cross country comparison/LTV
3	FX (esp. developing economies)	Monetary policy and financial stability	Macroprudential regulatory system
4	Measuring systemic risk	Political Economy	Attributing Systemic Risk to institutions
5	Garbage topic	LTV	Indicators for counter-cyclical regulation
6	Garbage topic	Garbage/only produced by two documents	Early warning systems/Forward looking Systemic Risk measures

¹⁰⁶We have used a parsimonious approach, selecting the maximum number of topics that provide meaningful topics with the minimum amount of garbage topics (that is to say non-meaningful topics) being produced. In that vein, the macroprudential sample contains one garbage topic, the only one among all of our topics. A list of all topics, including their most likely and most exclusive words can be found in Appendix 1 of this chapter.

¹⁰⁷ The short systemic risk sample consists of 13 topics and is largely congruent with the 17 in the extended list. However, it does not contain a cyclical topic and contains some larger topics, such as real economy and social costs of regulation, which in turn are split into several topics in the extended systemic risk topic model.

7	Bank deposits & their insurance	Various types of equilibrium modeling	Systemic Risk in the banking system
8	Mortgage securitisation	Macroprudential Tools and Monetary policy in DSGE models	Network/Contagion
9	Regulation	Market measures like MVAR/GARCH/Business cycle	Agent-Based-Modeling
10	Asset markets (esp. stock market)	Conventional Monetary policy tools (Reserve requirements)	
11	Risk estimation & modelling	Stress testing	
12	Bank funding	Macroprudential regulation and the housing market	
13	Hedge funds	Leverage and Asset Bubbles due to information shocks	
14	Payment & settlement systems	MacroPrudential supervisory setup post crises	
15	Sovereign risk	Early warning indicators	
16	Interbank contagion	Capital regulation as a macroprudential tool (in the context of the introduction of capital buffers)	
17	Equilibrium agent models	Banking market structure (Dependent on foreign banks, macroeconomic environment)	
18	Cycles	Capital flows and macroprudential regulation	
19	Panel studies, estimations & regressions	Shadow Banking/Hedge funds	
20	Derivatives & counterparty risk		

Table 4.2 Different Topics identified in the three different subsamples (extended model for Systemic Risk)

As can be seen from the table above, some topics appear in every subsample, since the discourses broadly deal with similar issues. The biggest topic in each subsample deals with the issue of regulatory set ups, which investigate best ways to deal with systemic risk or how to actually conduct macroprudential regulatory tasks. Other topics only appear in two of the three subsamples. The topic of financial networks/interbank contagion and topics dealing with the attribution of systemic risk to

institutions can only be found in the overlap and the systemic risk sample, while they are not discussed in the macroprudential sample. On the other hand, early-warning-indicators and stress tests for upcoming crises are not discussed in the systemic risk sample at all. This might be due to the fact that early-warning-indicators and stress tests are considered mere number crunching by academia (interview ECB economist, May 2016), the fact that in and of itself it is not an issue worth the consideration of academic economists.

Then there are topics unique to each sample, such as the risk estimation and modelling topic in the systemic risk sample (a highly mathematical topic) or the history of macroprudential regulation in the macroprudential topic. The most interesting of these single topics for our research purposes can be found in the overlap sample, where we find the only topic that actively attempts to evaluate the efficiency and efficacy of macroprudential tools and the only topic that discusses indicators for counter-cyclical regulation. A closer look into the topics themselves reveals another distinction between the three samples. The publications within the systemic risk sample focus heavily on the use of economic modelling, most notably the use of agent-based-modeling, portfolio models and in later periods' network and contagion models. The Macroprudential regulation (MPR) sample on the other hand relies mostly on statistical analysis of markets, mostly used for stress testing, the evaluation of MPR tools like LTVs or early warning indicators. If economic modelling is used, it is mostly used to integrate MPR tools into monetary policy via DSGE models. The overlap sample shows characteristics of both samples. Topics dealing with the evaluation of MPR tools focus on cross-country panel analysis, while topics addressing the systemic risk of institutions and network/contagion problems rely on economic modelling.

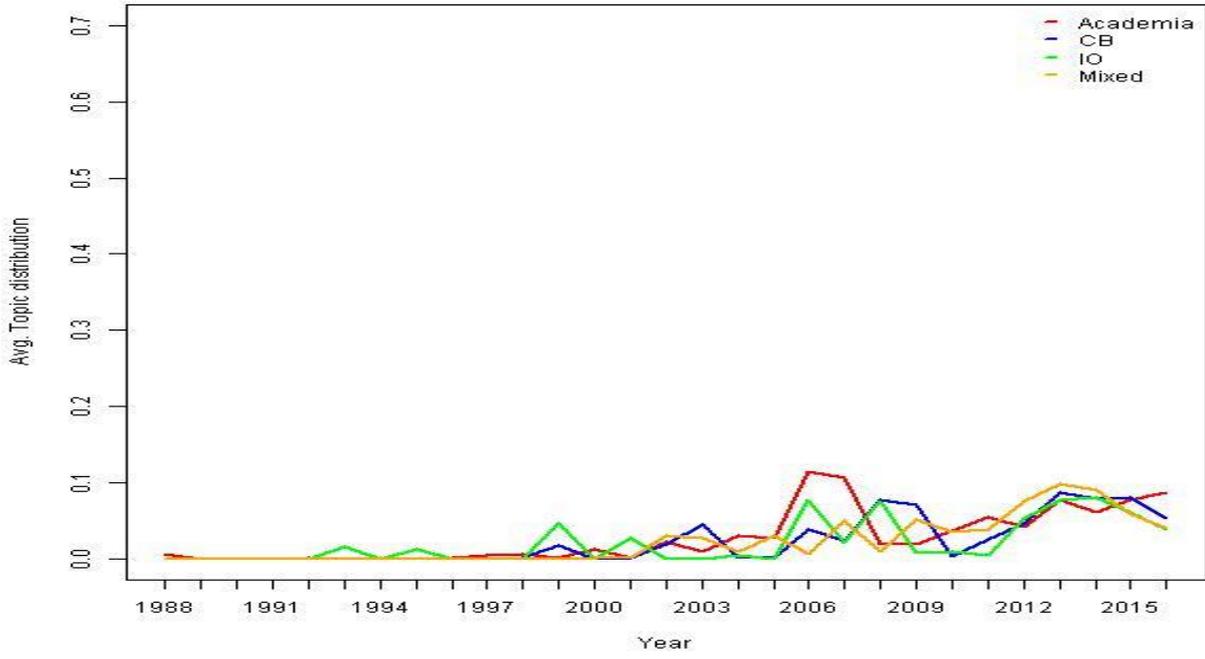
The content of the different samples hence reflects our first findings on the distribution of authors in the different samples. The academically dominated systemic risk sample has more theoretically driven mathematical models and econometric techniques, whereas the macroprudential sample uses more simple statistics, narratives and qualitative evaluation techniques. The overlap-sample, finally contains both styles of reasoning and seeks to apply it to the proper set-up of macroprudential regulation. In the following, we reorder these topics according to their content, in order to evaluate the temporal engagement of these different subgroups of economists regarding these different topics.

Topics regarding too-big-to-fail institutions

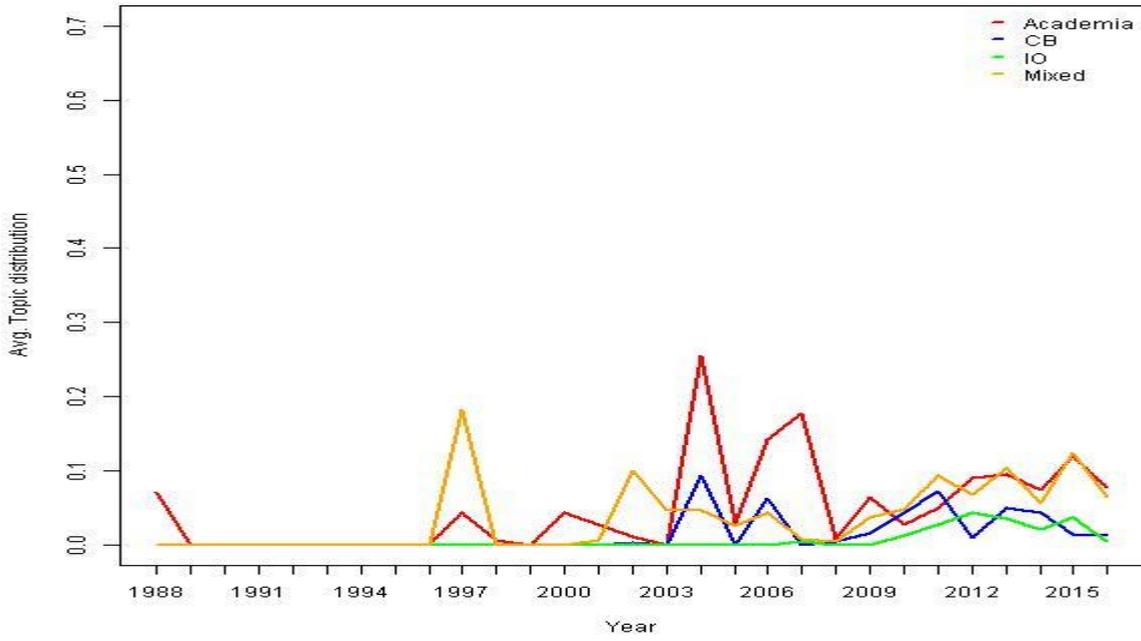
The biggest regulatory change post-crisis pertains to the regulation of too-big-to-fail financial institutions (Pagliari and Wilf 2016). Both the introduction of Global –Systemically Important

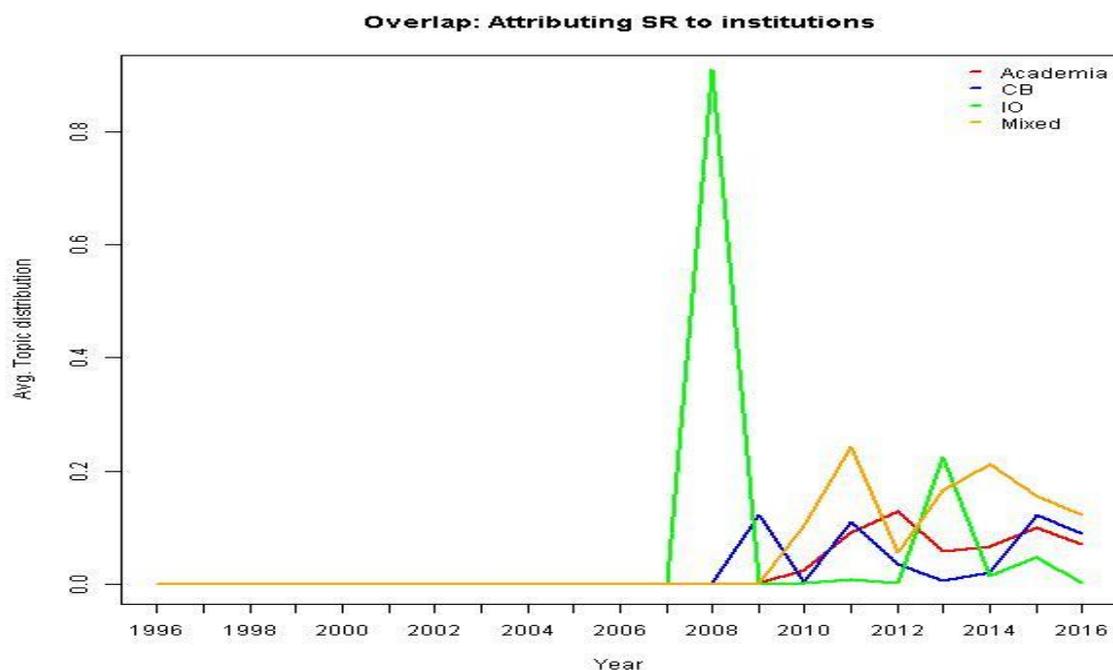
Financial Institutions (G-SIFI) and the adjacent TLAC and MREL measures require some sort of measurement on the contribution of financial institutions to systemic risk to justify their impositions. These types of measurement can be correlated to multiple topics within our subsamples. In the Systemic Risk sample, the topics of “Measuring systemic risk” and “risk estimation & modelling” pertain to these issues. Lastly, the overlap sample includes one topic regarding the Systemic risk of financial institutions. As can be seen in graph 4.2, every topic regarding too-big-to-fail institutions has some sort of backing from academia and the main regulators installing macro-prudential regulation, central banks. The risk estimation and modelling topic is mostly dominated by academics and only after the financial crises do central bankers engage with the topic. Pure central bank publications engage with them relatively late after the crises, the increase in mixed publications is most likely due to collaborations between academics and central banks. The topic of attributing Systemic Risk to institutions becomes popular immediately after the crises to academics and mixed/International Organizations publications alike, with the IMF becoming engaged in 2008.

SR: Measuring systemic risk



SR: Risk estimation & modelling



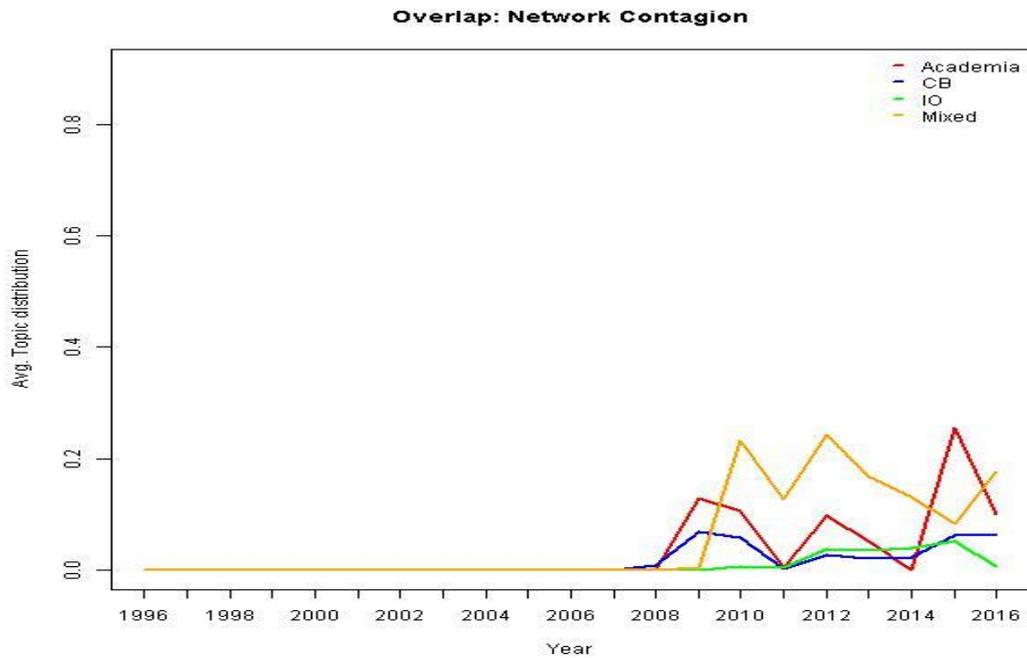
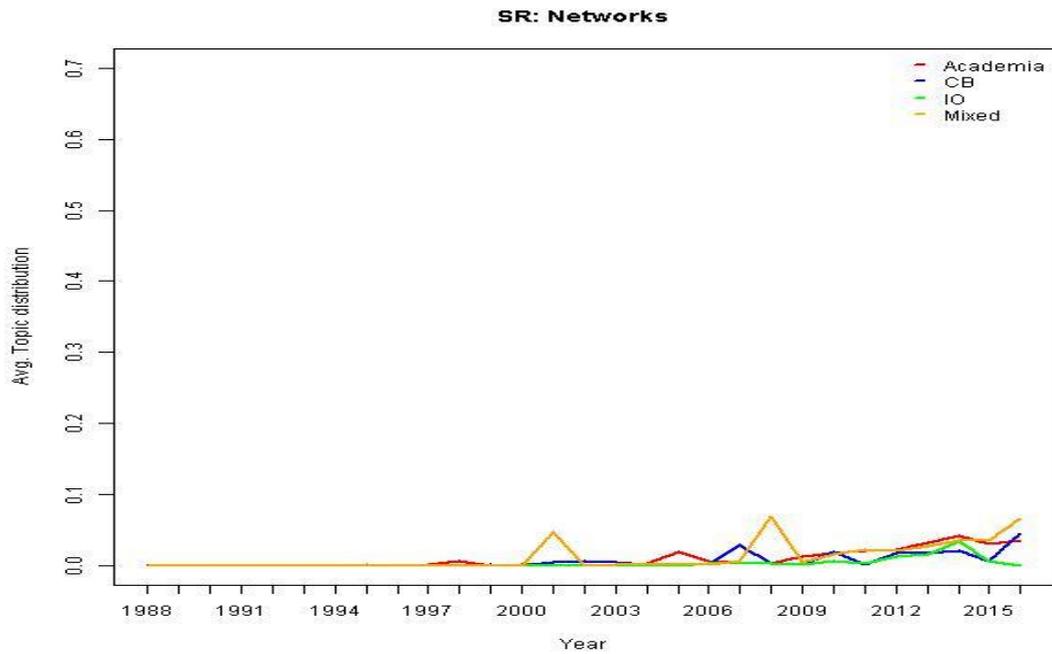


Graph 4.2: Average topic distribution per year per document type for topics regarding too-big-to-fail

These results show that the topic of attributing systemic risk to individual institutions is a topic that has been worked on by academic economists pre-crisis and is populated by all subgroups of economists.

Topics regarding networks, contagion and counterparty risk topics

The introduction of the mandatory clearing of standard derivatives through CCPs as well as the introduction of the Liquidity Coverage Ratio and the Net Stable Funding Ratio (NSFR) showcase a different conceptualization of the financial system than the too-big-to-fail problematic. Here, the relation between financial institutions comes to the foreground and more importantly, the effects the insolvency of one or more financial institution might have on the system as a whole. For this type of thinking that undergirds these regulations, namely issues of counterparty risk and contagion, a few topics can be found in the three subsamples, most of them in the Systemic Risk sample. These topics on financial networks, interbank contagion and derivatives & counterparty risks are most prominently connected to CCP regulation. The problematic of counterparty risk is particularly curious, since it changed its most common meaning over the last 30 years. While in the 90's and early 2000's counterparty risk was mainly an issue in the context of the payment and settlement system and was mainly an issue for central banks, it increasingly became regarded in the context of derivatives markets in the context of what happens to those markets, if a party becomes insolvent. The other subsamples offer fewer topics on this issue, only in the overlap sample were we able to find a topic regarding networks and contagion.



Graph 4.3: Average topic distribution per year per document type for topics regarding networks and contagion

The topic of derivatives & counterparty risks is treated by central bank and academic economists alike already more than a decade before the financial crises itself occurs, with a short drop during the crisis. After the crisis, the topic is picked up again, rather shortly by academics (up until 2011), while central bankers interest in the topic increases markedly after 2010, when the regulation for the mandatory clearing of CCPs is implemented. Publications in the topic of interbank contagion begin slightly later, in the late 1990s, begun by academic publications, but then also garners interest from academia and central banks much before the financial crises of 2008. Mixed publications begin to

pick up from 2004, while purely central banking and academic work increasingly focuses on the topic after the financial crisis. The closely related, yet different topic of networks in the Systemic Risk sample is only a small topic, but it is important since it provides much of the mathematical foundation for the ensuing contagion literature. In this topic, we mainly find academic publications, dealing with questions of how network topology and network effects impact the financial system at large. A similar pattern can be observed in the overlap sample, which now explicitly brings together issues of networks and contagion. Here again, academia and mixed publications dominate, providing a strong scientific backing for these measures.

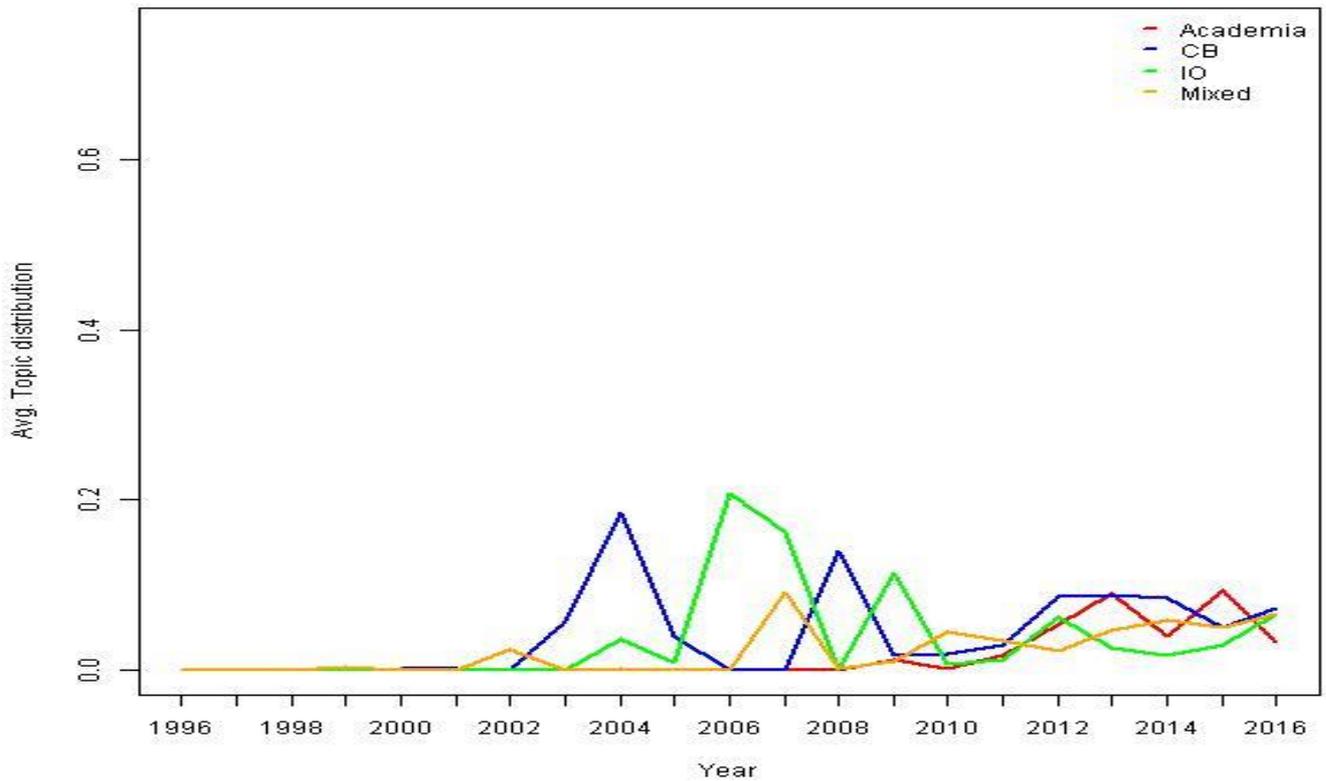
Topics regarding cyclical concepts

When it comes to topics dealing with the cyclical nature of the financial system (the core element of the macroprudential agenda according to Borio 2003b, 2009, 2012), only very few topics could be identified. None of the topics within the Systemic risk sample deal with financial cycles (or any other cyclical concept like credit cycles/business cycles etc) unless one moves to 20 topics in the systemic risk sample, and even that cycles topic contains publications on business and asset cycles, as well as papers on the financial cycle. Only sporadically can publications be found that directly deal with cyclical issues, which then are mainly revolving around asset-price cycles and the business cycle. Even more surprising than the absence of cyclical concepts in the Systemic Risk sample is that the subsample on macroprudential regulation does not show a clearly demarcated financial cycle topic either. Most of the topics within the MPR sample merely assume the existence of cyclical developments and that it needs to be addressed, focusing on the tools able to do so, but only rarely is the concept of the financial cycle directly addressed or investigated. Therefore, we chose to take a closer look at those topics that tacitly assume that the financial cycle exists. Among those is the topic of cyclical capital regulation, the topic on early warning indicators, a topic on loan-to-value ratios and lastly in the overlap sample, the topic on indicators of counter-cyclical regulation.

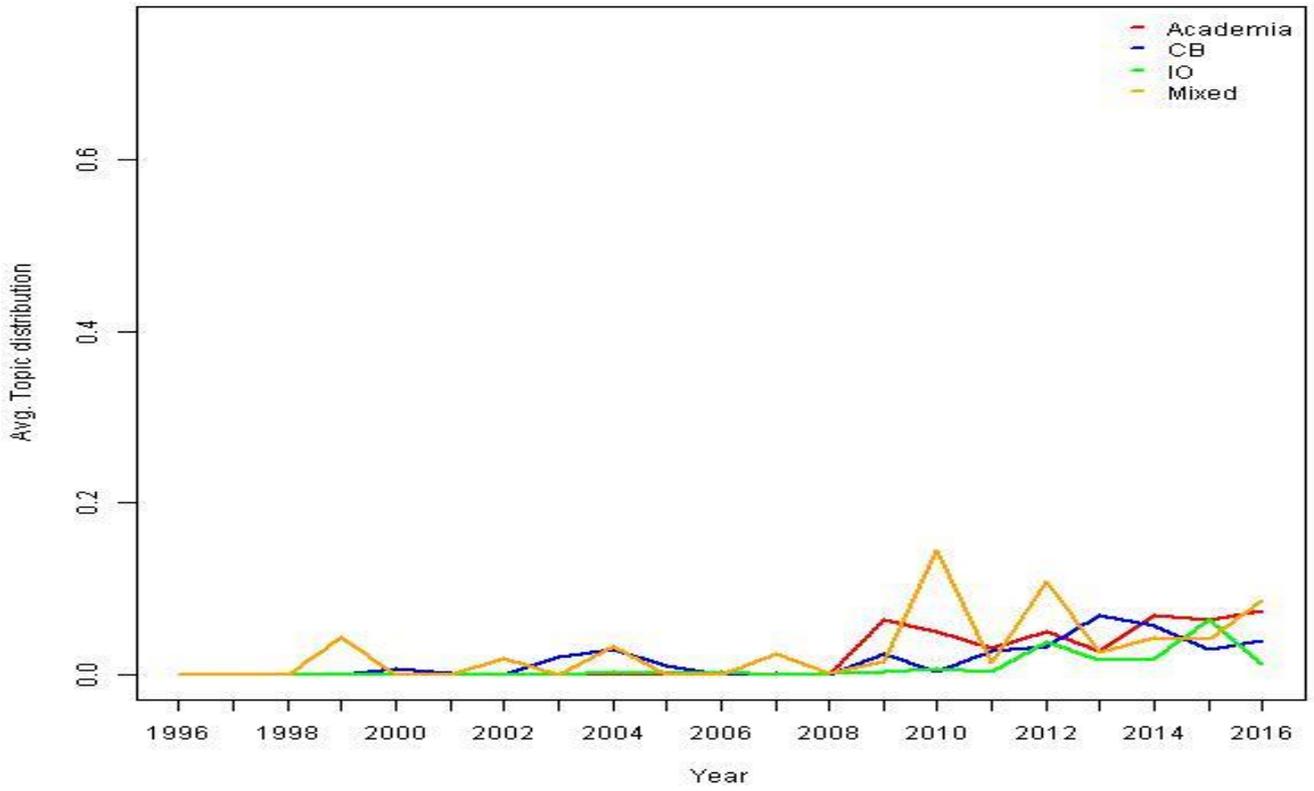
The cyclical capital regulation topic in the macroprudential topic corresponds nicely with the indicator topic within the overlap sample. In this topic central bankers are immediately interested in the issue after the financial crises and continue to be so afterwards, most likely due to the fact that Basel III delegates the implementation of counter-cyclical capital buffers to national regulators. The topic of early warning indicators is a peculiar one, since it exhibits an early interest of academics and mixed publications, a pattern, which makes them more likely to become institutionalized. This is a possible explanation as to why the credit to GDP gap became accepted as a measure post-crisis (Drehmann et al 2009), as it is based on such early warning system techniques. The last topic that tacitly assumes the financial cycle, without actually conceptualizing it is the topic of loan-to-value

(LTV) ratios. LTV ratios were already in use prior to the financial crises in some countries, in particular in emerging markets, yet the only authors interested in the topic seem to belong to international organizations (here the IMF is most notable, since they conduct a number of comparative studies on LTVs). Most notable, however, in all these topics is the absence or very late engagement of academic economists post-crisis, with three of the four topics being dominated by economists from central banks and international organizations..

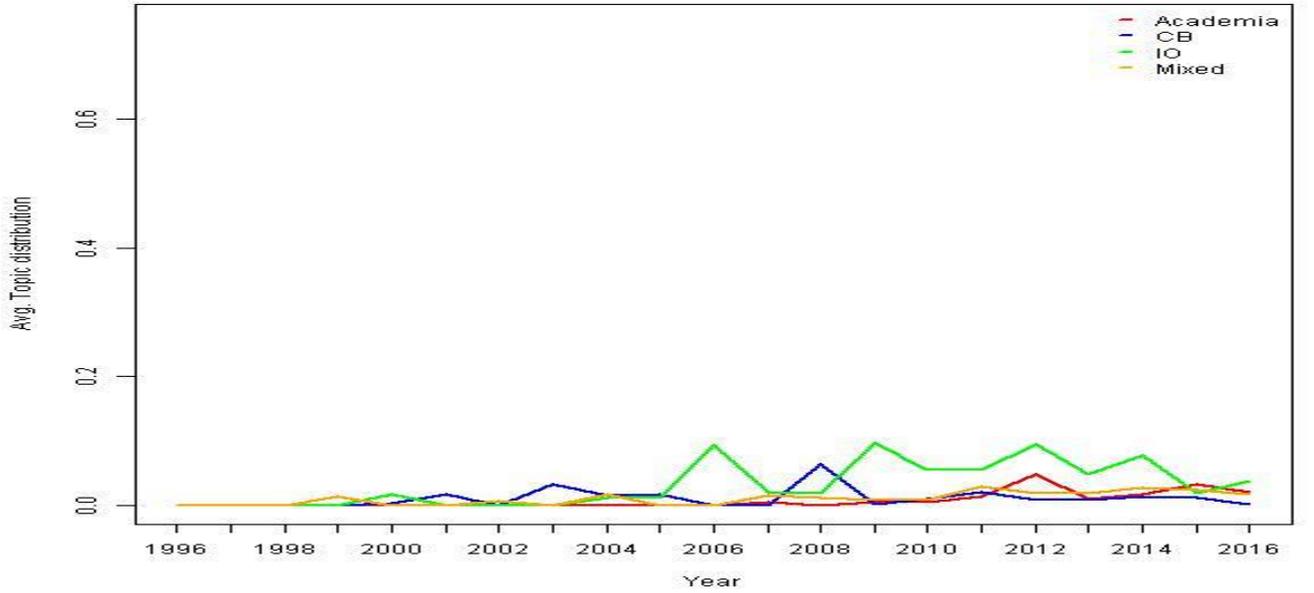
MPR: Cyclical Capital regulation as a macroP tool

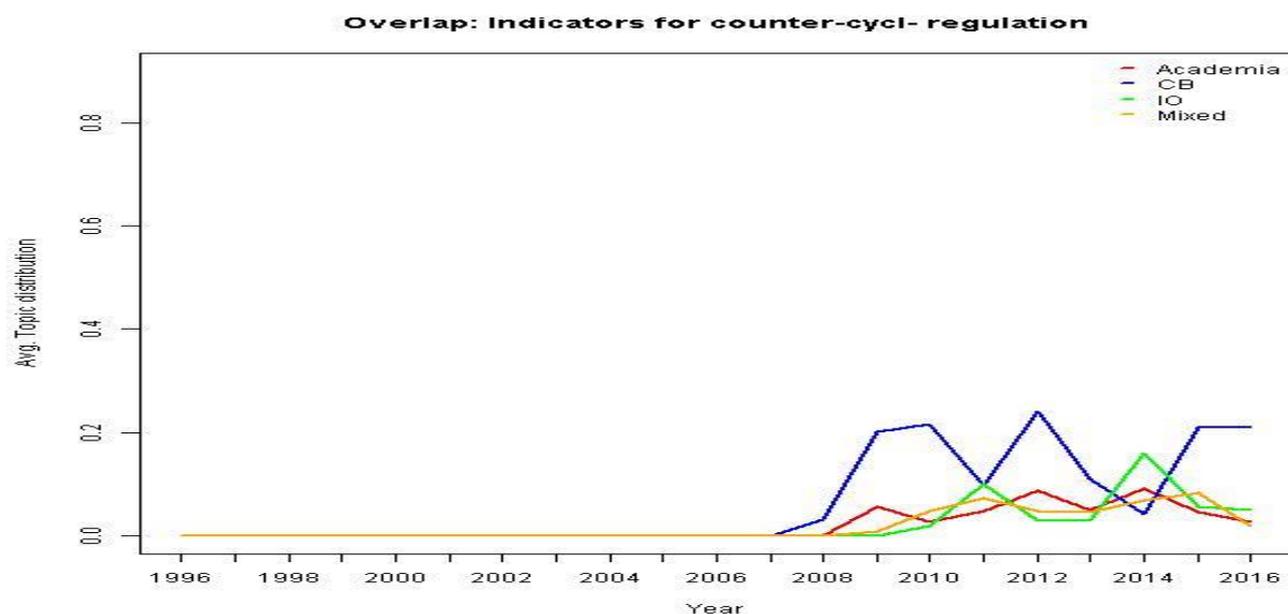


MPR: Early warning indicators



MPR: LTV





Graph 4.4: Average topic distribution per year per document type for topics regarding cyclicity

These findings indicate that among the different topics investigated, those regarding the cyclical nature of financial markets receive the least attention by academic economists. Furthermore, in all these publications, there is little to no theoretical engagement with the concept of the financial cycle in terms of models that could explain its unfolding (s. also chapter 3). This lacking engagement did not change much after the financial crisis.

The comparison to the other topics shows that the different concepts that underlie post-crisis regulation have been subject to a differential treatment by economists of different institutional backgrounds pre- and post-crisis. In particular, we find a selective engagement of academic economists with these topics. Topics that focused on systemic risk contributions by individual institutions as well as topics focusing on inter-connectedness and contagion are topics which are worked on by academic and central bank economists alike, often already before the crisis. In contrast, topics that focus on the cyclical component of the financial system are only worked on after the financial crisis and see much more limited engagement by the academic community, and crucially with much more focus on applying anti-cyclical regulation, rather than conceptualizing the cycle itself.

Old vs new systemic risk thinking and the engagement of academic economists

To verify these findings, in the next step of our analysis, we used the classification of new and old systemic risk thinking and the distinction of cross-sectional vs intertemporal dynamic which Borio

suggested in 2003 to develop a coding scheme for a total of 40 topics, using the short topic list of 13 for the systemic risk sample. Two independent coders coded each topic based on their use of time-variant or cross-sectional analysis and on its conceptualization of systemic risk as endogenous or exogenous. These two dimensions resulted in four categories a topic could be coded in: new systemic risk thinking with time-variant analysis, new systemic risk thinking with cross-sectional analysis, old systemic risk thinking with time variant analysis and old systemic risk thinking with cross-sectional analysis. Of the 40 topics in our sample, eight could not be classified in the scheme as they dealt with topics outside of the scheme (such as the history of macroprudential intervention). Of the 32 topics which remained, 18 were coded as belonging to old systemic risk thinking of the cross-sectional type, five belong to old systemic risk thinking in the time variant version, five are new systemic risk thinking of the cross-sectional variant and 4 to the new systemic risk thinking in the time variant dimension.

	Cross Sectional	Time Variant
New	5	4
Old	18	5

Table 4.3 The distribution of all topics in our coding scheme

In the systemic risk sample, we could only identify old systemic risk thinking (8 cross sectional and 2 time variant). In the macroprudential sample, old systemic risk thinking dominates with 10 topics (7 cross sectional, 3 time variant), but here we have also 5 topics with new systemic risk thinking (3 cross-sectional, 2 temporal). The overlap sample is characterized by 3 old systemic risk thinking issues on cross-sectional issues, and 4 topics characterized by new systemic risk thinking, evenly shared between cross-sectional and time-variant topics.

	Systemic risk	Macroprudential	Overlap
Old cross sectional	8	7	3
Old time variant	2	3	0
New cross-sectional	0	3	2
New time variant	0	2	2

Table 4.4 Distribution of topics in the different subsamples

The overlap sample, which is where systemic risk thinking and macroprudential regulation comes together is hence characterized by the biggest percentage of new systemic risk thinking, including the time variant perspective. However, the latter two topics, on Indicators for counter-cyclical- regulation

and early warning systems/forward looking systemic risk measures are again very applied, seeking to measure signs of booms and busts, without questioning or addressing the ontological existence of the financial cycle. Such a task, which would probably fall to academic economists is largely not tackled by this group.

This fact becomes clear, when comparing the distribution of author affiliations in the topics classified as new and old systemic risk thinking and their time variant vs cross-sectional distribution, which is summarized in Figure 4.2 below.¹⁰⁸

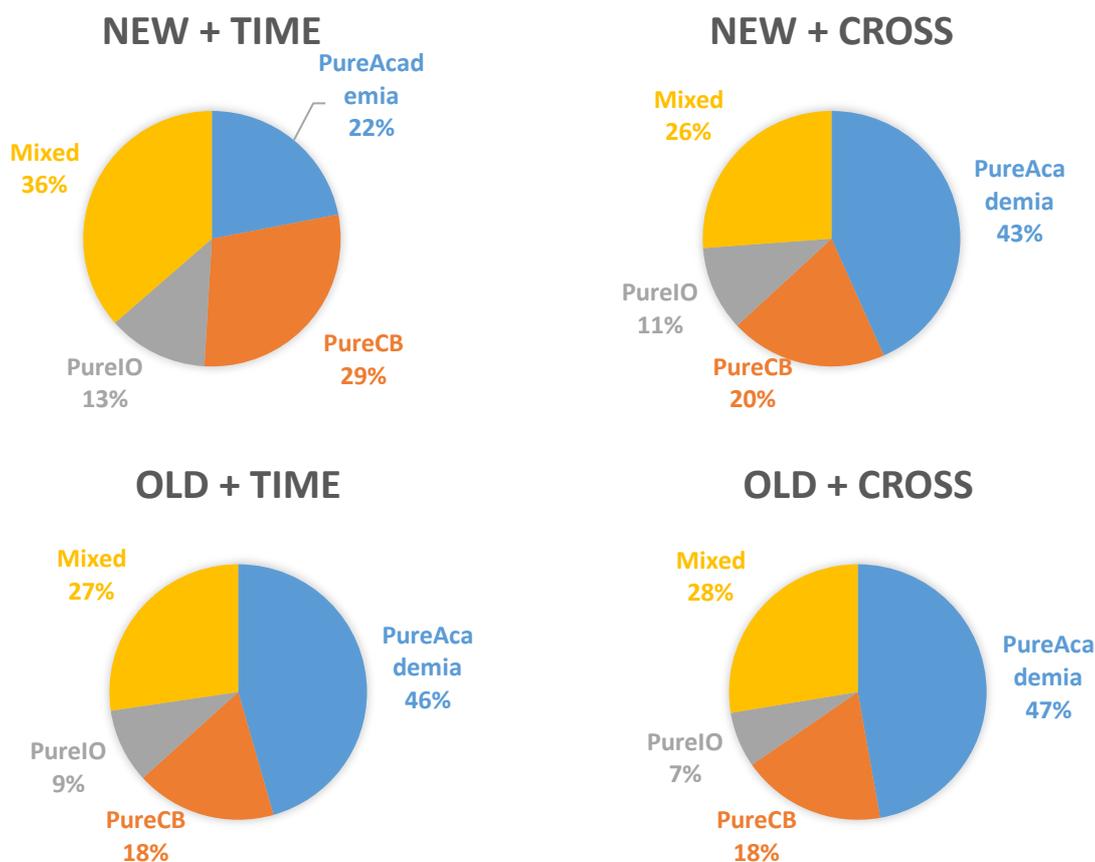


Figure 4. 1: Pie charts of author affiliation for papers in topics based on their coding in new/old systemic risk thinking and cross-sectionality/time-variance

Documents in topics, which have been coded as part of the new systemic risk thinking and utilize time-variant analysis are the biggest outliers in the overall distribution. Here, publications authored by academics only make up 22% of the overall contribution, whereas the average percentage of

¹⁰⁸ To generate these tables, we assumed that all the documents within a certain topic also belong to that category. Afterwards a simple summation of all types of documents coded as one of the four categories was done. We conducted chi² tests on the resulting distributions of authors within these topics to verify their statistical significance.

academic publications in the overall sample is about 41%. Purely academic publications hence under proportionately engage with new systemic risk ideas, especially if they are combined with the time-variant analysis. This becomes particularly obvious, when these publications are compared with new systemic risk thinking, that still utilize cross-sectional modes of analysis. In these publications, academics are much more represented than in its time-variant counterpart, with 43% of publications authored by academics. Another indication for the unique combination of new systemic risk thinking and time-variant analysis is the category of old systemic risk thinking and time-variant analysis. In this category, as well as the category of old systemic risk thinking and cross-sectional analysis, we find a similar representation of academics as in the entire sample.¹⁰⁹

Table 4.5 reveals several important facts about the distribution of topics in our overall sample and about the engagement of the different subpopulation of economists with these topics.

Number of authors (% of overall # of authors)	New time	New-cross	Old-time	Old-cross	Total
PureAcademia	47 (6.75%)	101 (14.5%)	165 (23.7%)	383 (55%)	696 (100%)
PureCB	62 (19.4%)	46 (14.4%)	64 (20%)	147 (46.1%)	319 (100%)
PureIO	27 (18.9%)	25 (17.5%)	34 (23.8%)	57 (39.9%)	143 (100%)
Mixed	78 (16.9%)	61 (13.2%)	99 (21.4%)	224 (48.5%)	462 (100%)
SUM	214 (13.2%)	233 (14.4%)	362 (22.3%)	811 (50.1%)	1620 (100%)
Percentage of authors in subsample	New time	New-cross	Old-time	Old-cross	Total
PureAcademia	21.96%	43.34%	45.55%	47.22%	42,96%
PureCB	28.97%	19.74%	17.68%	18.12%	19,69%
PureIO	12.6%	10.72%	9.39%	7%	8,83%
Mixed	36.44%	26.18%	27.3%	27.6%	28,52%
SUM	100%	100%	100%	100%	100%

Table 4.5: Author affiliation- publication correspondences in our differently coded topics

First of all, it shows the large preponderance of the cross-sectional old systemic risk thinking in our sample, with 50% of the author-affiliation publication correspondences in the old systemic risk thinking cross-sectional part. On the other hand, only 13.2% are in the new systemic risk thinking

¹⁰⁹ . To verify that these results in our sample are in accordance with the underlying universe of publication distribution, we performed chi² tests on the below distribution and found them to be statistically highly significant (p-value < 0,0001). The chi² test calculates the likelihood that a difference found is due to a random drawing error, these results hence mean that it is statistically almost impossible that the difference in the underlying real distribution on the topic with respect to the overall sample is 0. We further performed the same analysis on each of the three subsamples and have found similar results, which are mostly statistically significant (0,8 > p-value > 0,0001)

time-variant part of the sample. Furthermore, mixed authors (that is authors with multiple affiliations, e.g. academic and central bank affiliations) and central bank economists are particularly engaged in this topic, whereas academics form the single largest group in all other topics. This clarifies the degree to which pure academic economists avoid the new systemic risk time variant topic.

To test these results further, we draw on our expanded topic model for systemic risk, where we expanded the number of topics until a topic treating the cycle emerged (forcing us to move from 13 to 20 topics, including 3 garbage topics). Comparing the author distribution in the topic on cycles of the systemic risk sample to the average distribution in the overall systemic risk sample, we find a similar reduction in the overall distribution of purely academic authors, namely from 51.22% to 34,5% (s. figure 4.3 and figure 4.4 below). Here again, economists from international organizations and central banks are much more engaged with the topic of the financial cycle than academics.

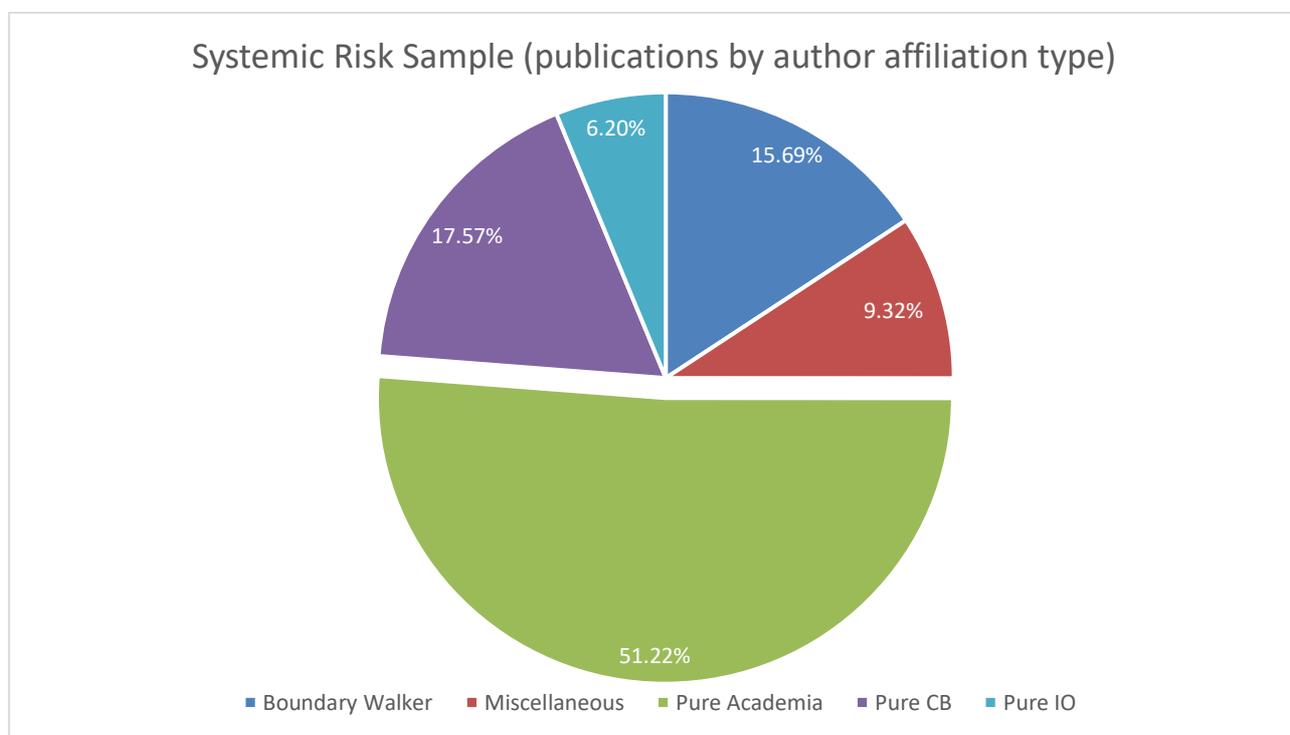


Figure 4. 3: Publications' Author Affiliation in in the Systemic Risk Sample¹¹⁰

¹¹⁰ The category BoundaryWalker represents papers that were written by authors that diachronically or synchronically have worked in academia and central banks or in academia and international organizations or in international organizations and central banks or papers that have been co-authored by agents from these different institutions. Miscellaneous authors are those that have been working in private finance, think tanks or are located in the miscellaneous category. The same coding scheme has been used for the other figures

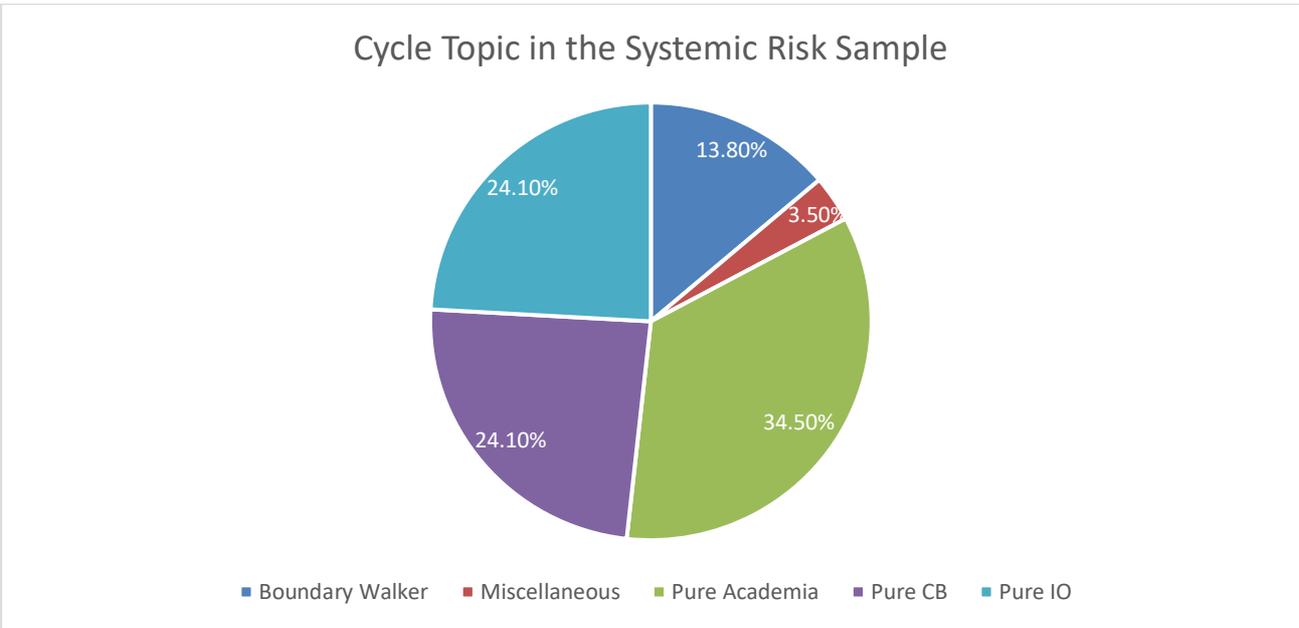
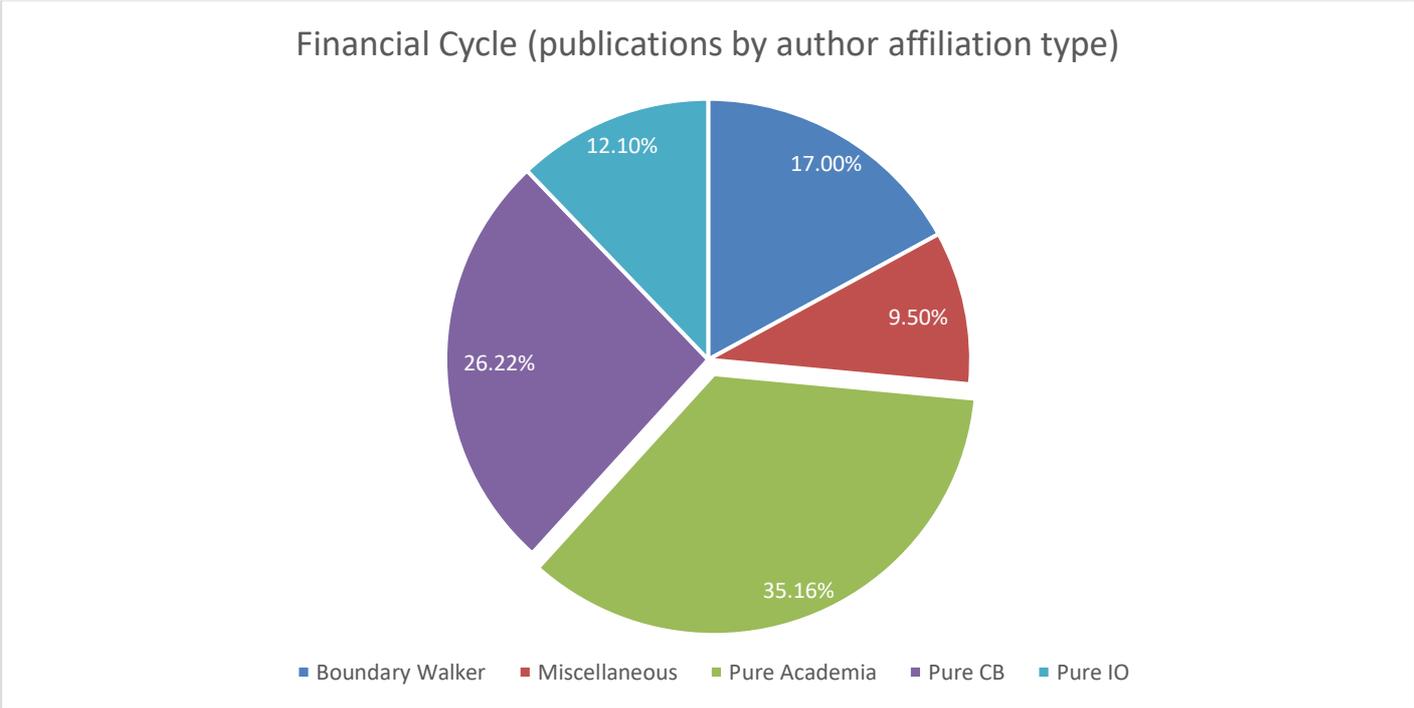


Figure 4. 4: Publications Author Affiliation in Cycles Topic in Systemic risk sample

To further test this finding of the markedly reduced engagement of academic economists with the time variant version of new systemic risk thinking by Borio, we additionally downloaded all papers from REPEC which have the financial cycle in the title, abstract and keywords, which gave us a sample of 235 papers. We then compared the author affiliation type for publications in that sample with the affiliation type for publications in the systemic risk sample. Here again, we find a similar reduction of academic economists, from 51,22% to 35,16%, and an increase in the engagement of economists in central banks and international organizations with this topic (s. below).



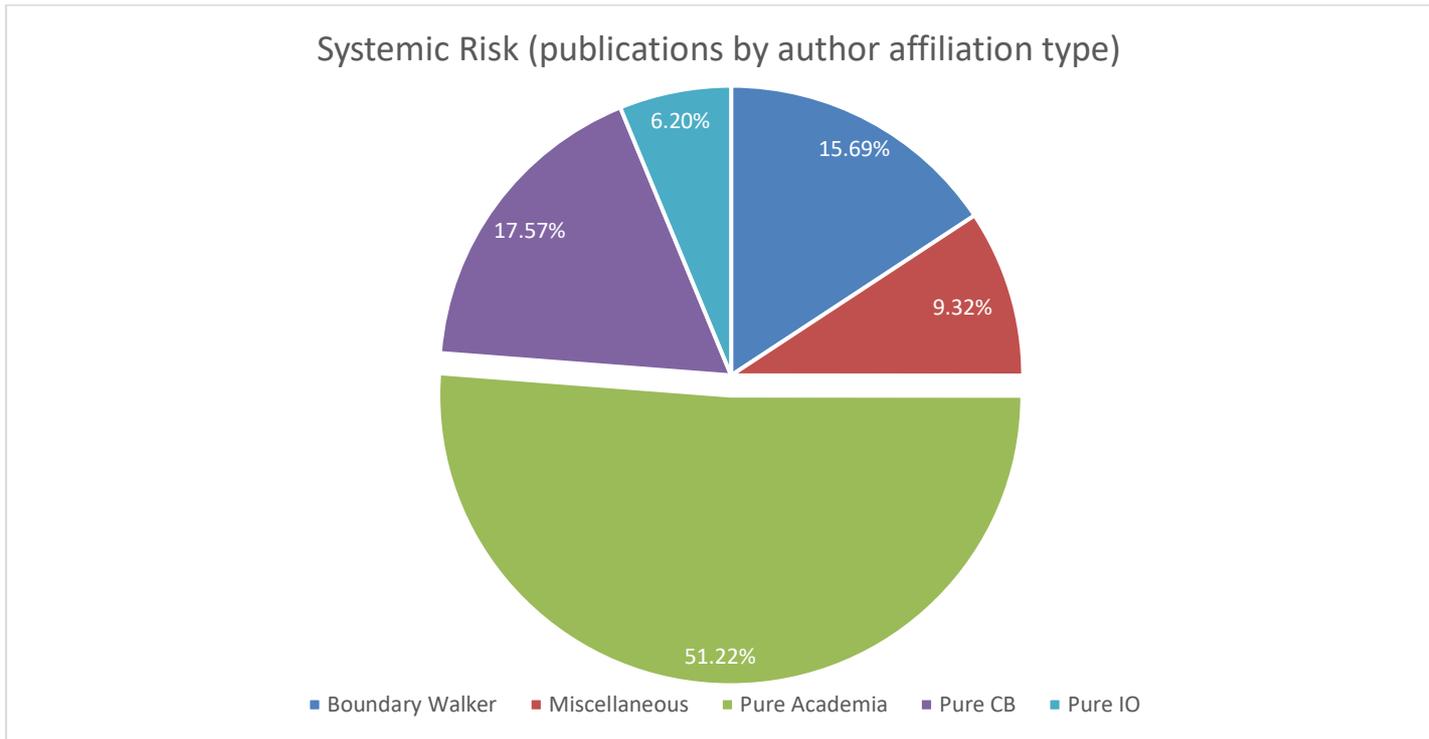


Figure 4.5: Comparison Publications by author affiliation type, systemic risk vs financial cycle sample

Using this sample on publications having the term “financial cycle” in the title, abstract or key word, we then employed author topic modeling to find out the reputation of the authors writing on the financial cycle. Our finding is that the sample is dominated by highly prestigious BIS and IMF and Central Bank economists and heterodox academic economists with relatively limited reputation. This can be seen in the graphic depiction below from the fact that there is but one highly reputed academic economist in the sample working on the topic of the financial cycle (Joshua Aizenman, the big black node in the graph below), all the other academic economists rather being part of the second tier.

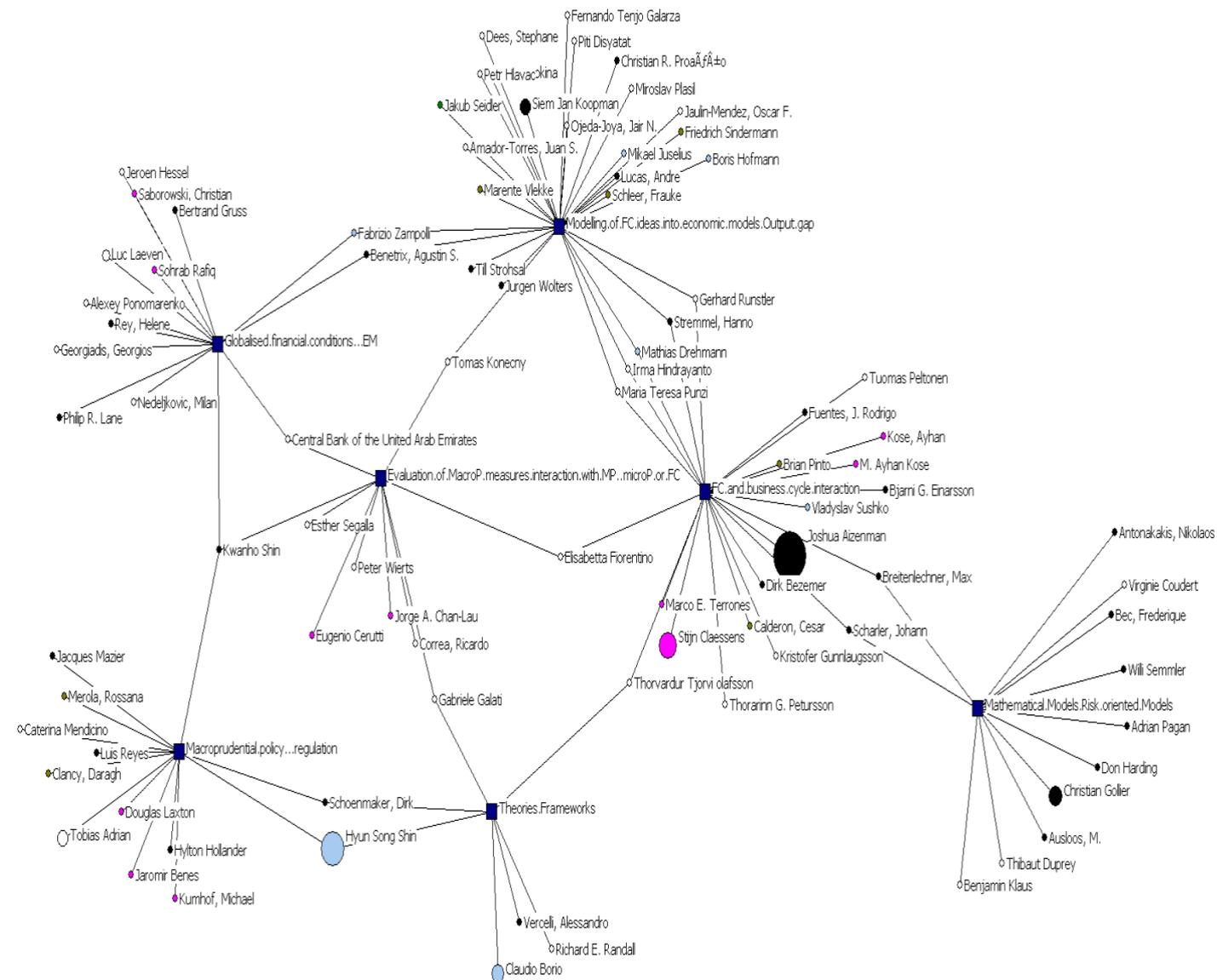


Figure 4.6: Bi-modal Network of all authors with two or more publications and the 7 topics within the Financial cycle sample. Node size indicates the reputation of the author. Color indicates affiliation (Pink = IMF, Light blue=BIS, black=academics, white=central bank, yellow = private finance, green = others)

Further pursuing the analysis, we investigated the place of publication and its citations, as well as the prominence of authors publishing on the financial cycle in contrast to the systemic risk sample and the other samples. To do so, we could make use of the fact that RePeC provides a measure of the top 10% of economists within the whole RePeC database, which we use to compare prominent authors within the topics. Table 4.6 below displays the distribution of the papers in the different samples in different publication venues, which at first sight does not suggest any remarkable differences between the subsample.

	Systemic Risk	Macroeprudential	Financial Cycle	SR-MP Overlap	TOTAL
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Journal article	20%	17%	18%	12%	18.94
IO WP	8%	12%	6%	20%	9%
CB WP	15%	31%	23%	27%	20.8%
Academic WP	44%	29%	38%	30%	38.4
Other	13%	11%	15%	11%	13%

TABLE 4.6. Different Samples by Type of Publication

Furthermore, looking at the impact factor of publication and mean citation count, we find that the financial cycle topic is both more cited and published in higher impact publications on average.

Sample/ Impact factor and Citation	Systemic Risk	Macroprudential	Financial Cycle	Overlap Sample
Median impact factor of publication series	2,2	2,3	2,4	2
Mean Impact Factor	3.8	3.9	4.6	3.8
Mean Citation	9.4	7.6	17.8	7.6
Mean Citation (Top 10% economists)	17.3	10.3	25.9	9.6

Table 4.7 Mean and median impact factor of place of publication as well as mean citation

However, when one decomposes these findings for the financial cycle sample further (s. table 4.8 below), one finds that these high impact publications are authored not by pure academics, but rather by central bank economists and those in international organizations. Table 4.8 below displays different author affiliation for publication for financial cycle. What can be seen is that only 34% of journal articles are published by pure academics, with central bankers alone contributing about as many journal articles on the topic as academics (32%).

	AuthorAffiliation	Sum Central Bank publications (incl. WPs)	Sum IO publications (including WPs)	Sum Journal publications	Sum Academic Working Paper publications	Total
1	Academia	11	0	17	103	131 (36%)
2	AcademiaCB	7	0	0	8	15 (4%)
3	AcademiaIO	2	2	8	14	26 (7%)
4	CB	56	9	16	29	110 (30%)
5	CBIO	6	1	1	4	12 (3%)
6	IO	17	20	8	26	71 (19.4%)
	TOTAL	99	32	50	184	365
1	Academia					
2	AcademiaCB	7%	0%	0%	4%	
3	AcademiaIO	2%	6%	16%	8%	
4	CB	57%	28%	32%	16%	
5	CBIO	6%	3%	2%	2%	
6	IO	17%	63%	16%	14%	
Total		100%	100%	100%	100%	

Table 4.8 Decomposition of Financial Cycle sample in terms of who publishes where

Furthermore, academics do not publish in IO publications, and only 11% of central bank publications stem from them. This finding becomes even more impactful when one differentiates the prestige of place of publication. Here, we find that publications in the sample which are published in venues by international organizations and central banks have a much higher prestige than the non-IO/CB publications (s. table 4.9 below). In line with this finding, IMF and BIS papers receive the highest average amount of citations (27 and 20 respectively) in the sample.¹¹¹

¹¹¹ In this vein, we find that of the top 10 most cited publications on the financial cycle, four are from the IMF or the BIS.

Prestige of Place of Publication	IO/CB Publications	non-IO/CB Publications
Mean	7.1	3
Median	6,7	1,2

Table 4.9: Mean and Median prestige of Publication for financial cycle: IO/CB vs non IO/CB

These results of our analysis have important implications for the academic backing of the epistemic claims of new systemic risk thinking. If, as Borio stated in the immediate aftermath of the crisis, everybody had indeed become a macroprudentialist in Borio’s sense (Borio 2009), one would expect all of our sample to move to these new systemic risk ideas he proposed. Yet, figure 2 and the following graphs show that the topics mostly concerned with new systemic risk thinking and time-variant analysis are most heavily populated by non-academics and mixed authors, while all the other combinations show similar distributions of publications types as the overall sample, with a very strong presence of academic economists. Moreover the key distinction between these topics does not seem to be new systemic risk thinking vs old systemic risk thinking per se, but rather the combination of time variant analysis with new systemic risk thinking, in other words the cyclical dimension of booms and bust cycles, a topic which is largely shunned by academic economists.

The fact that academics largely abstain from the cycle topic can be related to different barriers in the academic profession. On the one hand, the epistemic barriers of the profession to establish the ontological existence of the financial cycle as a “fact”. As one academic economist working on these issues explained, he can use the concept of the financial cycle in handbook articles or working papers, but it is very difficult to him to employ that language in peer-reviewed journal articles. This stems from the problem of properly identifying financial cycles in the data due to their rare occurrence and the fact that the financial cycle seem to be internationally coordinated, rather than individual country level events, thereby reducing the number of observations that one can use for econometric analysis even further (interview academic economist 19.01.2018). This reflects the orthogonal position of the financial cycle thinking to the predominant academic mainstream at that time, which only slowly evolves.¹¹²

¹¹² A very good illustration of this slow evolution and the persistent academic opposition to the ontological existence of the financial cycle is a blog post from November 2018 by John Cochrane, a leading Stanford economist with market-liberal orientation who was invited to a conference on financial cycles at the Bundesbank. In that blog post, he observes a group of central bank researchers that are convinced of the existence of a financial cycle, but he is rather sceptical (<https://johnhcochrane.blogspot.com/2018/11/state-of-thought-on-financial-regulation.html>). In his words, “Groups of researchers develop a common language and a common set of assumptions. This is productive -- to push a research frontier we have to agree on a few basic ideas, rather than argue about basics all the time. I, as an outsider, parachute in,

The second aspect of it is that beyond the econometric analysis, which could establish the financial cycle as a fact, there is the question of what kind of theory could explain this phenomenon in a parsimonious manner (ibid). It is hence a big risk for academics in terms of academic publications and hence career advancements to engage with this topic (on this point, interview ECB research manager, April 6th 2017, s. also Blyth 2013). In contrast to these academics which might choose to engage in incremental model building, applied economists do not get to weigh these academic considerations of research topics they choose as much. Instead, they are assigned tasks by their managers that pursue the goals of the central bank or international organization, for example building macro-models which combine finance and macroeconomics (interview ECB research manager, April 6th 2017, interview academic economist, 25.10.2019)

Discussion and Conclusion

This chapter has investigated the macroprudential discourse and its evolution since the 1990s. Based on an extensive dataset, we were able to provide a wholesale overview of the macroprudential and systemic risk discourse post-crisis, first showing that the two concepts of systemic risk and macroprudential regulation are not synonymous to each other. Rather, both discourses are focused on different topics and only occur together in a small overlapping sample, with academic economists mostly focusing on systemic risk, and economists in central banks on the implementation of macroprudential regulation. In addition to identifying and characterizing the divide in population of these discourses, we were also able to show that papers on systemic risk mostly remain wedded to “old systemic risk” thinking in Borio’s terms, and that those papers on macroprudential regulation treat the intertemporal dimension of new systemic risk thinking rather implicitly, not providing explicit models for the endogenous growth of systemic risk over time.

We then employed structural topic modelling to identify important topics within the macroprudential and systemic risk discourse and determined the engagement of various types of economists in these topics. By contrasting these topics with the ideal type macroprudential framework, outlined by Borio 2003b, we were able to show that ideas that follow a cross-sectional style of analysis, in particular

and learn as much what the shared assumptions are, as I do about particular points in elaboration of the program. Here, it is pretty much taken for granted that there is such a thing as a "financial cycle." It's in the conference title, after all! That means a "cycle" of credit expansion, usually "unwarranted," "excessive," or an "imbalanced," followed by a bust. It is also agreed that it is the job of financial regulators to manage this "cycle."...I'm a bit skeptical, of course.”

those linked to “old systemic risk” thinking had the backing of academic economists, whereas those topics engaging with new time variant thinking lacked such strong academic support. The analysis shows that different ideas received different attention by different groups of economists. Ideas surrounding the cross-sectional resilience of the financial system were a topic both for academia and central bank economists compared to topics, which included a time dependent analysis. Time variant topics dealing with new systemic risk thinking on the other hand are topics that academic only rarely engaged with, and much less endorsed. The lack of backing by the scientific community was problematic for regulators during the epistemic battle in the aftermath of the financial crises.

At the height of post-crisis uncertainty, epistemic power of different concepts makes a difference to regulatory battles over which regulations to implement. One of the most valuable resources in these battles is the backing of epistemic claims by academia, since it garners its epistemic authority from the larger position of science as the arbiter of truth in society. Our paper shows that this resource was largely unavailable during the discussions prior to Basel III and other regulatory changes to those macroprudential change agents pushing for the time-variant version of macroprudential regulation. It thereby provides an additional factor why post-crises regulatory reforms that were focusing on increasing the resilience of the system by making individual banks and the system as a whole more resilient were implemented right after the crisis, while measures seeking to combat the cyclical nature of the system are rather absent.

Our analysis improves on the current literature on the macroprudential ideational shift by actually providing an overview of when what kind of epistemic resources were available for which macroprudential idea. The analysis clearly shows that not all macroprudential ideas are equal. Some were backed by academia at different points in time, while others were denied the backing of the scientific community. In terms of new ideas, contagion, based on mathematical network model seems to be a topic that found consistent uptake both in the post crises economic discourse by all economists as well as in the regulatory process, but it is classified as old systemic risk thinking by Borio. New macroprudential ideas stemming from the fallacy of composition, such as herding find a much more muted uptake. Most remarkably, the most prominent part of the new macroprudential idea set according to Borio, the endogenous financial cycle has been largely ignored. Even more surprising than the lacking translation of this concept into forceful regulation is the lack of discussion on these issues in the macroprudential sample itself. The financial cycle in particular was described by Borio as the moment where “macroprudential comes into its own” (Borio 2003b, 11), yet the financial cycle

is at best a tacit assumption in most topics within the macroprudential sample. Even if one includes the overlap sample in the analysis, the situation does not markedly improve.

Considering the epistemic standing of the financial cycle in academia and the macroprudential discourse itself, it is unsurprising that so far only few new regulations have been implemented regarding the dampening of the cycle. As described above the only regulatory change that addresses the financial cycle are counter-cyclical capital buffers. CCyBs, however, are mostly aimed at increasing the resilience of the financial system prior to a financial crisis and not towards actually dampening the financial cycle itself. Furthermore, recent studies on the effect of capital regulation on financial stability have shown that capital requirements do not prevent crises, rather they only reduce the welfare costs once a crisis has occurred (Jorda et al 2017).

The analysis of publications according to the distinctions of old vs. new systemic risk thinking and time-variant/cross-sectional topics then indicates, that the main issue with new macroprudential ideas is not their “newness” per say, rather it is that particular parts of the macroprudential idea set separated according to these distinctions do not find the same support as others. In particular, we find that the combination of time-variant analysis based on new systemic risk thinking, namely the financial cycle lack academic engagement. One explanation for this is that academic economists are heavily invested in modelling approaches, which are still unable to handle the endogeneity of the financial cycle (s. chapter 3). Our analysis shows that academics do not engage in topics which include the financial cycle in general, even if they might work with it as a tacit assumption.

The analysis further shows that the combination of new systemic risk ideas and time variance is unique in the sense that it is the one which differs significantly from the overall distribution in the sample, with a much-diminished presence of academically affiliated authors. These results indicate that it is one particular mode of analysis and thinking that is largely rejected in academic discourse. More work is needed to investigate what prevents the engagement of the academic community with the time variant variety of macroprudential regulation. Whatever the reason for this finding, be it the continuous neglect of historical time in neoclassical economics (but s. Brunnermeier and Sannikov 2014) or the opposition to the concept of the financial cycle due to its implication for simple representative rational agent modelling, this finding is worrisome. It implies that an academic justification for anti-cyclical regulation is hardly forthcoming, endangering the project of anti-cyclical regulation in the long run.

Chapter 5 Measuring and mitigating systemic risks: How new Alliances of central bank and academic economists forge the transnational macroprudential agenda

With Carolina Raquel Melches and Edin Ibrocevic¹¹³

Abstract:

After the crisis, central banks were handed a macroprudential mandate to contain systemic risks, a mandate seen to endanger their independence due to expected distributional conflicts. At the same time, depoliticization through scientific expertise was largely foreclosed, as systemic risk was a largely undefined concept. This paper focuses on how central banks dealt with this conundrum by focusing on the scientific debate on systemic risk and macroprudential regulation post-crisis, focusing on its impact on final regulation. Employing author-topic-modelling on a unique data set of 2397 economic papers published on these topics, we detect the formation of a new alliance between central bankers and academic economists working jointly on developing systemic risk measures. Centered around the hinge of systemic risk contribution by individual banks, this new alliance expresses itself in the incorporation of macroprudential concerns of practitioners in abstract market-based systemic risk measures. These measures advance incrementally, using and repurposing techniques of financial economics pre-crisis to legitimize and justify macroprudential interventions post-crisis. This alliance allows us to account both for the incremental change witnessed post-crisis as well as pointing to its potential for long-run fundamental change.

¹¹³ This chapter is the outcome of a collaboration with Carolina Raquel Melches and Edin Ibrocevic. It is currently under review at a peer-reviewed journal as M.Thiemann, C. R. Melches and E. Ibrocevic. 2020. Measuring and mitigating systemic risks: How new Alliances of central bank and academic economists forge the transnational macroprudential agenda. Revise and Resubmit

Introduction

Couched in the language of economics as a science, central banks pre-crisis had achieved an unknown degree of autonomy and depoliticization (King 2005, Watson 2002, Marcussen 2009a). Coupled with a “self-regulatory” consensus, which increasingly based banking regulation on the private risk management tools of banks such as Value at Risk (Lockwood 2015), central banks presided over a golden age of central banking called the “Great Moderation” (Bernanke 2004). With the great financial crisis of 2007-2009, both this tranquility and the self-regulatory consensus ended. Economics as a science had ignored the potential for the build-up of financial instability during tranquil times and “market self-regulation”, to the surprise of its proponents, had proved to be a failure (Greenspan 2008). The costs of the widespread central banking stance of ‘post-hoc interventionism’ regarding the build-up of financial risks (Golub et al 2015) proved to be punishing, in turn undermining the expert authority of economics and central banks. And yet, in a paradoxical development, central banks, rather than seeing their mandates cut back, experienced their expansion, when in 2009 the G20 tasked central banks to design and implement a framework for dealing with systemic risks going forward (G20, 2009, Lombardi and Moschella 2017).

They now had not only the task to deal with the immediate effects of the crises, but also to develop new frameworks to deal with financial instability and systemic risk going forward, adding to their loneliness in the face of unexpected financial instability (Mabbett and Schelkle 2019). This new role, which implied both distributional conflict with homeowners as well as banks (Goodhart 2015), threatened to be a poisoned chalice, repoliticizing central banking (Marcussen 2013, Baker 2018). Acting on this mandate required central banks to agree on a common conception of systemic risk and how to measure it, a task made more complicated by the fact that these notions were remarkably undefined in mainstream academic discourse (Helleiner 2014, Hellwig 2014, Thiemann et al 2018a). Concerned about the reactivity of financial markets and the possibility for unintended consequences (Stellinga 2019, Stellinga and Muegge 2017) as well as the fear of political backlash (Tucker 2018), central bankers were only too aware that their macroprudential intervention would require careful legitimation based, if possible, on a scientific framework for measuring and mitigating systemic risks (Goodhart 2015, 287, Marcussen 2013, 29). Yet, when looking to financial economics, the scientific proposals on offer looked dim (Muegge 2013).

While the concept of macroprudential regulation had been present in the discourse of central banks and international organizations like the BIS since the early 2000s (e.g. Borio 2003b; Crockett 2000),

they were not formatted in mathematical models or language and therefore had not garnered much attention in mainstream policy making or academia (Thiemann et al 2018a). Furthermore, this new approach contradicted the micro-prudential focus of prior models of financial regulation, which maintained that if all individual institutions were sound, the overall system would be sound. As identification and measurement of systemic risk were to provide the basis for the use of macroprudential tools to limit their build-up (IMF-FSB-BIS 2016, Baker 2013a), central banks hence faced a conundrum. Having their reputation based on technical rationality (Abolafia 2012) and economic expertise, which they had also build-up in-house (Marcussen 2009a), they were to act on a largely undeveloped field in terms of economics (Tarullo 2013b, Thiemann 2019), “squishy science” in the words of a Fed official (as cited in Goodhart 2015, 295). Having little in terms of mainstream economic models to fall back upon, they were exposing themselves to charges of arbitrariness and lacking expertise.

Given this conundrum, the purpose of this paper is to trace the professional origins of different systemic risk measures and models that were developed after the crisis, especially those that have come to justify regulatory measures post-crisis. In other words, we ask which groups of economists proposed what kind of measurement of systemic risk and what characterizes the measurement of systemic risk that finally informed policymaking? If central banks were to establish a macroprudential framework that would take broader conceptualizations of systemic risks seriously, they would have to fundamentally depart from regulatory and economic mainstream assumptions pre-crisis (Baker 2013a) and develop a new framework to measure and mitigate these risks. And yet, to shield policymakers from legitimacy threats, the literature maintains that it is of central importance that these new measures and models are deemed ‘objective’ and based on quasi-scientific evidence (Jasanoff 2012, Porter 1995). Achieving the status of objectivity for such a regulatory framework, however, could hardly be the work of applied central bank economists alone, due to the perceived conflict of interest of in-house science justifying regulation (Tucker 2018) and their epistemic inferiority with respect to academic economists (Whitley 2000, Fourcade 2009), requiring intensive boundary work between academics and central banks on this question (Adrian 2018).

To investigate how this boundary work unfolded and to assess to which degree the systemic risk measures drawn upon by central banks were moulded by internal central bank-driven research, by academia or by cooperation between the two, we draw on a unique dataset of 2397 articles on systemic risk and macroprudential regulation compiled from the RePeC database. We use author topic modelling and document analysis to identify central themes in the economic discourse on

systemic risk measurements. We complement quantitative text and citation analysis with careful readings of the corpus of documents and nine interviews with prominent economists and regulators working on these matters. Our research thereby speaks to the performative power of economics in shaping regulation (Hirschman and Popp-Berman 2014), the shifting alliance of academic economists and central banks post-crisis as well as the dynamics of the macroprudential policy reforms post-crisis (Baker 2018), in particular regarding the economic input which underlies it. We find the formation of a new alliance between central bank economists and academics, who seek to justify macroprudential interventions combining pre-crisis methods with the new macroprudential ideas about the financial system, explaining both the incremental change post-crisis as well as its potential for changes in the long run.

The article proceeds as follows: Initially, we detail how economic ideas informed policymaking pre- and post-crisis and lay out our theoretical framework vis-à-vis the intellectual field of economics. Then, we introduce our dataset and method, with the next section presenting the results, distinguishing different approaches to systemic risk measurement based on their content and the authors' professional affiliation. We subsequently compare the most prominent systemic risk measures regarding their alignment with macroprudential concerns over the use of market data, detailing the nature of the new alliance of central bankers and academics as well as its partially paradoxical content. We conclude by placing the formation of this new epistemic alliance that undergirds the macroprudential paradigm into the context of the literature on post-crisis macroprudential regulation, pointing to its potential for long run fundamental change.

The role of economic ideas within financial regulation pre- and post-crisis

How do economic ideas feed into financial regulation? Policymakers increasingly elaborate financial regulation based on economic knowledge and ideas offered to them by the field of economics (Jasanoff, 2011b; Black, 2013, Harnay and Scialom 2016). They do so because they depend on “scientific, evidence based” knowledge to justify their regulatory interventions (Jasanoff 2011b). In this way, economic ideas have a legitimizing role, protecting policymakers against charges of arbitrariness or bias (Jasanoff, 2011a, Hirschman and Popp-Berman 2014, Boehmer-Christiansen, 1995). Economics in this respect provides an ideational infrastructure that defines the role and scope of legitimate public intervention in the economy to achieve certain goals, which in turn is usually derived from the array of contemporary mainstream economic theories (Braun, 2014, p. 51, Ban 2015, Clift 2018, 2019). But neither does economic knowledge feed into policymaking in a linear way, nor are economic ideas similar in content and authority (Ban 2015, Kentikelenis and Seabrooke 2017).

Instead, they need to be filtered and translated by experts (Chwieroth 2010, Jasanoff, 2011b; Spruijt, et. al. 2014; Bradshaw, Borchers, 2000). This gives experts considerable discretion in selecting which ideas flow into the policy sphere and how they are translated into policy-suitable knowledge (Ban 2015, Clift 2018).

The selection of ideas by experts is based on the fit with perceived local needs and capabilities of the implementing agency (Jasanoff 2011b, Porter 1995). This can be data availability (Kranke and Yarrow 2019), but also the personal interest in career advancement of professionals dealing with the issue of financial stability (Seabrooke and Tsingou 2009). Experts selecting ideas for regulation can form alliances with surrounding professions dealing with the issue of financial stability in private finance and/or academia (*ibid*), which, if sufficiently powerful, “can create the dominant understanding on how an issue should best and most legitimately be treated” (*ibid*, p. 5). These alliances are often based on “hinges”, shared conceptions whose promotion produces rewards in allied fields, thereby enabling professionals’ career advancement (Abbott 2005, Seabrooke and Tsingou 2015). Before the crisis, such a hinge between policymakers and financial industry professionals emerged, viewing the achievement of financial stability as “a matter of empowering regulation as risk management” by individual banks (Seabrooke and Tsingou 2009, p.16). It enabled rewarding policymakers by projecting expertise given rapid financial innovation and rewarding financial market professionals with the advantages of self-monitoring.

This hinge emerged because of the political-economic situation constraining the capacity of regulators to intervene in financial markets at that time and the allure of recently developed private risk-management techniques created in the 1990s. Pre-crisis, regulatory agencies had difficulties keeping up with private financial innovations and their implications for system stability. Yet, at the same time, they saw their capacity to limit these processes constrained by political will and the endorsement of innovation by high level regulators such as Greenspan (Tsingou 2004). Given their lack of data and understanding of the systemic consequences of innovation, they increasingly placed hopes for containing systemic risks on market discipline and market-based supervision (*ibid*), embracing both private risk transfer and private risk management techniques. Consequently, compensating for lack of technical expertise, policymakers were integrating advances in private risk-modeling (VaR models)—jointly developed with academia—into the global Basel framework (Seabrooke and Tsingou 2009), first in the market risk amendment in 1996 and later also for the treatment of credit risks in Basel II (Lockwood 2015, Adrian 2018). In this way, “central bankers

implicitly recognized that risk management models in use by major banks are far more advanced than anything they could ever propose (Jorion 1997a, 41, cited in Lockwood 2015, 723).

Based on a simplified version of the Efficient Market Hypothesis (Turner 2011), this pre-crisis regulatory approach excluded macro-prudential problems of liquidity risks and pro-cyclical tendencies of the financial system that emerge from system-wide developments (Stellinga and Muegge 2017, 17). Instead, it focused on the microprudential risk management of individual institutions. Ensuring the safety and soundness of these institutions was mostly delegated to the large banks themselves, as private bankers had succeeded to use their private risk management systems to portray themselves as responsible and reliable risk managers (Lockwood 2015, De Goede 2004). As an authoritative claim to control risks and limit future losses, these models produced “an easily understood number: the maximum possible loss on a portfolio likely to occur a given percent of the time” (Lockwood 2015, 722), excluding tail risks from consideration. Due to its assumptions and its exclusive focus on short-term volatility which allowed banks to increase risk-taking as volatility went down, this regulatory framework and the Value at Risk model it used to contain systemic risk widely underestimated the tail risks to the pre-crisis system (Lockwood 2015), leaving regulators and the financial system unprepared for their realization.

The crisis dynamics then empowered critics in academia and among central bankers, who for several years had pointed to the dangers of an exclusively micro-prudential approach and the pro-cyclical tendencies of Value at Risk Measures, installing a radical ideational shift in the way regulators and central bankers perceived the financial system (Baker 2013a). And yet, this radical ideational shift was not accompanied by a concomitant operational consensus on how to implement such a macroprudential approach (Baker 2013b). Instead, such an operational consensus was seen to evolve incrementally (Johnson et al 2019) due to the need to convince microprudential regulators of the merits of the new approach and the need to establish scientific evidence underpinning regulatory interventions (Baker 2013b, 2018, Moschella and Tsingou 2013). In particular, the need to produce scientific evidence based on which regulators could seek to measure and detect systemic risks proved to be an encumbering factor (Thiemann et al 2018b). In a bureaucratic environment characterized by scientization, these new ideas had to be operationalized, reconciled with existing models and corroborated by evidence (Clift 2018, 39f), before they could serve as foundations for regulatory devices that allow regulators to visualize systemic risk and justify measures to contain it (Hirschman and Popp-Berman 2014).

The macroprudential policy shift can therefore best be characterized as a fragmented change, “whereby a crisis may induce rapid change in one specific dimension of a paradigm ... at some point, while another dimension develops slowly in response to cumulative gradual pressures” (Kaya and Reay 2019, 392). Given the devastating consequences of VaR and its political-economic consequences, this gradual change in regulatory devices poses the question whose expertise flowed into these new regulatory devices to measure systemic risk. This, we argue, is at least partially determined by shifting alliances of epistemic groups in the field of economics and its underlying work incentives (s. also Seabrooke and Tsingou 2009).

Shifting alliances of academic and applied economists’ conceptualization of systemic risk

According to Whitley, economics divides into a “scientific” field and a much larger “intellectual” field (2000, see also Ban and Patenaude 2019). The *scientific field* refers to research conducted within universities by academics who are subject to the incentive regime of academia (Ban et al 2016). The purpose of conducting research is engaging in scientific discussion among peers and publishing in prestigious journals, which often involve mathematical models based on equilibrium thinking (Breslau 1997a). These models are commonly mathematically complex and tend to strongly simplify real-world situations to keep models traceable (Morgan 2012). *The intellectual field*—broader in scope—also comprises non-academic economic research within public and private organizations, like central banks and international organizations. The latter are different in the conduct of research, due to different work-related incentives and rewards for economists focusing on particular policy problems at hand which invites flexibility vis-à-vis overarching, dogmatic economic ideas¹¹⁴ (Reay 2012, Braun 2016b, Ban and Patenaude 2019). However, crucially they also produce economic knowledge.

Often, the research mandate for such applied economists is maximizing real world applicability, e.g. to derive useful policy prescriptions rather than produce a scientifically novel argument or insight. Therefore, they are much less constrained by academic markers of professional excellence—like applying the latest economic model or econometric technique—and it is much easier for them to cross research boundaries and engage with non-formal kinds of reasoning, such as historical observations (Thiemann et al 2018a). However, non-formal reasoning lacks the epistemic authority to establish scientific boundary objects, which is why these economists rely at least partially on academics and their quantitative and modelling skills to generate epistemically authoritative statements employable

¹¹⁴ Regarding the importance of these overarching dogmatic ideas for policy possibilities, s. Best and Widmaier 2006.

within policymaking (Gieryn, 1983; Jasanoff, 1987; Merton, 1945). Pre-crisis, this epistemic inferiority of central bankers and regulators, who often lacked the technical expertise to build risk models themselves (Tsingou 2004, Lockwood 2015, 723), led to the formation of coalitions with professional economists in academia and private finance (Seabrooke and Tsingou 2014, Ban et al 2016), paving the way for the inclusion of private risk models in financial regulation.

Post-crisis, it was exactly these risk frameworks—widely seen in the expert community to have contributed to the build-up of systemic risks—that validated early critics (Danielsson 2000, Persaud 2001,). As predicted, these models grossly underestimated risks that were accumulating in the financial system and even pro-cyclically reinforced them (Lockwood 2015), due to their incapacity to envision the amplification of risks within the financial system (Adrian and Shin 2010). Given this widespread criticism of private risk-models and the mainstream vision of financial economics that assumed efficient, ever liquid financial markets both in academia and by central bankers, the development of systemic risk models could hardly stem from private finance (cf. Adrian 2018). Therefore, academia was de facto left as the only option for policymakers to look for ideas, inspiration and legitimization in their quest to develop systemic risk models. This relationship, however, was complicated by the difficulties for central bank practitioners to place systemic risk thinking in mathematical models, as they largely followed a historical, more informal kind of reasoning and for academic economists to engage in real world systemic risk observations with the help of their mathematical models (Thiemann et al 2018a).

In other words, the different incentives and objectives of research between these two groups promoted different methods and theoretical approaches to systemic risk. Practitioners working in central banks and IOs, like the Bank of International Settlements (BIS) and the IMF, employed the more informal style of economic reasoning, more flexible in its methodological toolkit, and more problem-driven in its analysis (ibid). In their view, systemic risk was also created endogenously, through common exposures and network effects, as well building up over the financial cycle (Borio, 2003). However, these analyses were mostly narrative, lacking models and econometric techniques. Maximizing the policy-effects of these informal macro-prudential ideas pre-crisis for the post-crisis reform agenda would require adoption of these ideas into the formal language of economics (for the case of macroprudential capital controls, s. Gallagher 2016). The formal/informal divide in methods and styles of reasoning between these two, however, created frictions in the ideational transfer between these fields (Thiemann et al 2018a). The adoption of certain macroprudential standards post-crisis raises the question how the interaction between the formal, predominantly academic field, which

largely excluded endogenous systemic risk, and the informal field dominated by practitioners and economic historians unfolded, and how these processes influenced the policy measures adopted.

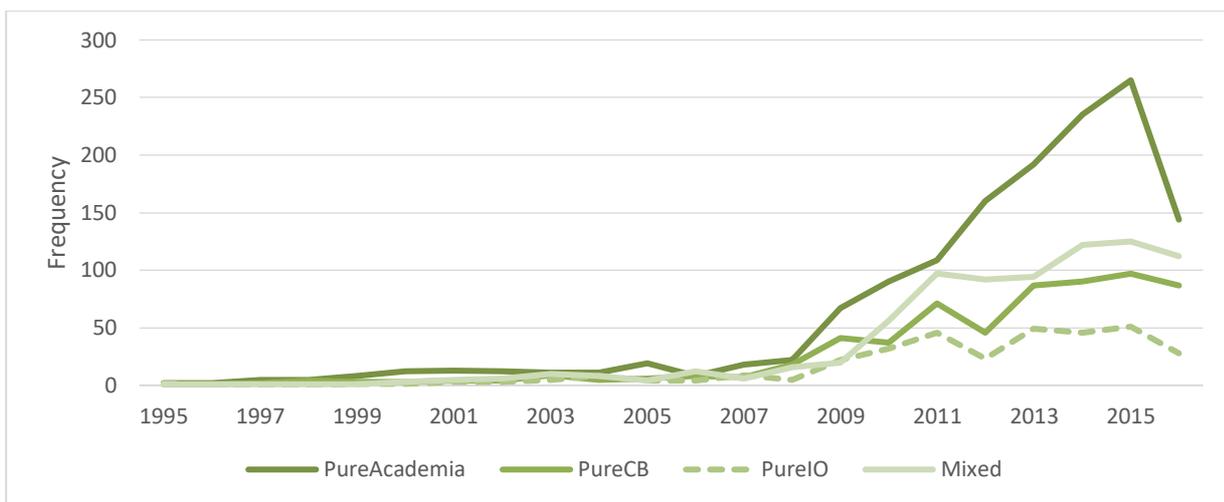
Such a translation of ideas from the non-formal to the formalized mode of economics might have been facilitated by the trend of increasing academic output by central bank researchers, called the “scientization” of central banks (Marcussen, 2009), a process beginning in the 1990s that accelerated post-crisis (Jacobs and King 2016, Dietsch et al 2018). Through the establishment of research departments with independent funding, central bank economists have become academic actors themselves and legitimate producers of scientific knowledge (Marcussen, 2009, 2013, Mudge and Vauchez 2016, Dietsch et al 2018, 86). Consequently, central banks are no longer solely dependent on academia, but have become semi-autonomous agents with their own instruments, working conducts and interests (Marcussen 2011). This newly amassed analytical capacity gained importance after the financial crisis, as central banks were tasked with implementing a macroprudential framework and had to co-produce analytical frameworks to that effect (Thiemann et al 2018b). Often unsatisfied by the speed and pace of existing academic endeavours, central bankers would take some of these matters in their own hands, as we detail below. Our large-scale data set enables capturing these dynamics and understanding the interactions between these different groups, looking at who writes on systemic risk, how these frameworks are received in the field, and what their final impact is. We complement these findings with expert interviews, to gain a more in-depth understanding of quantitative trends.

Data set and method

Analysing newly formed alliances between academic economists and practical economists for the purposes of measuring systemic risk, requires exhaustive analysis of all available systemic risk concepts. More importantly, it requires locating successful and unsuccessful systemic risk measures to identify the characteristics of the ones which allow them to function as hinges between both fields and to eventually move from one into the other. Here, the use of an unsupervised text analysis method approaches the text corpus without prior theoretical assumptions about the expected sociological properties of systemic risk measures.

To gather the most exhaustive collection of systemic risk measures, we use the RePEc (Research Papers in Economics) database—the largest collection of economic publications, including academic publications and output of institutions like central banks, BIS, IMF, think-tanks and financial institutions. From there, we retrieved every publication using the terms “systemic risk” or “macro-

prudential”¹¹⁵ in either keyword, title or abstract, yielding 5732 publications. Beyond the title, abstract and keywords, RePEc also provided relevant meta-data like author affiliation for each publication. After the elimination of duplicates, a dataset with 4212 entries in the time-period from 1988 until 2017 emerged. Of these 4212, we downloaded all accessible documents, yielding 2397 pdfs, which we used for full-text analysis via Author-Topic-Modelling (ATM)¹¹⁶. This method, one of the earliest extensions of structural topic modelling first introduced by Blei et al (2003) enables clearly associating different authors to different topics that emerge from the texts (Rosen et al 2009).¹¹⁷ This allows us to trace the professional affiliations of the authors that populate different topics, which is crucial to detect the development of hinges. After the dataset was downloaded and prepared for textual analysis, we therefore coded every author within the dataset based on his/her institutional affiliation as given in the document itself. The possible categories for authors are BIS, IMF, academics, central bankers, private finance, mixed¹¹⁸ and others (s. figure 1 and table 1 below for the distribution).



Graph 5.1: Number of publications per affiliation per year (1995 – 2017) (present author)

¹¹⁵ Variations of the terms were also used for the search

¹¹⁶ Abstracts only would have provided a too limited text corpus. We ran a statistical analysis on possible differences between the content of the remaining abstracts and full documents and found no statistically significant difference for our topics.

¹¹⁷ The process with which ATM constructs authors has two important implications for our study. First, we only focus on full texts instead of abstracts, since the topic attribution to authors becomes difficult if the number of words is too low in multi-authored publications (especially after removing non-essential words). Second, we use a cut-off threshold date of 0.25 to distinguish authors belonging to a topic from those not doing so. If, for example, only 5% of an authors’ work is on a certain topic, one cannot reasonably claim that the author has worked on it once one read the actual papers.

¹¹⁸ Mixed authors have either more than one affiliation within one document or have different affiliations in two different documents.

	T1: 1988-2003	T2: 1988-2008	T3: 1988-2013	T4: 1988-2017
Documents	96	267	1335	2397
Authors	130	399	1953	3496
Number of Topics	8	19	35	50

Table 5.1: Number of authors and documents in each period (n=2397)

To analyse the evolution of topics over time, we split the sample into multiple cumulative periods, which allows us to better understand how new concepts and systemic risk measures accumulate over time.¹¹⁹ The first period, named T1, lasts from 1988 until 2003,¹²⁰ the second period, T2, includes all publications from the beginning of the sample until the onset of the financial crisis in 2008. The third period, T3, includes T1 and T2 and goes until 2013¹²¹ and finally the entire sample, T4, until 2017. This led to the following distribution for documents and authors in each period, growing from 8 topics with 130 authors in T1 to 50 topics and 3496 authors in T4, expression of the growing interest in the topic from 2008 onwards (s. table 2 below)¹²²:

Author Affiliation	T1: 1988 - 2002	T2: 1988 - 2008	T3: 1988 - 2013	T4: 1988 - 2017
IMF N/%	6(5%)	33(9%)	144(8%)	225(7%)
BIS N/%	4(3%)	10(3%)	24(1%)	36(1%)
Academic N/%	61(49%)	153(40%)	862(46%)	1626(49%)
CB N/%	27 (22%)	114(30%)	504(27%)	869(26%)
PF N/%	2(2%)	12(3%)	46(2%)	66(2%)
Other N/%	14(11%)	32(8%)	161(9%)	268(8%)
Mixed N/%	11(9%)	32(8%)	153(8%)	241(7%)
Total	125	386	1894	3331

Table 5.2: Constitution of the author affiliations within the entire sample (N(authors)=3496) (present author)

¹¹⁹The advantage of a cumulative sampling is the ability to place newer literature in the context of previous periods. By doing this, we can improve our tracing of the origins of certain concepts, which would be much harder if we analyzed the periods separately.

¹²⁰ In 2003 a seminal paper on systemic risk and macroprudential regulation was written by Claudio Borio (2003), which galvanized research on this topic (Thiemann et al 2018a).

¹²¹ There is a crucial period from the onset of the financial crises until the passing of Basel III in 2013, during which regulatory action was taken. Any systemic risk measure, which could be the basis for policy making, had to be present in this time period.

¹²² ATM is essentially a tool for automating coding for large quantities of text. As such the task of the researcher is to determine the correct number of topics for the specific research question at hand (Roberts et al 2016). Even though there are some quantitative measures to choose the “correct” number most researchers rely on qualitative testing of topics. This involves checking the internal consistency of topics and to check whether the consistent topics appear even if the number of topics is increased (Chang et al 2009). For this study one researcher incrementally increased the number of topics until the above criteria were met. Afterwards a second researcher qualitatively checked if the final number of topics aligned with a qualitative reading of the documents.

The analysis proceeds as follows: after we analysed all the topics related to systemic risk measurement with respect to their appeal to both fields, we successively narrowed our analysis to topics, which appeal to both fields. Utilizing document analysis and 8 insider interviews (with authors at the FED, ECB and academia) we then focus on a selection of specific systemic risk measures, their development and how their specific constitution functions as hinges between the two fields and enable effective policy making.

Analysis of the Risk Modelling and Measurement Discourse

Throughout the four subsamples, the following risk related topics were identified in the overall sample: “Risk Measurement and Modelling” in T1, which splits into “Default Risk and Market Based Risk Transfer” and “Risk Management on a Macro Level” in T2. In T3, we identified “Default Risk and Market Based Risk Transfer”, “Tail Risk Modelling”, “Measuring Individual Systemic Risk Contribution” and “Early Warning Systems/ Composite Indicators of Financial Stress” as distinct topics. In T4, these topics largely remain stable, named “Default Risk and Market Based Risk Transfer”, “Tail Risk Modelling”, “Most Important Systemic Risk Measures: CoVaR, EMS, SRISK” and “Early Warning Systems” in T4 (s. figure 2 below and Appendix A).

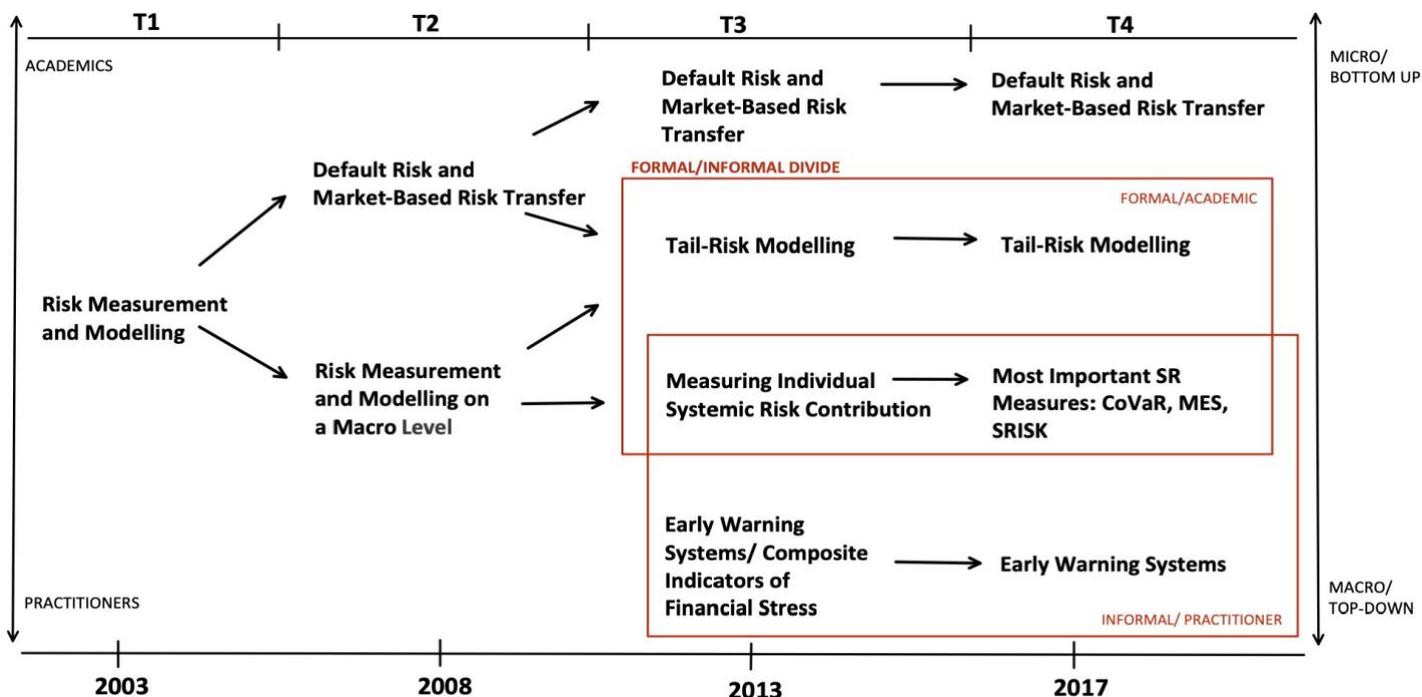


Figure 5.2: The Evolution of Topics over time

The topics can be distinguished across two scales. First, regarding the approach to systemic risk, one can distinguish a top-down, macroprudential approach from a bottom-up, microprudential approach (Borio 2003b). A bottom-up approach seeks to detect systemic risk where “the overall fragility of the financial system reflects the summation of the individual fragilities of financial institutions” (FSB et al, 2009a, 17). Exemplary for this perspective is the assessment of risk transfer through sale of specific financial instruments (Credit Default Swaps; Collateralized Debt Obligations) or institutions and actors. The aim is to combine idiosyncratic and systemic risk factors to assess individual risk exposure, risk sharing between agents or systemic risk contribution to the system (e.g. Krahen, Wilde, 2006). The top-down approach, on the other hand, is “examining the fragility of the overall financial system, focusing on the “assessment of the (often complex) interactions of the components” (FSB et al 2009a, 18), using aggregate data (credit growth, asset prices) and seeks to develop aggregate financial stress indices (i.e. Ong, 2012). Relatedly, topics can be distinguished according to their author populations, across the scale of central bank economists to pure academics.

These scales jointly clarify the persistence of different styles of reasoning in different parts of economics as an intellectual field (Whitley 2000). Academics on average apply a much more bottom-up, market-oriented and micro-founded approach, whereas practitioners, and most importantly central bankers on average use a top-down and macroprudential approach to the market. The analysis further reveals that the formal/informal research divide identified by Thiemann et. al. (2018a) as well as Whitley’s divide into scientific and intellectual fields of research (2000) largely persists throughout the risk measurement and modelling discourse. However, it also shows that the affiliations of authors (academics or practitioners) that populate topics can shift over time, if these topics allow economists to obtain the type of merit that are rewarded within their fields. Moreover, within these topics, important alliances between practitioners and academics can form, as we will detail below. To make visible these shifting author affiliations to topics over time, Figure 3 illustrates this topic development graphically by incorporating the findings on the kind of economists researching these topics. The following analysis follows the evolution of the topics regarding their assigned author population, their meaning and focus of the topic papers chronologically.

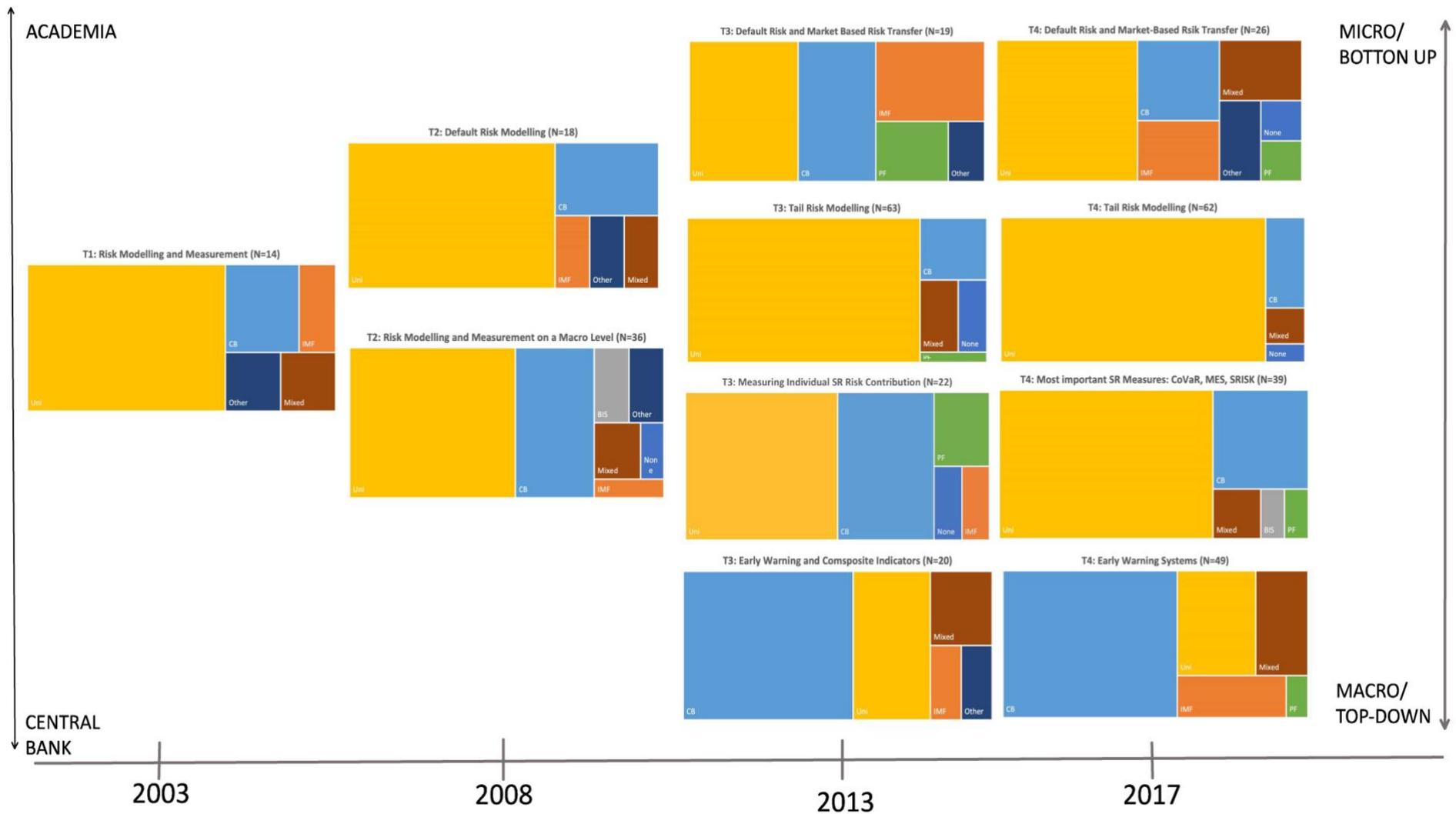


Figure 5.3: Risk Modelling and Measurement Discourse until 2017

In the first period, there is only one topic, “Risk Measurement and Modelling” (T1). It is an almost purely academic topic and with no clear content focus beyond the measurement of different kind of risks and market developments. These range from the measurement of stock market volatility through margin requirements, (stochastic) and volatility models to pricing models. Notably, however, it already includes a critical discussion of Value at Risk models, which are based on market data that is seen as endogenous to the system, subject to pro-cyclical amplifications and hence unreliable (Danielsson 2000). The small size and broad content scale of the topic reflects the infancy of the research on systemic risk measurement at this time. In 2003, the start of the sample period T2, Claudio Borio published his seminal paper on systemic risk and macroprudential regulation, laying the foundations of the macroprudential approach to regulation and a new field of research, initially particularly for practitioners. Consequently, it is possible to observe a starting tendency of a formal/informal divide in the topic content and assigned authors population.

The more “formal” topic “Default Risk and Market-based Risk Transfer” that emerges in T2 and persists until T4 is still a predominantly academic topic (67%). It is more micro-founded and focuses on improving existing risk measures. Of all the topics, its content is the least uniform as it comprises systemic risk measurements, but also work on counterparty risk and risk transfer through structured products and the systemic risks it might generate (risk transfer through CDOs and CDSs: Krahen and Wilde, 2006; Ueno and Baba, 2006). It has a microeconomic focus, in that it also deals with the improvement of risk models employed by financial institutions (Malone, et al. 2009), models to compute the risk of single financial instruments (CoCo Bonds: Brigo, et al., 2015), and models to assess the effect of systemic risk on a single institution (Suh et al, 2013). Interconnectedness and default correlation through portfolio simulations are also central to the topic, which illustrates the bottom-up view on systemic risk. The author population is predominantly academic, illustrating the more micro-oriented and market-based view on risk of academic researchers (see figure 2 above).

The second topic in T2 “Risk Management on a Macro Level” is more heterogeneous in author population. With 53% academics, a substantial proportion of central bankers (25%) and economists in international organizations (9%). This is also reflected in increasing policy focused research. There is increased research on measurements of banking sector soundness and fragility for bank supervisors (Krainer, 2008, Goodhart et al, 2006). Nevertheless, the divide is still weak, but becomes clearer in the next time period. After 2008, in T3, a further topic splits off from the topic “default risk modelling”, namely the the highly econometric and academic topic “Tail Risk Modelling”, which persists until T4. It constitutes the core topic of the formal side of the divide and records the highest proportion of academics (78% in T3, 87% in T4). With 63 affiliated authors in T3 and 62 in T4, it is a very robust topic. It had particular momentum after the materialisation of the financial crisis in

2008, which was considered a tail risk event. The central topics are tail dependence measurements (e.g. van Oordt and Zhou, 2012; Liu, et al., 2015) and alternative systemic risk measurements based on Extreme Value Theory (e.g. Glasserman, et al., 2013; Wang, et al., 2013).

The papers strongly rely on econometrics and, already in T3, there is a remarkable difference in their policy orientation. The few central bank and IO affiliated papers check proposed systemic risk measurements for their “reliability and robustness” in terms of tail risk analysis for financial regulation (Löffler, Raupach, 2013, p.1; Rocco, 2014). The academic papers, in turn, often start without reference to the financial crisis or to financial regulation. In their extreme, they are solely mathematical papers published by engineers or physicists under the subject of econophysics¹²³ (for purely mathematical papers in the sample, s. e.g. Bernard and Czado, 2015). Through its predominant academic author population, the heavy emphasis on econometrics and the weak reference to policy or real-world application, the “Tail Risk Modelling” topic further exemplifies the divide between academics and applied economists.

Diametrically opposed in terms of author affiliation is the topic “Early Warning and Composite Indicators of Financial Distress”, which emerges in T3 for the first time and constitutes the archetypical topic for the policy-oriented side of the divide. Already in T3, but also the “Early Warning Indicators” topic in T4 is predominantly populated by applied economists from CBs and the IMF. In T3, pure practitioners (CB, IMF, BIS) make up 60% of affiliated authors, not counting mixed affiliation, that make up 10%. In T4, pure practitioners make up 67% of the affiliated authors and mixed 12% (see figure 2), indicating growing interest from the policy side.¹²⁴ Aiming at developing Early Warning Systems (EWS) for supervisory and policy-making bodies, many authors propose EWS that produce a binary index of 0 or 1 to indicate the probability of crisis occurrence (Papadopoulos et al., 2016). They are supposed to detect financial distress at an early stage and predict systemic events (see for example Zigraiova, et al., 2014). The topic has high policy relevance and fully incorporates macroprudential thinking, employing a top-down perspective to the market. In this vein, most of the publications are published by central banks as e.g. the Macroprudential Research Network (MaRS) of the ECB and international organizations like the IMF (Alessi, et al., 2015; Arsov, et al. 2013; Blancher, et al. 2013).

The topic “Measuring Individual Systemic Risk Contribution” emerges in T3 as well. The author population is heterogeneous, counting approximately 50 percent academics, approximately 41 percent applied economists and 10 percent from private finance. Also for this topic, the events in

¹²³ Econophysics sets out to discover the mathematical properties of tail events to arrive to power laws capable of predicting the probabilities of events in non-Gaussian distributions (Bisias, et al., 2012).

¹²⁴ This is remarkable considering that the entire sample only contains approximately 34% of pure practitioners.

2008 gave momentum to the elaboration of new systemic risk models and the identification of SIFIs, which was especially important for supervisory authorities seeking to designate Systemically Important Financial Institutions (SIFIs, see, for example, Agarwal, et al. 2013; Price and Walter, 2011). The data used in the papers to compute systemic risk and importance is diverse and ranges from credit default swap (CDS) data (see, for example, Suh, et al., 2013) to stock return information (Gravelle, Li, 2013). Based on content analysis of the papers in this topic, it becomes evident that the three most important measurements in the discussion about individual systemic risk contribution measures are Marginal Expected Shortfall (MES), CoVar and SRisk, all based on market data, as most papers within the topic discuss, extend and apply these measures (see, for example, Fung, et al, 2009, Benoit et al., 2013, Agarwal et. al. 2013).

Whereas both MES and SRISK propose to measure the capital shortfall of an individual bank conditional on the banking system as a whole being in distress, CoVar captures the contribution of an institution in distress to the distress of the entire financial system. In that sense, MES/SRISK and CoVar are specular measures. The first two, using the technique of expected shortfall indicate banks that are likely to suffer most, given system-wide distress, a measure of interest to supervisors and investors who seek to locate frail institutions in times of crisis. CoVaR, extending traditional Value at Risk Model with a focus on tail risks on the other hand singles out the banks whose distress is most likely to contribute to system-wide distress, allowing anticipatory reinforcements of these banks by regulators. To identify the contribution to system-wide stress by individual banks, CoVar investigates the co-movement of value at risk measures of a bank and the financial system as a whole, focusing on the contribution that a bank entering into more troubled territory in terms of its Value at Risk (entering into the tail of the distribution) is causing for the system as a whole (a measure called delta CoVaR). It is using quantile regressions, a technique to model tail risks that allows it to capture this tail co-variance of individual banks and the system.

Central bank economists were often sceptical of these market data driven approaches favoured by academic economists, instead emphasizing the supervisory perspective using balance sheet data (s. e.g. DeBandt et al 2013, Tavoraro and Visnovsky 2014). Their efforts highlight the importance of practicality and applicability of risk measurement within policy and regulation. Given the insistence post-crisis that systemic risk is more than the sum of idiosyncratic risk, the coherence between a metric for individual systemic risk capable of adding up coherently to an overall systemic risk measure is a major concern within central bank and BIS/IMF papers in that period, as expressed e.g. in the paper by Tarashev, Borio and Tsatsaronis from the BIS (2010). In their paper, they propose a methodology to attribute systemic risk to financial institutions from one of the composite measures of systemic risk (p. 3), setting out a top-down approach to measuring systemic risk which decomposes

a single systemic risk metric into individual systemic risk contributions. They criticize MES, SRISK and CoVaR for regulatory purposes, pointing out how the former two measures, the impact for the bank of the “participation of banks in systemic events”, whereas regulators need measures for the contribution of banks to these systemic events (p. 2). CoVaR on the other hand, while doing just that is criticized as it does not sum up coherently to an overall measure of systemic risk (ibid).

After 2013 (in T4), the topic crystallizes further around these three most important risk measurements, so much so that now their names become prominent names on the wordlist for the topic itself (s. appendix A).¹²⁵ This topic, which we named “Most important SR Measures: CoVaR, MES and SRISK” is now mostly populated by pure academics (69%) and highly quantitative in methods (s. figure 2 above). Content wise, the publications contain extensions, comparisons, and applications of these three measures (see, for example, Banulescu and Dumitrescu 2015; Mainik and Schaanning, 2014). All of the practitioners associated to the predecessor topic “Measuring Individual Systemic Risk Contribution” in T3, including Tarashev et al (2010) fall below the association threshold in the “Most important SR Measures: CoVaR, MES and SRISK”, indicating the growing relevance of academic research in the field. Between T3 and T4, more specifically between the years 2010 and 2017, the topic transforms from being a predominantly policy-relevant and rather practically oriented topic, to becoming an academic topic dominated by marginal quantitative advancements.

The developments after 2010 indicate that as G-SIFI measures, leaning on CoVaR for legitimacy, became operational, academics became more involved in the issue and engaging in research on these measurements allowed academics to gain scientific rewards. The most important indicator for this change is that the three papers containing the original contributions regarding the most prominent risk-measures, after a long review process get published in highly ranked academic journals between 2016 and 2017.¹²⁶ Hence, the measurements developed in the aftermath of the crisis by academics and central bankers start to affect the scientific field, acquiring the reputation of *pure* science worthy of scientific merit (publication, citation), in a notable reversal of the usual model of regulatory science. In short, the findings on author populations within the relevant topics and publication processes reveal an evolution from initially solely policy-relevant work towards a scientific topic, with which academics are engaging, receiving rewards within their field. This shift demonstrates the fact that these measures act as a hinge between academics and central bankers.

¹²⁵ CoVaR as well as EMS are among the top 10 words that characterize this topic, SRISK being on place 22.

Qualitative reading confirms the central position of these three risk measures.

¹²⁶ The CoVaR paper by T. Adrian and M.K. Brunnermeier is published in the American Economic Review in 2016, the Expected Marginal Shortfall by Acharya, V. V., Pedersen, L. H., Philippon, T., & Richardson, M. in 2017 in The Review of Financial Studies as is the SRISK paper by Brownlees, C., & Engle, R. F. in the same special issue. Both journals are among the most influential economic journals registered at RePec.

In line with this character as a hinge, the topic Measuring Individual Systemic Risk Contribution is the most mixed of all topics in terms of author affiliation. It thereby contrasts with the divide between applied and academic economists we detected for the topic “Early Warning Systems”, the archetype of the informal and policy-relevant research field and for “Tail Risk Modelling” as the archetype for the formal and less policy focused research field. Thereby, the topic Measuring Individual Systemic Risk constitutes the overlap between pure academic and pure practitioner topics. By informing the search for proper risk-measurements for systemically important institutions for policymakers and engaged in the use of advanced econometric techniques to model tail-risks such as quantile regressions, this topic combines academic and practitioners’ interests and is therefore placed between the two archetype topics in Figure 3. Figure 4 illustrates the overlap of systemic risk discourses between practitioners and academics and locates different risk measurement models according to the relevance within the respective discourse.

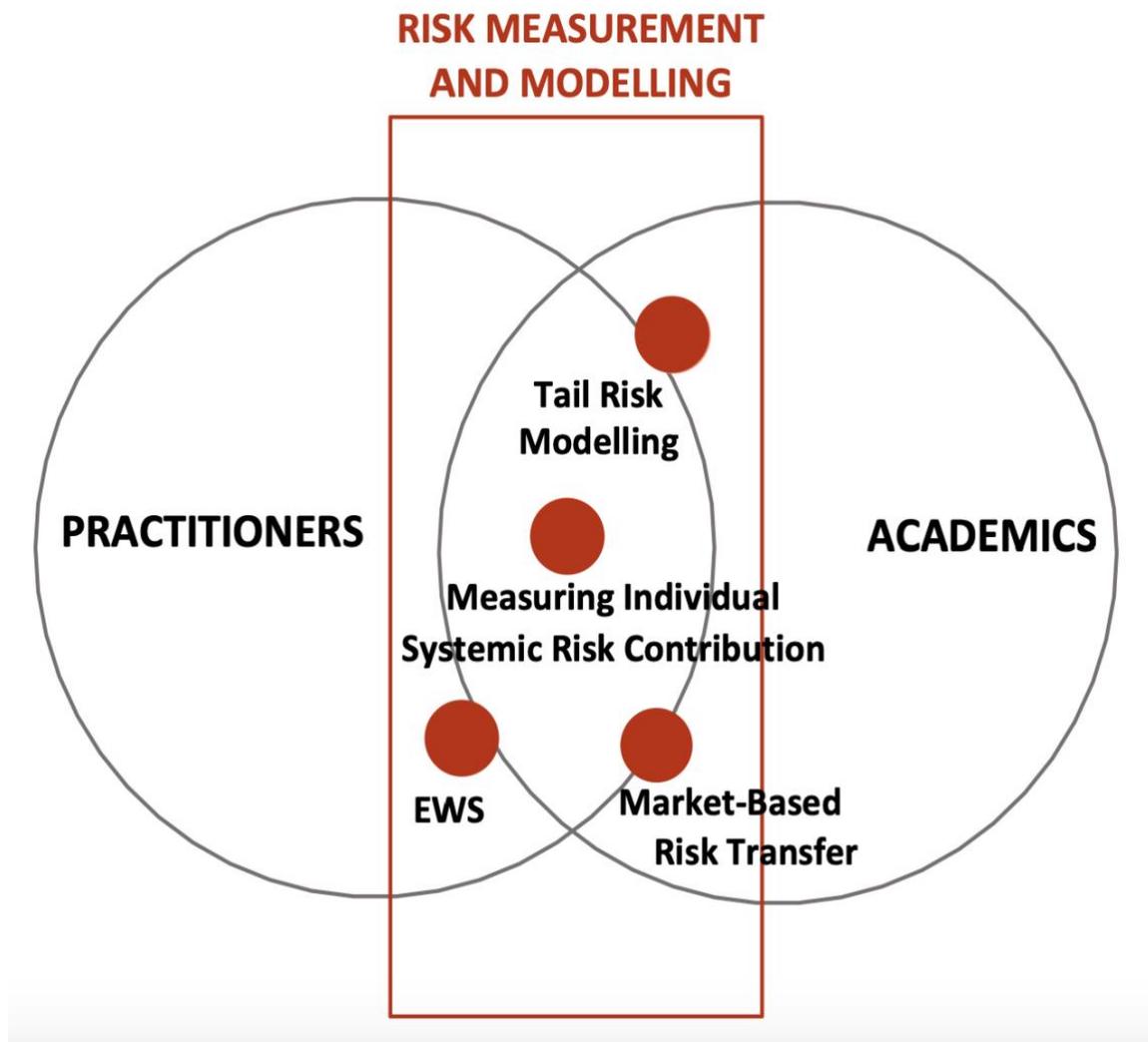


Figure 5.4: Discourse Overlap between Practitioners’ and Academics’ Discourse on Risk Measurement and Modelling

This is not to say that there is complete agreement in the topic of measuring individual systemic risk contribution. As sustained efforts to conceptualize systemic risk are a relatively recent phenomenon, there are competing and to some extent even contradicting approaches to the measurement of it within this topic (Biais et al., 2012, p.1). This diversity stems both from the lack of consensus on a clear definition, but most importantly from the difference in the micro- or macroprudential conception of systemic risk used by academics and applied economists respectively. On a methodological level, the divergence in micro- and macroprudential approaches finds its expression in the data employed, whereby the measures of systemic risk contributions of individual banks rely either on balance sheet or market data (de Bandt, et al., 2013).

While balance sheet data employed within the microprudential approach suffers from its retrospective nature, problems of comparability and availability, the conceptual problem for macroprudential experts vis-à-vis market data is much larger, as it poses a paradox. Market data builds on market prices and hence reproduces market perceptions, rather than the value of fundamentals (ibid, p. 18). Right from the start, however, macroprudential thinking implied that risk is created endogenously and that markets misprice risks (Persaud 2001). Consequently, regulators can hardly use market data to correct the tendency of these markets for booms and bust (Crockett 2000). Most importantly, the fact that the pricing of risk shortly before a crisis often is much reduced, whereas actual risks continue to grow, what is called “the volatility paradox”, speaks against such uses (s. Borio 2009, Goodhart et al 2009). This stance effectively ruled out simple measurements based on market data, if regulators wanted to adopt measurements in line with macroprudential thinking. However, developing systemic risk measurements based on market data is exactly what academics, who tried to reconcile systemic risk models with the macroprudential line of thinking post-crisis, have been doing. How, if at all, has this contradiction between academics and practitioners been resolved?

Interaction between academic and applied approaches and their translation into the most significant risk measures: CoVaR, MES and SRISK

The most impactful systemic risk measures in our sample in terms of both resonance in the academic field¹²⁷ and among regulators were the three individual risk measures Marginal Expected Shortfall (MES) (Acharya et al 2010),¹²⁸ Conditional Value at Risk (CoVaR) (Adrian and Brunnermeier 2008)

¹²⁷ A simple google citation analysis of the topic also shows the three respective papers to be cited the most with respect to the papers in the sample, with 2386 for CoVaR, 2004 for the MES paper and 1175 citations for the SRisk paper in its different versions (December 2019).

¹²⁸ The MES measure already circulated in 2009, s. e.g. <https://economics.mit.edu/files/4907>

as well as the SRISK measure (Brownlees and Engle 2010). They were developed during during and right after the crisis by six academics at NYU Stern School of Business or by a central bank economist at the Fed New York collaborating with a prestigious Princeton academic. Two of these three measures were published as working papers at Federal Reserve Banks and all three of them rely on market data. And yet, despite their common popularity in the overall discussion and their explicit engagement with regulatory issues, CoVaR received more recognition by the regulatory community. On the one hand, this is due to the different foci of these measures explained above. As regulators were seeking to designate systemically important financial institutions whose failure might provoke systemic turmoil, the focus from distressed banks to the whole system was more appealing (Tarashev et al 2010). However, a content analysis of the three papers reveals further reasons why CoVaR has been more appealing to practitioners, which have positively referenced it when reporting back to the G20 on how they intend to build their G-SIFI measure (FSB et al 2009b, 30f). This is because, adjusting the way they use market data and adopting a longitudinal approach, the measure displays much more sensitivity to macroprudential concerns with respect to the reliability of market data.

This sensitivity can be seen in the length of the data series used to construct the measure,¹²⁹ but also with respect to how that market data is used. First, CoVaR manipulates the data to generate not only a cross-sectional but also a forward-looking measure of systemic risk and pending crises (called Forward-CoVaR), which seeks to provide an early warning system for regulators to intervene during the build-up of systemic risk, rather than only during its unfolding. This approach explicitly allows the authors to account for the volatility paradox deemed central by the macroprudential community (Adrian and Brunnermeier (2008, 19). Second, while all three measures link their findings regarding the systemic risk contribution of banks to the balance sheet size and leverage of the financial institutions, Adrian and Brunnermeier draw a different conclusion. They use the fact that their study shows these variables to be highly correlated with CoVaR to suggest for future regulatory action to substitute CoVaR with measures for balance sheet size, leverage and the structure of the asset and liability side. In this way, they legitimate the balance sheet based SIFI-measure finally adopted through measurements based on market data.

This sensitivity to the preferred approach of practitioners arguably stems from the professional positioning of its authors, who seek to allow the regulatory community to move beyond market data with the help of market data. In contrast, the other two measures and their authors, while holding high epistemic authority in the academic field do not acknowledge to the same extent macroprudential concerns in the community of applied central banks and instead mostly insist on the efficiency of

¹²⁹ CoVaR uses 25 years, which includes 3 crises and 2 up and downswings, vs. the much shorter time span of five to ten years for the other two papers

easily replicable systemic risk measurements based on publicly available market data (s. also Benoit et al 2013). Hence, while Engle received a Nobel Prize in 2002 for his work on time series analysis and risk measurement and Acharya is the top economist in our entire sample according to the RePec measurement, they cannot translate their prominence into regulatory impact. They simply lack the sensitivity of the authors of CoVar to the concerns posited by the macroprudential epistemic community, which further contributes to the latter's appeal to the regulatory community.

This sensitivity was generated through the daily interactions one of the authors, a central bank economist had with these debates in the FED, at the same time that the other author was engaged with the macroprudential debates on the academic side when authoring the Geneva report (Brunnermeier et al 2009).¹³⁰ The authors themselves link this to frequent interactions with Fed staff, which made them more aware of these sensitivities (interview academic author, January 25th 2018). Through this sensitivity, CoVaR, which is a central systemic risk measure in the economic discourse post-crisis, becomes one of the epistemic foundations to justify the new policy device of systemic risk surcharges for global systemically important financial institutions (G-SIFI). At the same time, the technical maturity of CoVar, being based on quantile regressions made it very appealing to the academic community (interview academic economist, 6th of January 2019), a fact which can be directly linked to the scientization of central banks, which increasingly employ top-notch economists. Exemplarily, Tobias Adrian, the co-author of CoVar, holds an economics PhDs from MIT.

Discussion and Conclusion: The professional origins of systemic risk measures and their usability for systemic risk monitoring

The modified conception of systemic risk constitutes the centrepiece of the shift from micro- to macroprudential thinking post-crisis and it is crucial for the finally implemented macroprudential regulation. Investigating economic debates on how to measure systemic risks, we showed that the applied vs academic economics divide structured this debate. While there is continued divergence on the techniques, assumptions and outcomes of research by central bank economists and academics, we also identify areas of increased collaboration such as for the most prominent systemic risk measures post-crisis. Despite the general trend of persistent bifurcation in our sample, we hence find a trend of intensifying debate between central bank economists as well as academics for the topic of policy-relevant systemic risk measurements, which establishes the issue as an object of interest for both fields. This is because risk models unify theory and practice and are therefore a concern to both economists within the intellectual as well as the scientific field. This is very well visible in our results,

¹³⁰ CoVar was publicized in the Geneva report, which suggested it as the methodology to classify financial institutions based on objective risk-spillover measures (Brunnermeier et al 2009). The report has been an important document in the macroprudential ideational shift (Baker 2013a), published by influential change agents who actively sought to persuade the transnational epistemic community of new macroprudential ideas.

as both groups engage with risk modelling and measurement techniques, albeit within their own task-specific reward system.

Yet, this is not to say that the overlap between the work of applied and academic economists on systemic risk is complete nor that the advancement of macroprudential regulation solely relies on this new epistemic alliance. Instead, important differences in pre-occupation and focus of research persist between these two different fields. These differences explain why academics populate quantitative topics like “Tail Risk Modelling” and show a lack of interest in more policy-relevant topics like Early Warning Systems, which, as interview sources inform us, are looked down upon by academics as ‘pure number crunching’ due to lack of economic theory (interview ECB economist, May 2016). These warning systems, which are of quintessential importance for policymakers seeking to intervene in financial systems before systemic risks materialize, have little attractiveness for academics. For them, to engage in such policy-relevant research, it needs to allow them to incorporate it in formal equilibrium-modelling and econometrics. On the other hand, despite the scientization of central banks, the majority of practitioners’ science seems to remain at the periphery of economic science (Marcussen, 2011; Whitley, 2000). Hence, the different reward systems and incentives to research between the core and periphery of science seem to remain, at least partially, intact.

However, there is also increasing collaboration, which brings work on tail risks and early warning systems together. The most interesting point of intersection in this respect are the individual systemic risk measures developed since the crisis, which engage both academics and central bank practitioners. Most notable is the rising prominence of these measures in the academic economic discourse, itself in turn provoking important uptake by both practitioners and academics. The discourse on systemic risk measurement and modelling therefore is a case in which technocratic economists and academic financial economists enter a new post-crisis alliance, whereby certain topics, driven by practical and academic interests generate collaborations between academics and central bankers. These collaborations act as a hinge, producing rewards both in the academic field as well as in the field of central banking. In this respect, the analysis points towards an increasing openness of central bankers towards financial economists, which until the crisis confined their cooperation to monetary economists (interview academic 07.12.2018).¹³¹ In advancing this new field, the scientization of central banks plays a central role as work by applied economists in these institutions have become of the highest academic quality.

¹³¹ It is noticeable that work by macroeconomists has been largely absent from these debates on systemic risk, with contributions stemming rather from scholars working on financial intermediation (Pagano 2014).

Given their engagement in actual policy work, their papers however also seek to provide a theoretical rationale, a new outlook on the world which legitimizes macro-prudential interventions of central bank practitioners. Individual systemic risk measures, such as CoVaR thereby represent an important step forward in legitimizing macroprudential interventions. More concrete than the pre-crisis works of Borio and other macroprudential thinkers, CoVaR's appeal not only stems from the central positioning of its proponents in the regulatory decision-making circles (Baker 2013a), but also its analytical content and the academic rigour with which it is developed. To achieve that rigor, it repurposed techniques of financial economics developed to evaluate the riskiness of a portfolio to investigate the co-variance of tail-risks of banks and the whole financial system. CoVaR is thereby incrementally altering techniques developed for one purpose to serve a different goal. By using market data and by modifying Value at Risk models, it provides on the one hand the necessary continuity with the pre-crisis academic and regulatory discourse, while at the same time constituting an ontological break with the past, which was necessary to gain the endorsement of central bank practitioners. In a paradoxical way, it justifies an ontological doubt among this group inherent in the early macroprudential critique (you cannot trust markets to self-regulate, s. Danielsson 2000, Persaud 2001, Baker 2018) with an epistemological approach based on market data.

Indeed, this paradox of using market data to contradict the political authority of markets was a powerful way to resolve the legitimation problem financial regulation faced post-crisis, with limited evidence based on other techniques. This finding exemplifies the fragmented nature of the macroprudential shift (Kaya and Reay 2019), where a radical shift in outlook on financial markets is coupled with incremental, but meaningful change in policy devices. Here, change does not happen as a revolution, but as a gradual process, in which the epistemology slowly adjusts to a shift in ontology. Such an understanding contributes to better grasping the incremental steps taken with respect to macroprudential frameworks by central banks immediately after the crisis (Johnson et al 2019, Kranke and Yarrow 2019), while maintaining the possibility for longer term more fundamental change based on this new hinge between the central banking community and the academic profession. Further work by these collaborating academics and central bankers then sought to fine-tune these findings and to justify more wide-ranging interventions into what was perceived as dangerous build-ups of systemic risks. These works exhibit a certain path-dependency, in that they develop the themes of early warning systems jointly with tail-risk analyses to provide rigorous model-based justifications for anti-cyclical macroprudential interventions.¹³²

¹³² The most notable example in this respect is the Growth at Risk (GaR) framework (s. Adrian et al. 2016, published in 2019 in the *American Economic Review*), which extends the techniques of CoVaR and uses quantile regressions to predict the effect of the build-up of vulnerabilities in the financial system on future tail risks to growth. This framework is now used by the IMF for analysis and by the Bank of England to guide anti-cyclical macroprudential interventions (Brazier 2019).

The academic work of these scholars within and outside, but always connected to central banks has hence been an important source for the advancement of macroprudential agenda in the decision making of central banks. Operating at the boundary between regulation and science, these scholars seek to generate “actionable knowledge” (Hirschman and Popp-Berman 2014), metric systems which justify intervention. This new alliance means that central bankers today are no longer so lonely when having to act on financial stability (Mabbett and Schelkle 2019), as they can rely on rigorous research that lives up to academic standards. This means that beyond the strategic selection of economic theories in technocratic organizations to justify new policies, as described by Clift (2018, 2019) and Ban (2015), there is a possibility for technocratic economists and academic economists to join forces and jointly produce new policy devices that can justify a new policy agenda. Which of these economists’ initiatives has a regulatory impact and under which conditions provides for a new research agenda, for which we hope our research can provide a fruitful starting point.

Chapter 6: Is resilience enough? The macro-prudential reform agenda and the lacking smoothing of the cycle¹³³

Abstract

After the financial crisis, central banks were entrusted with implementing an ambitious macro-prudential reform agenda. The goal was arguably twofold, to increase the resilience of the financial system and to lower the amplitudes of the financial cycle. A decade later, the implementation of the agenda is characterized by the pursuit of measures to raise the resilience of the financial system, while tools to smoothen the cycle have been rather sidelined. To explain this difference in implementation efforts, the paper combines ideational scholarship with the analytical stance of reputational theory and analyzes the technocratic debate over macroprudential strategy among policy-makers of the Fed, the BoE and the ECB. The paper identifies reputational concerns linked to the need for discretionary interventions, the uncertain scientific status of the concept of the cycle and missing metrics as causes for concern, leading most central banks to shy away from forcefully implementing this policy goal.

¹³³ This chapter is an expanded and revised version of an article that appeared in 2019 in *Public Administration*. M. Thiemann (2019). Is resilience enough? The macroprudential reform agenda and the lack of smoothing of the cycle. *Volume 97, Issue 3*, pp. 561-575

Introduction

After the financial crisis of 2007-2009, G20 leaders embraced a new macroprudential approach to financial regulation to address the policy failures revealed by the crisis (G20 2009), which were ascribed at least partially to a microprudential approach to financial regulation. The latter had only focused on the risk-bearing capacity of individual institutions and had delegated much of this risk bearing analysis to private agents (Tsingou 2015; Lockwood 2015), completely missing the build-up of systemic risks during the boom years of the 2000s, finding its expression in above trend credit growth in the Western world, increasing leverage of financial institutions as well as increasing interconnectedness (Borio 2009). Not surprisingly then, the macroprudential approach which focused on these system-wide developments was hailed as a much-needed paradigm shift by policy makers and pundits alike (Baker 2013a, 2014; Borio 2009). As a consequence, regulators were tasked to focus also on the buildup of systemic risks in the financial system rather than on risks for individual institutions alone. On the one hand, they were expected to improve the resilience of the system, increasing its capacity to withstand shocks. On the other hand, measures were to be introduced to mitigate the boom-and-bust cycles of financial markets, limiting excessive credit provision to the economy that threaten financial stability (Borio 2009).

However, as of 2018, this ambitious policy program has been reduced to a much more scaled back incremental approach during the process of implementation. While focusing on increasing the resilience of the system,¹³⁴ implemented measures largely refrain from intervening in the build-up of financial risks during the upswing of the cycle. Looking at the measures introduced internationally to date, few if any bear a clear anti-cyclical character that could constrain credit in the upswing. The implemented G-SIFI measures, the Liquidity Coverage Ratio, the Net Stable Funding Ratio or the systemic risk buffer contain little to no anti-cyclical element (Claessens and Kodres 2014). Even the most prominent counter-cyclical measure, the Counter-cyclical capital buffer, primarily seeks to increase the resilience of the financial system, although it “may also help to lean against the build-up phase of the credit cycle in the first place” (BCBS 2015, 1). Also at the national level, tools to raise the resilience of the system have been much more prominent in the implementation phase than tools to smooth the credit cycle (Tucker 2016, p. 30f; McPhilemy 2015; Barwell 2013).¹³⁵ These lopsided reform efforts, pushing for resilience, but not for anti-cyclical

¹³⁴ While potentially a transformative concept, the prevalent managerial approach to resilience in the realm of financial market regulation reifies the inevitability of crisis and seeks to proactively improve shock-absorption capacities, e.g. by raising capital requirements (cf. Brassat and Holmes 2016).

¹³⁵ Edge and Liang (2017) demonstrated that only 2 out of 58 countries with a macroprudential framework developed effective anti-cyclical tools to reduce excessive credit growth

measures reducing the build-up of risks mean that a central part of the macroprudential regulatory agenda, deemed crucial by its early advocates (Crockett 2000; Borio 2003b; Persaud 2010) is not implemented. This despite a global regulatory discourse post-crisis, which at least until 2012 promoted anti-cyclical measures (cf. Thiemann et al 2018b).

Looking at these developments over the course of the last decade, in which the trust of current regulatory initiatives were laid out, the question arises: What hinders the anti-cyclical aspect of macroprudential regulation from becoming operative?¹³⁶ Prior literature has identified important obstacles to this ambitious aspect of the macroprudential policy program, primarily relating it to problems of implementation. Internally, the institutional capabilities to limit the financial cycle had to be generated, including new policy instruments and new settings (Baker 2013a, b). All of this had to occur against the interests and ideas of entrenched microprudential regulators (Moschella and Tsingou 2013) as well as against the persistence of market friendly ideas in the club of transnational policy-making (Tsingou 2015). The political economy of anti-cyclical macro-prudential regulation was seen to add further challenges, as constraining the financial cycle in the upswing requires unpopular measures such as credit-rationing and limiting economic growth, threatening the non-political status of independent central banks (Baker 2017).

While these accounts point to the institutional opposition and vested interests as external obstacles confronting the macroprudential change agents during the implementation of the macroprudential idea set, they pay little attention to the reflexive agency of technocrats tasked with implementing the policy. To improve upon the analysis of the limited implementation of macroprudential ideas, I argue that we should also pay analytical attention to the **internal** debates among these technocrats about the merits and drawbacks of the different goals and objectives of macroprudential policies and ask: Why have technocratic agents, who were given a broader mandate by the political principal chosen to implement a much less ambitious version of macroprudential regulation? Seeking to overcome the one-sidedness of principal agent studies, which focus on reasons for delegation and control strategies by principals (e.g. Gilardi 2006) I inquire into these agents' concerns over reputation and accountability which might lead them to embrace or abstain from certain delegated tasks (cf. Hood 2011; Carpenter 2010; Busuioc and Lodge 2017). Taking this angle of bureaucratic reputation theory (Rimkute 2018), I analyze the stance and reflections of technocratic change agents regarding the appeal and possible drawbacks of the policy objective of smoothing the financial cycle.

¹³⁶ Evidently, ten years are insufficient to complete the macroprudential policy-framework. However, no major initiative to date has a strong counter-cyclical component and the expert debates analyzed here point in the opposite direction.

To trace these reflections, I analyse all relevant public speeches of the agents tasked to develop and implement macroprudential regulation in the three most important Western central banks, the Federal Reserve Board in the US, the Bank of England and the ECB, on the topic of macroprudential regulation at regulatory conferences and speeches to finance industry between 2009 and 2016 (31 in total). I undertook an interpretive documentary analysis, focusing on the parts where these agents were weighing the different policy objectives. This analysis, complemented by 10 expert interviews and participatory observation during 3 ECB conferences, shows that reputational concerns of central bankers, coupled with institutional difficulties of implementation have hindered the goal of smoothing the financial cycle. The need for discretionary intervention into credit allocation by technocrats, together with the contested scientific status of the concept of the financial cycle as well as the uncertain metrics and measures to calibrate it posed problems for **legitimate central bank intervention**. The policy goal of smoothing the cycle is therefore seen to pose a challenge to the depoliticized status of central banks, clashing with epistemic ideals for objective policy knowledge and procedural and legal rules of decision making.

To document these concerns in the technocratic community, the paper proceeds as follows: it first reviews the recent literature that seeks to explain limited macroprudential change post-crisis and then presents its own theoretical framework, combining reputation and ideational theory. Based on a close reading of policy speeches and expert interviews, the discussion among technocratic leaders is then analyzed. In the discussion section, the paper reviews these findings in light of the accountability regimes these central banks are embedded in, finding a close match between these and the positions taken by central bank representatives.

An ideational shift, but lacking implementation- a literature review

Looking at the triad of ideas, interests and institutions that is often invoked to analyze (failed) paradigmatic policy changes (Hay 2004), it is striking that most explanations of the fate of macroprudential reforms treat macroprudential ideas as a fixed idea set, focusing on the hostile environment of opposing interests and institutional constraints to explain their timid implementation. Accounts focusing on opposing interests point to macro-prudential regulation as an idea set which challenges the pre-crisis system of market-based governance. This challenge, however, remains ineffective because of what is called “ideational adverse selection” (Underhill 2015, p. 470), where the persistence of private actors’ involvement within the regulatory community leads to the blocking of macroprudential policies, such as anti-cyclical regulation deemed as too invasive by powerful private actors (s. also Tsingou 2015). This view, however, must

contend with the much-reduced power of private actors in the immediate aftermath of the crisis (Young 2013).

It furthermore underestimates the challenges that the macroprudential ideas faced inside the regulatory community once their implementation began, that is how macroprudential ideas interacted “with existing institutional settings and interest-based politics as configured by these institutional settings” (Baker 2013b, 36). Baker points out that during the implementation of macroprudential regulation, institutional settings as well as interest-based politics slowed down the pace of change and diluted the macro-prudential agenda (ibid, 52). In particular, macro-prudential regulation has been held back by a lack of data needed to convince other regulators, such that change agents often “deliberately decided to embark on a slow-moving experimentation with the new regulatory ideas, in order to collect the necessary evidence ... to win the policy debate among technocrats “(Moschella and Tsingou 2013, 204, Goodhart 2015). Lastly, the need for international coordination among regulators to prevent regulatory leakages and circumvention has been identified as a further institutional obstacle to implementation (Helleiner 2014).

The problem with these otherwise insightful studies is that there is little attention to the reflection and internal strife within the macro-prudential community over intermediate objectives and tools to be employed, a lacuna stemming from a too rigid conceptualization of the rise of macroprudential ideas after the crisis. Conceptualized as “a ‘gestalt flip’ or third order change in Peter Hall’s terms (Baker 2013a, 112), it is argued that regulators suddenly obtained a new outlook on financial markets as cyclical and fragile and a new hierarchy of policy goals, including a strong commitment to reduce the cyclicity of financial markets (ibid). In this view, macro-prudential regulators’ shared new outlook on financial markets allows the macro-prudential regulatory rhetoric to act as a coordinative discourse (Baker 2014, 176), allowing macroprudential regulators, facing entrenched interests and institutional frictions (Baker 2013b), to act as a forceful policy advocacy group. This supposition rests on the assumption of mass conversion of regulators, displaying a rather naïve view of wholesale ideational change (Carstensen 2011), preventing an in-depth analysis of the reflections within the macroprudential regulatory community regarding which goals should be pursued and how.

Considering recent evidence (Lombardi and Moschella 2017), it seems more appropriate to analyze the rise of macroprudential ideas as a rhetorical shift in the official discourse on the level of politicians, which were keen to address the accountability gaps revealed by the financial crisis through symbolic politics (ibid, 99), but arguably not keen to be associated with policies restricting credit. Just as with anti-inflationary monetary policy in the 1980s and 1990s (McNamara 2002, Watson 2002, 192f), politicians delegated tasks to central bankers they deemed necessary, but did

not want to be associated with, “as the expected advantages of blame shifting exceed those of credit claiming” (Hood and Lodge 2006, 32). They hence delegated the issue towards technocrats without much further specification of concrete goals or the meaning of systemic risk (Helleiner 2014, 128), leaving regulators with the task of operationalizing this new approach largely on their own. In contrast to the delegation of monetary policy, however, which increased central bank independence and hence was widely welcomed by the central bank community, anti-cyclical policies threatened to re-politicize central bank action.¹³⁷

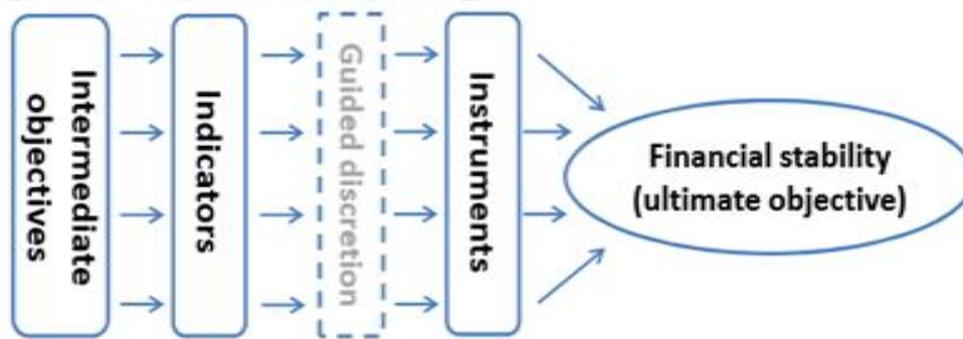
In response to the vague mandate, regulators, particularly in the US, veered towards some form of pro forma regulatory activism, “enhanced public oversight without actually constraining private financial activity in significant ways” (Helleiner 2014: 13). These half-hearted measures in the US largely maintained the status quo (ibid, 128), posing substantive problems for the implementation of anti-cyclical policies elsewhere, which often depend on international coordination with the US. Literature has rather superficially related this half-hearted embrace in the US to longstanding national preferences regarding intervention into markets (Helleiner 2014, 128; s. also Persaud 2010; Baker 2014). While rightly pointing to the vagueness of the mandate delegated from politicians to regulators as the basis for limited implementation, the fleeting reference to national preferences to explain is insufficient, as it abstracts from central bankers’ agency and neglects the role of debates among technocrats charged with implementing the new policy approach and the institutional constraints they were facing.

Given the large degree of powers delegated to technocrats, it was the internal expert debate over intermediate objectives, linking metrics and indicators of this new policy field with the ultimate objective of financial stability which was of fundamental importance to the final shape of the new policy regime. Being granted an ambitious policy agenda, it was their task to generate a policy strategy which would link these vague goals to indicators and instruments, by first defining intermediate objectives that are perceived as the best way to secure the ultimate objective of

¹³⁷ It was exactly the political nature of credit controls, which led the Fed in the 1970s to lift, seeking to escape the hotbed of political scrutiny (Krippner 2011).

financial stability (ESRB 2014: 8, s. graph 6.1 below).

Figure 2 Macro-prudential policy strategy



(Graph 6.1: Macroprudential Policy Strategy, ESRB 2014: 8)

To analyze these debates, I follow the lead of recent ideational scholarship that the discursive interactions of elites while constructing policies and the valence of ideas within these debates are crucial for program development (Carstensen 2011; Carstensen and Schmidt 2016). I combine this emphasis with recent scholarship on independent agencies which points to the degree to which reputational concerns structure the behavior of agency leaders (Carpenter 2010, Hood 2011, Busuioc and Lodge 2017).

A framework for analyzing technocratic debates: strategic interaction of bureaucratic agents with policy goals

Rather than treating policy ideas as exogenous to policy makers, either being fully adopted or fully rejected, recent ideational scholarship has maintained that policy-makers interact pragmatically and strategically with new policy ideas (Carstensen 2011: 148). They weigh their normative beliefs and their institutional constraints in a process of debate and contestation. Characterizing these debates as coordinative discourse that generates “the common language and framework through which key policy groups come to an agreement in the construction of a policy programme“ (Schmidt 2002, 171), these authors have maintained that these discursive interactions are crucial for the evolution of policy programs. During these debates, technocratic experts seek to wield ideational power, promoting “certain ideas at the expense of others”, based on their preferences (Carstensen and Schmidt 2016). This emphasis on the strategic reflexive agency of bureaucrats when adopting new policy ideas is paralleled in the recent literature that explains behavior of independent agencies through the attempts of agency managers to anticipate the effects of certain policies on their agencies’ reputation, “stressing the fundamental importance of reputational considerations in shaping organizational behavior in accountability” (Busuioc and Lodge 2017, 99).

Reputation theory points to the importance of the reputation of independent agencies for their de facto power and independence (Carpenter 2010). The awareness of this fact by agency managers in

turn leads to attempts to protect that reputation in the core areas of a. technical expertise, b. perceived performance, c. the moral core of what the agency stands for as well as d. appropriate legal-procedural elements, when acting (ibid, 45ff). As it is often impossible to enact policies, which are optimizing the reputation in all four dimensions, organizations strategically decide how they want to be understood and seen (Busuioc and Lodge 2017, 93), leading Carpenter to speak of an “organizational calculus of reputation” that agency managers employ (Carpenter 2010, 374). This organizational calculus, characterized by risk aversion and an awareness of the irreversibility of public decisions (ibid, 67) is largely shaped by the accountability constellation in which an independent agency is embedded, that shapes agency managers’ “attitudes and actions towards policies” (Christensen and Lagreid 2006, 17).

While this perspective has been applied to explain agencies’ focus and investments in accountability regimes regarding existing policies (Busuioc and Lodge 2017), it can easily be transferred to the role of administrative executive leaders in the implementation of new policies, especially when there is ambiguity over the goals they are asked to implement (Christensen and Lagreid 2006, 15f). Accountability, from the agency perspective then is about the management of these expectations regarding the new policies, “anticipating the reactions of these networks of audiences” (Busuioc and Lodge 2017, 93). In these moments, agency leaders will seek to anticipate the reputational risks these new policies imply, shaping in turn implementation. E.g. when given a vague mandate, they may seek to fill it with life in what they perceive to be the optimal way to protect the agency’s reputation and independence in the accountability regime. As such, they may engage in blame avoidance strategies, in particular what Hood calls “policy strategies” (2011, 18ff), which involves choosing among policies those which invoke “the least blame” (ibid, 90), as well as procedures which are least contentious. Policy strategies such as protocolization (minimizing the use of discretion and maximizing the use of science to increase legitimacy (Marcussen 2009a, 375f)) and “abstinence” (simply not implementing certain policies) have been documented for agencies which have been given tasks they deem as too risky for their reputation (Hood 2011, 18, 92).¹³⁸

Such concern over accountability constellations is particularly prominent among central bankers due to their increasingly independent status (Jabko 2009, 392), which replaces direct political control with accountability arrangements regarding the efficiency of policies pursued (Majone 1997). Central banks must provide an account of their activity regarding specified tasks to the public and politicians,

¹³⁸ As Hood puts it, “policy strategy may be the blame avoidance strategy of choice when agency strategies are not available- for example, by those to whom blameworthy activity comes to be delegated and who cannot delegate it further.” (Hood 2011, 20)

something which is facilitated when performance standards or outcomes can be agreed upon *ex ante* (ibid, 161f). While the sensitivity and investment of central banks to these accountability issues varies with respect to the accountability regime they are embedded in, where the less assailable the status of independence, the less the need to invest in accountability (Jabko 2009, 394), central banks in general are well aware of the need for legitimacy for their continued operation and the dangers of overburdening (BIS 2016, 22, as cited in Issing 2016).

An important constraint in this regard are the epistemological assurances regulators need to provide to the regulated and the procedural rules they need to follow to maintain legitimacy for their decision making (Fourcade 2009). Manifestations of the historically grown state specific cultural patterns of what is perceived as legitimate state intervention into economic affairs (Shonfield 1965, cited in Dobbin 1994, 91f) and linked to the institutional set-up of the polity (Hall 1986, 232), these “civic epistemologies” (Jasanoff 2012, 9) structure what is deemed a legitimate regulatory intervention. For the US, these studies find a need for peer-reviewed science to provide objective knowledge as well as a due process, which allows the regulated to be heard as crucial for regulatory legitimacy (Jasanoff 2012,12, 34). For the UK, it is the integrity of experts and the development of a “knowledge whose truthfulness any one in society, from the highest to the lowest, can in theory review and attest to” (Jasanoff 2011a, 313) that is crucial for regulatory legitimacy. As I will show, these requirements form an important constraint in the way policy makers relate to the goal of smoothing the cycle.

Placing the focus on technocrats’ concerns over the reputation of their agency and its legitimacy within an accountability regime when weighing new policy proposals directs our analytical attention towards the reflections of the group of experts that are charged to act as macro-prudential change agents implementing these new policies. How do these change agents relate strategically to these new ideas? And how do these internal moments of the debate among experts relate to the historically contingent civic epistemologies which hold them accountable?

Data and methods

To analyze the different positions of technocrats about which strategy to adopt which fueled the international debate, I screened all speeches available on the websites of the Federal Reserve Board, the Bank of England as well as the European Central bank by the top officials tasked with implementing macroprudential regulation and collected those that referred explicitly to the macroprudential mandate in the light of the technical, procedural, performative and/or moral core competencies of central banks (31 in total, held between 2009-2016)¹³⁹. The purpose of these

¹³⁹ For more information on the speeches, s. appendix for chapter 5

speeches, to communicate the reasons for domestic institutional choices, increase their legitimacy in front of multiple audiences (such as financial markets and other regulators) and facilitate coordination with markets and other regulators made it necessary to account for the public and scripted character of these speeches, which are historically specific interventions.

I did so by searching for persistent positions and by methodologically triangulating these speeches with the analysis of video recordings of the unscripted exchange among these policy makers on macroprudential regulation at numerous policy panels and participant observation at three conferences at the ECB on the topic of macroprudential regulation in 2016. I furthermore conducted 10 interviews between 2016 and 2018 with macroprudential policy makers involved in developing macroprudential policies at the ECB, the Bundesbank, the ESRB, the BoE and the FED. During these interviews, I probed for points of contention within the regulatory community, hindering the advancement of anti-cyclical policies. From the texts, these interviews as well as the conference attendances, common challenges for implementing anti-cyclical policies, such as the limited scientific evidence, the need for discretionary intervention and stark differences about how to resolve them among these policy makers emerged (for interviews and sources, s. appendix).

The different intellectual positions in the debate over intermediate policy objectives are best incarnated by the three policy officials leading the task to develop and implement macro-prudential policies since the Great Financial Crisis, vice-president Constancio of the ECB, former deputy director of the Bank of England responsible for financial stability, Paul Tucker (2009-2013),¹⁴⁰ and Federal Reserve Governor Daniel Tarullo (2009-2017). All three were dedicated civil servants with a bent towards macro-prudential interventions. Tarullo, as the New York Times put it, was “feared and hated in equal measure” by Wall Street Executives for his regulatory interventions (Cohan 2017). Tucker early on embraced the macroprudential agenda, including an anti-cyclical dimension (Tucker 2009) and Constancio has been a permanent voice for macroprudential intervention since 2010. Nevertheless, they publicly expressed opposing views on the scope of this new policy program, their differences being widely recognized in the technocratic community.¹⁴¹ They confirm once more the different macro-prudential stances between the US and Europe noted in the literature, with the US’ focus on resilience and too big to fail (Helleiner 2014, Persaud 2010) in contrast to the very European concern regarding the pro-cyclical character of finance (Baker 2014, 183).

¹⁴⁰ In my analysis, I complement his statement with those of his successor, Sir Cunliffe, as well as Donald Kohn, external member of the FPC at the Bank of England.

¹⁴¹ So much so that their different positions were brought up spontaneously by interviewees (e.g. European central bankers, July 9, 2016) or confirmed as correct upon enunciation (former Bank of England official, December 20th 2018)

They confirm once more the different macro-prudential stances between the US and Europe noted in the literature, with the US' focus on resilience and too big to fail (Helleiner 2014, Persaud 2010) in contrast to the very European concern regarding the pro-cyclical character of finance (Baker 2014, 183). However, reconstructing their views and arguments will reveal deeper-seated issues as to why they embraced or rejected it, linking the timid take-up of the technocratic project of anti-cyclical policies to reputational concerns over the legitimacy of central bank action and institutional constraints.

The different positions of macro-prudential change agents

The FED Position

The most restrained of the three positions regarding counter-cyclical interventions was taken by Federal Reserve Governor Tarullo, responsible for financial stability policies (2010-2017) who has advocated for a modest, structural approach to macro-prudential regulation. In 2013¹⁴², he laid out his case for structural measures seeking to increase resilience rather than measures seeking to fight the cycle most clearly (Tarullo 2013b). Acknowledging the original statement of macroprudential goals by Crockett at the BIS in 2000 as path-breaking, a speech which favored strong anti-cyclical measures, he nevertheless pleaded for a much more limited regulatory agenda. In a first rhetorical step, Tarullo admitted that time varying measures seeking to tame the cycle are “a conceptually appealing approach”. The problem of the excessive upswing could much better be controlled by time-varying measures (ibid, 23) while the structural “through-the-cycle-measures” he advocates would likely be largely ineffective for dealing with increasing leverage or asset prices that raise macro-prudential concerns. He thus concludes, “well-developed time-varying measures might be effective in slowing the increase in systemic risk to give monetary policymakers more time to evaluate the need for a monetary policy response” (ibid).

However, he qualifies this approach that favors time varying, discretionary measures to temper the cycle as one

“that raises a fair number of significant issues: the **reliability of measures** of excess or systemic risk, the **appropriate officials** to be making macro-prudential decisions, **the speed** with which measures might realistically be implemented and take effect, and **the right calibration of measures** that will be effective in damping excesses while not unnecessarily reducing well-underwritten credit flows in the economy” (ibid, 15).

¹⁴² the same year he became the head of the Supervisory and Regulatory Committee at the Financial Stability Board,

The problems of the reliability of measures, of appropriate calibration and speed of decision making coupled with the need to identify the competent authority are all issues that are problematic from the point of view of legitimate regulatory decision making, invoking the need for learning while doing (also interview Dutch central banker, 21st of September 2016). They are particularly challenging for the Fed, as the lack of a clear macroprudential mandate for the FED and a splintered governance field cobbled together under the umbrella of the Financial Stability Oversight Council proves a challenge for quick and decisive decision taking (interview Fed official, 6th of April 2017, Goodhart 2015, 285).¹⁴³

To these aspects, Tarullo adds the penultimate challenge, the lacking scientific proof of the financial cycle, in fact doubting its ontological existence. Directed at the proponents of financial cycle regulation, he points out that the “adoption of consistent terminology does not itself resolve questions of whether... increases in systemic risk are endogenous to the financial system and thus follow **a somewhat regular cyclical pattern, or are instead somewhat randomized, albeit repeated, phenomena**” (Tarullo 2013b, 2, *emphasis mine*).¹⁴⁴

He thus points to the uncertain ontological status of the financial cycle as a reason for caution, warning further that due to the concern of macro-prudential regulation with tail events, it is intrinsically difficult to generate sufficient data to test different theories regarding the propagation of systemic risk. This lacking scientific basis is particularly problematic for a US regulator, as regulators in the US are expected to base their interventions on scientifically backed concepts to support regulatory decision making (Jasanoff 2012, 12, 37).¹⁴⁵

And there is a second aspect, leading Tarullo- a trained lawyer- to favor structural measures, which is the need for a due process that includes a comment period, to allow the regulated their say and avoid regulatory arbitrariness. Structural measures have important advantages in this respect, because while such measures still require judgment, they do not depend on timely measurement of the build-up of risks. As he states, “unlike real-time measures – where time will presumably be of the essence if those measures are to be effective – the adoption of structural constraints can proceed with the full opportunity for debate and public notice-and-comment that attends the rulemaking process” (Tarullo 2013b, 23).

¹⁴³ These challenges were at full display in the only counter-cyclical decision taken by the Fed to date, the guidance on leveraged lending (<https://www.federalreserve.gov/supervisionreg/srletters/sr1303a1.pdf>), which had to be agreed by all supervisors. It was officially portrayed as a micro-prudential measure, given the limited financial stability mandate of the Fed (interview former Fed official 9th of January 2018).

¹⁴⁴ Tarullo, a former Harvard law professor is known to reach out to academic economists in the US to better understand recent developments (interview European banking regulator, 26th of September 2016). US academia in particular has been slow to embrace anti-cyclical thinking (interview ECB economist 21st of April 2016).

¹⁴⁵ For similar findings concerning the unease at the Fed with the concepts of systemic risk in general, s. Goodhart (2015).

Based on implementation problems as well as lacking certainty about the existence of the financial cycle and the appropriate metrics for mitigating it, he disparages discretionary measures that seek to lean against the wind and rather favors structural measures, which are non-varying and non-discretionary (Tarullo 2013b, 14). This does not mean that Tarullo completely eschews time-varying measures, but he instead calls for further development “of some well-conceived and well-tested metrics over time” by academia and central bankers (ibid, s. also Tarullo 2015a). Until those metrics exist however, he prefers to rely on static externality analysis, which allows for a due process that “can help identify the points of vulnerability and guide the fashioning of appropriate regulations” (Tarullo 2013, 23). For these reasons, to him “the task of buffering the financial system against a tail event seems more tractable than that of moderating the financial cycle”(ibid).

It is the suitability of structural measures to fulfil the procedural requirements of legitimate intervention and their scientific foundation, and not necessarily their adequacy to the task at hand that guides this choice. This position, characterized by an attempt to de-politicize regulatory intervention, is furthermore driven by the limited macroprudential mandate the Fed has received after the crisis. A completely opposite position is taken by Vitor Constancio, Vice President at the ECB, responsible for financial stability (2010-2018).

The ECB Position

Since taking up his position in 2010, Constancio at the ECB has advocated an expansive, ambitious macro-prudential policy framework (s. e.g. Constancio 2012a), a position which became even stronger once the ECB was granted financial stability tasks in the legislation for the SSM (Constancio 2014a). This expansive macroprudential stance focuses its efforts on locating economies in their positioning in the financial cycle and to initiate pre-emptive measures when booms start to accelerate (s. e.g. Constancio et al 2019, 32). Beyond personal preferences by the Vice-president, this stance is arguably grounded in the particular structure of the Eurozone, with a European wide interest rate coupled with national fiscal policy stances and a lack of automatic risk sharing mechanisms (Schelkle 2017). This structure makes the prevention of financial instability, of booms and bust both at the national level and the European level a major goal of macroprudential regulation. As Constancio puts it, „In the euro area context, the relative effectiveness of macroprudential policy in tackling the build-up of financial stability risks is even more pronounced owing to the fact that, in a monetary union, a single monetary policy is ill-suited to deal with financial imbalances emerging at national level. Such imbalances are better tackled with targeted national macroprudential measures.“ (Constancio 2018, also interview ECB economist

04.09.2014)¹⁴⁶ It is hence an analysis of the build-up of imbalances in the Euro-Zone pre-crisis which underlies the stance on macroprudential regulation inside of the ECB.

In line with this analysis and while acknowledging the need to increase the resilience of the system, Constancio has issued passionate pleas that macro-prudential regulation should go beyond that and be strongly anti-cyclical (e.g. Constancio, 2014a, b). In 2014, he was tackling the debate over the two intermediate objectives head on, posing the issue in the following terms: “Macro-prudential policy faces a major test going forward: will there be determination and boldness to try to smooth the financial cycle, or will the authorities just take refuge in building buffers and strengthening financial institutions?” (Constancio 2014a) His ambitious policy stance is concomitant with a rejection of resilience as the sole policy goal. As he points out,

“The aim of macro-prudential policy should definitely be about tempering the cycle, rather than merely enhancing the resilience of the financial sector ahead of crises. ...Admittedly, fully controlling the financial cycle is an unattainable objective, but it would not be worth setting up the macro-prudential policy area if it were to refrain from attempting to fulfil the ambitious goal of influencing the credit cycle.” (Constancio 2014a, 17f)

Attempting to merely increase resilience is rejected because, while much easier to achieve, he deems it to be completely unacceptable from a welfare perspective to observe a housing bubble and asset price growth and not to intervene (Constancio 2014a, 17f). He points to the welfare losses incurred due to the cycle and the dangers inherent in simply seeking to raise the resilience, as nobody can predict the exact place or the intensity of the next crisis.

His language is clearly a politicizing one, emphasizing the contingent character of the financial cycle amenable to intervention by central banks. This becomes most evident in his use of the metaphor of dykes:

“To use a Dutch (sic) metaphor, this is not just about building dykes for resilience because, like King Canute, we have no hope of taming the tide. The analogy does not really work, however, because financial instability is something man-made, and not an unassailable fact of nature.”(Constancio 2014a, 18)

¹⁴⁶ This point was driven home by the Euro-Zone crisis, which was interpreted in the ECB financial stability division as an outcome of „sudden stops“ of capital flows to the countries in the periphery. These countries had attracted pre-crisis a lot of capital due to an interest rate which overall was too low for the inflationary tendencies of the countries concerned and where much of the money went into real estate bubbles (Constancio 2018). In the speech, Constancio details how he, as a central bank governor of Portugal had warned of the inflationary wage agreements in Portugal pre-crisis and had sought to limit inflows to finance real estate appreciation in his country (ibid). In that sense, personal and structural stance are connected.

In this quote, Constancio points to the man-made nature of the financial cycle and hence the capacity of human agents to change it, making the fight against bubbles a moral imperative for central banks. In line with this strong stance, he states as a first principle of macro-prudential policy that it should be pre-emptive and strongly counter-cyclical, based upon the concept of the financial cycle. He further explains that “[t]o effectively tame the financial cycle, a time-varying dimension is crucial in the design of policy instruments – that is, the instruments must be adjustable over the cycle.” (Constancio 2016b).

Making his argument for such time varying tools, he draws on recent academic contributions, which endogenize boom bust cycles. However, given the early stages of the research program, he qualifies them as **“welcome first steps on the road towards a new framework for the analysis of macro-prudential policy”** (Constancio 2014b), while insisting that policy action cannot wait for scientific breakthroughs. He continuously points to recent advances in scientific approaches for measurement of the cycle and of simulations portraying possible effects of these measures (Constancio 2016a, b) to bolster his case, advances however, which are mostly produced by the BIS and in-house by ECB economists.¹⁴⁷

Constancio’s pragmatic stance towards the role of science in guiding policy, which builds on in-house research is contrasted by the skepticism of macroprudential change agents at European national central banks, which find these proposed measures that address the cycle largely unconvincing due to their limited scientific status, their limited scope and applicability (interviews European banking regulators 9th of July 2016, ESRB 19th of July 2016, Dutch Central Banker 21st of September 2016). What is further remarkable about Constancio’s interventions, driven by a focus on output legitimacy, is the absence of accountability concerns with respect to the parliament or the European demos in his speeches. This absence and the belief in the capacity of (in-house) scientific measures to guide anti-cyclical policies is what strongly differentiates the ECB position from both the Fed and the BoE position. Concerns over legitimacy of the central bank in exercising a discretionary macroprudential mandate, coupled with the difficulty of identifying and measuring the financial cycle also structure the position of BoE representatives. However, their stance is characterized by a much more pragmatic approach to boom and bust cycles, representing a mid-way position between Tarullo and Constancio.

The Bank of England

Right from the beginning of the financial stability mandate (2009), the BoE and its Deputy Governor Tucker elaborated an albeit restrained endorsement of anti-cyclical measures, which should play a (limited) role in the overall tool kit. This mooted endorsement was linked both to the

¹⁴⁷ These mostly stem from a major research program (MaRS) initiated by the ESRB in 2012 (cf. Constancio 2014b)

discretionary nature of this policy approach and the immense need for judgment and learning by regulators, as they needed to assess the build-up of systemic risk in certain sectors, coupled with yet unknown consequences of the measures contemplated (Tucker 2009, 13). At the BoE, the lack of reliable quantifiable targets in conjunction with the need for discretionary measures was seen as a danger to central bank legitimacy (cf. Tucker 2013a). Tucker clearly spelled out this concern at a BIS research conference in 2015: Without any clear guidelines or measurements, how was the public to observe the quality of central bank decision making? Indeed, they were most likely to focus on these activities only in case of failure. In that case, given the lack of clear guidelines for decision-making, central banks would be blamed for the next crisis, without having any means to defend themselves (Tucker 2015). This perceived danger was actively tackled by central bank officials through a cautious embrace of anti-cyclical policies in the negotiations over the future set-up of macroprudential powers.

Already before the election in 2010, which would hand micro- and macroprudential supervision back to the Bank of England, the Bank had negotiated with the Tories over how to reorganize prudential powers, including macroprudential regulation (interview BoE economist 13.01.2020). While the Treasury had intended to chair the new macroprudential body, Bank of England governor King prevailed in his opinion to model it based on the Monetary Policy Committee, based on an “*ex ante* mandate, *ex-post* accountability” (a BoE official, as cited in Hungin and Scott 2019, 342). The financial policy committee (FPC), which was to take over the macro-prudential tasks was then set up on an interim basis in 2011 and officially began its work in 2013. The FPC, which was established inside of the BoE hence had the governor of the Bank of England at its helm, but also included a non-voting seat for the treasury and for five experts. Instead of being controlled by the Treasury, strict accountability relationships *ex post* were established with all members due to give reports to Parliament and the Treasury Oversight Committee.

These negotiations were very much driven by the awareness of the risks inherent in anti-cyclical policies. First, the BoE officials, aware of the political dangers inherent in the project of smoothing the cycle, engaged in dialogues with politicians to shape the primary objective of the Financial Policy Committee, the macroprudential body in the Bank of England (interview former BoE official, 20th of December 2017). They crafted official language to be focused on the goal of resiliency; to “remove or reduce systemic risk, with a task to protecting and enhancing the resilience of the financial system” (Tucker 2011, 6). In effect, the BoE officials, wary of the political risks involved in anti-cyclical policies decided to abstain from “fine-tuning the cycle” (Tucker 2013b, 6f) and instead assigned a secondary role to anti-cyclical policies in the policy regime. They were now

seeking to maintain constant resilience of the system through time-varying measures (Cunliffe 2015, 8f), subordinating anti-cyclical policies to the goal of resilience.

Second, as learning would have to take place through trial and error, as regulators had no way of knowing ex ante what the impact of these measures would be (Tucker 2013a), BoE officials insisted on close collaboration with the Treasury and Parliament. Because of the need for learning through mistakes, the unobservable nature of systemic risk for the public and the need for expert judgment, the BoE insisted on the need for legitimacy granted to decision makers ex ante by Parliament (Dombret and Tucker 2012, Tucker 2012, 2013b). This was seen as important, as anti-cyclical policies, “taking away the punchbowl” would be unpopular (Tucker 2012, 7). Institutionally, anti-cyclical measures were hence subjected to persistent parliamentary feedback, an institutional mechanism explicitly endorsed and crafted by the bureaucrats (Tucker 2011, 2012), seeking to gain political legitimacy for central bank action. This mechanism was coupled with a very pragmatic use of financial cycle measures to structure the expert discussions in the FPC, seeking to achieve shared expert judgement that could be communicated to and be understood by the public (Kohn 27th of april 2016). In this way, based on carefully shielding the Bank of England from the threats to legitimacy immanent in counter-cyclical policies, policy makers set up a viable, if limited counter-cyclical framework.

Discussion

Analyzing the public speeches of the officials charged with developing macroprudential policies at the FED, BoE and ECB and the different regulatory stances they expose, we can extract both the common challenges linked to the project of anti-cyclical regulation as well as the different reactions to it. Table 6.1 below displays the characteristics of the two intermediate objectives regarding the form of regulatory intervention they require, the demands in terms of risk metrics, the political exposure they imply and the motivation for regulatory stance regarding the two different intermediate objectives that are shared.

<u>Macroprudential Objectives/Characteristics</u>	<u>Resiliency</u>	<u>Anti-cyclical</u>
Concept	Cross-sectional/interconnectedness	Intertemporal/Building up of systemic risk over time
Form of regulatory intervention	Time invariant (structural), possibility for due process	Time variant (discretionary), little possibility for due process
Requirement for metrics of systemic risk	Very low, rather theoretically driven than measurement specific, simple over time adjustment (quiet policy learning)	High: need for Ex ante warning systems, sufficiently early to allow intervention, sufficiently precise to justify intervention, high likelihood of error

Political exposure of regulator	Limited, in the sense that there is due process and calibration, existence of accepted economic analysis	Very high, no due process, no ex ante calibration, limited scientific knowledge
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Table 6.1: Resiliency vs. Anti-cyclical measures

What becomes clear is that the ambitious goal of taming the cycle is associated by all policy makers with (exigently) high demands upon metrics and with political dangers inherent in discretionary regulatory decision taking. On the other hand, the less ambitious goal of structural measures coincides with lower demands upon metrics and a process that permits to avoid the impression of unconstrained and arbitrary regulatory power. This shared problem assessment over the demands and risks associated with the goal of smoothing the cycle then interacted with the legitimacy concerns of bureaucrats related to the domestic accountability regimes they were subject to, leading to different, partially orthogonal approaches to the policy goal of the financial cycle.

Whereas all policymakers agree on the need to increase the resilience of the system and on the underlying economic concepts (externality analysis), this agreement disappears with respect to the financial cycle. The US largely abstains from engaging with the goal and the UK gives only a limited endorsement based on a pragmatic approach, policy makers at the ECB see it as the primary objective. This strategic positioning of macroprudential change agents is linked to the institutional constraints and civic epistemologies that these regulators are subject to, that is the historically contingent institutionalized ways in which societies bestow legitimacy on regulation through epistemological and procedural assurances. In this respect, the uncertain scientific status of the financial cycle and the lack of endorsement by academia, coupled with the need for discretionary decision making structured the stance of central bankers (s. table 6.2 below).

Civic epistemology	US	UK	ECB
Methods of ensuring accountability	Due process, assumptions of distrust, legal	Assumptions of trust; relational	Interaction ECB and National Central Banks
Preferred registers of objectivity	Analytical, Economic science/sound science: “view from nowhere”	Expert judgement: negotiated (view from everywhere)	Analytical, but in-house economists; statist science (view from technocrats)
Accepted bases of expertise	Academia	experts	Central bank economists
Accountability concerns and its interaction with the goal of smoothing the financial cycle	Input legitimacy: “View from nowhere” cannot be achieved for the financial cycle, discretionary	Throughput legitimacy: involve experts with different views, deliberation permits evolution of	output legitimacy: danger of welfare losses; technocratic knowledge by central banks to determine financial cycle is

	intervention cannot be reconciled with administrative due process	common sense judgment by experts; pragmatic use of financial cycle concept	capable of guiding regulatory decision making (at least in the long run)
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Table 6.2: Civic epistemologies and the regulatory stance regarding the financial cycle, drawing on Jasanoff 2012, 72)

The uncertain scientific status and the lacking endorsement by academia stood in opposition to the distinctive civic epistemology in the US, which puts value on scientifically backed, objective decisions based on expertise outside of the state (academia) and on due process (Jasanoff 2012, Fourcade 2009). A Federal Reserve subject to oversight by Congress was weary to take decisions based on an immature science that might lead to political questioning and hence vastly preferred structural measures, which could be based on (the scientifically accepted) externality analysis and be undertaken following a due process. This position is characterized by an attempt to de-politicize regulatory intervention, bringing it into line with the norms of US regulatory decision-making. In the case of the Bank of England, policy makers were also acutely aware of the political backlash that discretionary policy decisions might evoke and hence chose to privilege resilience over the anti-cyclical dimension. There, the immature scientific measurement led to a pragmatic use of cyclical metrics in the deliberation of the expert committee, based on common sense.

It is only fitting then that the ECB representative emerges as the most forceful voice for anti-cyclical intervention, given that in terms of the accountability regime, the ECB is a unique case among central banks, with complete independence enshrined in the European treaties and very limited accountability to politicians (Jabko 2009, 400f, McNamara 2002, 66). Absent these concerns, the immature science did not lead to the abandonment of the project or a subordinated role, but to the initiation of an in-house research project, where central bank economists are given the task to provide the analytics for central bank intervention. However, in the case of the ECB anti-cyclical policies need to be orchestrated with national central banks, which too date have been largely unimpressed by the scientific progress of the ECB. Constancio's attempts to re-politicize the issue, pointing to its man-made character and hence its amenability to change trails off among a discursive audience that is only too attentive to the political risks such an approach entails. Given these different approaches and the different weights they attach to existing scientific evidence and the need for due process, a coordinated international approach to anti-cyclical policies seems largely impossible, further reducing the scope of anti-cyclical policies.

Conclusion

This paper has sought to address the question as to why, in the process of implementation of the macro-prudential policy program, measures to tame the cycle are much less pronounced than those increasing the resilience of the system. Prior literature has related this lack of implementation to issues external to the group of macroprudential change agents, be it financial interests able to influence rule making or institutional opposition within central banks, where macroprudential change agents must carve out institutional space for new measures and instruments against the opposition of microprudential regulators (Baker 2014). The reduction of macro-prudential goals to the agreement on raising resilience has further been linked to the greater international coordination the anti-cyclical variant demands (Helleiner 2014).

What is common to these accounts is that they pay little attention to the debates internal to the technocratic community over the idea set they were asked to implement. This paper goes beyond these external constraints to argue that the lack of measures also reflects the conscious choices of agency leaders to refrain from this goal due to reputational concerns linked to the accountability regime of central banks. The lack of appeal of this policy goal is linked to the epistemic and political constraints technocrats face with respect to legitimate intervention. The different stances of ECB, Fed and BoE officials that I document show that reputational concerns linked to the accountability regime of central banks drives the positioning of central banks regarding the counter-

Particularly problematic in this respect are its lacking scientific status (in terms of technical expertise); its discretionary nature which violates certain norms of legitimate intervention in terms of legal and procedural rules and, in terms of the performative dimension, the difficulty to pin down success, linked with the high probability to be blamed in case of crisis. Taking these three dimensions together, accepting the policy goal of smoothing the cycle meant to expose central banks to a policy from which they could hardly win, but most likely stood to lose in terms of reputation. In terms of the moral dimension, the ECB makes a strong case for the need for action. However, in terms of the reputational calculus of other central banks more exposed to direct political oversight, this dimension holds little weight, as the other central banks are only too attentive to the political risks such an approach entails, favoring abstinence or a limited role. Central bankers' concerns over the status of central banks as apolitical actors whose legitimacy is not questioned, this chapter suggests, is an important factor in explaining the limited extent of anti-cyclical measures post-crisis.

And yet, by mandate after the crises, these central banks were tasked with developing counter-cyclical tools through Basel III, in particular the Counter-cyclical Capital Buffer. The next chapter hence enquires into the work they have undertaken to implement it and in particular the

contributions applied economists made to the calibration and fine-tuning of these tools, providing central bank managers with the scientific objectivity needed to install counter-cyclical policies.

Chapter 7: The creation of anti-cyclical policy devices by economists and their implementation in the context of macroprudential regulation

Abstract

The focus of this chapter is the development of the early warning systems of the Federal Reserve Board, the European System of Central Banks, including the ECB and the Bank of England with regards to cyclical systemic risks and how these inform the use of the counter-cyclical capital buffer in these jurisdictions. It thereby further probes into the construction of macroprudential apparatuses that have developed post-crisis and the macroprudential policy decisions that they provoked, seeking to trace how the identification of cyclical systemic risks by applied economists within these central banks fed into the set-up of macroprudential frameworks seeking to address it.¹⁴⁸ Focusing on the counter-cyclical capital buffer (CCyB), the way it has been the set-up and calibrated, it takes into view the central element in the anti-cyclical framework that has been agreed at the global level (Baker 2013a). This chapter first traces its inception at the global level, then to discuss the work of applied economists within the Fed testing and corroborating it, in a setting where the CCyB found a muted endorsement. While their work to date had limited to no impact in the US, it would prove influential in the European Union, in particular in the UK. Then I will discuss developments of the CCyB framework in the European Union, where I trace how the splintered governance within the Euro-zone from 2014 onwards led to a negotiated assessment of cyclical systemic risks and the need for activation of the CCyB, which led to a refinement of measurements of the financial cycle at the ECB, driven by the desire to influence national policies. Lastly, in the UK I trace the development of the most advanced framework that draws upon both the work of US and Euro-zone economist and calibrates the CCyB based on anti-cyclical stress test exercises. The latter is analysed as the synthesis of much of the work of these applied economists over the last decade, emboldening a more pro-active anti-cyclical macroprudential stance.

Introduction

The CCyB was enshrined in the Basel III Accord (BCBS 2010). This buffer set out to “achieve the broader macroprudential goal of protecting the banking sector from periods of excess credit growth” (ibid, p. 1). It was “designed to ensure that banking sector capital requirements take account of the macro-financial environment in which banks operate”. To achieve that, national authorities were tasked to vary capital requirements cyclically “when excess aggregate credit growth is judged to be associated with a build-up of system-wide risk” (ibid). This policy tool

¹⁴⁸ The global report by the IMF/FSB/BIS (2016) on macroprudential regulation reports a lot of diversity in national macroprudential framework, as there is no one-size fits all macroprudential approach. Instead, different national frameworks have different emphases, with some focusing on shorter-term and other on longer term development, some with a more time varying focus, while other frameworks focus more on the cross-sectional dimension of systemic risk.

required the instalment of an early warning system that was able to signal the build-up of risks with a sufficient amount of time in advance to permit anti-cyclical interventions. It was build on preliminary studies by Borio and his colleagues at the BIS (Borio and Lowe 2002, Borio and Drehmann 2009), in which they had tested the possibility to build effective early warning systems (Borio and Lowe 2002), finding the credit to GDP gap as well as time series on house price developments to be particularly powerful predictors of future systemic crises (Borio and Drehmann 2009).

These preliminary works were picked up by the macroprudential variables task force of the Basel Committee for Banking Supervision, which was constituted in spring 2009 after the London summit of the G20, and which was composed of applied economists from member state's central banks and financial regulators, as well as the BIS, most notably Drehmann himself (interview member task force, ECB economist 30.12.2019). It tested them for the member states of the Basel Committee on Banking Supervision (BCBS) and found the Credit-to- GDP gap to be the best single predictor of pending systemic distress (BCBS 2010). It hence suggested to make it the cornerstone for the setting of counter-cyclical capital buffer, a choice which was also motivated by the lack of reliable time series on real estate price developments in all countries, which had been found to also have good predictive qualities (Drehmann et al 2010). Whenever the credit-to-GDP gap was beyond 2, the CCyB was to be activated and accelerated in line with the rising gap. At the same time, the report emphasized the need for guided discretion by policymakers, which were to take into account a bundle of other variables and qualitative judgment when setting the buffer.¹⁴⁹

Prima facie, this episode confirms the focus on the positioning of economists in rule making bodies to explain economists' influence on regulation and policy. And yet, as this chapter will show this was only the beginning of the policy process and the influence of economists had on it, not its end. Capturing the credit to GDP gap required intensive econometric work, as time-series of both economic and credit growth require detrending in order to separate cyclical deviations from longer term trends. The credit to GDP gap, after all, is a statement about "excessive" credit growth when compared to trend growth of credit in the light of GDP growth. Generating this indicator involves important decisions regarding the assumed length of credit cycles, which inform the use of data filters to filter out random movements from the time series. Just like in business cycle research (Morgan 1990), these filters have a crucial influence on the results, in Callonian terms, they jointly with the data series chosen "perform" the credit cycle (Callon 1998 b, 259f). These theoretical assumptions are backtested, as are econometric methods in order to reach a robust and reliable

¹⁴⁹ In their 2009 paper, Borio and Drehmann similarly emphasize the the fuzzy character of the exercise and hence the need for expert judgement (Borio and Drehmann 2009, 44).

framework. As this chapter shows, the Basel Committee on Banking Supervision's proposal for the buffer guide regarding the CCyB has been based on what one IMF economist polemically has called „Mickey Mouse economics“ (interview IMF economist 15th May 2015), in other words it was early work which required further operationalization and testing of the specifications (interview Bundesbank economist, 06.11.2015).

What then ensued was a decade long attempt by applied economists within the different central banks to test and improve upon the proposed route and generate early warning systems capable of informing the policy makers. In that sense, central bank economists were engaging in regulatory science to bring about a macroprudential framework to measure and limit systemic risk, whereby they followed evidentiary standards which were not necessarily equal to scientific proof in terms of cutting edge econometrics, but which sought to answer the question at hand, confronting the challenges as good as they could given the data and seeking to further improve the data set. This effort often involved young economic PhDs, working in the financial stability divisions who were hired to provide rigour to these issues (interview LSE economist, May 30th 2015), and whose work was to have an unexpectedly large effect on the shape of these monitoring frameworks.¹⁵⁰ These economists could not freely choose their research interests but instead were told to work on issues of direct import for these divisions, namely building early warning systems that could detect unease sufficiently early to allow policy makers to act (interview BoE officials, 12th of December 2019, interview young ECB economist, 15th of August 2016, interview senior ECB Manager, 6th of April 2017).¹⁵¹

What we can observe in this case is thus a community of researchers that engages in regulatory science, seeking to generate instruments which are robust and which can reliably guide the macroprudential actions of their central bank. At the collective level, these researchers form an epistemic community, frequently interacting with each other in research conferences organized in central banks and outside of it, sharing research and experiences (interview BoE economists, 12.12.2019, BoE economist 13.01.2020).¹⁵² As importantly, these researchers also seek to publish their results in academic journals, establishing both their credentials as credible researchers, but also

¹⁵⁰ Examples are Yves Schueler, who having received a PhD in quantitative economics and finance from the university of Konstanz in 2014 starts his work at the ECB on the financial cycle as a trainee in the financial stability surveillance in the ECB. Also, there was Natalia Tente (born Puzanova), from the university of Muenster, who had written her dissertation in 2011 on Risk management systems in banking and then was hired at the Bundesbank in order to work out the optimal systemic risk measurement systems (Puzanova and Duellmann 2013), s. below. There are plenty of other researchers at different institutions, e.g. C. O'Neill at the Bank of England, or Michael Grill at the ECB.

¹⁵¹ In technical terms, the early warning models they tried to develop were seeking to minimize type 1 and type 2 errors of either predicting no crisis when one will come (type 1) or predicting a crisis when none will come (type 2), increasingly drawing upon stress tests to discipline their results.

¹⁵² However, the competition for opportunities to publish also means that databases, which are newly generated are often kept confidential, in order to exploit the access to this data to the fullest (interview BoE economists, 12.12.2019)

seeking to checking the robustness of their results through peer review (interview senior ECB researcher 6th of April 2017). At the individual level they are vying to become renowned transnational issue professionals (Seabrooke and Henriksen 2018), as the use of these instruments also positively impacts their career¹⁵³. One might hence see these different researchers as organized in laboratories to operationalize the CCyB, which often involved seeking to measure the credit/financial cycle.

As Mallard points out, (1998: p. 571), the network of institutions, conventions and procedures, which allow for the legal precision of such measurement are not available during the genesis of new instruments, instead these are developed during the process itself. The authority of the best measurement is established during the trials between the teams, where there is no clear *ex ante* procedure and there is change of instruments during the trial to improve results (*ibid*, 594). Mallard argues in the case of laboratories collaborating on the measurement of CO2 emissions, that in the process, measurements become conventionally true, because communities of practice are finding ways of settling an agreement on the method to approximate the truth in the best way. The question this chapter seeks to answer is whether such settlement has occurred in the community of central bankers. Asking that question, it is aware not only of the political economic implications of these measurement devices with respect to the need for action they might imply, but also the embeddedness of these researchers in institutional settings, which might be more or less prone to pursue anti-cyclical interventions and thereby shape researchers incentives (s. chapter before).

And still, these modelling devices, if they have enough authority and are easily communicable can exert an important effect as to the policy choices taken and hence reshape the institutional setting (Campbell 2001). For cyclical systemic risks, the problem, as a different interview source put it is that “when you are in a room with a policy maker, you want to have a number, a simple number, a framework in which you can easily explain where you will be in 3 years from now” (interview IMF economist, 15th of May 2015). Has such a framework been forthcoming? Conducting research on this process of possible consensus formation and the use of these models to inform anti-cyclical

¹⁵³ The implications of the use of these models for the career of their developers are neatly summarized in the interview quote below:

Interviewee: Career progression. If you go to a policy making body, how do you get promotions?

T: I don't know.

Interviewee: You really have to keep that in mind. Because you have to, if you gonna make it, as some, ... as a person of influence, you have to sell something. And there is no difference between me as an academic selling something, you as an academic selling something, you are doing research, you gonna sell some of that end of it. You may not like the idea, but you know...

T: That you have to do it.

Interviewee: You do marketing for your career progression. Do you wanna go up the academic ..., wherever you are operating. If you are working at the Bundesbank, ECB or Bank of England, you are responsible for policy, if that policy is pushed forward, your ideas used, you get promotion. (interview LSE Economist, May 2015)

policy decisions, it is important to place researchers in their institutional setting and to bear in mind the imprint these settings have on the research produced. In this vein, several of the economic papers on the CCyB analysed in the following seem to have been motivated more by internal political considerations, rather than actual convictions of the person writing (interview BoE economist, 13.01.2020). Institutional context, in line with Whitley's predictions shape research orientation and the rewards structure regarding certain findings. In the least, the scientific interventions are always formulated with that institutional context in mind, as change agents seek to adapt their models to the institutional realities (Clift 2018). For that reason, I will place in the following the different research efforts in the central banks into their institutional context, allowing to better appreciate the production process of these models as well as how they travel between these places.

The Creation of the CCyB at the Global Level

The decision to choose the credit to GDP gap to calibrate the CCyB buffer was the outcome of a larger philosophical debate within the Basel Committee on Banking Supervision (BCBS) task force in the years 2009 and 2010. It had initially convened with the goal of creating a macroprudential buffer and debated whether a capital conservation buffer would not be sufficient for that task. Weighing the pros and cons of a buffer that banks could tap into in times of crisis, but which would come with a prohibition to disburse dividends. Concerned that this option might prove too deterrent to exert a counter-cyclical function, the group decided to complement the Capital Conservation Buffer (CCB) with a countercyclical buffer that moves against the cycle (interview member task force, 30.12.2019). Here again, a debate ensued, this time over the possible use of market data to detect cyclical exaggerations. As the interviewee put it, "theoreticians" warned of the difficulties to detect the cycle and proposed to use market data to this effect, which would allow a symmetric build up and wind-down of the CCyB, increasing in times of heightened risk taking (e.g. measured through risk compression in financial markets) and decreasing in times of a sudden repricing of risks.

On the other hand, a second fraction in the group argued against the use of these data, arguing that recent experiences regarding the mispricing of risks by markets spoke against such an approach. They were instead suggesting the use of economic variables instead. While this made a symmetric approach largely unfeasible, requiring discretionary decision-making by regulators in the downswing. However, this group was confident that such a timely release would be a feasible task and relied in large parts on the works by Drehmann to make their case for the build-up of this buffer. An additional element, which spoke for this economic, rather than market-based approach was the fact that market-based measures were seen as unreliable in developing markets. Given that the aim of the Basel Committee on Banking Supervision (BCBS) working group was to develop a

global, unified framework for macroprudential regulation, this further disadvantaged the group pushing for market-based indicators.

This focus also implied that in the choice of the final recommended setting to calibrate the setting of the CCyB was univariate and specified the credit to GDP gap as the defining feature. While developments concerning real estate prices were found to improve the capacity to predict cyclical dangers (Drehmann et al 2010), the fear that these would not be available in all jurisdictions led to the focus on a single variable that was seen to be within reach of all statistical agencies (interview, ECB economist 30.12.2019). Bearing in mind the different data availability in different countries and the improved predictive capacities of the indicator, when bundling different variables, the framework is consciously formulated in an open manner, specifying the credit to GDP gap as an anchor that has to be used in calibrating the buffer, but keeping it open for other variables, be they market-driven or economic. It hence remained open to future improvements by applied economists in central banks around the world, seeking to optimize the early warning systems that underlie the buffer. In that sense, the initial specifications of the regulatory guidance published in the Basel III agreement on first of December 2010 (BCBS 2010) were but a beginning.

Federal Reserve (US): From rejection to muted endorsement

The work by applied economists in the Federal Reserve on a risk monitoring framework that could inform the counter-cyclical capital buffer was based on a provision in the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) that the agencies “shall seek to make such [capital] requirements countercyclical, so that the amount of capital required to be maintained by a company increases in times of economic expansion and decreases in times of economic contraction, consistent with the safety and soundness of the company” (s. section 616 of the Dodd-Frank Act, as cited in Federal Reserve 2016). This edict by the Dodd-Frank Act is concomitant with legal changes that severely limit the capacity of the Federal Reserve to pursue its long-standing strategy of non-intervention in cyclical upswings, but rather to “mop up the mess afterwards” (a strategy more formally called the Greenspan doctrine). These changes center around the reformulation of the capacity by the Federal Reserve to provide liquidity to institutions in distress according to Federal Reserve Act § 13 (3)), a restriction which was created despite opposition by leading technocrats such as Bernanke (Bernanke 2012, 2015) and Geithner (2014, 427ff).

And yet, the orientation of the Dodd-Frank Act towards systemic risk is not an anti-cyclical one. Its focus lies instead on attempting to prevent any future bailouts, installing mostly structural measures focusing on SIFIs (Persaud 2014). In terms of the regulatory landscape, the Dodd-Frank Act has not replaced a splintered regulatory landscape with a more unified one, centered around the Fed, but

instead it has opted for the creation of the Financial Stability Oversight Council, which brings together 10 heads of different agencies, making coordination on these matters difficult (Lombardi and Moschella 2017). This coordination is even made worse by the legal uncertainty which surrounds the Dodd-Frank Act and the Financial Stability Oversight Council, namely whether it actually bestows responsibility for financial stability upon the agencies brought together at the Financial Stability Council or only upon the heads of these agencies.¹⁵⁴ The Act also does not provide the Federal Reserve with a robust financial stability mandate that the Fed could draw upon to justify macroprudential actions (interview former Federal Reserve economist 9th of January 2018).

This splintered and legally challenging environment was one of the reasons that the upper management of the Federal Reserve Board initially abstained from seeking to implement too far reaching time varying reforms, being aware of the difficulties to implement them with the other agencies (interview Fed economist, 6th of April 2017). This abstention was further reinforced by the fact that the president of the Federal Reserve up until 2013, Ben Bernanke, looked highly critical upon the idea of detecting and intervening in booms (interview academic economist in direct contact with Bernanke, 19th of January 2018). The consequence of this institutional environment and the predispositions of its president set in place a dynamic that would lead to an initial rejection of the CCyB in the US, instead placing its focus on structural and non-time varying measures, that seek to increase through-the-cycle resilience“ (Quarles 2019a). In line with this predisposition, the reaction of the Federal Reserve’s Office of Financial Stability Policy and Research to the proposed buffer guidance for the CCyB was highly hostile, arguing that the statistical unreliability of the credit to GDP gap as an indicator made action based on it unjustifiable (Edge and Meisenzahl 2011).

Identifying two instances in the US in the early 2000s, where a real time credit to GDP gap measure would have led to unjustified measures constraining credit and using a very tendentious interpretation of the data, the measure is outright rejected as a meaningful indicator for policy action. Here, the authors assume that a CCyB at the level of 2% would have been (falsely) activated in the first quarter of 2001 (which is the highest value in their simulation), with a much smaller CCyB of 0.25 or 0.5% being much more likely. In addition, they then use the maximum assumed impact on credit provision to calculate an impact of credit not granted due to the measure of more

¹⁵⁴ This lack of legal clarity brings with it the possibility that other board members can refuse to support the head of the agency on matters that they see as clearly overstepping their mandate. This is what happened in the first attempt by Miss Shapiro, the head of the SEC, to push through capital requirements upon MMFs, an attempt the other board members refused to engage in, as they argued that financial stability concerns are not part of their mandate (s. Thiemann 2018).

than 140bn (Edge and Meisenzahl 2011, 294). Assuming the lower bounds of this simulation, the result would have been 6 billion dollars (p. 290), which in the context of the size of the US economy is completely negligible. If anything, the study shows the large uncertainty surrounding the impact of the CCyB measure on credit provision by banks that prevailed at this point in time, which in this context was used to reject the measure. In line with this rejection, the CCyB is installed by the Federal Reserve in 2013 for large, internationally active banks with the sole purpose of being able to reciprocate the CCyB decisions of foreign banking regulators, without foreseeing any domestic CCyB decisions. However, and despite that general predisposition and the initial rejection of the CCyB as a policy instrument, policy devices to measure cyclical systemic risks in the US financial system are developed, linked to the development of stress tests from 2009 onwards.

In this dimension, the US has been a true innovator, as it is the first country in the Western world which implemented a broad-based systemic stress test in 2009 (Geithner 2014). This test was initiated by Treasury Secretary Geithner, who already pre-crisis during his time at the Fed New York had placed the topic of financial stability at the center of discussions (interview academic economist 19th of January 2018, invited to the Fed NY in 2004 to discuss such matters)¹⁵⁵, based on his experience at the IMF.¹⁵⁶ The Office of Financial Stability Policy and Research was founded in 2009 to coordinate the stress test.¹⁵⁷ Nellie Liang, the leader of the office got the task by Bernanke in 2009 to coordinate and direct it, creating a hub for financial stability considerations within the Fed. Bernanke evidently did not like the language of cycles and the idea of anti-cyclical policies, but he did encourage the systemic logic in stress testing and its use for a cross-supervisory approach (Bernanke 2012, 2015). Furthermore, he specified that the hub organizing this work should not operate like a silo, but that it instead should draw upon the expertise within the system of the Fed as a whole (Bernanke 2015, 453).¹⁵⁸

Based on this instruction, Liang hence followed a very conscious attempt to avoid siloing the work on financial stability by drawing upon the existing expertise of researchers and central bankers in the Fed instead of hiring an independent and institutionally well demarcated division, which would

¹⁵⁵ At that time, Geithner fostered debate on how to stabilize an ever expanding financial system pre-crisis (ibid, Geithner 2014).

¹⁵⁶ In his work at the IMF, Geithner was exposed both to financial crises in emerging markets as well as with the IMF's financial sector assessment program, a first system-wide stress test (Seabrooke and Tsingou 2009).

¹⁵⁷ The office has been transformed into the Financial Stability Division at the Federal Reserve Board in 2016, upon the insistence of Stanley Fisher, who wanted to mark the fact that this work and this group would be permanent and wanted to provide organizational recognition for the hard work that had gone into the development of the financial stability division.

¹⁵⁸ In his memoirs of the crisis, Bernanke insists that the work on the stress tests was crucial for breaking down the silos in the way the Fed operated (Bernanke 2015, 453)

labor on its own. Developing the set-up of the stress test, the financial stability division was therefore drawing upon the expertise in other parts of the Federal reserve system, in particular the statistics department at the Federal Reserve Board and the New York Fed (interview Fed official 9th of January 2018). The stress tests in 2009 were then indeed the first exercise by the Fed where a cross-sectional systemic analysis was implemented. In contrast to the initial stress tests in the European Union, it was the Fed itself which determined the scenarios and which got also to adjust the results of the banks if it deemed them unrealistic¹⁵⁹. Imposing such a systemic view on the stress test allowed for the first time to present to regulators the dynamics that could unfold in the circumstances of a severe crisis (Bernanke 2012).¹⁶⁰

From the first stress test onwards the macroprudential component, which is developed and imputed into the actual stress test by the financial stability division would continue to grow. While at that time, no counter-cyclical elements were contemplated, the work on the stress tests initiated thinking about a framework focusing on amplifications and vulnerabilities in the financial system (interview former Fed economist 09.01.2018). Drawing upon the established contacts with the statistics department at the Fed New York and the Board, division manager Liang, together with Tobias Adrian (then Fed New York) and Daniel Covitz (Board's statistics department) set out in 2012 to develop such a monitoring framework for the Federal Reserve system, focusing on vulnerabilities in the financial system and how they might affect the macroeconomy. They had the explicit backing of Bernanke for their work (Bernanke 2012), who was worried that due to the restrictions imposed upon the Fed by the Dodd-Frank Act to provide liquidity in times of crisis implying the need for a **forward looking financial stability monitoring framework** (ibid, Bernanke 2015, Adrian et al 2013).¹⁶¹ And yet, despite this endorsement, it was clear that the language of the cycle and its proponents were deemed too unscientific for the higher echelons of policy makers within the Fed (Tarullo 2013, s. chapter 6).

Instead of going that route, the authors were basing themselves on the new mainstream economic literature on frictions and vulnerabilities in the financial system that had emerged post-crisis (interview former Fed economist 09th of January 2018), including the work that Adrian himself had

¹⁵⁹ E.g. not all banks can be the bank where people deposit their cash for safety, not all banks can be exceptionally profitable during crisis and other assumptions like this which could hold for a particular bank but under no circumstances for all banks at the same time (interview Fed official January 2018)

¹⁶⁰ "The simultaneous review, by common methods, of the nation's largest banking firms also helped us better evaluate the resilience of the system as a whole, including the capacity of the banking system to continue to make credit available to households and businesses if the economy were to perform very poorly." (Bernanke 2012)

¹⁶¹ In that same speech, Bernanke also admitted the need to include financial stability considerations into the actual work of central banks (Bernanke 2012).

developed (Adrian and Shin 2010, Adrian and Brunnermeier 2008).¹⁶² This allowed the authors to replace the language of the cycle with vulnerabilities and amplification mechanisms, which link finance to the real economy. Such vulnerabilities and amplification mechanisms are in principle connectable to the logic of the financial cycle, but they do not rely on it to be “risk objects” in and of themselves, as they can as well be put into motion by an external shock instead of the internal build-up of systemic imbalances. Hence, the framework does not require the ontological existence of the financial cycle to justify itself or to function properly, avoiding this issue entirely¹⁶³. The Fed monitoring framework instead is build on a simple model of how the price of risk over time relates inversely to the build-up of vulnerabilities in the financial system (volatility paradox), and how these vulnerabilities could be amplified through particular mechanisms such as firesales.

The Fed’s new monitoring framework hence reformulated the entire problematic: it was not about measuring the financial cycle as a whole and the position of the US economy within it, but instead it was about vulnerabilities in the financial sector which build up due to market failures in **the pricing of risk**, which in turn impose large negative externalities on the financial system as a whole due to amplification mechanisms. Both vulnerabilities as well as amplification mechanisms are derived from the accepted mainstream economics literature¹⁶⁴ as well as from the authors’ own work on the financial crisis (Adrian et al 2013, p. 9). In contrast, Borio is only cited three times with respect to the CCyB, but not the financial cycle, as the framework is based on market failures rather than the cycle. In contrast to the latter, the former allows to assume the rationality of agents, which however are confronted with coordination problems, a central step to justify government interventions in the mainstream New Keynesian literature (Clift 2018, 70f). These market failures were seen to lead to vulnerabilities of excessive leverage (which leads to deleveraging), excessive maturity transformation related to shadow banking, repo markets and money market mutual funds (MMFs), and lastly interconnectedness and complexity, as evidenced by the case of Lehman. Two further vulnerabilities were the degree of debt in the economy, both by non-financial corporations and by financial corporations. The amplification mechanisms, drawn from the mainstream literature were fire-sale dynamics, negative feedback loops and inefficient contractions in the supply of credit.

¹⁶² Following up on his interaction with financial market practitioners and Fed staff, Adrian started to work on broker-dealers (Adrian 2005) and started to collaborate with then Princeton professor Hyun Song Shin on broker dealers liquidity and leverage (Adrian and Shin 2010). Adrian had also written with Princeton Professor Brunnermeier on CoVar (seeking in his work to include the macroprudential concerns on the reliability of market measures for systemic risk measurements, s. chapter 5).

¹⁶³ This ambiguity satisfied the verdict of Tarullo (2013) analysed in chapter 6 that we do not know yet whether there is such a thing as the financial cycle and yet kept the possibility open that it might exist and inform future work.

¹⁶⁴ Here they cite the mainstream work by Allen and Gale, Acharya, Brunnermeier, Shin, Geneakoplos leverage cycle as well as Morris and Shin on coordination failures in runs (ibid, 9)

These vulnerabilities and amplification mechanisms were then to be monitored for four areas: SIFIs, Shadow banks, asset markets and the non-financial sector (Adrian et al 2013, 12). This new monitoring framework as well as the stress tests required the collection of more fine-grained information on credit quality and the position-taking of broker dealers, information which was subsequently collected by the Fed, an effort which benefitted from a changed willingness by the Federal Reserve to spend resources on these issues (interview academic economist working with the Fed, 19.01.2018).¹⁶⁵ Through this framework, the Federal Reserve was one of the first central banks to have a cutting edge monitoring framework, which was documented first in a Fed Working Paper (Adrian et al 2013).¹⁶⁶ The framework positioned macroprudential supervision between microprudential supervision on the one hand and monetary policy on the other hand (ibid), seeking to influence the latter.

However, before it could exert such an influence, the Board members, and in particular Jeremy Stein, a Harvard Professor of economics acting as governor of the Fed from 2012-2014 requested this framework to be backtested in terms of its capacity to signal dangers, using the available historical data (interview economist involved in the backtesting exercise, 13.01.2020). Not hostile to the idea, he however requested a thorough econometric investigation before he could believe in its usefulness. This work was also to play a role in the considerations of the Board to install a CCyB framework, for which considerations began in 2013.

The actual CCyB framework and its implementation

In fact, the financial stability division had come to reconsider the CCyB, and in a change of mind had come to find it to be a rather useful tool in 2013 (interview former Fed economist, 09.01.2018). Economists, which had opposed it only years earlier (Edge and Meisenzahl 2011) were now involved in the effort of figuring out when and how it should be activated (interview economist involved in the backtesting exercise, 13.01.2020). This is the context of the ensuing work by a team of Fed economists at the Financial Stability Division, jointly with economists from the research and statistics division as well as banking analysis, which sought both to apply the vulnerability framework to the data and to operationalize it in terms of a heat map, which could visualize the impending dangers that build up in the different sectors of the financial system to policy makers (Aikman et al 2015, for an actual visualization, s. p. 49f). To do so, they selected a range of 44 indicators of developments in financial markets and of credit growth in line with the framework and

¹⁶⁵ These data and the framework would be reported in the financial stability reports, first published by the FSOC from 2011 onwards and the complemented by the Fed's own financial stability reports from 2018 onwards.

¹⁶⁶ Expression of its cutting-edge nature, it is subsequently published in 2015 in the Annual Review of Financial Economics.

merged the linked databases available at the Fed (for an overview of variables, s. Aikman et al 2015, p.43).¹⁶⁷

In their work to generate a meaningful aggregate indicator, they were facing the challenge that there was little in terms of theory they could use to impose structure on the data. As they put it:

“A central challenge to presenting a single summary statistic of vulnerability is the relatively unstructured approach we take: in the absence of a specific theory regarding how asset valuations, nonfinancial borrowing, and leverage and maturity transformation by the financial system interact to generate the vulnerability of the economy to financial stress, there is no clear direction to combining the indicators we consider into an overall assessment.” (Aikman et al 2015, 19)

This stance reflected the fact that the analytical framework to describe these relationships was still not robust and reliable enough at this time (s. chapter 4), as nothing like the “the Philipps curve to weight the news that arrive” had emerged yet (interview economist, 13.01.2020¹⁶⁸). The research team hence decided to take a rather agnostic approach about how much to weigh individual variables. Testing different ways of aggregating and normalizing the data (ibid, 47f), they find that their measure persistently outperforms the Credit-to-GDP gap in terms of predictive capacities of impending dangers (ibid, 53). They hence suggest to use this indicator for the calibration of the framework and develop simple calibration rules, which suggest that the CCyB should be activated about one third of the time, standing at its maximum of 2.5% about 15% of the time (ibid, p. 36).

Furthermore, the paper found that investor risk appetite, operationalized through dataseries on developments in financial markets, such as CDS spreads and equity prices is a good predictor of developments both in the financial vulnerabilities’ category as well as the non-financial imbalances category (ibid, p. 26f). This finding was as much political as it was economic, as it sought to establish the category of risk appetite as a firm element of the monitoring framework (interview economist 13th of January 2020). The paper also provides a tentative interpretation for this fact, arguing that

“[t]he credit cycle is triggered initially by an increase in investor willingness to bear risk, which is reflected in higher asset prices and a relaxation of lending standards. Households and businesses respond to these developments by taking on more debt, further supporting asset prices. While financial institutions are initially able to accommodate this credit expansion, as the boom continues, their balance sheets become stretched and vulnerabilities increase. This interpretation corresponds with Adrian and Shin (2010), who argue that increases in asset prices lead financial institutions to increase their leverage.” (ibid, 26f)

¹⁶⁷ While most time series were going back to the 1950s, data restrictions meant that a full calculation of the aggregate indicator could only be undertaken from 1990 onwards.

¹⁶⁸ The same economist pointed to the Growth at Risk framework as the way forward.

This tentative evidence and the capacity to predict crises based on the aggregate indicator provided credibility for the framework and its visualization through the heat map, which since then has been an element that has informed the discussions of the Board over financial stability (interview economist 13th of January 2020).

These results were also an important step towards the calibration of the CCyB framework, for which a proposal for rule making is published in December 2015. Simultaneously with the publication of the proposal, the financial stability division publishes a Fed note in December 2015 in which it revisits the Credit-to-GDP gap (s. Bassett et al 2015). This time finds it to be useful, but suggests that it should be disaggregated and complemented with “financial-system vulnerabilities related to leverage, maturity transformation, asset-prices, and/or underwriting standards” (ibid), suggesting to either employ a multiple indicator approach as in Aikman et al (2015) or by employing a qualitative consideration. It ends by stating, “What seems most crucial is the consideration of additional vulnerabilities, since, as the episode preceding the crisis suggests, a persistent increase in the U.S. credit-to-GDP ratio should not automatically be assumed to be a favorable, or even benign, financial deepening.” Given the generally positive view about finance and financial growth in the academic economic mainstream pre- and post crisis (for critical reviews s. Turner 2015, Pagano 2013), this is a remarkable statement by the financial stability division.

However, these views of economists in the Financial Stability Division did not directly impact the political decision making at the helm of the Federal Reserve. Instead, the Board, having developed a framework outlining the objectives of the tool and the factors that would influence the determination of its appropriate level went through a period of public consultation, that had to be extended by a month due to wide interest for comment.¹⁶⁹ It was concluded by March 21st 2016. Following this process, the Board aligned its final policy statement in September 2016 with requests by industry to follow a cautious approach to setting the CCyB, now including new wording that refers to “excessive” credit growth, which had to be “meaningfully above normal” to bring about action (Federal Reserve System 2016). It furthermore assured industry that it would provide notice and seek comments before changing the CCyB, reflecting the administrative procedures common in the US.¹⁷⁰

The final CCyB regime in the US, as established by the policy statement and in contrast to the suggested rules by the Financial Stability Division (Aikman et al 2015, 36f) was set such that the CCyB would be 0% most of the time, a level at which it was kept to this date. The argument was

¹⁶⁹ <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20160129a.htm>

¹⁷⁰ S. <https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20160908b1.pdf>
<https://www.federalreserve.gov/newsevents/pressreleases/bcreg20160908b.htm>

that the measures taken to increase the resilience of the system after the financial crisis would make anti-cyclical interventions largely unnecessary. In the words of Vice-Chairman for Supervision, Quarles, when justifying the decision to keep the CCyB at 0% in March 2019: „A notable feature of the Board's current framework is the **decision to maintain a 0 percent CCyB when vulnerabilities are within their normal range**. Because we set **high, through-the-cycle capital requirements in the United States that provide substantial resilience to normal fluctuations in economic and financial conditions**, it is appropriate to set the CCyB at zero in a normal risk environment. Thus, our presumption has been that the CCyB **would be zero most of the time**.“ (Quarles, 2019a, emphasis mine)

This overall stance largely excluded anti-cyclical policy making in practice, both for structural and ideological reasons. The establishment of a scientific monitoring framework and the subsequent decision to publish semi-annual financial stability reports from November 2018 onwards, which communicates the assessment of the build-up of financial vulnerabilities in the US puts the Federal Reserve Board into a potentially awkward position (interview former Fed economist, 09.01.2018), as observations can hardly translate into action. Instead, it feeds into an institutional set-up in which the Fed has very limited powers to actually engage in macroprudential policies. This contradiction between analysis and framework of action places the Fed potentially in a bind, whereby the financial vulnerability monitoring framework allows the Fed to observe phenomena which it deems problematic but where it has very limited capacity to intervene. As one former financial stability division economist at the Fed put it, „what good is it to have a financial stability report, when you cannot do much about it anyway?“¹⁷¹

And yet, in the same speech of March 2019, Vice-Chair for Supervision Quarles notices with fascination the changes in the CCyB framework in the UK, which places it above 0 to be able to fluctuate it up and down, while reducing fixed capital requirements slightly. Consequently, in September 2019 the Federal Reserve considers the option to set the CCyB at a level higher than 0, in order to be able to move it up or down (Quarles 2019b) in the context of the introduction of a stress capital buffer (SCB), that was initially proposed in April 2018. This proposal is accompanied by research by the Financial Stability Division (Berrospide and Edge 2019) that investigates the

¹⁷¹ The fact that this focus on structural measure is not only a matter of predilection, but also of institutional constraints can be gauged from the fate of the only counter-cyclical decision taken by the Fed to date, the guidance on leveraged lending in 2013 (s. <https://www.federalreserve.gov/supervisionreg/srletters/sr1303a1.pdf>). Getting this guidance published required the agreement by all banking supervisors in the US and required careful negotiation. It was officially portrayed as a micro-prudential measure by the lawyers of the Federal Reserve, given the limited financial stability mandate of the Fed (interview former Fed official 9th of January 2018). This guidance later on was declared null in 2017 by the Government Accountability Office, because it had de facto the character of a regulation and therefore was supposed to be presented to Congress ((<https://www.americanbanker.com/list/6-policy-responses-to-leveraged-lending-fears>), leading the Office of the Comptroller of the Currency to declare that it would no longer enforce the guidance.

impact that raising the CCyB might have upon credit provision, using the stress test-imposed capital buffers as a stand-in. It finds that overall credit provisioning most likely would not be affected, thereby removing one more uncertainty hindering the implementation of a more active CCyB. Future policy changes based on the UK example might be possible, ironically drawing on ideas which were initially developed within the Fed itself.

« Die Gedanken sind frei »: When an idea goes on a trip

Despite this blockage in terms of policy actions for the CCyB, researchers within the Federal Reserve continued their work on the measurement of cyclical vulnerabilities developing in the financial sector, arguing that it should be taken into account when conducting monetary policy (Adrian and Liang 2016). These works “point out that monetary policy impacts financial conditions as well as vulnerabilities, thus producing an intertemporal trade-off for monetary policy between present macroeconomic objectives and risks to objectives in the future” (Adrian et al 2016, 20). Researchers at the Federal Reserves under the direction of Tobias Adrian then developed the “Growth-at-Risk framework” (Adrian et al 2016) in an attempt to operationalize these concerns, seeking to quantify this trade-off by visualizing the downside growth vulnerabilities created by excessively loose monetary policy with respect to developments in financial markets (ibid).

The development of this analytical framework was motivated by the desire to provide actionable knowledge to the Federal Open Market Committee (interview former Fed economist, 20th of August 2018). It is a path dependent outgrowth of the financial stability framework, placing at its center the volatility paradox and the underpricing of risk (Adrian et al 2016). The researchers at the Federal Reserve used these insights to explore more in depth the possible impact developments in financial markets could have upon GDP, reformulating the problematique of the financial cycle in a new language and linking it to what matters most, namely economic growth. It replicates the openness to the existence of the financial cycle in its analytical framework, by including both external shocks as well as endogenous risk build-ups within the financial system¹⁷². Just like earlier work by Adrian on CoVar (Adrian and Brunnermeier 2008), the Growth-at-Risk framework, is based on the technique of quantile regression, a technique to anticipate tail risk by focusing on the tail quantiles of a distribution, in this case the distribution of growth. The researchers then measure the build-up of endogenous vulnerabilities within the financial sector and their effect on the future distribution of

¹⁷² The term “financial cycle” is only used once in Adrian et al 2019, when referencing a paper with that term in the title.

growth to act as an early warning system (Adrian et al 2016, 1), much in line with what chapter 5 described as the emerging hinge between central bank and academic economists.¹⁷³

The investigation by Adrian et al (2016) finds that as financial vulnerabilities build up, tail risks to growth increase in an asymmetrical fashion: while positive surprises to growth do not increase, the possibility for recessions strongly do, hence requiring preventive action to mitigate these effects. This work bundles all the different indicators assembled within the Fed into a simple number that can be communicated to policy makers on a 3 months basis, in other words it is “actionable knowledge” (interview former FED economist, 20th of August 2018). This growth at risk framework, which was developed over a decade by Tobias Adrian and collaborators proved impossible to implement at the Fed, which instead had chosen the path towards resilience as the way forward. Instead, the model has had an interesting career. The paper, which was published in April 2019 in the prestigious American Economic Review was adopted by the IMF as a central element for its Financial Sector Assessment Program in 2017, right after Adrian had moved there to become the Director of the Capital Markets Department. It was also to become one of the early warning systems that feed into the setting of counter-cyclical policies in the European Union, with its most prominent role in the UK, where from 2019 onwards it is used to directly inform the setting of the CCyB.

First steps to setting the CCyB in the European Union

Once the transatlantic crisis hit the European Union in 2008, the field of banking regulation and supervision in Europe came into motion in a way that would substantially alter its set-up, empowering in due course national central banks and in particular the ECB (McPhilemy 2015, Schelkle 2017). Reform efforts began in earnest with the publication of the De Larosiere report in 2009. That report specified the lack of macroprudential supervision within the EU as one of the main shortcomings revealed by the crisis (De Larosiere et al 2009, p.39). While the authors fiercely opposed granting any microprudential powers to the ECB on the fears of interfering with the setting of monetary policy (interview economist involved in the report, 12th of March 2018), they advocated to grant it a central role for macroprudential supervision within the context of the European System of Central Banks (ESCB), which were seen as uniquely positioned to inform such an analysis.¹⁷⁴ The ECB was to chair the European Systemic Risk Council (ibid, 46, later to be named European Systemic Risk Board), whose task it was to develop effective early warning

¹⁷³ In content, it clings to the concerns of the macroprudential community, such as the underpricing of risk or the build-up of vulnerabilities, but it avoids formulating it in terms of the financial cycle, but instead speaks simply of vulnerabilities.

¹⁷⁴ The ESCB comprises the ECB and the national central banks (NCBs) of all EU Member States, whether they have adopted the euro or not.

systems for the EU as a whole and for national economies. It was to issue recommendations and warnings to nationally competent authority who were charged with implementing macroprudential measures based on the early warning systems it developed. In this task it was to be supported by the financial stability division of the ECB,¹⁷⁵ which from 2010 onwards also began to produce country-level specific analyses in addition to analysis for the Euro-Area as a whole (interview ECB economist, 09.05.2016).¹⁷⁶

These proposals were transformed into EU regulation in November 2010 and the ESRB was founded on the 1st of January 2011. Of all the bodies created after the De Larosière report, the ESRB is arguably the least authoritative and most coordinative body (Haar 2015, 174, McPhilemy and Roche 2013), as it only has the capacity to issue non-binding recommendations and warnings, with which National Competent Authorities are expected to comply or explain. Organizationally and operationally very closely tied to the ECB, both in terms of its setting within the ECB and its staff (McPhilemy 2015, 160) but also with respect to its financial stability analysis, the ESRB is supposed to coordinate 61 members from national competent authorities in their macroprudential decisions (Haar 2015 175). To help that coordination, on the same day, the first of January 2011, the Financial Stability Committee of the European System of Central Banks is installed. Chaired by the Vicepresident of the ECB responsible for financial stability it is tasked to facilitate exchange between the national central banks, the ECB and national supervisory authorities to support the Governing Council of the ECB in the fulfillment of its tasks relating to financial stability.

The Delarosiere report and the regulations which followed it hence installed a dispersed distribution of macroprudential powers, within which national competent authorities were to take measures in coordination with and supervised by the ESRB, that was to bundle the collective view on developments within the EU held within the European System of Central Banks and coordinate it with the different national bodies in charge of prudential supervision. This fragmentation installed at the heart of the European regime for macroprudential supervision a need for coordination and consensus between different technocratic entities in the European Union over cyclical developments (interview ECB economist 09.05.2016), as the ECB and the ESRB are largely bound to moral suasion and the attempt to convince policy makers to engage in the CCyB and other anti-cyclical measures (s. the case of Germany below).¹⁷⁷ It thereby raises the importance of commonly shared

¹⁷⁵ s. Council Regulation (EU) No 1096/2010 of 17 November 2010 conferring specific tasks on the European Central Bank concerning the functioning of the European Systemic Risk Board.

¹⁷⁶ This change of focus was both due to a specific request to support the emerging ESRB, but also due to the insight generated by the crisis that financial stability monitoring required national level analysis.

¹⁷⁷ The ESRB is arguably the least authoritative and most coordinative body of the bodies suggested by the Delarosiere report (Haar 2015, 174, McPhilemy and Roche 2013), as it only has the capacity to issue non-binding recommendations and warnings, with which National Competent Authorities are expected to comply or explain.

frameworks of meaning and measurement to come to a consensual agreement. It is also for that reason that among the three jurisdictions looked at, economists at the ESRB and the ECB have arguably invested the most in the generation of different measurement devices and why, according to interview sources (interview academic economist 30.05.2015), the ESRB is the macroprudential body which embraces most the engineering view on systemic risk and macroprudential regulation, believing in its measurability and clear capacity to instruct action based on science.

Seeking to take intellectual control over this task, the ECB and the ESRB could draw upon a rather long lineage of intellectual work at the ECB on systemic risk, including the ECB Working paper on systemic risk (DeBandt/Hartmann 2000), which was a crucial node in the early discourse on systemic risk (s. chapter 3).¹⁷⁸ Driven by the ECB under its Vice-President Constancio (in office from 2010 to 2018), the European System of Central Banks (ESCB) substantially expanded this expertise and engaged in a sustained and collective effort to generate new tools and metric devices. For that purpose, the European System of Central Banks assembled in 2010 199 applied economists from the European System of Central Banks with the “objective of developing core conceptual frameworks, models and/or tools that would provide research support, in order to improve macroprudential supervision in the European Union” (EU) (ECB 2014, 4)¹⁷⁹. These efforts gained additional urgency and importance with the political decision to install Banking Union and the Single Supervisory Mechanism in the Euro-Zone, granting an even bigger role to the ECB (interview ECB manager, September 11th 2019).

It was in the context of these tumultuous changes to the governance structure that the European Commission began its work on implementing Basel III in 2011, immediately after the publication of the BCBS document. This decision for rapid implementation meant that European central banks were overtaken by the speed of the political process in their assessment of the CCyB and possible methods for setting it up, scrambling to influence the process as it unfolded (interview Bundesbank economist, 06.11.2015). On 20th of July 2011, the European Commission published a draft of the Capital Requirements Directive which was to transpose Basel III into EU law (EC 2011). National authorities were to be designated that would decide the setting of the CCyB on a quarterly basis. The document envisioned both a transposition of the CCyB as set out in the Basel Accord as well as the methodology the Basel Committee on Banking Supervision (BCBS) had set out (ibid, p.23), but allowed for further structural variables to be taken into account by national authorities. In this

¹⁷⁸ Johnson et al (2019) in their review of central bank speeches find that the ECB engaged in the macroprudential discourse earlier than the average central bank in their sample, and well before the great financial crisis. Unfortunately, they do not differentiate the Bank of England, which most likely had an even earlier engagement.

¹⁷⁹ The project lasted for four years, held three large conferences at the ECB and yielded 161 individual research papers, including 72 ECB Working Papers as well as 50 published journal articles (ibid).

context, it deemed it “appropriate that the [newly founded] European Systemic Risk Board (ESRB) develops principle tailored for the Union economy”, making it “responsible for monitoring their application” (ibid, addition mine). This suggestion hence foresaw to embed the setting of the CCyB within the decentralized system of macroprudential supervision as it was installed in the EU following the suggestions by the De Larosière report in 2009 (De Larosière et al 2009).

While the final shape of CRD IV was still negotiated in Brussels (interview Bundesbank official, 06.11.2015), the ESRB therefore set up an instrument working group in 2012 to test the capacity of the suggested Basel Committee on Banking Supervision (BCBS) framework to function as a reliable indicator. Composed of 30 people delegated from different national European central banks, this group engaged in econometric studies that tested the suitability of the Credit-to-GDP gap in light of historical country-specific evidence. It met about every three months and exchanged on the results of the first tests for different countries (interview Bundesbank official, 06.11.2015). A particular finding of this group was that due to different historical paths in Europe the credit to GDP gap was not a reliable indicator for Eastern European countries because they had experienced a very strong above trend growth of credit to GDP post-1989 which was due to what could be called „financial deepening“. Hence for these countries, the credit to GDP gap was deemed an inadequate indicator (interview Bundesbank economist 06.11.2015) and alternative and more appropriate indicators were chosen. Through its early start, the work of the ESRB working group was already well advanced when the European Directive 2013/36 in Summer 2013 implemented Basel III in Europe and with it the CCyB.

Based on the econometric work of the working group, the ESRB publishes in the summer of 2014 its recommendation on guidance for setting countercyclical buffer rates (ESRB/2014/1- 2014/C 293/01), where it ties the objective of the CCyB to “the sustainable provision of credit to the real economy throughout the financial cycle” and specifies that the credit to GDP gap as specified in the Basel III framework as the default way for setting the CCyB (ESRB/2014/1- 2014/C 293/01, p. 5). At the same time, it acknowledges that for specific countries this measure can be ill-adjusted due to the specificities of the structural features of these countries and that other non-specified variables shall be taken into account (ibid). Concomitant with this guidance, the ESRB also published a working paper, which summarized the findings of the working group over the course of the last two years (Detken et al 2014), which reveals both the extensive econometric testing that had been undertaken but also the difficulties in generating more robust and reliable indicator guidance due to insufficient data availability with respect to all countries.

The group had tested different uni-variate and bivariate measures to detect the cyclical build up of systemic risks and in general found the Credit to GDP gap to be the most robust and best-performing univariate indicator (Detken et al 2014, 1). However, they also identified several alternative specifications including several indicators, such as real estate price appreciation that could improve upon the capacity of the Credit-to-GDP gap (ibid, 23, 36), but found the results not to be robust enough, also due to data gaps (ibid, 36).¹⁸⁰ Hence, the credit-to-GDP gap was deemed the best indicator, a decision also driven by the desire to ensure comparability among countries, given that other specifications did not materially improve upon the Basel method (interview Bundesbank economist, 06.11.2015). This view was furthermore bolstered by the fact that there was already some follow up work at the Bank for International Settlement, dispersing some doubts regarding the reliability of the indicator (interview Bundesbank economist, 06.11.2015, s. Drehmann et al, 2011, Drehmann and Julius 2014 and Drehmann and Tsatsaronis 2014). At that moment in time, the group was therefore recommending an approach they themselves designated as the least costly path towards a calibration framework called “Basel-revisited” (s. table 7.1 for an overview of the different models below), while not excluding more rigorous approaches in the future, such as a calibration based on stress tests or cost-benefit analyses. Such approaches would require an improved specification of the effects of capital on resilience (p. 51), which at that moment in time were not deemed sufficiently robust and were hence seen to require further research.

¹⁸⁰ These findings were in line with early work from the Bank of England which indicated that augmenting this indicator through other variables would improve its performance (Giese et al 2014). Giese herself was a member of the working group.

	Method	Pros	Cons	
Probability-based approach	'Basel-revisited'	Simple, mechanistic approach to link indicator levels to benchmark buffer rates. Easy to communicate.	Ad hoc (especially the choice of the upper benchmark buffer rate). Only probability based.	
	Containing crises Probabilities	Structured approach. Easy to communicate.	Only probability-based. Robust estimate of feedback assumptions difficult.	
Loss-based approach	Unexplained residual losses	Explicitly associates losses linked to credit cycle to indicators.	Based on typical losses that have occurred in past crises episodes.	
	Stress tests	Focuses on resilience in a forward-looking way.	Requires high degree of transparency and good communication.	
	Cost-benefit	Most rigorous approach. Provides estimate of the maximum buffer rate.	Complex functional assumptions or estimations needed to link CCBs to costs and benefits.	

Table 7.1: Pros and cons of different approaches to calibrating benchmark buffer rates, taken from Detken et al 2014, page 50

Researchers at domestic central banks subsequently used the input of this work to specify the best possible way of measuring the financial cycle and calibrating the CCyB, most often directly relying on the credit to GDP gap as the central indicator, also due to the central position of the credit-to GDP gap in the 2013 EU directive (for the case of Germany, s. Tente et al 2015, for the deviating case of the UK, see below). Within the Euro-zone, this work occurred in the context of an intensifying exchange between national competent authority and the ECB, which was granted co-decision making powers with the advent of the SSM in 2014. These new macroprudential top-up powers gave rise to an intensified exchange between the national central banks and supervisory authorities engaged in calibrating these buffers and the ECB regarding the latter's analysis of cyclical developments in these countries.

From assessment to action- The negotiated setting of the CCyB in the Eurozone

The calibration of the CCyB within the Euro-Zone received a strong push towards increased cooperation between national competent authorities and the ECB within the Euro-zone with the advent of the banking union and the instalment of the Single Supervisory Mechanism that was legislated on October 15th 2013 (Council Regulation (EU) No 1024/2013). Article 5 of that regulation bestowed direct macroprudential powers on the ECB, based on a concern for financial

stability formulated in Article 127(5) of the Treaty on the Functioning of the European Union.¹⁸¹ With its coming into force in November 2014, the ECB could now decide to top up measures established in CRD IV and CRR that were decided upon by national competent authorities (Haar 2015, 183), including the counter-cyclical capital buffer. This installed effectively a co-decision-making process between the ECB and national competent authorities, although the NCAs are still the primary decision takers (interview ECB manager 09.05.2016,), as the ECB is tasked to cooperate closely with them in case it wishes to top up measures (s. Council Regulation (EU) No 1024/2013, article 5, paragraph 4; Alexander 2017,356).¹⁸² Figure 7.1 below illustrates this new distribution of macroprudential powers in the Eurozone.

	CRD IV Tools	CRR Tools	Other Tools
Capital-based measures	<ul style="list-style-type: none"> • Countercyclical capital buffer (CCB) • Systemic risk buffer (SRB) • G-SII & O-SII capital buffer 	<ul style="list-style-type: none"> • Risk weights for real estate sector and intra-financial sector exposures • Capital conserv. buffer • Own funds level 	<ul style="list-style-type: none"> • Leverage ratio
Liquidity-based measures		<ul style="list-style-type: none"> • Liquidity requirements • Large exposure limits (incl. intra-financial sector) 	<ul style="list-style-type: none"> • Non-stable funding levy • LTD ratio caps
Borrower-based measures			<ul style="list-style-type: none"> • LTV ratio caps • LTI ratio caps • DSTI ratio caps • DTI ratio caps
Other measures		<ul style="list-style-type: none"> • Large exposure limits (incl. intra-financial sector) • Disclosure requirements 	<ul style="list-style-type: none"> • Margin and haircuts requirements
<p>Can be used by national authorities and the ECB (for SSM countries)</p>			<p>Can only be used by national authorities</p>

Figure 7.1 The distribution of powers to set anti-cyclical macroprudential policies in the EBU (figure taken from Constancio et al 2019, p. 22)

Within the context of this changed legal mandate and following the initial specification of the CCyB in the ESRB working group, researchers at the financial stability division within the ECB and at the ESRB focused their efforts on the refinement of the measurement of the financial cycle, both at the level of the Eurozone but also for its national level components (cf. Schueler, Hiebert and Peltonen 2015, 2017) in order to justify the ECB's views on the need to take anti-cyclical macroprudential actions. This endeavor sought to both produce a vision of the financial cycle for

¹⁸¹ Here the ECB based itself on a provision in Article 127(5) of the Treaty on the Functioning of the European Union, which specified that “The ESCB shall contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system.” (<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:12008E127&from=EN>)

¹⁸² Legal uncertainties over this burden sharing remain, e.g. regarding the question in how far the ECB could raise measures which have not even been activated by NCAs (interview former ECB manager, 11th of September 2019).

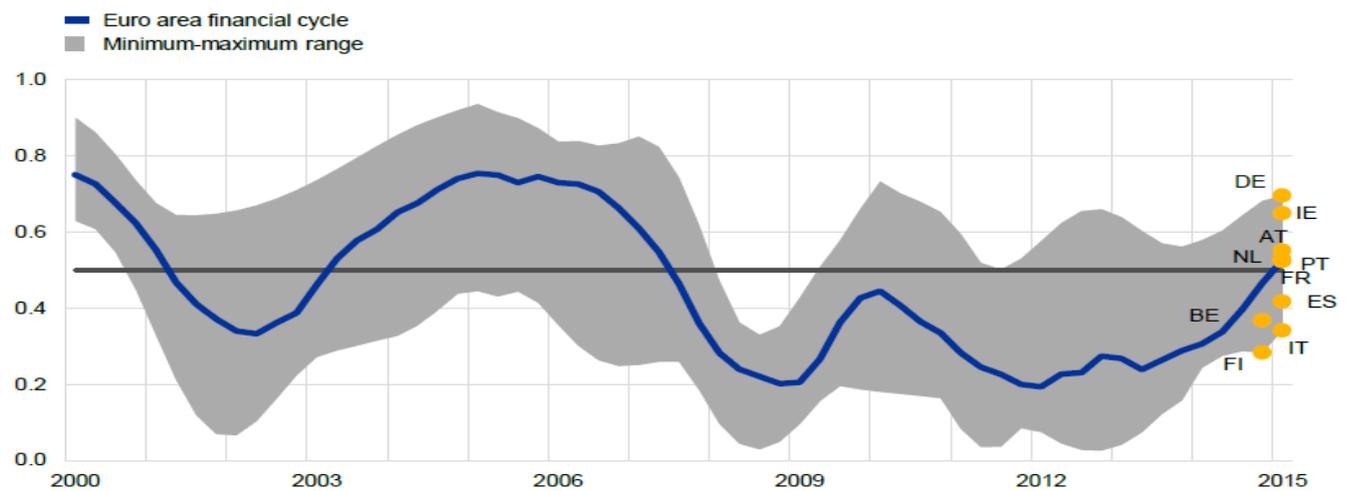
the Euro Area as a whole and for individual countries at the same time, paying both attention to the individual country level specificities and the common trend.

In the course of this work, Yves Schueler, a young Postdoctoral researcher hired in the ECB financial stability division in 2014 detected severe shortcomings in the way in which the Credit-to-GDP gap was supposed to be measured according to the proposal of the Basel Committee. The critique centered around a faulty specification of the filter used to detect cyclical developments in the data. In simple terms, the specified setting of the HP filter, a commonly used filter in business cycle research at the level of 400.000 created financial cycles at a spurious and too great length. This had immediate implications for the capacity of the Credit-to-GDP gap to function as a reliable early warning indicator, as it implied that in a bust phase, the credit to GDP gap thus calculated could not show any rise of the cycle for several years independent of actual developments in the data. The filter specifications would simply filter out any rise in the short-term (s. Schueler et al 2015, Schueler 2018a, b, Constancio et al 2019, 54). Schueler and his senior colleagues at the ESRB therefore proposed to use a multi-spectral approach instead, which used the co-movement of asset prices and credit growth jointly. They found this measure to outperform the credit-to-GDP gap based on the HP filter as proposed by the BIS (Schueler et al 2015, 3).

Figure 7.2 below displays the calculation of such a Euro-Area financial cycle with this new method, which is the weighted and aggregated average of all Eurozone countries together. It also displays the diversity of country financial cycles, with Germany being already well in the upswing phase in 2015, whereas countries such as Italy or Finland are still in the bust-phase. Such divergences were seen to provide additional impetus for country-specific anti-cyclical action. As Schueler et al put it, “Moreover, the distinct characteristics of financial cycles relative to business cycles within countries, as well as their divergences across countries, indicate that there is a potential scope for specialised country-level macroprudential policies targeted at the build-up of systemic risks.” (Schueler et al 2017, 3f).

Historical analysis of country financial cycles in the euro area

(correlation of financial variable with financial cycle)



Source: ECB calculations based on Schuler et al. (2017).

Notes: (Q1 2000 – Q2 2015; normalised deviation from historical median). The shaded area marks the locations of financial cycles of ten euro area countries (AT, BE, DE, ES, FI, FR, IE, IT, NL and PT). Figures for BE and FI refer to Q4 2014, while figures for PT refer to Q1 2015.

Figure 7.2: Historical analysis of country financial cycles in the euro area, taken from Constancio et al 2019, 54

This work on the length of cycles and other models developed to measure cyclical developments (s. Lang et al 2019) directly fed into the deliberations over the calibration of the CCyB between national central banks and the ECB. These deliberations took place in the Financial Stability Committee (FSC) of the ESCB, as the body in which macroprudential assessments of individual country developments of that division are discussed before entering the decision-making process of the ECB (s. figure 7.3 below).¹⁸³

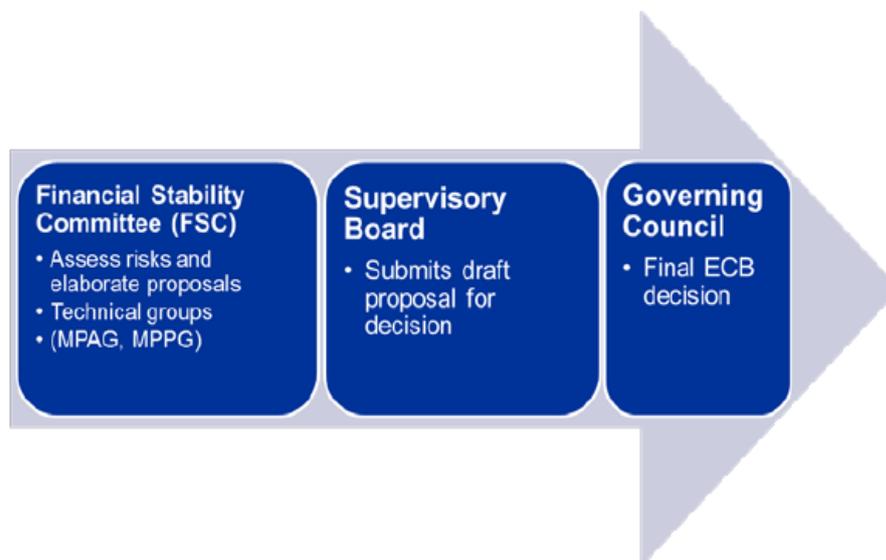


Figure 7.3 : Preparation of macroprudential policy decisions at the ECB, taken from Constancio et al p2019, page 24

¹⁸³ The latter also draws on insights generated by the supervisory board that introduces knowledge generated by the SSM into the decision making process. The microprudential supervisors by the SSM are in constant exchange with the financial stability division, inserting their data and their expertise (interview ECB manager 30th of December 2019).

Subordinated to the FSC are the macroprudential analysis group (MPAG), where the common models and data sets for country level analysis are developed and discussed at an expert group level and the macroprudential policy group (MPPG), which discusses its implications at a policy level.¹⁸⁴ In these fora, discussions focused on the by then expanded country level analyses of the ECB Macroprudential Policy Division, which had come to the length of more than 200 pages per country (interview ECB economist 09.05.2016)¹⁸⁵. In order to coordinate better on these reports and to increase their legitimacy, the leader of the macroprudential analysis group, who was also the leader of the financial stability surveillance division at the ECB deemed it crucial to determine common methods and a common data set ex ante, which had to be accepted by all the national authorities which were supposed to enforce these measures. As an ECB official put it, “if we had not done this and a model would signal dangers, then they [national authority] would say you have used the wrong data series on credit and you can always find one among the ten, where the results do not show up ...and so we have agreed on certain things to be reported...and it was a necessary condition that such a model can have any role“ (interview ECB economist, 09.05.2016, translation mine).

Using the „veil of ignorance“ over data set collection and models before the results were generated, the expert group set out to agree ex ante on a limited set of models and data sets in order to increase legitimacy of future results. This method of generating commonly accepted models and data sets was part of a strategy of the ECB to overcome the computing power advantages of the nationally competent authorities (interview ECB economist, 09.05.2016). This was motivated by an assumed „national inaction bias“ of national authorities with respect to counter-cyclical regulatory measures (s. Constancio et al 2019, 3),¹⁸⁶ an inaction bias grounded both in the political economy of the effects of the measures which have to be taken if there is a detected build up of cyclical systemic risks and in a bias of perception, which tends to see one’s own house in order (interview ECB economist, 09.05.2016). In order to overcome that national inaction bias, the ECB instituted a process, which based on these mutually agreed models grants the ECB the task to detect the build-up of systemic risks and requests the national competent authorities to take measures if the models request it or explain why they think that in this particular instance no action is required.

¹⁸⁴ From there the discussions are taken to the Financial Stability Committee, which feeds its work into the MacroPrudential Forum (MPF), which seeks to facilitate the collaboration between the ECB Banking Supervision and the Directorate General Macroprudential Policy and Financial Stability (DG/MF). Joining micro- and macroprudential expertise at the ECB, it seeks to advise the Supervisory Boards on the proposal it formulates for the governing council.

¹⁸⁵ Alternatively to the use of these top-up powers, the ECB could insist as the supervisor of the 118 largest banks in the Eurozone upon higher risk weights for real estate assets for banks using the Internal Risk Based approach (Constancio et al 2019, p. 56). However, to date this approach has not been used (interview ECB manager 30.12.2019)

¹⁸⁶ The conduct of macroprudential policy is a joint endeavour between the national competent authorities and the ECB. The latter can only further tighten measures decided at the national level, the rationale being that the ECB’s role is to counter any possible “inaction bias” on the part of member countries.“ (Constancio et al 2019, page 3)

In this way, „the burden of proof is shifted“ (interview ECB manager 09.05.2016) to the national authorities, allowing the ECB team of about a dozen experts to match the computing power and expertise of national central banks, which might employ twenty or more persons to assess financial stability risks in their particular countries (interview ECB manager 09.05.2016). The ECB uses the different early warning systems it has developed to compose a country level report that it sends to individual countries. These country reports are not public in order to prevent having discussions in public.¹⁸⁷ They signal impending dangers from the point of view of the ECB, based on the results of the different indicators of the early warning system. Like a red light, they signal problems in the format of yellow and red (s. table 7.2 below). The table illustrates the use of different models and the disclosure of different specifications (theta) by the ECB, which are meant to invite discussion between national experts and the ECB over model specifications (interview ECB manager 09.05.2016)¹⁸⁸.

¹⁸⁷ One of these reports was shown to me on-site within the ECB, it contained several hundred pages of analysis.

¹⁸⁸ The figure is not using actual countries, as these information are not publicly available, but illustrates the format of information.

Identified vulnerabilities based on selected multivariate early warning models

Latest observations	Bank Early Warning Model ¹⁾	Logit Model ²⁾	Random Forest ³⁾	Bivariate Signalling ⁴⁾		Markov Switching Model ⁵⁾
	Q1 2018	Q4 2017		Bank credit/GDP gap	Real equity price growth (3 years)	
				Q4 2017		
Country 1	9.2	0.1	13.3	-51.9	11.4	0.5
Country 2	5.5	17.2	24.8	5.5	3.1	3.8
Country 3	4.5	5.2	6.7	-2.4	7.5	2.0
Country 4		6.2	4.5	-5.4	6.7	1.5
Country 5	27.7	0.2	7.1	-54.7	-8.4	1.6
Country 6	15.9	2.1	3.0	-13.8	7.0	1.0
Country 7	4.0	0.2	2.2	-42.1	0.7	0.7
Country 8	7.7	0.6	2.0	-22.5	-15.6	1.0
Country 9		10.3	34.5	3.6	18.3	
Country 10	5.6	7.8	5.9	-7.5	16.6	2.2
Country 11	9.8	12.6	18.2	0.8	10.1	2.7
AUROC	0.85	0.83	0.94	0.84		
High threshold: theta = 0.3	18.08 (CP: 0.46 / T1: 0.44 / T2: 0.07)	15.91 (CP: 0.38 / T1: 0.33 / T2: 0.16)	17.15 (CP: 0.71 / T1: 0.30 / T2: 0.02)	6.12 / 7.93 (CP: 0.49 / T1: 0.42 / T2: 0.06)		
Med-high threshold: theta = 0.4	12.73 (CP: 0.32 / T1: 0.31 / T2: 0.15)	12.46 (CP: 0.33 / T1: 0.23 / T2: 0.22)	12.77 (CP: 0.42 / T1: 0.18 / T2: 0.07)	6.12 / 7.93 (CP: 0.49 / T1: 0.42 / T2: 0.06)		
Medium threshold: theta = 0.5	8.24 (CP: 0.23 / T1: 0.18 / T2: 0.27)	11.99 (CP: 0.32 / T1: 0.20 / T2: 0.24)	12.62 (CP: 0.41 / T1: 0.18 / T2: 0.07)	0.27 / 6.91 (CP: 0.26 / T1: 0.24 / T2: 0.24)		
Med-low threshold: theta = 0.6	7.03 (CP: 0.21 / T1: 0.14 / T2: 0.32)	11.28 (CP: 0.30 / T1: 0.18 / T2: 0.27)	11.09 (CP: 0.29 / T1: 0.13 / T2: 0.13)	0.1 / 7.07 (CP: 0.25 / T1: 0.22 / T2: 0.25)		
Low threshold: theta = 0.7	6.44 (CP: 0.20 / T1: 0.12 / T2: 0.35)	11.28 (CP: 0.30 / T1: 0.18 / T2: 0.27)	10.08 (CP: 0.17 / T1: 0.07 / T2: 0.28)	-0.44 / -10.87 (CP: 0.2 / T1: 0.15 / T2: 0.38)		
Conditional crisis probability > 40%			Conditional crisis probability > 25%			
Conditional crisis probability > 35%			Conditional crisis probability > 20%			
Conditional crisis probability > 30%			Conditional crisis probability > 15%			

Table 7.2 Identified vulnerabilities based on selected multivariate early warning models (taken from Constancio et al 2019)

Once these early warning systems and the inversion of proof were introduced in 2015, these measures created some concerns among economist in national central banks, as they feared a degree of automaticity in terms of setting the CCyB that would leave no discretion to the national authorities (interview Bundesbank economist 25th of July 2016). Agents at national central banks were scared that a red flag by these models would automatically define the need to take action, in effect limiting the discretion of national authorities and their capacity to juggle political sensitivities in their countries. In the end, however, there was more discretion than feared, as these discussions are not driven by singular models' detection of upcoming crises, but instead by the ongoing expert discussion which occur in different fora of the ESCB.

As the ECB clarifies, when analyzing the setting of the CCyB for European countries, the ECB is wary of using the credit to GDP gap indicator of the Basel Committee as a guide and instead prefers

to use other model based inputs and to coordinate with national authorities assessments based on their national frameworks (Constancio et al 2019, 53). In this effort, „[m]odel- based inputs will serve as the ECB’s starting point for calibration discussions within the Eurosystem, *in which expert judgement and knowledge about the sources of cyclical risks, as well as detailed information on the specificities of national financial sectors, will always be a key input.*“ (Constancio et al 2019, 42, emphasis mine). This expert judgment crucially stems from the ECB itself, which has build up a division with country level experts. However, these assessments are then fed into the dialogue between ECB and the nationally competent authorities in the Financial Stability Committee, right at the beginning of the regulatory process.

In the final analysis, the decisive expertise resides in the financial stability departments in national central banks, a fact amplified by the information asymmetries that exist between them and the ECB (interview German supervisor 10.01.2020). Despite a highly skilled expert group within the ECB (interview German BaFin 17.01.2020), the ECB can only structure the dialogue with national central banks through its models, but it cannot completely equalize the latter’s manpower advantages (ECB manager 09.05.2016). This final reliance on expertise within countries is also based on awareness of the dangers of models falsely capturing risks. The cautious ECB’s stance on the model’s input into policy making can be read off their statements on what is probably the most important ingredient of the financial cycle, namely risks emanating from the real estate sector. Hence, they argue that overvalued housing markets are not a necessary condition for real estate risk, as market prices tend to undershoot fundamental values in a crisis, but consistent overvaluation messages across different types of models are seen to provide a warning signal for potentially large corrections in the future. The report continues that these „mechanical ratings are adjusted by expert judgement taking into account country-specific information.“ (ibid, page 54) Rather than directly using its top up power, which the ECB has never done to this date (January 2020), it is in the dialogue with the national authorities that the ECB seeks to exert its influence, but it can take years before that suasion is successful as shown by the example of Germany.

The debate over the use of the CCyB in Germany

In Germany, the CCyB was officially introduced on the first of January 2016. It was to be set by the Ausschuss fuer Finanzstabilitaet (the committee for financial stability); with the Bundesbank, the German banking supervisor BaFin and the Ministry of Finance sharing the committee in a tripartite fashion. The committee is chaired by the ministry of finance, with 3 high level delegates from each institution meeting on a quarterly basis from 2013 onwards to discuss financial stability

developments in Germany.¹⁸⁹ The reason for this particular division of tasks, which assigns the role of analysis to the Bundesbank and the final decision to the ministry of finance and its subordinated agency BaFin resides in constitutional concerns over the independent central bank taking distributive decisions, which in the end are political (interview Bundesbank economists, 22nd of October 2014). In quarterly meetings, the committee has to decide upon the need for the CCyB to be activated and at what level, a decision it communicates to the ECB 10 days before the official decision is announced (interview BaFin economists, 17.01.2020). In the work of this committee, the rising house prices in Germany from 2010 onwards have played a persistent role, leading to the question whether Germany should raise its CCyB or not.

The Bundesbank, as the agency in charge of preparing the analysis underlying the political decision, which is published annually in the financial stability review has persistently singled out the housing price dynamic in Germany since 2013 as meriting sustained attention, speaking of overvaluations of more than 20% in cities (s. e.g. Bundesbank 2014, 2015, 2016). And yet, it was cautious with regard to the cyclical rise of systemic risks, not calling explicitly for a raise of the CCB, explaining the phenomenon mostly as an effect of supply and demand. It changed its language from the financial stability review 2017 onwards, calling for a close monitoring of house price developments (ibid, p. 47f) as it noted that price appreciations beyond fundamentals continued. From February 2018, it has been more or less explicitly been pushing for the need for a CCyB in Germany due to the rise in property markets (Bundesbank 2018a), first with cautious language speaking of estimates of about 15 to 30% of price exaggerations (ibid, p.54). In the Financial Stability Review of November 2018, the Bundesbank is then expressly evoking other European counterparts, which had set higher rates despite the credit to GDP gap and the buffer guidance not indicating any need for action (Bundesbank 2018b, p. 50). In this context, the Bundesbank itself emphasizes that there is no mechanical link between the buffer guidance and the way the buffer is subsequently set.

This marked a change of policy stance, as the Bundesbank for several years had used the fact that the Credit to GDP gap, calculated according to the initial proposal by the BIS had not been above 0, using this measurement to justify inaction (interview Bundesbank economist, 16th of October 2019). This change in policy stance was preceded by a multiplication of ways of measuring cyclical risks in the Financial Stability Review from 2017 onwards, a new pluralism that was including a new Early Warning Indicator (Financial Stability Review 2017, 45-47, Financial Stability Review 2018, 48), based on a new longitudinal dataset of financial crisis in the Euro-zone made available by the ECB (DoLuca et al 2017) and adjustments for the credit to GDP gap measure, including the multi-

¹⁸⁹ Gesetz zur Überwachung der Finanzstabilität (Finanzstabilitätsgesetz – FinStabG) from 28.1.2012 (Bundesgesetzblatt I, S. 2369)

spectral analysis as suggested by Schueler et al (2015) as well as growth at risk framework (Bundesbank 2018, 52). This pluralism expresses itself in the depiction of alternative results using different ways of calculating the credit to GDP gap in the financial stability review 2019 (s. figure 7.4 below).¹⁹⁰

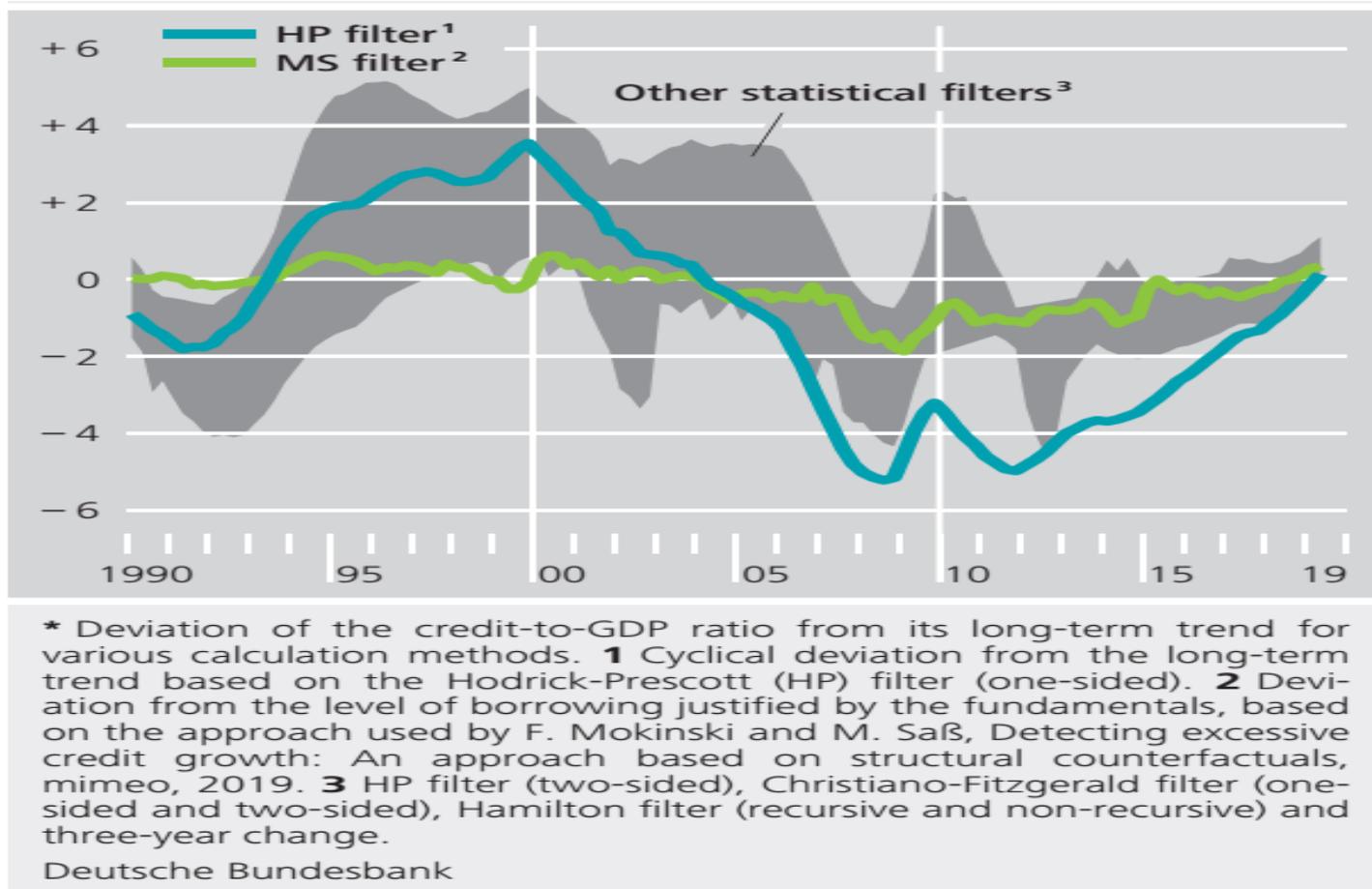


Figure 7.4: Credit-to-GDP gap for German banks' loans to household for house purchase (percentage points, quarterly data, taken from the Financial Stability Report of the Bundesbank 2019, p. 50)

The turnaround of the ministry of finance came in spring 2019, when the ministry of finance decided to agree to a rise in the CCyB by 0.25%, as it had gotten frightened by the rising financial stability risks in Germany amidst the fears of an economic downswing (Bundesbank official, October 2019)¹⁹¹. The Committee for Financial Stability hence recommended to raise the anti-cyclical capital buffer to 0.25% on 27th of May 2019¹⁹² and BaFin activated it on June 28th 2019. This decision is extensively justified in the financial stability review of the Bundesbank in 2019, which points to credit risks being evaluated too low by banks, property prices being too high and interest rate risks rising, all adding to substantial cyclical systemic risks (Bundesbank 2019). This is

¹⁹⁰ Note that all specifications other than the original HP filter show a persistently higher credit to GDP gap.

¹⁹¹ <https://www.bundesbank.de/resource/blob/797750/ab7a99676cb65ae024ef8d51deade90f/mL/2019-05-27-afs-anlage-empfehlung-data.pdf>

¹⁹² <https://www.bundesbank.de/de/presse/pressemitteilungen/der-ausschuss-fuer-finanzstabilitaet-empfehl-die-aktivierung-des-antizyklischen-kapitalpuffers-und-veroeffentlicht-seinen-sechsten-jahresbericht-797746>

also based on an investigation of the dynamic credit allocation by banks, where credit portfolio risks of banks are rising, as increasingly loans are given to more risky clients. This decision was announced one day after the ESRB issued a warning on medium-term vulnerabilities in the residential real estate sector in Germany (ESRB 2019b), in which the ESRB deems the flow risks (that is the risks stemming from current developments) as high, due to the “[p]rovision of new loans in an environment of overvalued house prices as well as uncertainties regarding lending standards due to significant data gaps” (ESRB 2019c, 60).

While published after the decision of the Germans to raise their CCyB, the recommendation and the prior debate within the ESRB on risks in the German housing sector most likely had a reinforcing influence on the decision. Members of BaFin were well aware of this debate and the final decision to issue this recommendation was somewhat expected well before (interview BaFin and Bundesbank economists, 10.01.2020). Importantly, an attenuating factor in the risk assessment of ESRB in the warning is the activation of the CCyB. As important, the 0.25% are not in any way binding for the German banking industry at the present stage, an issue confirmed by BaFin economists (10.01.2020). In that sense, the CCyB decision might be seen as an insurance policy against blame should a crisis occur, without any serious impact for the industry, an act of symbolic politics. On the other hand, the activation of the CCyB is also an outcome of a heightened sensitivity towards financial stability risks and an awareness of the inadequate capturing of these risks by the Credit-to-GDP gap. The German policymakers were hence moving, albeit moving slowly in the direction of the perception of risks by the ECB.

A less negotiated and hence less contorted and much more straight forward way to setting the CCyB can be observed in the case of the UK. Over the course of the last decade, economists there developed the most sophisticated approach for calibrating the CCyB among the three cases analysed, which was seen to require the most intellectual investment by the ESRB working group (s. table 7.1 above). It did so based on a very active and advanced financial stability division in the BoE, which stood in close exchange with both its colleagues from the ESCB and the ECB as well as with colleagues from the Fed. Combining stress tests with the growth at risk framework of the Fed, it would seek to engage in varying CCyBs up- and downwards with the financial cycle, based on a cost-benefit analysis/

Setting the CCyB: the UK experience

In setting up their financial stability framework, the technocrats at the BoE could rely on a long-standing tradition of thinking about financial stability at the BoE, which much preceded both the efforts at the Federal Reserve as well as the ECB. The Bank of England has in fact published

Financial Stability reports from fall 1996.¹⁹³ Initially called the Financial Stability Review,¹⁹⁴ these reports discussed events such as the East Asian Crisis (fall 1998 issues), but also were devoted to questions of how to define the financial stability mandate of the Bank of England (s. Large 2005, 135ff). It was renamed the Financial Stability Report in 2006, which was a watershed year for the treatment of financial stability at the Bank of England, with a newly formed Financial Stability Board¹⁹⁵ now directing these reports and a systemic risk reduction division installed inside of the Bank of England. The reports aimed “to identify the major downside risks to the UK financial system and thereby help financial firms, authorities overseas and the wider public in managing and preparing for these risks.” (Bank of England 2006,1). Indeed, as several Bank of England officials have pointed out, these financial stability reports very well described the dangers in the system before the crisis, but the Bank of England was missing any tools to transform words into action (as reported in Hungin and Scott 2019, 341).¹⁹⁶

The technocrats in the Financial Stability Division, driven by the Executive Director Andy Haldane and the newly joined head of the Macroprudential Strategy and Support Division David Aikman were indeed operating at the cutting edge of financial stability monitoring already before the crisis. When the crisis hit, this team was involved in creating a model to stress test the entire banking system, although the word was not used at that time (interview BoE economist, 13.01.2020). The brain-child of Andy Haldane, it later became known as the ‘Risk Assessment Model of Systemic Institutions’ (RAMSI) and has been praised as pioneering the use of macroprudential stress tests in the world (Aymanns et al 2018 p.368). While the crisis delayed its evolution, it was completed in 2009 (Aikman et al 2009), showing that analysts at the Bank were already considering mechanisms of fire sales to understand issues of systemic risk.¹⁹⁷ The model in turn helped disciplining the thinking about these issues (interview BoE economist, 13.01.2020) and

¹⁹³ Reports can be found here:

<https://www.bankofengland.co.uk/news?NewsTypes=ce90163e489841e0b66d06243d35d5cb&Taxonomies=4973ac117aea43ed91a798089845a4f5&InfiniteScrolling=False&Direction=Latest>; last accessed December 9th 2019

¹⁹⁴ The first financial stability review has the format of an academic journal, with insiders and outsiders writing. It is initially chaired by the forerunner of the FSA, namely the Securities and Investment Board. By the seventh issue, in November 1999 it is already very much dominated by BoE staff which report on their work, starting with the financial stability conjuncture and outlook, while there is still one contribution by a scholar of the Bank of Italy and then two academic contributions (namely Morris and Shin and Xavier Freixas). By 2000, the financial stability conjuncture and outlook, the work by Bank of England economists is 80 pages long, and by december 2000 there are only internal writers of the Bank of England, a trend which continues from then onwards.

¹⁹⁵ The board included both the governor of the Bank of England Mervyn King as well as the Deputy Governor, Paul Tucker (Large 2005).

¹⁹⁶ E.g. one finds in the Financial Stability Report of 2006 an interesting description of the liquidity risks amassing due to the short term funding of banks in capital markets (Bank of England 2006, 51ff), but no action followed upon this analysis.

¹⁹⁷ The model examines contagion effects of shocks to the liability side to understand second round effects of stress in the financial system, seeking to provide a better understanding of the impact a certain shock to the system can have, due to endogenous amplifying effects.

its presence was to exert an important influence on shaping the way the anti-cyclical framework in the bank would be set-up (s. below).

And yet, despite this headstart in terms of macroprudential thinking, the team was struck by the depth of the crisis, relating it post-factum to the lack of reliable evidence on issues such as leverage (interview BoE economist 13.01.2020). Immediately after the crisis, the division hence engaged in both the collection of more extensive data on the financial system and the further advancement of systemic risk analysis. Here, the development of monitoring devices became an important task. While experimenting with new metaphors and fields of knowledge, such as ecological analysis (Haldane and May 2011, Erturk et al 2011), the emphasis of the practical work of the division was from the beginning very much on the credit cycle (Aikman et al 2010), pushing for an extensive and ambitious program of macroprudential intervention. Summarizing this expansive stance despite the uncertainties surrounding the program, Aikman et al. write “the state of macro-prudential policy today has many similarities with the state of monetary policy just after the second world war. Data is incomplete, theory patchy, policy experience negligible. Monetary policy then was conducted by trial and error. The same will be true of macroprudential policy now. Mistakes will be made. But as experience with the other arms of macroeconomic policy has taught us, the biggest mistake would be not to try” (Aikman et al. 2010, 25). This expansive stance of the financial stability division was by no means universal in the bank. Instead, it should be seen as a rhetorical intervention that was also aimed at the discussions going on inside of the central bank at that time over the appropriate goals for macroprudential policies at the Bank.

Anticipating a victory of the Tories and the possibility that macroprudential powers could be handed to the BoE, the Bank had set up a working group in 2009 on the issue of what kind of design of these powers the Bank of England should want (s. chapter 6). Inside of this deliberating body inside of the Bank, there was a constant battle, whether the Bank should seek an expanded mandate, with Haldane pushing for an inclusion of the goal of the taming of the cycle, whereas Tucker was pushing to limit it to increasing the financial system’s resilience (interview Bank of England economist 13.01.2020), with the latter even being willing to give up the macroprudential powers altogether (interview former Bank of England economist 20.12.2017). Following the election victory by the Tories in 2010, the FSA was dismantled and the bank supervision as well as macroprudential policies were then handed to the Bank of England (Hungin and James 2019). In the ensuing debate with the Treasury over the mission and set-up of the Financial Policy Committee, the final stance of the Bank was a compromise of these two opposing views, turning the anti-cyclical dimension into a secondary objective. The exact powers of this committee, while already established as an interim body in 2011, were to be established in exchange with the

Treasury over the course of the next two years, with the FPC officially beginning its operations in April 2013.

Due to the ongoing debate inside of the BoE, the policy-makers chose to request only three initial binding powers, to limit the leverage of banks, to set the Counter-cyclical Capital Buffer as well as to impose sectoral capital requirements (Bank of England 2013a), which it was subsequently granted.¹⁹⁸ This meant that right from the beginning of the FPC, the macroprudential tool kit in the UK contained a counter-cyclical dimension. In line with this decision, the FPC produced the draft of the policy statement on the CCyB in January 2013 (ibid), which includes the credit to GDP gap as a leading indicator but makes clear that it embraces a wider model of core indicators. These indicators will be used in a framework of “guided discretion”, whereby the decision will always be taken in the end based on expert judgment, using financial indicators as structuring devices for the discussion. It notes that “the greater the degree of imbalance as measured by the core indicators, the more homogeneous the picture that the different indicators convey, and the more consistent that picture is with market and supervisory intelligence, the more likely it is that the FPC will adjust the CCB or SCRs in response” (ibid, 21).¹⁹⁹ This framework was confirmed in January 2014 (Bank of England 2014a), with the Bank of England assuming official responsibility for setting the CCyB in May 2014.

The approach to calibrating the CCyB was developed by the Bank of England’s Financial Stability group, basing itself on a newly formed database that contained data on financial instability in the UK from 1969 onwards. A working paper, produced in 2012 by 5 members of that group and a member of the Bank of Spain conveys the underlying work and its link to the credit to GDP gap as an indicator (the paper is published in an academic journal as Giese et al 2014). In contrast to the intervention by the Fed economists Edge and Meisenzahl (2011), which argued that the credit to GDP gap is too unreliable, they found it to be a reasonably reliable indicator for the UK economy, after having tested it as a predictor for the three crises in the UK since 1969 (Giese et al 2014, 25f).

¹⁹⁹ They then set out to suggest complementing indicators for the signalling of rising credit risks in

¹⁹⁸ The FPC did not make further requests because it initially feared that direction over loan to value and loan to income restrictions required a level of public acceptability that was not there yet (Bank of England 2012, interview former Bank of England economist 20.12.2017). The remit of the FPC over these macroprudential powers however would substantially increase over time, an expansion which was largely favoured by the shift in governorship from Mervyn King to Mark Carney in June 2013, who was much more open to anti-cyclical thinking and measures (interview Bank of England economist, 13.01.2020) In June 2014, the Treasury announced its intention to grant additional powers to the FPC, to which the FPC reacted, expressing the wish to gain powers over housing market developments and the leverage ratio (Bank of England 2014b). It formulated a framework for Loan to value and Loan to Income Ratios by 2015 (Bank of England 2015a) and finally, after negotiations with the Treasury in 2015 (Chan and Wallace 2015) gained regulatory powers over the buy to let market in 2016.

¹⁹⁹ They argue that while there is statistical uncertainty due to the difference between real time measurement and post factum corrections of credit growth, these tend to be correlated with gdp growth corrections, implying that the ratio of credit to gdp is not negatively affected (ibid, 26).

the UK (ibid, pp.30-36), including the quality of credit, the origin of credit and the level of credit, which might negatively affect an economy. Testing these variables on their predictive capacity, they found real estate price gaps to be a very good predictor of impending crises,²⁰⁰ although it is subject to type 2 errors (ibid, 40)²⁰¹.

These findings fed into the initial framework of the BoE, which used the Credit to GDP gap as the most important measure (Bank of England 2014a, 23), carefully specifying the other measures used to complement it (ibid, 30f). It also drew on the results of stress tests for the UK banking system, which inspired by the US experience had been developed in 2013 (Bank of England 2013b).

Undertaken for the first time in 2014, its outputs were used to inform the calibration of the Counter-Cyclical Capital Buffer (Bank of England 2014a, 25f). The measurements thus produced were then fed into the discussion in the Financial Policy Committee, which frequently challenged the analyses of the macroprudential division (interview BoE officials, 12.12. 2019). These debates allowed for the formation of an expert judgement, the prevalent mode of decision making at the Bank of England (interview former BoE economist, 23rd of October 2019).²⁰² In general, the initial stance is characterized by uncertainty over results, to be expected, not only regarding the effects of the measure in increasing the resilience of the system, but also its short-term impact on credit provision when increasing the capital buffer (ibid, 16). Due to the low recording of the Credit-to-GDP gap and this uncertainty over possible consequences, the CCyB is set at 0% from May 2014 until December 2015 (for an example of this cautious stance, s. Bank of England 2015a).

This changed, when the Bank of England published its medium-term capital framework (Bank of England 2015c), which envisioned to integrate the CCyB with the structural capital requirements as set by the Bank. The framework calculated the desired fixed risk weighted core capital of banks at 11%, de facto slightly reducing it (Quarles 2019a), and at the same time announced the decision to install the CCyB permanently at the level of 1%, when risks are neither subdued nor elevated.²⁰³

The reason for that shift in policy resided at least partially in the research undertaken in the Macroprudential framework and policy strategy division of the BoE, which showed that building up CCyB in good times is not very costly, but very beneficial to release it in the slump (Bahaj et al 2016, interview BoE officials, 12.12.2019). Based on that insight, the FPC deemed it beneficial to have at least 1% to be able to release in case of an unexpected shock as well as being capable of

²⁰⁰ For the list of indicators tested, s. Giese et al, p. 37

²⁰¹ In other words, it is likely to signal crises, when none is at hand.

²⁰² As Donald Kohn, the external member of the FPC put it: „And in pursuit of that mandate we have made many judgments and taken quite a few actions based on a variety of indicators and techniques. Although identifying risks and gauging resilience poses significant challenges, we have found sufficient empirical regularities tied to financial instability in historical experience to justify taking action.“ (Kohn 2019 a, 2).

²⁰³ In April 2016, the BoE revises its CCyB framework accordingly, s. Bank of England 2016b

raising it gradually if the need arises (s. also Bank of England 2016b). The goal was to provide the FPC with additional flexibility, being able to move the CCyB up and down according to circumstances (for a very positive view on this framework, s. Quarles 2019a), a goal the FPC made immediately use of in Spring 2016, setting the CCyB at 0.5% due to the risks to financial stability caused by the referendum (Bank of England 2016a).

Simultaneously with this more active role for the CCyB as an instrument, the importance of the stress-test to inform its setting also increased, while the role of the Credit to GDP gap was decreased due to what were perceived to be its limited predictive capacities (Bank of England 2016b, 15)²⁰⁴. Increasing the role of stress-tests, the Bank of England in October 2015 announces a new annual cyclical scenario, which is to stress-test the banking system based on the analysis of the FPC with respect to where the financial system is positioned within the financial cycle. “The Bank of England’s annual cyclical scenario will be calibrated to reflect policymakers’ assessment of prevailing financial imbalances — the state of the financial cycle. The severity of this scenario will increase as risks build and decrease after those risks crystallise or abate. This systematic approach should mean that markets and banks will be better able to anticipate the broad shape and severity of the scenario over time. But the precise calibration will not be mechanical — it will reflect policymakers’ judgements over the magnitude of prevailing imbalances. “ (Bank of England 2015b, 12, emphasis mine)²⁰⁵ Thereby, the FPC de facto moved its assessment of the financial cycle into the stress test, which takes an ever-increasing role informing the CCyB (Bank of England 2015b, p. 6).

In order to avoid surprises for banks, this scenario is supposed to evolve gradually, with the risk aversion of the policy makers staying constant and changes only occurring due to changes in observed indicators (s. e.g. Bank of England 2017, point 10). To ensure this consistency, they look at the evolving distance of a certain specified set of variables (e.g. house prices) from what they assume to be the equilibrium prices, and then they assess the likelihood of these prices falling (Bank of England 2015b, 16). They then set a scenario in which a tail event occurs that could lead to such a fall and ask the banks to be able to withstand a shock to e.g. a fall in house prices. Concomitant

²⁰⁴ This criticism is in line with a paper published by the ECB in 2015 (s. Schueler et al 2015 and s. below). The text on the calibration of the CCyB states: “While the credit-to-GDP gap performs well in retrospective studies of past crises, its reliability as a macroprudential indicator is limited by its reliance on a simple statistical measure for calculating the long-term trend.”

²⁰⁵ Statements by FPC members confirm this use of the stress test for this purpose. External FPC member Kohn reports that „we make heavy use of concurrent bank stress tests to judge whether we need to take steps to better assure that banks will be able to continue providing UK households and businesses with credit and other financial services in a severe stress.“ (Kohn 2019 a, 2) In a different speech, he adds „importantly owing to discipline in scenario construction, the stress tests have in fact been an effective, countercyclical, input into determining the appropriate level of the CCyB.“ (Kohn 2019b, 16).

with these changes, the Bank of England announced that it will increase its internal modelling capacities, to intensify its research efforts on stress-testing and to exchange with other central banks on their experiences (Bank of England 2015c, 28ff).²⁰⁶ The research of the macroprudential division at that point in time was seeking to reduce the complexity of the large information set it was looking at to inform the FPC on the current position of the British economy within the financial cycle. Distilling a set of 29 indicators for the cycle, indicators which were very close to the existing set of variables analysed in the Financial Stability Report (interview BoE officials 12.12.2019), they were de facto struggling to generate equivalencies and trade-offs between different variables, seeking to generate easily interpretable results for the committee. Trying out heatmaps and other devices to represent these changes (s. e.g. Aikman et al 2015), they found it difficult to easily communicate those to policy makers (interview BoE officials, 12.12. 2019) and therefore abandoned that effort.

In their work on early warning systems, the macroprudential research division notes, based on academic research that it is difficult to correctly predict the timing of a crisis (Aikman et al 2018, 5), and furthermore notes that a serious short-coming of these early warning systems is that they operate on a discrete 0 or 1 scale (crisis or not crisis) rather than a continuous one. However, they also note that these measures are good at predicting jointly the severity of crisis (ibid). They therefore started to experiment with the Growth-at-Risk framework (Adrian et al 2016), which they were exposed to at a joint IMF-Bank of England workshop in 2017, where Adrian himself presented his work (interview BoE economist 13.01.2020). In contrast to these other early warning measures, the GaR framework operates using a continuous measurement, which not only represents the likelihood of a crisis but also its severity. It was in this way much better attuned to inform the gradual rise or reduction of the CCyB in the framework of the Bank of England (interview BoE economists 12.12.2019). Rather than pretending to predict the timing of the crisis, it instead appresents to the policymaker both the likelihood and the severity of crisis, should it occur, impelling him to act.²⁰⁷

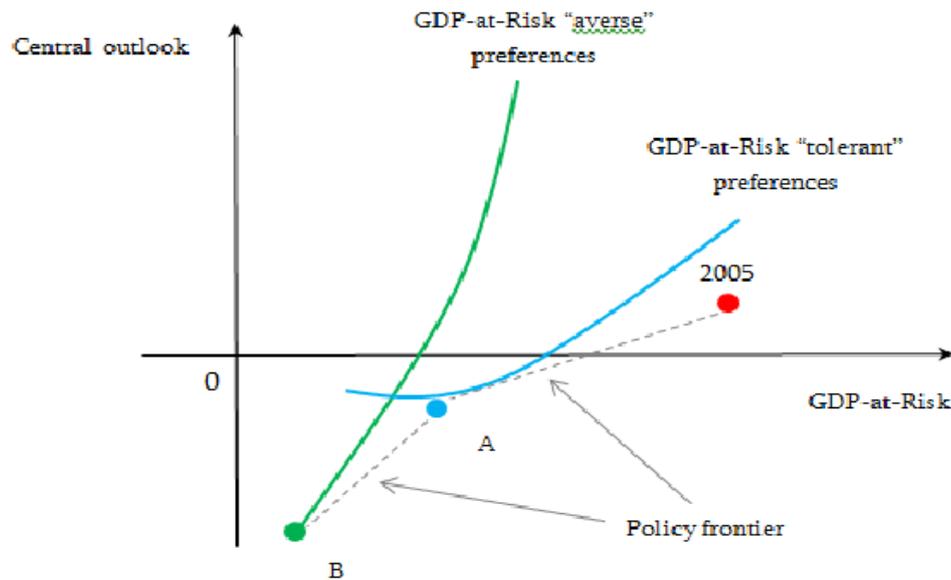
Adapting the GaR framework to the task of setting the CCyB in the UK however still required work by the team at the Bank of England, as it was initially calibrated to influence monetary policy rather than the CCyB and thus had an outlook of 3 months ahead, rather than the 3 to 5 years ahead that

²⁰⁶ One long term goal of this initiative is to conduct a stress test, which includes CCPs and the wider financial system (ibid, 29f).

²⁰⁷ The executive director of financial stability at the BoE, Brazier clarifies this change from crisis prediction to the building of resilience by using the metaphor of earthquake research and measures to prevent earthquakes. He points out that the “right approach, for building resilience to earthquakes into structures, and for building resilience to economic shocks into financial systems, is to focus not on tremors, but on the underlying vulnerability. By underlying vulnerability I mean how serious a quake – real or economic – could be *if one occurred at any point*. Whether a quake seems likely to occur soon has no bearing on this.” (Brazier 2019, 3)

are needed for the preemptive setting of the CCyB. From 2017 to 2019, the team was hence backtesting this framework, identifying 29 variables from the academic literature that it grouped into 3 broader categories (private sector leverage, asset valuations and credit terms and conditions) which it used to measure financial vulnerabilities. It then build a database for these 29 variables for 16 Western countries for the years 1980-2016Q4, refining a data collection exercise at the ECB (Do Luca et al 2017). They were then testing the framework's predictive capacities to capture rising crises probabilities 3 to 5years ahead of time. Using the full scale of data retrospectively as well as seeking to undertake pseudo-real time exercises (ibid), they find it to be operative. Overall, the GaR framework is praised by the team as a great step forward, going so far as describing the 'GDP at risk' measure as "a summary statistic of the ultimate objective of macroprudential policy" (Aikman et al 2018, 27).

This does not mean that the team is convinced that one can fully predict tail risks to growth or that this would ever be possible. Instead, it is the communicative aspect of this measure, capable of summarizing a host of indicators into a simple number which generated the appeal of this measure (interview BoE economist 13.01.2020). As an economist of the team, making a comparison to the monetary policy framework put it: "we are not that good at predicting inflation either, but this is not a reason for us to abandon inflation forecasting, is it?" Instead, it is about the entire capacity to set up a clear framework that can guide policy makers decision making (ibid). Figure 7.5 below displays the framework suggested by Aikman et al 2018 (11) for such a discussion, showing how policy makers could seek to adjust their macroprudential policy according to depictions by the GDP- at-Risk framework and their own risk preferences.



Notes: This figure illustrates an optimal policy problem using the GDP-at-Risk concept. The red dot is a stylised illustration of the outlook facing many economies in the run-up to the global financial crisis. The locus of points B-A-2005 defines the feasible policy frontier. The green and blue curves are indifference curves for highly risk-averse and less risk-averse policymakers respectively.

Figure 7.5 The optimal macroprudential policy space (taken from Aikman et al 2018, 11)

In addition to this capacity of the GDP-at-Risk framework to inform discussions with policymakers, the team also found that it could use the GDP at risk framework to engage in a tentative cost-benefit analysis by simulating the cushioning effects counter-cyclical capital buffers could have had if activated before the great financial crisis (Aikman et al 2019, 1). In other words the Growth-at-Risk framework allowed them to generate a credible model-world (Braun 2014), in which such an alternative scenario could be credibly tested. They found that gradually raising the CCyB by 2.5 or 5% before the crisis of 2008, following the early warning signals by the Growth at Risk framework would have reduced the probability and severity of the crisis, calculating a reduced impact of 21% and 42% respectively (Aikman et al 2019, 36f).²⁰⁸ This counterfactual analysis allowed the team to make a strong case for raising the CCyB ahead of time, as it could bring about a reduction in the crisis impact. This finding was furthermore supported by the fact that raising capital in good times was found to have little impact upon credit provisioning (Bahaj et al 2016

Based on this work by the Macroprudential Support Division, the Growth at Risk framework was inserted into the stress tests in 2019 to determine the size of the CCyB (Kohn 2019a, Brazier

²⁰⁸ While the team was aware that this result was very much determined by the specifics of the 2007-2009 financial crisis, a problematic finding from an econometric point of view, they thought of it as indefensible from a political point of view not to learn the lesson of this crisis (interview applied economists, BoE 12.12.2019).

2019).²⁰⁹ Concomitantly with this decision, the FPC decided to set the CCyB at 2% in a standard risk environment (Bank of England 2019, 2), while announcing at the same time a search for a reduction in other elements of the capital requirements for a similar amount, making the CCyB a more important element in the overall capital requirement framework. The reasoning that underlies this change is that by adjusting capital requirements in an anti-cyclical manner, policy-makers can guarantee that capital requirements are at its highest at the peak of the cycle and hence the system is safest, while not imposing such a high level through the entire cycle (ibid, 3) As Brazier, the executive director for financial stability at the Bank of England since 2015 states it, by using stress testing and GDP at Risk, „we can consistently build resilience into the financial system well ahead of when that resilience is needed“, because „disciplined macroprudential policy builds resilience to economic shocks into the financial system well before it’s needed.“ (Brazier 2019, 2).

He goes further in justifying their measure, by citing Andrew Crockett’s speech from 2000, where the latter argued: “The received wisdom is that risk increases in recessions and falls in booms. In contrast, it may be more helpful to think of risk as increasing during upswings, as financial imbalances build up, and materialising in recessions... And because the timing of downswings is exceedingly hard to predict, the approach implies a focus on measuring the vulnerabilities that build up in the upswing and on the more recurrent features of cycles. We may not know exactly when the rainy day will come, but we can be pretty sure that it will. It is not wise to decide on policies or business strategies on the assumption that it will not, or that we can predict its timing with sufficient foresight.” (Brazier 2019, 5)²¹⁰

Conclusion

The comparison of the development of different institutional set-ups of the CCyB and the intellectual work by applied economists underlying it reveals both substantial variation in terms of frameworks (s. table 7.4 below), but also a joint intellectual effort which shapes the use of early warning systems. The different set-up of the CCyB framework installed in the three jurisdictions and their fine-tuning can be directly related to the legal capacities of the competent authorities to intervene as well as the broader political economy, within which it unfolds.

²⁰⁹ This adoption was helped by the fact that the Growth at Risk framework is observing the state of the financial system with respect to a posited “normal state” and assuming the larger the deviation, the larger the eventual correction in the system (Brazier 2019, 8). In this sense, it is very much a continuation of the use of stress tests for the CCB right from 2016 (interview BoE economist, 13th of January 2020).

²¹⁰ And yet, even the growth at risk framework will not replace judgment by the FPC (interview former BoE economist, 23rd of October 2019). As external member of the FPC, Kohn put it regarding the results from stress tests and the setting of the CCyB: “But there is no mechanical link between the outputs of the stress test or the readings from a set of indicators and the setting of the CCyB. The FPC attempts to be systematic about our reactions to readings on risk and resilience, and we are transparent about what we are looking at and why we are or are not concerned about emerging phenomena in financial markets.” (Kohn 2019, 5f)

	<u>Federal Reserve</u>	<u>ECB/ESCB/NCAs²¹¹</u>	<u>Bank of England</u>
<u>CCyB</u>	Set at 0% in 2016 and expected to be 0% for the foreseeable future (but pending reform for Stress Capital Buffer)	Varied, 13 activations in 19 Euro-zone countries until end 2019	Placed at 1% generally since 2017, at 2% from 2021, before some variance already
<u>Early Warning Models</u>	Financial Vulnerabilities and Amplification framework	Composite Systemic Risk Indicator (CSRI)	Growth at Risk imputed into the stress test (2019)
<u>Relation of Stress Test to CCyB</u>	Macroprudential vision of stress test from the beginning; currently considering in the context of the Stress Capital Buffer legislation	Uploading macroprudential elements (Constancio et al 2019), but still not relevant for CCyB	Using anti-cyclical stresstests to inform CCyB from 2014 onwards

Table 7.4 comparison of the three different jurisdictions: ECB/ ESCB/NCAs, FED and BoE

In the US, a splintered regulatory field with limited legal backing for discretionary interventions at least partially explains the timid stance of the Federal Reserve, which to this date has refrained from pursuing an aggressive CCyB policy. On the other hand, the fact that the Eurozone has one interest rate set by the ECB, but not one fiscal policy stance enforced by a European treasury are important to understand the emphasis placed by the ECB upon the use of anti-cyclical macroprudential measures and its investment in early warning systems. This investment is undertaken jointly with all the members of the ESCB and national supervisory authorities, a step seen as necessary as it relies on suasion in its exchange with member states. The approach of using a uniform early warning system disciplined through a stress test scenario is prevented due to the splintered governance system and the lack of a unified annual Euro-zone stress test. We can find such an approach in the case of the UK, where broad political support for the macroprudential agenda as well as strong internal support by Mark Carney from 2013 onwards explain the more ambitious agenda of the UK, which has one of the most pronounced anti-cyclical CCyB frameworks in the world.

As a general finding, expert judgment remains the decisive input within all of these frameworks and models and indicators serve to structure the discussion (interview ECB economist 15.08.2016). The latter provide plenty of indicators regarding the build-up of aggregate systemic risk and it is

²¹¹ NCA: Nationally competent authorities

only through an aggregated expert view, based on discussion that a final decision is taken.²¹² A general conviction among practitioners is that for many years, one is unlikely to find a simple measurement of cycles and systemic risk which would allow the agency to take clear decisions, instead expert judgement will always be necessary. As the external member of the FPC, Kohn has put it for the case of the Bank of England, “We are a ways from having a “Taylor Rule” tied to a few right hand side variables to give us guidance; indeed one may doubt whether such a rule will ever be possible for as complex a phenomenon as “financial stability”.”(Kohn 2019, p. 5f) And still, applied economists at the Bank of England and elsewhere push in that direction, adopting the Growth at risk framework for anti-cyclical interventions and praising it as the summary statistic for anti-cyclical macroprudential policies. Its appeal resides in the need to discipline an overflowing array of indicators, providing a single number to discipline the focus of policy makers.

This framework and the data on which it is based is the outcome of a joint intellectual effort in the field of regulatory science by applied central bank economists regarding cyclical systemic risks, that over the course of the last decade has considerably expanded the depth of knowledge about what causes these cyclical upswings and how to measure it. This effort has first of all involved the construction of commonly shared databases that allow researchers to test their early warning systems on ever longer time series for ever more countries for an ever-larger list of variables. In this respect, the efforts within the ESCB and MaRs are particularly noteworthy, as they created a large, freely available database that included data on all European countries for a large list of variables (s. Detken et al 2014). These efforts continued, leading to an even larger database including more time series on different data (DoLuca et al 2017). Researchers from other countries such as the UK could build and expand on this database to pursue their own research efforts. This newly established depth of data gives much wider credibility to the results they generate, as it allows for more robust econometric findings that generalize findings over time and countries.

Secondly, it involved the continuous evolution and refinement of early warning systems and frameworks to make sense of that vast amount data. Common to the UK the ECB and the ESCB as a whole is the move away from the simple Credit-to-GDP gap as the guiding indicator, which was the initial foundation for the CCyB framework in Basel III and instead a move towards a use of an amalgamated set of different variables²¹³. Bringing in these different variables required careful testing by the applied economists of the causal impact they might have on financial instability, but it

²¹² In the case of the Eurozone, this expert judgement, supported by data and models is further fed into a negotiation process between the European and the national level, a process where one can actually see regulatory science at work as a negotiated process which not only involves the question of what science can say with certainty, but which also involves the political economy of the decisions to be taken.

²¹³ The case of the US is still pending, but the considerations undertaken to connect the calibration of the CCyB with

also posed the question of how to weigh them with respect to the ultimate policy goal of the CCyB, increasing the resilience of the system with respect to cyclical developments. This became particularly important in the context of communicating the need for action to policy makers. This problematique is one reason for the transfer of the Growth at Risk framework, which was initially developed in the US to provide actionable knowledge for monetary policy to now serve as a tool to calibrate the CCyB in the UK.

Retooled by the financial stability team at the Bank of England, which came in touch with it both due to a seminar with the IMF but also due to exchanges between the BoE and the Fed, it now also arouses increasing interest in the Eurozone as a tool to detect the cyclical build-up of systemic risk (for the ECB, s. Lang et al 2019, ESRB 2019a, for the case of Germany s. Hartwig et al 2019, Beutel 2019, as cited in Bundesbank 2019).²¹⁴ One reason for the appeal of this measure seems to be the capacity to move from predicting exactly when a crisis is supposed come and hence a 0/1 logic of action towards a continuous logic, one that does not seek to predict the timing of a crisis, but just like Brazier puts it, appresents to regulators the tensions that are building up in the financial system and to build resilience into the financial system as they grow. One can even see the first attempts of a cost-benefit analysis using the Growth at Risk framework, the most sophisticated form of setting the CCyB according to the ESRB working group (Detken et al 2014), although the results are still pronounced very cautiously (interview BoE economists, 12.12.2019).

Furthermore, rather surprisingly, the introduction of growth at risk in stress tests, and anti-cyclical stress tests in general reveal stress tests as the new frontier for anti-cyclical regulation. These stress tests are generating the model worlds in which the need for anti-cyclical actions are increasingly simulated, bringing together cross-sectional considerations of systemic risk, such as contagion and feedback effects from initial shocks with a vulnerability framework that observes the build-up of risks over time. As the example of the UK shows, the financial cycle thinking is pushed into the stress tests, where they assume a return to the mean and they measure the amplitude of deviation from that mean to anticipate the height of the coming stress to the system. At the same time, we can also observe different relationships between CCyB frameworks and stress tests in the current calibrations of the CCyB, which might prevent a convergence around this practice. While the UK uses stress tests to discipline its CCyB calibration and the US is currently considering a similar route, such a venue might be closed at the level of the Eurozone as a whole due to the fact that stress tests of the EBA, that include the whole European Union do not have a macroprudential focus

²¹⁴ One reason why the impact of the GaR is more muted in the Eurozone than in the UK might be the fact that the diversity of early warning systems currently still provides national authorities with sufficient wiggle room to debate the need for action with the ECB and that such wiggle room would be reduced by a uniform measure. More research is needed on this question.

and that ECB stress tests for the Euro-Zone are focusing on special problems to the Euro-Zone banking system rather than cyclical developments (interview ECB manager 30.12.2019).

The splintered data landscape and the operation of national stress tests by only some national authorities in the Euro-Zone might imply that the road towards the more sophisticated institutional framework of calibrating the CCyB through stress-tests might be foreclosed for these jurisdictions, unless every single country is willing to use its stress-test for such purposes, a probability which seems extremely low in particular for small jurisdictions with limited manpower. This points to the fact that the diversity of national/European specificities will continue to shape the future evolution of early warning systems, with current work being under way to advance the growth at risk framework, incorporating clearer causal links between the developments of financial vulnerability and subsequent crises (interview Bundesbank economist, 06.01.2020).

One problem which these early warning systems and anti-cyclical macroprudential regulation have in common is the perimeter problem of regulation. While they see problems building up in shadow banking, they cannot do much about it based on their tools focusing on banks capital requirements (s. Adrian et al 2015, s. also Constancio et al, 2019, p. 74). The next chapter will focus on the attempts by central banks' financial stability division to expand their anti-cyclical powers to the wholesale funding market, which connects the banking system and capital markets and lies at the heart of the shadow banking system, the repo-market (Gabor 2016b, Gabor and Ban 2016) and why these attempts largely failed.

Chapter 8 Much ado about nothing? Macro-prudential ideas and the post-crisis regulation of shadow banking

With Marius Birk and Jan Friedrich²¹⁵

Abstract

Post-crisis, macro-prudential ideas have challenged the epistemic authority of private risk management technologies, declaring them to be pro-cyclical contributors to systemic risk. This discursive challenge has been most critical of the shadow banking system, where private risk management instruments are central. This challenge, however, has not been translated into regulatory tools which reflect these convictions. This paper studies this process of discursive challenge to (failed) regulatory intervention for the case of the repo-market, the heart of the current shadow banking system. It traces regulatory efforts on the global and EU level from regulatory statements to (lack of) action, documenting both the persistent articulation of macro-prudential ideas challenging private risk-management systems and timid to no regulatory intervention. It links this hiatus to international coordination problems, the need for macro-prudential action to span regulatory communities, involving banking and financial market authorities and disagreements between micro- and macro-prudentially oriented regulators. The lack of evidence and the difficulty to generate it are identified as major impediments for regulatory consensus, further aggravated by ambiguities about the goals of anti-cyclical regulation. Beyond governance problems and the persistent appeal of private risk-management systems, the paper thus points to difficulties operationalizing macro-prudential ideas as a major explanatory factor.

Introduction

In 2008, private risk management technologies failed spectacularly, and with them, so did the pre-crisis regulatory consensus of market-based governance. The idea that financial stability could be achieved by sophisticated private risk management technologies, which had been incorporated in transnational regulation such as Basel II, was shattered by the financial crisis. The crisis not only questioned the microprudential approach, based on private risk management systems, but also vindicated the ideas of macro-prudential critics, which since the early 2000s had criticized the trust in private risk management instruments, stressing their pro-cyclical contribution to booms and busts (Crockett 2000, Danielsson et al 2001, for a review, s. Langley 2014, p.110). These critiques pointed to the “self-reinforcing interactions between perceptions of value and risk”, that is to say the link between these shifting “attitudes towards risk and financing constraints” which increase risk taking in the upswing and harshly reduce it in the downswing (Borio 2003b, 2012). This discourse took center stage after the financial crisis as political leaders, responding to the political pressures, sought to find a convincing policy program which prevents future calamities (Baker 2013a, b, 2014). But, while the macro-prudential view on financial markets was a major change in the regulatory discourse, respective policy tools and instruments have only been slowly forthcoming, if

²¹⁵ This chapter is the outcome of joint work and has been published as Thiemann, M., M. Birk and J. Friedrich. (2018) “Much Ado About Nothing? Macro-Prudential Ideas and the Post-Crisis Regulation of Shadow Banking.” *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie* 70, no. Supplément 1 (October 2018): 259–86

at all (Baker 2015). As such, the fate of macroprudential regulation adds to the general impression of a “status quo crisis” (Helleiner 2014), which has brought about only minimal change (Underhill 2015).

The post-crisis regulation of shadow banking offers a crucial case for understanding this curious fate of the macroprudential idea set, as it is in this part of the financial system where the negative consequences of private risk management systems became most evident. In no other area of financial markets was self-regulation through private risk management practices as pronounced as in the shadow banking system (Mehrling et al 2013, Kessler and Wilhelm 2013, Pozsar, 2015). Evolving outside of banking regulation, this system of credit intermediation lacked the access to lender-of-last-resort function of the central bank that bestows stability on the regular banking system. Its functioning was, hence, based on the capacities of private risk management techniques to generate an equivalent of certainty to lending institutions, thereby facilitating the “money market funding of capital market lending” that characterizes the system (Mehrling et al 2013). When the financial crisis revealed that those risk management systems, predicted the probability of default for essential assets and derivatives completely wrong, the confidence in the private provision of safety for lenders evaporated and with it the trust in the shadow banking system as a whole. As a consequence, a run on the shadow banking system ensued which led to its implosion (Swedberg 2012). What functioned in boom times as a substantial source of the pre-crisis expansion of credit, exaggerating the boom, now turned into a major source of financial instability, amplifying the defaults in the subprime mortgage market into a global crisis (for a detailed account, Gabor 2016b).

In this chapter, we study if and in how far macro-prudential change agents have been able to challenge and amend those private risk management practices which they identified as responsible for the pro-cyclicality of the shadow banking system. Doing so, we draw on discursive institutionalism (Schmidt 2008) and its focus on the discursive coordination of experts, based on the discursive construction of evidence and authority in these technocratic debates. Studying these debates and their results, we focus on the post-crisis regulation of the repo market, the core refinancing market of the shadow banking system that stood at the heart of the crisis (Gorton 2009). The unit of analysis is the formulation and implementation of macro-prudentially inspired reforms for this part of the shadow banking system on the global level as well as on the level of the EU.²¹⁶ Analyzing these processes, we apply the method of process tracing (George and Bennett 2005, Trampusch and Palier 2016), focusing on the turning points occurring within the evolution of the regulatory policy and the

²¹⁶ Being a market of global or at least regional reach, we ignore national solutions which the general literature as well as our interviewees largely saw as pointless.

underlying reasons for these developments. We will argue that the limited post-crisis regulatory intervention is not only the result of a splintered governance network and the persistent epistemic authority of private risk management systems, coupled with industry lobbying (adverse ideational selection), but also of the difficulties inherent in the operationalization of the macroprudential idea set.

This chapter proceeds as follows: After reviewing the current literature on the regulation of shadow banking post-crisis, we describe the repo-market and its role in the shadow banking system, pointing to the difficulties of translating regulatory discourse into deployable regulatory tools in a splintered transnational field of governance. We then document the existence of a strong macro-prudential discourse demanding an intervention into private risk management practices. Based on documentary analysis and twelve semi-structured expert interviews with regulators involved in regulatory efforts, we subsequently analyze the policy process of the formulation and implementation of regulatory measures regarding the repo-market both on the global as well as the EU level. We document the extensive problematization of the repo-market in regulatory discourse and then its lacking translation into actual regulatory measures, based on lacking regulatory consensus and difficulties of coordination. The chapter concludes by drawing the lessons from the regulation of the repo-market for explanations as to the limited regulatory change post-crisis and speculates on the future of the macro-prudential program.

Explaining the regulation of shadow banking post-crisis-insights from the literature

The few studies on the re-regulation of shadow banking in the aftermath of the crisis rather unequivocally identify regulation as timid and incremental (Rixen 2013, Kessler and Wilhelm 2013, Engelen 2015, Gabor and Ban 2016, Gabor 2016a), in line with the general perception of, a restorative, rather than transformative regulatory policy post-crisis (Engelen et al 2011, Bieling 2014). In order to explain this limited intervention, scholars have advanced explanations relating to the neoliberal embrace of markets which allowed private risk management systems to weather the challenge to their epistemic authority and to prevent substantial regulatory changes. A second strand of literature focuses on the difficulties of regulatory coordination in a transnational field of governance characterized by a splintered governance authority, both in terms of over- or underlap of regulatory authorities within nation-states as well as beyond. Those scholars explain this incremental shift by stressing the ideational component within regulatory discourses which tackles the problem of shadow banking. Along these lines, Kessler and Wilhelm (2013) show how the regulatory discourse interprets the failure of shadow banking as a market failure caused by market imperfections rather than as the incapacity of private risk management systems to price risks properly. They argue

that based on such a framing, regulatory action attempts to correct information asymmetries and other market imperfections, rather than to fundamentally question the epistemic authority of private risk management to read and interpret data properly (ibid, 258f).

This observation then falls in line with Underhill's statement that market-based governance, the reliance on transparency, market discipline and private risk management systems, persists as the main element of financial regulation post-crisis (Underhill 2015, p. 470). While Underhill points to macroprudential regulation as an idea set which challenges this system, this challenge to him remains ineffective. Underhill's explanation for this failure is what he calls "ideational adverse selection," arguing that the persistence of private actors involved within the regulatory community leads to the selection of those ideas to foster financial stability that suit their interests. In other words, as macroprudential regulation is more invasive as it decisively constrains the actions of private actors, it is rejected by their trade associations. In a sense, Underhill thereby presents a processual account of the regulatory capture hypothesis. As we will argue, these accounts not only overestimate the power of private interests, they also underestimate the difficulties of putting an alternative idea set into action.

Another stream of literature has pointed to the splintered governance authority, which was instrumental for the growth of shadow banking, both domestically and on a global level. Domestically, research on the development of crucial elements of shadow banking, such as the market for swap derivatives or the ABCP market, have pointed to the regulatory over- or underlap. That is, the fact that this market was not covered by any one regulatory authority, which facilitated its growth (Funk and Hirschman 2014, Thiemann and Lepoutre 2017). Similarly for the ABCP market, the lack of direct regulatory responsibility by banking regulators in several countries meant that the growth of this market was not impeded by regulatory constraints. In addition, the competition for financial activities among states (Rixen 2013) had led to the creation of regulatory loophole by legislatures, enabling the gaming of rules by means of regulatory arbitrage, which was conducive to the growth of shadow banking. Coupled with the impossibility of regulating shadow banking activities on the national level (Thiemann 2014a) this resulted in only symbolic politics and limited regulatory intervention.

In this view, the problems of regulatory arbitrage and the lack of international coordination which were at the heart of the pre-crisis growth of shadow banking (Thiemann 2012, 2014a) have not been resolved by recent reforms, hence continuing to hamper regulatory action. The emphasis here is less on the lacking problem awareness of regulators, but on the difficulties to translate that knowledge into concrete actions in a splintered global financial architecture. Lastly, academics have pointed to the central banking community and finance ministries that pushed for deregulated repo markets in

order to enhance government bond market liquidity. In the same vein that this fostered the growth of the shadow banking system pre-crisis (Gabor and Ban 2016), these forces also impeded re-regulation post-crisis, as they fear market fragmentations (Gabor 2016a, p. 925).

Overall, although scholars have argued that the crisis triggered an ideational change in banking regulation, the actual post-crisis regulatory environment is rather subject to incremental, if any, change. While scholars have pointed to either regulatory capture or difficulties of regulatory coordination, we suggest that these lines of arguments have to be extended by carefully analyzing how regulators try to operationalize these new ideas. While these accounts capture some important elements to explain the incremental reform steps, they do, as we will argue, pay insufficient attention to the labor involved in transforming alternative regulatory ideas into deployable tools. As we will show, the lack of regulatory change is also caused by difficulties in the operationalization and implementation of these ideas in an evidence-based policy environment. We argue that this is another important obstacle, which adds to the explanation for the current state of post-crisis regulations.

The missing link: from ideas to action

The first element to appreciate in the analysis of the conversion of macro-prudential ideas into action is the rather recent history of macro-prudential discourse and its position at the fringes of the regulatory discourse in Western countries up until the financial crisis (Borio 2009, Baker 2013a, Thiemann et al. 2018a). It is only from the early 2000s onwards that the macro-prudential view, which acknowledges that risks to financial stability are endogenously created within the financial system rather than exogenously, has been promoted both by the Bank for International Settlement and some academics (Crockett 2000, Baker 2013a). This means that the hallmarks of this approach, its emphasis on the build-up of systemic risks in the financial cycle, pointing to self-reinforcing feedback loops between market actors both in the up- and downswing (s. Crockett 2000, Borio 2003b, BIS 2010) have only recently been (re-)introduced in the regulatory mainstream discourse.

This critique questioned the epistemic and political authority of Value at Risk (VaR) systems, which had become both legitimate practice for private risk management and an important part of the regulatory tool-kit pre-crisis (Lockwood 2015). It pointed out that VaR increased the interdependence of price movements and market outlooks (Daniellson et. al. 2001, Lockwood 2015), underestimating risks in the upswing and amplifying the downturn through deteriorating risk assessments, a view corroborated by the financial crisis. Macro-prudential critics from the beginning pointed out that VaR wrongly treats prices as exogenous (Danielson et. al. 2001), underestimating the impact which it itself has on price movements.

However, the suspicion “that the completely normal, regular operational mode of the system, as it is, can lead to the self-destruction of the system” (Willke et al. 2013, p. 19) were largely ignored by the regulatory mainstream, and it is only after the financial crisis in 2008 that they gained prominence, being diffused by a few prominently placed academics and technocrats (Baker 2013a).²¹⁷ Until 2008, little-to-no time was spent by regulators in Western countries to focus on these concerns, much less to operationalize them. This means that the new macro-prudential view on regulation not only has to challenge the epistemic authority of private risk management systems but also to develop an alternative risk metric based on systemic concerns (Persaud 2014). As we will show, this poses great challenges in terms of intellectual as well as infrastructural work and technocratic craftsmanship. Given this lack of experience, macro-prudential change agents not only need to convince fellow regulators that their concerns are worthy of consideration, but also that their suggested measures cause more good than harm.

In this vein, Baker has analyzed the advent of macro-prudential thinking as an ideational shift in the outlook of regulators upon markets but has noticed the difficulties in developing metrics and tools to implement it (Baker 2013b, 2014, 2015). He points out that in the course of its implementation, institutional settings as well as interest-based politics have been slowing the pace of change and diluting the macro-prudential agenda (Baker 2013a, p. 52). In addition, macro-prudential regulation has been held back by a lack of data, where change agents often “deliberately decided to embark on a slow moving experimentation with the new regulatory ideas, in order to collect the necessary evidence ... to win the policy debate among technocrats” (Moschella and Tsingou 2013, p. 204). This finding points to the institutional context in which change agents operate (ibid, p.201), which is characterized by an incremental mode of learning based on data and evidence.

We build on this finding and combine it with the assertion of discursive institutionalism, that in order to understand regulatory change, we need to study “not only the ideational shift, but the complex processes of discursive interactions” that surround it (Wood 2015, p. 8; citing Schmidt 2011, 59; s. also Schmidt 2008, 310). In particular, we focus on the coordinative discourse among technocrats, where debates and contestation among policy experts provide “the common language and framework through which key policy groups come to an agreement in the construction of a policy programme” (Wood 2015, 13, referencing Schmidt 2002, 171). Quite limited in their deliberative nature, advancement in these discourses is based on the construction of evidence, as evidence-based policy has become the unquestioned norm among policy makers (Strassheim 2015). Hence, when explaining the incremental change regarding the regulation of the shadow banking system post-crisis,

²¹⁷ Baker (2013a) in this respect speaks even of an ideational shift in regulatory discourse, a third order change in Hall’s terminology (1993).

one has to also pay attention to the discursive labor involved in convincing fellow regulators, based on evidence, of the advantages of these regulatory tools. This embrace of evidence-based policy as the pre-condition for regulatory intervention has been, we will argue a major impediment for regulatory changes.

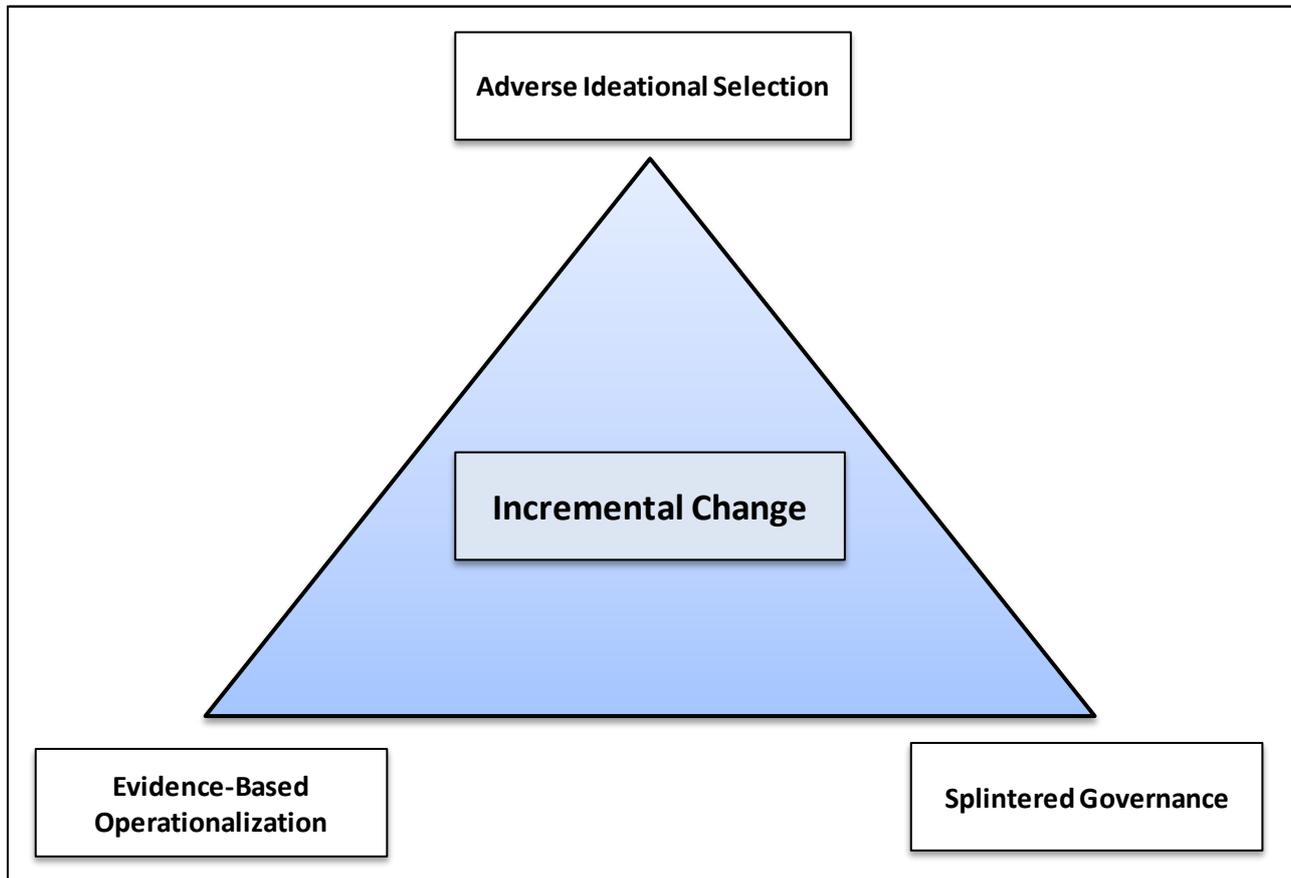


Figure 8.1: Factors inhibiting the translation of macroprudential ideas into action

In the following, we develop an empirical research design that enables us to examine how this triad of factors depicted in figure 8.1 affected the regulatory discussions on the repo market in the aftermath of the financial crisis.

Research Design

In order to better understand the influence of the factors identified above on the post-crisis regulation of the repo-market, we combined documentary analysis with expert interviews. We use these sources to trace the regulatory process and to identify causal mechanisms that hampered fundamental changes in the regulation of the shadow banking system (Trampusch and Palier 2016). With this goal in mind, we first conducted a document analysis of the different regulatory responses after the crisis of the Financial Stability Board (FSB) and of the European Union and compared them with initially announced policy intentions, reviewing in particular consultation documents and regulatory reviews. We then conducted 12 expert interviews with (former) regulators, supervisors and central bankers

involved in the process both in Frankfurt and London in order to better understand and contextualize the identified developments. Furthermore, we attended three ECB conferences in Frankfurt on the topic of shadow banking regulation in 2016, which enabled us to not only grasp what regulators *write* but also *say* about the topic, as they try to coordinate. In this way, we could deepen our understanding of the regulatory processes and countercheck the results of our document analysis by directly observing the communication and regulatory discussions among crucial stakeholders as well as asking them directly about the reasons for reluctant reform efforts. By first tracing the effects of the governance set-up, the influence of private lobby group and the difficulties of developing regulatory tools on the implementation of macroprudential ideas on the global level and then on the level of the more engaged European regulatory response, we can comparatively show the influence of these three factors on the post-crisis reforms.

The Repo-Market and its endogenous risk

The shadow banking system involves banks and non-banks in an intricate web of financial relationships, which finances long term capital assets with short term money market funding. In a popular depiction of shadow banking, broker-dealers and derivative dealers are seen to be at the center of the shadow banking system. They link risk averse cash-pools, that is institutional investors with a preference for liquidity and security (pension funds, corporate cash of treasurers), with risk-embracing actors, seeking financing to invest. The system is characterized by chains of intermediation which constitute “money market funding for capital market lending” (s. Mehrling et al 2013, critical Sissoko 2014, 2016), a business strategy executed on the balance sheet of banks (Sissoko 2014) or by hedge funds and bond funds, leveraging their bond portfolios in order to deliver equity-like returns with bond-like volatility (Pozsar 2015). The investment strategies of these investors are typically based on short-term money market funding, often through the use of repurchasing agreements (Repos). In a repo transaction, one party sells an asset (collateral) to another party, combined with an agreement to buy this asset back in the (near) future. In this way, the seller gets cash without effectively selling the collateral, while the buyer receives interest, creating an in-substance securitized loan. As the buyer becomes the legal owner of this asset during the transaction, he can re-use the same asset, in a repo agreement in turn, if he needs short-term cash. This so-called re-hypothecation can lead to long repo-chains, increasing the interconnectedness of the financial system. While repos represent an additional channel of liquidity for banks, it is the main source of refinancing for shadow banks (Pozsar 2015). Shadow banks, such as hedge funds, which otherwise face difficulties securing funding, use this instrument to further lever their portfolios. For this reason, the repo-market (cash against collateral) is at the heart of the shadow banking system, as depicted in Fig. 8.2 below.

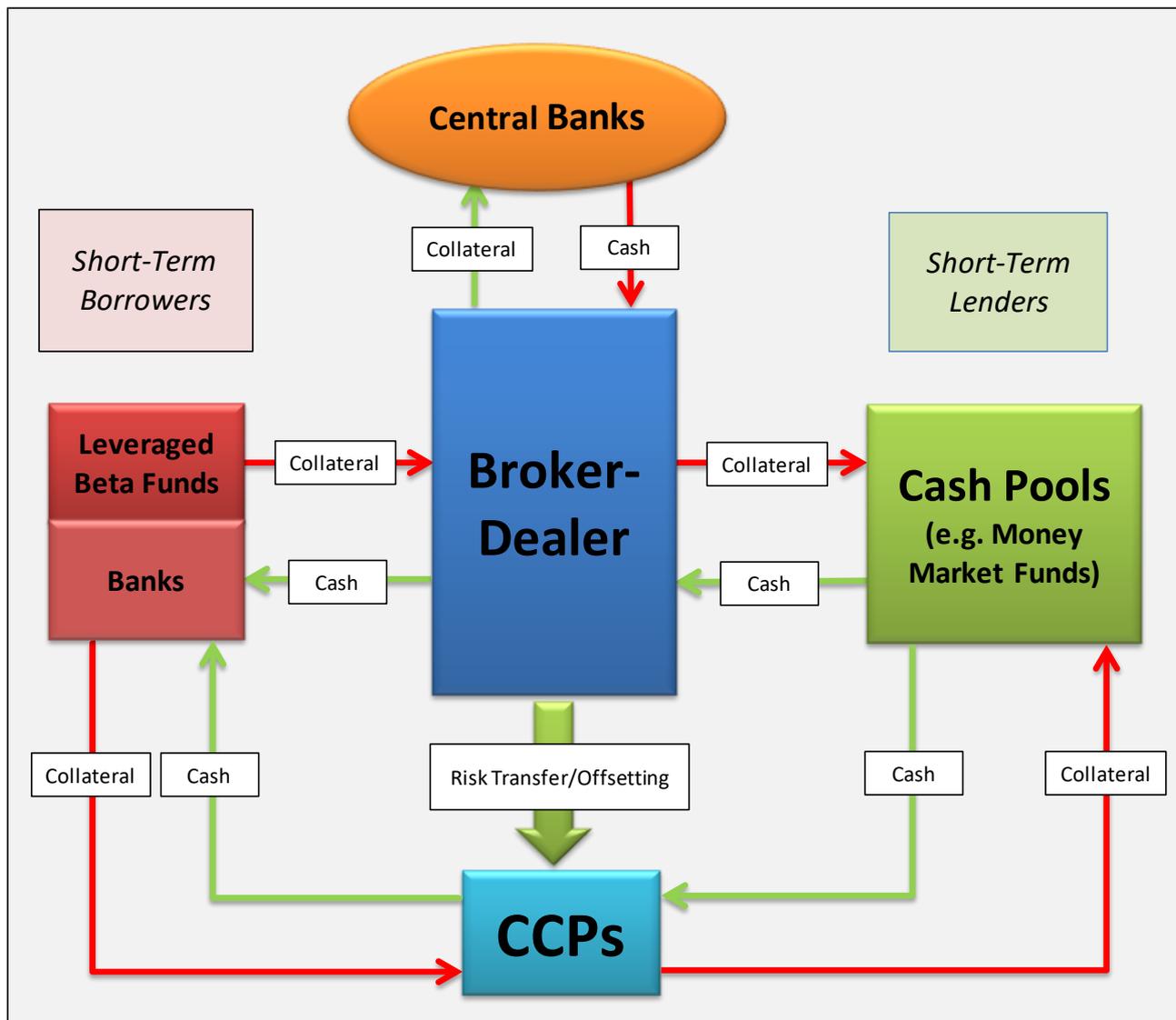


Figure 8.2 The Shadow banking system (based on Singh 2014)

When entering a transaction, both parties agree on a haircut, that is the difference between the current market price of the security and the money the lender is willing to lend against it. This haircut is supposed to “provide a buffer against market fluctuations and incentivizes borrowers to adhere to their promise to buy securities back” (Gabor and Vestergaard 2016, p. 12) and is calculated by means of VaR. In case that the value of the collateral decreases, the lender can claim additional collateral from the borrower (margin call) to compensate the under-collateralization of the repo transaction.

While haircuts and margin calls provide provide “extra-ordinary security to lenders” (Sissoko 2016, p. 1), this private risk management system translates volatility in market prices for the underlying collateral into fluctuations in margins and haircuts. It is there, where the pro-cyclical dangers of the repo-market reside, as they directly link prices in financial markets (based on market liquidity) to the availability of funding to financial market actors (funding liquidity) (Brunnermeier and Pedersen 2009). In the upswing, when volatility and credit-risk seem to be low while asset prices are gaining,

Value at Risk calculations indicate lower haircut requirements, incentivizing further risk taking through additional leverage. This causal chain from increasing market value of assets towards the pro-cyclical amplification of the repo-market on macro-prudential risks is illustrated in figure 8.3.

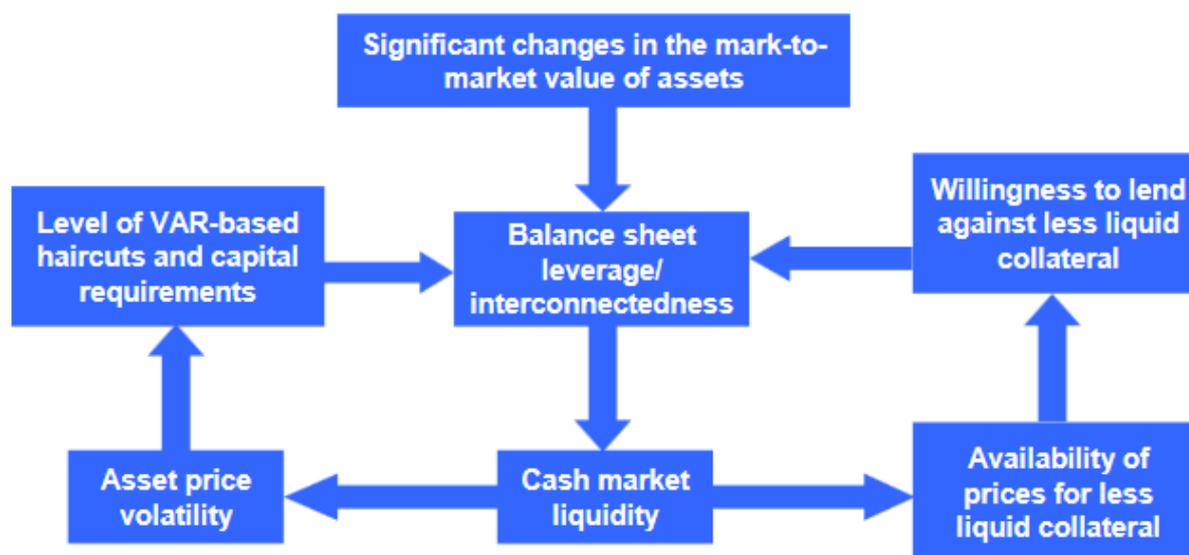


Fig. 8.3 Procyclicality – flow diagram (Source: FSB 2012a, p. 16)

However, when the cycle turns and volatility rises again, haircuts increase and highly leveraged market participants need to deleverage quickly due to widely occurring margin calls. The crisis moment occurs when highly leveraged market participants are forced to sell off their assets (fire-sales) which puts asset prices under increasing pressure. This, in turn, can cause additional fire-sales by other market actors which fuels a further deterioration in market liquidity. This link creates the systemic risks inherent in this form of financing, as violently demonstrated during the financial crisis (Adrian and Shin 2008, Brunnermeier and Pedersen 2009), exposing all the hallmarks of the pro-cyclical amplification of private risk management systems that macro-prudential critiques had criticized early on (Danielsson et al 2001).

Tracing post-crisis regulatory efforts: The macro-prudential critique of the repo-market²¹⁸

Against this backdrop, it is unsurprising that the repo market and private risk management systems became a focal point in the (macro-prudential) regulatory discourse after the financial crisis. Already in the midst of the crisis, the former Financial Stability Forum (FSF), now the Financial Stability Board (FSB), published a report in which risk measurements were identified as a source, which

²¹⁸ The following events are detailed in chronological order in figure 8.5 in the appendix.

contributed to the deterioration of the market in the run up and during the crisis (FSF 2008, p. 17). Later, the Bank for International Settlements (BIS) followed up with a note to the Financial Stability Forum, arguing that one fundamental source of the system's pro-cyclicality was the use of private risk measurement practices (BIS 2008, p. 2) and their linkages to margin requirements for collateral (ibid: 9). The report argues, that the short-term measurement of volatility, combined with a discretionary adjustment of the margins in times of stress, exacerbated the pro-cyclicality of the system during the crisis. The report finishes with different policy options such as conservative as well as the lesser use of market-value oriented methods for valuation of collaterals, even with time-varying, countercyclical adjustments to margins (ibid, p. 9).

In March of 2009, the prominent Turner report put the pro-cyclical effects of collateral margin calls center stage, linking them directly to the pro-cyclical effects of Value at Risk models (Financial Services Authority 2009, p. 112). In April 2009, the Financial Stability Forum followed suit and published two reports, one jointly with the Committee for the Global Financial System (FSF 2009, FSF-CGFS 2009), criticizing margins as strongly pro-cyclical and as important factors in the building up of leverage pre-crisis (FSF-CGFS 2009). In the next year, the center of the regulatory discourse on the repo-market moved to the Financial Stability Board (FSB), as the G20 in Seoul decided to task that body with developing an agenda for the regulation of shadow banking in general and of the repo market in particular. In April 2011, the FSB published a first report laying out its ideas (FSB 2011a) and in October 2011 released its recommendations to dampen the pro-cyclicality and other financial stability risks associated with securities financing and repo transactions. A close reading of these FSB reports from 2011 and of a follow up from 2012 shows that securities markets' liquidity is linked to leverage cycles, and systemic instability is attributed to cyclical repo-collateral standards (FSB 2011a, 2012a, s. also Gabor 2016b, p. 986 f.), which are lowered in the upswing and heightened in the downswing.

Concluding, the global regulatory discourse by the Financial Stability Board (FSB), the BIS, and the CGFS displayed critical analyses of the pro-cyclical effects of the repo-market, repeatedly calling for a macro-prudential intervention. The crisis thus triggered an ideational shift but, as we will show below, regulatory interventions on the global level have been much more timid and less interventionist. In the following, we focus on the regulatory dynamics that can explain this timidity, starting in 2009. We will argue that besides a splintered policy field and lobbying, another reason for the missing transformation of macroprudential ideas into action was the lack of data to justify regulatory interventions in the regulatory community, coupled with a fear of unintended consequences of these measures on market liquidity.

From ideas to (lacking) action on the global level

Following up on its report, the Committee on the Global Financial System, the forum of exchange of central bankers of the G10 (today G20) installed a working group in spring 2009. It was to record actual market practices in the repo-market and their impact during the crisis and to discuss the feasibility and desirability of the proposed policy options to limit their pro-cyclical effect. The agenda of the working group points to the lack of knowledge on the side of regulators (interview Bundesbank official 24th of August 2016), which regulators seek to overcome with the help of expert interviews and surveys. In fact, while academia had established a powerful narrative on the crisis as a run on the repo-market (Gorton 2009), the empirical evidence on which this narrative is based only demonstrates it for a very particular sub-segment of the US-market. Regulators had little further evidence for such dynamics and felt uneasy about imposing measures based on their limited knowledge. As has been argued by a German regulator, “it was difficult to assess what the side effects are because of the bad data” (interview Bundesbank 25th of July, similarly Bundesbank official 21st of July 2016).

Amid these conversations, the lacking conviction of US regulators concerning the imposition of counter-cyclical haircuts became evident. While European regulators openly embraced through the cycle haircuts and even possibly anti-cyclical haircuts, the British participants being the most vocal (interview Bundesbank official, interview Bank of England official, 22nd of September 2016), US regulators were pointing to the possibilities for regulatory arbitrage by market agents (a powerful theme of American regulators since the 1990s, s. e.g. Jones 2000). In addition, US regulators doubted whether regulators could identify the right haircuts better than market agents (interview Bundesbank official, 25th of July 2016). As a result of this quarrel, the option of setting minimum haircuts as well as of counter-cyclical add-ons by regulators to dampen pro-cyclical effects was not directly recommended by the group but only recommended “for consideration”.²¹⁹ This initial opposition against interventions in private risk management systems by the US and the subsequent emerging gridlock would prove decisive for the further regulation of risk management practices in the repo-market, both for direct bilateral repos as well as for those cleared in CCPs at the global level.

Based on its analytical work, the Financial Stability Board identified in 2011 three main areas of possible direct intervention for regulators (FSB 2011b, p. 22):

- a. Macro-prudential haircut requirements, “such as minimum margin or haircuts to mitigate procyclicality”

²¹⁹ This recommendation applied both to direct bilateral repos, as well as to repos cleared through central counterparties (CCPs), whose increasing use, should be seriously considered due to their mitigating effect on counterparty risk (CGFS 2010, p. IX).

- b. Possible limits for re-use and re-hypothecation
- c. The improvement of market infrastructure for the settlement and clearing of repos, in particular through Central Counterparties (CCPs)²²⁰

By October 2012, these areas had further crystallized into a work program. On the one hand, this agenda included the task to calibrate minimum haircuts and to introduce minimum standards for collateral management in order to reduce the pro-cyclicality of the system. On the other hand, specific measures should be developed which ensure minimum standards of transparency and a set-up of private risk management regimes that reduce pro-cyclicality. Most of these measures, however, did not involve material changes in market practices, rather benchmarking to best practices (such as extending the historical data based upon which these haircuts were to be calculated (FSB 2013b, p. 25). In essence, those measures solely seek to improve market practices, rather than fundamentally changing them. An eminent reason for this timid revision of current practices had been possible unintended consequences regarding market liquidity, as the Financial Stability Board pointed out at this moment (FSB 2012b, recommendation 7): a lower level of market liquidity could increase the fragility of the financial system. Importantly, this pressure for restraint originated from an internal opposition within central banks. In the ECB, the policy development for the Financial Stability Board was under the mandate of the DG Market Operations, which shared those concerns, but also feared additional market fragmentation in the Euro-Zone as well as the negative impact of these measures on monetary operations (interview former ECB official, 26th of September 2016).

Most prominently, the issue of lacking data and the fear of endangering the liquidity of the markets impeded stricter bilateral haircuts and margin requirements. In 2013, the idea of minimum haircuts materialized into an official table of proposed numerical haircuts (FSB 2013b). However, these measures, both in terms of the actual minimum haircuts imposed as well as their coverage are very limited. Therefore, this was a disappointing outcome for macro-prudential regulators (interview LSE economist and former BoE regulator, 17th of August 2016, see also Tarullo 2013, p. 15). In its final form, the regulation does not apply *inter alia* to government bonds as well as to transactions which involve CCPs. Hence about 80% of repo-transactions in Europe, which are backed by sovereign debt (ICMA 2015, p. 13) and all bilateral repo trades, which involve CCPs had been excluded. Furthermore, the required minimum haircuts were much below average haircuts at that time and were thus not constraining for market actors (interview Dutch central banker, 21st of September 2016). They were set at approximately half the level deemed appropriate by macro-prudential change agents (interview Dutch central banker, 21st of September 2016, interview former ECB economist, 26th of

²²⁰ CCPs were recommended as they mitigate the risks of contagion and interconnectivity in the financial system in a straightforward, mechanical manner, substituting one bilateral trade with two trades with the CCP.

September 2016). On the one hand, the difficulty to observe the pro-cyclicality of the repo-market based on a very limited data set was an important restriction in the calibration exercise (interview Dutch central banker, 21st of September 2016). On the other hand, this timid intervention was partially an outcome of concerns by regulators over the impacts these interventions might have on market liquidity. In particular, they were fearing to unintentionally cause market disruptions (interview former ECB economist, 26th of September 2016, s. also 09.2013 Global Investor: Analysis: FSB shifts focus to re-hypothecation), a fear aggravated by limited data availability at this point in time.²²¹ Macro-prudential change agents hope that these measures might function as an initial intervention that can be increased once the regulatory community achieves a better understanding of how these measures affect markets (interview Dutch central banker, 21st of September 2016). Particular hopes are pinned on the major data collection exercise which starts in 2018.

A similar dynamic of regulatory self-restraint can be observed with respect to the possible limits for re-use and re-hypothecation envisioned in 2012. The Financial Stability Board's main focus shifted to re-hypothecation (FSB 2013a, recommendation 7 and 8) where US and European regulators were "particularly keen to reduce the pro-cyclicality of repo markets by limiting the build-up of excessive leverage in the financial system resulting from re-hypothecation" (Euromoney 2013, Global Investor 2013). However, these measures only crystallized into three market-friendly recommendations seeking to improve market discipline and transparency rather than fundamentally changing it. In particular, these measures were asking intermediaries to provide sufficient disclosure to clients regarding re-use. The re-use of client assets (re-hypothecation) should exclude proprietary trading while "only entities subject to adequate regulation of liquidity risk should be allowed to engage in the re-hypothecation of client assets" (recommendation 9).

Based on these recommendations, the Financial Stability Board (FSB) installed a working group on re-hypothecation in 2014, which first undertook a stock-taking exercise of existing legal definitions of re-use and re-hypothecation before examining their possible global harmonization (FSB 2015b, p. 10). It also undertook extensive interviews with market participants to get a better understanding of the market, while also seeking to gain knowledge of possible consequences and feasibility of certain regulatory measures, such as data collection by industry (interview Bundesbank economist, 24th of August 2016). Despite an attempt by EU officials and certain European central banks within that working group to push for further measures,²²² these proposals could not overcome the resistance by the US representatives as well as by certain European central banks, which did not pursue the EU

²²¹ The calibration of the minimum haircuts in 2013, for example were based on only three data points for 17 large banks and broker-dealers" (FSB 2015, p. 14)

²²² Such as balance sheet constraints imposed upon balance sheets of banks.

position (interview Bundesbank economist, 24th of August 2016). While repo-chains were clearly perceived as a possible source of contagion and interconnectedness, the US was reluctant to pursue further regulation as it already had a balance sheet constraint for primary brokerage and did not want any further measures constraining the market.

This internal gridlock, caused by the difficulties of international coordination and lacking data meant that the statement by the Financial Stability Board that “[r]e-use of collateral may give rise to increased interconnectedness and contribute to the build-up of leverage” (FSB 2015b, p. 11) merely attained the status of a working hypothesis. As a regulator involved put it, “we have said that there are these risk for financial stability, leverage, pro-cyclicality, interconnectedness, etc. and when we will have the data we are supposed to verify in how far repos, in particular the re-use of collateral contributes to leverage” (interview Bundesbank economist, 24th of August 2016). So, the data which will be collected from 2018 onwards shall give a “feeling about the size of the market” (interview Bundesbank economist, 24th of August 2016) while the exact effects of these presumed mechanisms are to be discerned by the subsequent data analysis. This stance explains the focus of the Working Group on how to measure cash collateral re-use and on how to exploit the data newly to be collected (FSB 2016), rather than exploring possible new measures.

Regulators now face the daunting task of aggregating the data and providing meaningful results. The data collection exercise does present tremendous challenges to the ways these data will be aggregated and made available for statistical analysis, a fact further complicated by potential discrepancies between data collection efforts of the different private data repositories (interview Bundesbank economist 25th of July 2016). In the end, the qualitative problematization of the inherent pro-cyclicality of the repo market had been translated into a quantitatively-driven research project, rather than a project of regulatory intervention. However, the regulatory community is as of yet not sure how exactly to analyze the data, considering the ambiguity of how to properly conceptualize the cycle in analytical models (interview Bundesbank official 25th of July 2016). Furthermore, given that the data will become available by 2018 at the earliest, it is unclear how much time will be needed to generate sufficiently clear results from the data to convince the regulatory community of the need for action (interview Bundesbank economist 23rd of September 2016). Here, problems of exact causal specification in regressions might pose severe challenges. Most likely, data that would proffer anti-cyclical action will only become available once a full cycle is completed as only a new tail event, such as a financial crisis, would permit to complete those calculations.

Examining the regulatory agenda of the Financial Stability Board on the repo-market and its results, one can state that the process itself has been characterized by incremental, tepid reform steps, which

hardly changed the way private risk management systems operate.²²³ Regulatory efforts were hampered by US regulators, which acted as veto players with respect to new measures that challenged the predominance of private risk management system. Clinging to the pre-crisis notion of the private sectors' superior capacities to assess risks, they also pointed to a lack of data as a major impediment. In contrast, EU regulators have been vocal actors for more counter-cyclical interventions by public authorities. Accordingly, the EU was the first jurisdiction to fully implement the suggestions by the Financial Stability Board (FSB) from 2015, setting up a major data collecting and transparency effort as well as the proposed limitations on re-hypothecation. Furthermore, the EU was weighing additional steps, such as the imposition of macro-prudential anti-cyclical add-ons to the minimum haircuts proposed by the FSB. In the following we will focus on these reform efforts in the EU that tried to go beyond the FSB agenda.

The EU and the project of counter-cyclical haircuts

In the EU, the task of macro-prudential change agents face a governance field almost as splintered as on the global, based on a maze of distributed responsibilities and regulatory under- and overlap (Lombardi and Moschella 2016). In this maze, change agents, including the financial stability division of the ECB and the secretariat of the European Systemic Risk Board (ESRB)²²⁴ jointly pushed for the development of the tool of anti-cyclical haircuts in the EU since 2012, but had to confront skeptical, microprudentially-minded banking regulators and market regulators. Their efforts to control the pro-cyclical character of the repo-market mainly focused mainly upon repos traded with Central Counter-Parties (CCPs), which take up a substantial proportion of the bilateral repo trades in Europe (ECB 2015, p. 16) (s. figure 8.4 below).

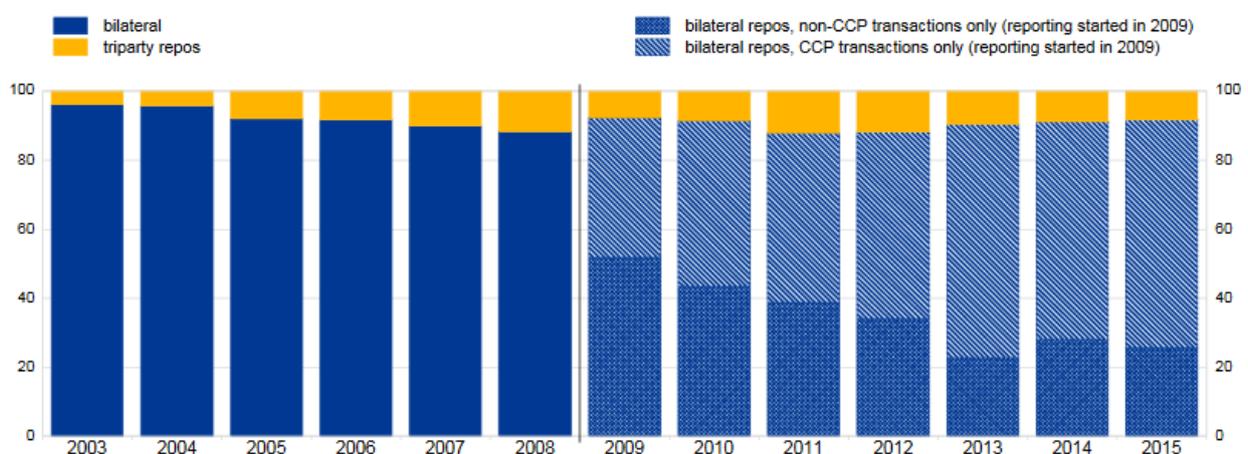


Fig. 8.4 Breakdown of total secured market (Source: ECB 2015: 16)

²²³ Its challenge to pro-cyclical risk management practices ended in minimum haircuts, which most of the time do not pose any constraint to the market. Limits to re-hypothecation and re-use of collateral, which builds the cornerstone of the private risk management system have not been imposed.

²²⁴ The ESRB is a EU-level consultative body focused on macro-prudential supervision and systemic risks, which brings together banking and market regulators in Europe.

The centerpiece of European regulatory efforts regarding CCPs is EMIR — the European Market Infrastructure Regulation — has hence been the main goal of regulatory interventions by macro-prudential change agents. Begun in June 2012, EMIR largely bases itself upon the Principles of Financial Market Infrastructure (2012), which were jointly developed by the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) and published in April 2012. EMIR delegates the task to deal with the pro-cyclicality of private risk management systems to CCPs which are required to set margins as well as haircuts conservatively in order to build up a buffer, preventing sudden pro-cyclical adjustments (EMIR 2012, p. 10, 37). Already in summer 2012, the ESRB (2012a) stressed that, beyond the resilience of CCPs themselves, the impact of their pro-cyclical behavior on the larger system requires further regulation. Therefore, the European Systemic Risk Board invited competent authorities to consider opportunities for the use of counter-cyclical instruments for the first review of EMIR in 2015. The goal of setting counter-cyclical haircuts was reiterated in four subsequent recommendations by the ESRB (ESRB 2012, 2013, 2014, 2015).

In its review of 2015, the ESRB questions the capacity of CCPs to set counter-cyclical haircuts head on. The report concedes that any evaluation of the way counter-cyclical haircuts are implemented by CCPs, suffers from the extremely short time span for which the respective data is available (EMIR only went into force in 2014). Hence, the actual data analysis does not permit the detection of pro-cyclical haircut behavior by CCPs (ESRB 2015). Instead of basing themselves upon data, the ESRB therefore advances theoretical reasoning that points to the incentive structure of CCPs, which opposes high (through the cycle) margin requirements. To counter these tendencies of competitive “undermargining,” among CCPs, it sees “a potential role for competent authorities to set margin and haircut requirements that go beyond the minimum requirements laid down by EMIR after appropriate involvement of the macro-prudential authorities” (ESRB 2015, p. 23). In other words, the ESRB suggests counter-cyclical add-ons, adjusted by authorities, which could be linked to the business or credit cycle. To do so, the ESRB points to the need to develop indicators and triggers, which “may encounter objective implementation difficulties due to a wide spectrum of financial instruments” (ibid).

Since then, macro-prudential change agents face opposition against the implementation of such counter-cyclical instruments even within the ESRB. This is due to the fact that the ESRB consists only to a third of staff from the financial stability divisions of central banks. They in turn face micro-prudential supervisors of central banks, market supervisors and the monetary policy division of the ECB, which to date show little inclination to embrace this macro-prudential project. In this institutional context, macro-prudential change agents find it very difficult to advance the project, as

the other regulators are skeptical of the need for intervention and would like to see evidence that justifies it before proceeding (interview ESRB economists 19th of July 2016). In addition, they are concerned about the competitiveness of CCPs within the EU, pointing to the fact that CCPs are already overburdened and stand in competition with CCPs from the USA (interview Bundesbank economist 25th of July 2016).

Seeking to deal with the diverse legal and practical challenges, the project is for the moment on hold. On the one hand, appropriate trigger points and indicators have to be identified. On the other hand, the continuing debate regards the question of who exactly the competent authority for such an intervention would be and upon which legal basis it would operate.²²⁵ The change agent, who most forcefully seeks to overcome these difficulties and vies for the position of a potential competent authority is the financial stability division of the ECB. Since 2012, this division has been the most vocal agent for the project of such counter-cyclical haircuts. In their own review of EMIR (ECB 2015), the ECB strongly recommends a broad encompassing use of macro-prudential haircuts and margins, for all transactions and institutions. Following this extensive proposal for the haircut measure, it is also the ECB which has sought to maintain further momentum for the policy measure, proposing models and measures in order to provide the indicators and triggers for regulatory actions. In its most concerted effort to date, the ECB published in a special feature of the ECB Financial Stability Review (2016) a theoretical model on leverage cycles in conjunction with an empirical analysis of pro-cyclical margins for stocks.

The special issue stresses the potential benefits of macro-prudential interventions through anti-cyclical margin requirements and sums up the efforts of the ECB to produce both theoretical and empirical evidence since 2013. In several speeches, Vítor Constâncio, the Vice-president of the ECB and responsible for the financial stability division, drew attention to this analytical and empirical work (Constâncio 2014b, 2016a), arguing for the expansion of macro-prudential powers. However, the position of the ECB's macroprudential division has not become the position of the entire European Central Bank. In particular, the department of market operations represents a strong veto player within the ECB against the implementation of counter-cyclical instruments, arguably fearing both market fragmentation and frictions as well as showing concerns over the competitiveness of CCPs, located in the EU (interview ECB supervisor 11th of October 2016). In addition, to date the empirical and theoretical work of the ECB has failed to even fully convince macro-prudential change agents from other national central banks in Europe. While these theoretical and empirical models are appreciated as valuable contributions, they are not deemed compelling enough to decisively move the argument in favor of macro-prudential regulation. In the end, only empirical work — showing the pro-cyclical effects of margins and haircuts in the repo-market — is seen to potentially convince skeptical

²²⁵ Background conversations in the ESRB point to the need for treaty changes on the EU level in this respect.

microprudential regulators within central banks as well as market regulators (interview Bundesbank official 25th of July 2016). Yet, the data needed for such an analysis will only become available from 2018 onwards.

Even once such data becomes available, however, it is still unclear exactly what question these regressions will be used to answer (interview ESRB economists 19th of July 2016). This epistemic uncertainty regarding the effects macroprudential change agents should be looking for relates to a missing unifying conceptual framework for macro-prudential regulation. This framework would have to clearly define the overall goals of the policy measures and the ways it is supposed to be achieved (cf. Tucker 2016 for a critical review). As one regulator involved in the ESRB pointed out, the persistently deadline driven work of macro-prudential authorities, with the agenda set by the timeline of reviews of legislation by the EU, prevents the necessary contemplation to establish such a coherent framework (interview ESRB economists 2016). Instead of seeking for conceptual clarity and internal consistency, these committees are dominated by the search for compromises in the face of time constraints. This lacking conceptual agreement contributes to further debate and lack of clarity among macro-prudential change agents within the ESRB over the exact goals and feasibility of anti-cyclical measures for the repo market.

In particular, questions are raised whether those measures should aim to temper the whole cycle or only to address the worst excesses during the upswing. Furthermore, if the goal of the measure is to address the whole cycle, there is continuing confusion among macro-prudential agents regarding the approximate length and the best indicators for this cycle. Repeatedly in interviews, the debate between the ECB and BIS over the length of the financial cycle was mentioned, adding to the confusion among macro-prudential agents. In addition, the related practical question to determine the best indicators for excessive liquidity, arguably the most appropriate indicator for the anti-cyclical intervention in repo-markets, are also daunting. This cacophony regarding the understanding of the financial cycle and the most appropriate indicators (email exchange regulator, 15th of September 2016) hinders coordination and agreement of policy makers. This lack of agreement regarding concepts and their measurements, in particular when considering the most extensive versions of tempering the financial cycle, prevents the unity among change agents needed to generate momentum for anti-cyclical regulatory measures.

Arguably, however, even if such momentum among macro-prudential change agents existed, the political decision by the European legislative bodies to grant such authority to an agency is likely to be weighed down by the internal opposition within European bodies as well as by the persistent fear of regulatory arbitrage due to lacking international coordination. Both of these themes were on full display at the ESRB conference on anti-cyclical margin and haircuts regulation, held in June 2016 in

Frankfurt. At this event, the aim of macro-prudential change agents to install anti-cyclical haircuts became evident. ECB Vice-president Constâncio wholeheartedly embraced macroprudential measures, presented by the ESRB and academics. At the same event, those tools only received a very lukewarm response by ESMA officials. In particular, they argued against the risks of moral hazard of regulators taking over the risk management function of private agents, as CCPs would no longer themselves monitor developments. Furthermore, the sheer amount of risk factors to be considered and the necessary granularity of data needed for regulators to calculate those measures made the task seem hardly achievable (also interview LSE economist, 17th of august 2016). In addition to these difficulties of implementation, they pointed to the problem of lacking international convergence and issues of regulatory arbitrage as another reason to not move forward on this issue, neither for bilateral repos nor for CCP regulation (author notes, conference attendance 06/06/2016). These points were further supported by the secretary general of the Financial Stability Board (FSB), Svein Andresen at the same event, anticipating that such measures would only be implemented in the distant future (ibid).

Discussion and Conclusion

Albeit being part of the regulatory debate early on after the crisis (The Turner Review 2009, CGFS 2010, FSB 2011b, 2012a), policy tools able to restrain the easing of funding conditions in the repo-market in the cyclical upswing, such as counter-cyclical margin and haircut requirements, have largely disappeared from the regulatory agenda. To date, there is no counter-cyclical regulation of haircut requirements, neither on the global level nor in the EU. The different implementations of the new macro-prudential ideas, challenging the epistemic authority of private risk management systems, have remained largely ineffective. Indeed, through the cycle measures applied to repo markets are too weak to pose an effective constraint to private market activity. Why is that the case? Theories of ideational adverse selection suggest that it is the involvement of regulators, close to the market with close ties to industry associations that leads to the choice of a market-based system of regulation. While this is partially true, it underestimates the difficulties inherent in implementing alternative non-market-based risk-management systems, in particular generating consensus in the technocratic debate.

Tracing the regulatory efforts of the Financial Stability Board (FSB) and ECB/ESRB in implementing macroprudential ideas, we have identified two recurring themes. The first theme relates to real governance problems and the challenge to overcome the belief in private market authority, embedded with central players. Here, the fact that the US is skeptical of such interventions is of high importance, as this causes a lack of international coordination and creates the threat of regulatory arbitrage. As a result, neither the working group on minimum haircuts nor the working group on the re-use of

collateral was able to fundamentally challenge market practices. In the case of minimum haircuts, the lack of evidence regarding general pro-cyclical effects within the market, as well as the continued belief by US regulators in the superiority of the knowledge-processing capacities of market participants diluted regulations. Similarly, the US insisted that the lack of data impeded an assessment in how far regulations on the re-use would endanger the proper functioning of the market, leading to a lack of constraints on the re-hypothecation and re-use of collateral on the global level.

In addition to those problems of global coordination, the case of the EU is highly informative regarding the practical problems such a new regulation faces, as this case relates to both governance authority and epistemic authority. True, the failure of setting counter-cyclical haircuts at the global level weakened the position of change agents in Europe significantly. However, this was not the only cause that prevented its implementation. While these measures have been pursued as a legislative project by the ECB and the ESRB, these change agents could not overcome the opposition both within their institutions and beyond. On the European level, the regulatory dialogues are mainly shaped by tensions between macro-prudential change agents and veto agents within and among regulatory institutions. Veto agents argue that any market intervention must be necessarily justified by empirical evidence (interview Bundesbank officials 09th of July 2016) and cling to the notion that no superior competent authority would be able to make a better decision than market participants themselves. Amidst this regulatory quarrel, the legislative creation of such competent authorities remains dim.

The second theme, which we identified, was the intra-regulatory debate regarding the epistemic authority of the macro-prudential idea set. To gain authority in front of micro-prudential banking regulators as well as micro-prudentially inclined market regulators, this reform program needs to generate evidence for the pro-cyclical effects of repo markets. However, it is the generation of such evidence which is a major impediment for the macro-prudential regulatory effort. First, the current lack of empirical evidence motivates the collection of further data. But, even if such data becomes available, processes of social learning within the regulatory community are not assured, a fact which is linked to the specific time scale of the macro-prudential regulatory framework. In contrast to private risk management systems, which operate on the basis of millions of data points, macro-prudential regulation is seeking to prevent or at least to cushion tail events within a financial cycle, which lasts over years. The production of numerical evidence, thus, faces the difficulty of the limited number of tail events and financial cycles, making it difficult to generate such evidence in the near future (Interview Bundesbank official 25th of July 2016).

This problem of generating evidence points to the possibility that the purpose and intent of macro-prudential regulation might be incompatible with a modus operandi of social learning in regulatory

communities, which pursues science-driven evidence-based regulation that aspires objectivity (Jasanoff 2011a, p. 308). As macro-prudential regulators are seeking to deal with tail events produced by an ever-changing financial system, their argumentation is based on logical reasoning and caution, rather than evidence, the accumulation of which might prove to be very costly. As another regulator put it, in the end, all these scientific measures are weak, the decision to make such regulatory interventions can be made politically, but one cannot decide it based on evidence (interview Bundesbank economist 27th of July 2016). Instead of such intervention, what we observe in our case is that the macro-prudential agenda has been transformed from a regulatory program, aiming for direct interventions, into a research program which transforms macro-prudential change agents into regulatory scientists, exploring data to prove pro-cyclical effects.

Overall, through processing the observable feature of the post-crisis regulatory debate (documents, conferences) in combination with expert-interviews, our analysis shows that the triad of a splintered governance network, adverse ideational selection, that is the persistent belief in the superiority of private market practices, in combination with a lack of data and evidence needed for operationalizing the regulatory tools impeded the process of implementing fundamental reforms. While regulatory change agents strongly pushed for macro-prudential ideas to become part of the post-crisis regulatory reforms, winning the internal technocratic debate was limited by a missing coherent framework, the lack of evidence and the persistent belief in the superior capacity of private agents to assess risks, expressed in the continued reliance of regulators on private market participants (CCPs) to control pro-cyclical effects. Indeed, this increased reliance on CCPs, which have become major agents for the clearing of repos post-crisis, is a good example of how current regulatory measures have changed the infrastructure of financial markets.

The increased use of CCPs has been promoted after the crisis by macro-prudential change agents (e.g. the financial stability division of the ECB, s. Constâncio 2012b) as well as by typical veto agents (e.g. the market operations division of the ECB, s. Cœuré 2013) and can be viewed as the only enforceable compromise between both. However, the business model of CCPs draws heavily upon private risk management technologies. Instead of a direct intervention, regulators delegated the task of dealing with the pro-cyclicality of risk management systems to these CCPs themselves, urging them to actively mitigate their potentially pro-cyclical behavior (interview ESRB economists 19th of July 2016). This entails a paradox: while private risk management systems are seen as deficient, only private agents themselves are seen as capable of correcting them. In that sense, the epistemic authority of private risk management systems and of market-based governance is not broken, but may even be restored through such interventions, with all its potential for the pro-cyclical acceleration of booms and busts.

Chapter 9 Open for business: entrepreneurial central banks and the cultivation of market liquidity

With Marius Birk²²⁶

Abstract

In 2013, the Governor of the Bank of England heralded that the Bank of England is “open for business”: ready to buy and sell every asset it can value, thereby adjusting the role of the Bank of England to the demands of market-based finance. This article examines this re-articulation of the role of central banks in financial markets, situating it in the context of the recently enacted Basel III regulatory reforms. By placing a regulatory price on private liquidity provision, these regulations hamper broker-dealers’ market-making capacity and the liquidity of assets used as collateral in repo-transactions. Through the buying / selling of collateral in times of crisis to market participants, the Bank of England counters these fragilities of market-based finance, setting boundaries for the volatility of collateral. Endorsing entrepreneurial principles of the governance of financial markets, a hallmark of neoliberal reason, this hybrid mode of external and internal intervention establishes a new balance in the relationship between central banks and private market actors. Liquidity, reduced in normal times through regulation, is actively provided by central banks in times of market disruption. Thereby, the central bank becomes the focal actor in the cultivation of market liquidity, fostering the transition towards “resilient market-based finance”.

Introduction

How, if at all has post-crisis regulatory change transformed the financial system?

Scholarship in political economy has largely been divided on this issue, with an important strand of scholarship pointing to merely incremental efforts stabilizing the status quo (Helleiner 2014, Moschella and Tsingou 2013, Underhill 2015), whereas others have pointed to the vast increase of areas subject to regulatory efforts (Pagliari 2012, Knaack 2015), a new macroprudential spirit with which these reforms are imbued (Baker 2013a, 2015) and regulatory measures, such as Basel III’s core capital requirements as credible interventions (Wilf 2016). These differing opinions of incremental reform efforts vs substantial interventions confront a similarly divided observable reality, with on the one hand industry complaining over intrusive regulation (Masters and Braithwaite 2011, JP Morgan 2014) and on the other hand a continued persistence of the rise of financial intermediation and debt (Ohnsorge and Yu 2016). How can we make sense of these developments?

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A paradigmatic case to answer this question is shadow banking, the trigger and flash point of the financial crisis of 2007-2009, which to the surprise of many observers, the regulatory community decided to transform into “resilient market-based banking” (FSB 2015a, for a critical review s. Engelen 2017). In this paper we hence seek to investigate how the post-crisis regulatory reforms have transformed and shaped the system of market-based banking. Conscious of the constitutive role state agencies and central banks had and still have in the evolution of this system pre- and post-crisis (Minsky 1982, Mehrling 2012, Thiemann 2014a, Gabor 2016b, Braun 2018), this paper seeks to draw out the principles which structure its reconfiguration after the crisis. Here, we are particularly attentive to the way the new macroprudential paradigm, with its focus on systemic risk is implemented and interacts with other regulatory initiatives.

The argument we will pursue is that these reforms are indeed far reaching and that they constrain the agency of bankers; however, in doing so, these actions are not a repudiation of neoliberal principles endorsed pre-crisis, but rather a refinement. : regulatory interventions remain committed to the market as the overarching guide for public policies, which now are used to embed markets in an institutional framework more conducive to bring out the “true” qualities and capacities of financial markets . Our answer hence is that change after the crisis is extensive, but in qualitative terms is still directed in the same neoliberal direction and driven by the same overall policy paradigm. This paradigm can be characterized as more state intervention to facilitate better markets, which combines an ordoliberal attempt to adjust the institutional framework in response to market failures and a speculative investment into these same markets by policy-makers seeking to harness the evolutionary forces of markets. However, both interventions meet in the attempt to build "real markets" (Carney 2015) and, in our case, to provide the infrastructure to cultivate market liquidity. To make this argument, we draw on the reforms of the repo-market in the wake of the financial crisis and the positioning of the Bank of England in that market as a market-maker of last resort.

Methodologically, this paper uses documentary analysis (compare Coffey 2014) of regulations and policy papers, published by the Basel Committee on Banking Supervision (BCBS), the Bank of England and market actors, to analyze the evolution of the post-crisis interventions. Nevertheless, a documentary analysis alone cannot be treated as firm evidence (ibid: p.371), which is why, in addition we draw on expert interviews. Since this paper developed as part of a larger project on the re-regulation of the repo-market post-crisis, we have conducted numerous interviews with central bankers, market participants, academics in Frankfurt and London. For this article in particular, we draw on 5 interviews: two central bankers directly involved in the re-regulation of the repo-market post-crisis, two interviews with five market actors from a large European bank, who helped us to

understand how these regulations affect the balance sheets of banks as well as one high level policy consultant, who was heavily involved consulting the German government and the European Commission on post-crisis regulatory initiatives.

This paper places this repositioning of the BoE and its expanding activities in the repo-market in the context of the regulatory community's attempt to transform "shadow banking into resilient market-based financing" (FSB 2015a). We argue that the Basel III framework and the new positioning of the BoE in financial markets can be understood as part of a two-pronged neoliberal regulatory response to the financial crisis. Change and status quo go hand in hand because the new liquidity regulations target the over-reliance on broker-dealers pre-crisis, while at the same time central banks seek to stabilize these markets through permanently institutionalizing their liquidity facilities. While the reforms of the Basel Committee (Basel III) and the Financial Stability Board's (FSB) interventions are *external* regulatory endeavors intended to transform a deficient shadow banking system into resilient market-based financing (FSB 2015a), the Bank of England, as an entrepreneurial central bank, complements this shift through its "open for business" status (Carney 2015), engaging directly in the provision of liquidity to the shadow banking system on a regular basis. The reconciliation of status quo and strong regulatory intervention thus reflects the centrality of market liquidity to a system of market-based finance built on liquid collateral and its attendant political economy.

Prior research has demonstrated the importance of repo markets to the regulatory agenda pre- and post-crisis (Gabor 2016b, Braun 2018), arguing that the financial industry gained infrastructural power over regulators in the process (Braun 2018). This paper complements these analyses by focusing on how regulators engage with the task of re-regulating this market that is both deemed vital to the system of market-based finance and deemed to be at the core of the crisis dynamic of 2007/2008. The resulting program to build "resilient market-based finance" is, as we show, characterized by a speculative investment of regulators into that market which we argue is the hallmark of a neoliberal reason. In particular, the entrepreneurial activities the Bank of England engages in when backstopping that market, exposing tax-payers to increasing risks to secure liquid collateral, is the gist of this neoliberal mode of financial governance.

In the first part of the chapter, we present the debate in recent scholarship in political economy on the extent, degree and effects of regulation of financial markets post-crisis. Next, we lay out our theoretical framework to analyze regulatory action by the state in terms of continuing neoliberal reason, distinguishing between external interventions by regulators and internal interventions by central banks. We then present the object of investigation, the repo market to the reader, explaining

banks' intertwinement with the shadow banking system and its role in the provision of liquidity to the financial system. This sets the stage for our analysis of the post-crisis regulatory interventions of Basel III in this infrastructure, which seeks to install a new regime of market liquidity through an external regulation on a global level. In the subsequent part, we turn to the Bank of England and its new role as Market Maker of Last Resort (MMLR) to argue that the Bank of England complements this liquidity reducing regulation through its pro-active policy stance, stabilizing liquidity in times of crisis. We conclude by discussing how this two-pronged regulatory response can be understood as a speculative investment to transform the risk of the shadow banking system into a value for society through cultivating market liquidity, thereby showing how change is made productive to re-vitalize the status quo.

Regulatory changes post crisis: Much regulatory activity maintaining the status quo

Some observers have described the post-crisis regulatory interventions as effective and outcome of a functional global regulatory network (Drezner 2014, Wilf 2016). These authors, in line with the financial industry (JP Morgan 2014) characterize Basel III as a powerful and costly intervention, which is accepted as credible by markets (Wilf 2016: p.763). New regulations are seen not only as powerful, but according to Baker (2013a, 2015), these regulations carry a new systemic outlook of regulators on markets, seeking to regulate systemic rather than idiosyncratic risks. While being hindered by industry opposition and skeptic microprudential regulators, this agenda proceeds, albeit incrementally (Moschella and Tsingou 2013). An opposing view has pointed to post-crisis regulatory measures as maintaining the status quo (Helleiner 2014), as regulatory activism which did not change much (p.128). Constrained by market agents, which remain present in the rule making process (Tsingou 2015), regulatory innovations remain wedded to the approach of market- based governance (Underhill 2015) and hence do not constitute a paradigm shift away from the neoliberal pre-crisis era (Muegge 2013). Similarly, for the case of shadow banking, Ban et al. find that reform debates and efforts were characterized by a reformist, albeit extensive recalibration of pre-crisis financial economics and regulatory measures (Ban et al 2016, p. 1003).

The literature is hence divided between those emphasizing strong and credible post-crisis regulatory intervention and those, which diagnose a continuation of the status quo. In the following, we propose a reconciliation of these two views, which focuses on the objectives of state intervention. Recalling insights from scholars such as Gamble (1988) or Vogel (1996), namely, that regulation and liberalization go hand in hand to allow market forces to evolve (Vogel 1996), neoliberal regulatory intervention "intuits speculation as a productive, ordering impulse and brings the engagement of uncertainty into the logic of governance" (Konings 2018, p.22). This angle allows us to acknowledge

massive state intervention, often against the interests of individual market participants. While Keynesian policy makers often similarly went against the interests of market actors, the mode behind neoliberal governance differs since neoliberalism embraces speculation whereas Keynesianism seeks to oppress it (Konings 2018: p.59).

An intervention guided by a neoliberal reason takes "the promises and prospects of investment" (ibid: p.23) as a tool to "construct an unknown future" (ibid: p.23). Thus, the paradox of neoliberal governance to regulate and build financial markets demands that "politics should embrace entrepreneurial principles and proactively engage the speculative dimension of economic life" (Konings 2016: p.272). The expanding liquidity facilities to backstop markets thus reflect a risky investment to govern financial markets and advance insights provided by scholars, who have highlighted that regulation and liberalization go hand in hand (compare Gamble 1988, Vogel 1996 and Harvey 2005, p.69).

Theorizing regulatory interventions post-crisis

On the face of it, strong state interventions in the aftermath of the crisis might appear as a rupture with the neoliberal modus of (de)regulation, which began in the 1980s. However, such a stance embraces an overly static conception of neoliberalism and overlooks the fact that the financial growth in the run-up to the crisis was forged by new institutional links between the state and the market, which constituted a particular phase of neoliberalism (Konings 2009). The typical state market dichotomy is unable to explain such interventions, because it neglects the role that public authorities play in providing the condition for the market to occur (recently e.g. Langley, 2014, Langley 2013). Rather than clinging to such static concepts, we embrace the concept of neoliberal reason (Peck 2010), which seeks to address the "methodological challenge – of finding neoliberalism in its various moments of actualization, failure, normalization, and adaptation" (ibid: p.33). As such, it is capable of delineating continuities in what, from the outset, might appear as ruptures, as we seek to demonstrate in the following.

State interventions can be investigated from the vantage point of which kind of (idealized notion of) financial markets state interventions seek to establish. Taking insights from Foucault's lectures about governmentality, Baud and Chiapello (2014) point out that neoliberal, public authorities generally seek to "create a framework in which competition can develop and markets can operate efficiently" (p.4). Through providing the right incentives (ibid: p.7), the neoliberal lawmaker practices a steady "cultivation of the market" (Gertenbach 2010, p.15; compare also Lemke 2001), meaning that the possibility of efficient markets is created through the medium of an appropriate institutional and

judicial structure (Gertenbach 2010, p.93-94). In this view, the spontaneous order of the market does not just occur but is created through a structure that secures the freedom of the market actor to allow for his/her business.

The conceptualization of the market through the idea of cultivation allows us to theorize the market as dominant and – at the same time – to relate the market to the state’s intervention itself (Gertenbach 2010, p.95-96). This is a crucial point because it allows us to think about the market as an “epistemic authority,” meaning that the market provides legitimization for intervention as well as guides the practices upon which it is built (Kessler und Wilhelm 2014, p.109-110, Kessler 2012). While these interventions “dictate rules via incentives” (Baud and Chiapello 2014, p.7), the neoliberal lawmaker tries to influence the incentives of private market actors in such a way that the invariable and resilient character of the idealized market can evolve (Mirowski 2013, p.287). Hence, state interventions do not legally prohibit certain market transactions, rather they set and enforce incentives, which may create a factual limit on the amount of certain transactions. The epistemic authority should thus be understood as a criterion: since the objective of the neoliberal lawmaker’s intervention is a judicial and institutional structure, which was inadequate in case of market failure, the state’s intervention is justified by the market’s own essence, which in the case of financial markets, is proper price discovery.

Interventions by state agencies can be differentiated into those external and those internal to the market (Konings 2009, 2016). External, regulatory interventions shape markets by influencing actors’ incentives and try to create the epistemic authority of the market. Such external interventions venture “beyond a limited safeguarding and correcting role for the state in an effort to prevent abuse of monopoly power or to promote and stabilize competition” (Mirowski and Plehwe 2009, p.101). Hence, regulations disincentivize market transaction in order to restore the proper institutional order, wherefore these policies of order can be labeled as ordoliberal and stand in the tradition of Walter Eucken. According to Biebricher (2012), the post-crisis answer to the failure of the markets saw an increase of such ordoliberal interventions (p.193). In our paper, these interventions stem from the regulatory agents of ministries of finance and central bankers operating within the Basel Committee of Banking Supervision (BCBS).

Conversely, internal interventions, such as those by central banks in open market operations, exert a direct influence on the functioning of the market (Hellwig 2014, Braun 2018) and go beyond the external intervention alone to shape an economic order. Internal interventions, as we will describe them, focus on an internal evolutionary process to foster and underpin competition between market actors. Such a notion is line with Hayek’s perspective of economic order (Konings 2018, p.101) and

reflects that the "economy as driven by nothing but trial and error, uncertainty and discovery" (ibid). In this sense, the Bank of England as a central bank has a distinct role in the internal governance of financial markets. As a central bank, it can interact as a market participant with other banks (Hellwig 2014, Mehrling 2012) and foster the internal evolution of the system since it is on the edge between the market and its external delineation, while, at the same time, being its most powerful actor.

Due to their direct linkages, central banks can insure markets. In line with Konings (2018) the "'federal financial safety net' underwent significant expansion during the neoliberal era" (p.114) and "become more engaged with the dynamics of the payment system and more alert to the need to proactively ensure its smooth operation" (ibid, Konings 2016). Insurance must then be understood as a shift in policymaking: towards containing crises and as an increase of facilities which seek to build market infrastructure. Whereas central banks before the crisis "operated a system of fire insurance whose ambiguity was anything but constructive when global markets were engulfed in flames" (Carney 2015, p. 4), wherefore, "[c]onstructive ambiguity has been replaced by Open for Business" (p.8). Extending this line of argument, we interpret this moment of institutional development as a moment of how neoliberalism advances after the crisis (compare Peck 2013).

The role of banks in the repo-market and its encouragement by central banks

In the run-up to the crisis, banks came to play a pivotal role within a new system of market-based banking (Hardie and Howarth. 2013, p.15). They became crucial intermediators of liquidity between other financial institutions (such as Money Market Funds and Hedge Funds) and themselves, facilitating the swift trades of financial assets on financial markets (called market liquidity, Brunnermeier 2009). They originated and distributed securitized loans and lent and borrowed short-term, in turn, becoming active players in wholesale financial markets (Singh 2014). Due to these activities, banks' business models became heavily intertwined with and dependent upon financial markets' liquidity, leading Hardie and Howarth. (2013) to speak of market-based banking. In particular, the broker-dealer branches of banking conglomerates as well as independent free-wheeling investment banks in the US became the linchpin in the reconfigured financial system of the later 1990s and early 2000s.

A key market to support these activities, providing funding liquidity by connecting banks and the shadow banking system, is the repo-market, identified to be at the heart of the crisis (Gorton and Metrick 2012). The repo-market is one for short-term securitized lending and borrowing, where one market participant sells a security to another participant in order to receive short-term funding

liquidity with a promise to buy the security back at a later date.²²⁷ Funding liquidity, defined as the availability of funds to institutions (see Danielsson 2013), is a primary reason for market participants to engage in such a transaction, for they use it both to manage their liquidity and to fund longer-term investments (Bundesbank 2013, p. 58). Customers in the repo market include banks, institutional money managers, insurance companies, hedge funds, and non-financial corporations that actively manage their cash flows.

Because they act as intermediaries between those who lend cash collateralized by securities and those who seek funding, broker-dealers or broker-dealer segments of banks play a distinct role in that market (FED 2015, p.15). Broker-dealer use the repo market to provide funding to market actors as well as receive funding through it, wherefore broker-dealers are dispatched with enhancing price discovery and market liquidity (Adrian et al. 2013, p.1), meaning that they make markets more liquid.²²⁸

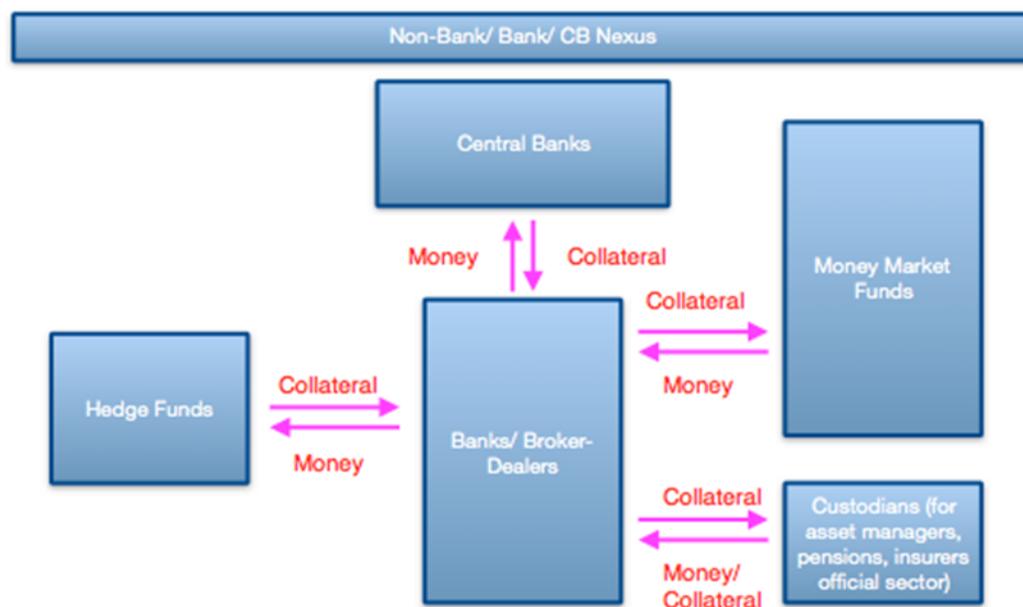


Figure 9.1: The bank/non-bank nexus

As figure 9.1 above (taken and simplified from Singh 2014) illustrates, market liquidity is provided by a private broker-dealer, which, on the one hand, absorbs money through repo-ing out collateral, while, on the other hand, provides funding through a reverse repo. The engagement of broker-dealer banks with other market actors, such as hedge funds or money markets funds, determines the price of collateral and, thus, the price of available liquidity (Singh 2014). So, market liquidity is a consequence of a broker-dealer, willing to absorb the collateral (Mehrling et al. 2012). Creating market liquidity

²²⁷ For a recent overview of the repo market and the role of broker-dealers consult FED (2015). For a critical analysis of the repo market and its relation to the Shadow Banking System, see Gabor and Vestergaard (2016).

²²⁸ A market is said to be liquid when “transactions can take place rapidly and with little impact on price” (Borio 2003a, p.217); notably, market liquidity is high when assets can easily be sold to raise cash (Brunnermeier 2009, p.36).

through borrowing and lending these securities at a certain price thus depends on broker-dealers' ability and willingness to buy and to sell securities instantaneously and on a repo market as a facilitating infrastructure.

This system of broker-dealers and its intertwinement with the shadow banking system was the pivotal infrastructure for the pre-crisis credit system driven by the search for yield (Nesvetailova 2014, Lysandrou and Nesvetailova 2014) and was also supported by central banks (Dow 2014, Gabor and Ban 2016, Gabor 2016b). In particular, in providing lender of last resort to banks, central banks provided further confidence in that system, the "foundation on which all the rest of the financial superstructure grew" (King 2016, p.235). Conversely, the ECB pushed for a unified European repo-market in order to create an integrated and liquid European debt market (Gabor 2016b, c). In this context, the repo market became the "lubrication" (Singh 2013) of a global financial system based upon an ever-more demanding search for yield. While treasuries and central banks had their own interests in the growth of repo-markets (for the case of the ECB, compare Gabor and Ban 2016, Gabor 2016b, Braun 2016a, 2018), it was the overall liquidity repo-markets provided, which "led to the deregulation of repo markets in EU and US in the late 1990s" (Gabor and Vestergaard 2016, p. 21, Gabor 2016c).

Because banks used the repo market to obtain short-term wholesale funding, their high leverage was based upon the liquidity of the collateral, which dried up during the crisis the beginning of the run on the repo-market (Gorton and Metrick 2012). The business of the broker-dealer thus proved itself to be a double-edged sword: on the one hand, it makes markets more efficient by providing market liquidity and price discovery; on the other hand, it is based upon funding liquidity risks that stood at the heart of the crisis. Against this backdrop, it is unsurprising that the post-crisis regulatory interventions – such as Basel III or those of the FSB – were intended to address the risks emanating from the involvement of banks in short-term funding markets. In the subsequent part, we show which regulatory measures affect this market and how the underlying regulatory discussions are torn between resilience and effectiveness in order to make the business of market-making less destabilizing, while keeping the benefits of providing liquidity to the markets.

Regulatory interventions after the financial crisis

The overreliance on short-term funding has been identified as a substantial contributor to the financial crisis by the regulatory community (FSB 2013a, BCBS 2011). This conviction in the regulatory community led to a fine-tuning of newly proposed measures within the Basel III framework and targeted the risks from the repo-market (interview German regulator, August 17, 2016). The Leverage Ratio as well as the Net Stable Funding Ratio dis-incentivize the activities of banks' broker-dealers in the repo-market. The Leverage Ratio does so by constraining the build-up of leverage in the banking sector, thereby helping to avoid destabilizing deleveraging processes. The second constraining regulatory measure is the Net-Stable Funding Ratio (henceforth NSFR), which is part of the new liquidity framework and tries to reduce the reliance of the banking system on wholesale funding. Short-term repos as well as reverse repos are disincentivized in this framework, as they are perceived to be unstable forms of financing, contributing to the fragility of the financial system (Second Interview Treasury Regulation European Bank, August 18, 2016).

Through the introduction of the Leverage Ratio and the NSFR, the business for broker-dealers in this market has, for the first time, received a regulatory cost. Given its status as a low margin business, there has been a reluctance in the provision of liquidity by broker dealers (Second Interview Treasury Regulation Large European Bank, August 18, 2016). Not surprisingly, in this new regulatory context, repo market activities of broker-dealers have been reduced.²²⁹ The decline in repo transactions can thus partially be explained through the new Basel III framework, which has altered the incentives of broker-dealers to engage in these transactions (First Interview Treasury Regulation European Bank, July 21 2016). Feared negative consequences are also projected by other industry studies, such as the one by Pricewaterhouse Coopers (PwC). Liquidity, which is considered to "be important for effective market functioning" (PwC 2015, p.8) and is essentially provided by broker-dealers (ibid: p.21-23), has been reduced since the crisis and "is [thus] a subject of concern for market participants" (ibid: p.7). Overall, these industry voices reflect the fact that post-crisis regulatory efforts are a push against market actors and their interests. In the following, based on a closer study of regulatory announcements and interviews, we provide evidence that these effects were, indeed, intended because "the people who wrote Basel knew exactly what they were trying to achieve" (ICMA 2015, p.10).

The post-crisis liquidity regime between resilience and effectiveness

²²⁹ Although a lack of data impedes a distinct statement if and why repo transactions have declined, current reports estimate that repo transactions have been reduced because of the new regulatory costs or have altered the market structure. (FED 2015, Bank of England E 2016c, ECB 2015, ESRB 2016). Nevertheless, as Adrian et al. (2017) argue, when actual trading behaviour with regulatory balance sheet constraints is measured, "post-crisis regulation has had an adverse impact on bond-level liquidity".

The regulatory interventions into the repo-market were based on a shared assessment by regulators about the broker-dealer's risk to financial stability. They argued that at the height of the boom "dealer banks were taking on exposures in ways that proved to be unsustainable [which is why] there was too much liquidity [...] in the broker-dealer sector" (Shin 2016, p.3). Similarly, Mark Carney argued that "much of the pre-crisis market making capacity among dealers was ephemeral" (Carney 2015) because they relied on short-term funding sources, which created a "tinder box" (ibid). The concern that broker-dealers' business models pose fundamental systemic risks to the system was shared by Daniel K. Tarullo, the Governor of the Federal Reserve Board responsible for financial stability, who argues that "broker-dealers generally do not internalize the externalities that arise in these cases [fire sales, if a broker goes down, where] they may use more than the economically efficient level of short-term funding" (Tarullo 2013a, p.10).

As an answer to the pre-crisis overreliance of broker-dealers on short-term funding for their market-making business, regulators consciously modified the liquidity regulations envisioned in Basel III. As Tarullo points out, a key concern regarding the revision of the Net Stable Funding Ratio (NSFR) was to address the systemic risks associated with matched books of broker-dealers, which stem from their short-term funding structure and might create "liquidity squeezes" to the market as a whole (Tarullo 2014a, s.). "To partially address these risks, the NSFR will require firms to hold some stable funding against short-term loans [...] to internalize the externalities produced" (ibid: 13) through the use of wholesale funding. Yet, while policymakers tried to reduce the funding liquidity risk to broker-dealers, they did not want to abandon the benefits of market liquidity. Rather, market liquidity and the efficiency it provides should be saved because, as Minouche Shafik, Deputy Governor for Markets and Banking of the Bank of England puts it, "central bankers retain a strong belief in financial markets' ability to facilitate price discovery, allocate capital efficiently, and provide useful signals about the macro economy and financial stability" (Shafik 2016, p. 3).

In this context, the dilemma that policy-makers faced becomes obvious: on the one hand broker-dealers contributed to the risk of runs and fire sales in the system. Their activities in the run-up to the crisis were implicitly subsidized, causing, at once, an underpricing of risk and distortions in markets (Carney 2015). On the other hand, their contributions to liquidity were essential for the creation of informationally "efficient" markets. Instead of abandoning these beneficial effects and excluding banks' broker dealers from the market, the post-crisis regulatory endeavor tried to build a resilient core, which was still able to provide market liquidity effectively (Anderson et al. 2015, also Bank of England 2016). Regulators explicitly acknowledged the costs that were endured by the decline in market liquidity but saw the gains of resilient markets as outweighing these costs, as the following quote illustrates:

“Market liquidity is integral to the resilience and effectiveness of the financial markets that serve the real economy. It follows that there will be some economic consequences of any enduring decline in market liquidity. The final impact of changes in market liquidity will depend on how market participants adjust to the post-crisis economic and regulatory environment. [...] But to the extent such costs of regulation arise, they need to be counterbalanced by considering the wider benefits of improved financial system resilience conveyed by the regulatory reform package that reduces the likelihood and costs of a financial crisis” (Bank of England 2016c, p.32-33).

As new regulatory costs have been applied to balance sheet capacities, market liquidity may have become more expensive in normal times, but it has become “reliable and resilient to stress” (ibid: 27). Because liquidity in the run-up to the crisis was “ephemeral” (Carney 2015), the regulators accepted a reduction of liquidity post-crisis, which may reduce the efficiency of the markets during normal times, but, in turn, contributes to a more resilient and robust financial system (Dudley 2016). Thus, the post-crisis regulatory endeavor has to be conceptualized as a push against market actors’ interests and for resilient markets. While consciously altering the incentives of broker-dealers through new regulatory costs, regulators still bear in mind that market liquidity is essential for the efficient functioning of markets.

However, regulators also realize that the pre-crisis market structure impeded the proper functioning of the market. Effective market liquidity, rescued from the excesses of a volatile system, is supposed to achieve just that while the idea of resilient market liquidity means that liquidity must be predictable and accessible (Anderson et al., 2015). The market is, thus, still the epistemic authority; however, it needs an active policymaker influencing the market actors so that the resilient character of the market can evolve. Taking our insights from this paper’s theoretical concerns, the governance against banks and their broker-dealer arms can be understood as an attempt to “correct the distortions caused by the structural under-pricing of risk on banks’ balance sheets” (Carney 2015). Furthermore, given this change in incentives, the Financial Policy Committee of the Bank of England expressed the hope that the regulatory impact “is likely to be transitory as firms adjust to new regulations” (Bank of England 2016c, p.27), so that in the long run “increasing choice and competition – real market forces” (Carney 2015), will be available.

Furthermore, as argued in the Winters Report (2012),²³⁰ the Bank of England can even play a more pivotal role in influencing the shift towards market-based finance in the interim phase, when banks recede as market-makers while new institutions providing this function are not yet available. That is, the BoE might play a crucial role in securing the transition to a more market-based financing system. As the report puts it, while the future “equilibrium will involve a greater role for non-bank financial institutions and capital markets” (Winters 2012, 80), this

“may involve a painful contraction of credit in the medium term, presenting possible macroeconomic reasons for the central bank to play a role in smoothing the transition away from banks as the key providers of maturity transformation to the broader economy” (ibid).

This suggestion is in line with Mark Carney’s notion that it is the task of “public authorities [to] complement private initiative” (Carney 2015).

Liquidity insurance: the internal intervention of the Bank of England to stabilize liquidity

Central banks, first and foremost the Bank of England, have markedly expanded their role in the repo-markets through their direct interventions. To ensure that the Bank of England keeps up with new challenges, the Sterling Monetary Framework (SMF), which regulates these interventions by the Bank of England, has been vastly expanded post-crisis. In the past, these adaptations have largely focused on the implementation of monetary policy (Winters 2012, p.18), but during the crisis, the Bank of England “noted that the available facilities were not sufficient to provide liquidity to solvent but needy banks” (ibid.). Therefore, the BoE undertook a review in conjunction with the industry which led to the introduction of the objective in 2010 to reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy (ibid.). Similar to the Basel Committee on Banking Supervision (BCBS), this process has been an iterative process, because once the reactive crisis management had been over, financial stability as the new task next to monetary policy has become a major topic for central banks (compare Papadia/Välimäki 2018 for FED and ECB and for the BoE Mervyn King 2016). Accordingly, the SMF currently has two objectives, namely to implement the Monetary Policy Committee’s decisions in order to meet the inflation target and to reduce the cost of disruption to critical financial services, including liquidity and payment services (Bank of England 2015d, p.3).

²³⁰ The Winters Report reviewed the BoE framework for providing liquidity and was undertaken by an American Banker called Bill Winters.

These new regulations determine how liquidity is provided to individual firms; who is eligible to receive liquidity and how market-wide liquidity is provided. First, liquidity is provided to individual institutions via a liquidity upgrade.²³¹ By engaging in repos and swap agreements, the Bank of England offers to exchange less liquid assets against more liquid ones.²³² Although three different facilities exist with slightly different terms, they share the mechanism that liquidity is only provided based upon a secured loan with a maturity and not on an outright sale. Second, since June 2015, the Bank of England has formally included central counterparties (CCP) and broker-dealers to grant them access to their liquidity facilities. While broker-dealers are included because they “play a central role in the intermediation of capital markets, which may leave them subject to liquidity risk” (ibid: p.6), the Bank of England argues that CCPs “provide critical services by mitigating credit risk in a range of financial markets” (ibid: p.7). Third, the Bank of England has formalized market-maker of last resort capacities. In contrast to the liquidity upgrade, where the Bank of England acts as a repo-counterparty, here the Bank of England buys or sells capital market assets against central bank money. The Bank of England can only do so if “the liquidity of one or more markets whose illiquidity posed a threat to financial stability or was judged to be important to the transmission mechanism of monetary policy” (ibid: p.6) is endangered.

Overall, the Bank of England has thus extensively broadened its liquidity provision framework, ostensibly putting it on a permanent institutionalized basis. Before the crisis, central banks used to provide emergency liquidity to banks through their role as Lender of Last Resort (LoLR). The principle of acting as a LoLR harks back to the Badeghot principle to lend freely against good collateral at a high rate of interest to solvent but illiquid firms. But, while central banks in the case of LoLR take collateral and apply high interests or haircuts, which can be adjusted daily, acting as a MMLR means that central banks take "outright risk" (ibid: p.30) onto their balance sheets since they actually buy securities. In this context, Gabor and Vestergaard (2016) notice that while central banks use market prices to value the collateral in the case of LoLR and MMLR, the problem with LLoR activities is that they do not backstop the market price the same way the MMLR does (p.27 f). Paul Tucker, the former Deputy Governor of the Bank of England, admits as much when he argues that neither LoLR nor MMLR "entail (...) putting a floor under (or ceiling on) the market price" (Tucker 2014a, p.30) since "it (MMLR) should post a selling price, i.e. stand on both sides of the market" (ibid). However, there is no guarantee that market actors will buy it back. Consequently, Tucker

²³¹ The BoE current's focus is on government bonds, however all liquidity facilities also allow "less liquid securitisations, own-name securities and portfolios of loan" (Bank of England 2015d, p. 7). Furthermore, formulations such as "The Bank's capacity to risk manage collateral is constantly evolving with a focus on collateral held by SMF participants in the course of providing financial services to the UK economy" (Bank of England 2015d, p.7) indicate that the BoE maintains a discretion to go beyond core assets.

²³² The BoE does so mainly through repos as the instrument, either the "indexed long-term repo" (regular facility) or the "contingent term repo facility" (market wide; stress situation).

admits that MMLR "entails unavoidable financial risk, with losses flowing one way or another to the taxpayer" (ibid: 31).

To risk taxpayers' money and backstop collateral of markets may be essential for a system, based upon liquid collateral (Gabor and Vestergaard 2016, p.27f, Gabor and Ban 2016). Whereas the Bank of England argues that its new SMF merely responds to the shortcomings revealed during the crisis (Carney 2013), these new facilities hence reflect more than that the Bank of England has simply learned its lessons from the crisis. Rather, through broadening its standing facilities as well as formalizing the MMLR function, the Bank of England "make[s] clear that it expects many of the structural changes that have occurred over the past few years to be enduring" (Winters 2012, p.9; compare also Tucker 2014a, p.28). According to Carney, these structural changes are a result of the post-crisis reforms, such as Basel III, but also the resolution regime of banks, which "make a further shift to market-based finance inevitable" (Carney 2015). The stabilization of liquidity through the stabilization of collateral or assets from whole markets then reflects the notion that "market-based finance needs good collateral to grow sustainably, (because) its availability directly influences the supply of finance to British households and businesses" (Carney 2013).

While it seems that the Bank of England only keeps up with ongoing market developments, it actually creates the developments that it observes. As argued by Carney, the new SMF "catalyze[s] more efficient and effective private collateral management by backstopping private markets" (ibid). The description by Carney that the Bank of England is now "open for business" thus reflects more than just that the Bank of England complements private initiative: it is the Bank of England's decision to support the shift towards market-based finance openly by engaging in the private business of collateral itself. According to Minouche Shafik (2015), this new relationship with the market has only become possible because of more stringent regulation. Through backstopping collateral of non-banks or even whole markets, the Bank of England redirects its attention towards the intersection of banks and markets, namely liquid collateral, and thus, balances the power between the market and the banks. Seeking to build a resilient core of broker-dealers, the new measures reduce the risk of moral hazard²³³ by forcing broker-dealers to internalize the risk of engagement in market-making. In this way, indirect subsidies are reduced, which contributed to moral hazard in the run-up to the crisis (ibid; also Carney 2015). Whereas the external governance mechanism altered incentives, thereby creating the condition in which market forces could evolve, both interventions share the idea of building markets.

²³³ "The more certain banks could be of the availability of liquidity insurance, the less incentive they would have to manage their own liquidity prudently through private markets" (Shafik 2015).

The Bank of England assumes that in the long run, “new entrants and approaches to client financing and trading could emerge to take advantage of profitable opportunities in intermediating markets” (Bank of England 2016c, p.32). In the eyes of the BoE, this creates more efficient markets through more stable liquidity – even if this means that the “central banks’ footprint in money markets is larger now than in the days prior to the crisis” (Shafik 2016). Again, both the internal and external intervention share a notion of building markets through influencing or providing the market-making infrastructure, as “real markets don’t just happen” (Carney 2015). The post-crisis financial regime, depicted in figure 9.2 below, is, thus, an outcome of a double strategy exercised through an external and an internal intervention both targeting the idea of building real liquid markets.

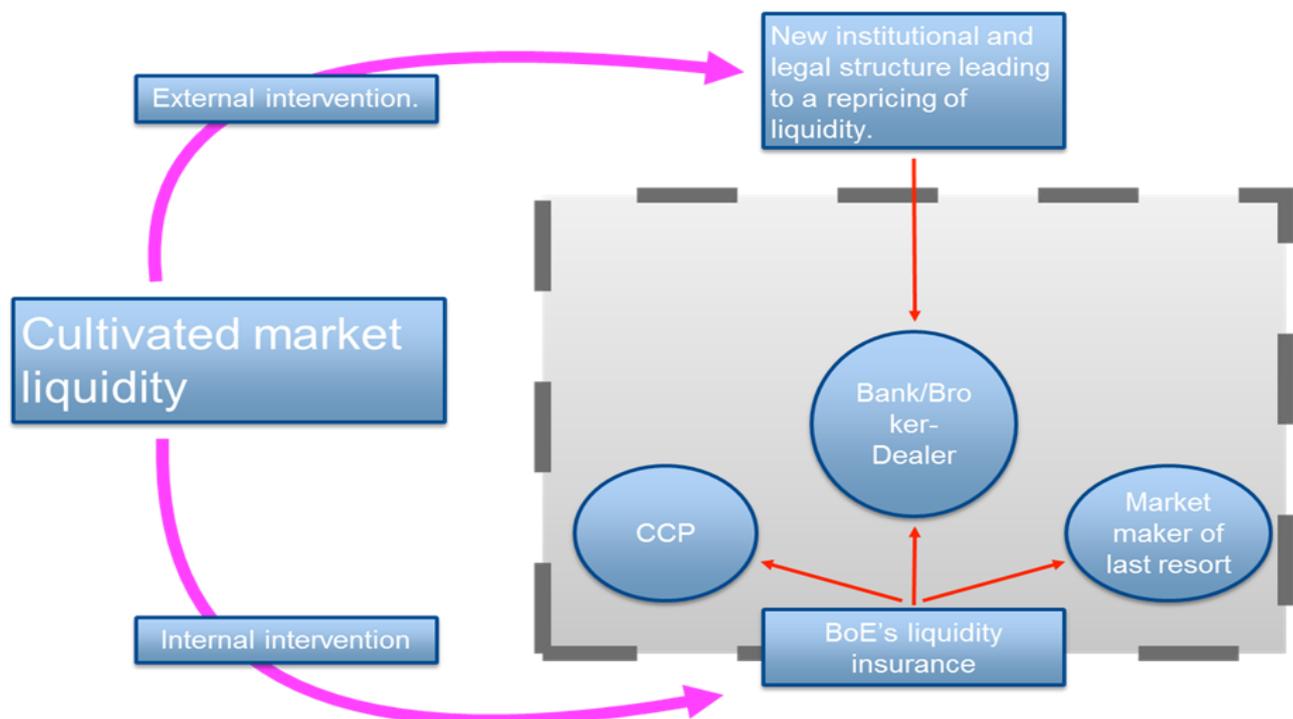


Figure 9.2: Resilient market-based finance and the cultivation of market liquidity

Both interventions thus cultivate market liquidity through influencing the price of liquidity as well as stabilizing it directly, when during a crisis of liquidity, the price of collateral threatens to disrupt the entire system. They are seeking to build real markets, that is markets which, due to their institutional configurations, can live up to the ideal functions ascribed to markets in neoliberalism.

Discussion

Having described the post-crisis evolution of the regulation of the repo-market through the framework of external and internal interventions, we can now return to the discussion of the extent and direction of the regulation of finance after the crisis. The investigated regulatory changes are strong, reordering the system of private market liquidity provision. They went against the interests of individual market participants, and the changes brought about can hardly be described as status quo. On the other hand,

the goals driving the intervention in the financial system remain wedded to the ideal of an efficient market as the ultimate epistemic authority guiding the intervention of policy makers. In this sense, there is a continuity in regulatory policies which points to a certain maintenance of the status quo, to the extent that market properties and market forces, e.g. price discovery are still the goal of regulators.

However, maintaining similar goals has come with substantial change in the way policy makers pursue them, as policy actors have come to understand that markets vanish „if they are not being fenced“ (interview economist and high level policy consultant, March 27, 2018, translation ours). This ordoliberal re-interpretation of the relationship between markets and states in bringing about market properties, we observe, has been complemented by a further internal mechanism at work, seeking to directly foster these properties of markets through central bank intervention. To stay in the metaphor, to cultivate market liquidity thus means to generate a fence (external interventions) and water the plants (internal interventions) until they become strong enough to survive on their own.

Recalling Baud and Chiapello (2014), who point out that neoliberal, public authorities generally seek to “create a framework in which competition can develop and markets can operate efficiently” (p. 4), we argue that the epistemic authority of the market in the post-crisis regime is restored by means of introducing regulatory costs, externally dis-incentivizing the ephemeral market-making capacity among dealers’ pre-crisis. The new incentives influence the price of market-making as private market-making and the market liquidity that it provides are externally reframed through a new institutional and judicial structures (the NSFR and Leverage Ratio). The first step in the cultivation of market liquidity must thus be understood as an effort to re-price the private business of market liquidity, which seeks to guarantee reliable and resilient market liquidity through limiting its excessive provision in the upswing. The push against market actors’ interest thus is explainable through an ordoliberal intervention.

In a second step, this external intervention is complemented through an internal one. Internal interventions, such as bailouts, are accused of creating moral hazards²³⁴ because they may foster excessive risk-taking by banks or other institutions. Theoretically speaking, any such direct interventions seem inherently to contradict the epistemic authority of the market itself because – by design – it “limits market discipline” (Allen et al. 2015: 14). However, such a short-term view of distorted markets fails to appreciate that through guaranteeing the functioning of the market, in the long run the market remains the epistemic authority. By providing a “government put” (Singh 2014), neoliberal regulators seek to catalyze the internal evolution of the system of market-based finance.

²³⁴For a nice overview and a critical reflection regarding moral hazard, s. Allen et al. 2015.

As market actors know both about the new safety net, providing stability in moments of crises and about new opportunities for non-banks to provide liquidity created by the new regulatory costs for banks, non-bank actors are incentivized to enter the business of providing liquidity. So, the internal insurance must be understood as an actual push for the market because it is an intervention to restore the functioning of the neoliberal financial system.

The cultivation of the market is subsequently bound to an external act of constraining and an internal act of supporting to allow the market to function so that the invariant, beneficial principles of the market can be realized in the long run. While the external ordoliberal intervention through repricing liquidity has reduced the market-making capacities of broker-dealers to provide for financial expansion, the BoE has speculated that the new internal intervention does not pose excessive risks for the central bank itself. Today, the central banks' footprint in the new system is necessarily larger (Shafik 2016), but this is vital and justified because it is the system of market-based financing which allows for financial growth and expansion to continue. This is a hallmark of neoliberalism: speculation used as a tool to transform a risk into value (Konings 2016), hence to reconstitute the resilience of markets, so that the market can bring about its beneficial effects. This move, however, requires a stance for a central bank for which "speculation does not represent an irrational divergence from fundamental values" (Konings 2016, p. 271) but, rather, becomes the tool for "ordering impulse and brings the engagement of uncertainty into the logic of governance" (Konings 2018, p. 22).

Given Carney's contention that "market-based finance needs good collateral to grow sustainably" (Carney 2013), it seems essential to invest into the infrastructure even if it "entails unavoidable financial risk, with losses flowing one way or another to the taxpayer" (Tucker 2014a: p.31). The engagement of the central bank with the repo market thus reflects that the BoE deems the repo market as essential to govern financial markets (Braun 2018), but even further that it is willing to enter a risky investment for the taxpayer to cultivate that market. Taking the view of the BoE, to cultivate the market for liquidity means that it deems the recent external interventions have created sufficient safety to enlarge engagement with repo-markets and that non-bank market actors will emerge over time to provide liquidity. The SMF's intervention, thus, has, as its constitutive moment, the attempt to transform the shadow banking system from a threat to a value for society. As Ewald (1991) illustrates, a risk can become an opportunity once insurance is applied to it, thereby actually inverting the meaning of this risk.

Through creating more direct linkages to the shadow banking system by broadening the collateral framework the BoE actively contributes to the push towards market-based financing. The transformation of shadow banking into resilient market-based is thus based upon the transformation

of risk into a value for society by accepting an entrepreneurial spirit to engage in a risky investment. As has been shown by Engelen (2017), while the shadow banking system was blamed for being responsible for the crisis in the midst of the crisis itself, in the aftermaths of the crisis, the shadow banking system has been identified as a tool to unlock economic growth. However, assigning a value to a former risk is more than a pure wordplay. As this paper has shown, assigning a value to a former risk is "performative rather than passively representational" (Konings 2018, p.12), since the new regulations and the new institutional linkages of the BoE are supposed to incentivise market actors and to elicit the value of the market forces. "Resilient-market based finance" is thus an expression for an external and internal intervention with the overall goal to transform the risk of the shadow banking system into value for society, guided by a neoliberal reason.

While central banks and Basel III differ in being national and supranational, both interventions share the idea of building a market infrastructure. On the one hand, Basel III tries to restore an orderly market infrastructure through disincentivizing broker-dealers to provide liquidity. On the other hand, the BoE speculates that their new liquidity facilities are constitutive for the market in the near future until non-bank actors have entered that market to make the BoE redundant. The ordoliberal and neoliberal interventions both meet in the cultivation of market liquidity: to secure the beneficial effects of that market liquidity, while trying to harness the danger of too much liquidity in case of overproduction. In our view, the literature which emphasizes strong and credible post-crisis regulatory intervention and those which diagnose a continuation of the status quo are in their separation analytically correct, but they fail to understand that change and status quo are inseparably linked. In fact, while the crisis problematized the risk of the shadow banking system, the ordoliberal and neoliberal engagement with these activities seeks to make this risk productive and to induce changes into the system (new regulations, new safety net) that can re-vitalize the epistemic authority of markets. Taking the vantage point of a neoliberal reason, the reconciliation of both interventions thus tells us more than the academic debate about status quo or change, as both interventions seek to re-vitalize the shadow-banking system.

Gabor (2016b) has shown that the BoE understood during the crisis that supporting the liquidity of markets became more important than supporting the liquidity of institutions (s. also Gabor and Vestergaard 2016). Following this line of argument, we have shown that this increasing engagement with market liquidity is driven by the intention to make shadow-banking an explicit value for society, guiding both the external and internal interventions. Hence, both interventions reflect the fact that the repo market is central for the provision of liquidity in a system of market-based finance while acting on its tendency to create cyclical vulnerabilities in the system. Our research complements the analyses that the shift to cultivate market liquidity is one of institutional

necessity (Braun 2018) by focusing on the way regulators deal with this market of central importance. By highlighting the entrepreneurial activities the BoE engages in when backstopping market liquidity and the fact that the BoE is even willing to accept a risk for the taxpayer to do so, we point to the neoliberal mode of financial governance that is inherent to these activities. While CCPs and broker-dealers evidently benefit from this measure, the outcome for the public at large is uncertain. The increased availability of credit, beneficial to the individual, might well feed into cyclical booms which in turn will cost the taxpayer. This gamble by regulators is at the core of the political economy of these regulations.

Even if the BoE, with its extensive engagement to ensure liquidity, acts as a pioneer among Western central banks, this new role for central banks is, by no means, limited to the BoE. Its new framework is comparable to the newly institutionalized links of the Fed and the ECB to support the repo-markets' leaky financial plumbing.²³⁵ These increasing engagements are partially driven by pressures created by Quantitative Easing, where new linkages must be set up in order to counteract the weakened financial plumbing as well as to restore the shadow banking system. These interventions are the expression of a capability gained by central banks with large balance sheets. And, there is ample reason to believe that central banks with large balance sheets of HQLA are likely to be a mainstay of the future (Mehrling 2014). Hence, while the BoE is probably the most outspoken about its new practices, it is by no means a singular case among Western Central Banks, thereby suggesting wider generalizability in the application of our findings. Future work can seek to specify in how far reconfigurations in these currency areas (Euro, Dollar) resemble the logic described for the British case and inquire into the bureaucratic battles undergirding its implementation.

²³⁵ The Fed has already installed a Reverse Repurchasing Program to permit Reverse Repos with Money Market Mutual Funds, offering HQLA on its balance sheet in case there is insufficient supply of investable collateral in the market. Similarly, the ECB already undertakes extensive repo-business in financial markets, which it recently expanded. Since November 2016, following complaints by market participants about the drying up of repo-markets, the ECB has begun swapping HQLA it now holds on its balance sheet for lower quality assets in order to secure the supply of high-quality collateral in demand by market participants (s. e.g. Debnath and Harris 2016 and ECB 2016).

Chapter 10: Conclusion: Post-crisis Ideational change and its impact on financial regulation

This habilitation set out to evaluate the changes in macroprudential regulation and the concurrent changes in economic discourse about financial markets and their capacity to inflict harm on the real economy that requires preemptive regulation. How did these two co-evolve? In contrast to prior work that analysed the moment of 2008-2009 as an ideational shift that completely changed the outlook of regulators on financial markets (Baker 2013a), this work rather followed Lombardi and Moschella (2017) and interpreted this shift as an act of symbolic politics by the G20. The shift hence was more an appeal of politicians to regulators to prevent the reoccurrence of crises based on a new vision of finance, but one largely unsubstantiated by economics. The work of setting up such a framework that could live up to the “initial vision” of financial markets as cyclical and dangerous to the real economy required the substantiation of this vision in the work of regulatory science, an iterative boundary process between technocrats and academics over whether such phenomena exist, whether they can be measured and mitigated. Building on the work of constructive institutionalists, I then traced the substantiation of this view by applied economists within central banks and their academic allies over the course of the last decade, which engaged in corroboration and operationalization.

In a first step, chapter 3 established that the economic discourse on systemic risk pre-crisis was characterized by a bifurcation between applied economists and historians who spoke of financial crises as a recurring pattern in financial markets in a self-evident way, using simple statistical and graphical evidence to back it up and on the other hand an academic discourse, which due to its mathematization and its focus on comparative statics had difficulties envisioning more than a short-term reduction in lending due to an external shock (Bernanke and Gertler 1990). As this paper shows, there was a certain irritation of the academic discourse by practitioners’ speaking of systemic risk and contagion (in particular Fed Governor Brimmer), but this irritation could not translate into a system-wide view which would include the dynamics of a banking system. We then documented a moment of discursive openness immediately after the crisis, when academic discourses on finance and banking regulation entered a period of self-doubt and questioning, whereas the discourse on systemic risk suddenly experienced a mathematization, seeking to generate models that could be able to capture the concept of systemic risks.

Chapter 4 followed up on this observation, using a much larger dataset to analyse which ideas were available to policy makers during the crisis and how these different idea sets developed. It thereby enquires into the effects of the crisis and the 2009 decision by the G20 on the evolution of economic discourse. It finds that the ideational shift, embodied in the statement that “we are all

macroprudentialists now”, pronounced by one of the most visible change agents for new systemic risk thinking, then chief economist of the economic and monetary department at the BIS Claudio Borio, does not extend to the field of economics as a whole. Using Borio’s distinctions between new and old systemic risk thinking and between the cross-sectional and the time-variant dimension of systemic risk, we find that academics in particular cluster around old systemic risk thinking in the cross-sectional dimension, focusing on the attribution of systemic risk to individual institutions. Other ideas for which we find substantial academic backing already before 2008 are the ideas of network contagion in inter-bank markets and counter-party risks. On the other hand, the new systemic risk thinking had little to no backing by academia, in particular with respect to the time variant dimension.

Whereas we found some engagement of academics with these topics in the cross-sectional dimension, such as stress tests, the time-variant dimension, which centers around the notion of the financial cycle and forms the core of the new systemic risk thinking according to Borio (2003) found little to no engagement by pure academics, especially not in the systemic risk sample, which formed the academic basis for thinking about these issues. Applied economists, on the other hand, working on early warning systems and LTV measures simply assumed the cyclical properties of the system without any theoretical underpinning. Probing deeper into publications that particularly focused on the financial cycle, we found that this topic was mostly treated by prestigious central bank economists and economists in international organizations such as the IMF or the BIS and that the most prestigious outlets for these papers were the Working Paper Series of Central Banks and International Organizations. Academics, again, were rather rare, pointing to a difficulty of this group of authors to engage with endogenous risks that are conceptualized to build up in forms of cycles in the system. This meant that the epistemic backing by academia of ideas such as contagion, the attribution of systemic risks to individual institutions or counter-party risks was much more pronounced than the backing for anti-cyclical time variant regulations.

Chapter 5 further pursued this question of work by both academics and central bank economists around the topic of the measurement of systemic risk. It detects the emergence of a shared understanding, in the words of Abbott a hinge between central bank and economic economists. The paper locates this hinge between the topic of tail distributions and early warning systems in the attribution of systemic risk to individual institutions, a question which is directly linked to the setting of the capital buffers for Global Systemically Important Financial Institutions (G-SIFI). Regulators at the time used this emerging hinge in 2011 to justify their calibration of G-SIFIs, while deciding to use a simpler method that was seen to be more robust and could not be gamed by the banks. Zooming in on the three most important measures suggested in this topic, the chapter detects an insertion of macroprudential concerns, such as the volatility paradox and the distrust of market

data in the most prominent of these papers, CoVar, written jointly by an academic and a central bank economist.

Being based on market data, the measure seeks to live up to these concerns, by expressing the willingness to substitute market data for balance sheet data, as is done in the final G-SIFI measure and by seeking to generate an early warning model that has the volatility paradox at its core. This paradoxical stance of using market data to contest the epistemic authority of markets is interpreted as a sign of the incremental shift that is occurring in academic discourse. Borrowing from the Value at Risk framework, which was prevalent before the crisis for the risk measurement of individual institutions and extending it to the banking system as a whole by using quantile regressions and market data, the measure represents the work of bricolage by these economists as they seek to envision a new macroprudential view of the financial system. The chapter also notes that the measure CoVaR itself is accepted by the *American Economic Review*, the flagship of academic economic discourse, providing academic recognition for these attempts, thereby establishing the topic in academic mainstream discourse.

Chapter 6 then placed this occurring incremental shift in economic discourse and in particular the uncertainty over the existence of the financial cycle as a stylized fact in the context of the deliberations of central bank managers in the US, the UK and the Eurozone (ECB) over the intermediate goals a macroprudential framework should pursue. It notices strong divergences between these managers over the question whether the macroprudential framework should pursue a strong anti-cyclical agenda or whether it is supposed to rather focus on increasing the resilience of the system. It finds both the uncertain scientific status of the financial cycle as well as the risk of exposure for central banks and their independence due to the discretionary nature of anti-cyclical interventions as well as their distributive consequences to be cause for substantial concern of these managers, a concern which varies with the “civic epistemology” (Jasanoff 2012) detected in these jurisdictions (that is the accepted way to establish objectivity in matters of regulation), the legal restrictions for intervention of these central banks as well as the degree to which independence of central banks is anchored in legal frameworks. These considerations are found to exert a permanent drag on the anti-cyclical side of macroprudential regulation, tilting the overall implemented frameworks in direction of cross-sectional structural measures that seek to increase the resilience of financial systems.

Chapter 7 further pursued the question of the implementation of anti-cyclical measures in these different jurisdictions by focusing on the development of the framework of the Counter-cyclical Capital Buffer (CCyB), the most prominent anti-cyclical measure agreed in Basel III. It combines an analysis of the evolution of this legal framework and the measures used within it with an analysis

of the applied economists within the financial stability divisions of these central banks and their work to further develop early warning systems that could provide reliable guidance for the setting of the CCyB. These efforts would not always directly translate into action, as is shown for the case of the US as well as Germany, whereby political economy considerations interfere with anti-cyclical CCyB calibrations. And yet, it observes underlying this institutional divergence a certain convergence of these applied economists in central banks around the measure of Growth at Risk (Adrian et al 2016), initially developed to inform monetary policy in the context of the US, as a reliable early warning system that could inform the calibration of the CCyB. This measure, which establishes the asymmetric impact rising vulnerabilities in the financial system can have on future growth is appreciated for its capacity to bundle the array of financial indicators into one number, which facilitates communication with policymakers.

This use of growth at risk, which received further epistemic backing by being published in the *American Economic Review* in 2019 goes hand in hand with the increasing use of stress tests to calibrate the counter-cyclical capital buffer, which applied economists use as model worlds to run simulations regarding the unfolding of crises. They increasingly deduce their counter-cyclical capital requirements from these results. In that sense, thinking about the state of the cycle and its implications for capital regulations are increasingly moved into these model worlds, which allow for a disciplined setting of these capital requirements. In its most pronounced form, in the UK, these developments lead to an ever-growing role of the CCyB, driven by the assumption that one can optimally set the capital requirements in line with cyclical developments. These developments point to the fact that a growing technical maturity with respect to early warning systems as well as stress-tests, albeit not mature enough yet in the view of policymakers to replace judgement increasingly encourages the anti-cyclical component of the macroprudential policy framework.

Chapter 8 then moved from the installation of counter-cyclical capital buffers to the attempt to install counter-cyclical margins in the repo-market, a crucial wholesale finance market which was seen as one of the major venues that spread illiquidity in the financial system at the height of the crisis (Gorton 2009). It notes the transformation of a radical agenda to set such anti-cyclical margins in the early publications of the Financial Stability Board (FSB) into the generation of a much more muted through the cycle margin requirements, which are very much toothless together with a large scale research effort on the cyclical character of repo-markets within the system of European central banks, in effect delaying the implementation of anti-cyclical margins until after the next cycle ends. This fate of this regulatory effort on the international level is explained by the opposition of the US to any anti-cyclical measures that could intervene in the functioning of the repo-market. On the European level, it is explained by the concerns of the financial markets divisions within the ECB, that in the wake of the Euro-zone crisis was wary to introduce any further frictions in the market.

This finding shows once more the problem that central banks are dependent on the smooth functioning of crucial wholesale markets to effect their own operations (Braun 2018, Walter and Wansleben 2019), and hence cannot intervene in it without taking effects on their own operations into account (Konings 2016).

In contrast to this largely futile attempt at regulation, the last empirical chapter studied a very impactful intervention in this central market in the context of the finalization of the introduction of the liquidity coverage ratio as well as the net stable funding ratio. Initially deplored as largely void of any macroprudential meaning, these measures were infused with structural concerns over the excess provision of liquidity by broker-dealers in times of booms. These concerns were formulated in the language of market failure and negative externalities by board members of the Federal Reserve, such as Harvard economist Jeremy Stein and Daniel Tarullo, as well as Boston Fed president Greenstein. They were then fed into the decision-making at the global level in a last-minute effort by Governor Tarullo, the leading manager at the Financial Stability Board guiding the design of these regulations. These interventions made the use of balance sheet space by broker dealers costly in terms of regulation, a fact which has had important reverberations in terms of the continuous provision of liquidity through the repo-market. This shows the power that economic thinking could develop in leading to direct action that interfered with financial markets, if formulated in the language of economic mainstream.

The paper goes on to trace the repositioning of the Bank of England following these regulatory changes, assuming officially their role as market makers of last resort. This positioning is characterized by a neoliberal belief in the capacity of markets to evolve, an evolution which is seen to require a transition period in which central banks are stepping into the void created by the increasing retreat of broker-dealers in terms of the provision of liquidity to market actors, extending the Bagehot rule of lending based on good collateral at a high discount to all kind of market actors. Stepping into this void, the Bank of England (and to a less pronounced degree the Federal Reserve and the ECB) are seeking to foster the transition of pre-crisis shadow banking into resilient market-based finance. Taking this position, these central banks are taking a gamble, by assuming that financial markets will sufficiently evolve to allow their own role to become less important in the future. Currently, that gamble means that the infrastructure underlying financialization both in the US and the UK is currently underwritten by these countries central banks' balance sheets and, in the final analysis these countries tax payers.²³⁶

²³⁶ A mitigating argument in this respect is the fact that the vast expansion of balance sheet since the crisis has provided windfall profits to these central banks, which have been transferred to the treasury of these countries. In the case of the US, 828 billion dollars have been transferred from the Fed to the Treasury in the 10 years between 2010 and 2019 (s. <https://federalreserve.gov/newsevents/pressreleases/other20200110a.htm>)

What do these findings imply about the impact the changed view on financial markets has had on the regulation of these markets? In a first analytical step, we can notice that arguments which were formulated in the form of mainstream academic arguments of market failures and which have had academic backing have been the most impactful. In this respect, a remark by an academic economist (interview academic economist, 19th of January 2018) involved in such regulatory discussions can help enlighten some reasons for it. He noted that welfare theoretical analysis and market failures operated on the assumption of rational agents and implied a need for corrective action by regulators due to coordination failures. In contrast, analyses of booms and bust, e.g. in behavioural finance imply irrational agents in financial markets. This stance causes epistemological problems for regulators, as they feel uneasy about assuming such superior knowledge for themselves and ask about the criteria which could be at the foundations of such knowledge. In contrast, the market failure theorem does not postulate superior knowledge, and hence allows regulators to treat financial market agents as at least equally knowledgeable but focused on different tasks.

Secondly, we can see that central banks today are no longer so lonely in the face of financial instability as they were in 2008 (Mabbett and Schelkle 2019). They have nurtured an economic research program within their financial stability divisions and their research departments that gave rise to a stock of knowledge that allows them to portray their interventions as rational and legitimate. This aspect does not only regard the structural, time invariant dimension of interventions that seek to increase the resilience of the financial system, but also those that seek to intervene into the cyclical build up of risks, seeking to mitigate the amplitude of booms and bust. The development of early warning systems, which have received the imprimatur of academic excellence (such as Adrian et al 2019 or Schueler et al 2020) and the refinement of stress-tests to include macroprudential elements allow central banks to project their considerations for the need of intervention with much greater legitimacy, providing policymakers with “actionable knowledge”, which at least in theory could lead to acts of mitigating cyclical swings.

And yet, this habilitation also finds that anti-cyclical interventions are much less common than structural interventions into the set-up of financial markets. While the latter have been constraining financial market actors to some degree (s. chapter 9), these latter measures do not represent the radical break with financialization early scholars on the macroprudential ideational shift had hoped for (Baker 2013a). Instead, it represents an intervention that seeks to secure the expansion of finance in a way that is resilient to shocks and that allows financialization, the increasing expansion of credit for households and corporations to continue (Langley 2014). The reasons for this have been tied back in this habilitation to both the lack of maturity of economic thinking about such cycles on the one hand, but also to the distributive and political consequences of intervening in the

contracting of credit. Constraining the access to credit for those at the lower end of income and wealth distribution is highly politically problematic in an era where asset-price inflation, in particular for housing has become a means for the middle class to experience upward mobility (Toporowski 2014). Intervening in the cyclical build-up of vulnerabilities within the financial sector and in the take-up of credit in the non-financial sector means to directly confront these political dynamics, and independent central banks are not properly equipped to deal with this issue.

The untenable status of central bank independence

It is important to remember that as Krippner (2011) points out in her seminal study on financialization, the Federal Reserve withdrew from constraining credit markets in the 1970s exactly because it wanted to avoid the ongoing politicization of its activities, which such credit constraints for individual borrowers inevitably involve. It seems counter-intuitive to assume that today they would re-enter this market for mortgage credit in a constraining way in an era which places much larger importance on these markets for society as a whole. Instead, the more these independent agencies seek to intervene in these dynamics, the more they endanger their status of independence due to their repoliticization. This means nothing else but that to enact powerful macroprudential policies, central banks need political back-up and hence need to recreate a link to the treasury which was very much capped since the 1970s. This can very well be seen for the most active case studied in this habilitation, the Bank of England, where the Financial Policy Committee is in direct and constant exchange with the Treasury of Her Majesty, seeking to ensure legitimacy for the actions it is taking. Fighting the dynamics and implications of financialization is therefore a task which central banks cannot shoulder alone, independent of how much scientific knowledge on the impending dangers of financial booms they can amass.

And yet, the “actionable knowledge” that central banks have acquired and the output in terms of financial stability reports and warnings they produce might play an important role in this societal debate. Whereas the initial phase of financialization unfolded in the context of an economic discourse which saw the expansion of finance as an indubitably positive aspect, this view is currently challenged by new research, much of which originates in the research departments of central banks. This outpouring of research has to do with the fact that today once more, much as in the 1970s (Padoa-Schioppa 2002), financial stability has become part of the implicit mandate of central banks, which can no longer be denied. If and when the next crisis occurs, the macroprudential mandate that central banks have been granted, more or less by their own choosing, imply responsibility, and that responsibility will lead to blame attribution. Better then for them to warn and to act within the limits of their political capacities, rather than stay quiet and just wait for

the next calamity to occur. In a sense, the current status of central banks in the context of financialization points to the untenable status of central bank independence in the coming decades.

The institutional set-up of central banks has varied over countries and over epochs since the first central banks were set up in the 17th century (Carruthers 1996, Pixley 2018). With this variation, the impact of central bank action on the distribution of income and wealth has varied (Carruthers and Babb 1996, Carruthers and Ariovich 2010). Over this time period different trends become evident: on the one hand, central banks are increasingly put into public, rather than private hands (e.g. Bank of England post 1945). On the other hand, in the 19th and 20th century, central banks reach a degree of independence from direct political interference hitherto unknown, with an important hiatus in the period from 1945 to the 1980s in Western Europe and the US (for the case of Banque de France, s. Monnet 2018, for the continuingly fragile independence of the Fed, s. Conti-Brown 2016). This central bank independence, which is supposed to guarantee technical independence that permits the application of scientific management of the monetary economy has spread since the 1980s and became the norm by the 1990s (s. McNamara 1998).

As Watson points out (2002), this depoliticization of central bank policy (now primarily focusing on the setting of interest rates) was an important victory for the propertied classes, in particular those holding financial assets (Jacobs and King 2016)²³⁷. While central bank policy can never be truly apolitical (s. McNamara 2002), the claim for central bank independence and technical management of interest rates by central banks always rested upon the strict separation of issues which are non-distributional (the realm of independent central bank action) and those which are strictly distributional, which were seen to fall outside the remit of central bank action. Optimal monetary policy was deemed as Pareto-optimal, which is why its decisions were deemed non-distributional (Tucker 2018). The reference to Pareto optimality already indicates the importance of abstract economics in this claim to independence, which itself never was undisputed but rather chosen also for political conveniences (McNamara 2002, Watson 2002).

Post-crisis, these claims to independence become increasingly questionable for two related reasons. On the one hand, the engagement of central banks in reflating stock markets and financial markets in general around the world post-crisis had clear and rather one-sided distributional implications (Jacobs and King 2016, Dietsch et al 2018), even though the ECB research department seeks to argue otherwise (s. Lenza and Slacalek 2019). Even worse, the quantitative easing central banks engaged in since 2009 was pretty much unprecedented but for the Japanese experience since the

²³⁷ On the different interests of industrial and financial capital at least pre-dawn of shareholder value in the 1980s, s. Pixley 2018

1990s. Given that, the claim to “scientific management” seemed increasingly shaky and its potentially negative distributional impacts around the globe were tackled by important contributors to the expert discourse on these matters, such as the BIS (Nagel and Thiemann 2019). On the other hand, it was the financial crisis itself which led to a re-strengthening of an economic analysis of finance which traces its potential impact on the macro-economy, an impact which does not necessarily have to be benign (Bezemer 2016). Going under the heading of (international) macro-finance, this new strand of economic research links financial conditions and financial instability to macro-economic variables (e.g. Adrian and Shin 2010, Adrian and Brunnermeier 2011, Adrian et al 2019).

Carried by prominent economists, such as Tobias Adrian, this research focuses on the vulnerabilities in the present financial system (Adrian and Shin 2010) and seeks to quantify the risks of financial instabilities through systemic risk measures (cf. Adrian et al 2013, Adrian and Brunnermeier 2011) and to analyze the impact of financial instabilities on the macro-economy, always in a forward looking modus that seeks to guide policy making (Adrian et al 2019). Macro-finance, which revives in modern mathematical language and with statistical tools the insights formulated by Hyman Minsky and others is linked to the attempts to operationalize macroprudential efforts post-crisis and thereby to guide central bank action, an attempt which oftentimes stems itself from research departments within central banks (Thiemann 2019, Thiemann et al 2018a). It links monetary policy and financial conditions to macro-economic outcomes and is increasingly published in the highest academic journals (e.g. the *American Economic Review*). This economic discourse questions the non-distributional aspect of monetary policy, thereby undermining the claim to the apolitical nature of central bank policies which were established pre-crisis.

Now, both developments place a strain on the claim to scientific expertise and central bank independence, and both are mutually reinforcing each other. QE, with its evident distributional implications questions the legitimacy of central banks, which seem to be subject to financial dominance to a degree that critics of fiscal dominance could hardly have imagined (Jacobs and King 2016). A benign reading of the events points out that given the double nature of central banks as administrative units that pursue their policies through financial markets and as banks (Hellwig 2014, as cited in Braun 2018), they were linked to such a degree to the fate of large financial institutions and those in turn to financial markets, that they could do little else but revive not only the financial system but the financial institutions themselves²³⁸. In addition, the success of

²³⁸ This dependence on the health of banks to implement their policies would explain the profit margins granted to banks in Europe and the US due to quantitative easing (Braun calls this the “infrastructural power” of banks (Braun 2018)).

quantitative easing in bringing stock markets to new highs, even despite serious cyclical warnings of an impending economic downturn today are a sign of the persistent power of central bank interventions, benefiting largely only the upper middle classes, who due to a wealth effect are supposed to revive the economy. This is evidently distributional. On the other hand, the counter-narratives of the increasing need to take financial conditions into account as central banks set monetary policies threaten to undermine on the one hand the Tinbergen principle that facilitates simple rules for the setting of interest rates (following the Taylor rule), but also questions its strictly non-distributional character. In other words, the financial cycle and its distributional implications are up high on the agenda even within the central bank community (Constancio 2014a, 2016, 2018 Thiemann 2019).

To date, the policy community is struggling with both issues, seeking to fend off the criticism that their interventions through QE were distributional²³⁹ and placing all the responsibility for financial stability onto macroprudential policies (Ekholm 2014). However, as recent research points out, macroprudential policies are by no means fully implemented, but instead suffer from problems of insufficient international coordination (Thiemann et al 2018b) and limited US buy in (Baker 2014, Goodhart 2015, Helleiner 2014, Persaud 2010). Current macroprudential arrangements regarding anti-cyclical policies suffer from central bank managers being risk-averse in getting too engaged in anti-cyclical policies which are distributional. The political nature of these interventions hence could provoke political backlash of the kind which led the Federal Reserve to withdraw from credit controls in financial markets in the 70s (Krippner 2011). For that reason, most countries do not have a functional anti-cyclical macroprudential policy framework (Edge and Liang 2017), most prominently the US.²⁴⁰ The central bank community are very aware that overburdening central banks with distributional policies could threaten central bank independence (Issing 2016, Tucker 2018) and hence prefer to limit macroprudential policies to those which increase resilience (Tucker 2016).

In other words, challenges to central bank independence and its legitimacy have arisen both through central bank practice and from a discourse that has been largely fueled by central bank economists which increasingly pushes central bankers to take financial stability into account as central banks set monetary policy (Adrian et al 2019). And yet, institutional change to respond to these challenges is incremental at best. To date, central bank largely refutes negative distributional effects of QE and claims that macroprudential regulation is enough to deal with the problems of financial instability.

²³⁹ Often using questionable counterfactuals (Lenza and Slacalek, for a similar defense of US QE with respect to its global repercussions, s. Bernanke 2015)

²⁴⁰ A fact demonstrated by a tabletop exercise of the Fed in 2015, which simulated the cyclical rise of mortgage financing through the shadow banking system and found that the Fed had no tool to effectively limit such an expansion of credit (Adrian et al 2015).

Looked at from the outside, this institutional stance points to the impossibility of central banks to reform from the inside (s. also Baker 2018). Political pressure seems to be needed to push central banks outside of the realm of independence and back into an expanded interaction with the treasury and political agents regarding the developments in the financial system. This will also require a debate on the desired financial system as well as the necessary steps to get there. Moving beyond financial dominance, the fact central banks have to reflate financial assets in case of crisis ²⁴¹ will require a move away from the link of financial markets and banks which resides in an expanded shadow banking system, rebranded as “resilient market based financing” (FSB 2014) and towards a provision of credit that is more reliant on domestic sources of deposits.

Instead, what we see post-crisis is a regulatory agenda pursued by central banks across the world that seeks to marry financial market liquidity to financial market resilience by placing in between the two the balance sheets of central banks (chapter 9). Instead of acting forcefully to shrink the shadow banking system, regulatory action has thus sought to reconcile the need for persistent financial expansion through capital market financing with a resilient financial system (Endrejat and Thiemann 2018). In this way, central banks are expanding rather than diminishing their institutional linkages to capital markets (Braun 2018), following a pre-crisis trend (Gabor 2016b). Indeed, one might best understand post-crisis reforms as seeking to bring forth a vision of financial markets that was heralded pre-crisis, in which the fall out of certain market segments, such as a subprime mortgage market in the US would be a mere blip in overall financial markets, as contagion has been limited and resilience increased.²⁴² Whether this regulatory dream pursued by the likes of Mark Carney will come true or not, it will most definitely involve the interventions of central banks seeking to prop up base assets of the financial system and their close substitutes through massive central bank purchases, once more clarifying to those willing to see the deep structural involvement of central banks in the maintenance of asset values of the propertied class and the financial system that it is based upon.

This institutional linkage, unbroken but rather re-configured after the financial crisis thus is likely to evoke the conditions for its own undoing by exhausting the one resource it rests upon. By undermining central bank legitimacy, central banks and their action will become subject to political pressures and action to limit their independence. However, whether that limitation of central bank independence comes from the left or from the right and whether it is used to finance a green new deal (Braun and Downey 2020) or another societal projects is an open question that history will have to answer. What is clear is that if Western societies were to confront the dynamics of

²⁴¹ Dubbed the “Greenspan put” in 2004, but still very much operative today

²⁴² For a formulation of this vision, s. the April 2007 Global Financial Stability Report of the IMF.

financialization head on, this would require political will and actions by treasuries and politicians, in particular with respect to the housing market and the credit dynamics it creates (Turner 2015). Massive social housing programs, which provide reasonable housing at affordable prices are one element of such action, taking the pressure off the rental market and thereby making purchases of property less enticing. It will also involve recreating trust in the sustainability of social security systems, in particular pensions, which make the acquisition of property less necessary as a means to insure against precarious old age. Evidently, these issues are beyond this habilitation, as they would require a careful study of the political economy of housing and social welfare in our current neoliberal era.

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Appendix:**List of interviews**

1. 19.08.2014: Academic economist, formerly Bundesbank
2. 04.09.2014: ECB economist
3. 22.09. 2014: former FSA regulator
4. 22nd of October 2014: Bundesbank economists
5. 18.05. 2015: IMF economist
6. May 30th 2015: Academic economist, UK
7. August 7th 2015: Academic economist, formerly Federal Reserve Boston
8. August 26th 2015: Employee large German Bank, formerly Banque de France
9. 06.11.2015: Bundesbank economist
10. April 21st 2016: ECB economist
11. April 29th 2016: Academic, US
12. 09.05 2016: ECB economist
13. 09.06.2016: Bundesbank economist
14. 09.07.2016 Bundesbank economists
15. 19th of July 2016 ESRB economists
16. 21st of July 2016: Bundesbank economist
17. 25.07.2016: Bundesbank economists
18. 27.07.2016: Bundesbank economist
19. 22.07.2016: interview economists large German bank, Frankfurt
20. 15.08.2016: interview ECB economist
21. August 17th 2016: interview academic economist, UK, formerly Bank of England
22. 17.8.2016 interview economists at large private bank, UK
23. 24th of August 2016: Bundesbank economist
24. 21st of September 2016: economist Dutch Central Bank
25. 22nd of September 2016: interview Bank of England economist
26. 23rd of September 2016: interview Bundesbank economist
27. September 26th 2016: formerly ECB economist, now Lithuanian Central Bank
28. 11th of October 2016 BIS economist
29. 12.10.2016: ECB supervisor
30. 28.10.2016 (employee large CCP, London)
31. April 6th 2017 Fed economist
32. April 6th 2017 ECB Research Economist)

33. 20th of December 2017: interview economist, formerly Bank of England
34. 9th of January 2018: Economist, think tank, formerly Federal Reserve Board
35. 19th of January 2018: Academic Economist, USA
36. 12.03.2018: Interview Italian economist
37. 27th of March 2018: Academic economist, Germany
38. 13th of march 2018: interview academic economist, formerly Banque de France
39. 20th of august 2018: interview IMF economist, formerly Federal Reserve
40. 20th of august 2018: interview BIS economist
41. September 11th 2019: former ECB economist
42. 25.09.2019: Academic economist, Spain, consultant for the Banco de Espana
43. 16.10.2019 : Bundesbank economist
44. 23rd of October 2019: ECB supervisor, formerly Bank of England
45. 25.10.2019 : Academic ; Spain, consultant for ESRB
46. 12.12.2019 Bank of England economists
47. 30.12.2019 (ECB economist, formerly Bundesbank
48. 06.01.2020: second interview Bundesbank economist
49. 10.01.2020 and 17th of January 2020: interviews German banking supervisors
50. 13.01.2020 Bank of England economist

Appendix Chapter 4.

1: Wordlists for Topics found in each subsample

Networks	network	node	degree	connect	link	central	structure	number	core	graph
FX (esp. developing economies)	country	current	rate	foreign	growth	sector	international	gdp	development	exchange
Measuring systemic risk	system	risk	insurance	financial	institution	measure	bank	sector	contribution	exposure
Bank deposits & their insurance	bank	deposit	system	insurance	market	liquid	asset	loan	failure	depositor
Mortgage securitisation	market	financial	security	mortgage	feder	reserve	asset	company	fund	loan
Regulation	financial	regulation	system	risk	institution	international	market	regulator	stabil	bank
Asset markets (esp. stock market)	market	model	time	data	financial	indicator	correlation	volatility	stock	period
Risk estimation & modelling	risk	distribution	estimation	model	depend	tail	condition	measure	return	value
Bank funding	capital	bank	risk	equity	debt	require	asset	regulation	ratio	cost
Hedge funds	fund	risk	market	hedg	asset	return	investor	portfolio	price	leverage
Payment & settlement systems	payment	bank	system	security	market	liquid	settlement	repo	transaction	central
Sovereign risk	bank	country	risk	sovereign	stress	spread	cds	crisis	european	euro
Interbank contagion	bank	system	default	contagion	interbank	asset	model	risk	shock	loss

Equilibrium agent models	model	risk	agent	equilibrium	asset	optim	price	liquid	invest	follow
cycles	financi	rate	polic	crisi	system	market	price	moneta	credit	econom
Panel studies, estimations & regressions	bank	variabl	tabl	result	return	effect	sampl	estim	regress	risk
Derivatives & counterparty risk	market	trade	deriv	risk	counterparti	default	clear	contract	cds	collater

Table 2: Top 10 most probable words for every topic in the SR sample

Networks	node	network	topolog	edg	peripheri	connect	layer	neighbor	modul	graph
Garbage topic	signi	nancial	rst	cient	cant	cation	diversi	ned	rms	bene
FX (esp. developing economies)	currenc	export	latin	czech	foreign	gdp	count	asia	domest	growth
Measuring systemic risk	reinsur	insur	covar	life	mes	srisk	sifi	contrib	system	sib
Bank deposits & their insurance	deposit	deposit	bank	fail	guarante	withdra	failur	compe	hazard	safeti
Mortgage securitisation	mortgag	shadow	sponsor	feder	lehman	aig	fed	securit	bankrup	fdic
Regulation	supervis	supervis	supervis	commi	prudenti	commis	jurisdi	resolut	regulat	reform
Asset markets (esp. stock market)	econom	forecast	jun	sep	dec	energi	seri	mar	oil	entropi
Risk estimation & modelling	copula	tail	quantil	var	multivari	asympt	extrem	gaussi	distribu	depend
Bank funding	capit	tax	compen	equiti	incent	debt	basel	requir	conting	bonus
Hedge funds	hedg	fund	tranch	investo	arbitrag	option	levera	portfol	strategi	jump
Payment & settlement systems	paymen	repo	settl	card	electron	settl	intrad	transa	particip	overnig
Sovereign risk	sovereig	greec	spain	euro	ireland	eurozo	itali	portug	stress	germa
Interbank contagion	interban	contagi	simul	default	shock	liabil	chann	fractio	sheet	algorit
Equilibrium agent models	equilibri	optim	proposit	agent	util	constra	proof	trader	welfar	lemma
cycles	cycl	bubbl	moneta	output	boom	gap	macro	inflat	polic	imbal
Panel studies, estimations & regressions	regress	variabl	dummi	sampl	ltd	yes	coeffi	panel	tabl	beta
Derivatives & counterparty risk	ccp	otc	clear	deriv	counterp	arti	ccps	dealer	swap	contra

Table 3: Top 10 most exclusive words for every topic in the SR sample

Historical accounts of central banking/macroP	bank	market	financi	central	crisi	govern	reserv	feder	system	regul
Monetary policy and financial stability	polic	monetary	financi	central	stabil	bank	inflat	rate	price	macroprudenti
Political Economy	financi	system	macroprudenti	institut	regul	polic	market	econom	process	network
LTV	loan	credit	ltv	macroprudenti	polic	mortgag	hous	ratio	measur	effect
Growth and Macroeconomic development in Asia and Latin America	percent	countri	region	develop	economi	fiscal	trade	growth	econom	latin
Garbage/only produced by two documents	constraint	price	model	equilibrium	period	asset	debt	tax	polic	consumpt
Market measures like MVAR/GARCH/Business cycle	model	variabl	estim	shock	price	data	time	index	result	rate
Macroprudential Tools and Monetary policy in DSGE models/BC#	polic	nancial	shock	model	rate	monetary	capit	rule	output	credit
Conventional Monetary policy tools (IT,Rserve requirements)	rate	bank	reserv	exchang	requir	loan	credit	increas	percent	deposit
Stress testing	stress	bank	risk	test	financi	loss	scenario	sector	system	model
MacroP and the housing markets	hous	household	price	debt	rate	mortgag	incom	increas	tax	market
Leverage bubbles	financi	credit	asset	leverag	cycl	risk	price	boom	bank	capit
Early warning indicators	countri	credit	crisi	indic	financi	gdp	growth	bank	variabl	ratio
MacroP supervisory setup post crises	bank	financi	risk	system	capit	stabil	regul	institut	requir	prudenti
Capital regulation as a macroP tool	bank	capit	risk	asset	liquid	cost	regul	requir	model	deposit
Banking market structure	bank	capit	loan	lend	ratio	effect	asset	total	firm	result
Capital flows and macroP regulation	capit	countri	foreign	flow	current	polic	domest	exchang	measur	intern
Asset Price bubbles based on information asym.	bubbl	model	firm	price	market	inform	product	valu	expect	invest
Shadow Banking/Hedge funds	market	liquid	fund	asset	risk	financi	bank	invest	term	bond

Table 4: Top 10 most probable words for every topic in the MP sample

Historical accounts of central banking/macroP	governor	feder	england	treasuri	war	congress	bill	presid	act	offici
Monetary policy and financial stability	moneta	inflat	polic	target	stabil	imbal	object	central	transmiss	mandat
Political Economy	networ	complex	polit	oversight	collect	actor	agenc	process	connect	organ
LTV	ltv	cap	kong	mortgag	dti	hong	tighten	loan	macroprud	propert
Growth and Macroeconomic development in Asia and Latin America	latin	america	region	china	asia	fiscal	export	commod	usa	oil
Garbage/only produced by two documents	constra	bind	equilibri	labor	collater	trader	constrai	planner	land	agent
Market measures like MVAR/GARCH/Business cycle	forecas	var	estim	error	varianc	index	compon	vector	seri	lag
Macorprudential Tools and Monetary policy in DSGE models/BC#	nancial	ect	ation	rst	erent	rms	cient	entrepren	steadi	nanc
Conventional Monetary policy tools (IT,Rserve requirements)	exchan	reserv	rate	dev	deposit	inflat	nomin	depreci	jan	export
Stress testing	stress	scenario	test	loss	provis	default	exposur	portfolio	solvenc	contagi
MacroP and the housing markets	hous	rent	househo	oecd	wealth	mortgag	age	incom	amort	home
Leverage bubbles	leverag	cycl	cyclic	boom	recess	procycl	counterc	bust	downturn	securit
Early warning indicators	indic	warn	gdp	countri	crise	czech	threshol	gap	signal	republ
MacroP supervisory setup post crises	supervi	supervis	basel	supervis	recomm	europa	committ	resolut	prudenti	ensur
Capital regulation as a macroP tool	wholes	banker	riski	intermed	retail	fire	return	intermedi	outsid	incent
Banking market structure	yes	lend	total	column	regress	relations	branch	firm	profit	sampl
Capital flows and macroP regulation	flow	inflow	foreign	currenc	border	eme	domest	global	local	exchan
Asset Price bubbles based on information asym.	bubbl	belief	ration	learn	fundame	uncertai	sell	burst	screen	firm
Shadow Banking/Hedge funds	hedg	cash	billion	secur	compani	insur	liquid	swap	jan	fund

Table 5: Top 10 most exclusive words for every topic in the MP sample

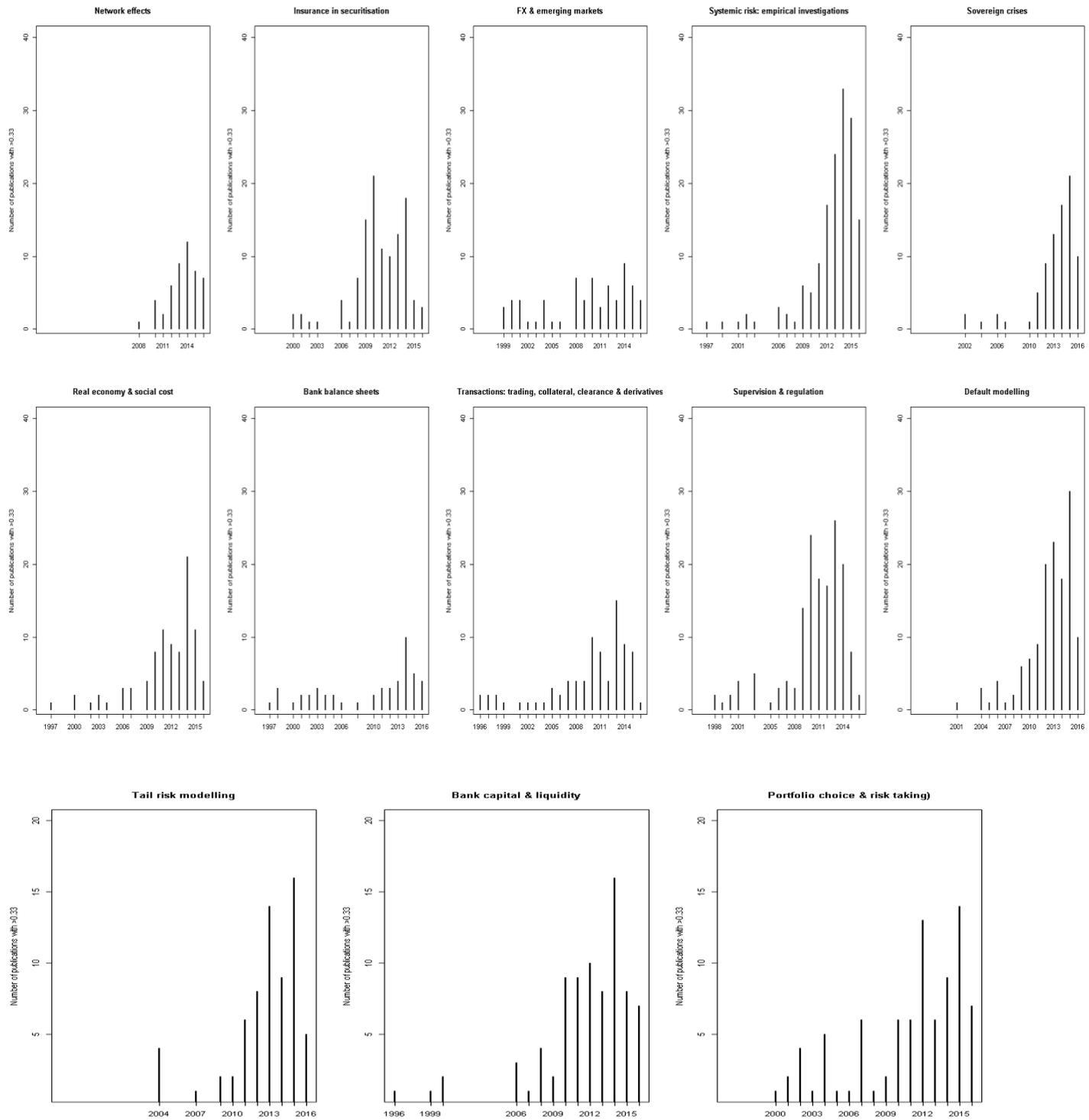
Macroprudential concepts/tools	financi	polici	system	risk	macroprudenti	stabil	bank	institut	monetar	market
Evaluation of macroP tools/Cross country comparison	polici	bank	credit	loan	capit	macroprudenti	rate	ratio	requir	percent
Macroprudential regulatory system	bank	financi	system	risk	market	regul	institut	crisi	liquid	supervi
Attributing SR to institutions	syste	risk	bank	financi	measur	regul	capit	institut	econom	crisi
Indicators for counter-cycl- regulation	bank	countri	credit	rate	sector	financi	indic	growth	gdp	loan
Early warning systems/Forward looking SR measures	risk	model	financi	marke	system	fund	data	stress	estim	time
SR in the banking system	bank	loan	risk	variabl	asset	capit	deposi	result	total	effect
Network/Contagion	bank	syste	networ	risk	model	asset	liquid	interban	default	capit
Agent-Based-Modeling	bank	asset	price	regul	polici	invest	levera	model	cost	market

Table 6: Top 10 most probable words for every topic in the overlap sample

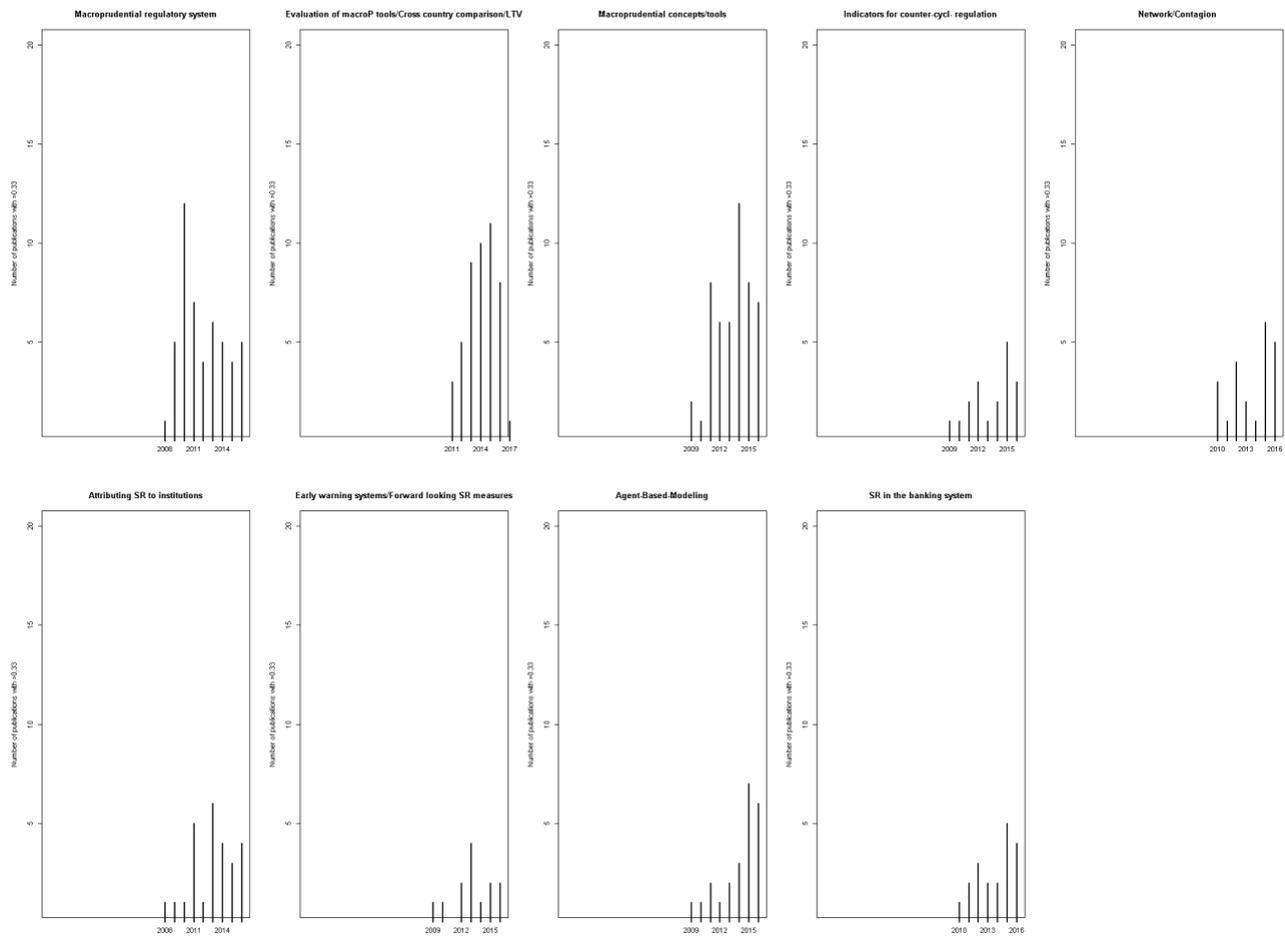
Macroprudential concepts/tools	tool	macroprudenti	macro	bis	stabil	prudenti	microprudenti	object	polici	cycl
Evaluation of macroP tools/Cross country comparison	ltv	percent	hous	mortgag	propr	reserv	tighten	limit	cap	instrumen
Macroprudential regulatory system	resolut	supervisor	supervis	repo	reform	law	supervisor	legal	manag	act
Attributing SR to institutions	tail	reliabl	acharya	system	shortfal	covar	var	inc	regul	brunnermei
Indicators for counter-cycl- regulation	gap	euro	household	foreign	gdp	trend	percentag	curren	save	chart
Early warning systems/Forward looking SR measures	stress	data	estim	compo	volatil	forecas	industri	signal	predict	lag
SR in the banking system	securit	regress	variabl	dummi	coeffici	column	signific	deposi	withdra	cross
Network/Contagion	network	interbank	contagion	default	connec	scenari	nancial	exposu	simul	ect
Agent-Based-Modeling	equilibriu	m	constraint	welfar	banker	optim	agent	shadow	fire	sale
										investor

Table 7: Top 10 most exclusive words for every topic in the overlap sample

Appendix 4.2: Publication distributions of topics Systemic Risk Sample (13 topics)



Publication Distribution of topics in the Overlap Sample: 9 topics



Publication Distribution of topics, Macroprudential Sample (18 topics)

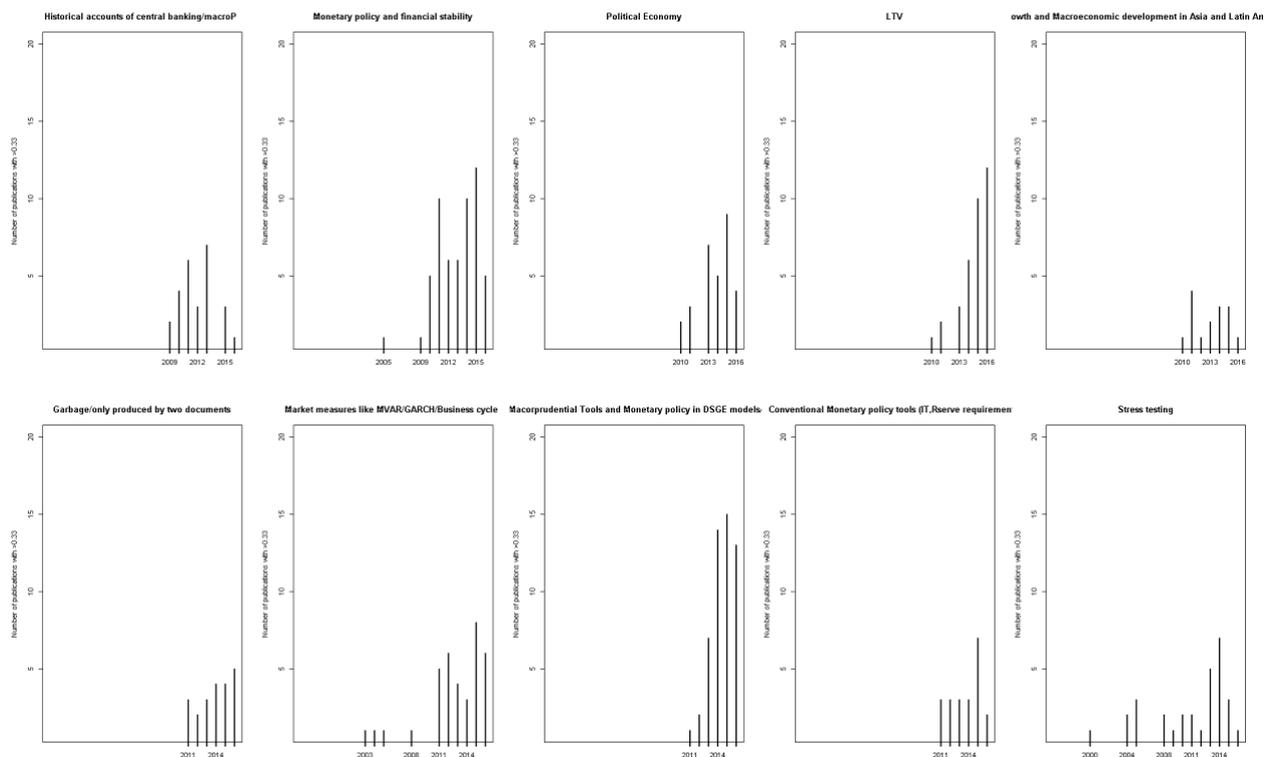


Figure 2: Publication distribution for topics 1-10

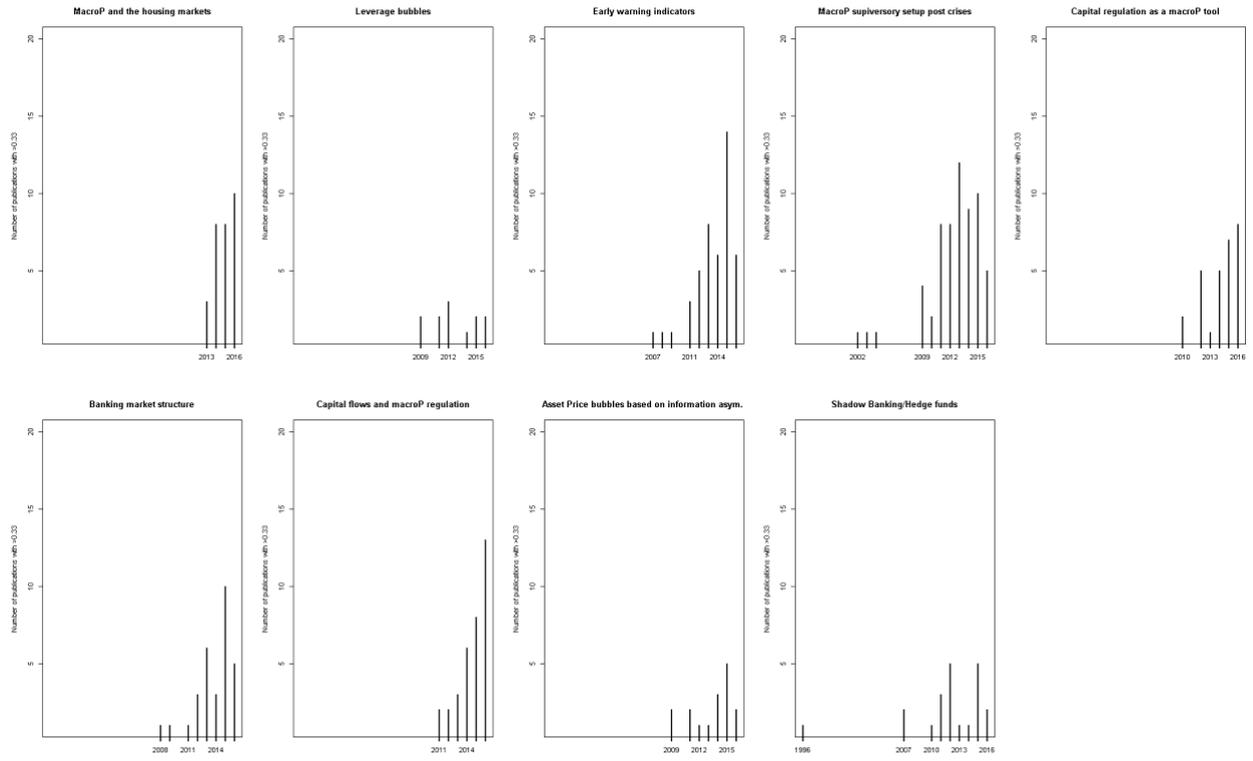


Figure 3: Publications distribution for topics 11-19

Appendix Chapter 5

Wordlist of topics for systemic risk measurement

	1998-2003	1998-2008		1998-2013				1998-2017			
	Risk Models & Crisis Simulation/Modelling	Default Risk/Market Based Risk Transfer	Risk Models and Measurement on a Macro Level	Tail risk modelling	Default Risk modelling: Market Based Risk Transfer	Measuring Individual Systemic Risk Contribution	Early Warning / Composite Indices of Financial Stress	Default Risk Correlation & Market-based Risk Transfer	Tail Risk Modelling	Early Warning Indicators	Most important SR Measures: CoVar, MES and SRISK : Extensions & Econometrics
1	model	risk	model	return	default	system	indic	default	distribut	crisi	system
2	return	default	estim	model	risk	risk	index	risk	depend	indic	measur
3	stock	portfolio	variabl	estim	cds	measur	jan	credit	tail	crise	institut
4	price	valu	return	correl	credit	institut	market	spread	estim	gdp	covar
5	volatil	probabl	stock	tail	valu	financi	period	rate	condit	variabl	risk
6	market	distribut	sampl	depend	loss	contribut	month	cds	extrem	gap	financi
7	margin	loss	crisi	distribut	rate	individu	time	valu	copula	model	mes
8	period	model	volatil	market	model	covar	spread	bond	var	signal	valu
9	level	depend	time	stock	probabl	distress	data	probabl	margin	credit	size
10	condit	asset	result	condit	spread	size	stress	loss	probabl	real	contribut
11	requir	rate	period	volatil	portfolio	bank	figur	option	model	predict	crisi
12	valu	correl	statist	risk	time	import	measur	price	statist	threshold	estim
13	estim	simul	signific	var	factor	valu	signal	portfolio	correl	forecast	sampl
14	time	factor	test	extrem	option	crisi	weight	expect	risk	warn	return
15	increas	measur	price	factor	expect	expect	forecast	factor	multivari	probabl	rank
16	result	equiti	tabl	time	tranch	mes	event	correl	quantil	ratio	var
17	follow	tail	measur	measur	correl	ltd	seri	market	paramet	quarter	shortfal
18	chang	assum	data	index	debt	level	predict	time	valu	estim	base
19	risk	result	margin	sampl	equiti	sector	jul	equiti	sampl	growth	import
20	variabl	expect	market	seri	price	base	dec	matur	normal	price	acharya

Appendix for chapter 6

Appendix I: Analyzed Speeches

UK	Name	Date	Title	Event
1	Paul Tucker,	22 October 2009	The Debate on Financial System Resilience: Macroprudential Instrument	At Barclays Annual Lecture, London
2	Paul Tucker	14 April 2011	Macroprudential policy – building financial stability institutions	the 20th Annual Hyman P Minsky Conference, New York

3	Paul Tucker	29 June 2011.	Macro and microprudential supervision	the British Bankers' Association Annual International Banking Conference, London,
4	Paul Tucker.	17.October 2012	Competition, the Pressure for Returns, and Stability	Speech at the British Bankers' Association Annual Banking Conference, London
5	Paul Tucker	28 May 2013.	A new regulatory relationship – the Bank, the financial system and the wider economy	Speech by Mr Paul Tucker, Deputy Governor for Financial Stability at the Bank of England, at the Institute for Government, London,
6	Paul Tucker:	Helsinki, 13 June 2013.	Banking reform and macroprudential regulation – implications for banks' capital structure and credit conditions	SUERF/Bank of Finland Conference, "Banking after regulatory reform – business as usual",
7	Paul Tucker	Tuesday 1 October 2013	The reform of international banking: some remaining challenges	Speech given At the Oliver Wyman Institute Conference, London
8	Sir Jon Cunliffe, Deputy Governor Financial Stability	28 July 2015	Macroprudential policy: from Tiberius to Crockett and beyond	Member of the Monetary Policy Committee, Member of the Financial Policy Committee and Member of the Prudential Regulation Authority Board At TheCityUK, London
9	Sir Jon Cunliffe, Deputy Governor Financial Stability	10 November 2015	The Outlook for Countercyclical Macroprudential Policy	The Graduate Institute, Geneva Tuesday
10	Donald Kohn, external member Financial Policy Committee Bank of England	April 27 th 2016	Macroprudential policy: implementation and effectiveness	Keynote speech, First annual ECB macroprudential policy and research conference (jointly organised with the International Monetary Fund)
11	Paul Tucker	June 26 th 2016	What is macroprudential policy for? Making it safe for central bankers	Kuala Lumpur
US				

1	Daniel Tarullo, Governor Federal Reserve Board	30.01.2015	Advancing Macroprudential Policy Objectives	Office of Financial Research and Financial Stability Oversight Council's 4th Annual Conference on Evaluating Macroprudential Tools: Complementarities and Conflicts, Arlington
2	Daniel Tarullo	20.11.2014	Liquidity Regulation	The Clearing House 2014 Annual Conference New York, New York
3	Daniel Tarullo	09.09.2014	Dodd-Frank Implementation	Before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Washington D.C.
4	Daniel Tarullo	08.05.2014	Rethinking the Aims of Prudential Regulation	Bank Structure Conference, Chicago
5	Daniel Tarullo	25.02.2014	Monetary Policy and Financial Stability	30th Annual National Association for Business Economics Economic Policy Conference, Arlington
6	Daniel Tarullo	22.11.2013	Shadow Banking and Systemic Risk Regulation	Americans for Financial Reform and Economic Policy Institute Conference, Washington D.C.
7	Daniel Tarullo	20.09.2013	Macroprudential Regulation	Yale Law School Conference on Challenges in Global Financial Services, New Haven
8	Daniel Tarullo	03.05.2013	Evaluating Progress in Regulatory Reforms to Promote Financial Stability	Peterson Institute for International Economics, Washington
9	Daniel Tarullo	10.10.2012	Financial Stability Regulation	University of Pennsylvania Law School Distinguished Jurist Lecture, Philadelphia
10	Daniel Tarullo	12.06.2012	Shadow Banking After the Financial Crisis	Conference on Challenges in Global Finance, San Francisco
ECB				
1	Vítor Constâncio	28.10.2015	Macroprudential policy in Europe: ensuring financial stability in a banking union	Financial Stability Conference, Berlin
2	Vítor Constâncio	03.07.2015	Strengthening macroprudential policy in Europe	Conference on "The macroprudential toolkit in Europe and credit flow restrictions", Vilnius
3	Vítor Constâncio	08.05.2015	Reinforcing financial stability in the euro area	OMFIF City Lecture, London
4	Vítor Constâncio	16.04.2015	Financial regulation and the global recovery	24th Annual Hyman P. Minsky Conference "Is financial reregulation holding back finance for the global recovery?", Washington

5	Vítor Constâncio	23.06.2014	The ECB and Macro-prudential policy: from research to implementation	Third Conference of the Macro-prudential Research Network, Frankfurt
6	Vítor Constâncio	10.06.2014	Making macro-prudential policy work	high-level seminar organised by De Nederlandsche Bank
7	Vítor Constâncio	30.10.2012	Opening remarks at the second conference of the ESCB Macroprudential Research (MaRs) Network	second conference of the ESCB Macroprudential Research (MaRs) Network, Frankfurt
8	Vítor Constâncio	14.06.2012	Financial Stability: Methodological advances and policy issues	European Central Bank conference 14-15 June 2012, Frankfurt
9	Vítor Constâncio	14.06.2012	Financial Stability: Measurement and policy	Conference of Financial Stability: Methodological Advances and Policy Issues, Frankfurt
10	Vítor Constâncio	28.03.2012	How can macro-prudential regulation be effective?	CFS Colloquium "Mission completed? Consequences of regulatory change on the financial industry", Frankfurt

Appendix II: ECB and ESRB Conferences attended

- I. ESRB conference on Anticyclical Margin Requirements (06/06/2016)
- II. First annual research conference of the European Systemic Risk Board (22/09/2016)
- III. Second Annual Research conference ECB Shadow Banking, 26th of September 2016

Appendix III Video-recorded Panels analyzed

IMF October 2017 Systemic Risk and Macroprudential Stress Testing

Moderator: **Tobias Adrian**, Financial Counselor, Director, Monetary Capital Markets Department, IMF

Speakers:

- **Claudia Buch**, Vice-President, Deutsche Bundesbank
- **Jon Cunliffe**, Deputy Governor for Financial Stability, Bank of England
- **Hyun Shin**, Economic Adviser and Head of Research, Bank for International Settlements
- **Daniel Tarullo**, Former Governor, United States Federal Reserve Board
- **Carolyn Wilkins**, Senior Deputy Governor, Bank of Canada

Available at https://www.imf.org/external/POS_Meetings/SeminarDetails.aspx?SeminarId=259

First annual ECB macroprudential policy and research conference (jointly organised with the International Monetary Fund)

Policy Panel: Macroprudential policy in Europe and the world: challenges, experiences and institutional structures

Chair: José Viñals, International Monetary Fund

Erkki Liikanen, Suomen Pankki – Finlands Bank
 Mario Nava, European Commission
 Sergio Nicoletti Altamari, European Central Bank
 Huw Pill, Goldman Sachs

Available at

https://www.ecb.europa.eu/pub/conferences/html/20151104_mp_policy_research.en.html

Brookings Institution. 2015. A look at the financial system, post-crisis: A panel discussion. 17th of November 2015, <https://www.youtube.com/watch?v=moGv-XDut40>

Appendix for Chapter 8

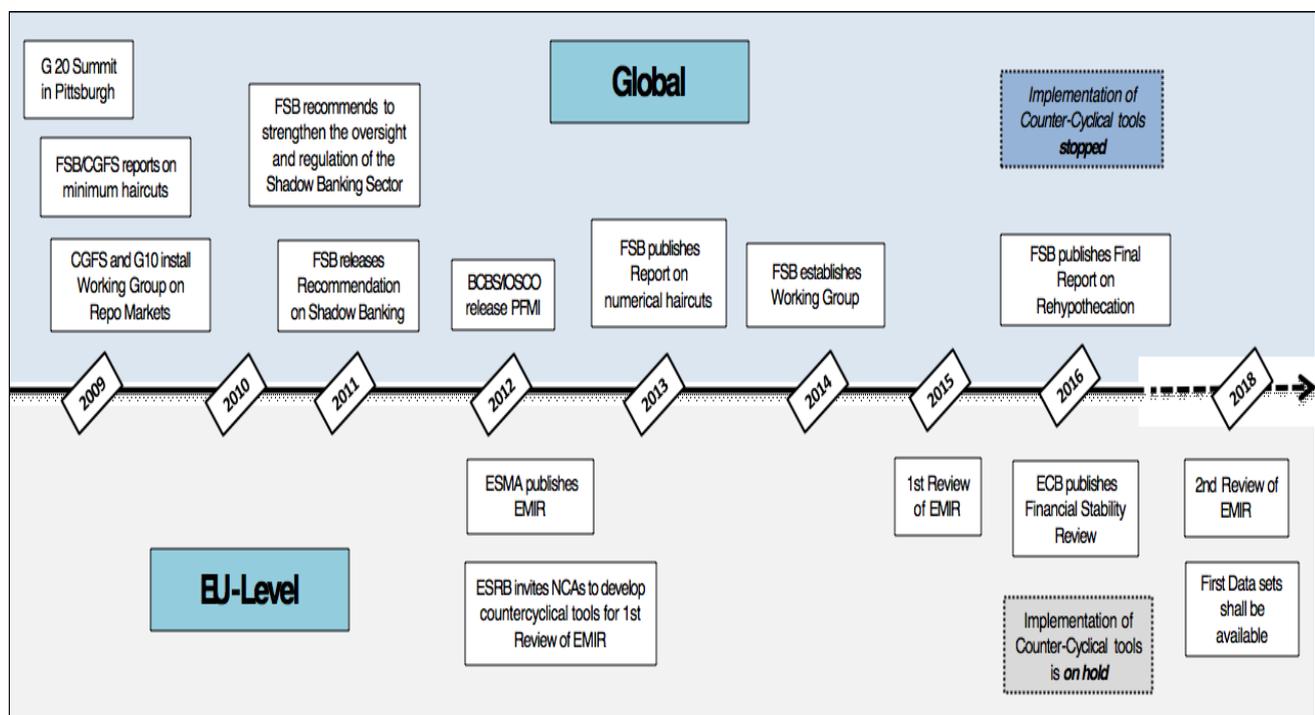


Fig. 8.5 Overview of regulatory Milestones for the effort of counter-cyclical margin haircuts