Asset Valuation, Liquidity Issues, and Growth Regimes. Financial Markets, the New Economy and Growth, 13th Villa Mondragone International Economic Seminar, CEIS University of Rome 'Tor Vergata', June 25-26 2001

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Asset Valuation, Liquidity Issues, and Growth Regimes[◊]

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> « The development of a child is normally accompanied by some growth in height, weight, physical power, etc. A simple recognition such as this could not possibly contribute anything substantial toward our understanding of the biological development of a human individual. This understanding has increased only with the discoveries of the physiological interrelations between phenomena that are not all as conspicuous as the outward manifestations of growth. Similarly, the understanding of the ways followed by economic change can come only from a physiological picture of that process » (N. Georgescu-Roegen 1976 pp 242-43).

1. Introduction

The `New Economy' proponents pointing to the recent and exceptional performance of the US economy are talking about a new golden age. This new age of the economy would be the result of a combination between the implementation of new information and communication technologies, a neutral monetary policy and a market-oriented finance mechanism. In this way, the last report of the US council of economic advisers points out that "extraordinary gains in performances…have resulted from this combination of mutually reinforcing advances in technologies, business practices, and economic policies" (Economic Report of the President, 2001, p. 23). This kind of statement pushes in the shade a real debate about the nature of growth, where the problem is to know whether a change in 'fundamentals' – technology, tastes, institutions – has the effect to shift upwards the productivity trend and to make obsolete the business cycle, or whether a better co-ordination of economic activity has been obtained, independently of the nature of the 'fundamentals'.

On the one hand, some growth accounting analyses (Jorgenson and Stiroh 2000, Oliner and Sichel 2000) seem to confirm the existence of a change in the trend of productivity whose dynamics would look similar to that of the sixties. They attribute it to the investment boom in the information and communication technologies in the nineties. Gordon (2000) claims that the recent increase in productivity (1995-98) is in fact due to a huge increase in the productivity of the computer industry, while for the rest of the economy the productivity slowdown is still alive and kicking. Nevertheless he maintains the focus on the trend of

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potential output, taking up the same issue of the slowdown of productivity in the last 20 years and of its recent revival in the United States. However, the very definition of a potential trend of output is only possible in equilibrium where it can be univocally associated to a technology which only in this state can be fully specified in terms of given input-output relations.

On the other hand, "if one looks at substantial more-than-quarterly departures from equilibrium growth, as suggested, for instance, by the history of the large European economies since 1979, it is impossible to believe that the equilibrium growth path itself is unaffected by the short-to-medium-run experience. In particular, the amount and direction of capital formation are bound to be affected by the business cycle, whether through gross investment in new equipment or through the accelerated scrapping of old equipment" (Solow 2000 p. xvii). In other words, short-run forces govern the growth performance of the economy. Among these forces, the financial ones have a strong impact. They cannot be reduced to saving incentives associated with specific institutional frameworks, as is the case when we keep making reference to an equilibrium path that they would determine, as suggested in recent developments of growth analysis (see Levine 1997). Rather finance has to be considered as an essential element of co-ordination mechanisms, which determine the actual evolution path followed by the economy.

The paper is aimed at investigating the financial problems, which characterize growth processes, and influence the global performance of the economy. Section 2, taking advantage of old and more recent controversies will be devoted to bring back to the surface the analytical issues to be discussed in the perspective of identifying the nature of the relations between finance and growth. Section 3 will discuss to what extent liquidity problems come to the fore when innovative choices involve intertemporal co-ordination failures. Finally, section 4 will present some empirical insights as concerns the role of money and finance in the determination of the growth regimes, which have characterized the United States, Japan and the largest European economies in the last decades.

2. Finance and growth: the analytical issues

Let us start from traditional equilibrium growth models (*à la* Solow). It is well known that one of the main achievements of these models is to "work out the price and interest-rate dynamics that would support an equilibrium path" (Solow 2000, p. xii) and to relate the stability property of the steady state to the competitive pricing. In this analytical framework,

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equilibrium investment as well as the value of capital only depend on exogenous variables i.e. the rate of productivity growth and the saving rate.

As a matter of fact, economies are not generally in a steady state in the sense that they do not follow a path characterized by a constant growth rate. The actual wage, interest and price dynamics do not support a steady state. As a consequence, the rate of accumulation is no longer determined only by the exogenous variables just mentioned. It also depends on the sequence of prices, which interact along the way with the actual dynamics of productivity and saving rate. Asset valuation comes to the fore as an argument of the investment function, but in a very complex way. It is well documented in the empirical literature that investment is inelastic with respect to changes in relative factor price, and is no more determined by the ratio between the market value of capital and its replacement cost (the Tobin's q). As a matter of fact, price disequilibria (including discrepancies between the price of assets and their fundamental values) result in unexpected changes in profits, which makes it difficult to predict the future value of assets and, hence, the investment level. The reason is that current asset valuation does not express 'fundamental' values, but also reflects co-ordination difficulties.

Briefly, things become much more complex when we try to combine short-run and long-run macroeconomics. "The hard part of disequilibrium growth is that we do not have – and it may be impossible to have – a really good theory of asset valuation under turbulent conditions" (Solow ibid. p. xv). This casts doubts on the view that asset valuation would be the main determinant of investment.

The intertemporal equilibrium approach

The modern way to escape from these difficulties consists in imagining an economy the evolution of which is strictly guided by the behaviour of an immortal consumer (or a dynasty) which is supposed to maximise an intertemporal utility function. Within this kind of model, fluctuations are interpreted as optimal paths followed in response to random (real or financial) shocks. Changes in wage and interest and associated changes in asset valuation support an equilibrium, which is no longer a position of rest of the economy, and becomes an assumption "included in the way the theory is set up (Hicks 1965 p. 17). Within this framework, "every firm is just a transparent instrumentality, an intermediary, a device for carrying out intertemporal optimization subject only to technological constraints and initial endowments. Thus any kind of market failures is ruled out from the beginning by assumption. There are no strategic complementarities, no co-ordination failures, no prisoners' dilemma"

(Solow ibid.). In sophisticated versions of these optimal growth models, an essential reference to firms' strategic behaviours and co-ordination failures can be introduced. Anyway, shocks of different nature determine the actual evolution of the key variables (investment, output, employment,…). Asset valuation does not create a problem insofar as different intertemporal equilibria correspond to different and alternative sequences of prices. The actual price dynamics does not support any longer a steady state, but it supports an intertemporal equilibrium path, and, in particular, equilibrium business cycles.

The structuralist view

Phelps' *structuralist* theory of slumps and recoveries belongs to this class of models. It brings into light the essential influence of assets pricing (Phelps 1994). According to this theory, recent developments in information and communication technologies would have stimulated expectations of a large set-up in productivity, and hence changes in the valuation of business assets, both tangibles and intangibles, physical and human assets. These changes in turn would have an impact on the rate of investment in these assets, and on the equilibrium growth path.

Decline in world rate of interest and quickening of productivity growth provide a partial explanation of US employment and output recovery in the nineties. But they do not fully explain the degree of this recovery. A better explanation is obtained when adding a stock market indicator as explanatory variable in the unemployment equations (Fitoussi, Jestaz, Phelps, Zoega, 2000). This empirical result seems to give consistency to the Phelps' model that focuses on the role of business assets' valuation.

In this analytical framework, the sharp slowdown of productivity growth from the seventies onwards and its recent revival in the US are purely exogenous phenomena. Interpreted as definitive changes in the rate of change of productivity, they result in definitive changes in assets' valuation, and hence in the bargaining conditions on the labour market, which involve changes in the demand for labour, and hence in the natural rate of unemployment. Changes in asset valuation and real or expected changes in productivity trend are the two faces of the same exogenous phenomenon.

In other words, only changes in 'fundamentals', including new expectations by firms' managers, are here considered. Then changes in managers' expectations and in their assets valuation would be at the origin of fluctuations actually interpreted as reflecting changes in the trend.

Whilst in standard equilibrium growth models asset valuation does not really matter in the sense that the competitive pricing insulates investment from any endogenous influence, a general equilibrium model, which makes an explicit reference to the way asset valuation really influences output and labour demand decisions, enlightens the nature of a specific transmission mechanism through which financial variables can affect the growth process.

Within the logic of models that describe intertemporal growth equilibria, the production side of the economy exactly performs what the maximizing economic agents require. As a consequence, no co-ordination failures occur which would involve unexpected outcomes. Investment and asset valuation fluctuate but remain determined by the fundamentals**.** On the other hand, no matter whether stock market prices express managers' valuation of business assets (based on their profit expectations) or whether they result from the valuation by independent stockholders (or speculators). The full co-ordination assumption makes them quite similar.

Towards an out-of-equilibrium approach

Another way to deal with the problem of asset valuation and investment behaviour under turbulent conditions implies to really pay attention to price disequilibria. As Solow (2000) reminds us, this is the way suggested by Malinvaud (1983). The analysis is based on two key ideas, "namely, that some disequilibria may sustained over rather long periods, and that the existence of these disequilibria significantly reacts on the growth process, to speed it up, slow it down or change its course" (ibid. p. 95). In the model, prices – the real wage rate and the real interest rate - are sticky so that their incomplete adjustment results in persistent market disequilibria. The key relation is an investment function, the arguments of which are excess capacity and profitability. However, the determination of profitability as a measure of the disequilibrium in prices (wage, interest and price of final output) is problematic for two reasons. Firstly, there is no clear understanding of the way prices are adjusted from time to time. Secondly, in absence of money and financial assets, the determination of the interest rate is itself problematic. In fact the puzzle of investment behaviour remains unsolved.

Co-ordination problems arise in particular in the market for savings and investment, where agents with different time horizons interact. "Financial markets are manifestly incapable of providing for the consistency of long-term production and consumption plans. The condition that the excess demand for 'bonds' be zero does not insure a 'correct' value for the interest rate" (Leijonhufvud, 1968, p. 276). Entrepreneurs base their demand of loanable funds on the current rate of interest, while supply is determined on the secondary market by

the portfolio choices of speculators who refer to the spread between expected and actual interest rates. A drop in the demand of loanable funds following an exogenous shock (say a fall in the marginal efficiency of capital), will not necessarily affect expectations on the secondary market; consequently, the price mechanism will fail to recover co-ordination by re-establishing investment at its full employment level. The conclusion, according to Leijonhufvud, is obvious: "It was Keynes' position that it is the failure of the incomplete market mechanism to reconcile the implied values of forward demand and supplies [...] that is the source of the trouble. Unemployment of labor and other resources is a derivative phenomenon" (ibid. p. 276).

Briefly, intertemporal co-ordination failures are apparent in asset valuation by the market, and they result from stockholders behaviours and/or from monetary and fiscal policy. They create unexpected constraints, and hence a break in the equilibrium, which induce firms to react in a way, which does not ensure that the economy will move back to the previous full employment equilibrium.

The transmission mechanism through which the real interest rate affects the demand for labour can be added to a standard macroeconomic model, as core building block. A basic sequence of events is the following. Too high real interest rates e.g. reveal the existence of intertemporal co-ordination failures. They result in a bias against consumption and in favour of savings, but also in a bias against shares and in favour of more liquid reserves. These different facets of the intertemporal co-ordination problem all contribute to reduce employment and output. Quite importantly, this mechanism can be activated by the structure of the policy mix at work, i.e. as the joint effect of an expansive budgetary policy and a tight monetary policy. While increasing budget deficit tends to rise nominal interest rates, monetary tightening keeps prices down. As a result real interest rates rise (Fitoussi and Phelps 1988 p. 60). Firms' time preference changes, and as a result these decide to raise prices and to reduce output and employment, in order to rise their current profits. Within this kind of analytical framework, different and successive short-term equilibria are defined, which corresponds to different and successive asset valuations, which do not correspond to the fundamentals.

In this approach as well as in the intertemporal equilibrium approach, the sole consideration of the impact of asset valuation on equilibrium values of key variables leads to ignore the problem of equilibration, that is how the economy gets from the old equilibrium to the new one.

3. Innovation, out-of-equilibrium growth, and finance

In order to justify the relevance of an out of equilibrium approach, it is appropriate to start from considerations about the real nature of the innovation process. As a 'gale of creative destruction', innovation is essentially a disequilibrium phenomenon. It results in a breaking-up in the temporal production structure, that is, in the balance between investment and final output (Hicks 1973, Amendola and Gaffard 1988, 1998). The structure of productive capacity inherited from the past can no longer sustain a steady state. This involves specific co-ordination problems, which cannot be reduced only to the information issues. The point is not merely that the market information is incomplete or ill-formed. Co-ordination failures are an intrinsic feature of a decentralized market economy in which investment decisions are not reversible and production takes time. These co-ordination failures result in discrepancies between costs and proceeds over time, that is in liquidity problems, which, to some extent, express the existence of disequilibria on the final output market, the labour market and the credit or the financial market.

The nature of disturbances

Discrepancies between costs and proceeds are essentially due to the distortions that inevitably appear in the balance between investment and final output. Let us see these mechanisms underlying any transition from the old technology to the new. The introduction of a new and superior technology implies an immediate increase in the pseudo-natural rate of interest[1]. As a consequence, the capital value of production processes, which embody the old technology, will be reduced, their economic life will be shortened, and hence proceeds from sales will diminish for a while (Amendola 1972). More generally, any human or financial resource constraint, which prevents investment from being at the level required by the new technology, will result in a fall in the wage fund, and hence in excess capacity on the market for final good which implies less proceeds at a given moment of time (Amendola and Gaffard 1998). On the other hand, insofar as innovation requires more resources to be invested in new processes, for the acquisition of new technology to be effective, there must be real reserves. "Failing this possibility, the only way to make things work is to transmute the capital that was embodied in the late stages of old production processes into capital embodied in the early stages of new processes, that is a disruption of other activities which is 'bound to be a strain' " (J.R. Hicks 1990, p. 535). Then inflationary pressures (and/or deficits in the trade balance in

[1] The pseudo-natural interest rate takes account of the movement of prices

open economies) necessarily appear "because the goods in which the wages (...) will be spent (...) cannot be provided out of the product of the labour which is newly employed, for that is not yet ready" (ibid.). All these disturbances create liquidity problems. Any supplementary pressure on real interest rates for monetary or fiscal reasons will aggravate them.

Of course, if one believes that a price dynamics exists ((and prevails), which supports the transition towards a new steady state associated with the new technology, then, asset valuation will coincide with fundamental values and will be in harmony with investment decisions. Required liquidity will be obtained. But there is no reason for expected value of business assets corresponds to their fundamental values. Such an expected value depends on what happens along the way, i.e. on the actual – out-of-equilibrium - price dynamics. This is why it does not explain investment behaviour. Profitability as a mirror of day to day changes in asset valuation cannot be an argument of the investment function.

The investment puzzle

As a matter of fact, the profitability of each investment (at each moment of time) depends on the undertaking of other investments in time. Each investment belongs to a bundle of complementary investments over time, and it would not be rational for a firm to drop it only because the interest rate increases at a given moment of time (Hicks 1989 p. 119). As a consequence, investment, at each moment, should be determined so as to maintain in equilibrium the temporal structure of productive capacity, i.e. so as to preserve the complementarity over time of successive investments. This behaviour, which does not refer explicitly to any asset valuation, could appear as a routine. Anyway it respects an intertemporal profitability condition. In that sense, it requires a quasi-equilibrium prices dynamics to be effective.

However, investment can deviate, and generally will deviate from this equilibrium path for liquidity reasons. Either liquidity constraints prevent firms from carrying out the required investment, or excess loanable funds make possible a strong competition between firms in each sector that results in an excess capacity with respect to the actual final demand. What happens to investment finally depends on liquidity decisions taken by both non-financial and financial agents. Any liquidity difficulty, which would result in a breaking up in the linked chain of investments, would provoke strong disturbances in the growth process, and in fact lower growth performances in the medium run.

The role of finance

Then banking policy as well as assets valuation by capital markets must be considered in relation with the necessity for an economy facing technological changes to have the right amount of liquidity and the right distribution of this liquidity at the right moment. Using an account table inspired from J.R. Hicks (1977), it is possible to give a more precise content to these liquidity issues.

	Liabilities	Assets
Core (central bank)	Money (M+m)	Financial securities (F)
Mantle (banks and stock-holders)	Financial securities (F+f)	Industrial securities (I) + Money (m)
Industry (firms, households, and government)	Industrial securities (I)	Real assets (R) + Financial securities (f) + Money (M)

As a consequence of their innovative choice, firms have to invest and hold more real assets (R). However, "an increase in real investment, with constant money supply (M+m), must reduce liquidity somewhere. If the investment is financed by borrowing, the main loss in liquidity falls on the mantle; if by drawing on reserves, the main loss falls on industry itself. If either has ample reserves, the loss of liquidity can be borne" (ibid. p. 79). Otherwise, liquidity difficulties emerge, which take the form of credit rationing or debt deflation. This makes critical the role of banking policy and/or stockholders' behaviours as for maintaining the economy nearby steady state growth equilibrium (within the limits of a stability corridor). What happens to investment, and hence to growth and unemployment strongly depends on the way liquidity issues are dealt with, that is on the joint influence of banking policy and stockholders behaviours. Too less or too much liquidity, we maintain, is equally damageable. In the first case the required investments cannot be carried out, in the second a too strong capacity competition can result in an excess capacity and negative current profits, which may induce both decreasing share prices and debt deflation.

Therefore, financial institutions are important, not so much because they are associated with incentives' schemes more or less appropriate in the sense that they determine a higher or a lower saving rate, or a better or a worse resource allocation, but as concerns their capacity to smooth the evolution of the economy. In this perspective, neither market-oriented nor bank-oriented financial institutions can be considered as optimal ones *per se*. As it is well documented (see Levine 1997), e.g., a large and liquid stock market may stimulate the acquisition of information, and hence improve the resource allocation. Its way of functioning may also deprive agents from any incentives to spend resources in this acquisition of

information. In fact, the existence of a large and liquid stock market as well as the existence of close relationships between firms and banks may result in strong (and inappropriate) fluctuations in asset valuation. What actually happens is determined by the interaction between banking policy and the liquidity of stock markets.

Policy dilemma

Here two policy dilemmas emerge, which are typical of economies that follow out-of-equilibrium paths. A first policy dilemma occurs as the time of reaching the growth rate, that corresponds to zero inflation, is accomplished, and the required accumulation of capital not yet completed. The choice lies between maintaining a loose monetary policy in the perspective of allowing the accumulation of capital to be completed, or adopting a tight monetary policy in the perspective of fighting any inflation pressures. If the latter alternative is chosen, it will determine a turning point in the business cycle and results in recession and losses of jobs. In the medium run, the growth – supply curve (the curve that links the real growth rate to the inflation rate[2]) shifts upwards. The growth rate of the economy that corresponds to zero inflation becomes lower and lower (and the NAIRU higher and higher) as observed in most of the European countries. If the former alternative is chosen, productivity gains will be obtained, and hence inflation pressures will be temporary, and structural unemployment will be eliminated. The growth supply curve will shift downwards as observed in the US.

As a matter of fact, business cycle peaks are endogenous. However, there is a real difficulty to identify what the limits that the economy hits are and why they change. "To understand the potential difficulty, suppose that erring policy makers have in the past reacted imprudently to `supply shocks' in ways that prematurely and systematically curtailed economic expansion. In that case, the business cycle peak is endogenous to policy. Suppose they did this because of the rise of a false doctrine of limits - such as the natural rate hypothesis. It is then possible that if growth policies had been more sustained, disciplined and aggressive, then the perceived decline in the trend productivity growth rate would have been smaller than it was, and the estimated natural rate would also have been lower than it has appeared to be" (J.K. Galbraith 1997, p. 99).

When a positive supply shocks occurs, central banks can try to bring inflation back to the target level as soon as possible, with the consequence of exacerbating the initial negative

[2] see Hicks (1977) p. 90.

impact of the shock on output and employment. It can, alternatively, decide an accommodating monetary policy bringing inflation back to the target more slowly with the consequence of simultaneously reducing inflation and unemployment. The latter policy consists in accepting a transitory inflation in the perspective of reducing unemployment.

Then the problem that central banks are facing is no longer a problem of credibility of the commitment to price stability. It is a problem of dealing with real constraints, which are in the nature of innovation processes. Assets' valuation, of course, depends on monetary policy. Tight monetary policy may be coupled with restricted new investment market financing. Loose monetary policy goes hand to hand with stock markets bubbles, which make easier for firms to realize their capital accumulation objectives.

The second policy dilemma is precisely about the relation of monetary policy to the financial assets pricing. Asset prices bubbles create distortions in the structure of productive capacity, leading to rise and then fall in investment with respect to final output. So raising or lowering interest rates as asset prices rise and fall above and below what are estimated to be required levels is supposed to help to smooth these fluctuations. In particular, central bank should prevent asset price movements if these movements originate in the asset markets themselves and result in an excess of investment with respect to the future final output. However, there is a difficulty both to evaluate the nature of the assets price movements and to reconcile the latter objective with considerations about the output gap.

All these considerations about the way an economy evolves out of equilibrium should allow us to better understand why countries, which have faced the same kind of shocks and have had access to the same technologies, have experienced so different performances.

4. Financial conditions of well managed innovation processes

Let us start from the observation of the different performances of the US on the one hand and European countries on the other hand. It is well documented that both have been confronted to successive positive supply shocks - e.g. the introduction of new and superior technologies - most of them involving a higher investment at cost[3]. But available data reveal that there are strong differences among the countries over time. The persistence of high and rising unemployment is becoming a sort of permanent character of the main European countries (France, Germany, Italy, Spain) in contrast to the United States where unemployment levels are much lower and relatively more stable. Different stylized facts,

[3] In Hicks (1973) parlance, gross investment in terms of cost is not the same as gross investment in terms of output capacity.

besides different institutional characteristics of the labour markets, match this variety of employment trends. Mainly, a substantially stable investment rate, and a relatively constant share of wages in the United States; high fluctuations in the rate of investment and in the share of wages in the economies of continental Europe. It remains that, generally speaking, differences in performances are much more documented than differences in growth regimes.

The nature of the growth regimes

Out of equilibrium, the dynamics of productivity is not exogenous. It is the expression of a process of transformation of the productive structure and of the ability of the agents to organize and carry out this process within the constraints posed by the institutional features of the economy. Productivity gains associated with the introduction of a new technology will be effective and unemployment will be reabsorbed only if co-ordination problems, in particular those associated with the finance mechanism of the growth process, are correctly dealt with. Productivity in other words, rather than the expression of specific technical conditions, is the outcome of the way in which the economy involved is able to deal with the co-ordination problems which emerge as the result of the breaking of the equilibrium (Amendola and Gaffard 1998 pp 220-22). As a consequence, complex relationships between productivity and investment characterize the growth process.

Understanding the productivity (and the investment) puzzle requires acknowledging the existence of the diversity of growth regimes, instead of concentrating the attention on convergence issues. A growth regime is defined as a set of rules and institutions which govern expectations and behaviours of economic agents, and hence investment and productivity dynamics. Then, each regime can be identified to a different region in the investment - productivity space (Böhm and Punzo 2001). Changes of regime are the result of alterations in expectations and behaviours. They are associated with shifts in the partitioned investment – productivity space (ibid.). The mechanism causing regime switches is both exogenous and endogenous (G. Brida, S. Bimonte and L.F. Punzo 2001) in the sense that change occurs when key variables reach certain thresholds, that is when the growth mechanism itself generates an alteration in the behaviour, which, nevertheless, obeys to exogenous rules.

In this analytical framework, the rate at which an economy grows without inflation pressures – i.e. the potential growth rate - certainly depends on the sustainable productivity growth. But given the intertemporal complementarity of production processes, productivity is no longer independent of investment dynamics. Growth regimes and changes in growth regime determine the growth performance. When e.g. the economy oscillates between two

unstable regimes, one characterized by an excessive investment growth with respect to the growth of final output, and the other, on the contrary by a too low investment growth, the growth rate that corresponds to zero inflation should be lower and lower. This growth rate can be the threshold at which there is a turning point. As turning point, it depends, among other things, on the monetary policy and its articulation with the asset valuation on the stock market.

Out of equilibrium, which is where we are during the process of restructuring of productive capacity stirred by innovation, actual output and productivity levels cannot be interpreted as deviations from a potential trend which is no longer in the background. So the main question to be addressed is not whether a new technology (e.g. information and communication technologies) generates a sustainable increase in the productivity growth rate. Rather, the focus must be on the conditions in which the economy can really take advantage of a new technology step by step. In fact, we consider that an economy does not *automatically* capture the gains associated with the implementation of a new technology. The object of the analysis becomes in other words the level of output and productivity which the economy is actually capable of realizing, that is, the effective evolution of the innovation process interpreted as a process of restructuring of productive capacity. The viability and the effective outcome of this process are the relevant issues in this light, and the conditions under which viability is assured the target of policy interventions and institutional devices (Amendola and Gaffard 1998 pp. 245-50). In this context, changes in liquidity constraints modify the short-run equilibrium of the economy, and hence the level of employment. The articulation over time between decisions and constraints determines the sequence of short-run equilibria, i.e. what happens to employment and output in the medium run. In this perspective, "monetary policy cannot be expected to lift the long term sustainable growth rate (but) the Fed's role is to make sure that any productivity gains that occur spontaneously or as a result of supply-side policies are realized in jobs and output and do not go to waste in recessions and unemployment" (J. Tobin 1997).

Out of equilibrium, capital accumulation conditions generate a multiphase or multi-regime dynamics in which changes of phase or of regime are determined by the impact of resource constraints and changes in economic policy. This is a conception of dynamic economics, which has been developed by R.M. Goodwin. "The nature of such an analysis is that one formulates an unstable (dynamically) system which, however, as it expands, contains a term which grows dynamically and eventually stabilizes the system" (R.M. Goodwin 1990, p. 63). In our perspective, such a term, e.g. a financial term, may stabilize the system and end

by dampening structural fluctuations, or, on the contrary, it may generate structural fluctuations strong enough but not explosive. In other words, there would be a self-regulation feedback mechanism, which would prevent, more or less efficiently, persistent misalignment between key variables (i.e. investment and consumption).

Comparative analysis of growth processes

The question to be addressed does not concern the convergence towards a given equilibrium growth path. It is about the nature of growth regimes and stability conditions. What international comparisons reveal is, on the one hand, the diversity of evolution among countries that have faced the same kind of shocks and have access to the same technologies, and, on the other hand, the essential role of monetary and financial behaviours.

Let us consider the growth rate of investment per person employed (i) and the growth rate of the labour productivity (v). Within this framework space, the horizontal axis, the vertical axis, and the 45° line delimit different regions. A particular growth regime corresponds to a given region in this space. Movements from one region to another are interpreted as changes in the growth regime. A path is traced as a sequence of dated states or pairs of co-ordinate values geometrically shown in the space, computed over sub-periods corresponding to the Gross Domestic Product business cycles (Böhm and Punzo 2001).

In the US case, there is no trace of significant changes in the growth regime during the last two decades (figure 1). On the contrary, most of the European countries and Japan (figures 2-8) exhibited strong and recurrent changes in growth regimes (Böhm, Gaffard, Punzo, 2001). One makes the conjecture that structural instability that may account for poor employment and productivity performances can be largely explained by banking policy and stockholders' behaviour. Some crucial episodes in the growth process of the different countries give consistency to this conjecture.

Most of the European countries (France, Germany, Italy) experienced an irregular growth from the late 70s. In these countries, as a consequence of previous co-ordination failures, including economic policy failures during the seventies, too stringent real constraints have emerged, which have implied that any recovery has raised inflation pressures, inflation expectations, and hence maintained a restrictive monetary policy. As a matter of fact, the lack of productive resources that has followed first negative (oil prices) then positive (technological) supply shocks has been responsible for a stagflation phenomenon. Then, restrictive monetary policies carried out in the perspective of dramatically reducing a too high rate of inflation have made the productive resource constraints more and more stringent.

Severe changes in growth regimes, as shown in the investment – productivity framework space, have been experienced (Böhm, Gaffard, Punzo, 2001). They have resulted in both in a productivity slowdown and in an increasing NAIRU[4]. Later on, attention has been maintained on inflation. A stable price level and above all a strong exchange rate (particularly in France) were the objectives pursued through a restrictive monetary policy. Low inflation eventually prevailed. During the 90's, share prices normalized by productivity more or less held their ground in Germany, France, Italy, and Spain, while they have strongly increased in the US (Fitoussi, Jestaz, Phelps, Zoega 2000). This confirms that liquidity constraints remained high on one side while being relaxed on the other[5]. Despite the need for a more intense accumulation of capital, investment was sacrificed, the consequence of which was a lower and lower non accelerating inflation growth rate. Inappropriate economic policies were responsible for irregular and low growth.

The Netherlands experienced convergence towards a quasi steady state from the eighties (Böhm, Gaffard, Punzo, 2001). The crucial episode has been a long expansion starting in the mid 80s. Trend inflation rose from 1987 to 1991. But rising inflation did not provoke an immediate policy response. Thus steady growth continued through 1992 whereas most of the European countries were in recession. Inflation run-up was not permanent. This episode was significant insofar as it revealed a better co-ordination, whose main aspects are, on the one hand, loose banking policy with respect to the price level, and on the other hand, regulated wages' movement. As it is well documented, the point of departure of the new way was the Wassenaar agreement, a 1982 agreement on wage restraints accepted by the Dutch unions. This agreement introduced an income policy, which has dampened the inflationary effects of final demand pressures, and allowed the central bank to carry out a less restrictive monetary policy. This policy mix was clearly aimed at boosting investment spending in a moment where it was necessary. Besides, from the early eighties onwards, the Netherlands have had rising rate of employment, which has clearly followed rising share prices (normalized by productivity) (see Fitoussi, Jestaz, Phelps, Zoega, 2000). That supports the hypothesis about the role of asset prices in employment determination, which is the proper of equilibrium models. But also the conjecture according to which releasing liquidity constraints – here thanks to stock market bubbles that push capital costs down – allows firms to manage transition to the new technologies and capture productivity gains associated with them.

[4] L. Ball (1997, 1999) who pointed out the influence of aggregate demand on long run movements of unemployment confirms this.

United Kingdom also appears as an economy having managed to escape from unstable growth regimes. After experiencing a strong growth cycle between 1978 and 1994, similar to those experienced by France, Germany, and Italy, it seems to have re-integrated a stability corridor (Böhm, Gaffard, Punzo, 2001). The crucial moment in the UK evolution could be the late eighties and the early nineties. UK experienced a strong expansion in the late eighties. The boom in borrowing commonly explains this expansion. Due to the combination of financial liberalization, high confidence and high asset prices, it has generated a boom in investment and in consumption as well. At the same time, the Bank of England did not tighten policy immediately after inflation had started to rise. Moreover, the experience of the UK in the early nineties was like that of the US in the early eighties: policy easing in response to the recession.

The truly important difference between most of the European countries and the US is likely that in the US the rate of investment has remained constant and investment has always augmented in response to supply shocks. This is due to the fact that "policy has not generate bouts of severe inflation and so has not had to generate bouts of recession to control it" (C.D. Romer 1999, p. 32). On the other hand, at the same time, the stock market bubble pushed capital costs down and allowed firms to carry out desired investments. As a consequence, the rate of growth consistent with the price stability has risen, and correlatively the NAIRU has decreased. US economy did not experience structural fluctuations (Böhm, Gaffard, Punzo, 2001). However, US recent investment boom was probably unsustainable. Rise in productivity growth in the late nineties encouraged firms to become over-optimistic about future returns. The inevitable result was an over-investment in new technologies with regards to the actual perspectives of profit[6]. Too much liquidity would have favoured excessive investments in the new sectors. Now as profits plunge, share prices evolution is going to reverse, and firms are being forced to cut their investment plans.

Recent evolution and policy issues, which characterize the Japanese economy, can be interpreted within the same analytical framework. From 1991 onwards, the Japanese economy has gone through an extended period of slow growth. This growth slowdown has been viewed as a correction of an unsustainable boom, which meant that the actual growth rate was for a while above the potential one. Similar explanations attributed the bulk of the slowdown to a

[5] Liquidity constraints do not necessarily take the form of rationing. They can be stringent only because firms decide to privilege the reduction of their indebtedness.

[6] Quoted by the Economist (2001 may 12th), Credit Suisse First Boston estimates that American firms have overspent on IT equipment to the tune of 190 billions over the past two years.

reduction in the rate of potential output due to a change in the demographic trend and in the Total Productivity Factor trend as well. However, estimations of the gap between actual and potential output conclude that it exceeds 4 or 5 per cent, so that not only demand policies, but, in a larger extent these growth policies aimed at promoting a better intertemporal co-ordination, should be of real importance. In fact, at the beginning of the nineties there was a break in the intertemporal co-ordination the main aspect of which was a too low consumption ratio and the inability of transforming savings in productive investments. This resulted in changes in growth regimes and structural fluctuations (Böhm, Gaffard, Punzo, 2001). Until 1985 the Japanese economy was near a steady state. Then Japanese economy has clearly exited from the stability corridor and started to experience a growth cycle, i.e. the alternation of unstable growth regimes. Here it is worth mentioning that one of the main features of the Japanese economy, in the last period, is the low interest rates. Co-ordination failures lead this economy in a liquidity trap. On the one hand, as it is well documented, Japan faced a huge problem of bad bank loans which is both the legacy of the burst of the assets bubbles in the eighties and the consequence of the subsequent slow growth. Cleaning up banks is essentially a microeconomic problem, the solution of which does not necessarily result in bad macroeconomic performances. However, as a matter of fact, a write-off of banks bad loans will intensify deflationary pressures. This makes it all the more essential to conduct a loose monetary policy, precisely in order to disconnect micro and macroeconomic problems. In this perspective, Krugman has proposed that the Bank of Japan should try to bring inflation and inflation expectations up to 4 per cent for 15 years (Krugman 1998). Insofar as it cannot cut short-term interest rates, which are equal to zero, the Bank of Japan, by purchasing long-term government bonds, could affect the economy through inflation expectations, a fall in the exchange rate and a rise in equity price. That could be the necessary conditions for the Japanese economy to escape from the liquidity trap (i.e. a particular growth regime), and converge towards a new steady state.

5. Concluding comment

Financial institutions and rules clearly affect the steady state, as other ‘fundamentals’ – technology, preferences – do it. But, on the other hand, financial and monetary behaviours have an essential influence on the nature of the growth path actually followed by the economy, and hence on its medium run performance.

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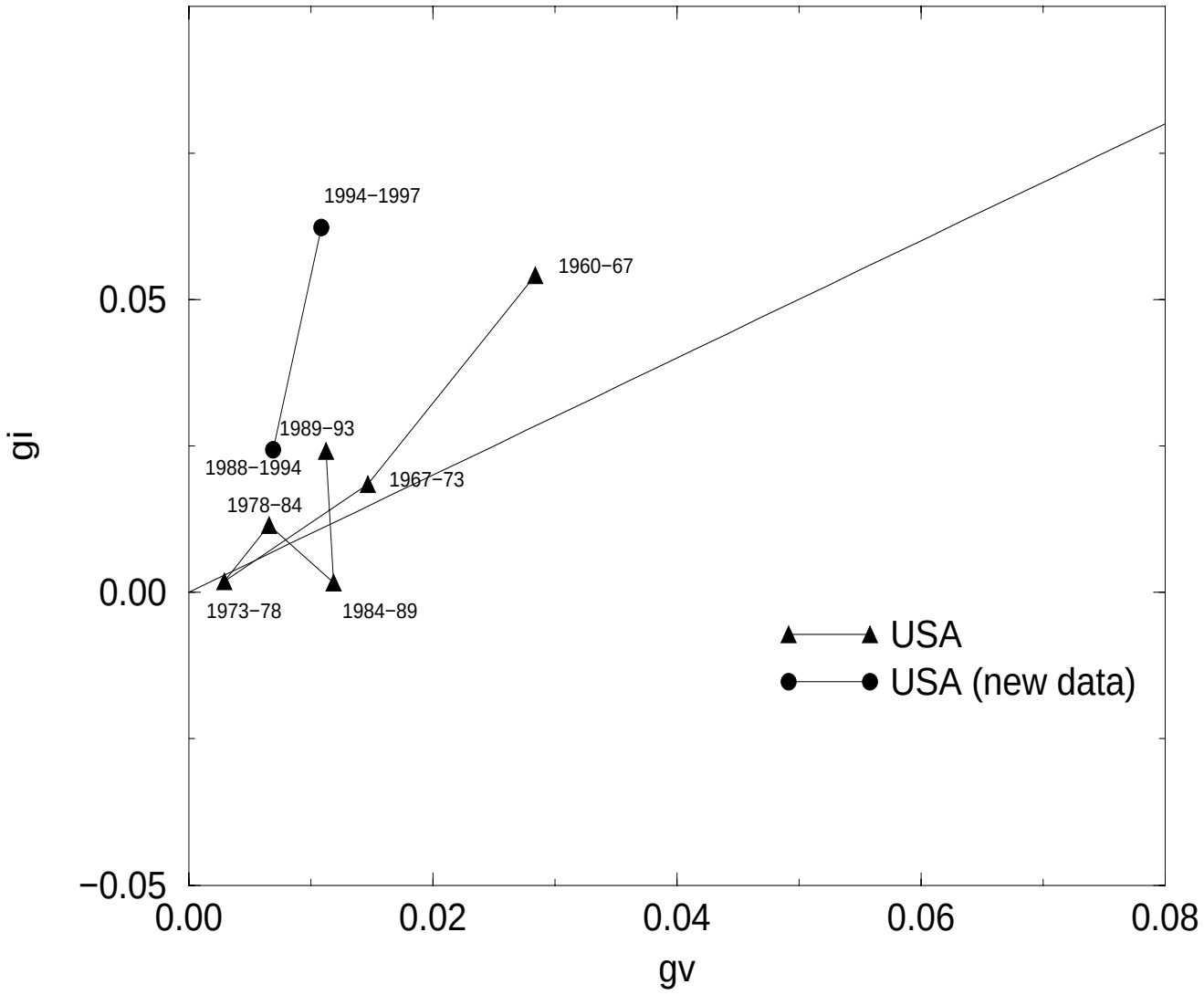
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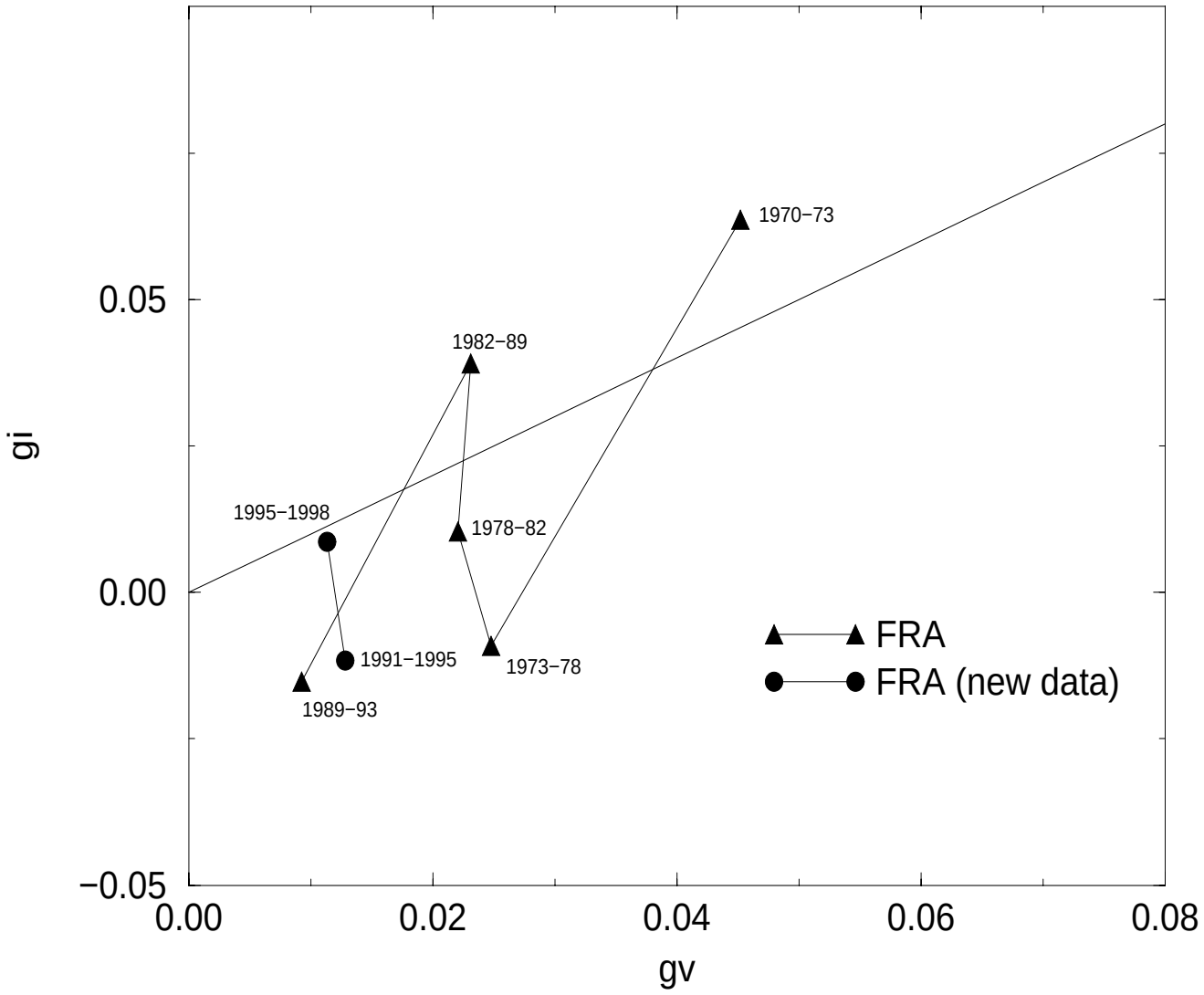
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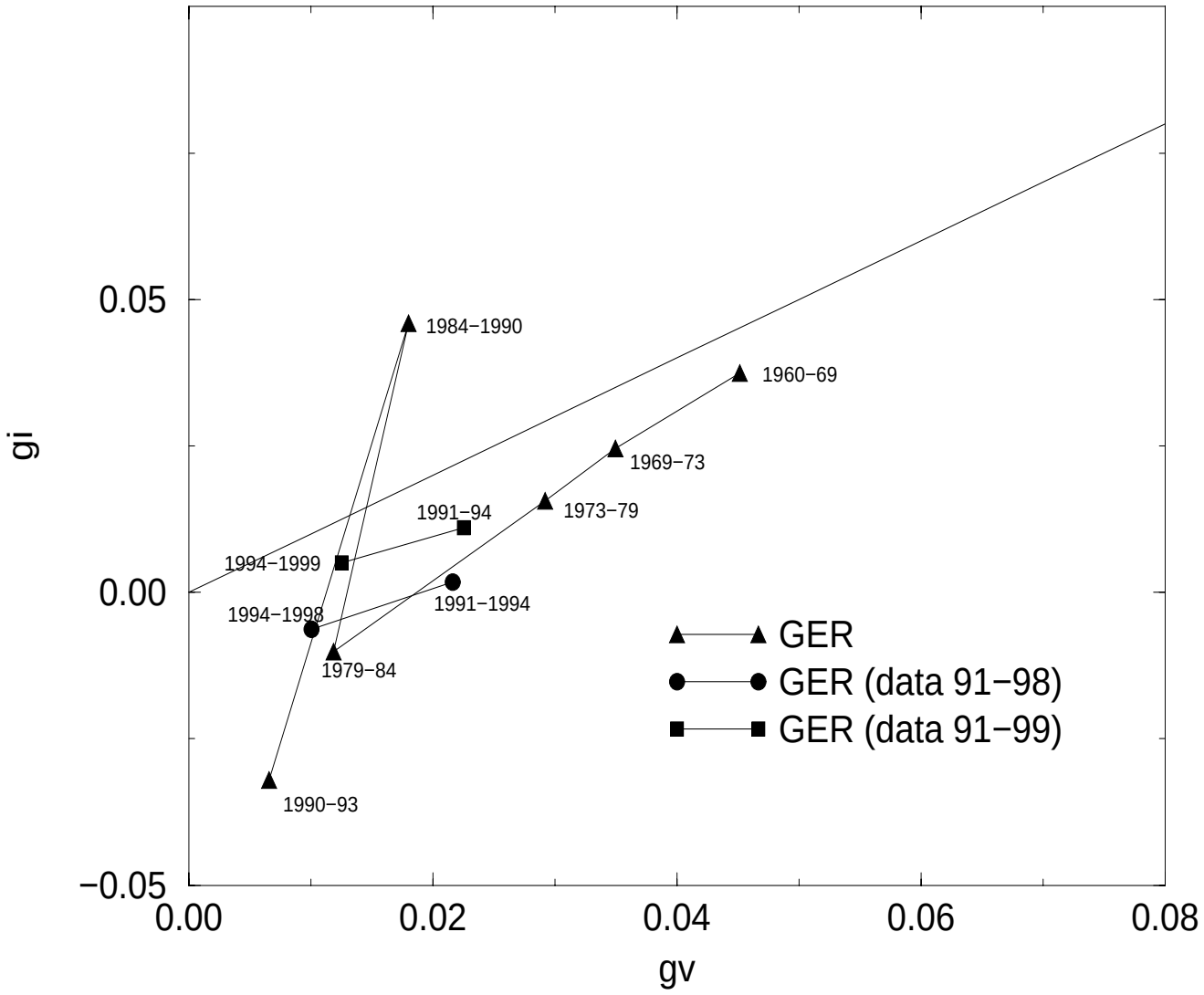
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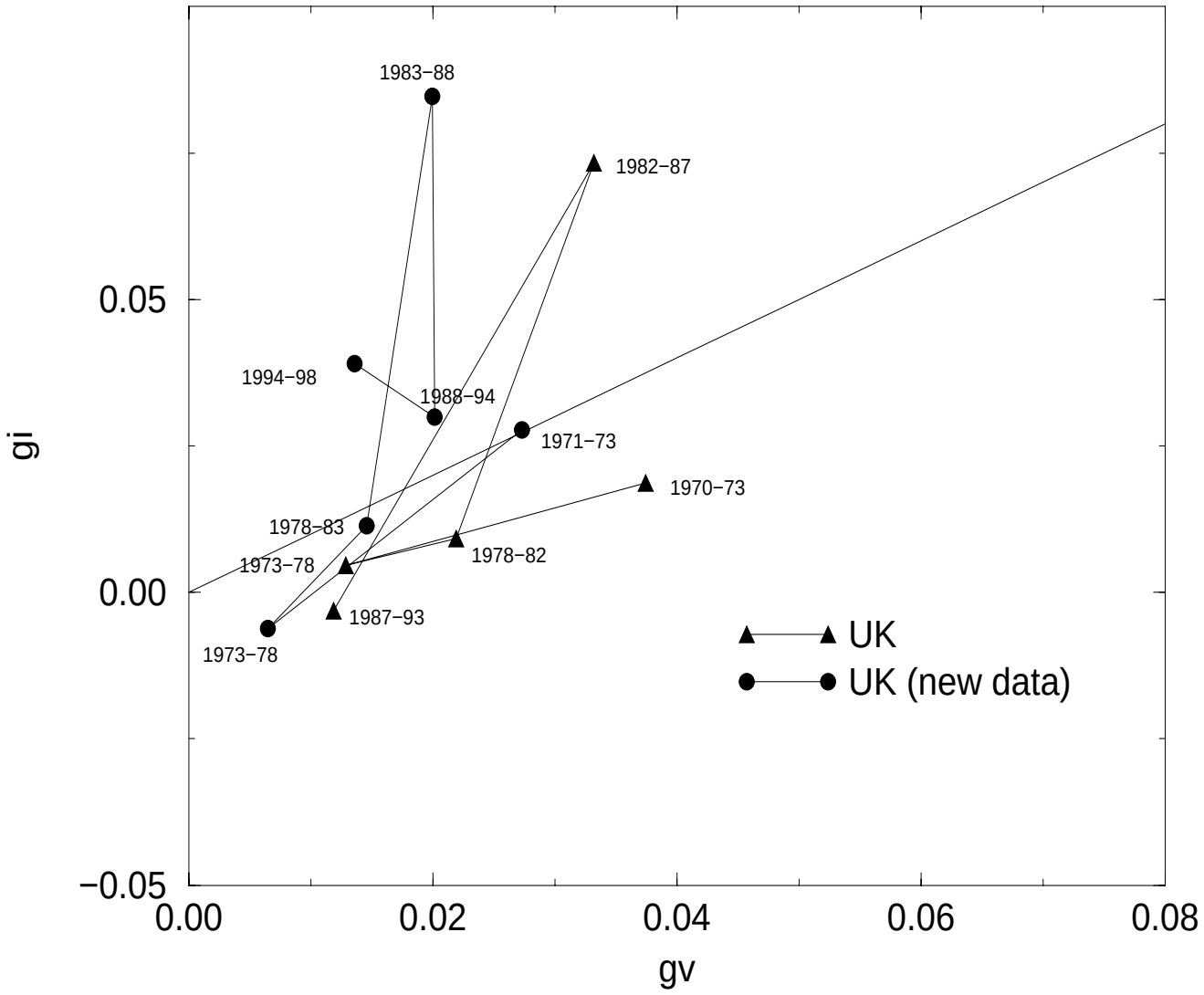
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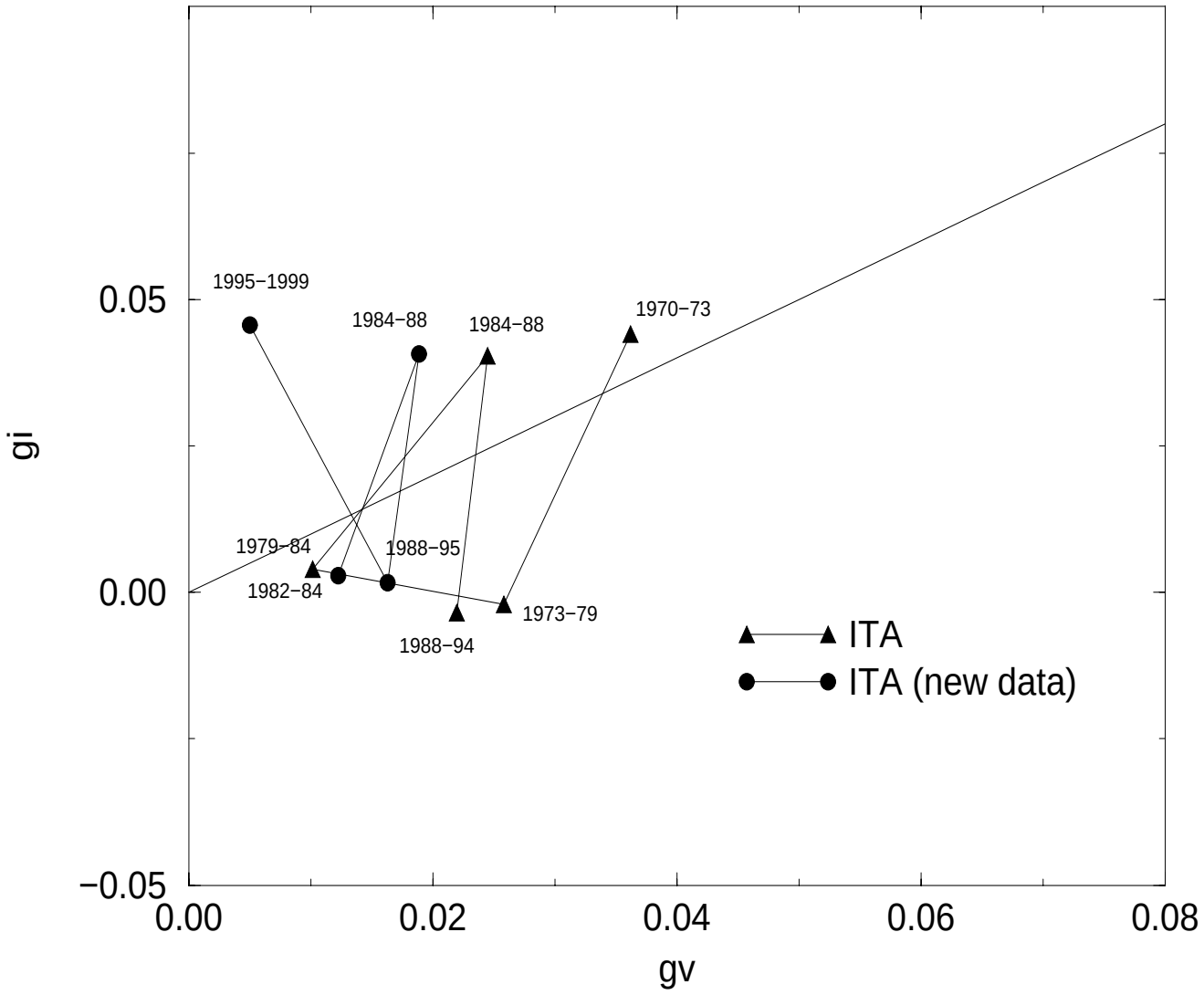
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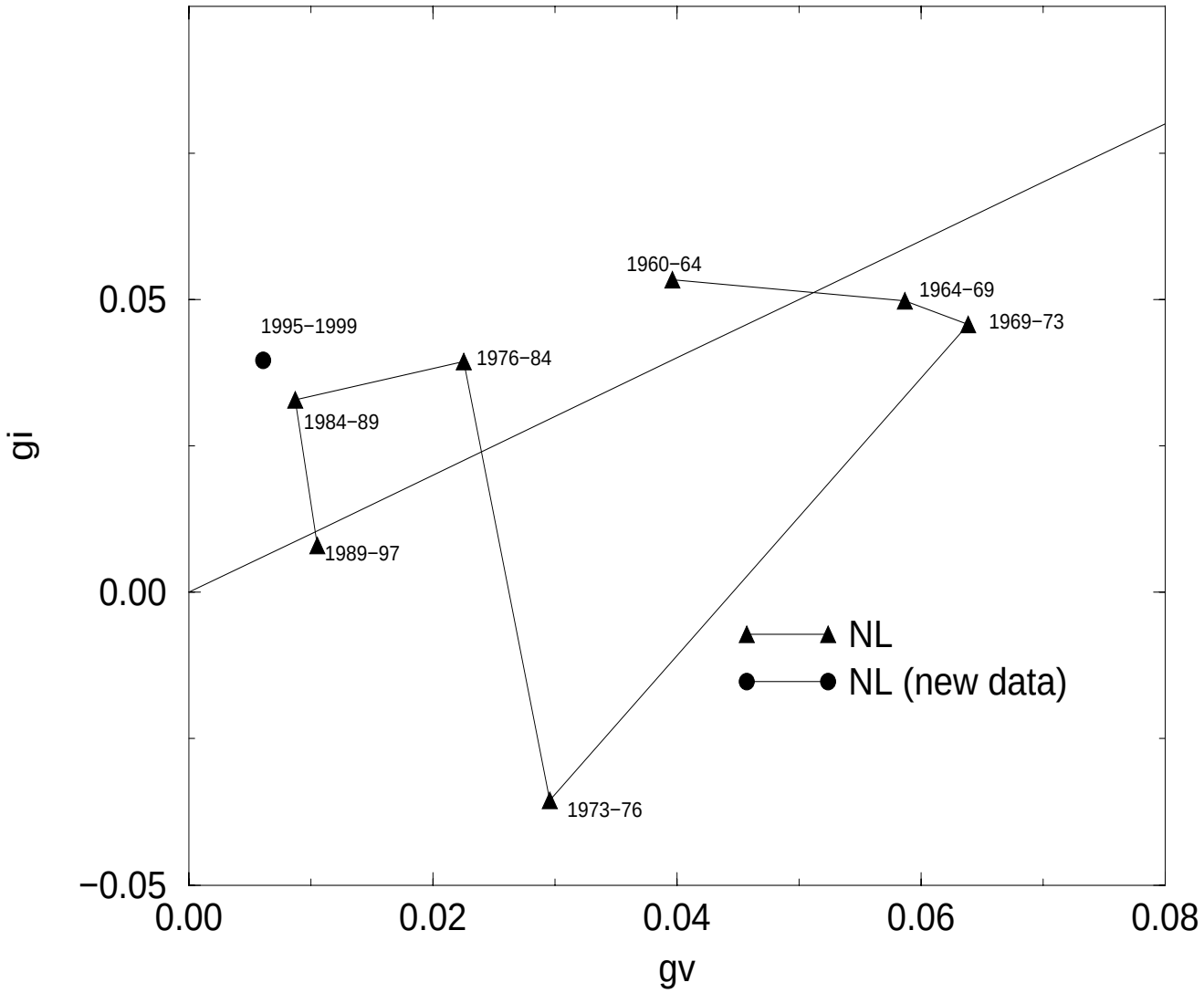
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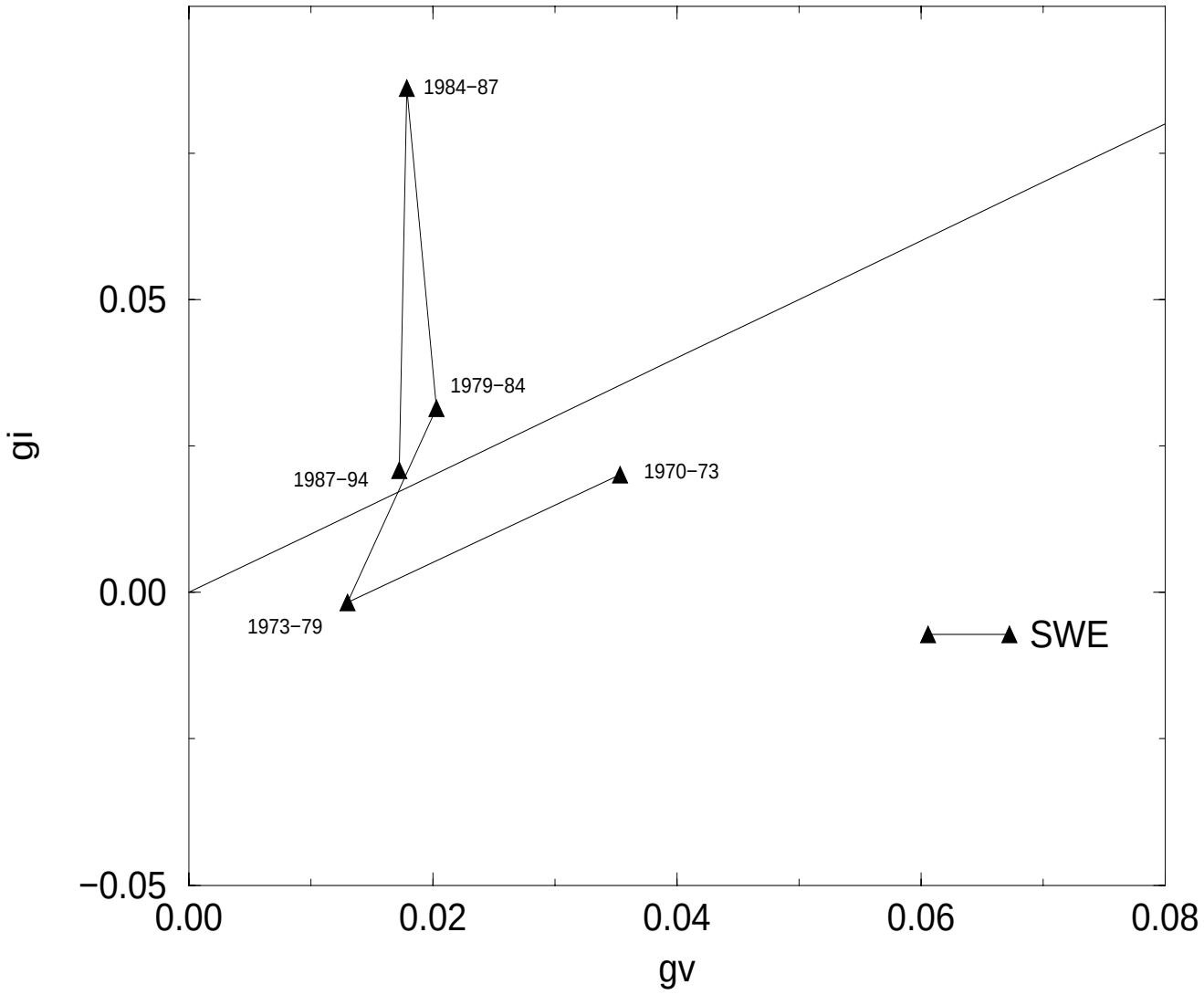
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Figure 7:

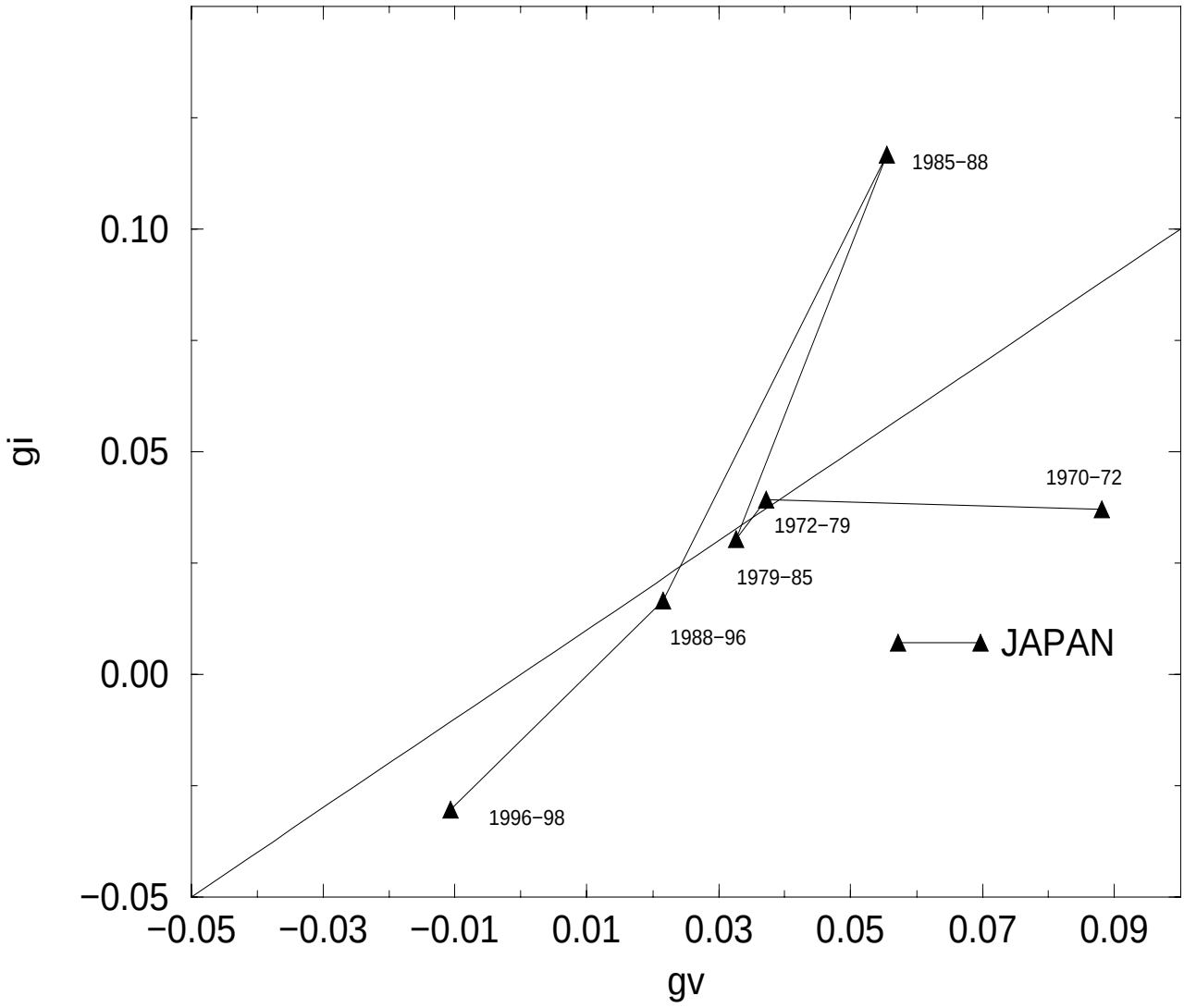
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Figure 8: