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Abstract

The economic situation of all the major developed countries has changed significantly during the 2007-2010 period. Yet many economic policies have been kept in place. This is true in particular of a key measure in French government policy: tax reductions on overtime hours and their exemption from social charges. In this article we propose simulations of this scheme based on the economic context in which it is implemented. According to our simulations, this kind of measure is pro-cyclical and therefore poorly suited to the current situation of the French economy. Furthermore, even in the case of good conditions, the scheme would not be funded. Without financing, this measure would widen the deficit and would amount to a fiscal stimulus. Financing it through an increase in levies would radically change its nature.

Classification JEL: C13; C22; E24; E32; J08

Key words: Macroeconometric model, economic cycle, NAIRU, Phillips curve, hysteresis

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The effectiveness of any economic policy depends on the conditions in which it is implemented. This obvious fact resonates even more strongly now, when we are experiencing a very turbulent economic situation. Decisions on economic policy taken before the crisis may have consequences that are diametrically opposed to those anticipated in a different economic context. Unfortunately, however obvious this may be, it is not properly taken into account in the econometric models used for *ex ante* evaluations of economic policies. These models are instead based on equations predicting linear behaviour that is independent of the position in the economic cycle.

In this article, we propose enriching the macroeconometric model used by the OFCE (*emod.ft*) by making certain behaviours depend on the economic context (Section 1). We then propose conducting an evaluation in different economic situations of a measure devised before the crisis, *i.e.*, tax allowances on overtime hours and their exemption from social charges, which is a central plank in French government policy. Concretely, compensation for additional hours worked beyond a threshold of 35 hours per week is now increased by 25%, regardless of the size of the enterprise, is subject to neither income tax nor employee social charges, and benefits from a reduction in employer social charges. This measure is intended to boost the purchasing power of French employees while increasing their working hours and lowering labour costs. But does this measure, which was designed in 2007 in a context of economic growth and falling unemployment, have the same impact in a context of severe economic crisis?

In Section 3, we offer simulations at different positions in the economic cycle of this provision for tax reductions on overtime, after having reviewed the main outlines of the scheme (Section 2). The section 4 attempt to develop an optimal policy with respect to working time, based on the position in the cycle.

I. Taking into account the economic cycle in variations in structural unemployment

In the OFCE's quarterly model, *e-mod.fr*, the standard Phillips equation is enriched by the analysis developed by Creel et al. (2011), and can be summarised in the following system¹:

$$\left\{ \begin{array}{l} \ddot{W}_t = \alpha_0 + \sum_{i=1}^n \alpha_i \ddot{W}_{t-i} + \sum_{i=0}^n \beta_i \ddot{P}_{C_{t-i}} + \sum_{i=0}^n \phi_i \Delta U_{t-i} \\ \quad - \gamma \left[\dot{W}_{t-1} - \mu_0 \dot{P}_{C_{t-1}} + \mu_1 \left(U_{t-1} - \bar{U}_{t-1} \right) - \mu_2 \pi_{t-1} \right] + \varepsilon_{W_t} \end{array} \right. \quad (1)$$

$$\left\{ \begin{array}{l} \bar{U}_t^* = \bar{U}_{t-1}^* + \gamma_1 \Delta U_t + \gamma_2 \left(\Delta U_t * Outputgap_t \right) + \gamma_3 \left(i_t - i_{t-4} \right) + \varepsilon_{U_t} \end{array} \right. \quad (2)$$

$$\left\{ \begin{array}{l} \bar{U}_t = \lambda \bar{U}_{t-1} + (1-\lambda) \bar{U}_t^* + \varepsilon_{\bar{U}_t} \end{array} \right. \quad (3)$$

$$\left\{ \begin{array}{l} Outputgap_t = \rho \left(U_t - \bar{U}_t \right) \end{array} \right. \quad (4)$$

- with \dot{P}_C : rate of growth of consumer prices
 \dot{W} : rate of growth of wages
 U : unemployment rate
 \bar{U} : rate of structural or equilibrium unemployment, NAIRU
 π : rate of growth of labour productivity
 $Outputgap$: difference between actual GDP and potential GDP

Equation (1) is written as an error correction model of the Phillips curve in which the equilibrium unemployment derived from the Kalman filter is described in Heyer (2010).

¹ In *e-mod.fr*, the consumer price is a function of the import price (P_M) and the value-added price (P_V):

$$\dot{P}_{C_t} = \eta \dot{P}_{M_t} + (1-\eta) \dot{P}_{V_t} + \varepsilon_{P_C}.$$

The value-added price setting results from profit maximisation in an imperfect competitive market. The firm's desired price level corresponds to a desired mark-up (M^d) over unit labour costs (CU).

$P_{V_t} = CU_t + M^d$, with $CU_t = W_t + T_{C_t} - \pi_t$ where T_c is the employer's social contribution rate.

Box: e-mod.fr

The OFCE's quarterly model, *e-mod.fr*², focuses on the study of the French economy and uses the framework provided by the national accounts. This model is used to analyse macroeconomic, fiscal and budgetary policies. It is also used as a tool to analyse the economic situation and for short-term forecasting and medium-term simulations. The model has a rigorous accounting framework and uses behavioural equations for the forecasting exercises. The productive sector is broken down into seven branches (agriculture and agribusiness, energy, manufacturing, construction and public works, commerce, market services and non-market services), and five agents are distinguished (households, corporations and quasi-corporations, financial institutions, government, and the rest of the world).

The model is built on the assumption of an economy functioning on neo-Keynesian lines. In periods of underutilisation of production capacity, aggregate demand (consumption, investment, inventory changes and exports) constrains supply and determines short-term production. However, this model of demand is tempered by the fact that the level of production interacts with price and thus with demand behaviour. A decline in production reduces employment, so much so that the number of unemployed increases. The production capacity utilisation rate decreases. The easing of pressure on the market for labour and goods and services reduces production costs, and thus prices, which tends to restore demand.

Supply conditions have a short-term influence on foreign trade via competitiveness and the pressures on production capacity, and on consumption, through inflation. The dynamics take into account inventory behaviour. Finally, in the medium term, the model returns to a more classic dynamic, with a steady state regulated by equilibrium unemployment.

Equation (2) describes the process of change in structural unemployment, which, in its simplest version, follows a random walk (King *et al.* (1995), Gordon (1997)). The standard, purely stochastic specification of structural unemployment cannot, however, explain its fluctuations. Moreover, most studies do not attempt to predict how it changes in the future, and thus shy away from making any economic policy recommendations to reduce its level (Richardson *et al.*, 2000; Irac, 2000; Boone *et al.*, 2001; and Laubach, 2001).

A number of studies (McMorrow and Roeger, 2000; Heyer and Timbeau, 2002; Logeay and Tober, 2003; Slacalek, 2003; Heyer, Reynes and Sterdyniak, 2007) have attempted to overcome the limitations of the standard model by enriching the dynamics of structural unemployment. From this starting point, these efforts limit the influence of the unobserved variable to the short term and define structural unemployment from the combined

2 For further information, the reader can turn to Chauvin *et al.* (2002).

dynamic of exogenous variables, such as unemployment (U), 10-year real interest rates (i) and labour productivity (π)³.

The basic model is thus enriched by these exogenous variables. This model is very similar to those formulated and estimated in Heyer and Timbeau (2002) and Heyer *et al.* (2007).

In these studies, a slowdown in productivity leads, all else being equal, to an increase in the equilibrium rate of unemployment. The long-term elasticity estimated in various studies on the French economy lies between -0.5 and -0.1: increasing productivity by 1 point reduces the equilibrium unemployment rate by 0.1 to 0.5 point. The comparable estimate for long-term real interest rates is between 0.1 and 0.6. The impact of interest rates on equilibrium unemployment can flow through simple channels via the user cost of productive capital (Bonnet and Mahfouz, 1996; Cotis, Méary and Sobczak, 1998) or more complex channels. For Fitoussi and Phelps (1988), labour demand depends on real wages, as in traditional theories, but also on interest rates, since they determine the price of the assets that companies wish to accumulate. The impact of interest rates on the rate of structural unemployment thus passes through the capital market. A high level of interest rates depresses asset prices, and hence the demand for labour, resulting in an increase in the equilibrium rate of unemployment.

Finally, changes in structural unemployment depend on changes in actual unemployment. This idea is already found in Cross (1995) and Mankiw (2001). This dynamic effect can be interpreted as a hysteresis effect⁴ (Blanchard and Summers, 1986): this corresponds to a long-term adjustment of actual unemployment towards equilibrium unemployment after a macroeconomic shock. The equilibrium rate of unemployment tends to increase with actual unemployment, explaining part of its variation (Phelps, 1994). This kind of situation can be explained first, by the possible persistence of the shock, and second, by shortcomings in the adjustment mechanisms. Thus, following a macroeconomic shock, when unemployment rises, some people are excluded, and the burden of unemployment on wages winds up decreasing, implying higher unemployment for a given inflation.

³ Other determinants of equilibrium unemployment are advanced in the theoretical literature. They are usually deduced from a WS-PS model (minimum wage – L’Horty and Rault, 1999); replacement rates (Layard *et al.*, 1991; Laffargue and Thibault, 1998); the tax wedge (Padoa-Schioppa, 1990; Manning, 1993; Corneo, 1994; Cotis *et al.*, 1998); as well as all other variables (bargaining power, mismatch, level of competition, cost of redundancies, etc.) which have been refined by the theoreticians of the labour market Cahuc and Zylberberg (1996). None of these variables are significant at the 10% threshold and they are thus not used in the rest of this article.

⁴ Some authors challenge the use of the term “hysteresis” to describe these phenomena. See Cross (1995) or Amable *et al.* (1995).

Conversely, when unemployment falls, the excluded are gradually reintegrated (either through active policies or by clearing out the queues), and the burden of unemployment on wages increases. The loss of human capital associated with periods of inactivity, which is greater as the average duration of unemployment increases, can also explain this kind of dynamic.

These explanations are not the only ones possible. Any dynamic process of adjustment between the supply and demand for labour may also account for this type of relationship. For example, Lipsey (1960), following Phillips (1958), considered imperfectly segmented labour markets. A shortage on a labour micro-market (segmentation can be geographic, by profession, by experience, etc.) is translated into higher wages, but also into a transfer of the surplus labour supply on other micro-markets. These transfers have a particular speed, with both the level of unemployment and its rate of change affecting formation of the wage. This intuition can be generalised by including the mismatch between the supply and demand for labour. When qualified employees accept less-skilled jobs, it takes some time for them to see that the labour market is improving and that by leaving their current jobs they can find more suitable employment. The argument can be both for a finite speed of information flow as well as for a calculation that includes the risk of accepting a more highly-skilled job. The dynamics of job search models or the Lindbeck and Snower (1989) insider-outsider models and the link with wage dynamics can be invoked here to explain the micro-economic foundations of this relationship.

In these studies, these three effects (U , i , π) are assumed to be constant, identical whatever the initial economic situation. Yet it is conceivable that these effects, especially the hysteresis effect, can be different depending on whether the economy is booming and close to full employment or on the contrary is far from its growth potential⁵.

Heyer (2010) proposed to supplement this earlier work by removing the assumption that these effects remain constant and by enabling them to vary over time.

This means taking into account the position of the economy in the business cycle by making the coefficients of equation (2) depend on it.

⁵ A recent study by Guichard and Rusticelli (2010) examined how the shock on aggregate unemployment resulting from the economic crisis can be transmitted to structural unemployment by the hysteresis effects that arise through the increase in long-term unemployment. The increase in structural unemployment resulting from the crisis was estimated to be $\frac{3}{4}$ of a percentage point for the OECD as a whole, but this study highlights the important differences between countries.

Whereas equation (2) translates the long-term changes in the equilibrium unemployment, equation (3) describes its dynamics. Equation (4) is the gap version of Okun's law (Abel and Bernanke, 2005) where ρ is the factor relating changes in unemployment to changes in output.

II. Presentation of the measure on tax reductions on overtime hours

The measure reducing taxes on overtime hours and exempting them from social charges applies to all employees in the public and private sectors in France. It covers both the complementary hours worked by part-time employees as well as the overtime hours performed by full-time employees, including those working for pay packages. It has been in force since 1 October 2007.

II.1 The basic principles⁶

The measure has a number of components:

A. Flat-rate reduction on employer social charges

The measure introduces a flat-rate reduction on payroll taxes of € 1.50 per hour of overtime worked for companies with twenty employees or fewer and € 0.50 in companies with more than twenty employees.

B. Alignment of the overtime hours supplement

The measure proposes aligning overtime hours at a minimum rate of plus 25% in all companies.

C. Exemption from income tax

The measure allows employees to exempt all wages paid for overtime hours worked, within the limit of the 25% increase, from income tax.

D. Exemption on employee social charges

The measure also includes a reduction on employee charges equal in amount to the French CSG and CRDS charges as well as all other charges mandated by law and bargaining agreements.

This measure has different implications for the overall cost of labour. Its impact on the cost differs depending on the size of the company and the level of the hourly wage. For companies with more than twenty employees,

⁶ For more on this measure, see Heyer (2007).

overtime costs fell once the measure was adopted. However, despite this lower cost, an overtime hour still costs more than a regular hour. At 1.33 times the French minimum wage (the “SMIC”), the cost of an overtime hour falls by 7 to 8% and its added cost compared to a regular hour is no longer 25%, but 15 to 16%.

For businesses with twenty employees or fewer, the cost associated with aligning the increase at 25% for overtime hours breaks even at an hourly wage of 1.2 times the SMIC, that is to say, for a gross monthly salary of 2000 euros. Beyond that, an overtime hour costs more after the reform than before it. At 1.33 times the SMIC, the average hourly wage for an overtime hour, the extra cost is 1.5% compared to the current situation.

With regard to the complementary hours of part-timers, their cost falls with the reform, regardless of the level of the reference wage or the firm size. Also, unlike overtime hours, a complementary hour costs less than a regular hour.

Finally, for businesses with more than twenty employees, this measure would at best lower the labour costs of their employees, whether full time or part time, by 0.5%. For businesses with twenty employees or fewer, the drop can reach up to 1.2% for their part-time employees. For full-time employees, the cost is very slightly less for those on up to 1.2 times the SMIC and slightly more beyond this (Table 1).

Table 1. Impact on the cost of labour

In %	Wage as share of the SMIC	1	1.1	1.2	1.33	2.0
<i>Full-time employee</i>						
<i>Companies w/ • 20 workers</i>	-0.2	-0.1	0.0	0.0	0.3	
<i>Companies w/ > 20 workers</i>	-0.5	-0.5	-0.4	-0.3	-0.1	
<i>Part-time employee</i>						
<i>Companies w/ • 20 workers</i>	-1.2	-1.1	-0.9	-0.8	-0.5	
<i>Companies w/ > 20 workers</i>	-0.4	-0.2	-0.2	-0.2	-0.1	

Source: OFCE calculation. The calculation is based on an average situation of working hours without overtime of 36.3 hours per week, and of 1.3 hours of overtime per week, amounting to 58 overtime hours per year per employee. For part-time work, the standard week is 23 hours, to which is added 2 complementary hours per week.

II.2 The goals of the measure

The measure to cut taxes on overtime work has three objectives: to increase the purchasing power of those who work, to reduce labour costs, and to encourage a longer working week. The impact on employment is ambiguous. Indeed, it has overlapping contradictory effects:

1. The first is positive and concerns the reduction in labour costs and the increase in employee purchasing power. Given the cheaper cost of overtime, companies would be encouraged to increase the working hours of existing employees, particularly in sectors experiencing pressure on hiring new workers (construction, hotels and health care). The remuneration of this overtime would increase purchasing power, thereby irrigating the entire economy, with a positive effect on employment.
2. The second effect is negative for employment: lowering the cost of an extra hour encourages entrepreneurs to extend working hours, thus enhancing the status of insiders (employees) at the expense of outsiders (the unemployed). This causes an increase in the per capita productivity of French workers, which is positive for the potential growth of the country's economy, but bad for employment in the short term.
3. Finally, as with any tax measure, a windfall is to be feared. With the recovery in activity, many additional hours that would have been performed in any case will now be tax-free.

III. Macroeconomic evaluations of the measure

Using the elements discussed in the previous sections, it is possible to assess the impact on the French economy of tax reductions on overtime hours depending on whether this measure is introduced at the peak of the cycle or at the bottom.

As we do not have the elasticity of overtime hours to their costs, we assume that companies will saturate the legal constraint on overtime (220 hours per year) for their employees who already work some overtime (37% of full-time employees). Working hours would increase by 0.8% for employees as a whole.

We then evaluate the different scenarios using the OFCE macroeconomic model, *e-mod.fr*.

III.1. Macroeconomic impacts of the tax reductions on overtime hours at the peak of the cycle

In the first simulation, we place ourselves in a favourable economic context, corresponding to a strongly positive output gap (3 points), as measured by the OECD. This was the situation observed in France in the early 1980s and 1990s. The main findings of this simulation, summarised in Table 2, are as follows:

In the very short term (1 year), there is competition between working time and employment: nearly 80,000 jobs would be destroyed, without stimulating activity. The extra income earned by those who work more is cancelled out, in terms of GDP, by the losses of those who no longer have jobs. In these circumstances, the public deficit would widen by 0.4 percentage point of GDP, and the unemployment rate would rise by 0.3 point.

Table 2. Impact of the tax reductions on overtime hours at the peak of the cycle⁷

	year	1	2	3	4	5	10
Total GDP (in volume)		0.0	0.1	0.2	0.3	0.4	0.5
Imports		-0.2	-0.1	-0.1	-0.1	-0.1	0.2
Household spending		-0.1	0.0	0.1	0.2	0.3	0.6
Government expenditure		0.0	0.0	0.0	0.0	0.0	0.1
Corporate investment		0.0	0.0	-0.2	-0.4	-0.4	0.0
Exports		0.0	0.2	0.3	0.5	0.6	0.6
Contributions to growth							
Change in inventory		0.0	0.0	0.0	0.0	0.0	0.0
Domestic demand		-0.1	0.0	0.1	0.1	0.2	0.3
Trade balance		0.1	0.1	0.1	0.2	0.2	0.2
Consumer prices		-0.2	-0.6	-0.9	-1.0	-1.1	-1.1
GDP price		-0.3	-0.7	-1.1	-1.2	-1.3	-1.3
Duration of work		0.8	0.8	0.8	0.8	0.8	0.8
Household income		0.6	0.6	0.6	0.6	0.6	0.5
Total productivity per capita		0.3	0.3	0.3	0.3	0.3	0.3
Total workforce (1000s)		-79	-48	-25	-7	13	64
Total workforce (%)		-0.3	-0.2	-0.1	0.0	0.1	0.3
ILO unemployment rate (<i>in points</i>)		0.3	0.2	0.1	0.0	-0.1	-0.2
Household savings rate		0.6	0.5	0.4	0.3	0.2	0.0
Business margin rates		0.0	-0.1	-0.1	-0.1	-0.1	0.0
Financing capacity (pts of GDP)							
Non-financial companies		0.0	0.0	0.0	0.0	0.0	0.0
Financial companies		0.0	0.0	0.0	0.0	0.0	0.0
General government		-0.4	-0.4	-0.3	-0.3	-0.2	-0.2
Households & self-employed		0.4	0.4	0.4	0.4	0.4	0.5
Non-profits serving households ("ISBLSMs")		0.0	0.0	0.0	0.0	0.0	0.0
Trade		0.0	-0.1	-0.1	-0.1	-0.2	-0.3

Sources: Quarterly accounts, INSEE, author's calculations

⁷ In this simulation, the peak of the cycle corresponds to an output gap of 3 points as measured by the OECD.

This increase in the unemployment rate would cause a fall in prices of 0.2 percentage point. Five years from now, this could be expected to be 1.1 points. This would enable additional growth of 0.4%, driven by domestic demand. Household consumption would be stimulated by growth in real income. Part of this extra income would be saved by households – the savings rate would rise by 0.2 percentage point – while the rest would be consumed.

Due to the expansionary impact of this measure and the very slight reduction in labour costs, it would create 13,000 jobs over the next 5 years, which is not enough to generate a reduction in unemployment.

The expansionary impact would not be enough to fund the measure. The government deficit would worsen by 0.2 percentage point of GDP over the next 5 years.

In the long term, there would be just over 64,000 jobs created, representing a slight decline in the unemployment rate (-0.2 point). But the measure would still not be funded: the extra growth of 0.5% would be accompanied by a widening deficit of 0.2 percentage point of GDP.

III.2. Macroeconomic impacts of the tax reductions on overtime hours in a normal economic situation

In contrast to the previous situation, in normal conditions, corresponding to a zero output gap, the equilibrium rate of unemployment varies with changes in unemployment with an elasticity of less than one (0.9). The disinflationary trend observed in the previous case would now be less pronounced (Table 3). This would not call completely into question the increase in household purchasing power or the increase in the competitiveness of the French economy, but it would limit their extent. The extra growth would be 0.2 percentage point at 5 years (0.3 point at 10 years). The measure still would not be funded, since the deficit would widen by 0.4 percentage point (0.3 point at 10 years).

Table 3. Impact of the tax reductions on overtime hours in a normal economic situation⁸

Difference from the central account, in %	Year	1	2	3	4	5	10
Total GDP (in volume)		0.0	0.1	0.1	0.1	0.2	0.3
Imports		-0.1	0.0	0.1	0.2	0.2	0.4
Household spending		-0.1	0.1	0.1	0.2	0.3	0.6
Government expenditure		0.0	0.0	0.0	0.0	0.0	0.1
Corporate investment		0.0	0.0	0.1	0.1	0.1	0.2
Exports		0.0	0.0	0.0	0.0	0.1	0.1
Contributions to growth							
Change in inventory		0.0	0.0	0.0	0.0	0.0	0.0
Domestic demand		0.0	0.1	0.1	0.1	0.2	0.4
Trade balance		0.0	0.0	0.0	0.0	0.0	-0.1
Consumer prices		0.0	0.0	-0.1	-0.2	-0.3	-0.4
GDP price		0.0	-0.1	-0.1	-0.2	-0.3	-0.6
Duration of work		0.8	0.8	0.8	0.8	0.8	0.8
Household income		0.6	0.6	0.6	0.6	0.7	0.6
Total productivity per capita		0.3	0.3	0.4	0.4	0.4	0.4
Total workforce (1000s)		-80	-75	-70	-64	-56	-20
Total workforce (%)		-0.3	-0.3	-0.3	-0.3	-0.2	-0.1
ILO unemployment rate (<i>in points</i>)		0.3	0.3	0.3	0.2	0.2	0.1
Household savings rate		0.7	0.6	0.5	0.4	0.3	0.1
Business margin rates		0.0	0.0	0.0	0.0	0.0	0.0
Financing capacity (pts of GDP)							
Non-financial companies		0.0	0.0	0.0	0.0	0.0	0.0
Financial companies		0.0	0.0	0.0	0.0	0.0	0.0
General government		-0.5	-0.4	-0.4	-0.4	-0.4	-0.3
Households & self-employed		0.5	0.5	0.5	0.5	0.5	0.4
Non-profits serving households ("ISBLSMs")		0.0	0.0	0.0	0.0	0.0	0.0
Trade		0.0	0.0	0.0	-0.1	-0.1	-0.1

Sources: Quarterly accounts, INSEE, author's calculations

⁸ In this simulation, the peak of the cycle corresponds to an output gap of 0 as measured by the OECD.

III.3. Macroeconomic impacts of the tax reductions on overtime hours at the bottom of the cycle

In the last simulation, the tax reduction on overtime is enacted in an economic climate that has seriously deteriorated, corresponding to a negative output gap (-3 points).

In a situation like this, with the kind of mass unemployment experienced in France in the late 1980s and 1990s, and as is once again the case, the hysteresis effect is strong. An increase in the duration of work in this context has a negative impact on employment (-72,000 jobs at 5 years and -125,000 at 10 years, see Table 4). The unemployment rate increases slightly (0.3 percentage point at 5 years, 0.4 point at 10 years). This measure has little impact on growth (0.1 percentage point at 5 years and 0.1 point at 10 years) and is not funded: the deficit would deteriorate by 0.4 point at 5 years (0.4 point at 10 years).

Table 4. Impact of the tax reductions on overtime hours at the bottom of the cycle⁹

	Difference from the central account, in %						
	Year	1	2	3	4	5	10
Total GDP (in volume)		0.0	0.1	0.1	0.1	0.1	0.1
Imports		-0.2	-0.1	0.0	0.2	0.3	0.6
Household spending		-0.1	0.0	0.1	0.2	0.3	0.4
Government spending		0.0	0.0	0.0	0.0	0.0	0.1
Corporate investment		0.0	-0.1	-0.2	0.1	0.4	0.7
Exports		0.0	0.1	0.1	0.0	-0.1	-0.4
Contributions to growth							
Changes in inventory		0.0	0.0	0.0	0.0	0.0	0.0
Domestic demand		-0.1	0.0	0.1	0.1	0.2	0.4
Trade balance		0.0	0.0	0.0	-0.1	-0.1	-0.3
Consumer prices		-0.2	-0.4	-0.2	0.2	0.4	1.4
GDP price		-0.2	-0.5	-0.3	0.2	0.5	1.6
Duration of work		0.8	0.8	0.8	0.8	0.8	0.8
Household income		0.6	0.6	0.7	0.7	0.8	0.9
Total productivity per capita		0.3	0.4	0.4	0.4	0.4	0.4
Total workforce (1000s)		-79	-73	-69	-68	-72	-96
Total workforce (%)		-0.3	-0.3	-0.3	-0.3	-0.3	-0.4
ILO unemployment rate (<i>in points</i>)		0.3	0.3	0.3	0.3	0.3	0.3
Household savings rate		0.6	0.6	0.5	0.5	0.4	0.4
Business margin rate		0.0	-0.1	-0.1	-0.1	-0.1	-0.1
Financing capacity (in points of GDP)							
Non-financial companies		0.0	0.0	0.0	0.0	0.0	0.0
Financial companies		0.0	0.1	0.1	0.1	0.1	0.0
General government		-0.5	-0.4	-0.4	-0.4	-0.4	-0.4
Households & self-employed		0.5	0.4	0.4	0.3	0.3	0.3
Non-profits serving households ("ISBLSMs")		0.0	0.0	0.0	0.0	0.0	0.0
Trade		0.0	0.0	0.0	0.0	0.0	0.0

Sources: Quarterly accounts, INSEE, author's calculations

⁹ In this simulation, the bottom of the cycle corresponds to an output gap of -3 points as measured by the OECD.

III.4. What increase for the working week?

In the preceding simulations, we have assumed that companies reached the limits of the legal constraints on overtime (220 hours per year) for their employees who already work some overtime (37% of full-time employees). Working hours would increase by 0.8% for employees as a whole.

But it is conceivable that business could make greater use of overtime and that the percentage of employees who work overtime could also increase.

We then conducted further simulations with up to a 2.5% increase of working hours for employees as a whole.

The results of these simulations at 5 years are summarised in Table 5: the more firms use overtime, the greater the sensitivity to the economic situation. The cost to public finances increases along with the duration of the work week and the worsening of the economic situation, *ex-ante* of course but also *ex-post*.

Table 5. Summary of the impact at 5 years based on the increase in the work week

		Difference from the central account, in %			
		Increase in the work week of 0.8 %	... 1 %	... 2.5 %
GDP	Bottom of cycle	0.1	0.1	0.3	
	Normal cycle	0.2	0.2	0.5	
	Top of cycle	0.4	0.4	1.1	
Employment (1000s)	Bottom of cycle	-72	-90	-224	
	Normal cycle	-56	-70	-175	
	Top of cycle	13	17	41	
Unemployment rate	Bottom of cycle	0.3	0.3	0.8	
	Normal cycle	0.2	0.3	0.6	
	Top of cycle	-0.1	-0.1	-0.2	
Gov't deficit (% of GDP)	Bottom of cycle	-0.4	-0.5	-1.3	
	Normal cycle	-0.4	-0.5	-1.2	
	Top of cycle	-0.2	-0.3	-0.8	

Sources: Quarterly accounts, INSEE, author's calculations

IV. What is the optimal economic policy?

A tax reduction on overtime work and its exemption from social charges would thus differ in its impact on the economy, depending on the market conditions prevailing at the time the measure is applied (Table 5). According to our simulations, this measure is pro-cyclical and therefore poorly suited to an economic slump such as exists in France today. Also, note that even in the case of a good situation, lower labour costs and the elimination of payroll taxes are expensive and are not funded. Without funding, this measure would widen the deficit and amount to a fiscal stimulus, an inappropriate policy during the peak of a cycle.

The next two sections attempt to develop an optimal policy with respect to working time, based on the position in the cycle.

IV.1 During a cyclical peak

In a booming economy, as the jobless rate falls and full employment is approached, a supply policy is effective. From this point of view, increasing working hours through the tax exemption of overtime may be one option to consider. It is necessary to ascertain, however, that, once the measure is funded, it would still have a positive impact on activity and employment. The issue would then shift to the choice of the instrument to be selected for funding.

According to our previous simulations, in the case of a moderate 0.8% increase in working hours, the funding effort would be 0.5 percentage point of GDP at 5 years and 0.2 point at 10 years.

This funding could be provided by higher levies. This would radically change the nature of the measure. Financing it through other social charges or by a VAT increase would lead among other things to an increase in the production costs that are being lightened. This would also accentuate the differential effects between the taxation of overtime hours and of normal hours. With this type of financing, the measure's impact would be neutral at 5 years but still positive at 10 years (Table 6): additional growth would come to 0.4 point over this period, with the creation of about 50,000 additional jobs, which would result in a slight decline in the unemployment rate (-0.2 point).

*Table 6. Summary of the impact at 5 years and 10 years based on how the measure is financed **

Measure funded by ...		5 yrs	10 yrs
... a VAT increase	GDP	0	0.4
	Employment	-51	50
	Unemployment rate	0.2	-0.2
... an increase in employer social charges	GDP	-0.1	0.4
	Employment	-67	57
	Unemployment rate	0.3	-0.2
... an increase in income tax	GDP	0.2	0.5
	Employment	-16	89
	Unemployment rate	0	-0.4
... a reduction in social spending	GDP	-0.2	0.4
	Employment	-71	46
	Unemployment rate	0.3	-0.2

* We have used a 0.8% increase in working time here.

Sources: emod.fr, author's calculations

With funding through income tax or the CSG (general social contribution) or a similar levy, the measure would lead to a transfer of levies on economic activity to capital income. According to our simulations, this type of financing would be the most optimal, as the impact on GDP at 5 years would remain positive (0.2 point). At ten years, the additional growth would be 0.5 point, nearly 90,000 jobs would be created, and the unemployment rate would decline by 0.4 point.

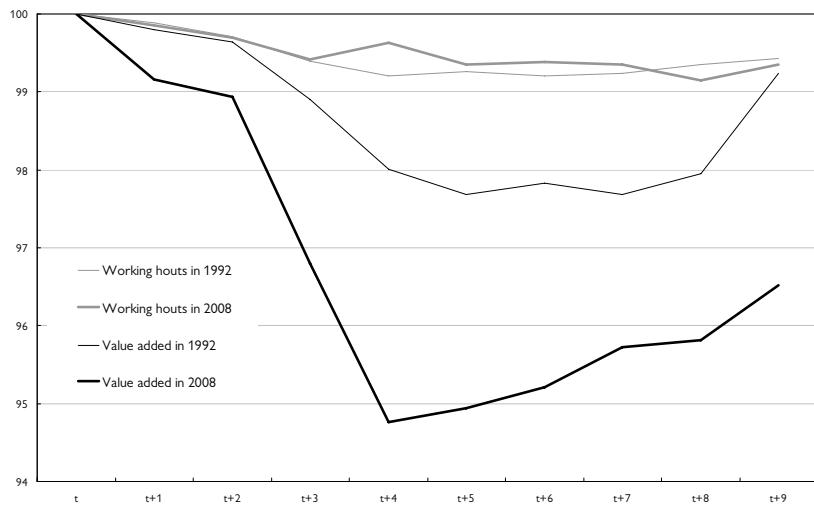
There is one last track for financing: to lower social spending. This solution seems less advantageous than the preceding one at 5 years, since it would negate the positive effects of the tax exemption of overtime. Job losses would amount to 71,000, and the unemployment rate would rise by 0.3 point. At 10 years, the impact of this track would be similar to the previous ones, while still being less advantageous.

IV.2 During an economic downturn

During an economic downturn, as in the recent period, the tax exemption of overtime clearly is inappropriate and counter-productive. Faced with an unexpected negative shock, firms usually start by reducing working time and then cut back on precarious jobs, and in particular their temporary workers, before finally proceeding with redundancies.

Figure 1. Comparison of trends in working time and value added during the last two recessions in France

100=2008 qtr 1



Sources: INSEE, author's calculations

However, during this crisis, the shock absorber role played by working time in France was less potent with respect both to other developed countries and to previous recessions in France, in particular the downturn in the early 1990s (Figure 1). More specifically, the magnitude of the decrease in working time was similar in the two periods of crisis, even though the slowdown in activity was three times greater during the recent period.

This difference in behaviour, despite a turn to partial unemployment, may be related to the implementation of the tax exemption of overtime.

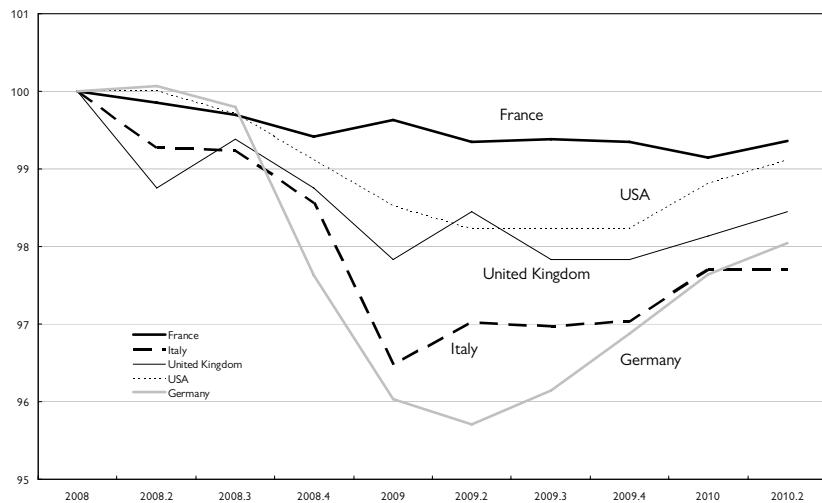
In a cyclical downturn, two alternatives to the tax exemption of overtime should have been implemented.

IV.2.1 A reduction in working hours

The first is to reduce working time. This was the strategy adopted during the recent crisis especially by Germany and to a lesser degree Italy (Figure 2). The reduction in working time was exceptional in both countries, both in its scale and in its duration.

Figure 2. Comparison of trends in working time during the 2008 recession

100=2008 qtr 1



Sources: OECD, author's calculations

These countries have opted for a sustained reduction in working hours in order to safeguard jobs. They extended their arrangements for partial unemployment and have drawn on more conventional mechanisms (time savings accounts, reduction of overtime, negotiations of reductions in working hours). In mid-2010, their levels of working hours per employee were still well below the pre-crisis level. In Italy, working hours have fallen by nearly 4% (5% in industry), mainly due to the spread of partial unemployment. As for Germany, it has a set of mechanisms for modulating the working hours, including time savings accounts – which can have negative balances – partial unemployment, and especially branch agreements negotiated within companies, all of which make it possible to safeguard jobs in return for wage cuts and reductions in working time. In the metallurgy sector, for example, a collective agreement on job security enabled companies to reduce the work week from 35 hours to 29 hours, with an equivalent decline in wages (15%), in return for stability in employment. Nevertheless, the almost total lack of any adjustment in employment during this crisis is exceptional: despite a collapse in GDP of almost 6%, employment has remained stable since the crisis began, and the unemployment rate has not budged. The reason is in essence the extension and increased flexibility of the arrangements for partial

unemployment (*Kurzarbeit*), which affected up to 1.5 million employees in the second quarter of 2009. Partial unemployment helped to keep 1.2 million employees in jobs in Germany in that year. This amounted to a wager on the future by the government and German business, which overwhelmingly supported the use of this arrangement despite the cost incurred in order to keep intact production capacity and the skills level of the work force, in the prospect of an imminent recovery.

IV.2.2 A pick-up in demand

The second alternative is a Keynesian demand stimulus. At the bottom of the economic cycle, characterised by a lack of demand relative to supply, a policy like this will have a lasting effect, as it is non-inflationary, with structural unemployment falling alongside actual unemployment.¹⁰ The stimulus multiplier is of course not sufficient to fund such a policy, but it has a stronger impact on economic growth and jobs than does a supply policy such as the tax exemption of overtime.

We simulated different stimulus policies by calibrating them to a deficit increase at 5 and 10 yrs that is identical to that generated by the tax exemption of overtime at the bottom of the cycle, namely, a deterioration of 0.5 percentage point of GDP.

Three stimulus instruments were selected (social benefits, public investment and subsidised jobs in the non-profit sector). The simulated increase with these instruments was calibrated so as to observe a deterioration of 0.5 percentage point of GDP in the public deficit at 5 years and 10 years, *i.e.*, an increase of 1 percentage point of GDP for each instrument.

¹⁰ In a recent study, Creel *et al.* (2011) showed that fiscal multipliers differ depending on the economy's position in the cycle when the measure is implemented. According to them, during an economic downturn the fiscal multipliers are strong, as will be the expansionary effects of a stimulus policy.

*Table 7. Summary of the impact at 1 year, 5 years and 10 years of various measures worsening the public deficit by 0.5 GDP point **

Difference from the central account (%)		1 yr	5 yrs	10 yrs
	GDP	0	0.1	0.1
Tax exemption of overtime **	Employment			
	Unemployment rate	-79	-72	-108
Increase in social benefits	GDP	0.3	0.3	0.4
	Employment	1.0	1.1	1.1
Increase in public investment	Unemployment rate	95	145	153
	GDP	-0.4	-0.6	-0.6
Increase in subsidised jobs in the non-profit sector	Employment	1.3	1.1	1.0
	Unemployment rate	184	226	204
	GDP	-0.7	-0.9	-0.8
	Employment	1.3	1.2	1.1
	Unemployment rate	317	229	127
	GDP	-1.2	-0.9	-0.5

* It is assumed here that the economy is at the bottom of the cycle.

** We have used a 0.8% increase in working time.

Sources: emod.fr, author's calculations

The results are summarised in Table 7. The first lesson is that, regardless of the stimulus instrument chosen, in a context of weak economic activity the policy has positive results on economic growth and employment in both the short term and long term. Unlike the tax exemption of overtime hours, which destroyed 79,000 to 108,000 jobs at 1 year and 10 years, respectively, a stimulus policy creates massive employment given an identical deterioration in public finances. The second lesson is that, in the short term, what appears to be most effective in terms of reducing unemployment is a stimulus based on subsidised jobs in the non-profit sector (-1.2 point at 1 year). In the longer term, at the 10 year horizon, the optimal choice of stimulus instrument seems to be public investment, which creates more than 200,000 jobs, thus generating a 0.8 point decline in unemployment.

V. Conclusion

The economic impact of a tax reduction on overtime and its exemption from social security charges would differ depending on the market conditions prevailing at the time that the measure is applied.

In a favourable economic environment, an increase in working time prompted by lower labour costs and the elimination of payroll taxes would seem appropriate. It is of course not funded, and financing it through higher levies would radically change its nature, even though this would not call into question its positive impact on employment and unemployment.

However, this measure is poorly suited to the kind of economic downturn being experienced by the French economy today. This corroborates the results of a recent study by Cochard *et al.* (2011). These authors examined data involving 35 sectors of the French economy and estimated that a 1% increase in overtime would destroy about 6,500 jobs in the commercial sector (*i.e.*, 0.04% of commercial jobs), three-quarters of which would be temporary jobs. Thus, in a context of severe economic crisis, it seems that an incentive to work more would hurt employment, especially temporary employment.

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