How strong of a rebound can be expected in the French economy?

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Over the last few quarters, France has entered a phase of economic recovery like the rest of Europe. In France, cumulative growth over the four quarters of 2013 stands at +0.8%, against -0.3% in 2012. However, GDP has only just returned to its peak of Q1 2008, which therefore means that average growth has been nil over the last 6 years, against average growth of +2% per year from 1980 to 2008. The situation is more unfavourable across the eurozone, where GDP today stands at more than 2% below its 2008 level.

There are many reasons for this lack of economic growth over the last 6 years. The cyclical turning point that occurred at the beginning of 2008 was accentuated by the end of the year by the triggering of the financial crisis following the collapse of Lehman Brothers. In Europe, this resulted in a slump in external demand, strong credit restrictions and, more generally, a reversal of expectations. From 2010, the crisis took on a new character in the eurozone with the sovereign debt crisis, which also led to a very marked fiscal consolidation. Overall, each of these shocks probably had an impact on production that was in part temporary, and in part long-term, both in the eurozone in general and in France in particular.

Assessing how much the French economy can rebound requires to distinguish between the long-term and the temporary aspects of the decline in growth recorded since the crisis. This is the aim of the output gap assessment carried out in this report. Potential output corresponds to the unobservable level of output obtained through a sustainable use of factors of production; it is a level of GDP that would correspond to growth when there are no tensions in the economy, and especially no price acceleration or deceleration. The gap between this potential level and the actual level of output (called the output gap) provides an indication of the position of the economy in the cycle. It indicates the capacity for rebound of GDP growth in the short term, and can guide economic policy. However, especially since the Great Recession represented a shock on an exceptional scale with potentially longer-lasting effects than previous shocks the output gap is difficult to assess.

Four techniques are applied here for estimating the output gap. The first, called the "structural" method, takes the standard methodology used by international organisations, and breaks down the contributions of the different components of a production function: labour, capital, total factor productivity (TFP). The second is a simplified variation, with labour as the only factor of production. The third is based on a "semi-structural" method, applying a model where the output gap is identified as the common

contribution to change in several short-term variables: inflation, production capacity utilisation rate and the composite business climate indicator. The last method, called the "direct" method, is a variation on the previous one, but with no modelling of dynamic relations between variables beforehand: the main component of the different indicators of imbalance (production capacity utilisation rate, wages, inflation, unemployment, business tendency surveys, etc.) is identified as the output gap. For France in 2013, these four main methods produced estimates of output gap ranging from -2.0 to -3.5 GDP points with a confidence interval of between -1.2 and -4.6 points. For the eurozone, estimates of output gap are similar, from -2.0 to -3.8 points with a confidence interval of between -1.2 and -5.4 points.

These estimates are fragile and surrounded by uncertainties. They are based on choices that are open to debate, for example the choice of production function for the structural method, and model specification in the case of the semi-structural method, as well as the smoothing methods that depend particularly on the final year's position in the cycle. The most recent points, also the most interesting ones, are therefore subject to revisions. The output gap for France in 2000, first estimated by international organisations to be 0, was revised to +2 points three years later and to almost 3 points today. Despite their differences in approach, particularly over the degree of economic assumptions, all of these methods are fragile because they estimate the output gap by identifying indicators of imbalance between supply and demand in the economy. Output gap estimates rely on these indicators, either directly in the "direct" method, or indirectly via the cyclical components of the TFP or of the unemployment rate. However, these indicators are not perfect: the production capacity utilisation rate consists of survey data covering only the manufacturing industry; inflation is affected by factors other than the relationship between domestic supply and demand; cyclical unemployment is not the only determinant of wages, etc.

Ultimately, despite the many limitations associated with these estimates, we can conclude that the capacity for economic rebound in France (and in Europe) is considerably less than the production loss observed since the crisis. However, the significant potential for rebound in the French economy should gradually contribute to the current economic recovery, once constraints have been removed(fiscal consolidation in France and abroad; appreciation of the euro; deteriorating financing conditions for companies in some European countries; need for households or companies in many countries to reduce their debts).■

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Six years after the collapse of Lehman Brothers, there is still considerable output lossin the eurozone

Activity has slowed greatly in the eurozone since the 2008 crisis

In the eurozone as in France, the loss of GDP when compared with the pre-crisis trend is greater than 10%

Activity in the eurozone is currently below the average level for 2008, which represents the pre-crisis peak. The cyclical turning point at the beginning of 2008 was accentuated by the start of the financial crisis, which led at the end of 2008 and the beginning of 2009 to a 4% reduction in activity in the eurozone. Activity then picked up relatively vigorously until Q1 2011, when GDP had almost returned to the same level as at the beginning of 2008. However, following the worsening of the sovereign debt crisis, the economy stalled and GDP dropped by 1% from Q1 2011 until Q1 2013. Since the end of the recession in Q2 2013, GDP has increased by 0.7%.

Although all the eurozone countries were affected by the crisis, the scale of the decline varied. Today, GDP has returned to its 2008 level in France, but it is still more than 2 points down in the eurozone. It is 6.7% lower than the 2008 average in Spain and 7.5% lower in Italy. In Germany it is 3% higher.

Before the crisis, the average GDP growth rate in the eurozone was slightly higher than 2% (from 1995 to 2008). The loss of activity in relation to this trend can therefore be estimatedin 2013 at around 12%. Measured in this way, the scale of the decline is also very varied according to country. As the trend until 2008 was varied, being much more dynamic in Spain in particular, the positioning of the countries may be changed. Compared with the pre-crisis trend, losses in Germany were much lower than in the eurozone, whereas those for Italy and especially Spain were very much higher. France held the middle ground with a loss of around 9%.

These figures were obtained by extending GDP growth rates from 2008 according to their average pre-crisis levels (1995-2008). This does not correspond to a gap in relation to the potential pre-crisis growth path: to be rigorous, this growth path would have to be extended from a date when the economy was at exactly its potential level (output gap of zero), which was not necessarily the case in 2008, especially for Spain which experienced a property bubble and credit bubble in the 2000s.

Also, potential pre-crisis growth was perhaps different from average growth between 1995 and 2008. On the one hand, in Spain, the development of the property bubble gave rise to what was probably excess capital accumulation, which resulted in an unsustainable pace of growth. In Germany on the other hand, growth slowed until the middle of the 2000s, first due to the costs involved in reunification in the 1990s, and then because of the initial effects of the Hartz reforms, which took their toll on demand (*Daussin and Sala, 2013*). In this country potential growth just before the crisis was probably higher than actual growth from 1995 to 2008.

What share of this slowdown in activity is temporary, and potentially recoverable in the years to come? One way to answer this question is to analyse past crises.

How strong of a rebound can be expected in the French economy?

Activity has been slowed by shocks of different kinds

The crisis was first and foremost financial, with potentially long-term negative effects...

The origin of the 2008 crisis was first and foremost financial. In the wake of the subprime mortgage crisis that started in 2007, the collapse of the Lehman Brothers bank in September 2008 only served to fuel tensions in the financial markets and stir up panic in the money markets, which resulted in a surge in the risk premiums that the banks were applying amongst themselves. The search for safe investments caused the collapse of the stock and bond markets, which had the effect of damaging the banks' balance sheets even further. In many countries, households increased their savings ratio in order to reduce their reliance on debt, which had grown considerably before 2008, while companies became more prudent and adjusted their investments and their inventory. In countries where the financial turbulence had little effect on the real sector, because the banks were supported by the State or the State had set up financial assistance for companies, the crisis nevertheless spread, due to the very significant drop in demand worldwide.

Generally, financial crises affect factors of production over the long term, thus causing a long-lasting loss of activity. (*Cabannes et al., 2010*) identified the channels by which financial crises can affect factors of production: capital stock, labour market participation, professional experience and technological progress.

... on capital accumulation ...

First of all, financial crises have an effect on the rhythm of capital accumulation. On the one hand, the fact that bankruptcies occur more frequently in times of crisis increases the depreciation of capital (*Fougère et al., 2013*). And in addition, when production units close, this also leads to the destruction of part of the existing capital. On the other hand, credit rationing reduces companies' ability to invest, which in turn restricts the renewal of productive capital and increases capital obsolescence.

... on employment...

Like demand crises, the effects of financial crises on the labour market are ambiguous. While labour market participation may decrease because the long-term unemployed may become discouraged and leave the labour market completely, the reduction in household income may on the contrary persuade an inactive partner to take up work. Financial crises can also result in a depreciation of professional experience, in two ways. Firstly, the deterioration in terms of employment, especially the sharp rise in very short-term jobs (less than one month), may result in a lack of accumulation of knowledge. Also, the increase in the numbers of long-term unemployed contributes to the gradual deterioration in accumulated experience and less acknowledgement of skills. Overall, the result of these effects is negative.

... and on total factor productivity ...

Lastly, financial crises have an ambiguous impact on technological progress. Spending on research and development, which brings progress in the long term but also carries more risk, is reduced in periods of financial crisis and periods of stronger risk aversion on the part of banks (and all financiers in general). As a result, investment may be directed towards renewal rather than towards extending productive capacities or acquiring new products, thus reducing companies' potential for development. However, the financial crisis may lead the most competitive companies to grow at the expense of the less competitive ones.

Other shocks then affected the eurozone

The crisis spread from the United States to become global in 2008, and from 2010 in the eurozone it transformed into a sovereign debt crisis. For some eurozone countries (Greece, Ireland, Portugal, Spain, Italy) the crisis produced a very sharp increase in interest rates on sovereign debt, then on private debt. The eurozone countries reacted by setting up some very extensive fiscal consolidation plans in 2011. Estimating the impact on activity of the sovereign debt crisis, and the fiscal consolidation that followed, is a difficult task. Estimates by INSEE[1] have

(1) See for example the *Conjoncture in France* published by INSEE in March 2012 for an estimate of 2011 effects, *Insee Analyses* no.7 for 2012 effects, and a Focus in *Conjoncture in France* of June 2013 for the 2013 effects.

assessed this impact in the eurozone at approximately one percentage point every year since 2011. This is the same result as that obtained by *Blanchard and Leigh* (2013). These estimates are probably low extremes because, when considering the tightening of credit conditions, they only include the increase in interest rates, whereas conditions for providing credit by the banks may also have been more stringent. In addition, they do not take into account the uncertainty shock which was felt throughout the eurozone economy during this period, not only with regard to prospects for economic activity but also for its very future as an institution, which affected people's expectations (*Zakhartchouk, 2012*).

Potential rebound in the short-term is likely to be on a much lesser scale than the loss of production since the crisis

Six years after the beginning of the crisis, the magnitude of the permanent part of the loss of output can be estimated

However, every crisis is different and the scale of the loss of activity has varied between the different episodes in the past. The current crisis has its own particular features. Unlike most financial crises since the Second World War, which affected few countries at a time, this crisis affected virtually all developed countries; the reaction of the monetary authorities was also unusual by their extensive use ofnon-conventional measures. Now that data covering six years of crisis are available, it is possible to hone the diagnosis a little and to make an initial assessment of the production losses that the affected economies will probably eventually experience, focusing here on France and the eurozone. Among these losses, we evaluate those that can be considered as cyclical, and which could therefore be offset in the years to come, as opposed to those that are long-term, unrecoverable and definitively lost.

The potential for rebound depends on the time horizon considered

In the short term, which is the horizon being considered in this report, because this is what is relevant for a short-term analysis, the potential for rebound corresponds to the immediately available unused capacity. At present this is limited by the hysteresis effects associated with the crises mentioned above. The sharp rise in the unemployment rate created a large proportion of long-term unemployed, whose "employability" in the short term was affected. The fall in investment since the crisis and the acceleration in capital obsolescence have taken their toll on the level of productive capital. The prolonged weak demand has probably caused innovation to be postponed, whether technological (R&D, patent applications) or organisational (optimisation of processes, etc.), and this in turn has reduced the potential level of output for a given level of capital and labour.

In the medium term, further capacities could be generated. The hysteresis effects on the unemployment rate can be cancelled out. In particular, (*Ball, 2009*) has shown from historic examples that after a prolonged period of economic expansion the hysteresis effects on the labour market can be offset. Capital stock picks up as and when investment recovers. Some of the innovations that have been deferred can now be implemented. Of course, it is not possible to embark on a quantification of these effects, the scale of which will mainly depend on the fiscal and monetary policies that are implemented.

The potential for rebound seems to be limited in the short term

International organisations (OECD, IMF, European Commission) propose evaluations of short-term rebound potential. Their assessments may differ slightly, but their overall diagnoses are in agreement: as far as they are concerned, the countries of Europe all have unused margins of capacity, enabling them to wait for a cyclical rebound in future years with an output gap of between -2 and -3 GDP percentage points, a level that is well below the loss of activity observed since the crisis.

In the next part of this report, we discuss this diagnostic for France and the eurozone, comparing various methods of establishing a diagnostic and pointing out the limitations and the degree of uncertainty inherent in the different possible evaluations.

How strong of a rebound can be expected in the French economy?

According to the methods currently available, the output gap in France today appears to be between -1.2 and - 4.6 percentage points of GDP

Output gap: a value that is difficult to measure, which requires several estimation methods

Four estimation techniques

Potential GDP can be defined as the level of GDP that the economy would have if the factors of production (labour and capital) were constantly being used in such a way as to maintain an equilibrium in the labour market and the goods market. Potential growth corresponds to growth in this potential GDP and the output gap is the gap between the actual GDP and this potential GDP. As the equilibrium in the markets is not observed directly, potential growth and output gap are difficult to estimate, particularly for recent years. Therefore, four different estimation techniques are applied here for France and the eurozone to measure the output gap. By comparing them, we hope to obtain some information about the uncertainty that surrounds evaluation of the output gap, and also about aspects where they converge, and thus draw some robust conclusions.

A «structural» approach brings into play the "production function" of the economy

The first approach, known as "structural", is based on a production function. It begins with a theoretical structure of potential output; the output gap can then be calculated from this as it is the gap between actual production and what it would be if all factors of production were used normally. Using this approach, potential production is the result of using capital and labour factors of production to their structural levels; thus the output gap depends on the cyclical component of each of its three determinants, labour, capital and total factor productivity (TFP). The main difficulty in using this method lies in estimating the cyclical component of TFP from which trends can be deduced. Following the example of (*Belet and Cotis, 1989*), the production capacity utilisation rate is often used for this in France.

A «reduced» approach based on an employment equation

The second method is a simplified variation, with only one factor of production, labour, and without going through the intermediate stages of capital and TFP. This method involves determining directly the cyclical component of the apparent labour productivity; this is estimated from an employment equation.

A method describing the output gap by modelling various cyclical indicators

The third approach was put forward in a working document by the IMF in 2010. Using this "semi-structural" approach, the procedure is reversed: cycles are estimated from several tension indicators and from this potential production is deduced. The causes of cyclical variations are not modelled; however, dynamic relationships between the output gap on the one hand and inflation, unemployment and production capacity utilisation respectively on the other hand, are modelled. This can be complemented by other cycle indicators; in the present report, we add the composite business climate indicator, which has the advantage of covering all sectors of activity.

A direct and purely statistical approach

The fourth approach, called the "direct" approach, was described in a working document by the British Office for Budget Responsibility in 2011. It is a statistical method which does not model dynamic relationships: this approach extracts the cycle of different variables linked with the position of the economy in the cycle. The output gap is obtained as the common component of these different cycle indicators, using principal component analysis (PCA), where the principle is to summarise in a limited number of dimensions (called axes or factors) the information contained in a large number of variables. The axis synthesising the greatest quantity of information is interpreted as the common component of the different indicators considered.

How strong of a rebound can be expected in the French economy?

The structural approach resulted in an estimate of the output gap in France at between -1.6 and -3.0 points in 2013

The "structural" approach brings into play the "production function" of the economy

This is a common method of estimating the output gap, based on the difference between actual production and the supply potential of the economy through a production function (*D'Auria et al., 2010*). The advantage of this approach is that it is based on a theoretical model, the production function, and hence it clarifies the hypotheses underlying the concepts and evaluations. Potential GDP is determined from three components, the level of factors of production, labour and capital, available in the economy, and total factor productivity. TFP corresponds to technical and organisational progress but also includes more broadly all sources of growth not covered by the two factors of labour and capital, such as the higher level of knowledge on the part of workers.

The output gap can be represented as follows:

$$y - y^* = pgf - pgf^* + \alpha(popact - popact^* - (U - U^*) + h - h^*) + (1-\alpha)(k - k^*)$$

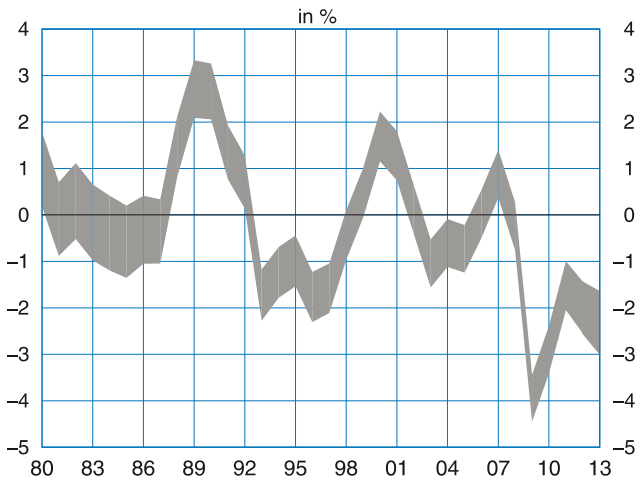
where all the variables are expressed as a logarithm, except U and y is production
pgf , pop act and h are TFP, labour force and number of hours worked per capita,
k is capital stock,
U is the unemployment rate,
α the share of labour in value added,
* denotes the potential level of variables.

With this method, the central estimate of demand deficit in 2013 in France was 2.3 percentage points of GDP, within a range of -1.6 to -3.0 points (*see Graph 1a*). Thus according to this method, demand deficit was probably a little less marked in the eurozone at -2.1 GDP points in 2013, within a range of -1.3 to -2.9 points (*see Graph 1b*). These estimates for the eurozone mask some very different situations in the four main economies. The output gap for Germany appears to have almost closed in 2013. Conversely, in Italy and Spain, the output gap seems to have opened up considerably in 2013 in both these economies (around -4 and -5 GDP points respectively in the central estimate).

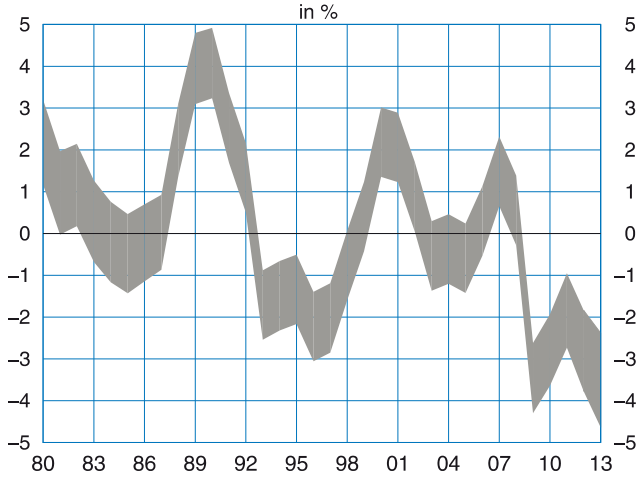
The contribution to the output gap of the three main determinants, labour, capital and is now described.

Output gap (structural approach)

1a - France



1b - Eurozone



Scope: economy as a whole, Eurozone of 17
The ranges presented are built by summing the 80% confidence intervals of each of the components (the intervals are derived from the standard deviations of the estimate residuals).
Sources: INSEE, Ameco

How strong of a rebound can be expected in the French economy?

The cyclical component of capital is disregarded

Capital stock changes every year according to investment and wear and tear. However, corporate investment dropped in 2009 then again in 2012 and 2013, in France, as in most other eurozone countries. The unprecedented fall in demand revealed some very high levels of excess production capacity. In addition, the Great Recession began to take hold, with the tightening of credit terms, which may have affected those companies with large cash flow requirements, increasing uncertainty and, to a lesser extent, increasing the cost of capital for small and medium-sized enterprises. As a result, companies cancelled or delayed their capital expenditure during this period, thus slowing the accumulation of capital.

After a long period of recession, investment in the eurozone in 2013 was 17.5% down on its 2008 average. In France, where investment had held out rather better than in the other European economies (*Eudeline, Gorin, Sklenard and Zakhartchouk, 2013*), the slowdown was less pronounced, with a drop of 9.8%. Of course, a proportion of this decrease can be explained by the bursting of the property bubble in several eurozone countries, but the scale is equivalent if we consider investment excluding construction, where there was a drop of 15.9% in the eurozone, and 5.1% in France.

Logically, this slump in investment resulted, although to a lesser extent, in variations in capital, which slowed considerably in the eurozone and to a lesser degree in France.

Some of this slowdown in capital could be structural, and so it is rather difficult to evaluate the cyclical component of the downturn in the rate of capital accumulation. As in this report we are interested in estimating the short-term demand deficit in the French economy, it is logical to ignore the cyclical component of the contribution of capital. Indeed, even if the contribution is significant, the capital is too inert for it to be available quickly. On the other hand, the cyclical component of the contribution of capital should be taken into account if we are trying to assess the rebound potential of the economy with no tension, and considering a more distant horizon (e.g. the next five years). In this case, we must take into account the fact that the constraint on capital may ease in the long term: like investment, capital stock is cyclical, although to a lesser degree, and hence it may have a tendency to increase in the next few years as and when the current demand deficit is made good.

In France in 2013, about 1 point of the unemployment rate appears to be cyclical

Potential labour is derived from the product of three components: the potential labour force, the structural unemployment rate and the trend of the number of hours worked per person.

The labour force is people of working age who have a job or who are looking for a job. Changes in this population are governed largely by significant trends: first of all demographic trends, which determine changes in the population of working age; labour force participation rate trend by age and gender, governed mainly by long-term sociological changes (increased integration of women into the labour market, increase and then stabilisation in length of studies, etc.) and the effect of pension reforms on the activity of the older population. In France, since 2008 the potential labour force is on the increase: the population of working age (aged 15-64) may have virtually ceased to grow, but the trend participation rate has continued to increase substantially since 2008, due to the growing inclusion of the 55-64 year-olds in the labour market.

Labour force participation rates can also be affected by the economic situation, but these cyclical effects on labour market participation may in fact be ambiguous: the recession may discourage part of the population who would then become inactive (discouraged worker effect); on the other hand, it may encourage inactive spouses to return to the labour market to make up for the

shortfall in household income (additional worker effect). In France, these effects seem overall to have been offset from 2008 to 2012 (see *Focus* in "The crisis has changed the effects of the economic situation on joining the labour market", in *Conjoncture in France* INSEE, March 2013). In 2013, on the other hand, the halt in the participation rate could be interpreted partly as a predominance of the "discouraged worker"effect, although there is not sufficient perspective to draw any conclusions. Overall, the labour force participation rate in 2013 appears to be close to its potential level, which suggests that it would contribute only about -0.2 points to the output gap.

The structural unemployment rate depends on the characteristics of the labour market and the way it operates. It cannot be measured directly. One way of assessing it is to deduct it from changes in inflation, where a drop in inflation represents a labour market where the actual unemployment rate is higher than the structural rate. An evaluation based on this reasoning gives 1 point of cyclical unemployment (*see Box 1*). Given the share of the payroll in value added (65%), the contribution of the unemployment rate to the output gap would then be -0.6 points, with a confidence interval of between -0.8 and -0.4 points.

Since the middle of the 2000s, the number of working hours has remained stable overall in France, and so it does not seem to have reacted to the economic climate. We therefore assume here that it does not contribute to the output gap.

Overall therefore, the contribution of the labour factor to the output gap in France is estimated at -0.8 points, with a confidence interval of between -1.2 and -0.5 points (*see Table 1)*.

In the eurozone, the labour force has increased only slowly since 2008. As in France, the working age population has stagnated due to the low fertility rate in many eurozone countries. It has decreased in Spain in particular since 2009, because of a reversal of migratory flows. In contrast, the labour force participation rate continues to increase in most countries, as it has done for several decades, especially among women and older people. As is the case in France, the labour force participation rate appears to have contributed little to the output gap in 2013, at around -0.1 points.

Using a model similar to that used for France, the structural unemployment rate would appear to have increased significantly in the eurozone and the cyclical unemployment rate would stand at around 1.5 points. Finally, the number of hours worked per person in the eurozone decreased sharply when the crisis was at its height, particular in Germany (linked with measures to change working time arrangements) but in other countries too (reduction in amount of overtime, increase in part-time work). However, this large decrease was only temporary and working hours returned to their original trend. Overall, they did not contribute to the output gap in 2013.

Table 1

Breakdown of the output gap in 2013 into its different factors (structural approach)

	France			Eurozone		
	Lower limit	Central estimate	Upper limit	Lower limit	Central estimate	Upper limit
Labour force1)	-0.4	-0.2	-0.1	-0.3	-0.1	0,1
Unemployement rate (2)	-0.8	-0.6	-0.4	-1,4	-1.0	-0,6
Worked hours (3)		0.0			0.0	
Labour factor **(4)=(1)+(2)+(3)	-1.2	-0.8	-0.5	-1,7	-1.1	-0,5
Capital factor (5)		0.0*			0.0*	
TFP(6)	-1.8	-1.5	-1.1	-1.2	-1.0	-0,8
Output Gap** (7)=(4)+(5)+(6)	-3.0	-2.3	-1.6	-2.9	-2.1	-1,3

*by assumption
**limits built as the sum of the confidence intervals of the contributions
Scope: economy as a whole, Eurozone of 17
Sources: INSEE, Ameco

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Box 1 - Structural unemployment and potential total factor productivity (TFP)

In 2013 the unemployment rate in France was nearly 10.3% of the labour force, i.e. around 3 points more than in 2008. The increase has been even more marked in the eurozone (12.1% against 7.6%), despite the strong performance of a few countries such as Germany. The increase is higher than 15 points in Spain, Portugal and Greece.

Bearing in mind hysteresis effects, it is likely that the economic recovery is insufficiently strong to fully bring down this rise in unemployment. Indeed there are still many vacant posts, which could reflect poor suitability of skills to jobs, aggravated by long-term unemployment and the rise in the number of very short-term (less than one month) jobs leading to a shortfall in knowledge and skills accumulation. Long-term unemployment has increased by 2 points in the eurozone since the crisis (3.4% of the labour force in 2007), while the very long-term unemployment rate has doubled. In France, the hiring difficulties reported by businesses in the activity survey in industry have barely lowered from the pre-crisis average (in the order of 3 points), pointing to a structural share in the recent increase in the unemployment rate.

One way of obtaining a quantitative evaluation of this structural share consists in estimating a Phillips curve, which shows the relationship between the unemployment rate and inflation (core inflation here, in order to correct for temporary supply shock variations such as a change in oil prices). In this approach a rise in unemployment without a drop in inflation is interpreted as a rise in the structural portion of unemployment. Using a model inspired by *Renne (2007)*, these two variables are related to each other by means of a state-space model whereby core inflation () is explained by inflation expectations, assumed to have formed from past inflation and surplus or insufficient demand, approximated by the differential between actual (Ut) and structural (Ut*) unemployment.

The estimates show that indexation to past inflation is not unitary, translating either the presence of nominal illusion or the fact that agents partly form their expectations on a constant long-term target such as the 2% target retained by the European Central Bank.

The estimate covers the period 1980-2013 (*see Graphs 1a* for France and *1b* for the eurozone). Parameter -0.49 represents the slope of the Phillips curve for France (*see Equations 2a*). It is statistically significant, meaning that the demand surplus (or deficit) contributes significantly to variations in core inflation. A similar model is used for the eurozone (*see Equations 2b*).

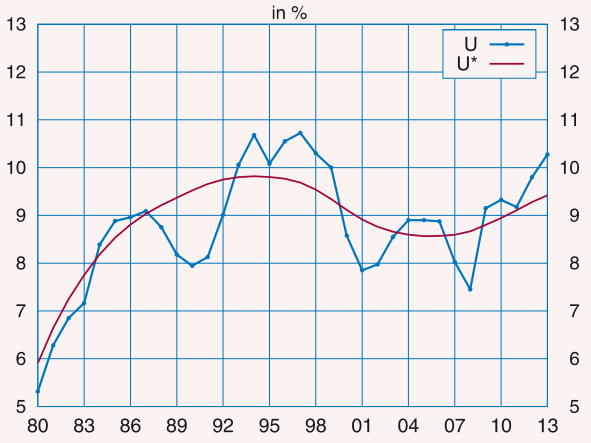
The TFP estimate is affected by the errors in the measurement of factors of production. For example, if the improvement in new-technology products is estimated as a price drop, the capital is increased in volume and the associated TFP measure is mechanically reduced by the same amount. The same goes for an underestimation of capital downgrading following bankruptcies during crises, for example. Conversely, a rise in concealed work would tend to overestimate TFP (and underestimate the labour factor). The separation between the TFP measurement on the one hand and the factors of production measurement on the other hand is thus fragile.

Additionally, the TFP series is obtained from actual production and is therefore affected by economic cycles. To extract these cycles, the production capacity utilisation rate[1] is used, derived from the business tendency surveys in industry. More precisely, we use a smoothing method which is very similar to the previous one in order to determine potential TFP from the production capacity utilisation rate, considered as the cycle indicator[2] (*see Equations 3a and 3d*).■

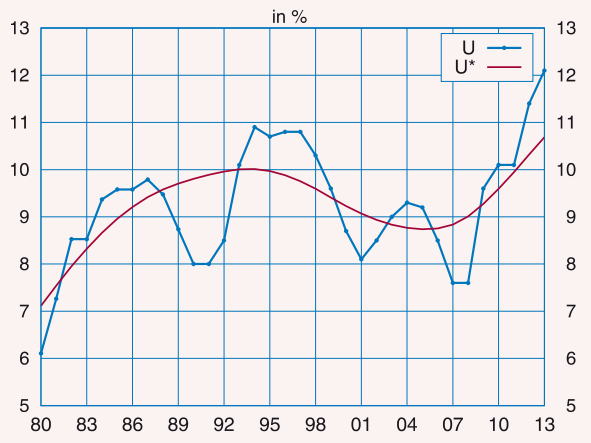
(1) Other balances from the same surveys were also tested: production bottlenecks, opinion on production capacities and demand difficulties.
(2) More precisely, the state-space model assumes TFP and potential TFP to be integrated of order 1, with the aim of ensuring consistency with the stochastic nature of GDP. Additionally, the smoothing parameter, also known as the signal-to-noise ratio in this modelling type, is set at 6, the value recommended in the literature (*Ravn and Uhlig, 2002*). The sensitivity of the estimate to this parameter is low (0.1 points upwards or downwards).

Results of the model

1a - France



1b - Eurozone



Scope: whole France and dom, Eurozone of 17
Sources: INSEE, Ameco

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Estimation of the model parameters

2a - France

$$\pi_t^{sj} = \underset{(1.5)}{0.0053} + \underset{(-3.8)}{0.63}\,\pi_{t-1}^{sj} - \underset{(-3.8)}{0.49}\left(U_t - U_t^*\right) + e_1$$

$$U_t = U_t^* + c_t$$

$$\Delta U_t^* = \underset{(4.1)}{0.80}\,\Delta U_{t-1}^* + \varepsilon_t^1$$

$$c_t = \underset{(2.9)}{0.71} c_{t-1} + e_2$$

2a - France

$$\pi_t^{sj} = \underset{(0.4)}{0.002} + \underset{(6.0)}{0.84}\,\pi_{t-1}^{sj} - \underset{(-3.0)}{0.40}\left(U_t - U_t^*\right) + e_1$$

$$U_t = U_t^* + c_t$$

$$\Delta U_t^* = \underset{(15.3)}{0.94}\,\Delta U_{t-1}^* + \varepsilon_t^1$$

$$c_t = \underset{(4.5)}{0.82} c_{t-1} + e_2$$

Estimation of the model parameters

3a - France-

$$PGF = PGF^* + \underset{(2.6)}{0.28} \times (TUC - 85.6) + e_1$$

$$\Delta PGF_t^* = \underset{(0.5)}{0.06\,\%} + \underset{(1.1\,8)}{0.89}\,\Delta PGF_{t-1}^* + e_2$$

3b - Eurozone

$$PGF = PGF^* + \underset{(7.5)}{0.29} \times (TUC - 81.2) + e_1$$

$$\Delta PGF_t^* = \underset{(0.4)}{0.02\,\%} + \underset{(25.3)}{0.92}\,\Delta PGF_{t-1}^* + e_2$$

In France, it is the cyclical component of TFP that contributes most to the output gap

As employment and capital adjust with a time lag to fluctuations in activity, total factor productivity is cyclical, low in periods of weak growth and high in periods of strong growth: an estimate of this cyclical portion is made here using the production capacity utilisation rate in industry *(see Box 1)*.

In France the cyclical share of TFP is thus estimated at -1.5 GDP points in 2013 (with a confidence interval of between -1.8 and -1.1 points), against -1.0 point in the eurozone (with a confidence interval of between -1.2 and -0.8 points).

An alternative approach uses only the employment and labour productivity data.

How strong of a rebound can be expected in the French economy?

Evaluations based only on variations in potential employment and apparent labour productivity lead to a more marked output gap in France, of between -4.6 and -1.2 points in 2013

The TFP measurement is particularly fragile

The use of a production function with two factors to evaluate the output gap relies more on a theoretical plan, but is dependent on the accuracy of the particularly fragile TFP measurement. Indeed, this measurement is affected by all the factors of production errors. And the measurement of capital is particularly difficult and subject to measurement errors which, furthermore, may be cyclical (*see Box 2*). This is why an alternative approach, based only on the use of employment data and a labour productivity equation, is also worth using in order to complete the diagnostic; it avoids the need to measure capital but, on the other hand, it does not take into account any changes in the way capital is formed and its contribution to potential production.

We thus use a market-sector employment equation...

Here an equation is used covering the non-agricultural market-sector branches. The advantage of this restriction to market-sector branches only is that it concentrates on the areas of the economy in which the notion of productivity is the most relevant. In particular, an evaluation of non-market sector productivity is dependent on fairly standard assumptions in terms of this sector's production. The drawback is obviously the need for other hypotheses to calculate the potential growth of the overall economy.

... which directly estimates the apparent labour productivity cycle

The equation selected is the one used regularly by INSEE *(Argouarc'h et al., 2010)*. It models employment as a function of a productivity trend, of the impact of employment policy, and of the value-added of the non-agricultural market sector. Like TFP, labour productivity is cyclical: during a slowdown in activity overall labour productivity also slows, because employment adjusts with a time lag. Symmetrically, an upturn in activity is accompanied by strong productivity gains because companies can satisfy demand with the labour force they already have and can wait before hiring new staff. The impact of the cycle on productivity is accounted for here via the delayed adjustment of employment to value-added; hence it does not depend on the production capacity utilisation rate, unlike the cyclical component of TFP in the previous method.

This approach then results in a central estimate of -2.9 points for the 2013 output gap within a range of -4.6 to -1.2 points, of which -1.1 point for the productivity cycle in the private sector and 1.3 points for the cyclical component of the labour factor, i.e. mainly unemployment.

A comparable analysis can be performed on the eurozone with an employment equation regularly used by INSEE for eurozone growth forecasts (*see Table 2*).

The effect of the cycle on productivity would then be -1.4 points in 2013, bringing the central estimate of the output gap to 3.8 points, within a range of between -5.4 and -2.2 points.

Table 2

Breakdown of the output gap in 2013 into its different factors

	France			Euro zone		
	Lower limit	Central estimate	Upper limit	Lower limit	Central estimate	Upper limith
Labour productivity (private sector) (1)	-1.6	-1.1	-0.6	-1.8	-1.4	-1.0
Field effect (2)	-1.1	-0.5	+0.1	-0.8	-0.6	-0.4
Labour factor * (3)	-1.9	-1.3	-0.7	-2.8	-1.8	-0.8
Output Gap* (4)=(1)+(2)+(3)	-4.6	-2.9	-1.2	-5.4	-3.8	-2.2

*limits built as the sum of the confidence intervals of the contributions
Scope: economy as a whole, Eurozone of 17

Box 2 - The capital stock measurement and its limits

There are at least two ways of evaluating capital stock (*see Graph*).

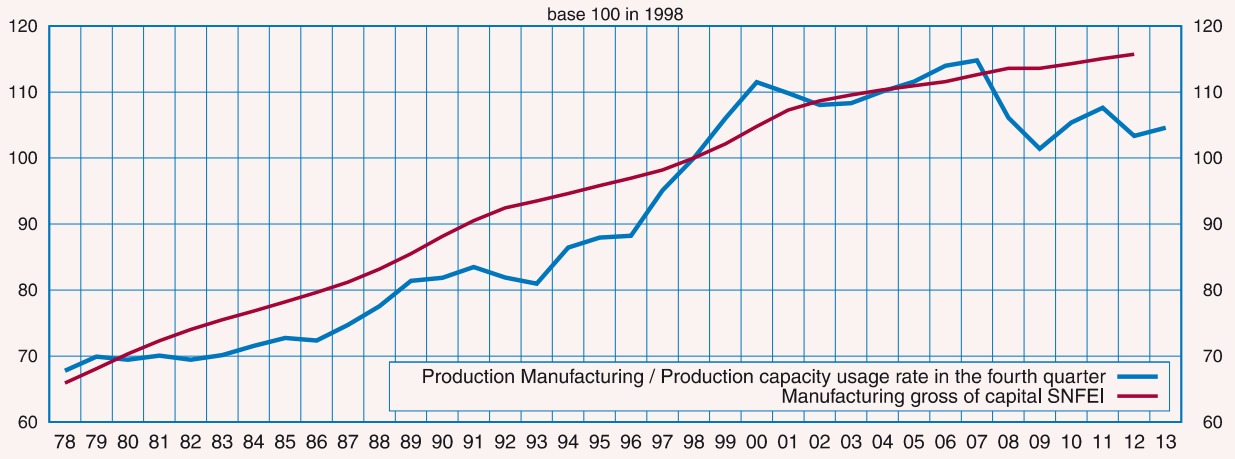
The first method is the one used by the national accountants in all developed countries[1], the results of which are used in our estimates. It is based on the principle of permanent inventory: a gross capital stock is constituted via input flows (investment) and output flows (downgrading). To measure the net capital, a stock is constituted *via* input flows and wear and tear (consumption of fixed capital). Investment is measured but retirement and consumption of fixed capital are estimated (respectively mortality laws and depreciation laws) from the mean lifetimes of the assets measured against historical data. This method allows a detailed approach of the accounting type, and avoids series breaks. However, by definition it does not take into account certain effects linked to the short-term situation. The measurement of capital stock is thus more fragile than that of employment or flow variables of the economy, for example investment or consumption.

This fragility is heightened further after a long recession. The use of fixed tables for capital downgrading does not necessarily reflect the real behaviour of companies. For example, the downgrading rate increases in France during phases when activity slows and diminishes during expansion phases *(Bonleu, Cette and Horny, 2013*). Additionally, in certain sectors undergoing a short-term depression, the seizure of capital at the moment of bankruptcy may lead to accelerated depreciation. The capital seized may have been resold at its metal price rather than reused, or resold to a foreign company: in both cases, the bankruptcy leads to a reduction in capital on the territory which is not measured by the national accountants, since they apply constant mortality laws. And since 2008 the number of business failures has skyrocketed in many European countries, for example Spain. In France, while business failures over the last five years have been 30% higher than before the crisis, they are nonetheless at a level comparable to that in the period 1992-1997. The most affected sectors are construction, real estate and services directed at households (personal services, accommodation and catering, etc.). Lastly, certain closures of production sites but not involving a business failure have also led to a loss of capital due to the lack of domestic buyers.

In an attempt to respond to these limitations, a second evaluation method consists in using the measurement of the capacity utilisation rate derived from business tendency surveys: by producing the ratio between manufacturing output and the production capacity utilisation rate, a direct measure of industrial production capacity as reported by business managers is obtained. Assuming that productivity of capital varies little in the space of a few years, the calculation would tend to indicate that since 2008 growth in capital stock actually available in the short term is somewhat overestimated by the national accounts data. However, this result should be treated with caution: as well as being based on the assumption of a relative constancy in the productivity of capital, it is affected by the uncertainties that surround responses to business tendency surveys (see the last part of this report for a discussion of the production capacity utilisation rate).■

(1) For France, see the methodoolgical note "*Wealth accounts and variations in wealth*", *Jean-François Baron, January 2008*, http://www.insee.fr/fr/themes/comptes-nationaux/default.asp?page=base_2000/documentation/methodologie/resume_nb10.htm.
See also the OECD manual, Measuring Capital, 2001, http://www.oecd.org/std/na/1876369.pdf , chapter 5.

Two measurements of capital



Source: INSEE

How strong of a rebound can be expected in the French economy?

A "semi-structural" approach results in an output gap estimate of between -2.4 and -4.6 points in France today

A method deriving the output gap by modelling various cyclical indicators...

In line with (*Benes et al. , 2010*), the "semi-structural" method is based on the idea that the position of the economy in the cycle can be calculated from a set of cyclical variables such as production capacity utilisation, inflation and the "business climate" observed in business tendency surveys (*see Box 3*). The level of GDP observed can then be adjusted for the position in the cycle thus estimated, and provide an estimate of potential GDP.

... leads to an output gap evaluation between -2.4 and -4.6 points in France

For 2013, this method results in a central estimate of the output gap of -3.5 GDP points in France (respectively -2.4 points in the eurozone) with a confidence interval of between -2.4 and -4.6 points (respectively -1.2 and -3.5 points, *see Graphs 2a and 2b*).

Even when economic information is added, this method is prone to side-effects, making estimates over the recent period uncertain.

... lower than the production losses observed since 2008 ...

The output gap estimated using this method is also much lower than the production losses observed since 2008. This is the direct consequence of the dynamic of the cycle indicators used, reflecting an imbalance which is real but unexceptional in scale.

... especialy because of the relative resistance of the production capacity utilisation rate...

As an example, the production capacity utilisation rate in the eurozone in 2013 is just 3 points lower than its long-term average, and comparable to its 1993 level. In France the differential with the long-term average is slightly higher (80% against 85%). This relative resistance of the production capacity utilisation rate is thus consistent with the loss in productive capacities, as is the balance linked to the variations in production capacities in the INSEE survey on investment in industry in France, which in the last few years has been 20 points below its pre-crisis average.

...and inflation

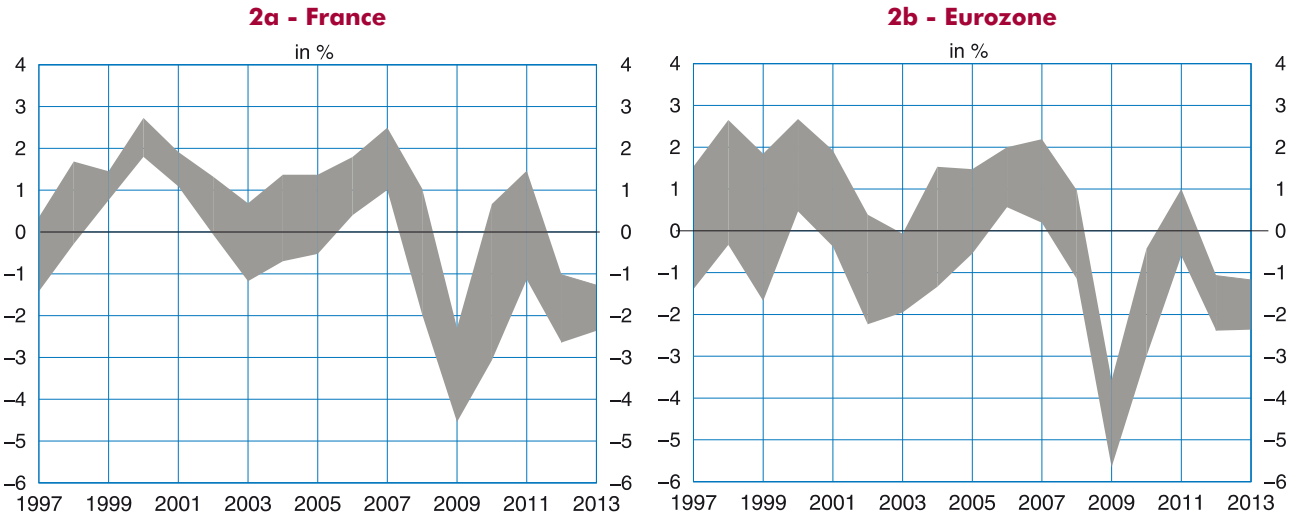
Similarly, inflation is low in Europe, but still positive. Inflation has undergone sharp variations in recent years, due on the one hand to the increase in indirect taxes, particularly in Spain and Italy, and on the other hand to variations in the prices of commodities (which sustained inflation in 2012 and accelerated its fall in 2013). Once these effects are corrected inflation has still been low in recent years, especially in the eurozone. But the differential with pre-crisis values is not so large. In Germany, which was not affected by variations in indirect taxes, average core inflation in 2012-2013 is close to its 2000-2008 value, even though average growth in GDP slipped from 1.4% per year to 0.7% per year. In France core inflation did fall between these two periods (1.6% per year before the crisis, 1.0% in 2012-2013) but this drop is very moderate.

A final approach focused on a direct, purely statistical estimate of the output gap indicates a demand deficit of between -1.3 and -2.4 points in 2013 for France

The final method, which is more recent in the literature (*Pybus, 2011*), proposes a direct estimate of the output gap using economic cycle indicators. Unlike the previous method the dynamic relationships between variables are not modelled. The economic cycle indicators have an important common component, which is interpreted as a measure of the output gap. The list of indicators is established a priori and their provenance is diversified (business tendency surveys, national accounts) and their different markets (goods and services, labour, real estate) and sectors (industry, services and construction) are represented. The list comprises core inflation, real hourly wage, property prices, unemployment rate, investment rate, economic climate indicator, factors limiting production and the production capacity utilisation rate in the survey in industry.

How strong of a rebound can be expected in the French economy?

Output gap ("semi structural" approach)



Scope: economy as a whole, Eurozone of 17

The 95% confidence intervals are presented here (the intervals are derived from the standard deviations of the estimate residuals)

Sources: INSEE, Ameco, Eurostat, OECD

Box 3 - Modelling in the semi-structural approach

In the "semi-structural" approach the output gap is dynamically related to inflation, production capacity utilisation and the composite climate indicator. The model involves four state equations which explain the evolution of unobserved structural variables, as well as five measurement equations which bind them to the observed variables in order to extract the cyclical information.

The measurement equations include the following values:

-definition of the output gap as the gap between the GDP log (y) and its potential level (y*)

- core inflation, in line with an augmented Phillips curve (*see Graph a*)

- the difference between the actual (U) and structural (U*) unemployment rates, in line with an Okun's law (*see Graph a)*

-production capacity utilisation rate, providing information on the intensity with which capital is used in manufacturing industry (*see Graph b)*

- business climate related to output gap variation. This composite indicator is also assumed to be a good indicator of the economic cycle, but for the economy as a whole (*see Graph b*).

Potential growth, the output gap and the variation in structural unemployment are assumed to follow an autoregressive AR(1) process (*see Equations*). The integration of these unobserved variables is consistent with the integration of the corresponding observed variables: for example, potential GDP must be integrated of order-1 as it only deviates from GDP, which itself is integrated of order-1, by a stationary component, the output gap.

The majority of the coefficients are significant at 1% level, the constants in the inflation and potential growth equations being the exceptions[1] (the Student test statistics are indicated in brackets). The Okun's law coefficient relating unemployment to the output gap comes out negatively, and the production capacity surplus is positively related to the output gap. Similarly, a higher than average core inflation (corrected for fiscal measures) is related to a positive output gap. Lastly, a business climate indicator above 100 indicates an improvement in the output gap. All these variables provide relevant information about the economic cycle (*see Graphs a and b*).■

(1) These two constants are nonetheless conserved in the model, as excluding them would be tantamount to considering that in the long term, potential growth and inflation are null.

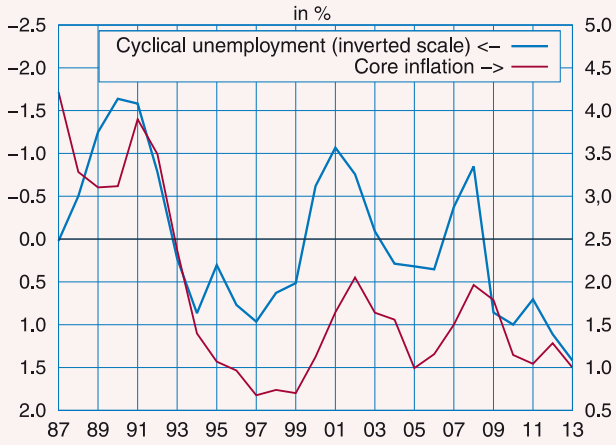
How strong of a rebound can be expected in the French economy?

Models and estimations of parameters

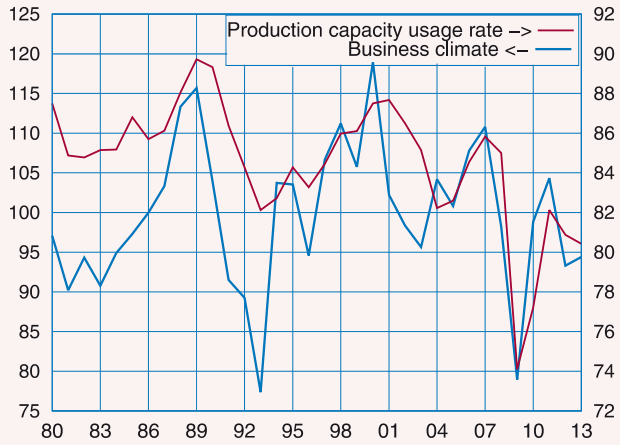
France	Eurozone
Measurement equations	
$y = y^* + OG$	$y = y^* + OG$
$\pi = \underset{(1.2)}{0.6\%} + \underset{(6.8)}{0.6}\,\pi_{-1} - \underset{(-2.9)}{0.4} \times (U-U^*) + e_\pi$	$\pi = \underset{(0.3)}{0.1\%} + \underset{(8.7)}{0.8}\,\pi_{-1} - \underset{(-2.1)}{0.5} \times (U-U^*) + e_\pi$
$U-U^* = \underset{(-6.1)}{-0.4} \times (OG+OG_{-1})/2 + e_{UG}$	$U-U^* = \underset{(-3.7)}{-0.45} \times (OG+OG_{-1})/2 + e_{UG}$
$TUC = \underset{(32.2)}{84.4\%} + \underset{(4.6)}{1.2} \times OG + e_{CG}$	$TUC = \underset{(42.3)}{80.5\%} + \underset{(2.2)}{1.3} \times OG + e_{CG}$
$climat = 100 + \underset{(7.0)}{6.2} \times (OG-OG_{-1}) + e_{is}$	$climat = 100 + \underset{(4.6)}{5.2} \times (OG-OG_{-1}) + e_{is}$
State equations	
$y^* = y^*_{(-1)} + g^*$ $g^* = \underset{(1.2)}{0.3\%} + \underset{(10.3)}{0.84} \times g^*_{-1} + e_g$ $OG = \underset{(4.6)}{0.81} \times OG_{-1} + e_{OG}$	$y^* = y^*_{(-1)} + g^*$ $g^* = \underset{(0.4)}{0.2\%} + \underset{(6.7)}{0.88} \times g^*_{-1} + e_g$ $OG = \underset{(3.5)}{0.69} \times OG_{-1} + e_{OG}$

France

a - Core inflation and unemployment



b - Production capacity utilisation rate and business climate



Source: INSEE

The last approach extracts the common component, assimilated with the output gap

These economic cycle indicators are highly correlated with each other. A principal component analysis (PCA) is used to extract their common component which explains the majority of their variability. In order to be interpreted as the output gap, the common component must then be normalised (in mean and in variance) by estimating the output gap given in the past. In this case, the output gap from the structural method is used.

This estimate relies on the ability of the indicators to correctly reflect the economic cycle, and depends on the list of indicators selected. When the set of variables is modified, the estimates are consistent overall but the output gap may nonetheless differ by one point, upwards or downwards.

In France, according to this approach the central estimate of the output gap would be equal to -2.0 GDP points in 2013 and, when the set of variables is modified, could be between -1.3 and -2.4 GDP points (and the output gap in the eurozone would be equal to -2.0 points and then between -1.2 and -2.4 points, *see Graphs 3a and 3b*).

How strong of a rebound can be expected in the French economy?

The fragility of the estimates makes it difficult to precisely quantify the French economy's ability to rebound

The four methods developed here provide ranges for the demand deficit, which indicates the uncertainty surrounding these estimates.

The magnitude of these intervals can however be underestimated: for instance, no account is taken of the uncertainty around the estimates of the coefficients; the modelling choices themselves (choice of imbalance variables, the very form of the model) cannot be considered a perfect representation of the data.

The estimates are approximate...

Numerous sources of uncertainty surrounding the measurement of the output gap...

Output gap estimates are indeed fragile and include a significant margin of uncertainty. They rely on debatable choices such as the production function for the structural method or model specification for the "semi-structural "method, but also the choice of imbalance indicators used for all the methods, particularly the direct method. They may also rely on smoothing methods; these methods use the information surrounding each point to provide the smoothed series underlying the data. These methods are fragile and the evaluations subject to more extensive revisions on the last known points, as and when the variations beyond these points are known and gradually incorporated into the measure of the trend in these points.

... translating into revisions over the course of time, among other things

The estimates may undergo significant revisions when new observations are available or when the national accounts series on which they are based are revised (*Borio et al, 2014*). Hence the output gap for France for Q1 2000 was successively estimated at 0 point in 2000, 1 point a year later and 2 points three years later (and almost 3 points today) by the OECD, the European Commission and the IMF.

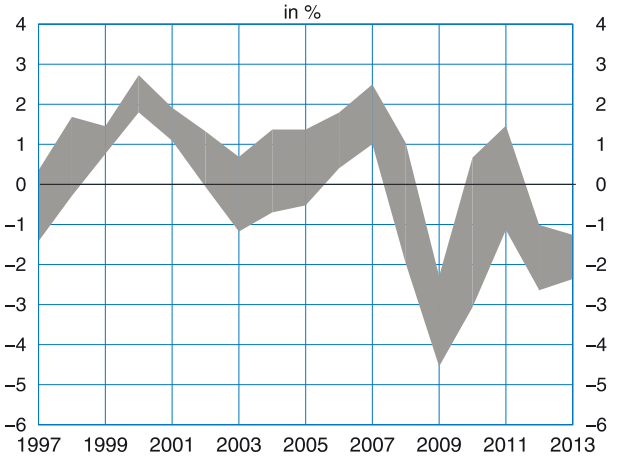
According to *Orphanides and Van Norden (2002)*, when the estimate of the gap is based solely on smoothings, output gap revisions may be in the same order of magnitude as the output gap itself.

In the case of France, it is possible to illustrate the fragility surrounding the semi-structural estimates for the last pointsthrough a "real-time" analysis. Within the same specification, the relation is estimated with the information available at the end of the year, for each year from 2007 to 2012[2]. Output gap estimates until

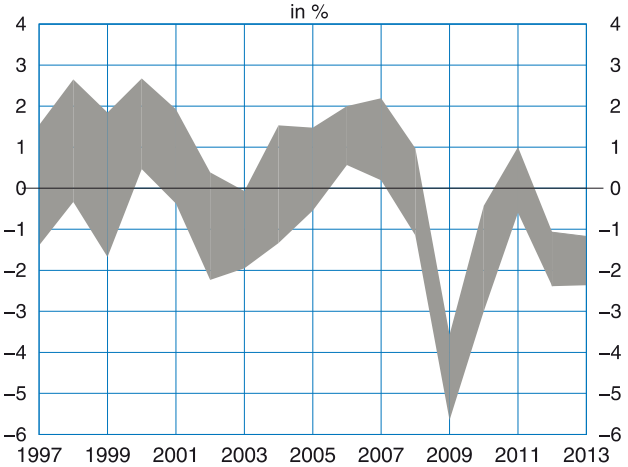
(2) The autumn GDP and unemployment forecasts by the European Commission for the following year are included.

Output gap ("direct" approach)

3a - France



3b - Eurozone



Scope: economy as a whole, Eurozone of 17
The ranges are obtained by varying the set of indicators.
Sources: INSEE, Ameco, Eurostat, OECD

2008 and from 2009 differ significantly, since the coefficients of the model are significantly revised with the advent of the Great Recession. Yet since 2009, the coefficients are quite stable and the different estimates remain in a relatively narrow interval, of one and a half points for the output gap.

... mainly due to imperfect cycle indicators

In each of the methods presented above, the position of the economy in the cycle is estimated indirectly via imbalance indicators such as the production capacity utilisation rate in manufacturing, inflation, and the composite business climate indicator, among others.However, these variables imperfectly measure the position of the economy in the cycle in absolute terms, especially today. For example, the Bank of England, which introduced forward guidance in August 2013 based solely on the unemployment rate, decided in February 2014 to extend this guidance to the examination of 18 indicators, a sign that the Bank feels it needs numerous indicators to measure the position in the cycle[3].

The production capacity utilisation rate only concerns the manufacturing industry

The production capacity utilisation rate, which is calculated from the questions posed to the manufacturing industry in a quarterly business tendency survey, suffers from several imperfections:
- this indicator only applies to manufacturing industry, which represents just 10% of the value-added of the French economy. An extrapolation of this utilisation rate to the economy as a whole is therefore fragile. It is nonetheless indispensable because the production capacity utilisation rate for the service sector is only calculated starting from 2012[4], while in the building and public works sector it is an approximation derived from other questions in the survey. However, the manufacturing industry creates a considerable knock-on effect on the economy as a whole, in particular through its intermediate consumptions, and explains a large portion of variations in activity, as its activity is more variable than that of the other sectors. This is probably the reason why the production capacity utilisation rate is still by far the most significant indicator of cycles in our estimates.
- its quantitative value should not mask the fact that since it is a response to a survey, even one that covers several thousand enterprises, its estimation is marred by inaccuracy, in the order of 0.5 points according to a calculation based on the survey's characteristics. Furthermore, it is sensitive to non-responses by large companies in certain sectors. Added to these measurement errors there is also the way the question is phrased, which can give rise to different interpretations according to the company. For example, when a production line is momentarily shut down, should it be counted as available capacity? And how do companies take capital downgrading into account?

Inflation is affected by factors other than the supply/demand relationship

Inflation is classically used as a measure of an economy's production capacity tensions. When demand outstrips production capacities, inflation does indeed rise. However, the reality is more complex because inflation is affected by other factors, such as commodity prices which are determined worldwide, variations in indirect taxes and regulated prices. To take a very recent example, in southern

(3) The following indicators are selected: credit access and cost indicator; new mortgages; loans to non-financial companies; exchange rate; household consumption; investment; situation of the developed countries; situation of the rest of the world; unemployment rate; number of hours worked; labour force participation rate; productivity; unused capacities (measured by the surveys); inflation forecasts; average wage per head; cost of labour; commodity prices; prices of public services.
(4) The utilisation rate in services fell by around one point over the year 2013. In the manufacturing sector the production capacity utilisation rate is obtained by asking enterprises how much more they could produce, if needs be by taking on workers, while in services the question is posed without reference to hiring.

Europe and the United Kingdom inflation levels were high in 2011 and 2012, although economic activity had fallen sharply[5]. Some of the factors exogenous to the relationship between supply and demand can be corrected by using core inflation, or inflation at constant tax rates, but this correction is only partial.

An increase in cyclical unemployment does not always lead to a slowdown in wages

Like inflation, wages are theoretically good indicators of the position of the economy in the cycle, with trends that run counter to those of the unemployment rate. In practice this relationship differs from one economy to the next, but also over time, which is more problematic from an empirical viewpoint. In particular, the existence of nominal rigidities can reduce the downward adjustment of wages in periods of low inflation, potentially resulting in a reduction in the scale of the demand deficit of the economy. The amplitude and nature of rigidities in the French case are however strongly debated[6]. As well as the nominal rigidities, the automatic indexation of the minimum wage, which is transferred to the first wage deciles, constitutes an institutional rigidity which is more of a constraint when the «spontaneous» growth in wages is lower than inflation. Additionally, the existence of very high property prices, which has been the case in France for ten years, may have made wage adjustments more difficult and this may force certain companies to reduce the scale of these adjustments or postpone them. Lastly, forecasting errors may lead temporarily to real wage gains, including in periods of high cyclical unemployment. For example, in France in 2013, the sharp drop in inflation was not expected (+0.9% against +1.8% forecast in the initial Budget Law for 2013). The direct method estimate confirms that in the best-case scenario, wages are weakly correlated with the cycle.

Conclusions

According to the central estimates presented here, the output gap in France ranged from -2.0 to -3.5 points in 2013, with a confidence interval of between -1.2 and -4.6 points. The strength of the rebound would therefore be much far lower than the loss in activity compared to the pre-crisis trend, which in 2013 is in the order of ten points. This diagnostic brings us back to the fact that the indicators tracking the position of the economy in the cycle are not so low now, close to the levels reached in 1993 for example.

The uncertainties surrounding output gap estimates have just as much an effect on potential growth estimates. Indeed, potential growth was estimated from 1.2% and 1.9% medium-term according to the evaluations presented in Économie Française 2013 (*Cabannes et al., 2013*).

At all events, the very negative output gap gives rise to expectations of a significant rebound in France. Despite that, annual growth is forecast at barely 1% in 2014 in this *Conjoncture in France*. There is nothing mechanical about the reduction of a negative output gap and it can take place within time periods and along trajectories that are highly variable. Thus in the short term, the forecast is built on information about the projects of business managers via business tendency surveys, and on an analysis of the dynamics underway in all the components of demand.■

((5) *Jegou and Testa, (2013)* for an analysis of the inflation differentials in the eurozone in 2011 and 2012.
(6) According to *Biscourp et al. (2004)*, rigidities are not significant in France except for the basic wage excluding bonuses. According to *Verdugo (2013)*, wages can react individually to the cycle, but composition effects may mask this relationship at aggregated level.

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