



Focus

II. The impact of the economic and financial crisis on potential growth*

This focus section analyses the consequences of the ongoing economic and financial crisis on potential output and growth and assesses the policy implications. Financial crises can impact potential output via their effect on labour input and productivity. Looking back, available historical evidence shows that financial crises are deeper and last longer than other recessions. They also tend to have a permanent negative effect on the level of output, shifting the economy down to a lower expansion path. Available evidence on the impact of financial crises on long-term growth is mixed but a closer look at a broader sample of crises, including non-financial recessions, points to a substantial risk of a TFP-driven drop in potential growth after recessions. Projections of the Output Gap Working Group up to 2010 and medium-term Quest simulations suggest that the most likely scenario is that the current crisis will lead to a sharp drop in euro-area potential growth in the short term, followed by a slow return to pre-crisis potential growth. However, risks of a more permanent downshift in potential growth should not be ruled out. To contain the permanent losses in the level of potential output traditionally associated with financial crises and to reduce the risks of a lasting deceleration of TFP growth, timely and appropriate policy responses – encompassing a wide range of measures and covering several reform areas – need to be put in place. Moreover, policy mistakes, albeit politically tempting, must be avoided at all costs (i.e. protectionist policies undermining the Single Market, measures reducing labour supply, and unsustainable public finances).

This first Focus Section assesses the possible consequences of the ongoing economic and financial crisis on potential output in the euro area. Section 1 discusses the main channels through which financial crises tend to affect potential output. Section 2 reviews the available empirical evidence on the effect of past crises. Based on this evidence, Section 3 discusses the likely impact of the current turmoil on short to long-term prospects for potential output in the euro area. Section 4 outlines a number of policy implications.

1. Tracing the transmission channels of the crisis on potential output

A thorough understanding of the impact of the crisis on potential output and its growth requires an analysis of its individual components, productivity and labour.

Financial crises are likely to affect productivity growth in the short to medium run, but also in the long run ...

The two components of productivity, namely capital accumulation and Total Factor Productivity (TFP), might be affected by the

crisis. A crisis can reduce potential output growth in the *short and medium term* through its adverse impact on investment. The negative effect of the ensuing slower capital accumulation can be combined with the impact of accelerating obsolescence of some capital vintages due to economic restructuring.

A slow process of industrial restructuring, caused either by credit constraints – due to delayed adjustments in the banking sector – or by entrenched structural rigidities, can also hurt the level and growth rate of TFP in the *medium to long term* by locking resources in (relatively) unproductive activities.

TFP growth in the *medium and long run* could also be curtailed by depressed investments in private R&D, which are markedly pro-cyclical. TFP drivers, such as physical investment, R&D and innovation, may suffer further from a prolonged recession and the changes in attitudes towards risk leading to the tightening of credit conditions and the rise in capital cost.

...while labour input growth would also be hit but in the short to medium run only

A short recession should not affect the pace of growth of the labour force, leaving potential growth unharmed in the longer run. However, a long and deep recession may cut the level of the

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labour force by discouraging some workers from seeking jobs and by reducing migration flows. Moreover, pressures to implement policies that curtail labour market participation (e.g. early retirement, curbs on migration flows) may increase.

Structural unemployment (i.e. the non-accelerating inflation unemployment rate or NAIRU) will increase in the short to medium run as a result of a financial crisis. Given the frictions in the labour market and long adjustment lags, the rise in actual unemployment brought about by the sharp contraction of activity in some sectors will lead to a temporary rise in the NAIRU. Other things remaining equal, the NAIRU should return to its original level when the sectoral reallocation of labour is completed, which is likely to take some time.

Some factors could lead to a more lasting increase in the NAIRU. This would be the case, for example, if short-term policy measures taken to limit the welfare damages of the crisis – e.g. temporary increase in unemployment benefits – are not reversed in time. Equally, a durable increase in capital costs, arising from the changes in attitudes towards risk brought about by the financial turmoil, could raise the NAIRU permanently as firms would increase their mark-up to recoup the higher cost of capital.

Finally, in the case of a prolonged recession, long unemployment spells may cause a permanent destruction in human capital, leading to an irreversible rise in the NAIRU (the so-called 'hysteresis effect') and further losses in potential output level. Although the rise in NAIRU reduces the potential output level (via lower potential output growth in the short to medium run), it is not likely to affect the long-term path of potential growth, since this would mean, implausibly, that it will rise for ever.

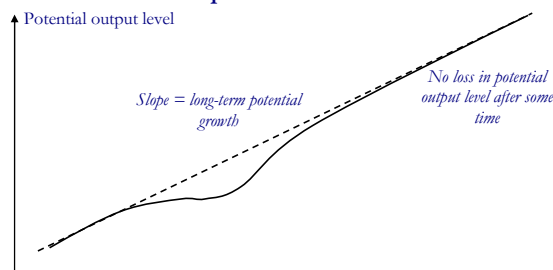
Distinguishing between level and growth effects

A useful conceptual distinction can be made between the effects of financial crises on the level and the growth of potential output. Deep financial crises tend to have a negative short-term effect on potential output due to their cyclical effect on capital accumulation and the NAIRU.

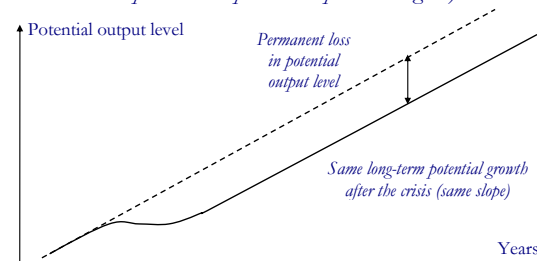
Three medium to long-term scenarios are then possible.

Graph 27. Three possible theoretical cases

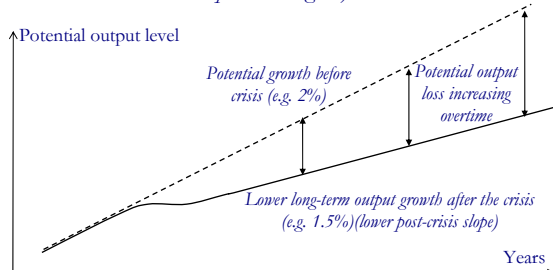
Case No 1: Loss in potential output level entirely recouped after some time



Case No 2: No change in long-run potential growth but permanent shift in potential output level (permanent loss in output level compared with pre-crisis regime)



Case No 3: Downward shift in potential growth in the long run (output loss in level rises steadily over time compared with pre-crisis regime)



Source: Commission services.

As depicted in the upper panel of Graph 27, the temporary negative effects of the crisis can be progressively reversed as the economy recovers and potential output returns eventually to its pre-crisis expansion path. This scenario requires the initial deceleration of potential growth during the early stages of the crisis to be followed by several years of rapid (i.e. above trend) potential growth to compensate for the initial shortfall.

The middle panel of Graph 27 illustrates a second possible scenario where the temporary negative effects are progressively reversed but only partially. Long-term growth returns to its



pre-crisis level but the initial losses in output are not entirely recouped and the economy moves along a lower expansion path. A key issue in this scenario is the time needed by the economy to return to its pre-crisis trend growth. The slower the adjustment of medium-term growth rates to long-term trends, the greater the final loss in the potential output level compared with the pre-crisis expansion path.

Finally, the lowest panel depicts a scenario where long-term growth does not return to its pre-crisis level but declines to a permanently lower level. In that case, the pre- and post-crisis expansion paths diverge continuously in the long run.

A key objective of the analysis presented in this focus section is to assess which scenario is the most likely to prevail in the current context.

2. Lessons from past episodes of financial and economic crises

The analysis of past episodes of economic and financial crises offer interesting insight into the possible effects of the current turmoil on potential output growth. The past two years have seen the emergence of substantial empirical literature on the impact of severe financial and banking crises on growth and other macroeconomic variables. This section reviews the main findings of this research. Recessions driven by financial and banking crises remain rare events in advanced economies in general and in the euro area in particular. In an effort to broaden the sample of crisis episodes considered, the section also analyses the impact of past severe recessions – whether triggered by banking crises or not – on potential.

Financial crises are deeper and last longer than other recessions...

In a seminal paper, Reinhart and Rogoff (2009) review recent episodes of severe financial crises in a broad sample of advanced and emerging economies and examine the macroeconomic performance in the aftermath of these crises.¹⁷

¹⁷ Reinhart, C. M. and K. S. Rogoff (2009) 'This Time is Different: A Panoramic View of Eight Centuries of Financial Crises', *NBER Working Paper Series*, No. 13882.

They find that financial crises lead to larger losses in output and employment than other recessions. On average, output falls by over 9% and the duration of the recession averages around two years, which is about one year more than usual recessions. This sharp drop in output is typically followed by a significant deterioration of the labour market. Similar analyses are carried out by Haugh et al. (2009) and by Claessens et al. (2008) for OECD countries.¹⁸ They confirm that recessions associated with financial distress last longer than other recessions and that the output losses are two to three times larger.

... and they tend to have a permanent negative effect on the level of output

Cerra and Saxena (2008) analyse the behaviour of output following banking crises using a simple autoregressive model.¹⁹ They find that the impact of banking crises on the level of output is negative, large and highly persistent. Their result applies both to emerging and to industrialised countries. This persistent impact on the level of output is also documented by Pisani-Ferry and van Pottelsberghe (2009), who analyse four countries (Finland, Japan, South Korea and Sweden) that were severely hit by financial crises in the 1990s.²⁰ Another recent study based on 30 OECD countries, by Furceri and Mourougane (2009), goes one step further and assesses the impact of financial crises on GDP potential. It reports a significant and persistent effect with a permanent reduction in the level of potential output of 1.5% to 2.4%.²¹ When restricting the

¹⁸ Haugh D., P. Ollivaud and D. Turner (2009), 'The macroeconomic consequences of banking crises in OECD countries', *OECD Economic Department Working Paper*, No 683, OECD.

Claessens, S., M; Ayhan Kose and E Terrones (2008), 'What happens during recessions, crunches and busts?', *IMF Working Paper*, WP/8/274, IMF.

¹⁹ Cerra, V. and S. Saxena (2008) 'Growth dynamics: the myth of economic recovery', *American Economic Review*, No. 98(1), 439-457.

²⁰ Pisani-Ferry J. and B. van Pottelsberghe (2009) 'Handle with care! Post-crisis growth in the EU', *Bruegel Policy Brief*, 2009/02.

²¹ Furceri D and A. Mourougane (2009), 'The effect of financial crises on potential output: new empirical evidence from OECD countries', *OECD Economic Department Working Paper*, No 699, OECD.

sample to major financial crises, the estimated effect is even bigger, at 4%.

But evidence on their impact on long-term growth is more mixed

In contrast, there is only limited evidence of a lasting negative impact of financial/banking crises on potential growth. Haugh et al. (2009) analyse the impact of banking crises on potential growth in Finland, Norway, Sweden, the US and Japan by comparing potential growth estimates before and after the crises. While potential growth decreased markedly in Japan, it increased moderately in Sweden and Norway and remained broadly stable in the US and Finland. In the case of Japan, lower potential was the result of a fall in TFP growth and lower capital deepening. The increase in potential growth in the other countries was driven by higher TFP growth.

In line with the conclusions of Haugh et al. (2009), a recent study from the CPB finds mixed results on the effect of financial crises on long-term growth.²² Major financial crises are analysed in 14 emerging and advanced countries by comparing changes in GDP/capita growth before and after the crises. In half of the sample, the growth rate prevailing ten years after the trough of the crisis appears lower than before the financial crisis. The sample is, however, dominated by emerging countries and conclusions should therefore be interpreted with caution.

The two studies reviewed here do not offer any analysis on the possible causes of country differences in developments in potential growth following recessions. Box 2 provides some insight on the issue by analysing the impact of past financial crises in Japan and Finland using data by industrial sectors. The differences in the impact on potential growth can be explained by the fact that Finland used the crisis as an opportunity to engineer a fundamental restructuring of its manufacturing sector, with a sharp reallocation of resources to 'ICT producing' industries (with positive spillover effects on related service sector industries). In contrast, in Japan, the 1990s were marked by

significant and sustained shrinkage in the economic importance of the manufacturing sector.

Higher output growth volatility tends to be associated with lower GDP growth

Another strand of literature also appears to have some relevance in the current context. A large number of studies have looked into the impact of macroeconomic volatility on output growth. Although this literature does not specifically cover financial crises, it is of particular interest now since the current turmoil marks a clear inflection in the so-called Great Moderation²³ (i.e. the trend of declining output volatility observed during the past three decades). Studies based on both cross-sectional regressions and panel regressions have generally found a negative correlation between medium-term GDP growth and the volatility of GDP in OECD countries (Ramey and Ramey 1995, Kneller and Young 2001, Hnatkovska and Loayza 2005).²⁴ ²⁵ The negative correlation is probably due to large recessions rather than small fluctuations around trend growth. This argument is supported by the findings of Hnatkovska and Loayza (2005), who test the impact of measures of normal and crisis volatility. Only cyclical volatility due to economic crises is found to have a significant impact on growth.²⁶ Therefore, the negative impact of output volatility on long-term growth identified

²³ European Commission (2007), 'Quarterly report on the euro area', Vol. 6, No 1, pp. 37-46.

²⁴ The negative correlation between GDP growth and the volatility of GDP growth can be explained by the same factors that have a negative impact on growth during recession, as discussed in the previous section, such as the hysteresis effect, sharp drops in investment, etc.

²⁵ Ramey, G., and V. A. Ramey (1995), 'Cross-country evidence on the link between volatility and growth', *American Economic Review*, Vol. 85, No 5, pp. 1138-51.

Kneller, R. and G. Young (2001), 'Business cycle volatility, uncertainty, and long-run growth', *The Manchester School* 69, 2001 (5), pp. 534-552.

Hnatkovska, V. and N. Loayza (2003), 'Volatility and Growth'. Working Paper WPS3184, World Bank.

²⁶ A given level of volatility (as measured, for example, by the standard deviation of output growth) can reflect frequent small cyclical fluctuations or less frequent but sharper cyclical swings. According to Hnatkovska and Loayza (2005), only the latter affects growth negatively.

²² M. Roscam Abbing (2009), 'The credit crisis and the Dutch economy 2009-2010', CPB Memorandum, CPB.



Box 2: Assessment of the impact of the financial crisis in the 1990s in Japan and Finland: an industry perspective

This box uses the EU KLEMS industry level database to explore the impact of the financial crises that Japan and Finland experienced in the late 1980s / early 1990s.

The specific situations and different starting positions partially explain the differences between the two countries. The cases of Finland and Japan are very different, with the scale and nature of the domestically generated financial/housing bubbles having specific country features and Finland having experienced the collapse in its trade with the former USSR. Furthermore, any potential policy recommendations must take account of the very different starting positions of both economies. For example, it is clear that since Japan already had exceptionally high capital-output ratios and had relentlessly pursued a technology-driven development strategy over many decades that it was a lot easier for Finland, which was a heavily resource-based economy in the early 1990s, to move up the value added chain by pursuing an innovation-driven policy path.

Significantly different policy strategies to address essentially similar policy challenges resulted in a fundamentally different degree of restructuring of the economy. Despite the country differences, both Japan and Finland were faced with the same fundamental policy challenge, namely how to react to the immediate contraction in output and how to restructure their economies in a way which would re-utilise the resources released from the inevitable shrinkage of specific industries (finance, construction, traditional manufacturing industries, etc.) in an efficient manner. Finland used the crisis as an opportunity for a fundamental restructuring of its manufacturing sector (with spillover effects on related service sector industries) – in stark contrast to Japan where the 1990s saw a significant and sustained reduction in the economic importance of its manufacturing sector. There were large differences in the extent of restructuring in the Japanese and Finnish economies, the overall rate of change being significantly higher in Finland, and a sharp increase in its share of "ICT producing" industries being a feature not only of its manufacturing sector but also of related areas in its private services sector.

Finland's experience shows that any recovery strategy must focus on ensuring the health of the tradeables sector. An interesting observation from the analysis is the contrasting fortunes experienced by the Finnish and Japanese authorities with respect to their "tradeable" goods and services industries. The extent to which Finland successfully achieved a radical restructuring of its manufacturing sector away from resource-based materials and products to high technology, ICT-driven, product ranges is quite striking. These new product ranges were also linked, in a complementary manner, with the expansion of ICT-related tradeable services. In the case of Japan, it is equally extraordinary to witness the ongoing deterioration in the relative share of manufacturing in its overall value added. This deterioration is pervasive across almost all of the manufacturing industries and is surprising given that Japan's economic success over the previous decades had been based essentially on shifting resources into capital-intensive, export-oriented, manufacturing industries.

Japan made significant structural policy mistakes. Whilst an industry-level analysis cannot assess the merits of the conventional view that most of Japan's problems reflect fundamental monetary and fiscal policy errors in its reaction to its 1990s crisis, what it can do, however, is gauge the extent of the structural policy mistakes that were made. The Japanese authorities appeared to be in collective denial about the scale of the downturn, with the desire for fundamental structural change held back by having a track record of enormous success up until the late 1980s with its previous policy approach and by having large stocks of accumulated financial assets with which to cushion the income losses for its rapidly ageing citizens. This absence of a desire to change was reflected in the slowness of the Japanese response in reducing employment levels in the affected industries; by its slowness in shrinking its bloated industries and releasing the labour and capital resources needed for the new industries of the future (e.g. the construction/real estate; wholesale and retail trade; and financial services industries either maintained or increased their shares of total value added in the period up to 2000); and an economy-wide slowness to restructure as reflected in an overall industrial structure which in 1999 / 2000 looked remarkably similar to the one that existed in 1989 / 1990.

The analysis supports the view that all "economic decisions are at the margin" – consequently, without detailed assessment at industry/firm levels, the potential for serious policy errors in the present crisis is significant. The EU KLEMS analysis shows clearly that a lot of the changes in macro level trends in GDP, investment and TFP are being driven not only by a small group of industries but also by a very small proportion of the total capital stock. In the case of Finland, for example, its mid-1990s turnaround was driven by just one pivotal industry, communications equipment, and by technology / investment decisions that affected less than 2% of the overall Finnish capital stock. It was undoubtedly the efficiency and industry focus of specific investments, rather than the overall macroeconomic quantity of investment, which dictated the evolution and intensity of the Finnish recovery process.

in the literature appears to be particularly relevant in the current situation.

A closer look at a broader sample of banking and non-banking recessions

Because financial crises are relatively rare events in advanced economies, the samples of historical episodes analysed in the above-mentioned studies are either small or extended with emerging markets. Whether conclusions based on such samples can be extrapolated to the current situation in the euro area is therefore difficult to say. Finland in the early 1990s is the only example of a serious banking crisis in the euro area since World War II.

In an attempt to circumvent this size limitation while making the sample more euro-area relevant, the remainder of this section presents an analysis based on all major recessions (whether associated with a banking crisis or not) in the EU-15 and the US since the 1990s. Beyond statistical considerations, the extension to non-banking recessions is also justified by the fact that banking crises and other major recessions share a number of similarities. Although recessions tend to be somewhat less deep when they are not triggered by a banking crisis, they are still characterised by important disruptions in activity, sectoral reallocations and sharp drops in investment, with possible implications for potential growth.

Table 6: Major recessions in the 1990s

Recessions	
<i>Major banking crises (1)</i>	
FI	1990-1993
SE	1991-1993
US	1991
<i>Other major recessions</i>	
BE	1993
DE	1993
EL	1992-1993
ES	1993
FR	1993
IT	1993
PT	1993
UK	1991-1992

(1) The major banking crises are Finland (1991) and Sweden (1991) and the US Savings and Loan crisis (early 1990s).

Source: Commission services.

To shed some light on the impact of major recessions on long-term growth, potential growth

and its components are compared in the ten-year period before and after a major recession in each country (see Table 6).²⁷ This is similar to the approach used in Haugh et al. (2009).²⁸ DG ECFIN's production function estimates are used to assess potential growth and the contributions of TFP, capital and labour.

History points to high risks of a TFP-driven fall in potential growth following recessions

Potential growth increased following the major banking crises in Finland, Sweden and the US (Tables 7). When expanding the sample to all severe recessions during the 1990s, the picture appears considerably more mixed. Potential growth increased in broadly half of the episodes considered (EL, ES, FI, SE, UK and US) and decreased in the other half (BE, DE, FR, IT and PT).

The analysis does not point to a significant effect of recessions on the contribution of capital to potential growth in the long run. A persistent post-recession deceleration in capital intensity can only be seen in FI, SE and EL. Changes in capital accumulation in these countries seem to reflect structural factors and a shift to a less capital-intensive growth model.

There is some evidence of an increase in the contribution of labour to potential growth after a severe recession in some countries. Seven out of the eleven recession episodes considered exhibit an increase in this contribution. This increase is explained by the rise in the participation rate resulting from the structural reforms carried out in euro-area countries since mid 1990s. In Germany, Italy and Sweden, the contribution of labour to potential growth decreased persistently.

²⁷ The criteria chosen to identify major recessions are: (i) a minimum contraction of annual GDP per capita of 1%; or (ii) two or more consecutive years of GDP/capita contraction with one contraction of at least 0.5%

²⁸ It should however be noted that the 10-year periods do not cover exactly the same years. Haugh et al. (2009) take the 10-year period prior to the onset of the downturn and compare it with the 10 years immediately following it. Here the 10-year periods exclude the most severe part of the downturn, i.e. when GDP/capita is still contracting. This should allow to calculate 10-year averages that are not dominated by the economy's behaviour during the contraction phase.



Table 7. Changes in average potential growth and its determinants around major recessions
(ten-year averages in %) (1)

	Potential		TFP (2)		K accumulation (2)		Labour (Hours) (2)	
	Before	After	Before	After	Before	After	Before	After
<i>Major banking crises*</i>								
FI	2.8	3.1	1.9	2.4	1.0	0.3	-0.1	0.4
SE	1.9	2.5	0.7	1.8	0.8	0.5	0.4	0.2
US	3.1	3.3	1.1	1.2	0.9	1.0	1.1	1.0
<i>Other major recessions</i>								
BE	2.2	2.1	1.5	1.0	0.7	0.7	-0.1	0.4
DE	2.5	1.6	1.7	1.2	0.7	0.7	0.1	-0.2
EL	0.9	3.1	0.0	1.7	0.8	0.8	0.2	0.6
ES	2.7	3.1	1.4	0.3	1.1	1.3	0.1	1.5
FR	2.2	1.9	1.7	1.1	0.9	0.8	-0.4	0.0
IT	2.4	1.4	1.2	0.5	0.9	0.6	0.4	0.2
PT	3.2	2.5	2.1	1.0	1.3	1.3	-0.2	0.2
UK	2.4	2.8	1.6	1.8	0.6	0.7	0.2	0.3

(1) The averages exclude the years of the downturn, during which GDP/capita is still negative (see Table 6).

(2) Contributions to potential growth – Components do not always add up due to rounding.

Source: Commission services.

In Germany and Italy, the fall can be largely explained by a significant drop in the working age population; a development independent of the recession. In Sweden, the reason lies in the fall of the participation rate.

TFP growth emerges as the key factor explaining country differences in developments in potential growth around recessions. The group of countries which experienced an increase in TFP growth (EL, FI, SE, UK and US) coincides with the group that also benefited from an increase in potential growth, except for Spain.²⁹ In the other episodes, recessions were associated with a large decrease in TFP growth of 0.8% on average.

Overall, the analysis points to a substantial risk of a TFP-driven drop in potential growth after recessions. An in-depth study would be needed to analyse the causes of the drop but at least four factors seem to have been at play. First, TFP growth was already on a downward trajectory before the recessions in some of the countries, in which cases it is difficult to judge to what extent the post-crisis deceleration in TFP is attributable to the recession or merely a continuation of pre-crisis trend. Second, there seems to be some

relation between a country's success in increasing or at least preserving its level of R&D during and after the crisis and its TFP performance. Third, most of the countries which were able to lift or maintain TFP growth after the recession also posted a comparatively high degree of flexibility in resource reallocation, allowing the economy to absorb shocks better. Fourth, in some of these successful countries, trade seems to have played an important role in the recovery phase, with nominal exchange depreciations acting as a catalyst.

3. Assessing the impact of the crisis on euro-area potential output

A sharp drop in potential growth in the short term...

Estimates of the euro-area's potential output based on production functions point to a marked deceleration of potential growth over the short term. As shown in Table 8, the economic crisis has led to a sharp downward revision of the Commission's estimates of potential output growth rates in 2009-10. In the euro area, potential growth is projected to drop by half in 2009-2010 compared with 2008, i.e. from a growth rate of 1.3% to 0.7%. This fall is due to large increases in structural unemployment and

²⁹ In Spain, the increase in potential growth was mainly the result of a substantial increase in the contribution of labour input, which can be explained by the strong rise in the participation rate during those years.

Table 8: Potential growth rate developments, euro area
(in %, 2007-2010)

	Potential growth (annual changes)	Percentage points contribution to potential growth			NAIRU (% of labour force)	Investment ratio (% of potential output)
		Labour	Capital	TFP		
2000-2006	1.8	0.4	0.8	0.6	8.5	8.5
2007	1.6	0.3	0.9	0.4	8.7	8.7
2008	1.3	0.1	0.8	0.4	9.0	9.0
2009	0.7	-0.3	0.5	0.4	9.7	9.7
2010	0.7	-0.1	0.4	0.5	10.2	10.2

Source: Commission services.

to a substantially reduced contribution of capital. Trend TFP growth is projected to remain close to its pre-crisis level. These projections are subject to considerable uncertainty and should therefore be interpreted with caution.³⁰ They suggest, however, that the crisis will have a deep short-term impact on potential output via a rise in the NAIRU and a fall in the investment rate. Both channels should be roughly equivalent in size over the 2009-10 period, although the NAIRU effect may kick in somewhat more rapidly. The two effects reflect the exceptional strength of the ongoing crisis and should a-priori be gradually reversed once the economy recovers. The rise in the NAIRU is attributable to the temporary impact of nominal wage rigidities while the slowdown in capital accumulation reflects the strong cyclical nature of investment.

... followed by a slow return to pre-crisis potential growth

At this juncture, the most likely scenario is one of a medium-term return of potential growth to its pre-crisis long-term trend as the negative capital and labour effects identified above are gradually reversed. Empirical evidence of the effect of past crises shows, however, that the economy will not return to its pre-crisis expansion path but will shift to a lower one (as in the middle panel of Graph 27). In other words,

the crisis will entail a permanent loss in the level of potential output. One of the factors that will shape the size of this loss is the speed at which the economy reverts to long-term trends. The slower the adjustment to long-term trends, the greater the final loss in potential output level compared with a pre-crisis expansion path. The risks that the adjustment process will be protracted appear unfortunately to be high due to the specific characteristics of the current crisis, including its duration, its global nature and underlying changes in risk behaviour.

First, the latest forecasts suggest that the current crisis will be more protracted than its predecessors.³¹ This will lengthen the potential output adjustment phase as the capital and employment effects identified above are only reversed slowly. Moreover, the protracted rise in the NAIRU might lead to hysteresis effects as workers lose their skills, causing a larger loss in the potential output level. Many discouraged workers may also withdraw from the labour force, thereby cutting labour supply. Second, the global nature of the current crisis makes it harder to engineer a strong recovery via rechanneling resources from the non-tradable sector to the export sector, as world demand is sharply depressed. The Finnish and Swedish 'miracles' seen after the financial crisis in the early 1990s were partly due to sectoral re-allocation of labour and capital toward the IT export sector. Third, the changes in attitudes towards risk brought about by the turmoil may have a lasting impact

³⁰ The estimates of potential growth in 2009-10 are based on the Commission's spring forecast and are therefore subject to the usual uncertainty. In addition, estimates of trend TFP appear particularly uncertain at this juncture due to the unprecedented decline in capacity utilisation, the difficulty in estimating capital obsolescence rates and uncertainties regarding the impact of the financial crisis on R&D spending and the pace of innovation.

³¹ The Commission's spring forecasts project euro-area GDP to contract by 4% in 2009 and by 0.1% in 2010. Previous post-war recessions were clearly shorter with a single year of GDP contraction followed by a year of healthy growth.



Box 3: The impact of the financial crisis on growth – Some model simulations

This box presents a model-based analysis of the impact of the financial crisis on euro-area growth. The European Commission's QUEST III model is used to simulate the medium and long-term impact of the crisis on potential output. To illustrate the likely effects of the financial crisis, a recession scenario is constructed by simulating the effect of a 200 bp increase in risk premiums in the equations determining corporate and housing investment as well as house prices. The increase in risk premiums can be interpreted as a correction to over-optimistic expectations in financial markets. It is calibrated so as to generate a fall in euro-area GDP of about 4% in 2009.

Economic downturn generated by an adverse financial shock (increase in risk premiums of 200 bp for 3 years) (1)

	2009	2010	2011	2012	2013	2018	2028
GDP	-3.98	-4.24	-3.96	-3.77	-3.65	-3.26	-2.25
Capital T	-0.57	-1.71	-2.72	-3.56	-4.27	-6.50	-7.16
Capital NT	-0.28	-1.09	-2.06	-3.01	-3.89	-6.80	-7.86
Employment	-4.08	-4.64	-4.03	-3.50	-3.07	-1.64	-0.01
Employment smoothed	-0.44	-1.23	-1.79	-2.14	-2.34	-2.22	-0.67
Investment	-13.88	-21.24	-22.28	-21.54	-20.26	-13.86	-6.12
Real wages	0.31	0.13	-0.20	-0.50	-0.76	-1.75	-2.30
Nominal wages	-0.71	-1.94	-3.04	-4.01	-4.87	-7.93	-9.68
Price level GDP	-1.02	-2.06	-2.84	-3.53	-4.14	-6.29	-7.55
Potential output (2)	-0.37	-1.17	-1.91	-2.53	-3.04	-4.31	-3.98
Capital	-0.13	-0.49	-0.93	-1.37	-1.77	-3.12	-3.62
Labour	-0.24	-0.68	-0.99	-1.18	-1.30	-1.22	-0.37

(1) All variables reported in the table are in per cent deviations from baseline levels.

(2) Potential output is calculated by using a weighted average of capital and smoothed employment (in order to capture the low frequency components of employment).

Source: Commission services.

As shown in the table above, the rise in risk premiums affects potential via both employment and investment in the short run. However, whereas the effect of employment on potential growth becomes negligible after 5 years, it is far more persistent in the case of capital and still significant after ten years (as the simulations are presented in deviations from the baseline, effects on potential growth should be measured by comparing two successive years). Interestingly, the simulations also suggest that the shock on risk premiums will have a **permanent effect** on the level of potential output (i.e. they entail a downward shift in the expansion path of potential output) and a **lasting (but non-permanent) effect** on potential growth. The simulation does not point to any loss in potential growth after 10 years.

The negative contribution from capital to potential GDP results from increases in risk premiums on loans to firms and households (reflecting more cautious lending behaviour on the part of banks) and from a correction of overinvestment after a boom period (possibly generated by a bubble in financial and housing markets). The shock to risk premiums causes a lasting drop in the investment rate, which, given the direct relation between the investment rate and capital growth, explains the persistent effect on the contribution of capital.

As the NAIRU increases substantially in the short run, the negative effect of employment in the first two years is larger than the adverse contribution from capital, while in the medium term the negative contribution from capital is dominant. Downward nominal rigidity of wages appears to explain the rise of the NAIRU. Indeed, an increase in real wages for 2009 and 2010 can be seen. To test whether this conjecture is correct, the same simulation experiment was run, but this time with very low nominal wage stickiness. With this assumption on wage behaviour, wages respond strongly to adjust employment, however at the cost of a very sharp decline in real wages. This suggests that it is indeed very costly for workers to keep unchanged employment levels in an economic environment with falling capital stock. Additional QUEST simulations indicate that in the absence of frictions in both goods and labour market the economy adjusts much more smoothly to the shock in risk premiums, leading to less fluctuation in GDP.

on potential growth. Model simulations, described in more detail in Box 3, suggest that a permanent increase in risk premiums, reflecting investors' and corporations' more cautious approach to risks, could have a long-lasting impact on capital accumulation and therefore potential growth. According to the simulations, for example, a 200 bp increase in risk premiums still translates into a 0.2 pp reduction in potential growth – mostly due to the capital channel – after ten years.

An additional source of uncertainty regarding the phase of adjustment of potential growth to its long-term trend relates to TFP. There are indeed serious downside risks to medium-term prospects for TFP growth. These concern the ongoing process of industrial restructuring and innovation. Major recessions are generally associated with a process of industrial restructuring as some of the shocks causing the recession also force resources to be reallocated across sectors and from less productive to more productive enterprises. A slow process of industrial restructuring, caused either by credit constraints – due to delayed adjustments in the banking sector – or by entrenched structural rigidities, could have a lasting negative effect on the level and growth rate of TFP by locking resources in relatively unproductive activities or enterprises.³² In the case of Japan, Caballero et al. (2008) argue that the slow restructuring of the banking sector during the Lost Decade allowed credit to continue to flow to bankrupt firms (the so-called "zombies"), keeping them alive at the expense of the entry of more productive competitors.³³ This seems to have depressed overall productivity growth in Japan for several years. The effect of restructuring on TFP could also be magnified by the accelerated obsolescence of some capital vintages brought about by the restructuring process.

Finally, downside risks to medium-term TFP prospects also relate to depressed investments in

private R&D, which is known to be markedly pro-cyclical. TFP drivers, such as physical investment, R&D and innovation, may suffer further from a prolonged recession and the changes in attitudes towards risk. In particular, credit constraints and investors' more cautious attitudes towards risks could have a disproportionate effect on young and innovative firms, thereby reducing the pace of innovation. There is indeed evidence that R&D investment becomes even more pro-cyclical as firms face tighter credit constraints.³⁴ Finally, risks to R&D spending are not confined to the private sector. Strains in public finances could also constrain public investment in research as attention shifts to more short-term spending priorities.

Risks of a permanent downshift in potential growth should not be played down

We have argued that, although the adjustment phase could be protracted, the most likely scenario for the euro area is for a return of potential growth to its pre-crisis long-term trend. Nevertheless, risks of a moderate crisis-induced reduction in long-run potential growth cannot be ruled out in the absence of adequate policy responses.

Whereas economic theory suggests that the effect of the crisis on potential growth via the capital and labour channels should be largely temporary, the same does not apply to TFP. Basically, most of the sources of downside risks to TFP identified in the previous section could also turn into sources of permanent downshift in TFP growth. Changes in attitude towards risks and a rise in risk premiums could have a lasting effect on R&D spending and innovation activity, leading to a drop in long-term TFP growth prospects. There is also a risk that rigidities and bad policies might durably hinder the necessary industrial restructuring processes, thereby weighing lastingly on TFP growth. The existence of such risks is backed by the historical evidence presented in Section 2. In a number of euro-area Member States, the recession of the 1990s was

³² This argument obviously only applies to cases where the recession is associated with a shift from low to high productivity sectors. In the opposite situation, a slow restructuring process would delay the downshift to lower trend TFP.

³³ Caballero R.J., T. Hoshi and A. K. Kashyap (2008), 'Zombie lending and depressed restructuring in Japan', *American Economic Review*, 98:5, 1943-77.

³⁴ Aghion, P., P. Askenazy, N. Berman, G. Cette and L. Eymard (2008), 'Credit constraints and the cyclicity of R&D investment: Evidence from France', PSE Working Papers, 2008-26, PSE (Ecole normale supérieure).



followed by enduring deceleration in potential due to weaker TFP growth. The long-lasting deceleration of potential in conditions which were arguably less dramatic than those prevailing now suggests that the downside risks on long-term prospects for TFP growth are substantial. Such risks should not be played down and curtailment appears to be an essential policy challenge at the current juncture.

4. Adequate policy responses are needed

To sum up, unless appropriate policies are implemented, the euro area is likely to experience a sharp drop in potential growth in the short term, followed by a very gradual return to pre-crisis trend growth. As a result, the economy will have to face permanent losses in the potential output level compared with a pre-crisis expansion path. This situation is reflected by the middle panel of Graph 27. The return to long-term trends is likely to be slower in the current crisis than in previous recessions due to the duration of the crisis, its global nature and the changes in attitudes towards risk. Moreover, there is a risk that part of the reduction in potential growth seen in the short term may become entrenched, especially if the new financial conditions are more restrictive in the long run and harm TFP growth through less dynamic innovation and depressed R&D investment. This is the situation shown in the bottom panel of Graph 27.

Nevertheless, the ultimate outcome of the crisis will depend to a very large extent on the policy reactions. To contain the permanent losses in the level of potential output traditionally associated with a financial crisis and to reduce the risks of a lasting deceleration of TFP growth, timely and appropriate policy responses – encompassing a wide range of measures and covering several reform areas – need to be put in place

Need for timely policy action

It will be crucial to start implementing adequate policy action promptly so as to raise the long-run potential output growth, while avoiding policies that may be appealing in the short run but could be potentially damaging for the potential output growth in the longer run. Growth- and

efficiency-orientated policies are necessary not only to help EU economies to return to the "pre-crisis" potential growth path but also, if possible, to recoup some of the cumulated loss in the GDP level suffered in the course of the crisis. Making up for this loss will require a steep increase in "potential growth", i.e. (at least) a temporary increase in potential growth above the rates experienced prior to the financial and economic crisis.

Since the crisis may already have exerted adverse effects on future potential growth (e.g. due to a drop in investment rates), long-term supply-side action should be undertaken now, in addition to demand-enhancing measures, and should, by no means, wait until the crisis is over before being implemented. Despite the difficulties involved in taking action and the possibly lesser appetite for reforms, there is a need for a comprehensive approach using a wide range of available instruments to tackle the multi-faceted factors impinging on potential growth. The need to continue and, indeed, deepen the structural reform processes in a number of European markets could be catered for by the Lisbon strategy, which is to be reviewed in 2010. In any case, the issue of adequate and timely policy responses will be a substantial part of the debate on "Lisbon post-2010". The timing of policies aiming to dismantle structural rigidities is a particularly important and sensitive issue, given that, in the short term, the latter may to some extent strengthen "automatic" stabilisers, on the one hand, while hampering recovery and medium-term potential growth, on the other.

Adequate policy responses should encompass a wide array of measures

Adequate policy responses should encompass a wide range of areas, including financial markets, business environment, labour markets, physical investments, R&D investments and innovation policies.

A sine qua non condition – albeit not necessarily sufficient – for solving the financial and economic crisis and limiting its adverse impact on innovation and R&D investment – and ultimately on long-term TFP growth and potential growth – is to effectively address the disruptions in financial markets.

Apart from difficult access to the requisite financing, the recovery prospects of European firms are also potentially threatened by a failure to restructure and adapt their business models to a new economic environment, including global competitive pressures. Rescue policies in favour of industries that have been particularly affected by the crisis need to support the euro-area's long-term goals and not freeze resources in unproductive activities, which would reduce potential output growth in the medium run through lower efficiency and lower adjustment capacity.

The role of policies aimed at enhancing labour supply, including financial incentives to work, is important, including from the perspective of protecting the most vulnerable groups threatened by long-term exclusion from the labour market. Policies that promote wage moderation, alleviate nominal rigidities of wages and cut labour taxes will reduce structural unemployment and boost competitiveness and adjustment capacity. Policies that facilitate labour market transitions (e.g. active labour market policies such as training and public placement) are needed to ease the short-run adjustment and to smooth the longer-run reallocation of resources.

It is crucial that policies should also be geared to sustaining investments in physical and intangible capital during the downturn. This will bring considerable medium-run and long-run gains in potential output growth. In order to sustain and,

where possible, increase the relatively low pre-crisis potential growth rates, policies also need to promote R&D and innovation efforts already in the time of crisis and to prevent their cyclical downturn, although some short-run costs associated with these policies have to be borne.

Avoiding tempting policy mistakes

The current circumstances may increase the temptation to have recourse to ill-designed policies, the cumulated effect of which could severely harm potential output both in the short term and also in the longer term.

First, there might be a tendency to yield to protectionist temptations or to try to promote national interests at the expense of the proper functioning of the Single Market. Such policies would lead to sizeable losses in output, have negative spillover effects across the world and put the long-term credibility of the Single Market at risk.

Second, measures reducing labour market participation, such as early retirement schemes, would significantly reduce potential output.

Third, a prolonged crisis may undermine the commitment to sustainable fiscal policies, which may ultimately lead to higher taxes and limit the budgetary scope for accommodating future reform efforts.