

Potential growth: a crucial but complex concept

French potential growth has fallen by approximately one percentage point in the space of a few years. A specific investment and research drive will be needed to restore it, backed by labour and goods market reforms to marshal production factors effectively. An accommodative monetary policy will support these developments.

Merely observing economic growth is not enough to form a judgement on the underlying trend driving an economy. Many events – an unusually harsh winter, a one-off hike in government spending, a trade partner’s recession – can impact growth from time to time, blurring the picture. Yet separating out developments that are attributable to cyclical conditions from those that stem from deeper trends, i.e. the economy’s potential growth, is essential for the conduct of economic policy both at the cyclical level (response to short-term shocks) and at the structural level (reforms to raise the growth potential).

Definitions

Potential output can be defined as the maximum level of output that an economy can reach without putting strain on production factors that translates into inflationary pressures.

Potential growth, i.e. the growth rate of potential output, is the growth rate that the economy can sustain over the long run, excluding short-term effects linked to a difference between demand and the potential level of supply.

Output gap, which measures the difference between actual GDP and potential output, describes a shortfall or excess of demand relative to potential supply.

These variables are theoretical and cannot be observed, unlike GDP. They must therefore be estimated.

However, identifying potential growth is difficult, especially when the exercise is conducted in “real time” to help economic policy decisions. Several methods are available, each with advantages and drawbacks. To read different situations as accurately as possible, it is thus important to have an overall view of the various methodologies and to understand how they work.

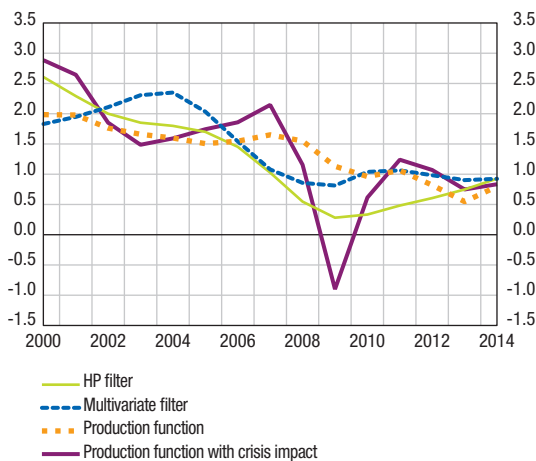
Part 1 of this paper reviews the methods usually used to estimate the potential level of GDP. Part 2 presents past trends, current estimates and the prospects for potential output in the USA, Japan, emerging countries and the main euro area countries based on estimates by several institutions. Part 3 discusses steps that may be taken to strengthen potential growth.

Measuring potential growth

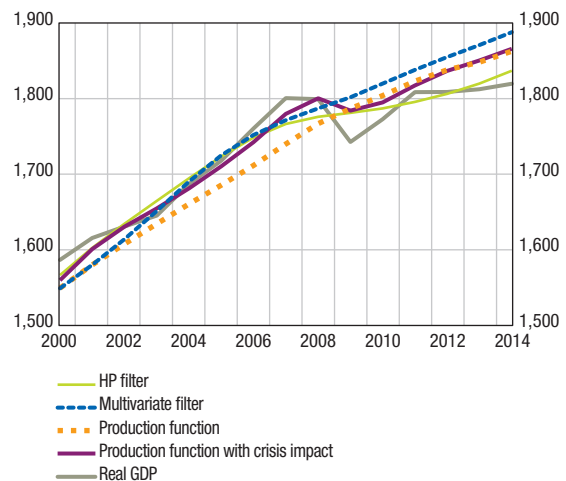
Assessments of potential growth may vary widely depending on the method used (Chart 1). Understanding how these estimates are constructed is essential to determining how appropriate they are.

Charts 1 – Four estimates of potential growth (left) and potential output (right), France

a) Growth
(%)



b) GDP
(EUR billions)



Sources: Banque de France, multivariate filter Insee, 2014.

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Using statistical smoothing techniques

The simplest way to estimate potential growth is to use a purely statistical smoothing process that strips out short-term fluctuations from GDP to leave only medium- and long-term movements. This is the **HP filter method**¹ (green curve). Although widely used because of its simplicity, this method does not paint a reliable picture in real time because, aside from the fact that it provides no explanation for changes in potential growth, it is overly influenced by past trends (low-frequency filters that cannot detect breaks in a timely manner for economic policy) or cyclical trends (high-frequency filters whose weakness becomes particularly acute during crises and upturns).²

Incorporating cyclical information

To draw a clearer distinction between what is and what is not linked to the business cycle, one solution is to incorporate cyclical information in the model. The cyclical indicators that most effectively capture the intensity of a demand surplus or deficit are the capacity utilisation rate (CU), unemployment and inflation. If business equipment is idle (low CU) or if firms are using few workers (high unemployment), this suggests that the economy is underusing its potential capacity and hence that potential output exceeds GDP. Similarly, weak inflation points to a demand shortfall, because companies cannot increase prices without losing market share, while workers cannot obtain substantial wage increases when unemployment is high. This gives an **enhanced or “multivariate” filter** (blue curve). However, while this method describes the state of the economy more accurately in real time, it still does not explain the sources of growth.

¹ HP stands for Hodrick and Prescott, after the two economists who invented the method.

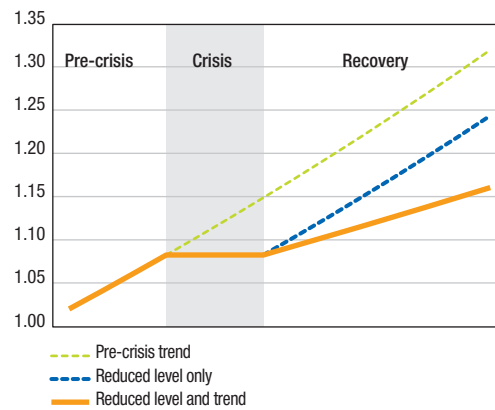
² Revisions may be substantial. For example, the European Commission estimated a zero output gap in 2000, but this was revised to 1% in 2001, then 2% in 2003 (Larch and Turrini, 2009). The gap was put at 2.7% in 2014.

Modelling a production function

To address this problem, we use methods with a **production function** for the economy (yellow and purple curves), in which growth factors are explicitly included: the total output of the economy results from i) labour, i.e. the number of people in employment, skill levels and working hours, ii) use of buildings and equipment (physical capital) and iii) the efficiency with which labour and physical capital are jointly used (total factor productivity, TFP).³ To obtain potential output, we strip out the cyclical part of TFP and labour (cyclical unemployment for example) with the help of the cyclical indicators shown above. Widely used by the international organisations, this methodology has the advantage of being able to explain the sources of (potential) growth. Estimating potential TFP is particularly tricky, especially during a severe economic crisis with a potentially lasting impact on TFP.

Chart 2 – Overview of the possible impact of the crisis on potential output

The crisis may have reduced the level and/or trend of potential output



Source: Banque de France.

The GDP slowdown observed since 2008 may reflect three different situations:

- ✦ the crisis did not affect potential output (green curve in Chart 2), and observed GDP slowed only cyclically;
- ✦ the crisis caused a break in the level of potential output, which fell during the crisis relative to its pre-crisis trend but reverted to its original growth rate once the crisis was over (blue curve in Chart 2);
- ✦ the crisis caused a break in the level and trend of potential output, with a long-term decline in the level of potential output plus a weaker post-crisis growth rate compared with the pre-crisis rate (yellow curve in Chart 2).

Overall, and in most past cases, crises lastingly lower the level of potential output (Cerra and Saxena, 2008). However, long-term potential growth seems rarely affected.

Introducing other variables

To decide between these interpretations, we can introduce different variables that represent possible explanations and then choose the most appropriate one. Among the various effects linked to the crisis that should vanish over the long run, the Banque de France (Chouard *et al.*, 2014) introduces, for example, the CU rate to assess a demand shortfall, or the age of capital to highlight the relationship between ageing equipments and their performance. These two variables explain part of the TFP slowdown, but cannot account for the entire sharp decrease seen at the time of the crisis. In other words, the crisis had a permanent impact on TFP. To capture this loss, the Banque de France's "production function with crisis impact" method (Chart 1) includes a break in the level of TFP.⁴

Other approaches are also possible, including **structural vector auto-regressive (SVAR) models**, which consist in estimating a set of equations representing a simplified economy, to which restrictions consistent with economic theory are applied.

Yet the crisis showed that growth could be unsustainable even if no strain was apparent in the real economy, for example in the event of major financial-sector imbalances. The most recent literature seeks to incorporate these potential imbalances into assessments of potential growth by including such indicators as credit to the private sector or real

³ TFP reflects technical and organisational progress but also includes more broadly all sources of growth not captured by the two labour and capital factors, such as increased skill levels among workers.

⁴ At this stage, after considering the three possibilities presented, no loss of TFP trend is found for France, but there is surely insufficient distance to be sure of this assessment.

estate prices (Borio et al., 2014). The first four methods described above are the most commonly used to estimate potential growth and are often combined for a more finely-honed analysis. Structural methods, such as production function or SVAR approaches, may for example be used to more effectively forecast future potential growth.

Theoretical effects of a large-scale crisis on potential output

A deep-seated crisis, such as that of 2008, can lastingly reduce an economy's potential output. When a speculative bubble bursts, as the subprime bubble did in 2008, agents see their wealth shrink and adjust their demand. Companies respond to slacker demand by adjusting production factors. If demand remains weak, as is unfortunately the case in the current crisis because agents are taking several years to correct the imbalances built up previously, a downside output adjustment occurs, impacting growth factors and TFP.

- **The labour factor** first: unemployment linked initially to economic conditions can turn into structural unemployment. Known as “hysteresis”, this phenomenon has several possible explanations, including loss of skills among the long-term unemployed, the decision by people in this situation to give up their search for employment, or a mismatch between workers’ skills and the available opportunities. To illustrate the third explanation, Spanish workers specialising in construction, a sector where employment shrank from 2.7 million people in 2007 to 1 million in 2013, may struggle to find jobs in other areas of the economy.
- Next, the **capital factor** may emerge from the crisis diminished. Companies tend to trim investment in response to a gloomy growth outlook or financing difficulties. Business failures (Fougère et al., 2014) and accelerated retirement of obsolete equipment (Bonleu, Cette and Horny, 2013) combine to reduce the stock of physical capital.
- **TFP** may also be reduced if, assuming unchanged capital and labour, the economy is unable to produce as efficiently. This may have several causes, including a downturn in R&D expenditure or disruption to the industrial fabric following multiple business failures. A notable cause of reduced TFP is weak investment, which slows the renewal of equipment leading to decreased efficiency. Cahn and Saint Guilhem (2010) estimate that a one-year increase in the age of production tools reduces productivity by 3.1%-3.6%.

Current situation and prospective potential growth in the leading economies

Central banks, such as the Banque de France, and other institutions, including the European Commission (EC), the Organisation for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF), conduct assessments of potential growth and the output gap for different countries.⁵ These estimates are not based on any single method but draw on a set of the methods mentioned earlier.

To provide an overview of trends in the global economy, Chart 3 shows actual GDP and potential output levels and output gaps for four large economic zones: the USA, the euro area, Japan and emerging countries. While US and euro area business cycles are more or less synchronised, emerging countries, and to a lesser degree Japan, follow different paths.

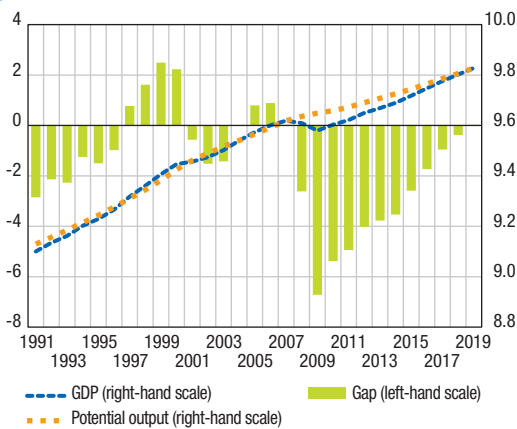
In the **USA** and the **euro area**, growth was relatively sustained prior to 2008. The crisis caused the level of GDP to drop swiftly in both economies. The sudden collapse in demand led a sizeable gap to open between potential supply and effective demand. According to the IMF’s October 2014 forecasts, the output gap is expected to narrow slowly, and GDP should catch up with potential output over a five-year horizon.

Japan experienced a relatively long spell of weak growth and short recessions in the 1990s and early 2000s. A few years after the speculative bubble burst in 1990, the Japanese economy was hit by the 1997-1998 Asian crisis, and the country entered a prolonged period of deflation. The output gap, which was negative for a long time, reflecting structurally depressed demand characteristic of deflation, closed in 2007. The next year, the country entered recession once more in the wake of the global economic crisis.

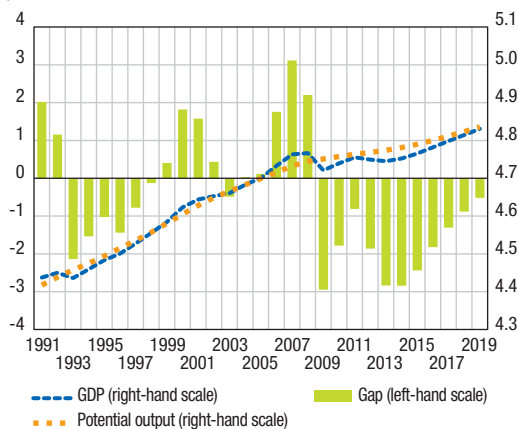
⁵ Differences in the estimates stem from the potential levels of TFP and employment, but also from specific choices in terms of parameters and assumptions.

Charts 3 – GDP, potential output and output gap in four large economic zones

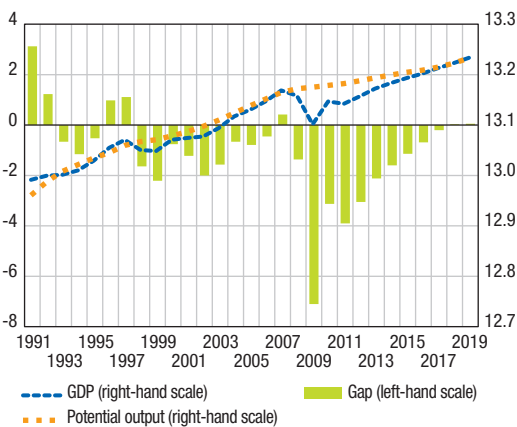
a) United States



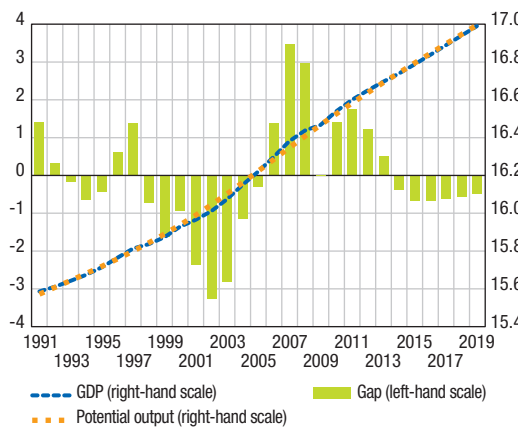
b) Euro area



c) Japan



d) Emerging markets



Note: GDP and potential output, log of levels (right-hand scale; the difference between two points can be read as a growth rate). Output gap as a % of potential output (left-hand scale).

Sources: Data, forecasts and estimates of the gap, IMF (October 2014); for emerging countries, the output gap is calculated by the Banque de France using a simple HP filter method.

Unlike developed economies, **Emerging countries** did not experience a sharp drop in output overall after the outbreak of the crisis, although there was a slowdown when the crisis occurred and then again in 2013, following a recovery phase.

Chart 4 shows estimates of potential growth and the output gap by four institutions (BdF, EC, IMF and OECD) for Germany, Spain, France, Italy, the euro area and the USA.⁶ The differences between the estimates are sizeable in some instances, reflecting the variety of methods used and highlighting the considerable uncertainty associated with measuring potential output. Even so, a few trends may be picked out.

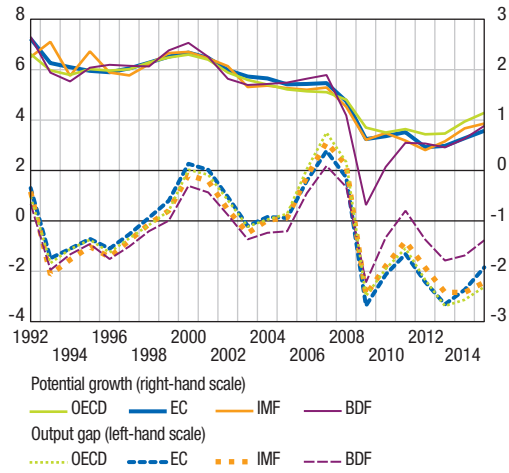
Before the 2008 crisis, the estimates prepared by the different institutions concurred broadly on the historic pattern of potential growth: in the euro area, for example, potential growth averaged approximately 2% per year over the 2000-2007 period, and the output gap was positive on average. Potential growth in the overall area was higher than that of France and Germany, chiefly because of vigorous growth among smaller euro area countries, which made a large contribution to TFP. These performances largely reflected a catch-up effect as the smaller countries made up ground on the area's most advanced economies, but they were also driven in some cases by financial or property bubbles. For example, Spain's potential growth was driven by a strong contribution from the labour factor, which reflected increased employment in the construction sector, with substantial immigration, a decline in unemployment and increased labour participation.

⁶ See the European Commission's *European Economic Forecast*, the OECD's *Economic Outlook*, the IMF's *World Economic Outlook* and the 2013 Annual Report of the Banque de France.

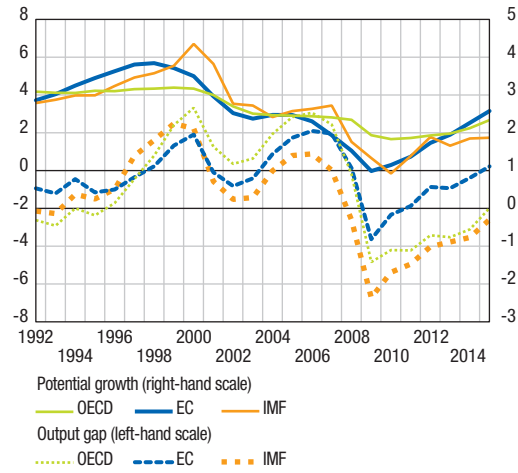
Charts 4 – Potential growth and output gap in the USA and large euro area countries

(%)

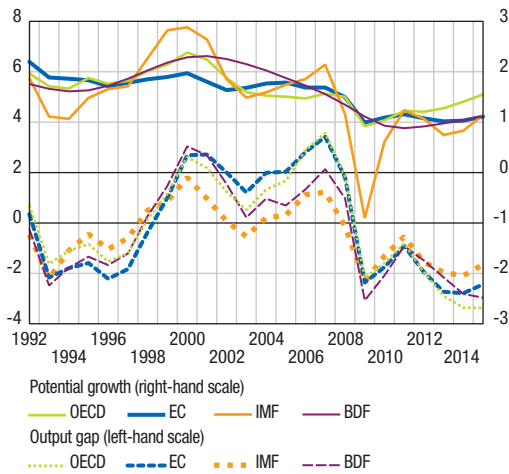
a) Euro area



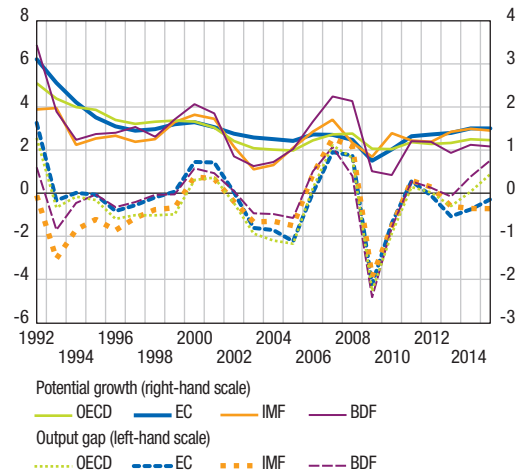
b) United States



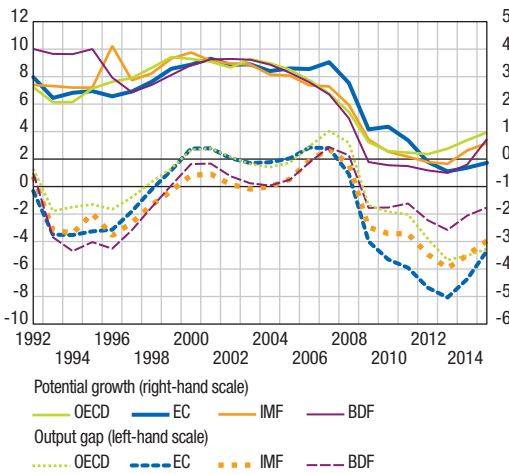
c) France



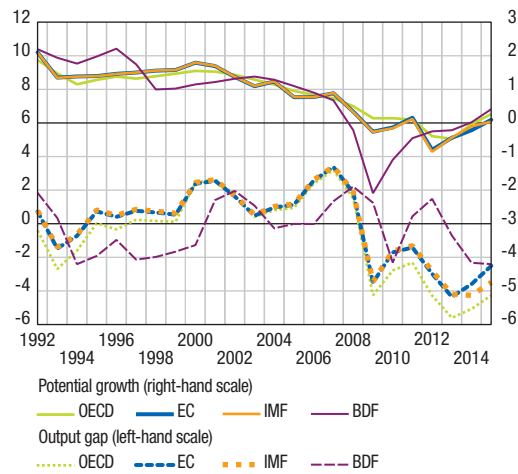
d) Germany



e) Spain



f) Italy



Note: the output gap is shown by a dotted line and uses the left-hand scale (%); potential growth is shown by an unbroken line and uses the right-hand scale (%). Calculations were performed using base 2005 data.

Sources: OECD: Economic Outlook No. 95, May 2014; EC: Spring 2014 forecast (May 2014); BDF: May 2014 forecasts; IMF: WEO October 2014.

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Today, potential growth is lower than it was before the crisis in all the main economies considered here, with the possible exception of Germany. In the euro area, potential growth is one point lower than its pre-crisis level. This overall figure masks mixed situations among the Member States, with a less pronounced fall in France but a sharper decline in Italy and especially Spain. In Spain, potential growth was driven down mainly by the labour factor, with a swift run-up in structural unemployment until 2013. In France, potential growth has fallen by around 1% since 2008, with labour, capital and TFP all making smaller contributions than in the past.

In 2014, the output gap was very wide in Spain, Italy, France and the euro area overall; it was also negative in the USA and zero in Germany.

■ How to stimulate growth ?

The way that the main advanced economies have struggled to extricate themselves from the crisis has fuelled a debate over possible “secular stagnation”,⁷ i.e. a situation where demand is depressed for a protracted time because of accumulated debts or other factors, such as slower demographic growth or TFP, and where cuts to nominal interest rates are constrained by the zero lower bound and are therefore insufficient to properly stimulate activity. Note however that most institutions are now forecasting activity to gradually pick up in France and the euro area.

While the debate goes on, the measures that may be used to stimulate potential output are known. Economic policies need to target persistent factors of vulnerability in the economy to improve the growth outlook.

In the short and medium term

Most advanced economies with a negative output gap need to restore demand while maintaining long-run equilibria. This will require a highly accommodative monetary policy and, particularly in the euro area, decisive support for investment. Fiscal policy has to adapt to the situation of each country, giving priority to ongoing efforts to cut government deficits, for this will preserve investor confidence and lessen the debt burden. Commitments made in this respect must be honoured. Countries that still have some room to manoeuvre would be wise to implement pro-investment and growth policies. Taking advantage of the low interest-rate environment to invest in infrastructure could be a useful solution insofar as this kind of investment has a beneficial impact on activity both in the short term, by boosting demand, but also in the longer term, by strengthening production factors and hence potential supply. However, care must be taken to ensure that investments are properly targeted based on needs and expected returns. In the case of the euro area, a genuine European growth strategy using all available measures is vital.

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In the long term

To strengthen potential output over the long run, government expenditure must be efficiently managed, since out-of-control deficits will inevitably lead to higher taxes that could impair the action of economic participants. Similarly, labour and goods and services markets should be underpinned by structural reforms to make economies more competitive and responsive. Reforms on goods and services markets will eliminate rent-seeking and improve the productivity of the entire economy. Labour market reforms should seek to provide greater flexibility for businesses to make them better equipped to cope with recessions and less unwilling to hire during upturns. In return, however, workers and unemployed people need better support, including proper training so that they can benefit from greater flexibility. These two aspects are crucial to reducing long-term unemployment. A study by the Banque de France⁸ has demonstrated the value of such reforms: in the case of France, aligning the regulation of labour and goods and services markets with best international practices would boost productivity by approximately six percentage points over a decade. These reforms should be brought in without delay, for while they need the support of the public, introducing them does not generally entail a financial cost for the community and the economy as a whole.

⁷ This concept, which was invented by economist Alvin Hansen (1938), was revived by Lawrence Summers, an academic and former US Treasury Secretary.

⁸ Cf. Cetto, Lopez and Mairesse (2014).

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