

## Benoît Cœuré: Scars that never were? Potential output and slack after the crisis

Speech by Mr Benoît Cœuré, Member of the Executive Board of the European Central Bank, at the CEPII 40th Anniversary Conference, Paris, 12 April 2018.

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Accompanying [slides](#)

Perhaps the biggest mystery facing policymakers today – and especially central bankers – is what is happening on the supply side of the economy.

Subdued price and wage pressures globally are raising questions about both the true level of supply capacity, and about how much it is being lifted by strong current demand. Given that the supply side was traditionally thought to be determined by structural factors alone – Say’s law in short – this is sparking many questions in the current public debate about the outlook for the economy, the likely path of inflation and the appropriate stance of macroeconomic policies.

At a deeper level, this discussion appears to even challenge the traditional view of the business cycle and whether deviations of actual economic output from its potential level – the “output gap” – can still meaningfully inform policy discussions.

To paraphrase Winston Churchill, the output gap is a riddle, wrapped in a mystery, inside an enigma, but perhaps there is a key. And that key is the impact of demand fluctuations on supply capacity.

To bring some clarity to this debate, in my view we need to distinguish between two different ways through which demand and supply can interact.

The first is the normal effect of business cycles on supply, which comes about, among other things, through people entering and exiting the workforce in response to changes in demand, through firms delaying and restarting investment in new capacity, and through firms’ pro-cyclical investment in research and development.

Such effects are in principle temporary, and their scope depends in part on a country’s product and labour market institutions, but they typically have no long-run impact on the economy’s growth potential.

The second is what are known as hysteresis effects – the notion that recessions can do lasting damage to the growth potential that does not automatically unwind as the economy improves. This understanding of hysteresis is much along the lines first laid out by Blanchard and Summers, who noted the tendency of unemployment in Europe to rise during recessions and to remain elevated thereafter.<sup>1</sup>

If such effects are at play – that is, if workers become permanently detached from the labour market as a result of a temporary slump – it may be the case that only targeted structural reforms or a “high-pressure” economy created by unusually loose macroeconomic policies can provide a solution.<sup>2</sup> The impact of a long period of above-potential growth on the supply side would in turn constitute “reverse hysteresis”.

The distinction between *persistence* and *permanence* is important because it can help us better explain the developments we are seeing in the economy today and how macroeconomic policies should react to them.<sup>3</sup> In particular, if we are primarily seeing normal effects of the cycle, there is no real mystery about why inflation is so low in many economies, and there is also no need to run the economy hot to undo the damage of the crisis.

## Hysteresis versus measurement

My first slide shows the mysterious situation that has been the subject of much debate in recent months. Output gaps across many advanced economies, including the euro area, are widely thought to have closed, or to close in the very near future.

But on the right-hand side you can see that while global inflation – here proxied by the OECD average – has recovered from its mainly oil-driven lows in 2015 and 2016, it is stabilising just above 2% and has shown no convincing signs of accelerating. Inflation excluding food and energy has hardly moved for the last four years.

Broadly speaking, this could mean one of two things.<sup>4</sup> Either the relationship between output and inflation – the Phillips curve – has broken down. That is, firms are unwilling to increase prices even when capacity constraints are kicking in. Or there is something wrong with the way we measure the supply capacity of our economies.

I would dismiss the first assertion, by and large. There is a plethora of empirical studies that prove that the Phillips curve is alive and well, in particular if one accounts for changes in the way firms and households incorporate past inflation developments in their price and wage setting behaviour.<sup>5</sup>

Many of these studies, however, highlight that the output-inflation relationship is non-linear, with a much more muted inflation response at high levels of slack – after all, no one speaks of a “Phillips line” – and that it crucially depends on the measure of economic slack we use.<sup>6</sup>

These studies typically start from the principle that the way we measure conventional slack is correct and that wages and prices would therefore need to depend on a narrower or broader measure of slack.

This is not an innocent assumption, however.

As you can see on my next slide, there is considerable real-time uncertainty surrounding the estimates of structural unemployment and potential output growth – the two key metrics to measure slack in the labour market and in the economy more generally.

In 2013, the Commission estimated that in the euro area the NAWRU – a rough measure of structural unemployment – was likely to have increased from pre-crisis levels of around 8.5% to 11.6%.<sup>7</sup> Estimates of other institutions have been revised likewise. Currently, the Commission estimates that the NAWRU in the euro area is closer to 8.4%, compared with an actual unemployment rate of 8.5%.

You can see the same pro-cyclical pattern for real-time estimates of potential growth on the right-hand side. In 2007, just before the outbreak of the financial crisis, the European Commission estimated that potential growth two years ahead would be above 2%. In 2010, in the aftermath of the crisis, it estimated the rate to be below 1% for the same year.

There are two competing and very different hypotheses that could explain the sort of revisions we see in the data, which relate to the two types of supply and demand interactions I outlined at the beginning.<sup>8</sup>

One is the “hysteresis view” that we have experienced structural changes on the supply side of the economy in both directions during the crisis. The lows of the crisis years were, at the time, thought to represent a “new normal” of low growth and secular stagnation that only determined policy action could overcome. Now, some believe that structural reforms coupled with above-potential growth are healing the scars of the crisis.

The implication of this view is that, as the global expansion strengthens, supply is expanding in tandem with demand and the output gap does not close. That is, we are chasing a moving target of potential output that keeps inflationary pressures in check.

The other view is that, during the crisis, potential growth never fell by as much as what canonical estimates would tend to suggest in the first place, and that these estimates may have mistaken temporary shocks for more permanent ones.

A crude reference point for understanding the consequences of this second hypothesis is to look at trend real GDP growth over a long period of time, abstracting from any models and their underlying assumptions.

You can see this on my next slide, starting in 1970. The chart on the left-hand side would tend to confirm the traditional view of the business cycle. There are booms and there are busts. But if one assumes for a moment that output tends to grow over time along a linear trend, this chart suggests that it was well above trend before the outbreak of the crisis, has sharply adjusted and continues to linger below trend still today.

The same is true for real gross fixed investment, one of the most cyclical of all demand components, as you can see on the right-hand side. Incidentally, the chart is consistent with the view that the crisis was the inevitable correction of a period of excesses and false promises.

Of course, in reality the trend is neither linear nor exogenous – this is why we can't use such simple charts for informing policy. It instead depends on the potential of the economy to generate sustained economic growth. And the factors generating growth – for example, the rate of technological progress, the institutional framework or the working-age population – do change over time, which is an issue I will return to later.

The question, however, is whether booms or recessions themselves affect the trend, and by how much – the hysteresis view.

Recent research suggests that many of our current models may overestimate the effects that changes in demand can have on our economies' supply potential, beyond the normal effects of the cycle. These models tend to produce potential GDP estimates that may be overly sensitive to transitory shocks.<sup>9</sup> They may therefore compound problems that are related to statistical measurement issues, such as the well-known failure of HP filters to capture end-of-sample effects.<sup>10</sup>

This suggests that a portion of the revisions to potential growth that we have seen in recent years, both upwards and downwards, may have exaggerated the impact of transitory factors.

This may also put earlier findings into a different light. For example, Olivier Blanchard and co-authors have shown that revisions in long-run potential growth estimates are strongly correlated with movements in consumption and investment.<sup>11</sup> To the extent that these correlations are misperceptions about the impact of transitory shocks, they tend to corroborate the view that potential growth estimates are too sensitive to normal cyclical fluctuations in output.

To be clear, like many others I do believe that deep recessions can have effects on the supply capacity of the economy that may take some time to unwind.<sup>12</sup> For example, the crisis has affected the “intensive margin” of the euro area labour market – that is, people working involuntarily in part-time or temporary positions.<sup>13</sup>

But it is not plausible that those effects could be as dramatic and long-lasting as the “hysteresis view” would suggest. Since these workers remained attached to the labour market, they represented a broader definition of slack rather than a new category of structurally unemployed workers – and indeed, measuring slack in this way helps explain recent low inflation outcomes

better.

Such people, in other words, had been scratched by the crisis, but not necessarily scarred. This is not to say that these scratches are not deep, in particular in economies worst hit by the crisis. As William Shakespeare put it, “He jests at scars that never felt a wound”.<sup>14</sup>

But, as I showed before, current estimates of structural unemployment do indeed confirm that the initial revisions were exaggerating the impact the recession would have on labour force participation. And they might currently exaggerate the impact the current expansion might have on lowering structural unemployment.

Insofar as it can be reversed by higher demand, this would presumably happen only late in the cycle when the labour market is especially tight. It would be quite a stretch to claim that the euro area has been in such a “high-pressure economy” up to now that would explain the recent notable downward revisions in structural unemployment.

This is probably true for the economy as a whole. In other words, it may well be that potential growth fell by less than we estimated during the depths of the crisis, and it is rising by less than we believe as the economy strengthens. So both the sudden drop in estimated potential growth in 2009, and the sharp rebound thereafter, are likely to be statistical artefacts, at least to some extent.

The relevance of this view for monetary policy makers is corroborated by research from ECB staff, which you can see on my next slide.<sup>15</sup> It finds that a much more constant rate of potential growth, and therefore a larger output gap in recent years, is consistent with recent inflation dynamics.

### **Potential output, secular trends and the fourth industrial revolution**

As I said before, none of this is to say that potential output growth is invariant. In fact, even if we dismiss the sharp revisions to output growth during the crisis years, the chart on the right-hand side still suggests some slowdown in potential growth compared to the pre-crisis period.

But rather than being a direct outcome of the crisis, this decline may rather reflect a continuation of a more secular trend rooted in the gradual waning of the IT-related productivity boom that started in the 1990s and extended into the early 2000s. Robert Hall and co-authors have recently provided empirical evidence to support this view for the United States.<sup>16</sup>

If such structural factors were to continue to have an effect, it would certainly raise questions about the longer-term outlook for potential growth – and whether the simple trend-line chart I showed earlier will indeed hold true in future.

So the relevant question is whether the slowdown in productivity growth that we observed before the outbreak of the crisis will prove permanent or transitory, with all its repercussions for future macroeconomic policies.

I would argue that there are two, largely complementary, reasons for cautious optimism. Both are related to the fourth industrial revolution, or the digitisation and automation of our economies.

The first factor relates to the time it usually takes for new technologies to reach critical mass.

History suggests that technology usually takes considerable time. We all remember Robert Solow’s famous statement back in 1987 that “you can see the computer age everywhere but in the productivity statistics”. The “Solow paradox” became less of a paradox when productivity started to accelerate measurably in the 1990s.<sup>17</sup>

Researchers have attempted to quantify this assertion. According to one study, over the past two centuries, it took countries about 45 years on average to adopt new technologies.<sup>18</sup> Adoption time has declined over the past 50 years, but the McKinsey Global Institute estimates that it still takes some eight to 28 years from commercial availability to 90% adoption rates.<sup>19</sup>

All of this suggests that it could be less of a concern that we are not yet seeing the effects of digitisation in our productivity figures. It may simply be a matter of time.

This brings me to my second factor.

A more fundamental transformation of business models along the lines of digitisation is typically more difficult in periods of weak demand, such as after the great financial crisis. New technologies often come with large fixed costs or may even cannibalise the way businesses operate today. If demand is weak, these costs may easily exceed the benefits of adoption in the short run, causing firms to delay investment plans.

This is different from hysteresis effects, where some observers argue that we are *permanently* entering a “1% economy” of low growth, low inflation and low neutral rates of interest as firms invest less in new capacity and technology, causing productivity growth to stabilise at lower levels and weak potential growth to become self-fulfilling.

This is rather about the timing of investment: the coincidence of a protracted period of weak demand and major transformative technological breakthroughs may have further delayed closing what some call the “innovation gap” – the distance to the technological frontier.<sup>20</sup>

In the euro area, for example, the double dip of the great financial crisis and the sovereign debt crisis may have delayed investment in new technologies. Indeed, research finds that Europe operates at only 12% of its “digital potential”, and the United States at only 18%.<sup>21</sup> For example, the share of retail e-commerce in Europe was less than 9% last year, compared to 15% in the United States.

But this coincidence should in principle be temporary. Another scratch so to speak, not a scar. As the cycle matures and we reach the point where capacity is starting to constrain firms in meeting rising demand, they could well become readier to bear the fixed costs associated with technology upgrades.

## **Policy implications**

All this leaves me with two tentative conclusions.

One is that what we are currently seeing may be more likely to reflect the normal interactions between demand and supply caused by the cycle, than hysteresis effects and their reverse. The second conclusion is that the outlook for productivity growth may be less concerning than current figures suggest.

This has a number of implications for economic policies.

For structural policy, it shows that policies that accelerate the diffusion of productivity growth from the technological frontier are of critical importance. As I have discussed elsewhere, frontier firms in the euro area are generally as productive as their global peers, especially in manufacturing.<sup>22</sup> It is non-frontier firms that are weighing on aggregate productivity because the diffusion engine has slowed.

For this reason, the aim of structural reforms in Europe should above all be to tackle this inefficiency by allowing labour and capital to be allocated in a more efficient way across the region, including by completing banking union, keeping up with the ambition of capital market

union and launching a more ambitious single market agenda.<sup>23</sup>

And this will only become more important going forward, as the drag from an ageing society can be expected to lower the labour contribution to potential growth, meaning future gains in living standards will have to come more from productivity.

For monetary policy, I see two implications.

The first is that our current monetary policy stance is appropriate. It has been calibrated on the view that the uncertainty around canonical output gap estimates is considerable and that slack could be larger. Ample monetary policy accommodation therefore continues to be necessary for inflation to reach levels closer to 2% sustainably.

However, and this is my second point, the possibility of larger-than-estimated slack does not mean that monetary policy will have to remain unchanged. If potential growth has not fallen by as much as we thought, it may imply that the neutral rate of interest – the level that determines the degree of accommodation our policies provide – might be higher than is commonly estimated.<sup>24</sup>

This could help explain why our current measures have been so effective in stoking the recovery: they may have been more expansionary than many believed. And if confirmed in the future, a higher than believed neutral rate would allow us to recalibrate our monetary policy as the expansion continues, while still providing the accommodative stance that is necessary for inflation to converge sustainably towards our aim. Meanwhile, we continue to expect our key interest rates to remain at their present levels for an extended period of time, and well past the horizon of our net asset purchases.

Thank you.

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<sup>1</sup> See Blanchard, O. and L. Summers (1986), “Hysteresis and the European Unemployment Problem”, NBER Macroeconomics Annual, 1986, Volume 1; and Blanchard, O. (2017), “Should we reject the natural rate hypothesis?”, Peterson Institute for International Economics Working Paper, 17–14, November.

<sup>2</sup> See for example, Ball, L. (2009) “Hysteresis in Unemployment: Old and New Evidence”, NBER Working Paper No 14818; and Holzer, H. J., S. Raphael and M. A. Stoll (2006), “Employers in the Boom: How Did the Hiring of Less-Skilled Workers Change during the 1990s?”, *Review of Economics and Statistics*, Vol. 88 (May), pp. 283–99.

<sup>3</sup> See Blanchard, O. (2017, op.cit.).

<sup>4</sup> A third broad explanation could be related to the type of shock hitting the economy. For instance, it could be the case that favourable supply shocks were predominantly pushing output higher while keeping inflation in check in recent years. But given subdued productivity growth, this is unlikely to be able to explain weak price pressures at a global scale.

<sup>5</sup> See, e.g., Ciccarelli, M and C. Osbat (eds.) (2017), “Low inflation in the euro area: Causes and consequences”, ECB Occasional Paper No 181; and Coibion, O. and Y. Gorodnichenko (2013), “Is The Phillips Curve Alive and Well After All? Inflation Expectations and the Missing Disinflation”, NBER Working Paper Series No 19598.

<sup>6</sup> See, e.g., Albuquerque, B. and U. Baumann (2017), “Will US inflation awake from the dead? The role of slack and non-linearities in the Phillips curve”, ECB Working Paper No 2001; and Krueger, A. B., J. Cramer and D. Cho (2014), “Are the Long-Term Unemployed on the Margins of the Labor Market?”, *Brookings Papers on Economic Activity*, Vol. 45(1), Spring.

<sup>7</sup> Technically, NAWRU is the trend unemployment rate. The structural unemployment is the ‘natural’ rate of unemployment that the economy would settle at in the long run in the absence of shocks. See, for example, Orlandi, F. (2012), “Structural unemployment and its determinants in the EU countries”, in Economic Papers 455, May 2012, European Commission.

<sup>8</sup> See e.g. Cerra, V. and S. C. Saxena (2017), “Booms, Crises, and Recoveries: A New Paradigm of the Business

Cycle and Its Policy Implications”, IMF Working Paper WP/17/250; Yagan, D. (2017), “Employment Hysteresis from the Great Recession”, NBER Working Paper No 23844; Fernald, J.G., R. Hall, J. Stock and M. Watson (2017), “The disappointing recovery of output after 2009”, NBER Working Paper Series, No. 23543; and Jarocinski, M. and M. Lenza (2018), “An inflation-predicting measure of the output gap in the euro area”, *Journal of Money, Credit and Banking*, forthcoming.

- <sup>9</sup> See Coibion, O., Y. Gorodnichenko and M. Ulate (2017), “The cyclical sensitivity in estimates of potential output”, NBER Working Paper No 23580.
- <sup>10</sup> See e.g. Hamilton, J. (2017), “Why you should never use the Hodrick-Prescott filter”, Department of Economics, UC San Diego, mimeo; and Mohr, M. (2005), “A trend-cycle(-season) filter”, ECB Working Paper No 499.
- <sup>11</sup> See Blanchard, O., G. Lorenzoni and J.-P. L’Huillier (2017), “Short-Run Effects of Lower Productivity Growth: A Twist on the Secular Stagnation Hypothesis”, NBER Working Paper No 23160.
- <sup>12</sup> See e.g. Yagan, D. (2017, op.cit).
- <sup>13</sup> See Cœuré, B. (2017), “Scars or scratches? Hysteresis in the euro area”, speech at the International Center for Monetary and Banking Studies, Geneva, 19 May.
- <sup>14</sup> Shakespeare, W. (1597), *Romeo and Juliet*, Act 2, Scene 2.
- <sup>15</sup> See Jarocinski, M. and M. Lenza (2018, op.cit).
- <sup>16</sup> See Fernald et al. (2017, op.cit).
- <sup>17</sup> Some, however, claim that the productivity boom of the 1990s may have merely reflected a strong economic expansion; see in particular Gordon, R. (2000), “Does the “New Economy” Measure up to the Great Inventions of the Past?”, NBER Working Paper No 7833.
- <sup>18</sup> See Comin, D. and B. Hobijn (2010), “An Exploration of Technology Diffusion”, *American Economic Review*, Vol 100(5), pp. 2031–59.
- <sup>19</sup> See McKinsey Global Institute (2017), “A future that works: Automation, employment, and productivity”, January.
- <sup>20</sup> See, for example, Pellens, M., B. Peters, M. Hud, C. Rammer and G. Licht (2018), “Public Investment in R&D in Reaction to Economic Crises – A Longitudinal Study for OECD Countries”, ZEW Discussion Papers No 18–005, Centre for European Economic Research.
- <sup>21</sup> See McKinsey Global Institute (2016), “Digital Europe: Pushing the frontier, capturing the benefits”, June; and McKinsey Global Institute (2015), “Digital America: A tale of the haves and have-mores”, December.
- <sup>22</sup> See e.g. Cœuré, B. (2017), “Productivity and Growth: Innovation and Diffusion”, introductory statement at the session “Revitalizing the Global Economy”, Davos, 20 January.
- <sup>23</sup> See Cœuré, B. (2014), “Structural reforms: learning the right lessons from the crisis”, speech at the Economic conference, Latvijas Banka, Riga, 17 October.
- <sup>24</sup> Indeed, according to one widely-used estimate, the neutral rate for the euro area has been revised up over the past three years. See Holston, K., T. Laubach and J. C. Williams (2016), “Measuring the Natural Rate of Interest: International Trends and Determinants”, Federal Reserve Bank of San Francisco Working Paper 2016–11.