Economic recovery with little inflation acceleration: Transitory or structural change?
- Andrew HUGHES HALLETT -
MONETARY DIALOGUE
February 2018

In-depth analysis for the ECON Committee
An economic recovery with little sign of inflation acceleration: A transitory phenomenon or evidence of a structural change?\textsuperscript{1}

IN-DEPTH ANALYSIS

Abstract
This paper investigates the possibility that there has been a structural shift in inflation (upward) in the euro area since the recovery in 2014 or 2015. From the perspective of policy, it is important to be sure that any such shifts are significant statistically, sustained or likely to be sustained (durable) over the near future, and are evenly distributed over the member economies so that no one of them is damaged by anti-inflation measures taken to help the others.

We approach the problem in two steps: we first examine the circumstantial and informal evidence, and then conduct formal statistical tests for structural changes in euro area inflation in 2015 or 2016. We find no evidence of a structural change under the four criteria mentioned. The even distribution of inflation criterion is the closest to being satisfied, but the other three are far from satisfied in any formal sense. There was a brief acceleration in inflation in mid-2016 towards 2\%, but it flattened out in 2017 and has been constant at 1.5\% ever since. Core inflation was constant at 0.9\% throughout.

The question is why has there been no inflation in the recovery and how long is that likely to last? In a third step, we explain how low growth in real wages and self-reinforcing low productivity growth produces slow output growth and low inflation. This model fits the data pretty well, down to the lack of labour and total factor productivity and to substituting cheaper labour for excess capital stock. It implies a fall in investment spending (also seen in the data) which in turn extends the period for which low productivity-low inflation outcomes apply.

\textsuperscript{1} I thank David Hughes Hallett and Marie-Claire Murphy for their help with the structural break tests in section 3.
This document was requested by the European Parliament's Committee on Economic and Monetary Affairs.

**AUTHOR(S)**

Andrew HUGHES HALLETT,  
Department of Economics, Copenhagen Business School, Frederiksberg, Denmark

**RESPONSIBLE ADMINISTRATOR**

Dario PATERNOSTER

**EDITORIAL ASSISTANT**

Janetta Cujkova

**LINGUISTIC VERSIONS**

Original: EN

**ABOUT THE EDITOR**

Policy departments provide in-house and external expertise to support EP committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

To contact Policy Department A or to subscribe to its newsletter please write to:  
Policy Department A: Economic and Scientific Policy  
European Parliament  
B-1047 Brussels  
E-mail: Poldep-Economy-Science@ep.europa.eu

Manuscript completed in February 2018  
© European Union, 2018

This document is available on the Internet at:  

**DISCLAIMER**

The opinions expressed in this document are the sole responsibility of the author and do not necessarily represent the official position of the European Parliament.

Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the publisher is given prior notice and sent a copy.
CONTENTS

EXECUTIVE SUMMARY 4

1. INTRODUCTION 5

2. INFLATION TRENDS AND STRUCTURAL CHANGE TESTS 7
   2.1. Inflation trends by country 7
   2.2. Core inflation and inflation forecasts 7

3. SIMPLE TESTS FOR STRUCTURAL CHANGE 9

4. WHY HAS THE RECOVERY NOT PRODUCED A MATCHING STRUCTURAL CHANGE IN INFLATION? 11

5. LONGER TERM IMPLICATIONS OF SLOW PRODUCTIVITY GROWTH, LOW INFLATION RECOVERY 14

6. CONCLUSIONS 18

REFERENCES 19
EXECUTIVE SUMMARY

The question posed in this paper asks us to test whether the uptick in euro area inflation, observed in the slow recovery since the great recession, now constitutes a permanent state of affairs (a “new normal”) and therefore warrants a new policy stance from the ECB on a permanent basis: a degree of monetary tightening to offset the extra inflation to be expected in the future.

It is therefore necessary to establish (test formally) whether this observed increase in the inflation rate is transitory; or whether it constitutes a structural change – that is, be expected to continue indefinitely at the higher rate observed in 2016-17 and ultimately to settle at or above the ECB’s 2% inflation threshold that would normally trigger a change in policy.

Thus, from the perspective of policy, it is important to be sure that any shift in inflation is a) significant statistically, b) likely to be sustained into medium term and prove durable thereafter, and c) be evenly distributed so that the low inflation economies are not unfairly penalised by the measures taken to help those who have caused the inflation.

Circumstantial evidence and informal tests show that there was a brief acceleration in inflation in mid-2016 towards 2%, but it flattened out in early 2017 and the proximity to 2% was lost. Inflation since then has been constant at 1.5%. Moreover core inflation was constant at 0.9% throughout, which demonstrates that inflation itself was mostly generated externally, not by the recovery. It is therefore doubtful if this inflation episode could be classed as a suitable candidate for a policy change.

What accounts for the weak price dynamics so far? It appears that low growth in real wages has led to substantial increases in (mostly) low skilled employment. That then implies slow productivity growth and consequently slow output growth and low inflation.

It turns out that this model fits the data rather closely, down to the lack of labour productivity growth and low total factor productivity. It also implies the advanced economies have been substituting now cheaper labour for the excess capital stocks of the past.

As a result, some of the inefficiencies caused by excessive capital are being worked off which will help the euro area economies in the long term if this process is allowed to continue. It is also true that the euro area is not alone in this situation; the same process has been unfolding in all the advanced economies to a greater or lesser extent (although the euro area is not among the better performers in this regard). This may be cold comfort, but it is some comfort.

Hence, it is unlikely that the subdued inflation and weak wage dynamics are due to excess capacity (or slack) in the euro economy as a whole (as opposed to in the labour market per se). Instead it would require changes in the wage setting process and/or productivity growth to effect a significant change, unless changes appear elsewhere in the economy. This seems improbable because one of the implications of our low inflation, low productivity growth argument is a fall in investment spending (also seen in recent data). That then extends the period for which low productivity-low inflation outcomes would apply.
1. INTRODUCTION

Inflation in the euro area has not been significant, from a policy perspective, for the past decade – that is, since the financial crisis began to have an impact at the end of 2008 (Figure 1; all items index). Rather, the main concern was the prospect of too much disinflation (after 2011) and then actual deflation through 2015-16.

However, the euro area’s gradual recovery starting in 2015 has generated a small recovery in inflation starting in 2016, accelerating from August 2016 to February 2017, then roughly steady to April 2017 before decelerating again to the end of 2017 (Figure 2). But the numbers are small. Inflation, at the peak of the 2016-17 increase, only just touched 2% before drifting back to 1.5% by May 2017 until the end of that year. So, while it is fair to say that economic recovery in the euro area has led to an increase in inflation, that increase has been small, has remained within the ECB’s target of 2% or less and was not sustained. Hence, on a superficial look at the data, it would be hard to argue that there had been a structural change. We test that proposition directly in the next section.

Figure 1: Euro area inflation and its components, a longer perspective (2007-2017)

![Graph showing Euro area inflation and its components from 2007 to 2017](source)

Source: Eurostat.

Figure 2: Euro area inflation and its main components (% year-on-year), December 2015-November 2017

![Graph showing Euro area inflation and its main components from December 2015 to November 2017](source)

Source: Eurostat.
A second point is that there is a fairly clear correlation between the euro area inflation rate in Figures 1 and 2, and inflation in energy prices and to some extent food prices. But there is no corresponding correlation between inflation and industrial goods or services prices. This is important because energy is mostly imported, as is food to a significant degree. Hence the principle factors driving inflation are external, rather than internally generated. That puts them beyond the ECB’s immediate control; imported inflation could be a signal of increasing competitiveness.
2. INFLATION TRENDS AND STRUCTURAL CHANGE TESTS

2.1. Inflation trends by country

Inflation had reached 1.5% by the end of 2017. However three points about that increase:

i) it still falls short of the 2% Euro-wide target, the mandated ECB target;

ii) it is unclear if this inflation was caused by the recovery; more likely it was caused by external factors such as the recovery in energy prices in 2017, occasional food price spikes and wage bargains in Germany;

iii) the inflation increases were distributed unevenly, 0.8% in the average Euro economy in 2016, but 1.7% in Germany (1.5% in France, 1.0% in Italy, 0.9% in Spain, 0.2% in Greece, 0.1% in Ireland).

Inflation rates since then have tended to converge. Euro area inflation touched 2.0% in February 2017; but then fell back to 1.5% in April (remaining there for the rest of that year), and is forecast by the ECB to remain in the 1.4%-1.8% range until 2022. Likewise, inflation in Germany briefly reached 2.2% in February 2017 (Figure 3), but fell back to 1.5% in March and 1.8% in November. In Italy, it fell to 0.9% in March and stayed there; in Spain from 3% to 1.7%; and in France it fell to 1.2% from 1.5%.

Figure 3: Inflation rates by country in the euro area, 2007-2017

![Inflation rates by country in the euro area, 2007-2017](image)

Source: OECD

2.2. Core inflation and inflation forecasts

We now examine recent developments and forecasts for core inflation in the euro area (Figure 4). Core inflation itself has moved very little in the past two years, apart from a small uptick from 0.9% to 1.2% in 2017. This has now been fully reversed and is evidently

---

2 These figures are for December 2016 (Datastream).
not expected to reappear. Nor do Eurostat’s current forecasts give any reason to suppose that the existing core inflation rate, 0.9%, is likely to change in the near future. The initial part of the uptick in early 2017 is probably due to food price increases (see lower left panel, Figure 4); but the second part would have to be an internal matter, such as a period of increased wage settlements in Germany, since energy prices are stripped out of the core inflation measure. As a result, the forecasts of actual inflation (top right) show that inflation is not expected to increase either. In addition, despite the uptick, the month-on-month figures show no trend tendency (or forecast tendency) to increase. Again, there is no evidence for a structural change here.

**Figure 4: Core inflation and forecasts in the euro area**

![Core inflation and forecasts in the euro area](image)
3. SIMPLE TESTS FOR STRUCTURAL CHANGE

To perform more formal direct tests for a structural change in euro area inflation outcomes, we conduct a series of regressions on monthly euro area data starting from January 2011 to December 2017 inclusive. The regressions are specified as follows:

\[ \hat{P}_t = \alpha_0 + \sum_{j=1}^{m} \alpha_j \hat{P}_{t-j} + \beta t + \gamma D_t + \delta (\hat{P}_{t-1}, D_t) + \epsilon_t \]

where \( m=4 \), \( t=\) time trend, \( D_t = 1 \) if \( t \geq \) January 2015 (0 otherwise) is a dummy variable to detect a level change in trend inflation, and \( (\hat{P}_t, D_t) \) is the corresponding dummy to detect a slope change (an acceleration) in the inflation process, at any time since the start of 2015. Not all variables are included in each regression since we aim to pick up only the most significant. The results are displayed in Table 1, with t-ratios to allow tests of statistical significance for each factor in the inflation process and specifically for the structural change variables.

What does Table 1 tell us? There are three types of regressions to describe the evolution of inflation: a time trend (regression (1)); five autoregressive or lag processes (regressions (2) to (6)); and two direct structural change tests (regressions (7) and (8)):

i) Each has a constant term which is the most significant part of the regression for models (1) to (5), but a goodness of fit (Adj. R²) statistic less than half that of those in regressions (6) to (8). This suggests that the constant (intercept) term is a standing proxy for some other significant factor/factors not yet represented in regressions (1) to (5).

ii) The time trend in the data is strongly significant, but negative – as can also be seen in the actual data (blue dots) in Figure 5. It is negative until December 2014, and not positive until May 2016 (and not positive enough to outweigh the negative trend up to 2014). It would therefore be premature to expect a structural change to positive trend inflation (as opposed to occasional positive values) after the long negative trend.

iii) There is strong (cyclical) serial correlation in the residuals of this regression, evident in the scatter plot of the residuals in Figure 5. So the coefficients in time trend regression are likely to be poorly determined, which calls for alternative specifications. Interestingly though, the scatter plots of the observations and residuals show a tendency to converge after 2014 (without coinciding) which implies inflation is returning to an underlying pattern of behaviour rather than a new trend. A structural change seems relatively unlikely.

iv) The lag models, (2) to (6), show very similar results, if slightly improving with lag length. The trend effect is still negative but significant. There is not much that is new to be learned from these models, except that nothing is gained if several lags are used together (although the proxying role played by the constant term vanishes in that case).

v) The two structural change tests, models (7) and (8), are rejected. Both the level change test and slope change (acceleration) tests return weak and strongly insignificant results – though the changes would have been positive, had there been any significant evidence for them.

The implication of these tests is therefore that inflation has not been subject to a change in price dynamics, merely to a continuation of past trends (since 2011 at least).
Table 1: Trends and structural change, euro area inflation, Jan. 2011-Dec. 2017

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>2.42</td>
<td>2.49</td>
<td>2.56</td>
<td>2.63</td>
<td>2.71</td>
<td>0.31</td>
<td>-0.052</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(13.23)</td>
<td>(13.43)</td>
<td>(13.67)</td>
<td>(13.90)</td>
<td>(14.22)</td>
<td>(0.78)</td>
<td>(0.86)</td>
<td>(0.63)</td>
</tr>
<tr>
<td>time</td>
<td>-0.275</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.39)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{t-1}$</td>
<td>-0.029</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.68)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{t-2}$</td>
<td></td>
<td>-0.030</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{t-3}$</td>
<td></td>
<td></td>
<td>-0.031</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(8.31)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{t-4}$</td>
<td></td>
<td></td>
<td></td>
<td>-0.037</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(8.70)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_t$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.101</td>
<td>(0.66)</td>
</tr>
<tr>
<td>$P_{t-1}, D_t$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.010</td>
<td>(0.22)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.395</td>
<td>0.417</td>
<td>0.441</td>
<td>0.463</td>
<td>0.489</td>
<td>0.950</td>
<td>0.955</td>
<td>0.953</td>
</tr>
</tbody>
</table>

Source: Own calculations, OECD CPI-inflation data, t-ratios in brackets. Dependent variable, current inflation $\hat{p}_t$. 

Figure 5: data points for table 1
4. WHY HAS THE RECOVERY NOT PRODUCED A MATCHING STRUCTURAL CHANGE IN INFLATION?

In contrast to all the recoveries over the past six decades, all of which were heavily criticised for being “job-less” and slow to take effect, the most striking features of the recent recovery have been the rapid reductions in unemployment, apparent immutability of real wages and persistently slow growth in output levels. In fact, this recovery appears to have been the antithesis of those that went before: employment was quickly restored to full employment (pre-crisis) levels; unemployment rates fell to broadly full employment levels very soon after; output started to grow at 1%-1.5%, but unlike in previous recoveries failed to speed up from there; and real wages failed to increase at all (in fact, at times, they decreased by a small amount in several economies).

To be fair, this has been a feature of many (if not most) of the advanced economies, not just the euro area. Nevertheless, the essential message is the same in the euro area as elsewhere. With wage settlements subdued or static under the high unemployment resulting from the recession itself, and with limited prospects of rapid growth in the near future, short term low wage contracts would seem to be a less risky and more flexible alternative to large capital investment projects so long as output growth remains slow or uncertain. In effect, the choice became to substitute relatively cheap labour (in real terms) for relatively expensive capital – especially when, in previous years in a number of euro area economies, an inexorable rise in unit labour costs had led to an overinvestment in (the then relatively cheap) capital at the expense of labour.

However, there is a catch; once this process has set in, a reinforcing mechanism comes into play. So long as there is little upward pressure on wages (likely to be true at the semi- and unskilled ends of the labour market), it will remain attractive to employ extra labour rather than invest in new capital. But if the extra employment grows at the same rate or nearly the same rate as output (also likely in this context), or possibly faster, labour productivity will be static, very slow growing or possibly falling. Slow growth, no growth, or declining growth in productivity makes it very hard to justify any growth in wages: which in turn projects the incentives that created this mechanism in the first place further into the future and ensures that it continues.

There is no “productivity puzzle” here as some have claimed. Instead we see the inevitable consequences of correcting relative input prices in the production process. But what might appear to be a natural correction to the distortions of the past is going to be hard to escape because of the self-reinforcing mechanism identified above. That is then the explanation of the absence of structural change to the higher rate of inflation that we might have otherwise expected as the recovery took hold. And given the self-reinforcing mechanism, the absence of a structural change is likely to continue for a while.

How does the data look? Does it support this explanation of the lack of a structural change to higher inflation rates in the euro area? Figures 6 and 7 show that it does. Figure 6 shows both labour and total factor productivity (TFP) growth in the euro area since 1999. Both fell sharply in the great recession in terms of average growth rates. But, despite a noticeable recovery thereafter, their post-recession growth rates are now, on average, still only half to three-quarters of their pre-recession (1999-2007) levels. That, projected over a period of time, is quite a reduction.
Figure 6: Euro area productivity growth

Figure 7: Labour productivity growth in the euro area, vs. the world and regions

Figure 7 reinforces this point at least for labour productivity (but labour productivity is the central issue in this analysis). A secular decline in euro area productivity has clearly been in evidence since 1997, but it has been reinforced since 2006 and into the great recession. In fact, and unfortunately from the point of view of competitiveness, the euro area’s productivity growth is the weakest in this diagram – not far behind the US and other advanced economies perhaps; but clearly below the world average, and significantly below that in the emerging market economies.

There also evidence of misallocation of inputs into production in the lead up to and into the great recession, sufficient to warrant undoing the inefficiencies of a distorted balance of inputs when the great recession triggered changes in relative input prices. Unfortunately, we do not have complete data to support that contention beyond doubt. But Figure 8 shows increasing over-allocations of capital in a number of economies, if not a majority, over the years up to 2013 according to the calculations made by ECB (2017). This was most marked...
in Finland, Italy and Belgium; but they are still significant (a 20% increase over 10 years) in France and Spain.

**Figure 8: Capital and labour misallocations in euro area economies, 2002-13**

This sets the starting point for, and is entirely consistent with, our hypothesis of a “job-rich” recovery with low real wages, low productivity growth, slow output growth and no structural change in inflation. Labour misallocations, by contrast, appear to have been small over the same period and on average (rising slightly in 2007, falling in 2012-13), but show nothing on the same scale as the corresponding capital misallocations – which completes the story.

Notice that the precepts and implications of this model of the recovery are the direct opposite of those assumed in Basu et al’s (2006) model of the short run impact of technological change on output and factors of production. First because, once productivity is endogenized (if only partially) as here, causality can flow both ways: from technology/productivity changes to the choice of factor inputs and output; and from the choice of inputs and relative prices to the productivity outcomes. The Basu et al model lacks this second interaction channel and may give biased results. Second, Basu et al do not allow for recessions or recoveries which leads to assumptions that are inconsistent with the circumstances of this paper. Capital and labour inputs are considered to be fixed, with serious adjustment costs. Whereas utilisation of capital might vary with output to an extent, an effectively fixed labour supply means hours worked and labour effort have to vary – which leads to a “shift premium” (a premium on real wages) on wages to balance rises in demand for labour against a quasi-fixed supply. The key link is between the shift premium in wages and hours worked reflecting both effort and capital utilisation. The upshot is rising real wages and very little employment increase in a recovery – exactly opposite to what we have seen in the Eurozone, where labour supply has evidently been very responsive.
5. LONGER TERM IMPLICATIONS OF SLOW PRODUCTIVITY GROWTH, LOW INFLATION RECOVERY

Investment in a low wage world: Now we come to the undeclared “elephant in the room”: investment. If low real wages have been induced by the fear that firms will otherwise invest in automation, or might otherwise “export” jobs to a cheaper location or country, then capital investment will necessarily be restricted – in particular, productivity enhancing investment, including that which demands a greater use of skilled labour, will be reduced. Productivity growth, both that which comes from a greater use of capital (capital deepening) and that from new skills, techniques, rationalisation or more efficient organisation (TFP: total factor productivity), will be lower and future productive capacity (not to mention competitiveness) will be lost.

The implications of a low inflation, low real wages world for investment spending were already implicit in the relative adjustment of inputs discussion in section 4: the shift to low real wage growth, whether triggered by the fear of automation, globalisation, or a fear that the financial crisis would persist, would naturally lead firms to switch to employing cheaper labour over more expensive capital. This effect is corroborated by the data in Figure 9. Comparing the euro area and the US, net investment has been lower in the euro area for several years; certainly since 2000, but most obviously since the recovery started (after 2012). Moreover, capital deepening, which remained positive (just) in the US, is clearly negative in the euro area starting in 2014. More generally, employment has expanded (read downwards on the inverted scale) by more than capital deepening in both places – even to the extent of having outpaced the losses in capital deepening in the euro area. This confirms that there have been increasing substitutions of labour for capital, more so in the euro area than in the US.

Figure 9: Capital deepening in the euro area and the United States
Thus, this section is now arguing that there is an additional mechanism in which losses in investment spending will have further reduced productivity growth, and hence future output capacity and growth. This too can be seen in the data (see Figure 10). The same losses of capital deepening contributions to productivity growth are present; indeed, they vanish altogether in Europe in the recovery period (2013/16) and are small in the US. In addition, the labour productivity contributions in Europe drop through the recession itself while the TFP contributions turn negative. This is not observed in the US, but the contrast provides the clearest evidence so far of cheap, low productivity labour inputs being substituted for TFP-inducing capital inputs in Europe during the crisis – an effect extended by slow productivity growth from both labour and TFP sources, but nothing from extra capital, in the post-crisis recovery. Similar, but rather more positive results for capital investment, appear in the recovery period in the US.

To complete the picture, Figure 11 shows the development of euro area TFP (to go with euro area labour productivity in Figures 6 and 7) over time and compared other advanced economies. Slow TFP growth in Europe is certainly not a new phenomenon, and has not been eliminated in the post-crisis recovery although the margin by which Europe lags the US may have reduced a little. Europe seems to lag a number of other economies too.
Two further implications which may play a role:

1) Harris (2002) outlines a mechanism in which the form of exchange rate regime between economies affects investment spending and the productivity dynamics in those economies, and hence the capacity or likelihood that there will be a structural change in inflation rates. Ultimately this mechanism will not change any of the conclusions reached so far, but it may affect the size or strength of their impact. And it provides insight into what is needed for structural changes in inflation to appear.

The exchange rate mechanism operates as follows: faced with a cost advantage created by a currency depreciation, firms would feel little pressure to upgrade their plant, rationalise production, cut costs, increase efficiency or improve work practices. In addition, there is less pressure to exit poorly performing markets or enter new ones. Investment and consequent productivity growth will be lower than they might have been. Conversely, a cost disadvantage caused by a currency appreciation, or a real appreciation through rising domestic costs, will have the opposite effect. The depreciation of the euro in 2015/16 may therefore have been the origin of the slight increase in inflation in late 2016/early 2017 (Figure 2) and consequent slowdown in productivity growth in the same period (Figure 6).

But within the euro area, there are no currency depreciations/appreciations, only changes in relative costs leading to real exchange rate changes. The pressures to upgrade, invest in new work practices, in productivity enhancements, to cut costs, exit and enter new markets – or lack of such pressures in the case of falling relative costs under the structural reform policies associated with austerity programmes – still exist therefore. But they may be less obvious or immediate; and they will be slower to arrive, and may last much longer. The result, in the current circumstances, would be a tendency for the euro area economies to diverge rather than converge; and, if the austerity economies are in the majority, for productivity growth to slow down (a second-round effect to that in the previous paragraph).

Thus, when competitiveness falls below average (costs rise), firms will seek to upgrade and productivity will grow. But when competitiveness rises (domestic costs fall, especially if real wages are low and are likely to remain so) there is less pressure to innovate and productivity growth will be slow. Hence, to get structural change in inflation, you need
structural changes in cost inflation of one sort or another; otherwise inflation will remain low and productivity low. This conclusion adds to those in previous sections of this paper.

2) In an analysis of long-term fiscal sustainability, Hughes Hallett et al (2017) find that interactions between income inequality and the distribution of gains from productivity growth affect output growth and the level of public debt in the economy. Specifically, increases in the share of the gains from productivity growth that go to the private sector will lead to:

i) a lower level of optimal (output maximising) sustainable debt in the public sector;
ii) but, also, to higher rates of output growth – other things equal.

These desirable improvements in performance will ultimately have an effect on an economy’s inflation performance. But they are tempered by the fact that: a) increasing the share of productivity gains going to the private sector becomes less effective as a means to generate income growth, the more inequitably those incomes are distributed to start with; and b) it becomes even more ineffective, the greater is the share of productivity gains already going to the private sector. So: the distribution of productivity gains matters; but there are natural limits to how much that can be used to induce income or inflation changes in a desirable way.
6. CONCLUSIONS

The bottom line here is that there appears to have been no structural change in euro area inflation in its recovery over past three years. Nor has there been a change in the underlying conditions that would suggest that such a change in inflation has, should, or is likely in current circumstances to take place.

So it is not possible to argue that a material (significant) improvement has taken place in the ECB’s inflation objective since the recovery began that is:

i) sustained over the medium term;
ii) likely to be durable;
iii) internally generated (self-sustainable) in the sense that it would remain if monetary or other policies were to become less accommodating;
iv) that affects all euro area members rather than a few.\(^3\)

The evidence for that is simply not in the data (section 3); and there are too many extenuating circumstances in section 2 to suggest that evidence for those properties, desirable as they may be, is unlikely to emerge anytime soon.

A deeper analysis of the price dynamics underlying this continued low inflation environment, despite a recovery in production, showed the key factors to be persistent low real wages and low productivity growth (sections 4 and 5). Not only does that analysis explain the lack of structural change in inflation; it implies we should expect low inflation to continue into the near future. The key issue appears to be low productivity growth, leading to low investment spending driven by changes in relative prices for capital/labour inputs, and by capital misallocations in the past, and then to lower investment spending again because expectations for growth and future rates of return are reduced.

It would be hard to conclude that inflation had changed structurally until the various forces that underpin low real wages and/or low productivity are resolved or removed. At the moment there is no sign of that happening. However, the approach take here is rather general. It is entirely possible that real wage rises begin to spillover from the skilled labour market (where there may well be excess demand) to the labour market more generally (where, evidently, there is not). That would break this process and bring us back to a structural break in inflation, higher productivity and faster output growth. Similarly, a secular increase in productivity or increased competition in the markets for tradeables could do the same. By contrast, austerity, sharper financial regulation, and the threat that rising wages might make firms switch to investing in automation (causing real wages to fall again), will do the opposite. The impact of structural reform, on the other hand, is unclear: it represses prices but enhances efficiency, investment and productivity. These are all interesting and important extensions to the current paper, but require a more detailed investigation than can be achieved within the confines of this paper. Until that is done, the further outcomes of this recovery necessarily remain somewhat speculative.

Interestingly, as an aside, the argument in this paper illustrates the differences between the current recovery and that after the great depression in the 1930s. In the latter case, more attention was paid to reflations and the output side of the recovery. The result was a faster recovery, rising wages and productivity without obvious inflation. Other stabilising measures like financial regulation, and any fiscal restraints, were then fitted in afterwards.

---

\(^3\) This last criterion will likely be the first to be satisfied: Figure 3 shows that national inflation rates varied by factors of 2 to 4.5 in late 2017, with Austria and Belgium on one side vs. Italy and Ireland on the other. But national inflation rates had varied by factors of 17 or more just 18 months earlier.
REFERENCES


DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A
ECONOMIC AND SCIENTIFIC POLICY

Role
Policy departments are research units that provide specialised advice to committees, inter-parliamentary delegations and other parliamentary bodies.

Policy Areas
- Economic and Monetary Affairs
- Employment and Social Affairs
- Environment, Public Health and Food Safety
- Industry, Research and Energy
- Internal Market and Consumer Protection

Documents
Visit the European Parliament website:
http://www.europarl.europa.eu/supporting-analyses