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Searching for the Phillips curve

Silvia Dall'Angelo
Senior Economist

OUTCOME 14

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THE PUZZLE OF MISSING INFLATION

- Despite the recent acceleration in economic activity, inflation has been absent. This has led to questions about the robustness of the traditional Phillips curve framework, which is based on the relationship between inflation and resource utilisation.
- In general, the framework makes economic sense. However, its shortcomings could be due to poor estimates of its inputs. For instance, there might be more slack in the economy than generally believed.
- In addition, external factors might be responsible for masking the Phillips curve. Productivity growth has been slow since the global financial crisis, in turn curbing wage inflation.
- Also, globalisation and technological progress might have affected the structure of the labour market, likely resulting in downward pressures on wages. Labour has become more fragmented and commoditised in the last 10-15 years, weakening workers' bargaining power.
- In 2018, typical Phillips curve models for the US and the eurozone suggest that inflation will rise slightly. The US will probably take greater strides towards its official target in the next couple of years, while slack in the eurozone implies slower progress.

Global growth accelerated in late 2016 – but has left inflation behind

The recovery that emerged from the global financial crisis has been extremely slow and long by historical standards. In late 2016, the expansion entered a new constructive phase, featuring a synchronised upswing in global demand and, in turn, a pick-up in capital investment – an element largely missing from a recovery that had been mainly consumer driven. The current, positive mini-cycle has been sustained throughout 2017, helping to erode remaining slack in the economy. In most developed economies, there is arguably little slack left, with the eurozone being a notable exception.

Yet, inflation has been conspicuously absent. It has systematically run below official targets in most developed markets and, over the last year, has even retreated in places where the output gap has probably turned positive, such as the US. This has led to a renewed debate about the ultimate drivers of inflation, essentially prompting questions about the Phillips curve framework – which lies at the heart of central banks' models and reaction functions.

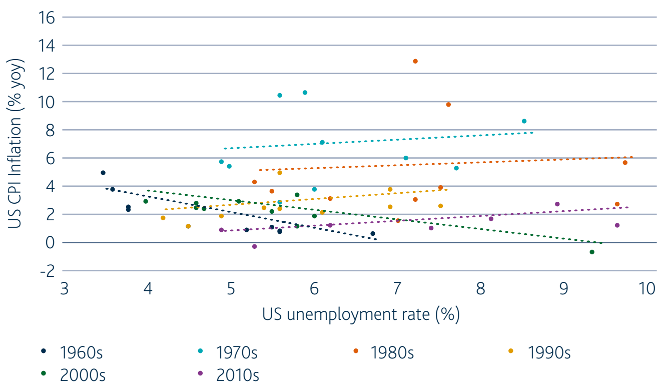
The slope of the Phillips curve has been elusive over time

In his famous 1958 paper, William Phillips parsed UK data between 1861-1957 to conclude that there seemed to be an inverse relationship between the unemployment rate and wage inflation. In its original formulation, the Phillips curve was a simple concept, based on an empirical observation. But the stagflation of the 1970s, in which both unemployment and inflation ran high, showed that the original Phillips curve construct was probably too simplistic, and more theoretical efforts were focused on developing versions that could better reflect the data.

Modern formulations include both short-run and long-run Phillips curves. The short-run version identifies a short-term inverse relationship between inflation (in wages or prices) and resource utilisation relative to potential (in the labour market or in output). Also, it includes inflation expectations. In the long run, the relationship becomes irrelevant as the unemployment rate converges to the non-accelerating inflation rate of unemployment (NAIRU), regardless of the inflation rate.

Since the start of the current recovery, the relationship between slack in the economy and inflation has been elusive, leading to speculation about the disappearance of the Phillips curve. Yet, as already suggested, **the relationship between unemployment and inflation has been hardly stable over time. The slope of the Phillips curve in its original and simplest specification has varied significantly over time** (see chart 1). Hence we might just be in a period when the relationship has temporarily loosened, possibly due to the extraordinary nature of the global financial crisis and subsequent recovery.

Chart 1. The slope of the Phillips curve in the US has been elusive over time (and the picture is similar across the G4)



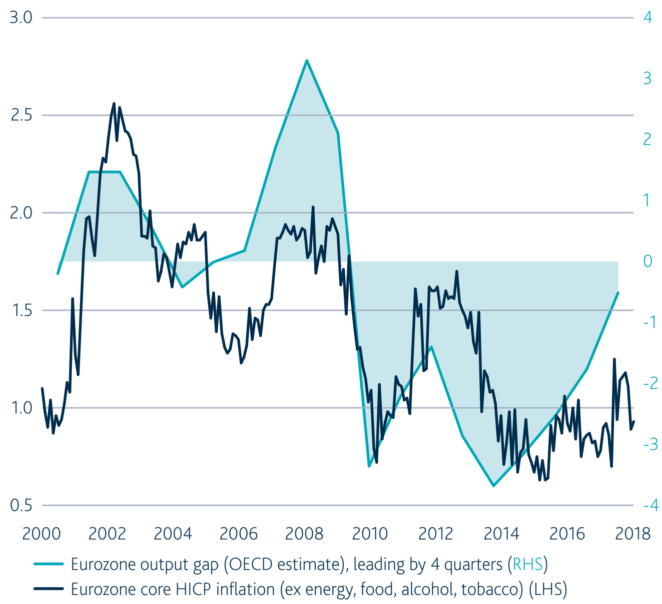
Source: Hermes, BLS as at 2016

Across economies, there might be more slack than meets the eye

The more complete specification of the Phillips curve includes variables that are not directly observable (slack in the economy) or are hardly measurable (inflation expectations). Therefore it implies a certain degree of uncertainty. It is possible that inflation expectations have slid because of increased confidence in the ability of central banks to prevent high rates of inflation and, more recently, because of the slump in oil prices, resulting in a downward shift in the Phillips curve. **It is also possible that there is more slack in the economy than generally estimated. The deep scars left by the global financial crisis and the slow recovery has resulted in a gradual, and perhaps incomplete, absorption of unused labour and resources.**

But volumes of spare capacity vary across economies. At this stage of the expansion it is hard to argue that there is much – if any – residual slack in the US economy. A range of estimates of the output gap in the US suggest that the economy is now operating at about potential. The situation is quite different in the eurozone, which was hit by two recessions in short order between 2008 and 2012. The output gap there is still quite large: the OECD estimates that it is currently running at about 1% of potential GDP, but it could be even larger (see chart 2). This is corroborated by measures of underemployment, which are still running high by historical standards, consistent with lingering slack in the labour market (see chart 3).

Chart 2. The output gap is still large in the eurozone, which explains subdued core inflation



Source: Eurostat, OECD as at November 2017

Chart 3. In the eurozone, there is more slack than GDP and employment data suggest

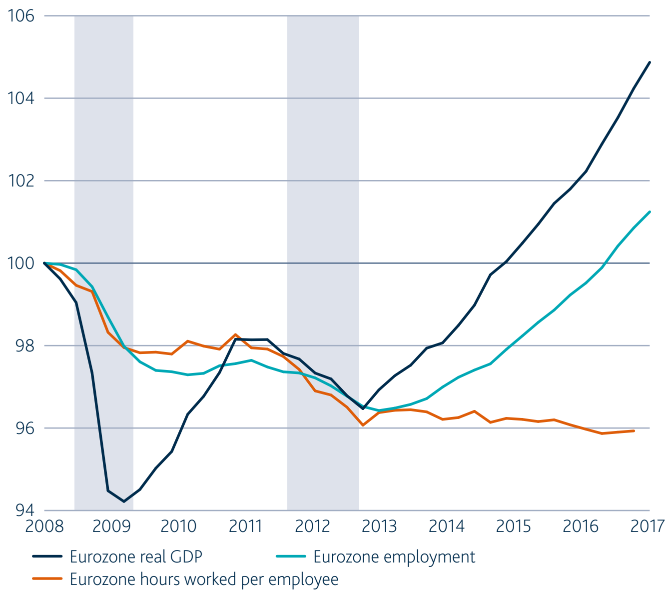


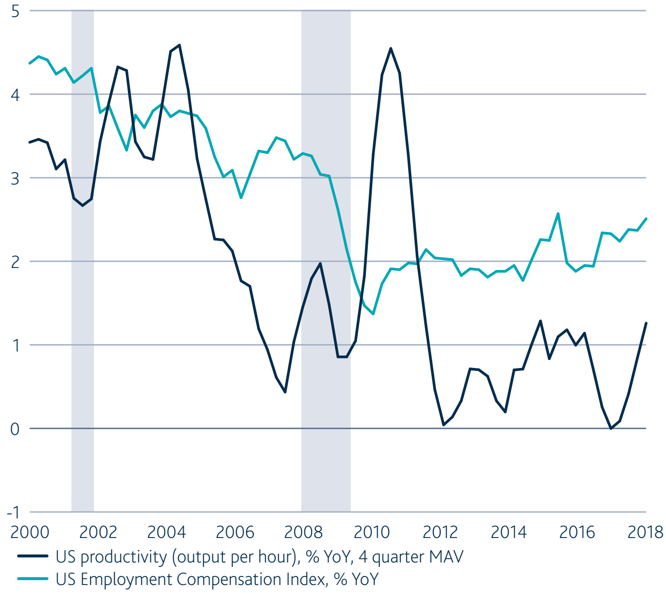
Chart rebased to Q1 2008=100. Source: Hermes, Eurostat as at Q3 2017

Other influential factors: low productivity growth and the changing structure of the labour market

Other external factors might also be responsible for masking or overriding the Phillips curve. First, **productivity growth has been slow across developed economies since the financial crisis and has failed to properly recover. This has curbed wage inflation** (see chart 4). According to some recent work by the European Commission, including productivity in a Phillips curve formulation used to explain wages, weak productivity has been an important factor in determining wage inflation in the US, while its impact in the eurozone has been relatively small overall[1].

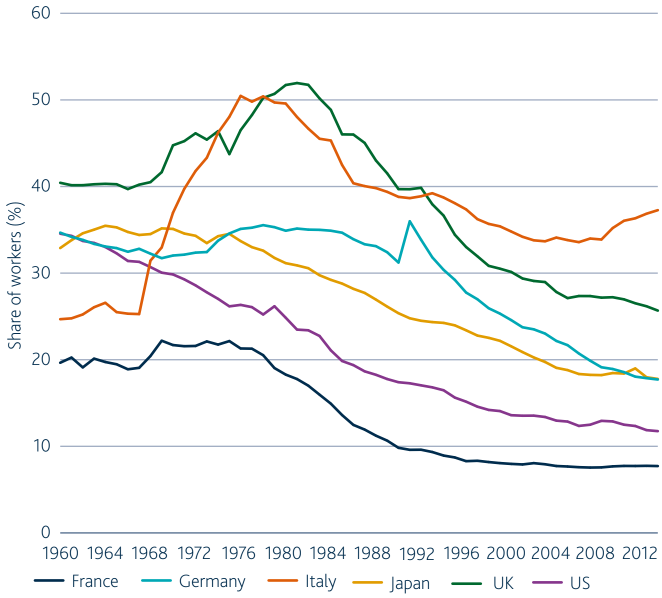
[1] Box 1.2: "What drives wage developments?" published by the European Commission in its Autumn 2017 Economic Forecast.

Chart 4. US wage inflation has been constrained by low productivity growth



Source: BEA, BLS as at Q3 2017

Chart 5. Workers' pricing power has weakened in the developed world: share of employment covered by union membership (collective agreements in the US)



Source: Amsterdam Institute for Advanced Labour Studies as at 2013

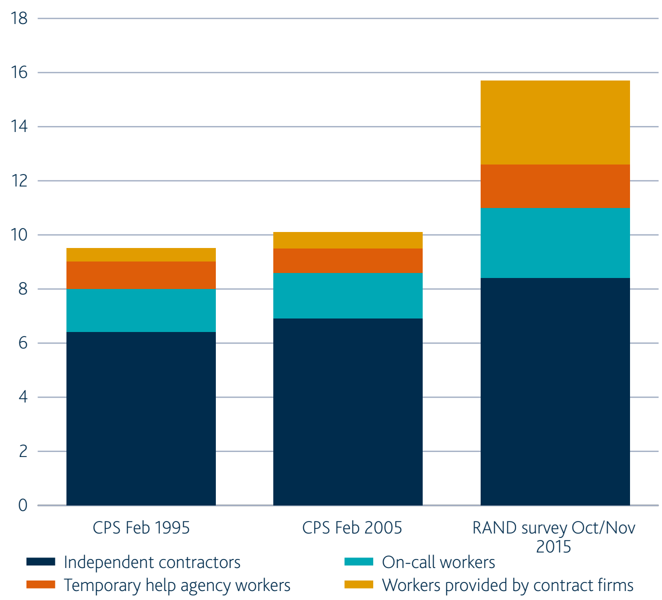
A more radical explanation for the apparent weakening of the Phillips curve framework concerns the impact of globalisation and technological progress on the price-formation process. Globalisation has affected wages by effectively widening the pool of available labour, either allowing for easier movement of workers or enabling outsourcing. Technological progress, meanwhile, might have impacted prices in different ways.

Some studies have focused on online retailing, finding that it has modestly influenced price pressures, at least so far[2]. However, new technologies – including robotic automation, platforms enabling on-demand use of labour, and analytical processes allowing workers to be efficiently matched with demand – are affecting the structure of the labour market, notably at the lower end of the skills spectrum. They have probably had a more significant impact on wages and prices in general.

Studies in this area are at an incipient stage and are primarily limited by the lack of data concerning this emerging phenomenon. Nonetheless, **a prominent feature in a range of new data series concerning labour markets across developed countries is the increasing fragmentation and commoditisation of labour in the last 10-15 years. This has probably negatively affected the bargaining power of workers, intensifying a trend that began to emerge in the late 1980s** (see chart 5).

In the US, a survey by Katz and Krueger showed a significant increase in the incidence of alternative work arrangements in the 10 years to 2015[3]. Alternative work arrangements as a share of employment rose to about 16% in 2015, having been fairly stable at around 10% in 2005 and 1995 (see chart 6). In particular, around 0.5% of employment now consists of workers providing services through online intermediaries.

Chart 6. Alternative work arrangements have increased significantly in the US in the 10 years to 2015



Source: BLS for 1995 and 2005 data, Katz and Kreuger for 2015 data. Last observation was made in 2015.

[2] See, for instance, the ECB Economic Bulletin, Issue 2/2015, Box 6: "Effects of E-Commerce on Inflation".
[3] "The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015," by Katz, Lawrence and Alan Krueger. Published in 2016.

In the UK, the Bank of England's Chief Economist, Andy Haldane, drew attention to the recent transformations in the labour market and their impact on wages in a June 2017 speech[4]. He mentioned recent studies suggesting that **alternative work arrangements – including self-employment, temporary and agency labour and zero-hour contracts – are typically associated with wage discounts in the range of 3%-15%.** He also noted that the overall potential impact on wages was likely to be larger when their influence on the pay of other workers is taken into account.

2018: a make-it or break-it year for inflation?

Let's briefly consider likely inflation developments for the year ahead. For all its limitations and the factors masking it, the short-run Phillips curve still makes economic sense as it predicts that prices need to adjust upwards as demand outstrips supply. That should become more evident in 2018 as the recent acceleration in activity starts to influence prices and the echo effect of the large and relatively recent drop in oil prices gradually fades. **Typical Phillips curve models for the US and the eurozone suggest that inflation will increase slightly this year, with the US making the greatest progress towards its official target**, defined for the Federal Reserve as a growth rate of 2% in the Personal Consumption Expenditures (PCE) price index. **Based on a Phillips curve approach similar to the one used by Fed Chair Janet Yellen[5], US core PCE inflation should average 1.8% in 2018, up from 1.5% in 2017** (see chart 7). Granted, special factors imply some upside risk this year. Base effects in the prices of telecommunication services and the recently announced increases in drug prices will provide some boost in Q1, jointly adding 0.2pp (or potentially more) to annual core PCE inflation.

Meanwhile, in the **eurozone, core inflation** – defined by the Harmonised Index of Consumer Prices (HICP) – **is also likely to keep gradually increasing this year, and possibly accelerate slightly in comparison with the last couple of years. However, given the abundant spare capacity in the economy, core inflation is likely to remain below target and edge up to an average of 1.2% in 2018, rising from 1% in 2017 and 0.9% in 2016.**

Chart 7. US core PCE inflation likely to increase in 2018, reversing the 2017 decline, but is likely to remain slightly below target

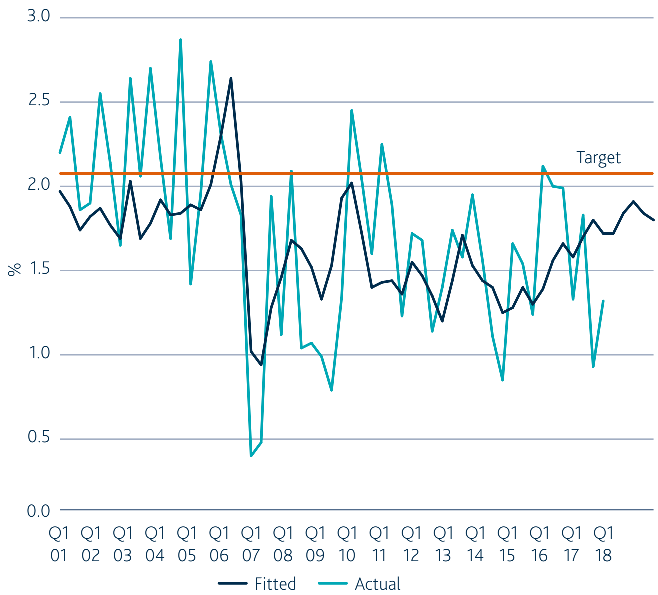


Chart shows US Core PCE inflation on a quarter-on-quarter seasonally adjusted annual rate. Actual and estimated values are based on a Phillips curve model. Source: Hermes, based on data from the BEA, BLS, CBO, Philadelphia Fed SPF and Census as at Q3 2017.

In general, runaway inflation looks unlikely in the near future – but for once there are upside risks. First, while domestically driven price pressures should re-emerge, China is unlikely to produce the same kind of global disinflation it did from the mid-1990s and other emerging markets are unlikely to take up that role in the short term. Second, automation and globalisation have created winners and losers, which partially explains the recent appeal of populist rhetoric to voters worldwide. It is hard to say whether that trend will persist, but these protectionist inclinations, if fully expressed as policies, have the potential to generate a surge of inflation – and the wrong sort of it.

[4] "Work, Wages and Monetary Policy," a speech by Andrew Haldane, delivered at the National Science and Media Museum, Bradford, in 2017.

[5] "Inflation Dynamics and Monetary Policy," a speech by Janet Yellen, delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, in 2015.

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