

## Core Matters

# Where has inflation gone?

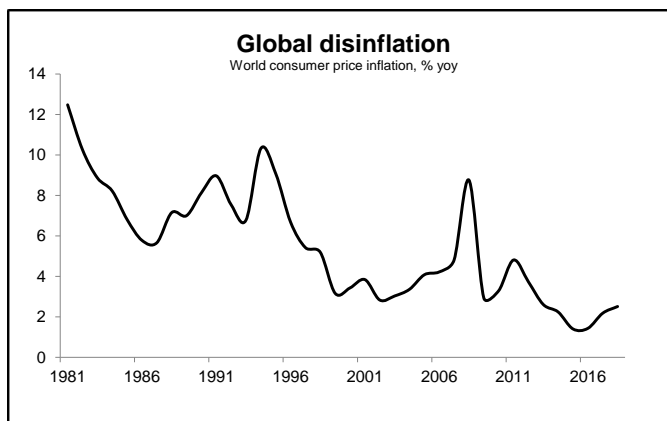
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- The protracted weakness of inflation during the past cyclical upswing caught central banks and investors by surprise.
- There are several, partial explanations for this phenomenon, ranging from the impact of globalization, changes in the structure of goods and labor markets to the success of central banks to keep expectations in check.
- As the business cycle softens and the risk of “lowflation” reappears, central banks need to rethink their toolbox for a world where inflation is likely to be permanently lower than in the past and increasingly driven by expectations.
- Sluggish inflation has raised fears of a “Japanification” of the US and especially euro area economies. However, we consider low inflation in Japan to be held up by special macro imbalances that do not apply to other countries.
- Too low inflation dents profit margins and equity returns, and slows down the reduction in the real burden of debt, even though low interest rates help solvency in the short term.

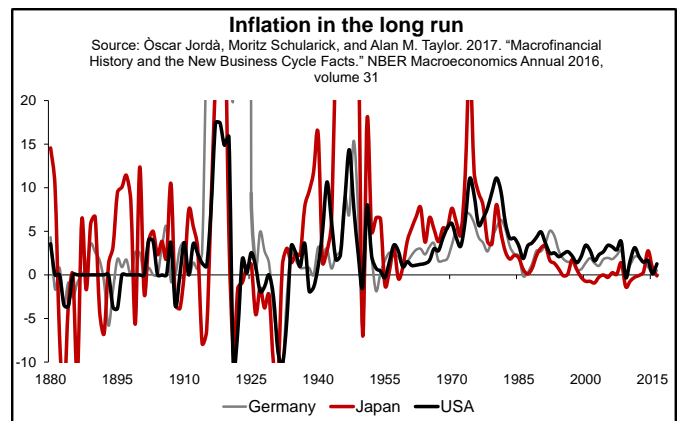
### Inflation falling and undershooting forecast

Over the past decades global inflation has been trending down. It averaged 8% yoy in the 1980s but stands at just 2.7% yoy in the current decade. Inflation is much lower in developed economies. Since 2011 it has hovered around 1.8% and 1.3% yoy in the US and euro area respectively, but only at about 0.3% yoy in Japan (excluding the sales tax hike in 2014).



Taking a longer (more than 100 year) horizon, current inflation looks much less volatile and more persistent. This is due clearly to the absence of large shocks (like the two world wars and the 1973 oil price spike) but also to monetary policy that, since the 80s is explicitly targeting inflation. Its level is similar to those prevailing in relatively stable periods (like the Pre-WWI years or the 50s-600s), with the notable exception of Japan, where it is near its post

WWII low. What stands out is the very long period of stable inflation.

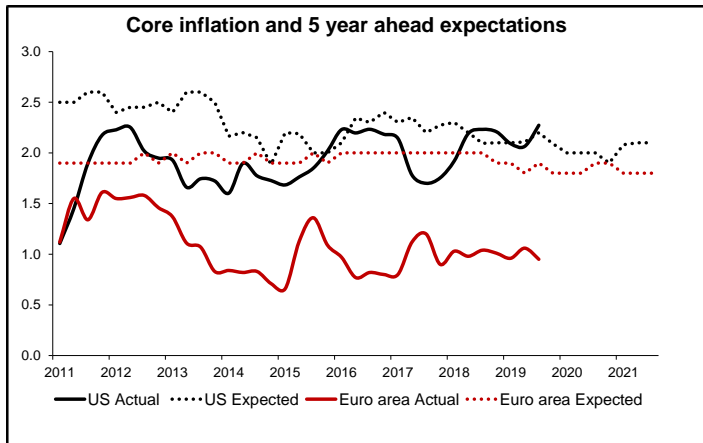


Up until the 2008 Great Financial Crisis (GFC), the stabilization of inflation within a narrow range around 2% was hailed as a success. Yet, since then central banks' failure to prop up inflation risks is eroding their credibility.

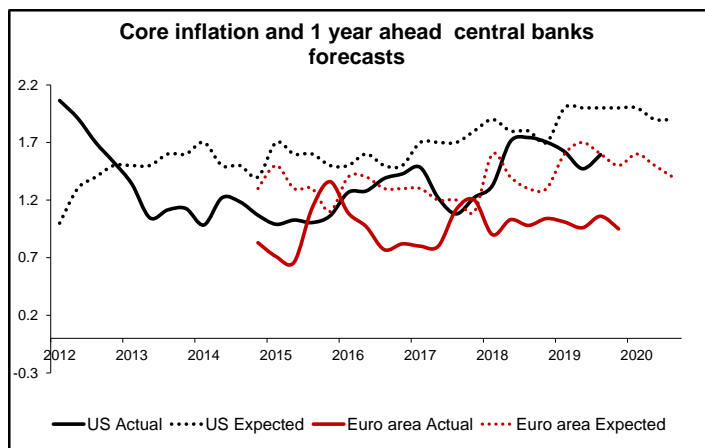
Against this backdrop, a key question for central bankers, firms, financial market analysts and households is whether inflation is ‘dead’ or not, i.e. whether the persistent undershoot of inflation targets is the new norm. If so, this would trigger a marked downward revision in expectations made by economic agents and financial markets, with bold repercussions on monetary policy, wage bargaining and financial asset pricing.

A lot of private and public resources are being devoted to forecasting inflation. Yet, the track record has generally

been rather poor over the past years. Looking at the surveys collected by the Fed and the ECB, it appears that professional forecasters did not even rudimentally anticipate the sluggish progression of inflation in the post crisis recovery in their long-term projections. This was especially true in the euro area where overestimation is close to one percentage point (pp). Moreover, somehow puzzling recent downward revisions in expectations have been minimal. Over the next five years period, core inflation (i.e. stripping out volatile components like fuel and food) is still expected to average 1.8%.



The systematic overestimation of inflation neither appears to be a matter of the forecasting horizon nor of the forecasters. Since 2015, one year ahead forecasts of core inflation made by the ECB have been on average 0.4 pp higher than the realized figure. Moreover, the ECB staff has almost constantly overestimated it since 2016, and does not seem to factor in the mismatch in forward projections.

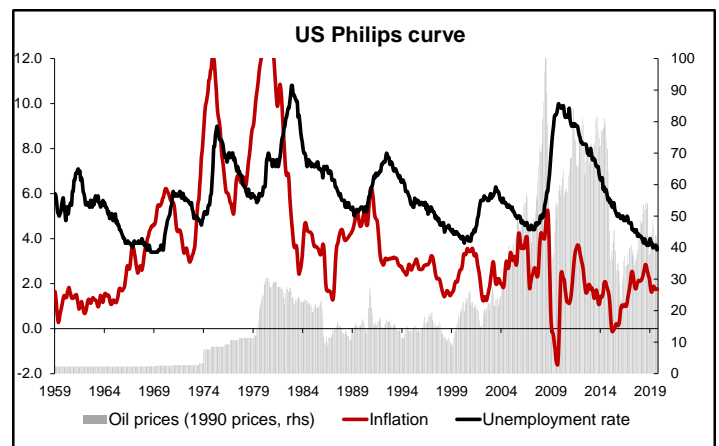


Financial markets are not doing particularly well in anticipating the inflation trend either. Starting in mid-2015, inflation expectations derived from inflation linked swaps (ILS) were systematically too high. Both in the US as well as in the euro area, ILS overestimated the average 5-year actual inflation by 0.6 pp since mid-2014, even though parts of this deviation may be attributed to risk and illiquidity premia.

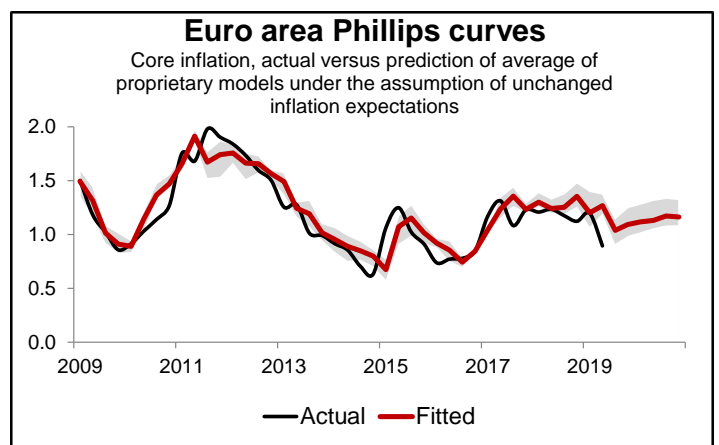
All in all, the widespread **poor performance of inflation forecasts casts doubt about the effectiveness of the models used to explain inflation. In other words, it is unclear whether** the traditional economic mechanisms driving inflation are still working or have seen a structural shift.

## Factors holding back inflation

The most popular way with which economists look at inflation is the Phillips curve. It is a simple economic model describing the inverse relationship between unemployment and the wage growth. When unemployment is low, firms tend to offer higher wages to attract workers. Higher labor costs are then reflected in higher retail prices and therefore, in periods of low unemployment inflation tends to increase. Of course, the state of the labor market is not the only driver of inflation; as empirical analyses show, other factors increasing firms costs (like commodity prices) have played a key role in explaining fluctuation in retail prices. Moreover, the level of inflation expected by firms and households influences price setting and wage bargaining, affecting actual inflation.



In the past, Phillips curve estimates have been able to explain the evolution of underlying inflation quite well.<sup>1</sup> However, its ability of fitting the data has dropped since 2017. Predictions from models for the euro area and the US systematically overshoot actual data.



Looking ahead, our models do not suggest a significant improvement of inflation dynamics over the next couple of years. Given the past undershooting of inflation and the latest economic weakening, there are even concerns that

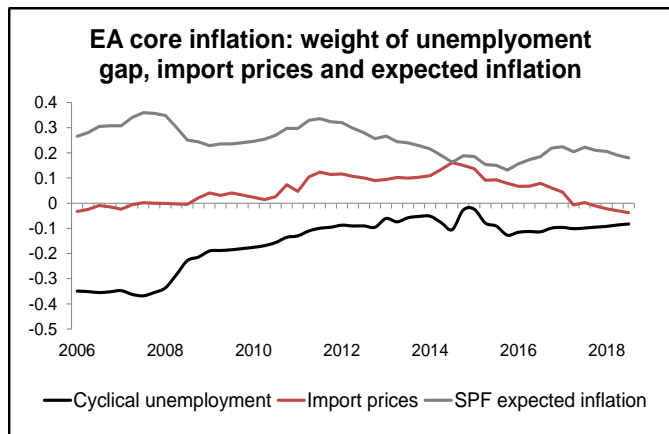
<sup>1</sup> See also [Bobeica, Elena and Sokol, Andrej \(2019\): Drivers of underlying inflation in the euro area over time: a Phillips curve perspective. In: ECB Economic Bulletin 4/2019, 87 – 106](#) who report on the basis of 550 estimated Phillips curves that the explanatory power fell since mid-2017. This conclusion also stays unchanged if alternative measures of labor market slack are incorporated.

core inflation might embark on a weakening path into dangerously low territory. More fundamentally, structural changes might play a role, augmented by the current, less favorable macro environment.

### a. Reduced responsiveness to economic slack

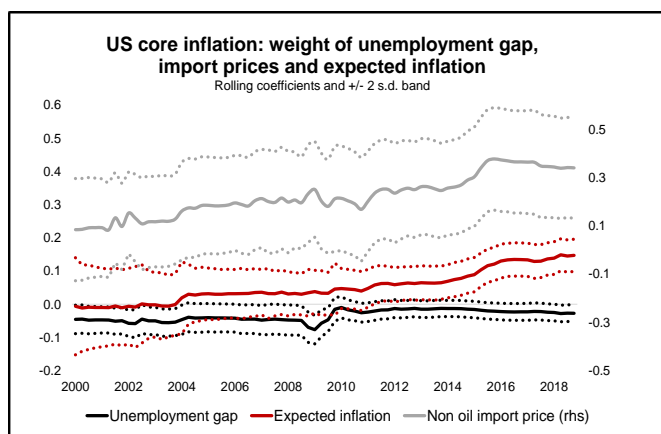
One possible reason for the failure of the Phillips curve to predict inflation is that its parameters may have changed over time as a consequence of structural changes in the economy.

In order to test this, we estimated Phillips curves for US



and euro area core inflation, considering a standard specification which includes labor or economic slack (deviation of GDP or unemployment rate from their equilibrium values), lagged and expected inflation as well as non-oil import prices, using rolling samples. Rolling regressions reveal significant **changes in the key parameters underlying the Phillips curve estimates**: the reaction of inflation to economic slack is getting smaller over time in both the euro area and the US<sup>2</sup>. This implies that fluctuations in demand have now less power in determining inflation.

In the US the weights of expectations and imported inflation have grown over time. In the euro area, less sensitivity to the labor market as well as to import prices has raised the relative importance of expected inflation since 2014.



Hence, models show a **growing importance of inflation expectations for future inflation suggesting that generating inflation is more and more a “psychological challenge”**.

Another approach takes into account the state of the business cycle when assessing firms’ price-setting behavior. Lansing<sup>3</sup> for instance suggests including as explanatory variable a so called interaction variable defined as the multiplicative combination of the inflation rate and the output gap. The rationale is that firms chose to adjust their prices more frequently when inflation is higher and vice versa. For the US, he finds a more stable coefficient for this adjusted output gap than elsewhere. Applying this idea for the euro area yields a systematically lower response of inflation to the output gap with respect to the standard Philips curve, but the prediction for the period since mid-2017 are still higher than the actual values. When defining the interactive term by means of the output gap and expected inflation (we tried the Survey of Professional Forecasters (SPF) expectations for 1Y, 2Y, 5Y) the gap becomes smaller. In the end, these considerations suggest that **a long period of low inflation leads consumers and firms to lower their expectations, which in turns pushes down inflation**.

### b. Globalization of inflation

The sharp increase in the size of the import price coefficient in the US rolling Philips curve points to another phenomenon which is being widely discussed: the globalization of inflation.

Global economic integration has been increasing over the past decades. As a result, it may well be that domestic economic conditions lose importance in the explanation of inflation. This approach has been very much emphasized by the Bank for International Settlements (BIS).<sup>4</sup> Its research finds evidence that the expansion of global value chains, - including cross-border trade in intermediate goods and services – is an important channel through which global slack impacts domestic inflation. As a consequence, the sensitivity of domestic inflation to the global output gap increases.

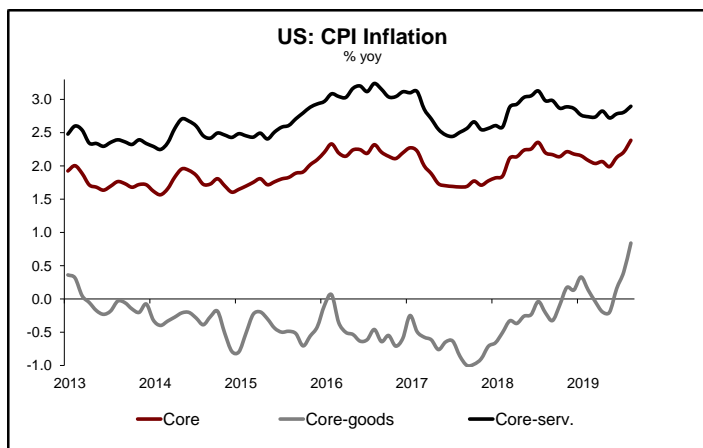
The recent price evolution in the US shows how important trade liberalization has been in containing inflation. The recent surge in core inflation coincided with the coming into force of the steep rise in tariffs on Chinese imports. While it is true that these effects will wane over time, the risk is that deglobalization will lead to higher prices, as the effect of tariffs and of a less efficient reallocation of the parts of global value chains in the longer run will vanish. This is particularly important given that protectionism, especially against China and other low cost producers enjoys bipartisan support. The programs of some of the leading candidates to the Democratic primaries contain measures to scale back free trade.

<sup>2</sup> See also BIS (2017): ‘87th Annual Report, 67-68, IMF (2013): ‘. The dog that didn’t bark: has inflation been muzzled or was it just sleeping?’, Chapter 3.

<sup>3</sup> Lansing, Kevin (2019): [Improving the Phillips Curve with an Interaction Variable](#). FRBSF Economic Letter 2019-13.

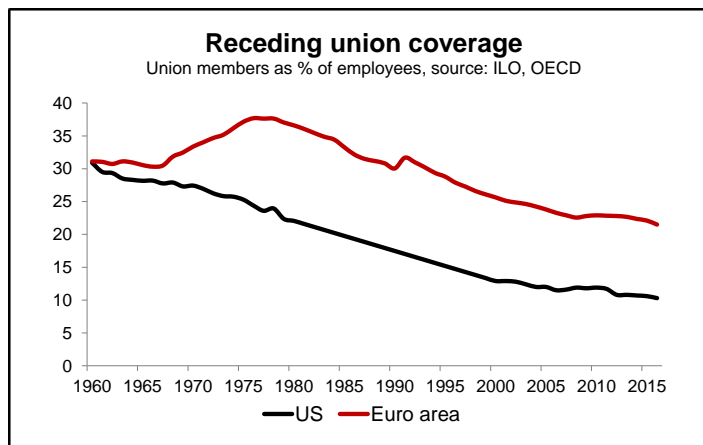
<sup>4</sup> See Auer, Raphael, Borui, Claudio and Filardo, Andrew (2017): [The globalization of inflation: the growing importance of global value chains](#). BIS Working Papers No 602.

However, an additional ECB<sup>5</sup> paper finds only very limited support for the inclusion of measures of foreign slack into traditional Phillips curve analyses. Moreover, over the past years the euro area output gap was below measures for the global one suggesting that if anything global factors should have provided upward pressure from global factors on euro area inflation. All in all, while **global factors of inflation may be at work, they are not able to fully explain the surprising weakness in underlying inflation either.**



### c. Decrease in workers' power

As a third reason, it might very well be that changes in the labor market altered the transmission of slack to prices. Therefore, the lower responsiveness of inflation to the labor market is a mirror image of another trend, the decline in labor's share of total income observed since 2000. In the case of the US, it fluctuated around 61%, then started to fall and averaged 57% over the past ten years. In the euro area a similar development could be observed. This development might very well be related to a declining share of union member workers in all employees (union coverage) going hand in hand with reduced bargaining power. Likewise labor market reforms – especially some euro area economies like Germany and, in response to the euro crisis, Spain, Italy and Portugal – have probably also weakened unions' bargaining power.



<sup>5</sup> ECB (2017): Domestic and global drivers of inflation in the euro area. ECB Economic Bulletin 4/2017, 72-96.

This might help to explain subdued wage growth but not necessarily why wage growth did not contribute to price inflation. In the euro area for instance the correlation between wage growth and core inflation was 0.68 in the 2000 to 2016 period but has fallen to only 0.38 afterwards when wages started to rise more visibly.

The unemployment rate may also overstate the tightness of the labor market, because it is not taking account of all those people who have left the labor market in recent years but might be lured back now that jobs are increasingly available. This is especially relevant in the case of the US. Labor supply might also be larger than reported in official statistics as large multinational companies draw from labor resources across the world rather than just in the U.S. or euro area, meaning that they might respond to low unemployment here by hiring more workers abroad, rather than by raising wages. However, if this was the case inflation would be less sensitive to domestic factors and more dependent on the global output gap, something which is not sufficiently supported empirically as stated above. Overall, **factors like decreasing bargaining power along with labor market reforms are probably part of the explanation why responsiveness of inflation to reduced labor market slack has fallen.**

As in the case of globalization, such a trend could be partially be reversed. In the US the strong case for redistribution made by presidential candidates like Senator Warren could, should she be elected, lead to a tighter regulation in wage bargaining. Other measures, like higher corporate taxes could have an inflationary impact too.

### d. Well anchored inflation expectations

Additionally, it might be the case that firms and consumers are expecting stable or declining inflation and this affects pricing and wage bargaining. This might be the result of **increased credibility of the central banks' inflation targets.** In the US for instance, inflation expectations have generally been low and stable around the Fed's 2 % inflation target since the 1980s – a noteworthy success after the high-inflation period of the 1970s. This stabilization of inflation expectations could be one reason why the Phillips curve trade-off appears weaker over time; if everyone just expects inflation to be 2 % forever because they trust the central bank, then this might tune down price changes in response to unemployment. This is indeed the reason put forward by some central bankers as to why the traditional Phillips curve has become a bad predictor of inflation.

Another aspect – highlighted by ECB researchers<sup>6</sup> – is that **the longer the period of low inflation lasts the more agents will adjust their expectations to the downside.** Technically this leads to an inward shift of the Phillips curve and makes the observed Phillips curve flatter. According to this study there were even signs for a de-anchoring of inflation expectations after the 2014 large drop in oil price, at least over short horizons. It is claimed that QE helped to re-anchor inflation expectations.

<sup>6</sup> Ciccarelli, Matteo and Osbat, Chiara (eds.) (2017): Low inflation in the euro area: Causes and consequences. ECB Occasional Paper Series No 181.

### e. E-commerce

Finally, the rise of large online stores like Amazon has increased efficiency in the retail sector and boosted price transparency, both of which have led to lower prices. Because this phenomenon is coinciding with a decline in the unemployment rate, it might be offsetting the increases in prices that would otherwise be forthcoming. Indeed, there is empirical evidence regarding the European Union that the shift to distribution channels with higher price elasticity could lead to a reduction in overall retail price inflation of 0.1 pp per annum on average over the period 2010 to 2025.<sup>7</sup> This result has also been confirmed by the ECB<sup>8</sup>.

In any case, e-commerce is a rather slow moving structural change that cannot be blamed for reluctant inflation development over the last two years.

### Is inflation correctly defined?

Economic research has found so far only partial explanations for low inflation. Thus another line of potentially explaining factors is related to measurement issues. It might well be the case that standard measures of inflation miss key ingredients, or that the average inflation rate considerably deviates from the one experienced by people belonging to various income groups.

### a. Measurement issues

There are widely acknowledged problems related to the measurement of consumer price inflation. Inflation measures suffer from various biases ultimately resulting in an overestimation of inflation: Holding constant the consumer good basket misses out the substitution bias as consumers tend to adjust their purchases towards lower priced goods. New products are typically introduced at a higher price which is then progressively lowered. Statistical offices tend to cover new products with a delay: therefore the downward impact on inflation of the introduction of new product or services (e.g. data bundles for mobile phones) could be underestimated. Another measurement problem concerns technological improvements or quality changes. It is claimed that price changes also incorporate quality changes and that the “pure” price effect is overstated. Finally, as already mentioned the trend away from traditional shops towards lower-price larger chain stores, discounters and internet retailers overstates consumer prices.<sup>9</sup>

These measurement problems are far more frequently raised in the US than in the euro area. For the US, the Boskin report claimed that the published CPI overstated inflation by about 1.1 pp per year in 1996 and about 1.3 pp prior to 1996. In the aftermath of this report methodological changes in order to take into account technological progress were introduced. Subsequent calculations show that the upward bias in the US CPI has come down.<sup>10</sup> Regarding the euro area, estimates of the measurement bias do

<sup>7</sup> Lorenzani, D and Varga, J. (2014): *The Economic Impact of Digital Structural Reforms*. European Commission Economic Papers No 529.

<sup>8</sup> See Ciccarelli, Matteo and Osbat, Chiara (eds.) mentioned before.

<sup>9</sup> See ECB (2014): *Potential measurement issues in consumer price indices*. ECB Monthly Bulletin 4/2014, 40-42.

<sup>10</sup> See Greenlees, John (2006): *The BLS response to the Boskin Commission Report*. International Productivity Monitor, No 12, Spring 2006, 23-41

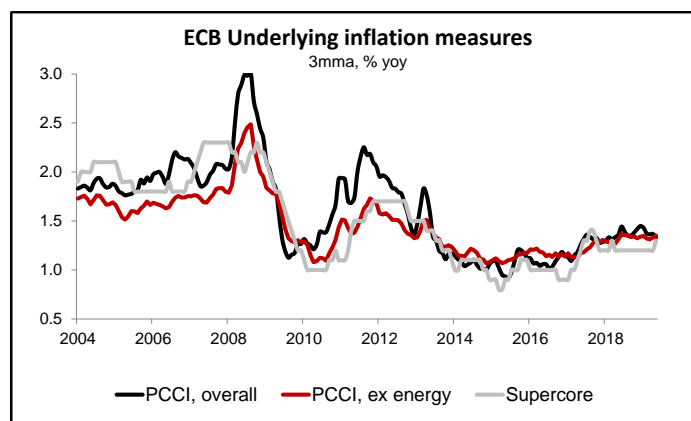
not exist. The ECB<sup>11</sup> puts forward that it would vary over time and depends to some extent on the business cycle but also states that a number of measures to reduce the bias have been introduced.

Overall, the literature on CPI measuring implies that a potentially remaining bias rather overstates and definitely not understates inflation. Hence, **measurement issues cannot be blamed for the latest lower than expected inflation data**.

### b. How to define underlying inflation?

Inflation is the increase of a price index over a certain period of time, typically of consumer prices. For its measurement several specific indices have been developed. In the US, the Fed targets the Personal Consumption Expenditure (PCE) index, while the ECB looks at the Harmonized Index of Consumer Prices (HICP).

That said, for the assessment of actual inflation, supplementary concepts are used. First, it is widely acknowledged that it is important to **disentangle noise from signals** in the inflation data. Therefore, the concept of **underlying or core inflation** is frequently used.<sup>12</sup> A straightforward and popular approach is to merely strip out the volatile subcomponents like oil-price related energy and food prices. Another approach is to exclude outliers due to temporary and sector specific shocks and calculate trimmed means or a weighted median for inflation. The third and more sophisticated approach to core inflation is to econometrically filter out transitory components in order to isolate the underlying trend. An application of the latter is the ECB's supercore measure of inflation which establishes a macroeconomic link to domestic drivers of inflationary pressure and is routinely used to monitor inflation developments. Another approach chosen by the ECB is the Persistent and Common Component of Inflation (PCCI) which aims at filtering out the temporary to extract the medium term fluctuations of the HICP components of individual euro area countries.



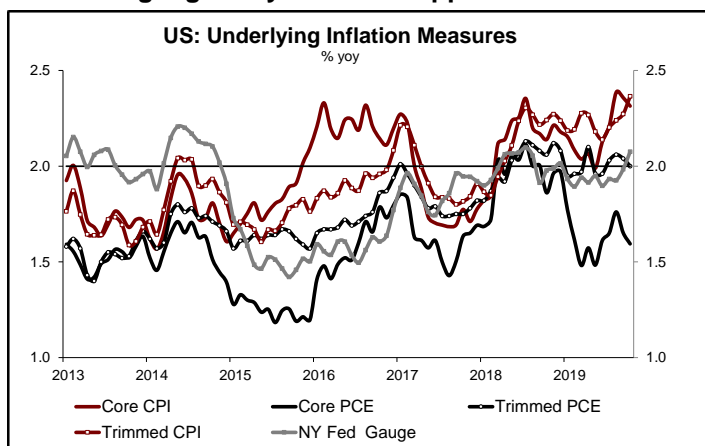
As of November, these measures of euro area underlying inflation vary from 1.2% yoy (PCCI) to 1.4% yoy (HICP ex energy & unprocessed food prices). **All these measures**

<sup>11</sup> See footnote before on the ECB (2014).

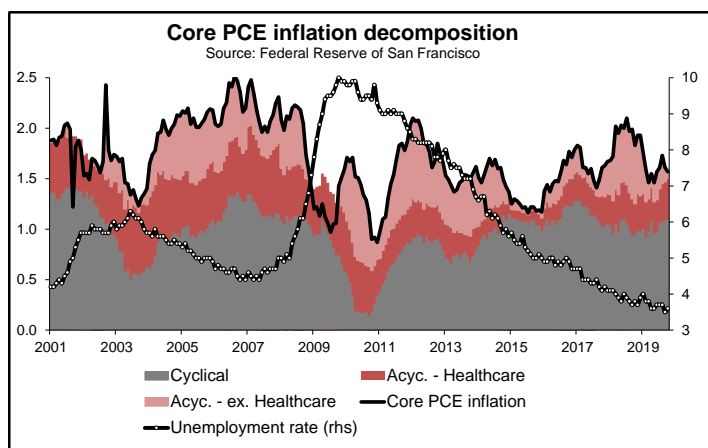
<sup>12</sup> The ECB's concepts for the euro area are explained in greater detail in Ehrmann, Michael, Ferrucci, Gianluigi, Lenza, Michele and O'Brien, Derry (2019): *Measures of underlying inflation for the euro area*. ECB Economic Bulletin 4/2018

of core inflation have recovered from their 2015 lows but failed to move closer to pre-GFC levels.

In the US, several alternative methodologies to measure underlying inflation have been developed. For example, subindices were used or aggregated based on their volatility or in combination with other macroeconomic variables which are able to forecast inflation. Their relevance has increased recently as Fed chair Powell repeatedly referred to the trimmed PCE measure, developed by the Dallas Fed, as a better measure than standard core inflation. While the core PCE measure showed pronounced swings and in October dropped to 1.6%, **the trimmed measure appears steadier around the 2% Fed target.** But when looking at the last 30 years **the current level of unemployment (3.6%) would be consistent with the trimmed mean being higher by around 0.5 pp.**



Another methodology groups price indexes according to their responsiveness to the business cycle in order to account for the fact that in some areas like healthcare (which accounts for over a third of the whole inflation basket) many prices are regulated and do not respond much to demand. The San Francisco Fed has accordingly developed measures of cyclical and acyclical PCE inflation. This decomposition shows that much of the recent weakness is due to large swings of components not responsive to the business cycle. **Cyclical component appears somehow weaker than what one would expect,** comparing it with the period of low unemployment of the mid-2000.



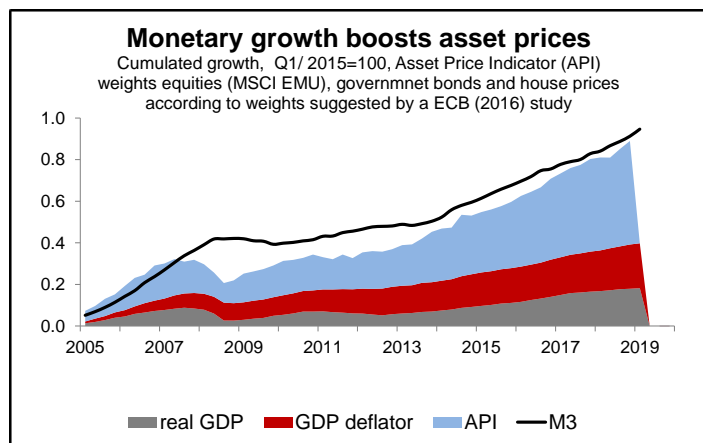
All in all, **alternative and more sophisticated measures of underlying inflation for the US and the euro area**

**confirm that price dynamics are low and lagging behind past experiences.**

When comparing transatlantic inflation differentials, however, one needs to keep in mind that there are major methodological differences. A key **difference is the share of rent prices in the CPI (40% in the US vs 12% in the euro area) and the fact that only the US index also includes an owner's equivalent rent,** which accounts for two thirds of the share in rents. Without rents, the transatlantic inflation differential shrinks significantly as according to a study in the 2012 to 2016 period almost 70% on average of the differential resulted from differences in rent developments.<sup>13</sup>

### c. Asset price vs. consumer price inflation

Another partial explanation is that **inflation pressures in goods and services have been subdued due to changes in the structure of the economy. Then, the large monetary stimulus has shown up more markedly elsewhere in the economy, more specifically in asset prices.** To the extent that inflation pressure unfolds via higher asset prices and exceeds goods price inflation, the true inflation pressure is underestimated when focusing on consumer prices only. Real estate as well as financial asset prices sometimes indeed decouple from real sector consumer price developments.



Regarding the euro area, we find some evidence that **asset price inflation outpaces consumer price inflation.** In line with standard approaches,<sup>14</sup> we constructed two types of asset price indicators for the euro area: Index 1 consists of house prices, share prices and government bond prices with the weights reflecting the respective share in private wealth.<sup>15</sup> Index 2 incorporates housing and stock prices with the weights depending negatively on the relative standard deviations of both variables.<sup>16</sup> In both

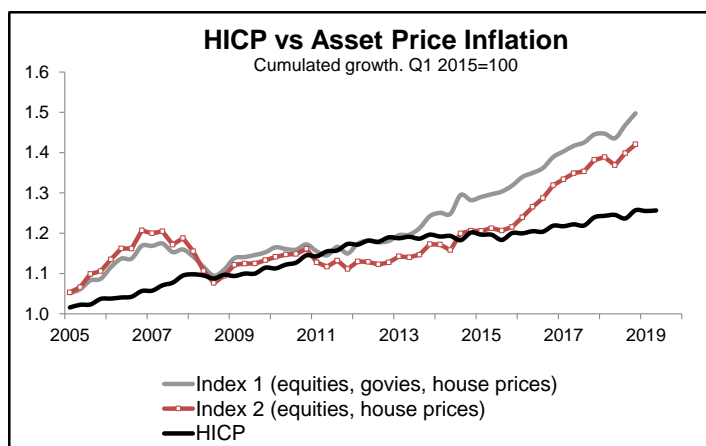
<sup>13</sup> Grossmann-Wirth, Vincent and Monnet, Eric (2016): [Why is inflation higher in the United States than in the euro area? Banque de France blocnotes.](#)

<sup>14</sup> See for instance Gerdesmeiner, Dieter; Reimers, Hans-Eggert and Roffia, Barbara (2011): Early warning indicators for asset price booms. [Review of Economics & Finance](#), Vol 1, 1-19.

<sup>15</sup> Drawing on the [ECB \(2016\) asset survey](#), the household main residence share in total assets is 49.5% while the household other real estate share in total assets is 18.3%. For the construction of our indicator we assumed a real estate share of 70% and distributed the remaining share somehow arbitrarily to government bonds (20%) and equities (10%).

<sup>16</sup> The resulting weights are 13% for stock prices and 87% for house prices.

cases, asset price inflation started to decouple from goods price inflation. While consumer prices cumulatively advanced from Q1 2005 to Q2 2019 by 26%, asset prices rose by 42% (Index 2) or even 50% (Index 1). Most of the decoupling has taken place over the last five years.



We think that the inclusion of asset price inflation makes the inflation picture look less puzzling as it helps explaining where the stimulus from the extremely accommodative monetary policy measures has gone. **Negative interest rates and QE seem to have pushed asset prices more than goods and services prices.** In fact, over the above mentioned period M3 rose by 91% and this growth was almost completely matched by the sum of real GDP growth (18 pp), the increase in the GDP deflator (21%) and the strong rise in asset price inflation (Index 1, 50%).

#### d. Specific versus overall inflation

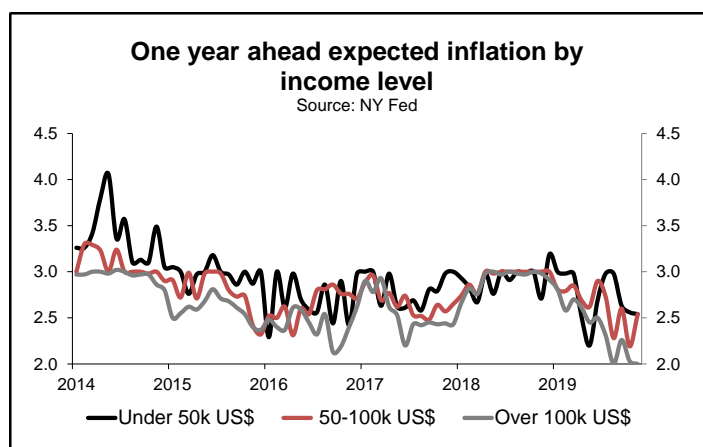
Another issue related to measurement is that the **aggregate measure can mask individually experienced inflation, which might differ substantially.**

People usually recall only the prices of goods that they frequently buy in small amounts.<sup>17</sup> Inflation in these so called frequent **out-of-pocket purchases (with a weight of currently 42% in the euro area HICP) tends to be higher than the aggregate** (by on average 0.37 pp in the 12/2009 to 11/2019 period) with variations in energy price inflation being a key driver. However, in the end there is a very close correlation (of 0.98) with headline inflation over this period.

Apart from these “felt” differences, individuals might experience large “real” differences depending on their individual situation (single or not), age (older or younger households), income (poorer vs richer households) or with regard of owning real estate or not. For the **US, there is evidence that low income households, larger households or those with an older head experienced higher inflation on average.**<sup>18</sup> Over the 2004 to 2013 period average inflation cumulated to 33% for households with incomes below USD 20k but to just 25% for households with incomes above USD 100k. Similar results could be found for Europe. According to a recent study (covering inflation in

25 EU countries from 2001 to 2015), the poorest decile has seen its consumption bundle becoming 10.5 percentage points more expensive than the richest decile’s, translating into a 0.7 pp average yearly inflation rate difference.<sup>19</sup>

This difference is also reflected in inflation expectations. **Data on the US show that lower-income consumers have on average a higher expected inflation.** Moreover, inflation is also more volatile, reflecting the higher weight of volatile items like gasoline and food in their consumption basket.



Bottom line, overall consumer price inflation is low by all indicators. Potential measurement errors rather imply lower than higher inflation. **All measures of underlying inflation are still below the pre-GFC levels and currently show no signs of picking up.** In contrast to that, longer term analysis for the US and the EU suggests that **inflation for poorer households is considerably higher than for richer ones.** However, unlike to consumer price inflation we see evidence that **asset price inflation has gone up considerably** over the past years.

Looking ahead, the key question is **whether inflation in the US aggregate and especially in the euro area will rebound again or will remain stuck on low levels.** Escaping low inflation and anemic growth would require a persistent and massive central bank support as well as growth supporting reforms and fiscal policy measures to keep up. The Appendix discusses in more detail the risks of Japanification of advanced economies.

Our take is that **in the medium term the upside for inflation in advanced economies is rather limited.** The **business cycle has clearly peaked** and therefore the (structurally decreasing) support from demand will get weaker. The risk of a fall into a deflation trap is non negligible and has forced the ECB to restart monetary stimulus. However, a big question mark remains as **monetary policy alone may not prove sufficient without support from the fiscal side.**

On a longer horizon, demographic changes will increasingly play a role. In our [research](#) on ageing, we argued that population ageing would have an inflationary impact, as

<sup>17</sup> For the euro area see also Eurostat, Statistics Explained.

<https://ec.europa.eu/eurostat/statistics-explained>.

<sup>18</sup> See Kaplan, Greg and Schulhofer-Wohl, Sam (2017): Inflation at the household level. Journal of Monetary Economics 91, 19-38.

<sup>19</sup> See Güler, Eren and Weichenrieder, Alfons (2018): Pro-rich Inflation in Europe: Implications for the Measurement of Inequality. SAFE Working Paper No. 209.

the shrinking of working age population would reduce the economy's productive capacity.

### Implications for central banks and markets

Low and less responsive inflation has clearly big implications for both central banks and financial markets.

Consider central banks first: evidence from the rolling Philips curve shows that imported inflation increasingly matters at the expense of domestic economic conditions and that expected inflation plays a more important role. This means that **central banks will have to step up their efforts in order to keep inflation expectations anchored**. Therefore, the standard policy tool, the short term rate, will have to be complemented by others. Here, **the size and composition of the balance sheet and, very important, communication efforts will be in focus**.

**For example forward guidance** (i.e. the commitment to keeping the policy stance unchanged until a point in the future) will become more common. The definition of the inflation target may change. As suggested by the Fed's review of policy tools, whose final result will be published in the summer of 2020, central banks are likely to start **targeting average inflation over a long period of time**. Also, new President Lagarde announced a comprehensive review of the ECB strategy, with a broad scope and lasting over the course of 2020. Verbally, the ECB had already under predecessor Draghi emphasized the symmetry of the inflation target. We expect that a common denominator of the redefinition of the inflation target is that in future prolonged periods of shortfall from the target will be compensated by a protracted overshooting, in order to avoid swings in expectations. In the present context this would imply **keeping an accommodative stance beyond inflation has reached the target**.

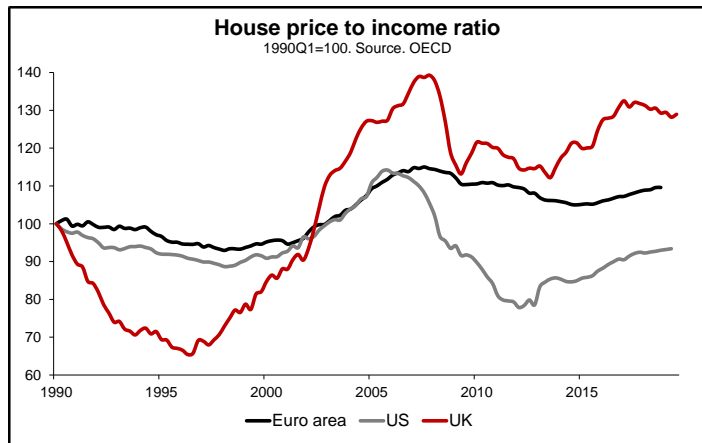
Moreover, if monetary loosening leads to asset rather than goods price inflation, **the risk of bubbles undermining financial stability increases**. Traditional monetary policy tools like short term rates are probably too blunt for financial stability purposes. Regulation, especially for lending has to step in. House prices are a clear example of this happening. Very low long term rates have pushed down mortgage costs in developed economies. That's said, house prices in relation to disposable income are still below the peak seen in the mid-2000.

**Long term rates are clearly capped by muted actual and expected inflation**. This compounds the effect of the secular downtrend in real rates in depressing nominal bond yields.

Too low inflation, to the extent that it filters into expectations, can become problematic as **it compresses firms' pricing power and may signal lower growth expectations feeding through inflation ones**.

### Summing up

Inflation widely undershot forecasts over the past years. This result is robust with respect to various measures of core inflation and unlikely due to methodological problems. There is evidence that the responsiveness of inflation to economic slack receded while the importance of inflation expectations increased.



That said, the reasons for this are not yet fully understood. Explanations brought forward are the globalization of inflation, the decrease in worker power, the anchoring of inflation expectations and growing importance of e-commerce. Still, the surprisingly low consumer price inflation over the past years cannot be fully explained by the factors we have illustrated. But a few measures of asset price inflation show a different picture implying an inflation rate north of 2% for the euro area. All in all, we **conclude that underlying inflation dynamics are not dead but have become weaker**.

We think that in the presence of extraordinary monetary policy measures in place over the past decade, asset prices were boosted more than it would otherwise have been the case.

Looking ahead, the global economic slowdown that has started will weaken the cyclical inflation dynamics and rather put the risk of deflation in the spotlight again. But when taking a look at Japan (Appendix) we conclude that **concerns about a 'Japanification' of the euro area or even the US are overdone**. Unlike to Japan, firms in these economies do not exhibit a structural financial surplus implying sufficient demand so that a deflationary trap is avoided.

From a **central bank's** perspective the expected persistence of the low inflation environment will keep policy making challenging. In order to keep inflation expectations anchored at a level with a sufficient safety margin away from a deflation threat, the **degree of policy accommodation needs to be stronger than in the past** for the same level of economic slack. Forward guidance, balance sheet expansion and QE will likely continue to be part of the 'normal' monetary tool box, especially for the ECB. In the end more extreme and completely untested measures, like permanent purchases of government debt by central banks or "helicopter money" (direct supply of cash to consumer by the central banks), which were unthinkable only few years ago, may be attempted.

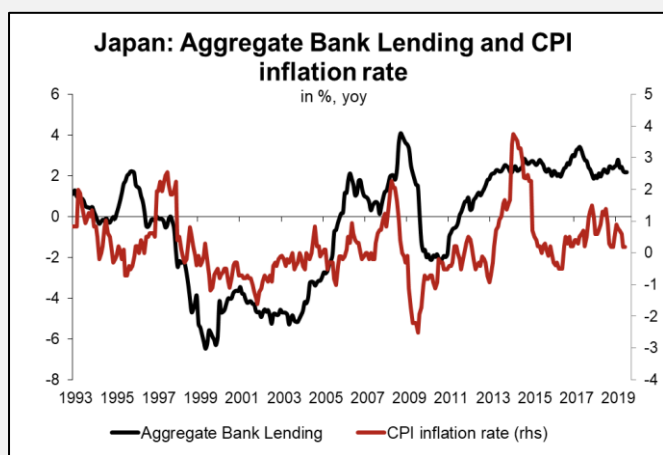
For markets looser monetary policy and the search for yield brought about by ultra low yields may have created and continue to create a wedge between valuations and fundamentals thereby adding to concerns for financial stability (bubbles). With low inflation remaining entrenched, the **recovery in long term rates seems capped**, even after the monetary policy stimulus will have ended.



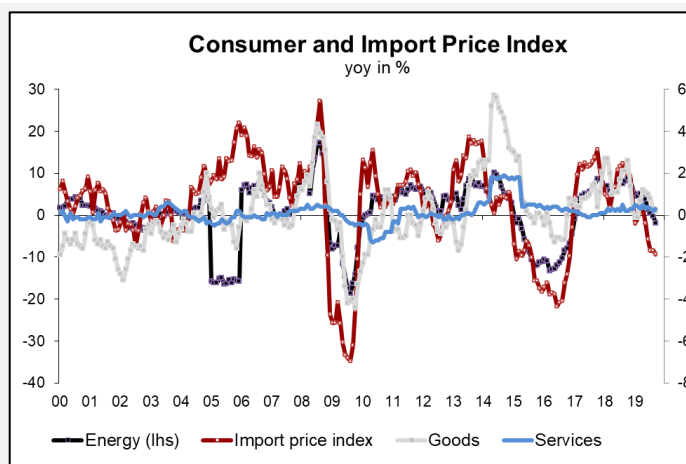
## Appendix: Japanification ahead?

“Japanification” is not a precisely defined notion. It broadly describes an economy which is stuck – after a severe (financial) crisis – in a **low-growth-low-inflation environment** for a prolonged period of time. This is coupled with extremely low yields and a major rise in public debt. Despite substantial efforts of monetary and fiscal policy, the economy looks **unable to develop enough “escape velocity” to leave the insufficient “new normal”**.

**Historical background:** In 1990, Japan’s real estate bubble burst and stock markets slumped. Given the destruction of wealth and the “worthless” real estate collateral, more and more loans went bad, resulting in a systemic financial crisis by 1997-98. Major banks and insurance companies went bankrupt. After several attempts from the government to stem the crisis, markets started to calm down again only after the Diet (Japan’s bicameral legislature) finally legislated on banks recapitalization in October 1998, making available large amounts of public money. It is estimated that banks had to dispose bad loans worth 17% of GDP (as of 2002). Accordingly, a **huge deleveraging took place with aggregate bank lending diminishing by about 30% from the end of 1997 until mid-2005**. This break-down in credit drove Japan into a **five year period of deflation until 2006**. Deflationary tendencies repeated during the Great Financial Crisis in 2009, with **negative rates lasting until 2012, and again in mid-2016**.



**Inflation:** Despite the sustained recovery in aggregate bank lending, Japan has still difficulties to escape deflation. Service price inflation, which would show domestic price pressures more prominently, still fluctuated below 0.5% yoy of late. **Consensus forecast for headline inflation is 0.7%, 1.0%, and 0.8% for 2019 to 2021.**



**Monetary policy response:** Since the burst of the bubble, the BoJ has eased its monetary policy. It pioneered the **Zero Interest Rate Policy (ZIRP)** in February 1999 and a first **Quantitative Easing Policy in March 2001**. The current monetary policy – **Quantitative and Qualitative Monetary Easing Policy (QQE)** – was set up in **April 2013** as the monetary “arrow” of Abenomics<sup>20</sup>. The main new feature was an unprecedented rise in the monetary base, achieved by buying financial assets (mainly government bonds) at a speed of 1.5% of nominal GDP per month (JPY 60-70 tr. per year, later stepped up to stepped up to JPY 80 tr). **In 2016, the BoJ added a yield curve control, while de facto purchases of assets slowed.** On top of traditional monetary transmission channels (interest and exchange rate), the BoJ stressed very much the **expectation channel**. **The goal was to achieve an inflation target of 2% “at the earliest possible time, with a time horizon of about two years”**.

### Evolution of Japan’s Monetary Policy

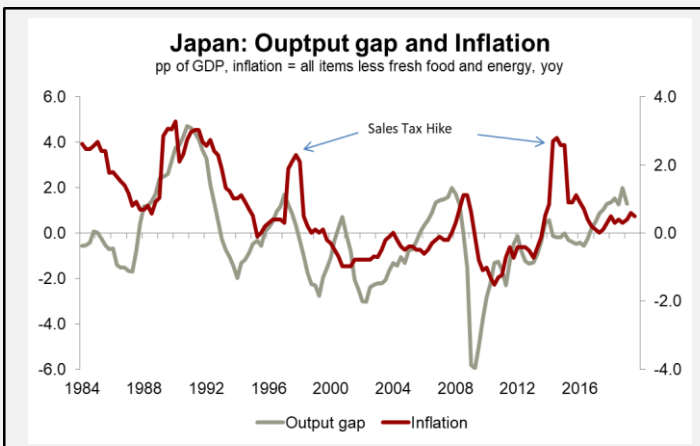
Start date	End date	Name/description
Feb. 1999	Aug. 2000	Zero Interest Rate Policy (ZIRP)
Mar. 2001	Mar. 2006	Quantitative Easing Policy (QE)
Oct. 2010	Apr. 2013	Comprehensive Monetary Easing (CME)
Feb. 2012	Apr. 2013	Enhancement of Monetary Easing (Introduction of “the Price Stability Goal,” etc.)
Jan. 2013	Apr. 2013	Joint Statement of the Government and the Bank of Japan; “Price Stability Target” and the “Open-Ended Asset Purchasing Method”
Apr. 2013	-	Quantitative and Qualitative Monetary Easing (QQE)
Oct. 2014	-	Expansion of the Quantitative and Qualitative Monetary
Jan. 2016	-	Quantitative and Qualitative Monetary Easing with a Negative Interest Rate
Sept. 2016	-	Quantitative and Qualitative Monetary Easing with Yield Curve Control

The BoJ balance sheet surpassed 100% of Japan’s nominal GDP late last year. The share of its holdings of central government debt rose from 11.4% (end-2012) to 42.5% of late. **Compared to what has been achieved so far within six years in terms of inflation, the measures cannot claim to be effective.** Inflation expectations across different measures had risen after the introduction of the strong monetary easing, but have fallen back to the range of 0.9% to 1.3% (fluctuating in a similar range since 2017), likely reflecting disillusion about the BoJ’s capacity to

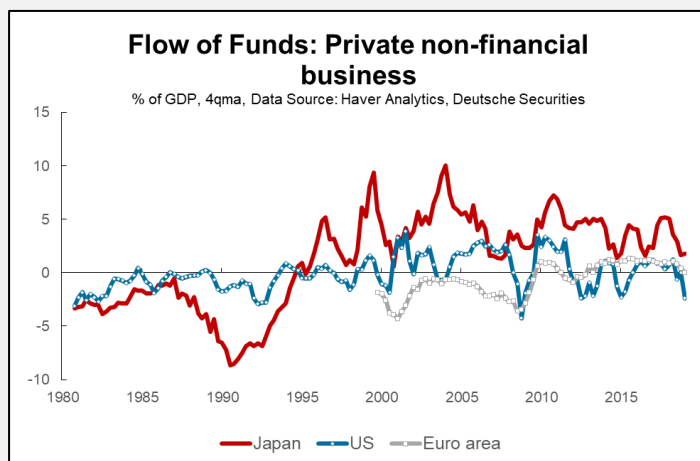
<sup>20</sup> Abenomics refers to economic policies enacted by Japanese PM Abe at the outset of his second term in 2012.

break the “deflationary mindset” even by an unprecedented growth of money supply.

**Output gap:** While the direct impact of money supply on inflation looks weak, this seems not true for real aggregate demand. The output gap and CPI inflation still have a strong positive correlation, with a delay of about six months. According to BoJ data, the output gap turned positive in Q4 2016, and peaked at about 2 pp of GDP end of 2018. Thus, the recent slight upturn in inflation has to a large extent been driven by cyclical factors. As described elsewhere, the Japanese economy has significantly benefited from international demand, and thus **Japan’s inflation is likely to slow again amid the current global slowing.** The global export PMI and the Japanese output gap show a correlation coefficient of 0.67 with a lag of four months. Japan, like Germany, is a very much internationally driven economy.



**Flow of funds:** Against this background, the question arises, why within the monetary transmission process an increase in money supply looks ineffective while a rise in aggregate demand still has the usual impact? Looking into the flow of funds statistics, Japan’s private non-financial sector (=households and private non-financial corporations) maintained a financial surplus between 5% and 10% of GDP. What is unusual is that also corporations maintain a substantial, positive balance, meaning that household’s savings are insufficiently transformed into corporate investments. The time series turned

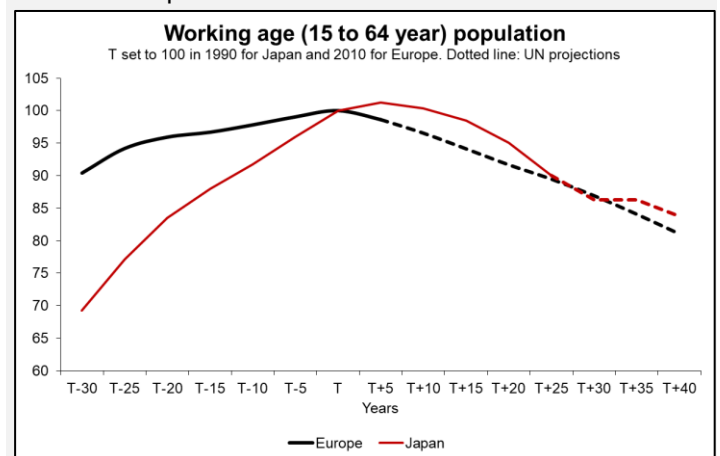


around in 1990, i.e. exactly when the bubble burst, which we consider a strong indication that this macroeconomic imbalance plays a large role.

**Explanations:** There is no broad consensus, what causes the ineffectiveness of the BoJ policy. The BoJ maintains that monetary policy still needs more time to filter through. A significant hurdle in this regard is the seniority-driven wage setting (while basic payment rise was rather soft) which prevents a significant wage-price spiral. Moreover, shortly after the introduction of this policy, there was a global deflationary oil price shock.

However, after six years of huge monetary easing, this view has lost explanatory power. The flow of funds statistics reveals that corporates in aggregate can rely on self-financing. Aggregate bank lending growth (see first graph in the Appendix) did not accelerate with the QQE. The BoJ’s Tankan report show that firms characterize its corporate financial position as “easy” and the bank lending attitude as “accommodative”, with both readings among the highest on record. **Corporate credit does not look scarce, thus increasing money supply (which traditionally fosters credit availability at a lower price) is “pushing on a string”.** At the same time, inflation expectations seem not to rely too much on the boost in money supply. If this line of causation is true, then Japan will fall back to very low inflation once the cyclical upturn has reversed (which is already ongoing).

**Demography:** This in turn implies the question why this imbalance – a lack in private demand which creates a deflationary gap – is perpetuated. While the original cause was clearly the burst of the bubble and the huge deleveraging, the reason for the maintenance of the problem could have shifted to demography. This reasoning had already been more popular with the [Shirakawa BoJ](#), the predecessor of the current BoJ Governor Kuroda. Japan’s population growth already peaked in the early 1990s, and turned outrightly negative in the last decade. An ageing population tends to reduce extension investments (but not replacement) while households tend to save more, preparing for retirement. In this view, a zero interest policy has large costs in terms of building enough retirement capital.



**Is Europe different?** Fears of Japanification – the euro area to follow Japan into a prolonged period of stagnation – have repeatedly popped up in markets, esp. after the 2008/2011 financial crises. However, pure extrapolation does not necessarily make sense and must be supported by economic causation.

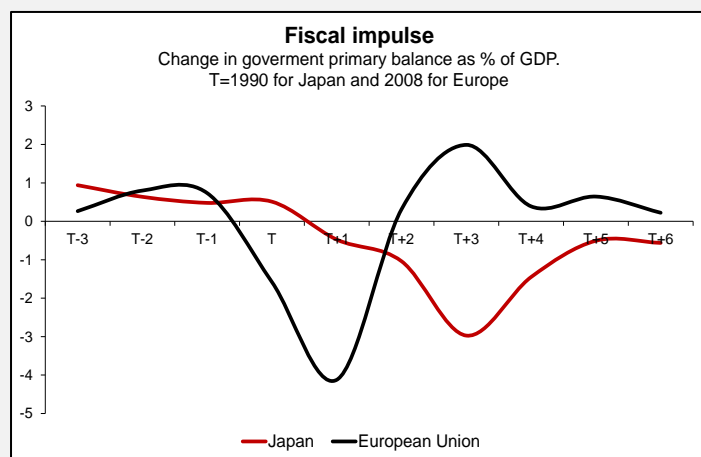
- **The most striking similarity is the demographic evolution.** Europe is likely to follow Japan with a delay

of about 15 to 20 years. In both Japan and Europe, working age population peaked around the eruption of the crisis. In Japan its subsequent steep decline lowered potential growth, making a rebound in the economy more difficult. In addition, the demography impact on aggregate consumer demand has been amplified by the long-term ZIRP, requiring households to increase their savings to build up adequate retirement capital.

However there are several and significant differences:

- First of all, as the corporate financial surplus in Europe or the US is lower than in Japan, the macroeconomic imbalances are smaller, the potential impact of the central bank more powerful and thus the risk to fall into a deflation much smaller.
- What also set apart Europe and Japan was the response of policy makers. The ECB in 2008 reacted much more quickly and aggressively than the BoJ in the 1990s. This shielded the banking sector, led to much lower real interest rates and a faster rebound in credit growth in the euro area. However, it is also propping up asset price inflation to a larger extent than consumer prices.
- Third, **fiscal stimulus was timelier and stronger in Europe**, even though its boost to income may have been weakened somehow by its drastic reversal in 2010. The initial inadequate fiscal response in Japan is credited to have been a leading factor in compressing activity and leading to the deflation that – by keeping real rates high – provided another drag to GDP growth. However, overall, Japan's gross government debt cumulated from 64.3% in 1990 to 237.7% in 2019 (IMF data), basically spent to stimulate (unsuccessfully) aggregate demand, and often interpreted as de facto taking over the financial sector debt. (In the early 90s, it was hugely unpopular in the general public in Japan to bailout banks, which were considered one of the main drivers of the damaging bubble.)

**Summing up**, while Europe and Japan share some long term traits like demographics, there are also significant differences. The materialization of the risk of a Japanification of the single currency area is less likely due to its more favorable position regarding macroeconomic imbalances. This can additionally be assured by the measures, timing and scale of the policy response to the current slowdown.



- Fourth, regarding the **exchange rate**, the euro depreciated in the aftermath of the 2008, helping activity, while in 1990-91 Japanese exports were penalized by a marked appreciation of the yen.

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