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Is inflation definitely dead or simply dormant?

Consequences for central banks

Research
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Is inflation definitely dead or simply dormant?

Consequences for central banks*

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Abstract

Inflation never disappears completely. In history, there have been periods when it was dormant, but revivals have always been painful. What is striking at present is the inability of some countries to boost inflation despite low rates, liquidity injection programs... The BoJ and the ECB have made the bet (losing for the moment) that an ultra-accommodative monetary policy would quickly translate into a rise

“In a dark room you move with tiny steps. You don't run but you do move”

Mario Draghi,
President of the ECB, March 7, 2019

in inflation rates, while the Fed has opted for a “friendly” normalization of its monetary policy, helped in this, it must be said, by a fiscal and tax policy that has never been as pro-cyclical as in recent years (the Trump years). Recall that the theme of the “end of inflation” refers to some advanced countries, and that emerging countries have inflation rates close to 4% - 5% (Russia, Brazil, India in particular) while Turkey is

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struggling with inflation close to 15%. Why is it important to question the end of inflation? First of all, because there are no more inflation expectations and a rise - even a small one - is likely to have significant impacts on the financial markets and economies, and second, because it also affects very directly the objectives, instruments and prospects of central banks and governments. With regard to central banks, there are talks on inflation targeting (is it still useful, is it credible or dangerous to adopt another target such as the price level?), on strategy (should we keep low rates for a long time and take risks on financial stability?) and on tools (are non-conventional monetary policies now part of the “classic” central banker toolkit?). For governments, it is a matter of properly assessing the fiscal and tax leeway “offered” by the low interest rate and low inflation environment: is this reasonable in a world where the accumulation of debt has never really stopped for almost all advanced countries? How to be sure that fiscal and tax complacency will not be back?

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Executive summary

Since the 1970s, central banks have followed different objectives: to offer a good level of liquidity in the 1980s (especially in the US), to bring inflation back to the desired level from the early 1980s to the 2008 Great Financial Crisis, to avoid crises and deflation, and to extend periods of expansion as much as possible since 2008. However, since the 1980's, the bulk of central banks has adopted and kept inflation targeting, concluding that inflation around 2% or at 2% or close to 2% could be considered as “price stability”.

Since 2008, facing deflation fears, central banks have also adopted ultra-accommodative monetary policies, with sometimes the addition of non-conventional measures (QE programmes). Unfortunately, inflation is still largely absent. The puzzle of “missing inflation” can be explained by the structure of the labour market (the lack of bargaining power of employees...), competition, the lack of inflation expectations (partly due to the extreme credibility of central banks, and, especially in the Eurozone, the weakness of the structural component of inflation).

This new situation implies major changes in the way OECD countries are now perceived: low wage costs growth, low underlying inflation, and low interest rates persist despite the positioning in the business cycle (late cycle positioning) and despite tensions in the labour market. In this atypical context, with low wages and low interest rates, corporates are able to maintain a high profitability. Last but not least, the maintenance of low interest rates improves the solvency of public and private borrowers.

As a consequence of these “disruptions”, one can mention:

- The absence of recession due to interest rate hikes or declining profits or solvency problems of borrowers. Other factors (geopolitics, trade issues, accumulation of debt...) still exist, though;
- No deterioration in business fundamentals at the end of the expansion period... and therefore no sharp credit cycle;
- Lower risk of debt crises due to low interest rates;
- Lower oscillation (swings) of inflation cycles;
- Lower oscillation (swings) of growth cycles.

Central banks face therefore new challenges.

1. **Inflation targeting has become an illusion**, but central banks will probably not change course... even if the Fed has recently decided to review targets, toolkit and communication policy.
2. **Monetary rules do not work properly, and one can say that central bankers are lost**. The flattening of the Phillips curve (i.e. the weakening of the relationship between inflation and unemployment) reduces the

capacity of central banks to reach their inflation targets. Inflation-targeting might be officially dead. Central banks should therefore revisit their inflation targeting policies. These policies are easily understandable, with high transparency... but they are inadequate at present.

3. **Inflation is not dead... it moved from goods and services to financial assets**, with additional risk on financial stability (excess of debt, excessive valuation, potential wealth effect...).
4. **Central banks have been particularly efficient in fighting inflation.** Inflation expectations have mostly disappeared and central banks do not have to raise rates. But low interest rates for long might push again credit and indebtedness in dangerous territory. How to manage this paradox of credibility?
5. **The “absence” of inflation does not necessarily mean the “absence” of economic cycles** (both growth and inflation) because cycles do not rely on inflation alone. However, the magnitude of cycles has been naturally reduced.
6. **Without inflation, the use of fiscal policy seems easier... but It is just an illusion.** The risks still exist, should one consider the size and the trend of fiscal deficits and indebtedness. Moreover, what could be the interaction between nineteen different fiscal and tax policies and a common monetary policy in such a context? (Claeys and alii (2018)). Is fiscal complacency close to come back? Can differences in national macro-prudential frameworks (in the absence of significant reforms) weaken the overall resilience of the system?
7. **Non-conventional monetary policy tools are definitively in central banks’ toolkit.** Lower inflation / lower potential growth means lower neutral interest rates (in advanced economies). It may reduce the power of central banks’ conventional monetary policies.
8. **Central banks are more and more concerned with financial stability:** will it become a specific target for the ECB? Not sure. Country-specific tools are by far more appropriate, alongside with closer coordination with national macro-prudential authorities.
9. **Central banks will face pressure alongside with the governments.** Critics claim that the main problem of central bank independence is that it was introduced to solve a problem - high inflation - that no longer exists. Their independence would prevent them from using more direct and effective solutions to solve current problems. According to the critics, their role should be revisited, while the main problem is not inflation anymore, but deflation, over-indebtedness and financial crises (in other words, the world since 2008)... *Reviewing the central bank’s status, role, mission and independence seems inevitable, and enlarging*

their role is an inescapable fact. Governments and central banks are most likely to be under pressure, and among the “solutions”, lower taxation and rising wages are at the forefront. In other words, the shock which is supposed to represent the only way / risk for inflation to rise could come soon, earlier than generally expected.

10. Inflation is not dead, it is dormant, different, and potentially on the rise. Whatever and whenever the next step, uncertainty is still ongoing, and central banks (and other institutions) will have to continue to navigate without having a perfect knowledge of what the post-financial crisis “new normal” is going to be.

Introduction

Inflation: where do we stand now?

Usually, at the end of the economic expansion cycle, inflation has already begun to rise and has pushed monetary policy to a restrictive stance. The recent period has not validated this assertion, especially in Europe and Japan. Where do we stand exactly?

US and Europe: inflation at the end of the expansion is below standards....

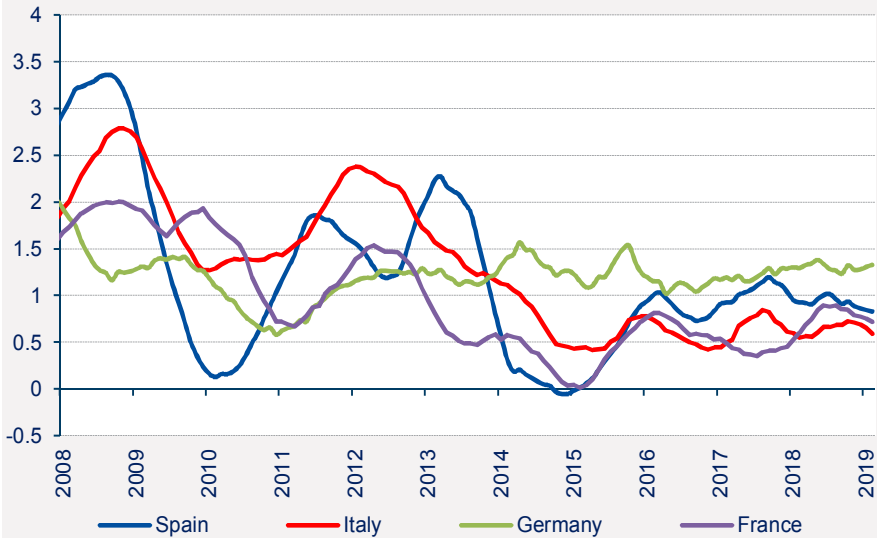
In recent months, the trajectory of underlying inflation has tended to normalize in the **United States**, stabilizing slightly above 2%. While the unemployment rate is very low and the capacity utilization rate very high, the unit wage costs increase little and the underlying inflation does not progress. The flexibility of supply in the United States is crucial to explain the absence of inflation at the end of the expansion period.

- In the labour market, rapid employment growth has led to an increase in the participation rate (the increase in employment has not led to an acceleration of wage costs), and the nature of the jobs created had the same effect: low-skilled, low-wage jobs had little impact on inflation. Unit labour cost remains soft (lack of bargaining power of US employees).
- In the goods and services market, while the capacity utilization rate is high, there has been a rise in productivity and a deterioration of the trade balance. It allowed to avoid domestic price increases.

At the same time, inflation remains anchored around 1% in the **Eurozone**, where unit labour costs rise (difference with the US), but where companies have not the capacity to raise prices due to competition. Here lies the question of the structural weakness of inflation in the euro area.

To sum up, the “absence” of inflation comes from the nature of the jobs created, the lack of bargaining power of employees and/or the lack of capacity of firms to pass eventual wage increases in output prices. Here lies the question of the structural weakness of inflation in the advanced countries.

Graph 1: inflation (core CPI) in the Eurozone moving average 6 months



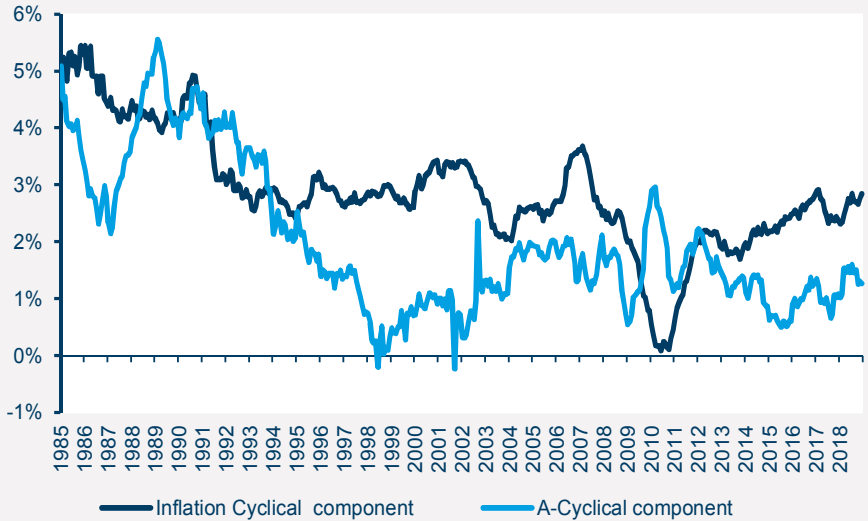
Source: National Sources, Amundi Research

To give an example, we have used the methodology the Federal Reserve Bank of San Francisco applied to the US economy. It allows us to distinguish between two categories:

- **The “cyclical component”**: categories exhibiting a pro-cyclical relationship make up 35% of the PCE and include housing, recreational services, food services, and some non-durable goods;
- **The “a-cyclical component” or “structural component”**: a-cyclical categories make up the remaining 65% and include health-care services, financial services, clothing, transportation, and some other smaller categories.

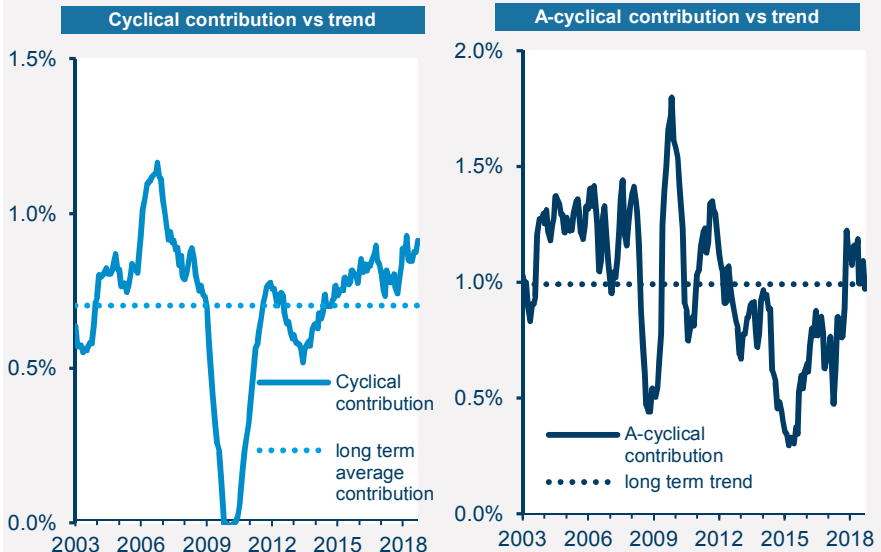
Based on this categorization, **we at Amundi (Usardi (2019) have created two distinct aggregate inflation series** (graphs 2 and 3): **the cyclical component and the a-cyclical (structural) component**. Our analysis suggests that core PCE inflation has been persistently low due to weak a-cyclical / structural inflation: **the structural component is systematically weaker than the cyclical component, and the structural component is structurally below trend for the past 10 years.**

Graph 2:
PCE Core, cyclical vs a-cyclical inflation in the US



Source: Amundi Research

Graph 3:
Cyclical and structural contribution to core PCE in the US



Source: Amundi Research

In total, core inflation is relatively stable. What is valid for the US is valid for most advanced countries. For all OECD countries, inflation (overall index and underlying inflation) are both around 1.5% (core inflation has been stable for 8 years while inflation was at 0% in 2015).

Central banks now face three types of pressure:

1. **The absence of inflation**, which, even with strong labour market pressures, encourages very low interest rates;
2. **The high level of indebtedness**, which gives central banks incentives to improve the solvency of borrowers by leaving rates at low levels, even if it encourages the use of credit and deteriorates the debt situation further;
3. **The weakening of potential growth and effective growth**, which also deteriorates potentially the solvency of borrowers and leads to the maintenance of low interest rates.

Low inflation and low expected inflation have many advantages in the current situation:

- They allow to keep rates very low;
- They make it possible not to suffer from high debt ratios because of lower interest payments (interest rate lower than the growth rate)... and help avoid a debt crisis;
- They support the prices of financial assets, and help avoid negative wealth effects and contagion to the real sphere;
- They help support investment (and growth).

Central banks have to manage a trade-off between inflation and financial stability. In the event of rising inflation, central banks should choose between fighting inflation and avoiding a debt crisis and “killing” bond holdings. **In the event of financial instability** (rising debt, the appearance of bubbles on the prices of financial assets...), central banks should choose between avoiding a debt crisis and fighting against financial instability.

I. Is inflation dead?

How to explain the absence of inflation? Different approaches exist, so different explanations too.

1. The “historical” approach: The idea that a growth phase has to be translated - with a certain delay - into a resumption of inflation is so common that it is very seldom questioned. Yet a very interesting study by Cooley and Ohanian (1991) showed precisely the limits of such an assertion. These authors were able to count a very large number of periods (since 1820) during which the economic expansion did not result in a significant increase in prices (the interwar period nevertheless validates the assertion). The authors are not even sure that it is more reasonable

in times of expansion to wait for price increases than... lower prices! It all depends, in fact, on the structure of growth. To be more precise, it is necessary to show whether the expansion period is more related to demand factors than to supply factors, which significantly modifies the impact on prices.

2. Supply-demand models: The analysis of supply (productivity growth, labour force growth, state of competition, etc.) and demand (disposable income, etc.) would make it possible to detect price changes. An increase in demand (with stable supply) would lead to higher prices while a simultaneous and equivalent increase in both would have no net effect on prices. The empirical verification turns out to be complex. In sum, these partial approaches do not allow us to perceive the breaks or even the reasons for the absence or the presence of inflation.

3. The “potential growth” model: Another way to predict inflation is to use the concept of potential growth. This is the level of growth that defines the onset of inflationary pressures. The absence of inflationary pressures can only be explained if the actual growth is lower than the potential growth.

4. The statistical approach (decomposition of inflation): Cyclical inflation is traditionally distinguished from structural inflation. It is possible to calculate both components either by distinguishing cyclical and structural components (see above) or by comparing cyclical factors (such as inflation expectations 1-year ahead, oil prices, wage growth, the Euro/Dollar exchange rate, the output growth gap...) and structural factors (such as potential growth, the natural interest rate, the trend in the employment rate, the overall stance of ECB monetary policies...). Most studies conclude that both types of cyclical and structural inflation are weak.

The question of measuring inflation has also been raised for a very long time. Are we underestimating or overestimating inflation? In the mid-1990s, the Boskin commission concluded that inflation was overestimated by 1% per annum; in the Eurozone, there were many analyses in the 1990s explaining that real inflation was higher than official indices... At present, inflation is supposed to be underestimated.

This debate explains why, over the past twenty years, beyond price indices, underlying inflation indicators have been developed: some (core CPI) excludes volatile components (like energy and food prices) or assign smaller weights to more volatile items, some (“super-core CPI”) exclude particularly volatile prices, increase the weighting of services and take into account the output gap. Tracking such an index can undeniably help policymakers identify real changes in the “heavy” trend of inflation. The core measures are less volatile than headline inflation rates, and all of them point to the lack of inflation in the Eurozone.

5. Cost models: The cost model is much more interesting. According to this approach, an increase in production costs ends up being passed on to the price of finished products, and thus to the general level of prices. This model is thus focused on what is driving rising production costs. The relationship between inflation and unemployment (known as the “Phillips curve”) is one of the cornerstones of this approach: (i) a low unemployment rate puts pressure on wages and therefore on prices; ii) the lower the unemployment rate, the stronger the relationship. This trade-off between unemployment and wage growth, and, as a consequence, between inflation and unemployment can be exploited by the business cycle and by central banks.

This relationship has been strongly criticized: according to opponents to the Phillips curve, monetary policy cannot sustain unemployment below its “natural rate” (determined by structural factors) without leading to accelerating inflation (it explains the NAIRU = the Non-Accelerating Inflation Rate of Unemployment). In short, in the long run, the Phillips curve is vertical. In the short-run however, there is sufficient scope for monetary policy to smooth out fluctuations around the independent pathway of potential output by affecting cyclical unemployment (and the difference between observed unemployment and the NAIRU), and thus inflation.

This relationship is no longer very strong. US unemployment is below structural unemployment... but inflation is still below its target. In recent decades however, the slope of the original Phillips curve appears to have flattened worldwide, i.e. the relationship between unemployment and inflation appears to have weakened. The substantial variability in unemployment has had less effect on inflation, which has remained anchored at relatively low levels in the US and the euro area, despite large swings in the economic cycle. Using NAIRU, NAWRU (Non-Accelerating Wage Rate of Unemployment) or Greenspan NAICU (Non-Accelerating Inflation Capacity Use) does not change the results. The curve is desperately flat...

The graphs 4 and 5 stress the transformation of the Phillips curve. Negative in the 1960's in line with the “theory”, it became rapidly flat in the US... and it followed suit in Germany in the 2000's. Phillips curve is flat mostly everywhere now... Does it mean it has disappeared?

- If the Phillips curve has disappeared, the Fed can look for lower unemployment without any risk of higher inflation. Interest rates can stay low for long and “normalisation” is not that necessary;
- If the Phillips curve has not disappeared, then there is a pending risk for inflation to resurface (soon?) (strongly?)... normalisation and interest rates hikes have to be pursued.

So, What's up?

- **Observation # 1: Inflation expectations are anchored to low levels;**
- **Observation # 2: the determinants of inflation have changed.** Inflation is now a function of long term expected inflation and not a function of past inflation;
- **Observation # 3: the Phillips curve is now different.** It is a relation between unemployment and inflation (as in the 60s) and not a relation between unemployment and inflation changes anymore.

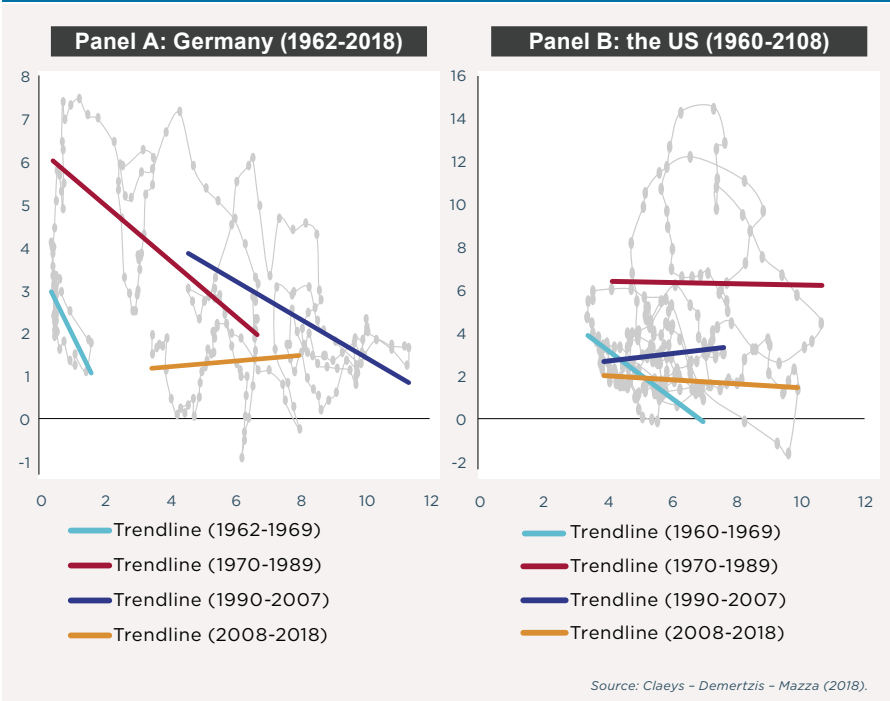
Why such a situation?

- **Explanation # 1: the high central bank's credibility.** For the past 20 years, and especially in the past 10 years, central banks were doing well in controlling inflation. The nature of the Phillips curve has therefore changed. It is sustainable as long as wages remain under control.
- **Explanation # 2: another reason for the Phillips curve is the nature of jobs created:** low skills jobs, low wages, low impact on inflation. It is probably not sustainable.

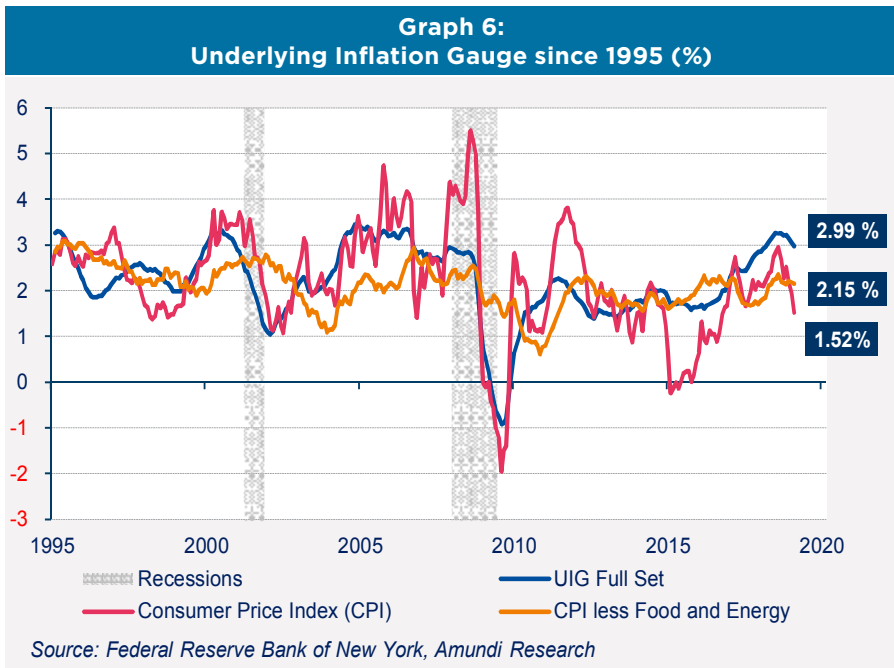
Graphs 4-5: The Phillips curve in Germany (left) and in the US (right)

X axis = quarterly unemployment (in%)

Y axis = quarterly inflation (YoY in %)



As a result of changes in the labour market, globalization or e-commerce, the consumer price index continues to decline in advanced economies. **But inflation has not disappeared. It has partly moved towards financial assets** (stock markets, real estate, private equity, etc.). It is another way to consider that inflation is underestimated at present. That's why the Fed calculates a new price indicator: the "Underlying Inflation Gauge" (UIG). The UIG captures inflation (CPI, PPI, PCE, Import prices, export prices...), real activity (ISM, unemployment, average weeks unemployed insurance...), money (Money stock, no-borrowed reserves of depository institutions...) and financial data (Fed funds, T-Bills rate, bond yields, USD FX rates, NYSE index, NYSE volume, S&P PER, DJIA, future oil contracts, S&P futures...). The latest full set (prices of goods and services + prices of financial assets) is 2.99% while the price of goods and services component is 1.93%. Current CPI Headline is now 1.52% and Core CPI is 2.15%.

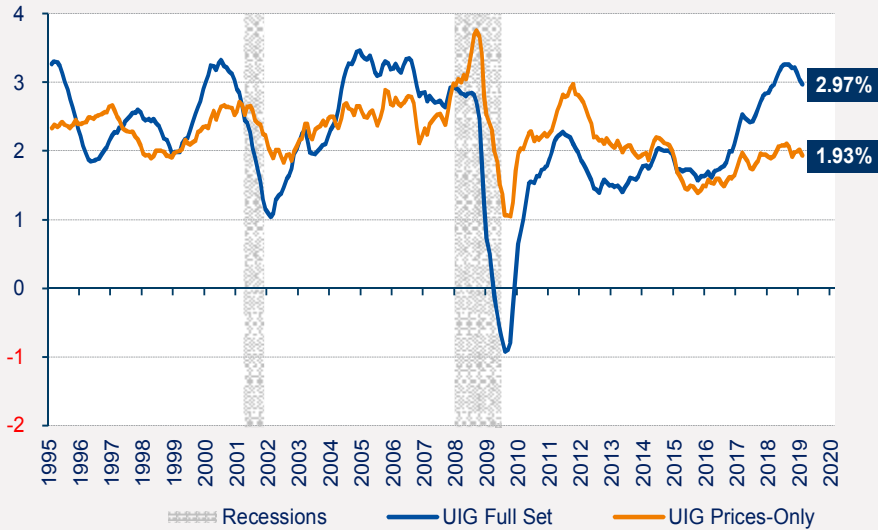


Had the Fed been using a 2% target based on the UIG, former chairs Janet Yellen and Ben Bernanke would have been compelled to raise interest rates much earlier than they did.

Some studies have tried to calculate UIG for the Eurozone and for Japan. UIG forecasts do not show any sign of a meaningful increase in core inflation in the Eurozone. These levels are much lower than the ECB's "below but

close to 2 percent” inflation target and would justify a cautious approach to policy normalisation in the period ahead. The Japanese UIG points to a new moderation of core inflation, well below the Bank of Japan’s 2% target. Monetary policy in Japan will likely remain also very accommodative.

**Graph 7:
Underlying Inflation Gauge and Prices with CPI, Core CPI (%)**



Source: Federal Reserve Bank of New York, Amundi Research

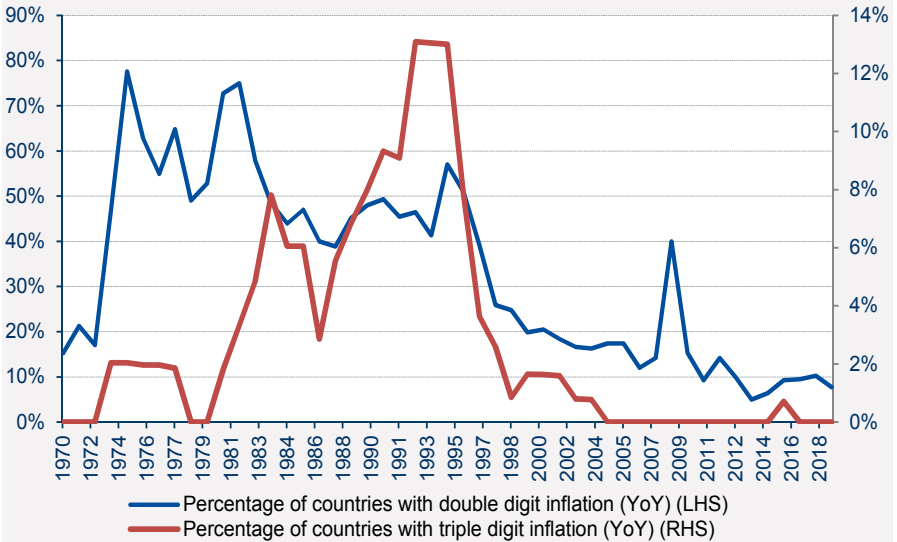
There is no longer any relationship between employment and inflation, nor is there any relationship between money supply (M2 / GDP, monetary base / GDP, for example) and inflation. If we consider that the central banks arbitrate between short-term growth and inflation, and monitor the evolution of monetary aggregates which is supposed to determine inflation in the long term, one can understand that they are a little lost. **If inflation is not (no more?) determined by the growth of the money supply, what is the point of monitoring monetary aggregates?**

How is long-term inflation now determined? Currently, it appears that the structure of the labour market determines long-term inflation. Greater labour market flexibility would lead to lower long-term inflation. **Monetary policy would ultimately have relatively little impact... it would “accompany” the level of inflation more than it would determine.**

To sum up, what we are seeing is not the death of inflation, but the death of high inflation. We are in the “*flat-flation*” phase (low and stable inflation, see insert below). As a consequence, the number of two-digit and three-digit

inflation countries has dropped considerably over the last 30 years (graph 4). Moreover, **high inflation is always associated with severe political and social disruption. High inflation is nowhere and never “a merely monetary phenomenon”.**

Graph 8: Number of countries with double-digit and triple digit inflation since the 1970s



Source: National Sources, Amundi Research

Insert: What investment strategies for which inflation regimes?

Different inflation regimes can be identified:

- **Inflation:** a widespread and cumulative increase in prices, which drives up the rate of inflation or keeps inflation excessively high;
- **Disinflation:** declining rates of inflation; inflation still positive but declining;
- **Flat-flation (or Low-flation):** stable and low inflation;
- **Deflation:** regime of simultaneous contraction of the rate of inflation and economic activity. This period of deflation often stems from an excess of recourse to credit, resulting at one point in a reduction of indebtedness (the intense deleveraging period is referred as “debt deflation”) which, when it comes from public excesses, strongly constrains economic policy. It then struggles to support growth. When deflation reaches high levels, it is called depression;
- **Stagflation:** low economic growth paired with high inflation. This situation is not so frequent, and the last episode dates from the 1970s.

Table 1: Asset classes and inflation cycles

	Inflation	Disinflation	Flat-flation	Deflation	Stagflation
	General and uncontrolled price increases	Deceleration of price increases (inflation under control)	Low inflation	Declining prices and declining activity	Low growth and high inflation
Money markets	Buy	Sell	Sell	Massive buy	Sell
Bond markets	Massive sell	Buy	Buy	Massive buy	Buy... to some extent
Equity markets	Massive sell	Massive buy	Buy	Buy... to some extent	Massive sell
Commodities	Massive buy	Sell	Neutral	Massive sell	Buy
Gold	Massive buy	Massive sell	Neutral	Buy	Massive buy
Real estate	Neutral	Buy	Buy	Massive sell	Sell

Source: Ithurbide Ph. and M. Bellaiche (2017)

II. What consequences for central banks?

Several consequences must be mentioned.

2.1. Is the « Underlying Inflation Gauge » the answer? NO

The Underlying Inflation Gauge (UIG) is useful because it provides a good view of underlying inflation and the shift of inflation from goods and services to financial assets, and vice versa. It can therefore be used to guide monetary policy... but caution is required: if inflation from goods and services prices has a stabilizing character (too high inflation generates expectations of monetary tightening and weakening of economic activity...), inflation via financial assets has a destabilizing character: the induced wealth effects push the runaway economy, the use of credit, economic overheating, the amplification of financial imbalances ... The messages for central banks are very different. In the first case (price inflation), it is about growth, in the second (financial assets inflation), it is about financial stability... Central banks cannot therefore use the UIG as such as a goal... its breakdown is crucial. Inflation from the goods and services component or from the financial assets' component does not have the same meaning and must be treated differently.

2.2. Inflation targeting: is this illusory?

Will central banks change course? Probably not.

Inflation targeting was born in New Zealand in March 1990. Admired for its transparency, and thus for facilitating accountability, it achieved success there, and has been rapidly implemented in Canada, Australia, the United Kingdom, Sweden, and Israel. It subsequently became popular in Latin America (Brazil, Chile, Mexico, Colombia, and Peru) and among other developing countries (including South Africa, South Korea, Indonesia, Thailand, and Turkey). Inflation targeting unofficially died in the 2010's, when it became clear that those who had been relying on it had not paid enough attention to asset-price bubbles. But its death was never announced, owing to uncertainty over what should succeed it. Many central banks have therefore maintained an inflation target, mostly at 2% or around 2% (see Annex).

In past economic cycles, the Fed began to raise interest rates in the middle of the expansion period (early 1994 for the expansion period from 1992 to 1999, at the end of 2004 for the expansion period from 2002 to 2007). But in the current economic cycle, the Fed has raised its interest rates until 2017, while the unemployment rate has been falling since the beginning of 2010. The reason is simple: full employment in the United States no longer brings back inflation. So, the Fed ended up not concluding that inflation would not come back, but that there was a need to normalize monetary policy in order to be able to use it counter-cyclically in the future. So, in practice, inflation targeting has to be abandoned. From the beginning of 2017, the Fed has increased its interest rates.

Under the “inflation targeting” rule, interest rates must be raised when price increases exceed a target level. This approach is highly criticized. J. Stiglitz, for example, considers that *“this rudimentary method is based on a weak economic theory and little empirical evidence ... and there is no reason to believe that, whatever the source of inflation, the best solution is to raise interest rates.* In any case, the current inability of central bankers to have inflation converging towards their 2% target, despite the scale of the measures taken since the financial crisis, has led them to question their strategies. The Japanese Finance Minister recently encouraged the BoJ to be more flexible on the inflation target given its adverse effects. Olli Rehn, a member of the ECB, warned on the effect of prolonged low interest rates reinforcing reliance on unconventional tools, which have not been proven effective in terms of inflation. Reluctance is however strong to adapt a strategy (inflation targeting) which has long made it possible to strengthen the legitimacy and credibility of monetary policies. ECB Chief Economist P. Praet recently acknowledged that the current period *“may not be the right time”* for a review of both tools and strategy. M. Draghi, shared this caution, indicating that *“in a black room, we must move slowly.”*

In November 2018, however, the Federal Reserve decided to launch a broad review of its monetary policy, including the inflation target. The conclusions will be made public by mid-2020. As Richard Clarida, vice-president of the Fed explained, three questions will be asked:

1. Can monetary policy achieve its statutory objectives, or should it take into account past deviations from its inflation target?
2. Is the toolbox available to the Fed sufficient or should it be expanded?
3. How to improve the communication of the Fed?

If the communication style is important, the content is more important. Thus, market participants will inevitably give priority to the first two issues. The question of whether the monetary policy of a central bank should take into account deviations from the inflation target is not new. This comes down to choosing between an **inflation targeting** or a **price-level targeting** strategy. Since the crisis, the concept of Price-Level Targeting has gained ground as it has become clear that central banks are failing to bring inflation back on target. Rather than targeting inflation, the alternative would be to target the price level.

If the strategy is based on an inflation target, the fact that inflation has long remained below target does not in itself influence future monetary policy, which aims only to bring inflation back to the target level. But **if the strategy is based on the price level**, the central bank sets a moving target (the target price level increases each year with the inflation target): if inflation is significantly lower than the target, this will have to be offset by inflation above this target: once inflation has remained below target for a given period, the central bank commits to maintaining it beyond this objective as long as necessary. To take a simplistic example, if inflation is at 1% (instead of 2%) for 5 consecutive years, then the Fed would tolerate 3% inflation for 5 years to compensate for “lost” inflation. This would reinforce the idea that the inflation target is symmetric.

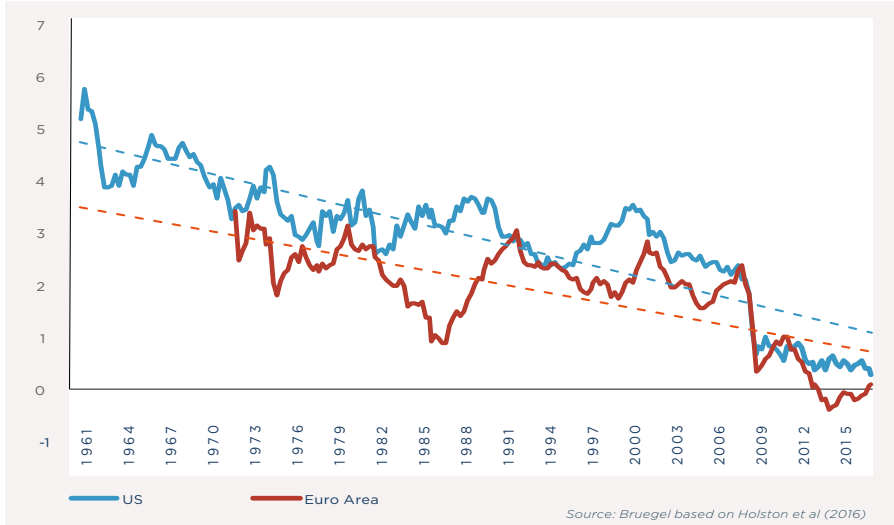
Price-level targeting might become a dangerous strategy. If this policy of “price-level targeting” is not credible (vis-à-vis households, companies, investors...), exceeding the inflation target could eliminate the anchoring expectations of inflation, which would complicate the control of the inflation rate. One can also wonder about the consequences of this policy in terms of risk of bubble formation and volatility on the financial markets. “Low rates for longer” imply that risky assets (equities, corporate bonds, real estate) would reach high valuation levels, driven by the belief that monetary policy should remain accommodative as long as the accumulated inflation deficit will not be fixed. The need to encourage a prolonged overrun of the inflation target to correct the inflation deficit could further increase these concerns. All of this shows the complexity of the price level targeting approach.

2.3. Monetary rules: are central bankers lost? 100% yes (J. Yellen, Amundi Forum - 2018)

Chair Janet Yellen said that the reason why inflation remains low is a “mystery” (Yellen 2017 and 2018). There are many monetary rules (McCallum’s Rule (1987, 1993), Feldstein- Stock’s rule (1993) and Hall – Mankiw’s rule (1993), Haldane’s Rule (1995), Svensson’s Rule (1996), Bernanke – Mishkin’s rule (1997)...), but the best-known monetary rule is undoubtedly Taylor’s rule (1993), a rule used by a number of central banks, research and Central Bank Watching departments. According to this rule, the key interest rate must depend on the equilibrium real interest rate, the expected inflation rate, the output gap (difference between actual growth and potential growth), and the difference between inflation and inflation target. The equilibrium is reached when inflation expectations have disappeared, the output gap has disappeared, and the inflation target has been reached. Otherwise, the monetary policy should be adjusted by +/- 50bp for any percentage difference between inflation and the inflation target of +/- 50bp for any percentage of output gap.

Note that the “neutral” interest rate (the equilibrium rate between demand and supply of funds compatible with full employment of capital and labour resources, and with price stability (i.e. inflation around the central bank’s target) has fallen significantly in the past decades (with an acceleration since the 2008 Great Financial Crisis). This means that central banks’ margin for manoeuvre has also been reduced ... following monetary rules has become more difficult in such a context.

Graph 9:
US and Eurozone neutral interest rate 1960- 2015



Since the creation of the euro until 2013, the ECB has more or less followed a Taylor rule... But since 2013, the divergence has become glaring. According to the rule, from 2012 to 2015, the ECB conducted an overly restrictive monetary policy, and interest rates should have been reduced to zero in early 2013 and not in 2014. The QE should have been adopted in 2013, when the Taylor rule indicated a negative “optimal” key rate “. Since 2015, however, the ECB has been conducting a loose monetary policy. The QE should have been interrupted by mid-2015 (and not by the end of 2018). The key rate should now be above 2% and not equal to 0%.

How to explain these gaps?

- **Lack of consensus within the ECB to quickly adopt an QE?** Without a doubt. QE was initially rejected by Germany and the Netherlands in particular.
- **A lag in time?** As the QE started tardily, it also ends tardily.
- **Some kind of compensation?** After conducting a policy that has been too restrictive for a long time, the ECB is probably trying to compensate with a softer monetary policy.
- **The failure of the Taylor rule?** Without any doubt. When inflation does not react to the unemployment rate, why follow such a rule?

2.4. Does the “absence” of inflation mean the “absence” of economic cycles? Yes, to some extent.

In none of the OECD countries, inflation is no longer observed during periods of economic expansion and / or when the unemployment rate returns to its structural level. This comes from three elements essentially:

- The weak response of wages to the fall in unemployment, due to the decline in the bargaining power of employees;
- Low price response to rising wage costs due to domestic and foreign competition;
- The reaction of shale oil production to the rise in oil prices: when the price of oil rises, shale oil production increases, which lowers the price of oil (see 2017H2 and 2018H1).

The absence of rising inflation at the end of the expansion period keeps interest rates at (very) low levels, as well as the maintenance of low expected inflation and long-term interest rates. Can we hope / fear the disappearance of economic cycles? Can growth reach the growth potential (long-term growth) and remain there for long.

This scenario may seem attractive, but it is not credible. And if this is neither inflation and rising interest rates, nor excessive debt, nor the deterioration of the financial situation of corporates, nor the bubbles on asset prices, where could the next recession come from? The low interest rate is a condition

that improves solvency but does not guarantee it. Factors such as wage bargaining and value-added sharing have not fully disappeared, as are fears of escalating trade conflicts or geopolitical risks. In short, economic growth does not depend on the reaction of inflation alone. The new situation has certainly – and considerably – reduced the likelihood of recession at the end of the expansion period. But many drawbacks still exist: abnormally low interest rates show a rapid rise in the prices of financial assets, an excessive valuation in risk premiums, and an incentive to increase public debts ... and debts in general. Cycles have not completely disappeared.

2.5. What could ECB do if core inflation remains at 1%? The ECB would keep rates at low levels.

The ECB recalls that in order to normalize key interest rates, euro area inflation should “*return in a sustainable manner to levels below 2% but close to 2% in the medium term*”. This is not happening:

- Unit wage costs in the euro area are not accelerating and despite the fall in unemployment, they remain in a weak progression (less than 1% YoY);
- The price of commodities, particularly oil, is declining (we have revised our 2019 and 2020 forecasts downwards);
- Growth in the euro area is slowing down quite sharply, especially in the first half of 2019. In addition, with very low indexation of nominal wages to prices, as inflation rises, real wages decline, which weakens growth and prevents a sustained rise in inflation.

Will prices return to 2% without an external shock? Probably not ... this means that unlike the Fed, and like the BoJ, the ECB will never restore any leeway that could be necessary in the event of a major slowdown or crisis (so the QE tool may be reactivated). The use of inflation targeting is becoming more and more complicated. Even when the unemployment rate is very low (United States), or if hiring difficulties are critical (euro area), the rise in unit wage costs remains low, and the underlying inflation remains well below its level.

Two options for the ECB if inflation remains below 1%:

- **Either maintain its inflation target and leave its key rate at 0%.** This is dangerous if it leads at the end to significant financial imbalances (excessive valuations, financial bubbles, excessive use of debt). Admittedly, the valuation of certain assets (bonds, real assets...) may seem excessive, as well as the overall indebtedness and indebtedness of companies (but not everywhere: probably in France, but not in Germany).
- **Either consider that this goal is no longer appropriate and that it becomes dangerous to keep rates at zero for long;** the ECB can therefore change its inflation target, or change its objective in order to be

able to increase rates. It would then be a question of choosing a nominal growth objective or a price-level target. The debate also exists in the US.

It seems difficult to imagine that the ECB will change its focus: it is committed for long to the inflation target and all its communication is focused on this (officially) unique objective. **It seems more likely that if inflation does not recover or fall further, then interest rates will remain close to zero.**

2.6. Low inflation, low rates, paradox of tranquillity and paradox of credibility... some dangers to come? Probably yes.

Low and stable inflation for long tends to favour excessive risk-taking (more leveraging), especially if the central bank is credible. Indeed, since agents are assured of the central bank's commitment to ensure price stability, their inflation expectations are more firmly anchored around the target it pursues, so that the rise in credit and asset prices will not necessarily translate into higher inflation (see section on UIG). It is positive to some extent. However, the maintenance of price stability does not encourage the central bank to tighten its monetary policy, so that the latter ultimately allows financial imbalances to accumulate excessively: it is what we call the "**paradox of credibility**". (Goodfriend (2001), Borio and alii (2002, 2003)).

The main driver of financial crisis is credit / indebtedness, as refer to history. Back to H. Minsky ideas and papers is useful at this stage. He referred to three different types of financing (debt):

- **The hedge financing:** payment of both debt and interest being hedged by the expected return of the investment. This debt is healthy.
- **The speculative financing:** the expected return covers interests only. As a consequence, the debt is systematically rolled.
- **The Ponzi financing:** the expected return does not cover anything, neither the debt, not the interest payments. The debt rises or assets are sold... this is a very unhealthy and dangerous debt.

Minsky (1982) has also focused on the magnitude of instability. The longer the period of stability, the higher the unhealthy debt, the deeper the financial crisis (more speculative financing or even Ponzi financing): this is what we call the "**paradox of tranquillity**". Are we living in such an environment at present? Probably yes, to some extent.

2.7. Without inflation, is the use of fiscal policy easier? Yes, to some extent.

There is no fixed rule for determining the sustainable level of deficit and indebtedness. However, one of the decisive factors is the difference between the interest charge (r), which mechanically contributes to the growth of the debt, and the increase in income (g). This difference ($r-g$) determines the "snowball" effect, positive or negative, inherent to any indebtedness:

- If it is positive, the “snowball effect” of debt will sooner or later lead to net spending reductions;
- If it is negative, it mechanically reduces the ratio of debt to GDP: refinancing the debt is not problematic and a deficit equal to this effect will not impose any subsequent tax increase.

The good news is that for the euro area as a whole, the “snowball effect” has been a mechanical factor since 2015 in reducing the debt ratio by around 1 percentage point (pp) of GDP per year. For the most recent period, only Italy is an exception. On the other hand, the Eurozone has a primary surplus of close to 1% of GDP. In total, the debt-to-GDP ratio falls by around 2 pp of GDP per year. With the exception of the 1980s and 1990s, growth far exceeds the cost of public debt until the 1970s, and significantly since the end of the Great Recession of 2009.

O. Blanchard (former chief economist of the IMF) recently went further (Blanchard (2019)), saying that public debt was not necessarily a problem: according to him, **if interest rates remain permanently low, any public debt can be reimbursed easily, no matter how big, without the need to raise taxes or cut spending. Just be patient.** A structural public deficit can be tolerated, provided it is not too high... and in case of emergency as in 2008, we can accept a sharp deterioration of public accounts, provided thereafter return to a reasonable deficit. For the New York Times, this statement is a complete turnaround for the IMF, as if “*a former pope claimed to support the devil.*” This paradigm shift would thus be proof of a new budget orthodoxy giving less room for debt payment efforts. **By going to the end of Blanchard’s logic, and if we want to make the r – g effect even more favourable, the State has to finance itself on very short maturities, where the interest rates are even lower.** The public debt would become a monetary debt. There are currently many proposals in this direction... It is obviously dangerous: **who can swear that interest rates will not rise sharply one day or the other?** Blanchard’s analysis nevertheless helps to understand that in the current context, the solvency constraint of public accounts remains low in many countries. However, it would be totally unfair to consider that Blanchard recommends loose fiscal policy: his article is much more sophisticated than generally presented.

In any case, all countries must not overestimate the effectiveness of public spending. On the other hand, **raising nominal wages or cutting taxes** (and raise disposable income) or **using more extensively public expenditures** would have different impacts, and should be decided looking at efficiency and second-round effects.

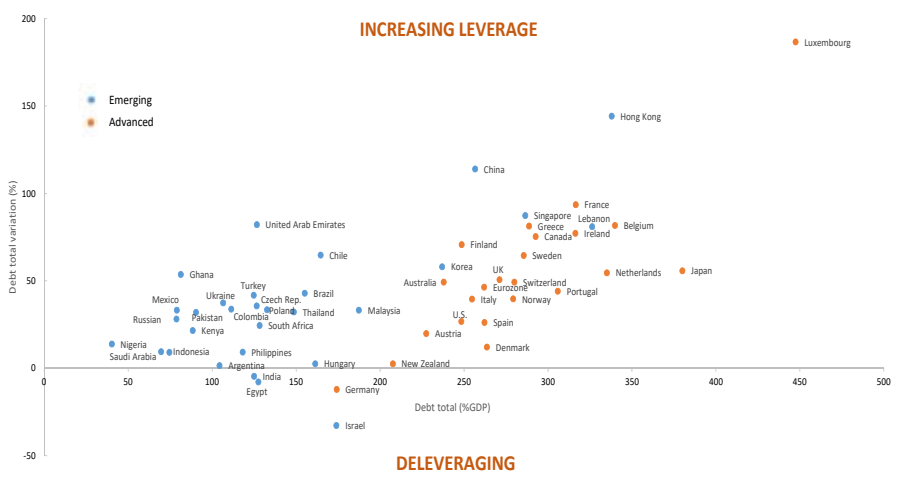
We must also admit that even if interest rates stay low and inflation under control, and even if economic growth stays largely above interest rates, **the**

trend in indebtedness is still a major problem and fiscal discipline is limited.

To illustrate the **impact on low interest rates on budget deficits**, let's mention the "savings" in interest payments on Eurozone government debt. In percentage of GDP, during the 2008-2018 period (cumulated figures), Germany has "saved" 10.85% of GDP (368 bln euros), France saved 14.9% GDP (350 bln), Greece close to 30% GDP (55 bln), Spain 8.35% (101 bln) and Italy 14.80% (261 bln). On average, the Eurozone has "saved" 11.8% of GDP, i.e. 1417 bln euros. According to the Bundesbank, the average interest rate went down in Germany from 4.2% to 1.5%, in France from 4.4% to 1.9%, in Italy from 4.9% to 2.8%, and in Spain from 4.2% to 2.5%. for the Eurozone as a whole, the interest rate went down from 4.5% to 2.2%. The most spectacular plunge occurred in Estonia, where the interest rate went down from 5.1% to 0.5%. In other words, a large part of the reduction in fiscal deficits in some European countries came from debt servicing.

The graph below presents the **evolution of global debt** (government debt + households' debt + corporate debt) since the 2008 Great Financial Crisis: a few countries (Germany, Israel, Egypt and India) have been able to reduce it in the past decade, which means that low interest rates are not sufficient, in practice, to give additional leeway to plenty of countries.

Graph 10: Total debt to GDP since the Great Financial crisis emerging vs. advanced countries



Source : Datastream, Amundi Research, Data 3Q2018, Total debt = Govt Debt + NFC Debt + HH Debt

The case of France: France borrows at low cost. It's positive, but it's still risky due to the sharp increase in French debt in the past 20 years (and since 2008, see graph 10). In this respect, France is in an ambiguous zone: weak safeguards, particularly institutional ones, to limit expenditure or to make sure of its merits. Its membership of the Eurozone deprives France of the control of its currency, but gives it in return an important privilege, that of being, in the absence of German public deficits, the least bad of the big countries of the Eurozone capable of issuing liquid debt and good credit quality. This privilege, added to the room for manoeuvre provided by the environment of permanently low interest rates and persistently low inflation, should not allow France - and other countries - to avoid paying attention to the quality of the public expenditure incurred. It is to be hoped that it will not cause excessive damage to those of future generations who are in debt.

2.8. Low inflation, globalisation, low wage increases, higher debt, independence... will central banks face pressure? Definitely yes.

The rationale behind central bank independence is well known: any government would have a natural tendency to manage monetary policy with little respect of the objective of price stability. It is believed to be at the origin of an inflationary bias stemming from its inability to anchor the expectations of private economic agents at a low level. It is this lack of credibility of the government that the transfer of monetary policy to an independent central bank is supposed to offset. The fact of entrusting this institution with a single goal of price stability drastically reduces the temptation to seek to revive the real economy at the price of higher inflation.

Critics claim that the main problem of central bank independence is that it was introduced to solve a problem - high inflation - that no longer exists. Does their independence prevent them from using more direct and effective solutions to solve current problems? What should be their role when the main problem is not inflation, but deflation, over-indebtedness and financial crises (in other words, the world since 2008)? Moreover, according to a CFM-CEPR expert survey (2017), the traditional argument that less central bank independence leads to higher inflation is considered to be relevant over the next 48 months in Western economies for around 50% of respondents only (panel of economists based in Europe).

Critics also point out that the need or desire to preserve their independence often prevents central banks from responding quickly to these problems in the most direct and effective way:

- The uniqueness of target (price stability or the internal value of the euro) was already criticized as early as the 1990s;

- Their current room for manoeuvre (quantitative easing, ultra-low or negative interest rate policies) distorts financial markets, can have serious consequences for financial stability, and is not commensurate with current issues.
- There is also asymmetry in monetary policy: central banks have more tools to restrain inflation than to stimulate it. The main problems today, and those likely to loom on the horizon, are the persistence of disinflationary and even deflationary forces in the world, the over-indebtedness of the public and private sectors, and the risk of new financial crises. Conventional and unconventional policies have reached their limit since the financial crisis.

In other words, central banks would be better prepared to face the current economic challenges if they worked closely together and under the control of a democratically elected government.

The rise of the rejection of elites, technocrats, the rise (and sometimes the rise to power) of populist parties in some countries is fuelling mistrust in central banks. These are more often the subject of pressure from politicians and governments. This could call into question the current balance and revive the debate on their institutional, operational, functional, organizational independence... In short, call into question the very pillars of central banks such as the ECB (see Appendix 2). As The economist (2018) recently pointed out, monetary policy is becoming dangerously political in some countries:

- In the United States, President Trump has threatened to sack Jerome Powell, the Fed's chairman, whom he accuses of hampering US growth by keeping interest rates too high;
- In the UK, Brexit supporters criticize the Bank of England and governor Mark Carney's involvement in the Brexit debate. But leaders of major political parties have also written articles criticising the Bank of England's independence.
- In Turkey, President Erdogan lashed out at the central bank.
- In India, the government replaced the governor of the central bank with a political sympathiser who lowered interest rates in the run-up to the elections.
- In Europe, the upcoming renewal of positions at the European Central Bank, including that of its president, Mario Draghi, has become an eminently political issue. His departure next October almost coincides with the formation of a new European Commission and a Council, which had not happened in 40 years.

It should be recalled that independence within the meaning of the European Treaties goes far beyond institutional, organizational and

operational independence... it was also a matter of assigning the ECB a single objective, price stability. Already criticized during the creation of the ECB and the introduction of the euro, this choice has shown its limits.

- **Theoretical limitations:** the problem of coordination of monetary and fiscal policies remains intact, and the lack of flexibility due to the ex-ante allocation of an instrument with a single objective (price stability), or the reducing assumption of perceived inflation only as an exclusively monetary phenomenon do not appease the debate.
- **Empirical limitations:** Is central bank independence an absolute necessity to defeat inflation? Certainly not. The Bank of Japan is not very independent of political power, but it performs very well in controlling inflation... probably because the nature of inflation has changed, which we have shown above.
- **The reality is even more complex:** are central banks really still independent when playing, as in the 2008 systemic crisis, such a role of lender of last resort? Is the ECB really independent when it agrees to finance the Greek, but also Irish and Portuguese, debt by relaxing the conditions it accepts as “collateral”, in return for liquidity provided, the “junk bonds” attached to the sovereign debt of these countries? Does the phenomenon of moral hazard not diminish their degree of independence? As a consequence, only 30% of Germans trust the European Central Bank (ECB), according to recent Eurobarometer surveys of public opinion. In sum, it seems fairly easy to question the true degree of independence of central banks in developed countries, even for central banks that have provided evidence of the credibility of their monetary policy such as the ECB or the Fed.

If we can question the advantage that the independence of the central banks would offer in terms of cyclical regulation, should we then go back to a strict independence, should the role of the central banks be supplemented to the detriment of the concept of independence, or should one completely abandon the status of independence, a status that is ultimately very recent? **Reviewing their status, role, mission and independence seems inevitable, and enlarging the role of central banks is an inescapable fact.** Charles Goodhart (a former member of the Bank of England’s Monetary Policy Committee, and a well-known and respected expert of central banks) has even suggested that “*the idea of the central bank as an independent institution will be put aside*” (Goodhart 2010). He sees central banks as increasingly involved in interactions with governments on issues like regulation and sanctions, debt management and bank resolution.

The reason why both central banks and governments face pressure is clear. Disinflation, low interest rates and globalisation have had

an important impact: the inclusion of 2 billion workers (from emerging countries) has put pressure on wages, while governments tried to compensate some negative effects (competition, lower growth, unemployment ...) with higher deficits and became complacent with the rise of global debt. At the same time that a middle-class was created in the set of emerging countries, the middle-class of advanced countries was fragilized with higher taxation, lower employment, a decline in disposable income, the perception of inequalities etc., This had without any doubt contributed to the rise of populism, favoured “yellow vests” in France, Brexit in the United Kingdom ...

Governments and central banks are most likely to be under pressure, and among the “solutions” to the current problems, lower taxation and rising wages are at the forefront. In other words, the shock which is supposed to represent the only way / risk for inflation to rise could come soon, earlier than generally expected.

Conclusion

With persistently low inflation, what becomes different?

Inflation never disappears completely. In history, there have been periods when it was dormant, but revivals have always been painful. What is striking at present is the inability of some countries to boost inflation despite low rates, liquidity injection programs ... The BoJ and the ECB have made the bet (losing for the moment) that an ultra-accommodative monetary policy would quickly translate into a rise in inflation rates, while the Fed has opted for a “friendly” normalization of its monetary policy, helped in this, it must be said, by a fiscal and tax policy that has never been as procyclical as in recent years (the Trump years). The theme of the “end of inflation” refers to some advanced countries; some emerging countries have inflation rates close to 4% - 5% (Russia, Brazil, India in particular) while Turkey is struggling with inflation close to 15%.

Why was it important to question the end of inflation? First of all, because there are no more inflation expectations and a rise - even a small one - is likely to have significant impacts on the financial markets and economies, and second, because it also affects very directly the objectives, instruments and prospects of central banks and governments.

With regard to central banks, there are talks on inflation targeting (is it still useful, is it credible or dangerous to adopt another target such as the price level?), on strategy (should we keep low rates for a long time and take risks on financial stability?) and on tools (are non-conventional monetary policies now part of the “classic” central banker toolkit?).

For governments, it is a matter of properly assessing the fiscal and tax leeway “offered” by the low interest rate and low inflation environment: is this reasonable in a world where the accumulation of debt has never really stopped for almost all advanced countries? How to be sure that fiscal and tax complacency will not be back?

Since the 1970s, central banks have followed different objectives: to offer a good level of liquidity in the 1980s (especially in the US), to bring inflation back to the desired level from the early 1980s to the 2008 Great Financial Crisis, to avoid crises and deflation, and to extend periods of expansion as much as possible since 2008. However, since the 1980's, the bulk of central banks has adopted and kept inflation targeting, concluding that inflation around 2% or at 2% or close to 2% could be considered as “price stability”. Since 2008, facing deflation fears, central banks have also adopted ultra-accommodative monetary policies, with sometimes the addition of non-

conventional measures (QE programmes). Unfortunately, inflation is still largely absent. The puzzle of “missing inflation” can be explained by the structure of the labour market (the lack of bargaining power of employees...), competition, the lack of inflation expectations (partly due to the extreme credibility of central banks, and, especially in the Eurozone, the weakness of the structural component of inflation).

This new situation implies major changes in the way OECD countries are now perceived: low wage costs growth, low underlying inflation, and low interest rates persist despite the positioning in the business cycle (late cycle positioning) and despite tensions in the labour market. In this atypical context, with low wages and low interest rates, corporates are able to maintain a high profitability. Last but not least, the maintenance of low interest rates improves the solvency of public and private borrowers.

As a consequence of these “disruptions”, one can mention:

- The absence of recession due to interest rate hikes or declining profits or solvency problems of borrowers. Other factors (geopolitics, trade issues, accumulation of debt...) still exist, though;
- No deterioration in business fundamentals at the end of the expansion period... and therefore no sharp credit cycle;
- Lower risk of debt crises due to low interest rates;
- Lower oscillation (swings) of inflation cycles;
- Lower oscillation (swings) of growth cycles.

Central banks face new challenges.

- 1. Inflation targeting has become an illusion**, but central banks will probably not change course ... even if the Fed has recently decided to review targets, toolkit and communication policy.
- 2. Monetary rules do not work properly, and one can say that central bankers are lost.** The flattening of the Phillips curve (i.e. the weakening of the relationship between inflation and unemployment) reduces the capacity of central banks to reach their inflation targets. Inflation-targeting might be officially dead. Central banks should therefore revisit their inflation targeting policies. These policies are easily understandable, with high transparency... but they are inadequate at present.
- 3. Inflation is not dead... it moved from goods and services to financial assets**, with additional risk on financial stability (excess of debt, excessive valuation, potential wealth effect...).
- 4. Central banks have been particularly efficient in fighting inflation.** Inflation expectations have mostly disappeared and central banks do not have to raise rates. But low interest rates for long might push again credit and indebtedness in dangerous territory. How to manage this paradox of credibility?

5. **The “absence” of inflation does not necessarily mean the “absence” of economic cycles** (both growth and inflation) because cycles do not rely on inflation alone. However, the magnitude of cycles has been naturally reduced.
6. **Without inflation, the use of fiscal policy seems easier... but It is just an illusion.** The risks still exist, should one consider the size and the trend of fiscal deficits and indebtedness. Moreover, what could be the interaction between nineteen different fiscal and tax policies and a common monetary policy in such a context? (Claeys and alii (2018)). Is fiscal complacency close to come back? Can differences in national macro-prudential frameworks (in the absence of significant reforms) weaken the overall resilience of the system?
7. **Non-conventional monetary policy tools are definitively in central banks’ toolkit.** Lower inflation / lower potential growth means lower neutral interest rates (in advanced economies). It may reduce the power of central banks’ conventional monetary policies.
8. **Central banks are more and more concerned with financial stability:** will it become a specific target for the ECB? Not sure. Country-specific tools are by far more appropriate, alongside with closer coordination with national macro-prudential authorities.
9. **Central banks will face pressure alongside with the governments.** The middle-class of advanced countries is fragilized with higher taxation, lower employment, a decline in disposable income, the perception of inequalities etc. This had without any doubt contributed to the rise of populism, favoured “yellow vests” in France, Brexit in the United Kingdom... Critics claim that the main problem of central bank independence is that it was introduced to solve a problem - high inflation - that no longer exists. Their independence would prevent them from using more direct and effective solutions to solve current problems. According to the critics, their role should be revisited, while the main problem is not inflation anymore, but deflation, over-indebtedness and financial crises (in other words, the world since 2008)... Governments and central banks are most likely to be under pressure, and among the “solutions”, lower taxation and rising wages are at the forefront. In other words, the shock which is supposed to represent the only way / risk for inflation to rise could come soon, maybe earlier than generally expected.
10. **Inflation is not dead, it is dormant, different, and potentially on the rise.** Whatever and whenever the next step, uncertainty is still ongoing, and central banks (and other institutions) will have to continue to navigate without having a perfect knowledge of what the post-financial crisis “new normal” is going to be.

APPENDIX 1 - An inflation target of 2% or around 2%, a common language for central banks

**Table 2:
Price stability objectives and measures of underlying inflation
of selected central banks**

Central bank	Price stability measure	Price stability quantification	Measures of underlying inflation typically monitored
European Central Bank	HICP	Year-on-year increase in the HICP for the euro area of below, but close to, 2% over the medium term	Range of exclusion-based measures, trimmed means, weighted median and two frequency exclusion measures (Persistent and Common Component of Inflation (PCCI) and Supercore)
Federal Reserve	PCE	Annual percentage change in the total PCE deflator at 2% over the longer run	Official publications mainly refer to exclusion-based measures, but trimmed means, weighted median and factor model are also used
Bank of Japan	CPI	Annual percentage change in the total CPI at 2%	Diffusion index, trimmed mean, mode and weighted median officially released by the Bank of Japan two days after the release of the monthly CPI for Japan
Bank of England	CPI	Annual percentage change in the total CPI of 2%. Deviations greater than $\pm 1\%$ trigger an open letter (this is not a target range)	Various exclusion-based measures monitored and occasionally discussed in official publications
Bank of Canada	CPI	Annual percentage change in the total CPI at 2%, the mid-point of the target range of 1-3%, over the medium term	Three preferred measures regularly monitored: trimmed mean, median and a tracker of common price changes across categories in the CPI basket
Sveriges Riksbank	CPI with fixed interest rate (CPIF)	Annual percentage change in the CPIF around 2%, with a variation band of 1-3%	Range of exclusion-based measures, trimmed means, weighted median, volatility-weighted measures and factors from principal component analysis monitored and occasionally presented in official communication

Central bank	Price stability measure	Price stability quantification	Measures of underlying inflation typically monitored
Norges Bank	CPI	Annual percentage change in the CPI of close to 2% in the medium term	Range of exclusion-based measures, trimmed means and weighted median regularly monitored and reported in official publications. Projections are also produced for these indicators
Reserve Bank of Australia	CPI	Achieve an inflation rate of 2-3%, on average, over time	Trimmed mean, weighted mean and CPI excluding volatile items (fruit, vegetables and automotive fuel) regularly published on the bank's website
Reserve Bank of New Zealand	CPI	Future CPI inflation outcome between 1% and 3% on average over the medium term, with a focus on keeping future average inflation near the 2% mid-point	Factor model, trimmed means, and variance-adjusted and exclusion-based measures

Sources: Central bank websites; FOMC statement of longer-run goals and policy strategy, press release, Federal Reserve, 25 January 2012; The "Price Stability Target" under the Framework for the Conduct of Monetary Policy, Bank of Japan, 22 January 2013; Monetary policy remit: Autumn Budget 2017, HM Treasury, 22 November 2017; Renewal of the Inflation-Control Target – Background Information, Bank of Canada, October 2016; 2016 Statement on the Conduct of Monetary Policy, Reserve Bank of Australia and Australian Government, 19 September 2016; and Policy Targets Agreement 2018, Reserve Bank of New Zealand and Ministry of Finance, 26 March 2018. The classification in the last column partly follows Table 1 in Kahn, M., Morel, L. and Sabourin, P., "A comprehensive assessment of measures of core inflation for Canada", Bank of Canada Discussion Paper 2015-12, 2015.

Source: Ehrmann M., G. Ferrucci, M. Lenza and D. O'Brien (2018)

APPENDIX 2 - The independence of central banks: what are we talking about exactly?

It must be remembered that the independence of central banks is a relatively new concept. A government has a natural tendency to weakly manage monetary policy, given the objective of price stability. Often for political reasons (complacency or lack of courage) or electoral (“gifts” in the election period), and sometimes for financial reasons (the reduction of the weight of the debt), It would be at the origin of an inflationary bias coming from its inability to anchor the expectations of private economic agents to a low level. It is this lack of credibility of the government that the transfer of monetary policy to an independent central bank is supposed to offset. The theory - relatively recent - lends to an independent central bank the credibility that a government does not have. The central banks of the developed world gained independence only in the 1980s and even in the 1990s. European banks obtained it under the Maastricht Treaty and had to amend their statutes even before the end of the 1980s adoption of the Treaty. The case of the Bank of England is fairly representative: founded in 1694, it only achieved operational independence in 1997, after more than 300 years of existence. It was then a question of pursuing a 2% inflation target set by the state.

Economists measure the legal independence and real independence of a central bank using different indicators:

- The legal independence of the central bank is measured mainly in the economic literature using two indices:
 - # *The GMT index*, named after its designers Grilli, Masciandaro, and Tabellini (1991), which measures political independence and economic. The GMT index is composed of two sub-indexes, political independence and economic independence of the central bank. The political independence includes the procedures for appointing central bank officials, the relationship between the governing board and the government, and the official responsibilities assigned to the central bank. The economic independence includes elements such as the financing of the central bank’s budget and the nature of the monetary instruments. Each of these sub-indexes is evaluated according to a binary system under which the number 1 is assigned or not. The overall index is obtained by adding the scores obtained.
 - # *The Cukierman index* (1992) has the advantage of continuously evaluating the degree of independence, ad to be more precise (not binary) than the GMT index. Sixteen sub-indices are grouped under four main themes: (i) the variables on the status of the Executive Director (terms of office, appointment and resignation procedures and incompatibility clauses); (ii) variables concerning the formulation

of monetary policies; (iii) the objectives of the central bank; iv) Regulations regarding borrowing limitations. Each of the sub-indexes is assigned a score from 0 to 1.

- **The effective independence of the central bank** is measured by indicators such as the low frequency of change of central bank governors or the absence of electoral cycles. The aim here is to assess the effective, and not a priori, independence of the central bank. This approach has the advantage of continuously measuring the independence of central banks.

It should be recalled that the independence of the ECB is based on five pillars set out in the Statute of the European System of Central Banks and in the Treaty on the Functioning of the European Union.

- **Institutional independence:** The ECB must not solicit or accept instructions from an institution, government or other body of the Union. The governments of the Member States and the other institutions of the European Union are also not allowed to influence the decision-making bodies of the ECB.
- **Personal independence:** The bylaws protect the personal independence of the members of the Executive Board of the ECB, who are appointed for a non-renewable term of eight years and can only be removed from office in the event of serious misconduct. This allows them to make responsible and objective decisions.
- **Functional and operational independence:** The ECB's statutes give it the necessary powers to achieve the objective of price stability, and the Eurosystem alone exercises the power of monetary policy in the euro area. The ECB cannot lend directly to the public sector.
- **Financial and organizational independence:** In order to further limit external pressures and influences, the ECB and the national central banks have their own financial resources and revenues.
- **Legal independence:** The ECB also has its own legal personality and can thus appeal to the Court of Justice of the European Union to assert its independence, if it becomes necessary.

The ECB, however, is accountable to the Parliament on this independence. Every quarter, the President of the ECB takes part in a hearing before the Committee on Economic and Monetary Affairs of the European Parliament. Members of the European Parliament can also send written questions to the ECB.

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