

The anchoring of long-run inflation expectations today

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Monetary policymakers today benefit from having earned a capital of prestige in the eyes of the public. This capital, and the political clout that comes with it, has allowed them to stay independent even in polarised political times. In part, this capital was earned during the response to the Great Financial Crisis as a new Great Depression was avoided. An even greater part of this public respect has come from policymakers' success at taming inflation. In most OECD countries, inflation is not at the top of the list of concerns that citizens express in surveys. This was not the case in the 1980s and 1990s. But by the end of the 20th century, the variability of long-run inflation had significantly and persistently declined across most advanced countries.

A simple way to illustrate this is to estimate a Beveridge-Nelson model where annual inflation is the sum of a random-walk permanent component and a white-noise transitory component. Doing so for the United States and the euro area shows that the permanent component has been steady since 2000 near the 2% inflation target, and that there has been a clear decline in the estimated variance of this permanent component. In terms of reduced-form statistics, this accounts for the visible fall in the serial correlation of inflation, as well as for the fall in the variance of inflation itself. The permanent component, which one might better call long-run inflation, has become tightly anchored around 2%. This accomplishment is rightly hailed as the proof of success of having an independent central bank with an inflation target.

About 20 years after this change occurred, how do things look today? That is, what is the current inflation anchor? Inflation itself in 2019 may be somewhat above or below target in different countries, but to what long-run level is it converging? This is the topic of this talk. The key emphasis is on long-run inflation, measuring it and controlling it, not on the fluctuations around this anchor. I will repeat the words "long-run" as many times as I can to ensure that this focus is not forgotten.

1. What is the long-run goal of the central bank?

Uncontroversially, I will contend that the long-run goal of the central bank is to control inflation around a stated target. Perhaps a little more controversially, I will argue that there is a good case for this to be the sole goal. Certainly more controversially, I suggest that perhaps the most adequate way to express this target is in terms of a price level target.

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The first argument for inflation being the long-run goal of the central bank is simply that this is what is in its legal mandate in most advanced economies. One might wish it was not so, but for a central bank to be legitimately independent it must stick to what the State has instructed it to do.

A second argument is that the central bank can control inflation in the long run. After all, inflation is a monetary phenomenon, so the monetary authority should be the one controlling it.

More interesting is the question of whether the central bank should combine its long-run target for inflation with a long-run target for some measure of real activity, like the unemployment rate or the growth rate of real output. The argument for a long-run dual mandate is that it is hard to reject the null hypothesis that the Phillips curve is not vertical in the data. In fact, when inflation exceeds 30% (or thereabouts), there seems to be a negative relation between the change in the price level and the growth rate of output. There are several theoretical arguments for why a long-run trade-off would exist, including changes in the bargaining power of workers and firms when inflation rises, hysteresis through skills and effort on labour force participation, and the anchoring of expectations on past experience. If such a trade-off exists, why focus solely on inflation?

First, for the higher inflation experiences – well into the two digits – the evidence suggests that lowering inflation increases real outcomes. But then, there is no conflict between a target for inflation and a target for real growth. A redundant dual mandate is better stated as a single mandate.

Second, when inflation is lower, and in the one-digit range, it is also very hard to reject the null hypothesis that the long-run Phillips curve is vertical. The problem is simply that one needs data for a long enough period, and one during which the monetary policy regime is approximately unchanged, in order to estimate the slope of this long-run Phillips curve. We simply do not have this, so any estimates have wide confidence intervals around them. It is hard to move the prior that the central bank can do nothing about real outcomes in the long run.

Third, perhaps this is the right prior to have. Milton Friedman's 1969 presidential address convincingly argued that it is so. Ultimately, the real effects of monetary policy come from fooling agents into confusing absolute for relative price changes. Systematic long-run policy should not rely on constantly fooling people.

Fourth and finally, as a policy stance, I am yet to see a single country successfully exploit a long-run trade-off between inflation and real activity through monetary policy. The principle that if one does not know what the effects of a policy are, one had better not use it (a "do no harm" principle) supports sticking to the prior that monetary policy cannot affect real variables in the long run. As such, output should not be part of the long-run goals of the central bank.

Another goal to consider is financial stability. Yet again, the difficulty is to see where the trade-off is in the long run. High inflation tends to be associated with financial instability. Having a goal of low and stable inflation in the long run is probably what maximises financial stability in the first place.

Unexpected inflation leads to redistribution among different actors that sign nominal contracts and have nominal portfolio positions. Contracts that specify nominal payoffs have their real outcomes depend on what the future price level will be. Therefore, from the perspective of financial stability, it is important to lower the variance of the price level at long-run horizons.

The common practice of inflation targeting, whereby bygones are bygones, imparts a unit root to the price level, which will make this variance grow with the horizon. This suggests that, in order to deliver financial stability, a better practice would be to instead have a target for the price level, which corrects past positive (negative) deviations of inflation from target with negative (positive) deviations in the future, in order to return to the target path for the price level.

This is not such a radical proposal, since the ECB's policy of targeting inflation on average over the medium run, often stated as a 2% target over a five-year horizon, gets very close to what a price level target would be. In the United States today, price level targeting is making a comeback under the new name of average inflation targeting.

A further argument for a price level target is that it provides a commitment to not let below-target inflation persist. It may help central banks regain the credibility they may have lost by repeatedly undershooting their target.

To conclude, the answer to the question I posed is: the long-run goal of the central bank should be to have inflation over the long run stay anchored at its announced target. Stating this in terms of a price level target over, say, a five- or 10-year horizon lowers the forecasting mistakes that agents may make about nominal variables and helps to deliver a better functioning real and financial economy.

2. The centrality of expectations in the long run

To think about the long run, the classical dichotomy is a reasonable starting point. As David Hume famously wrote, a doubling of the amount of money in a person's pockets that comes with a doubling of every price in the economy, should not lead to any change in any actions by any private economic agent. One compelling way to explain this point is that I can count the money in my wallet in dollars, or I can do so in cents, and so can a shopkeeper quote me prices in dollars or cents. It makes no difference which one it is.

In the long run, under the classical dichotomy, inflation is tightly linked to expected inflation. Through multiple channels, expecting higher long-run inflation leads to higher long-run inflation.

If households expect higher inflation, they will hold less currency. This decline in the demand for currency will, *ceteris paribus*, lead to a fall in the real value of the currency and so to inflation.

If firms expect higher inflation, they will set a rising path for the prices of their goods. As all do so, this results in higher inflation.

If workers expect higher inflation, they will demand higher wages. This raises the nominal marginal costs of firms and leads to higher prices set, and thus inflation.

If investors in financial markets expect higher inflation, they will want to hold fewer reserves at the central banks for a given nominal return on these reserves set by the central bank. This will lower the real value of these reserves, which is the same as higher inflation.

Controlling inflation in the long run then requires controlling expected long-run inflation. Expectations are central to achieving the long-run goal since if they deviate from this goal, bringing inflation and expectations back on target is quite costly.

In the case where expected inflation is too high, experience shows that reducing actual inflation can only happen through a deep recession. In part, this is because adaptive expectations imply that private agents keep on expecting high inflation even after it has started declining. The unexpected decline then becomes associated with some firms setting too-high prices, some workers asking for too-high wages, and some households choosing too-high savings, all inducing a contraction in real activity. Another reason is that once agents expect high inflation, indexation clauses become the norm in many contracts, especially in the labour market. Lowering these built-in inflation clauses requires renegotiations that often are only triggered by rising unemployment. Finally, lowering inflation when expectations are high often requires a fiscal reform that provides fiscal backing to the central bank in its efforts to engage in contractionary monetary policy. This reform is tied to fiscal austerity, with higher taxes and lower spending, reducing the level of output.

When expected inflation is too low, raising it is also hard and costly. Japan has been in this scenario for almost 20 years now. The Bank of Japan has tried forward guidance, quantitative easing, qualitative easing, yield curve control, and a series of other policies, all to no avail. It seems to require a great deal of commitment to convince economic agents to move from expecting 1% inflation in the long run to expecting 2% instead. Economic theories do not provide a clear answer for why it is so, but the Japanese experience gives credence to the fear that raising long-run expected inflation is a hard task.

As Mario Draghi stated unequivocally in Sintra in June 2018: “What is key is that inflation expectations remain well anchored”.

3. Are long-run inflation expectations anchored at 2% today?

The most natural way to measure what economic agents expect inflation will be in the long run is to ask them. In the euro area, four times a year the ECB Survey of Professional Forecasters asks a select group of forecasters working for large firms what they expect inflation to be on average over the next five years. Between 2008 and 2018, the median response was never below 1.8%. It was never above 2.0%. Given the ECB’s target for inflation of 2% or below, long-run expectations seem very well anchored.

In the United States, the Survey of Professional Forecasters run by the Federal Reserve Bank of Philadelphia asks a similar question with reference to the next five or 10 years, on average. Focusing on the five-year response, for comparability, again over the decade until 2018, the median answer was always between 2.1 and 2.4%. The Michigan survey asks a few hundred households every month in a rotating panel to report what they expect inflation to be in the long run. It is well known that the answers tend to be above actual inflation and are quite volatile, which is probably accounted for by households being not so well informed. Still, the range of answers over the 10 years before 2018 was only 2.5 to 3%. Again, US long-run inflation expectations seem remarkably well anchored.

Finally, for the United Kingdom, the Survey of Economic Forecasters asks professional forecasters what they expect inflation to be on average over the next three years. The range here was 1.9 to 2.2% in 2008–18.

Looking at these data alone, the answer is loud and clear: long-run inflation expectations seem very well anchored. Yet, I am sceptical, and dare I say, fearful. Household expectations of events quite far away are quite sluggish. People are inattentive, and they heavily discount the benefits of good forecasts far in the future relative to the costs of paying attention today. At the same time, when expectations do move, they do so persistently. The other side of the inattention is that there is a great deal of sticky information. It can take quite a while for the anchor to change in the expectations, but it will likewise take a lot for it to move back to the desired original anchor. Given the long and variable lags from monetary policy actions to inflation outcomes, by the time the surveys change, it is often too late for the central bank to do something about it. The pain of trying to shift back long-run inflation expectations that I described earlier in this lecture becomes inevitable.

Japan is a case in point when it comes to the inflation anchor moving down in a persistent way. The answers to the Consensus Economics survey of economic forecasters about long-run inflation were quite close to 2% between 1988 and 1996. By the end of the century, they had fallen to around 1%. Since then, they have rarely exceeded 1.5%.

4. A faster-moving alternative: market measures

An alternative measure of inflation expectations to that provided by surveys comes from financial market prices. Looking at the prices at which inflation swap contracts trade, or the difference between the yield on nominal government bonds and inflation-indexed government bonds, one can obtain some measure of the expectations of the participants in these financial markets. In the major financial markets, these financial contracts have been sufficiently liquid for about one decade that their prices reveal reliable information.

Looking at these measures over the same five-year horizon for the decade 2008–18 provides a much more sobering view. For the euro area, the standard deviation of long-run expected inflation was 0.5%, as it fluctuated between as high as 2.6% in Q1 2008 and as low as 0.6% in Q4 2014. The ratio of the standard deviation of expected long-run inflation to actual inflation is a strikingly high 0.44. For the United States, the standard deviation is also 0.5%, and again this is as high as half of the standard deviation of actual inflation. Expected long-run US inflation was as high as 3.2% in Q2 2008 and as low as 1.3% in Q2 2015.

Especially worrying are the numbers for 2019 so far. In both the euro area and the United States, expected long-run inflation has been steadily falling, and in the euro area it is already below 1.3%. At face value, these numbers suggest that long-run expected inflation may be about to fall below the central banks' targets. If so, the central banks that benefited from (and contributed to) a favourable anchoring of long-run inflation expectations around their target over the last 20 years may be about to endure the pain that comes with a change in that anchor.

Before making that inference it is important to ask what could lead to such a steep decline in market expectations contrary to survey expectations. One hypothesis

is that inflation risk premia have declined, becoming negative and large in absolute value. Qualitatively, this story makes sense. Perhaps the dominant fear in 2019 is that we will have deflation combined with economic stagnation. The bad, high marginal utility state of the world that investors in financial markets want to insure against would be that of inflation being too low. Thus, inflation risk premia are negative, and a perceived higher likelihood of this deflation-stagnation state of the world has driven down market inflation expectations over the last 12 months.

While this hypothesis is sensible, it does not work quantitatively. In the inflation options market, we find the same traders who trade inflation swaps. The prices in these markets give a measure of the probability that inflation will be below -2% over the next five years on average. That number is small, but more importantly, it has moved very little in the last 12 months. If the deflation-stagnation fear was driving the fall in expected inflation, then it should show up significantly in the probability of the event. That probability would have risen from say 3% to 30% to account for the 1% change in the compensation for risk in expected inflation. Instead it changed by a couple of percentage points, far too modest to be consistent with raised fears of this state of the world.

More generally, historically, the standard deviation of expected long-run inflation according to the options moves little from quarter to quarter in spite of large movements in expected inflation. We would expect compensation for risk to come tightly associated with the perceived variance of inflation. In equity markets, the variance of expected equity returns in option markets often moves in excess of 10% within one year, and so do expected returns and the compensation for risk associated with them. In inflation markets, however, the standard deviation barely moves by more than 0.5% across years in the decade before 2018. This is less than one order of magnitude what is necessary to justify a compensation-for-risk interpretation of the movement in expected long-run inflation.

If not compensation for risk, then what is moving markets' long-run inflation expectations? Disagreement can do so, across two dimensions. First, disagreement between market participants and survey respondents, or, if you want, between the markets and the people. In the last 12 months, the markets have become significantly more pessimistic about future long-run inflation. In surveys of financial participants, where they are asked to report their subjective expectations, not their market-adjusted or risk-adjusted ones, the fall in expectations of inflation is clear. The public may be sluggish and inattentive, but these market traders are not, as they think about and trade on inflation information every day. The median response in these surveys has fallen significantly in 2019, explaining a large chunk of the decline in the market prices.

Second is disagreement among market participants – between the marginal trader (whose view the market price reflects) and the average trader. This shows up statistically as a change in the skewness of the distribution of the survey of inflation expectations among market dealers. In recent times, one sees the emergence of significant mass in the left tail of distributions of beliefs across traders. This shifts the marginal trader to the left of the distribution away from the median, explaining another part of the sharp fall in the market prices.

This alternative explanation is worrying for the anchoring of long-run inflation expectations around the target. Markets often lead people. A decline in the market perceptions may be a leading indicator that public perceptions are about to fall as well. That is, unless policy does something about it.

5. Policy actions to re-anchor expectations

The experience of the euro area in 2014–15 is instructive with regard to what policy can do when long-run inflation expectations start falling in a way that threatens a change in the anchor. During that time, there was a similar decline in market expectations to the one that we have seen in the last 12 months. We also saw a similar decline in the subjective belief in surveys of market participants. And finally, we also saw a similar change in the skewness of the distribution of expectations. By the middle of that period, there was a similar fear that the anchor for long-run inflation expectations was about to fall.

In that period, though, the ECB acted very aggressively. It implemented quantitative easing through its asset purchase programme, expanding the size of its balance sheet significantly, and buying and directly holding long-term government bonds. It further extended its period of forward guidance in the commitment to keep interest rates very low for a prolonged period of time. Its commitment to keeping inflation anchored at 2% was made clear and backed by expansionary policies when the anchor seemed to be falling. In 2016 and 2017, market expectations reversed track. Expected long-run inflation rose and went back to the 2% target.

The first lesson from this experience to central bankers is: be aggressive. When there is a fear that long-run inflation expectations are about to move, respond right away. Realise that a change in the anchor is one of the biggest dangers that a central bank can face.

Comparing this period with Japan in the late 1990s and early 2000s leads to the second lesson. The Bank of Japan was at the time still focused on restoring financial stability and dealing with the cleaning-up of banks and the associated outstanding bad credit. While it stated its commitment to 2% inflation, it gave the impression that it was happy to somewhat undershoot this target. By the time it adopted expansionary policies, it was already a few years since the decline in long-run inflation expectations. As soon as actual inflation started edging upwards, the Bank of Japan started discussing policy normalisation and reversing expansionary policies. It has since then been stuck with low long-run expected inflation.

Thus, the second lesson is: mean your commitment to the target, for it will be tested. In the case of the euro area today, inflation has been below 2% for almost five years now. By itself, the deviation each year has been relatively small, but once they are accumulated over these many periods, they imply that the euro area is now 6.8% below its target price level. At the same time, during this period and now, the real exchange rate has been appreciating between the core areas of the euro and the periphery regions. Therefore, correcting the deviation of the price level from target requires inflation to be well above 3% in Germany for a few years.

A third lesson is: do not be afraid of inflation going up to 3 or 4%. Policymakers today may worry about inflation being 1%, and want to raise it to 2%. But if they are mortally afraid that it may rise to 3%, then they are probably going to fail to achieve their goal. Every month a different shock is going to push inflation up or down by quite a few decimals. It is quite likely that on the path from 1% to 2%, a shock here and there will push inflation up to 3% or more. If policy reacts strongly to these and reverses course in an attempt to raise inflation expectations, then it will never get on the path towards a long-run inflation anchor of 2%.

Furthermore, shocks in the other direction will sometimes result in inflation staying at 1% or lower even as the central bank is doing all it can to raise it to 2%. If the anchor has indeed fallen below the 2% target, and the central bank is in the difficult position of pulling it back up, doing all it can to get the attention of private agents may be worth it. This may well include aiming for inflation temporarily above 2%.

An example comes from the United Kingdom in 2017–19. The effects of Brexit, and the loss in value of the pound through several moments of uncertainty, have led to inflation in the past two years being routinely around 3%. Perhaps it is not strange that, among the advanced economies, the United Kingdom is the one where long-run inflation expectations seem to be solidly anchored at 2% rather than trending down.

The fourth and final lesson is a familiar one to modern macroeconomics. Policy regimes, not isolated policies, are needed to sustain long-run outcomes. Most of the time, it makes sense to have monetary policy be set with an eye on inflation, and for the central bank to ignore the fiscal consequences of its actions. The separation between monetary and fiscal policy then implies that central banks refrain from engaging in operations that have too large a fiscal footprint. In exchange, they are independent from the fiscal authorities.

Sometimes, though, the monetary-fiscal separation can, and perhaps should, be broken. A tried and tested way to raise inflation and inflation expectations all the way into three digits is to give fiscal goals to monetary policymakers. Modest fiscal interventions by monetary policymakers directed to producing fiscal revenues that are transferred either to the government or directly to the public may well be able to raise long-run inflation expectations. In general, given our current knowledge, it is hard to calibrate these fiscal interventions to make inflation hit its target. Most likely, breaking the separation between fiscal and monetary policy will produce runaway inflation rather than slightly higher inflation as desired. However, keeping this option as an escape clause may play a role in keeping long-run inflation expectations from falling below target.

6. Communication and expectations

The goal of communication policies is ultimately to manage the expectations of economic agents. While communication that is not backed by fundamentals cannot accomplish much, at least in the long run, there is much work to be done by a central bank in explaining its policies and their goals. It is an essential part of what monetary policy must do, given the dependence of outcomes on agents' expectations. When it comes to the topic of this lecture, the anchoring of long-run inflation expectations, this becomes even more important. By communicating effectively, the central bank gains credibility with the public, and reveals its commitment to the targets. Every modern central bank today invests resources in communicating effectively and worries about the failures and successes of these messages.

Most of this existing communication is useful and especially important in light of keeping the anchor of long-run inflation expectations on target. Through communication, central banks have repeated what their target is, and reinforced their commitment to achieve it. Especially when it comes to unconventional policies, like

those that involve the composition of assets in the balance sheet, communicating what the central bank is doing and why it is doing it has been fundamental for those policies to be able to affect expectations. When it comes to some policies, like forward guidance, that rely almost entirely on being able to shift expectations, then communication is in many ways what the whole policy is about.

Central banks do a worse job of communicating the links between policies and goals. Using reason, logic and, especially, economics, central banks must explain why they have used some tools given their targets. Explaining economics to the general public is hard, and central banks are not alone in not being successful. I am more worried, though, that in pursuing this worthwhile goal, they have overstepped.

A few central banks today go far beyond communicating goals, targets, and their links. They state that their goal is to “engage a broader cross-section of society”. They worry that most people have no idea who the head of the central bank is right now, or that a vast majority is unaware of whatever the last communication was by the central bank. As a result, a few central bankers have started making regular speeches about topics that are more likely to get them onto the front page of newspapers. Climate change, trends in inequality of labour income, or changes in long-run business dynamism and competition are some examples. Invariably, the issues involved are important. Arguably, they matter more for social welfare than controlling inflation. There is therefore a good case to make for central banks to talk about them: they allow them to be relevant, as well as to focus on what matters to people and their well-being.

At the same time, there is very little that the central bank can do about these issues. Continuing with the focus on the long run, I started this lecture by stating why inflation may well be the sole objective for central banks in the long run. The arguments I made for why, maybe, neither real activity nor financial stability should be additional objectives, apply with much greater strength to inequality, competition, or the average temperature. Moreover, these topics are by their very nature controversial. Partly, this is precisely why they get so much media attention. It is almost impossible for central banks not to be dragged to these controversies. Being dragged into a controversial debate when you can do close to nothing to affect the debated outcomes does not seem like effective communication.

Another form of communication that central banks have been quick to embrace is simple messages to the public of the type: “trust me; I know what I am doing”. Central banks have started producing video clips, cartoons, music videos, and different forms of media outreach where the message is so simplified that it boils down to bland statements that the central bank is very important and that inflation is very bad. Central bankers have been quite willing to support stories that they saved the world during the financial crisis, and/or have prevented more than one recession through their diligent actions. In many ways, this is fine, and appropriate. But it also implies that when a recession or a financial crisis comes, or even when inflation deviates from target for a few years, central banks will be blamed. After all, they communicated clearly that the absence of these bad outcomes was to their credit. And yet, each of these outcomes will inevitably happen given the limits of what monetary policy can actually achieve.

My worry is that being relevant and simple may be attractive but it will backfire. It may erode the trust that the public has in the central bank; trust which will be especially important if the next challenge for the central bank is to raise long-run inflation expectations back to target.

7. Conclusion

This lecture asked a few questions and provided answers along the way. The conclusion section is a good place to restate them in a shortened version (albeit a less nuanced one than is adequate):

- What is the long-run goal of the central bank? Low and stable inflation, alone.
- Why are long-run inflation expectations central? Because anchoring inflation is anchoring expectations.
- Are long-run inflation expectations anchored on target today? Surveys make it seem so, but they are too sluggish to allow detection of incipient changes.
- Do markets provide a better measure? Yes; they are more forward-looking, and show that there is cause for concern in the euro area and United States.
- What policies can re-anchor expectations on target? Be aggressive; mean it; don't fear inflation at 3–4%; fiscal escape clauses matter.
- What is the role of communication? Key to describe goal, tools and their links, but central banks need to be careful when trying to be relevant and simple, as this can lose them trust along the way.

A final word directed to the emerging economies represented at this conference. The reduction in long-run inflation expectations in European countries, the United States, the United Kingdom and Canada throughout the 1980s had persistent effects that spread to the rest of the world. Most central banks since then have adopted the tools and approaches followed by those central banks in terms of institutional design for independence, adoption of numerical inflation targets, operational procedures for setting interest rates, and the like. If low long-run inflation expectations turn out to be the new challenge for the next few years, and those same central banks find ways to raise these expectations, sooner or later this is likely to have an impact on emerging economies as well.