

200 YEARS
since 1816



OESTERREICHISCHE NATIONALBANK
EUROSYSTEM

Central banking in times of change

A compilation of speeches delivered
in the OeNB's 200th anniversary year



Stability and Security.

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Editorial

In 2016, the Oesterreichische Nationalbank (OeNB), which was founded in June 1816, celebrated its 200th anniversary. The 200-year history of the OeNB has been very eventful. In its first 100 years, the Nationalbank was the central bank of a major empire; in its second 100 years, that of a small open economy in the heart of Europe.

Milestone birthdays not only provide an occasion to gather family and friends. They also afford an opportunity to pause for a moment and reflect on one's past as well as one's plans and hopes for the future. To mark its 200th anniversary, the OeNB thus organized a number of events to discuss past accomplishments and the challenges lying ahead. After all, central banks around the world today face an environment of strong global interconnectedness, elevated uncertainty and low medium-term growth.

This publication comprises speeches given on the occasion of two major academic events organized in the OeNB's anniversary year:

- On June 2, 2016, the OeNB hosted a 200-year anniversary ceremony at the Vienna City Hall, where it welcomed distinguished guests from central banking, politics and academia. The event took place right after the monetary policy meeting of the Governing Council of the European Central Bank (ECB), which was held in Vienna on this occasion. The present compilation includes three speeches given during the high-ranking panel session on *Central bank policies – past challenges and future perspectives*, i.e. the keynote address of ECB President Mario Draghi and the lectures delivered by the renowned economists Barry Eichengreen and Charles Goodhart.
- The second part of the publication comprises presentations given during the conference on *Central banking in times of change*. The conference, which took place on September 13 and 14, 2016 in Vienna, was organized by the OeNB in close cooperation with the Bank for International Settlements (BIS). We are highly honored that BIS General Manager Jaime Caruana agreed to this fruitful collaboration. The three conference sessions dealt with various challenges central banks face today: Is there a case for modifying or broadening central bank mandates and what are the associated risks? Is the 2% price stability target still appropriate? How independent can central banks actually be in a financially liberalized world? Several high-ranking members of the international central banking community joined us to discuss these topical questions at this important juncture for monetary policy.

This compilation of speeches complements other anniversary publications the OeNB released during 2016, among them a historical volume authored by Clemens Jobst and Hans Kernbauer, *The Quest for Stable Money. Central Banking in Austria, 1816–2016*, as well as a special edition of our quarterly series *Monetary Policy & the Economy (Q3–Q4/16)* on *Two hundred years of central banking in Austria: selected topics*.

These anniversary publications pay tribute to 200 years of central banking history – we hope our readers enjoy them.



Ewald Nowotny
Governor of the Oesterreichische Nationalbank

200 YEARS
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OESTERREICHISCHE NATIONALBANK
EUROSYSTEM

Part 1

Speeches at the 200-year anniversary
ceremony, June 2

Central bank policies –
Past challenges and future perspectives

Ewald Nowotny

Governor

Oesterreichische Nationalbank



Opening remarks: Central bank policies – past challenges and future perspectives

Mr. President of the Republic Heinz Fischer,
Prime Minister Christian Kern,
Dear President Mario Draghi,
Ladies and gentlemen,

It's a great pleasure for me to welcome you today to the commemoration of the 200th anniversary of the Oesterreichische Nationalbank and we are very grateful and proud that such an eminent audience has followed our invitation to this celebratory event.

In the 200 years of its existence, the fate of the Nationalbank has always been closely entwined with the fate of Austria, for better and for worse. It is not by accident, that it was Schumpeter, the great economist and short-term finance minister of the Republic of Austria, who said that the condition of the monetary system of a nation is a symptom of all its conditions, or in German: *Der Zustand des Geldwesens eines Volkes ist ein Symptom aller seiner Zustände*.

If there is one lesson to be drawn from the eventful monetary history of Austria, then it is that the greatest threat to financial and monetary stability has been, and continues to be, war. In fact, it was also war, which triggered the foundation of the Nationalbank in 1816. When on June 1, 1816, Emperor Francis I signed the decrees establishing the privilegirte oesterreichische National-Bank, he did so almost exactly one year after the conclusion of the Congress of Vienna, which marked the end of more than twenty years of war in Europe. Ultimately, the Austrian Empire emerged as one of the victorious powers, but the price of victory had been steep. A significant part of the

war effort had been financed by issuing paper money, which resulted in high inflation. In addition, the Austrian state had to declare default on its debt in 1811. As is always the case in periods of high inflation, the consequences for the population were disastrous.



The agenda for the new bank can thus be summarized quite briefly: get the monetary system back in order. The most important ingredient for stability was the reestablishment of trust. The Austrian people had lost their faith in the Austrian currency because of inflation and state bankruptcy; now a way had to be found to regain public confidence. The solution was to create the new issuing bank as an institution held by private shareholders. This arrangement was not uncommon at the time. The Bank of England, which dates back to 1694, as well as the Banque de France and De Nederlandsche Bank, which had both been founded only a couple of years before the Oesterreichische Nationalbank, had been set up as privately held joint stock corporations. The advantage of this arrangement was two-fold. On the one hand, the shareholders contributed capital,

which was the foundation of the financial strength of the new institution and which the Austrian government itself would have found difficult to raise. On the other hand, private shareholders' participation in the management of the bank was thought to pose limits on the government and prevent government from intervening in a way that might prove harmful to monetary stability. Thus, the new institution would find it easier to obtain confidence and trust. The shares of the bank were subscribed by a rather broad group of people. Indeed, we find many entries with just one or two shares in the list of shareholders. One of many medium-sized investors was the composer Ludwig van Beethoven. In our museum you can have a look at a share made out to his name. By the way, this was quite a good investment: Between 1818 and 1827, when Beethoven died, he earned something between 15% and 20% per year on his investment.

The Nationalbank was not only financially successful for its shareholders; it also succeeded in stabilizing the value of the Austrian florin in terms of silver. The period of calm lasted until 1848, when the people of the Empire toppled Metternich's repressive regime. The bank, which was perceived as quite close to the state, faced a run – everybody tried to convert his banknotes into silver coins. In response, the Nationalbank resorted to a measure that was a small revolution in itself. To restore confidence, the governing board decided to start publishing end-of-month financial statements. Before 1848 nobody apart from a handful of bank officials and civil servants at the ministry of finance had known about the true state of the bank, notably the amount of banknotes in circulation and silver reserves held. Now this information was made public. In the following years, the

bank never returned to its former secrecy, but recognized the importance of transparency for the confidence in the quality of the money. Transparency and accountability are also key elements in how we think about policy in the Eurosystem today.

In the 19th century, the privileged Austrian central bank evolved from a bank that mainly financed the government to a central bank of the banking system of the monarchy. In 1847, the bank had opened its first branch office in Prague. By 1913, the network comprised some 100 offices all over the monarchy. These branch offices were not only useful when it came to stemming local banking crises, they also helped facilitate the flow of capital within the monarchy, thus forging together this vast, yet highly heterogeneous economy. This way, the bank – which had for its first forty years been mainly active in Vienna – became a truly “national” bank, in the original sense of encompassing all the people of the Empire.

By that time, however, “national” already referred to a rather exclusive concept, which opposed rather than united different groups of the population. The bank could not escape the national struggles that marked the Habsburg monarchy during the last decades of its existence. In 1867, Hungary obtained a significant degree of independence within the Empire, now renamed Austria-Hungary. As a consequence of this “compromise,” most competences of the central government were devolved to the levels of the Austrian and the Hungarian parliaments and governments, respectively, notably fiscal policy. Only few areas of policy continued to be run jointly: including foreign policy, the army, the navy, foreign trade and – last but not least – the common currency. The

bank faced an environment that had fundamentally changed. Before 1867, the bank had negotiated with just one counterparty, the Imperial government, about its statutes, which had to be renewed at regular intervals, and all other laws pertaining to the monetary system. Now, the bank faced two interlocutors, which more often than not found it difficult to agree. The Austrian central bank was renamed the Austro-Hungarian bank, Budapest was promoted to become the second head office equal to Vienna and a common, but independent decision-making process was installed. In the following years, the relationship between Austria and Hungary was not always harmonious, to put it mildly. More often than not, important decisions were blocked. Within this difficult setting, the bank operated quite successfully. In the 1890s, after almost 50 years of floating exchange rates, Austria-Hungary succeeded in pegging its currency to gold, then seen as the seal of prudent policy. As it turned out, being an independently run, supranational institution, the bank was well placed to take decisions swiftly, when the political process was fraught with difficulties. Here, all of you probably see some similarity to the role of the Eurosystem during the recent crisis. Quite often the Eurosystem had to take the lead, e.g. with the SMP or OMT, until the governments managed to agree on long-run arrangements like the ESM or banking union.

That war is the greatest threat to financial and monetary stability became again painfully clear when the First World War broke out in 1914. The four years of war proved catastrophic, for the population, which suffered death and hunger, for the monarchy, which fell apart after centuries of existence, and for the currency, which by November 1918 had lost 95% of its pre-war

value. But worse was to come. The new Republic of Austria, found itself in a horrendously difficult position. In the post-war chaos, Austria was cut off from the supply of food and coal and its traditional markets. The only way to finance the burgeoning government expenses was to print money. It is therefore not surprising that those parts of the monarchy, like Czechoslovakia, that found themselves in a better economic and political condition created their own currencies. Czechoslovakia, i.e. today's Czech Republic, by the way, is the only part of the former Empire that to this day uses the name "Crown" for its currency, the name introduced by the Austro-Hungarian central bank in 1892. By 1919, the monetary area governed by the Austro-Hungarian bank for more than hundred years did no longer exist.



In the meantime, Austria faced the worst inflation in its history that could only be stopped when the newly founded League of Nations arranged a loan for Austria in 1922. The League loan, which was the first international support scheme of its kind, came with severe conditions attached. For several years, Austrian fiscal policy was under direct supervision of League commissioners. In 1923, the Oesterreichische Nationalbank was resurrected from the

ashes of the defunct Austro-Hungarian bank. Here again, a representative of the League sat on the board. The stabilization succeeded and the republican Schilling replaced the crown of the old monarchy. The new bank, however, soon had to face a banking system that was weakened by hyperinflation and the need to shrink after the old markets of the monarchy were lost. A number of banks failed in the 1920s. The long-drawn-out crisis culminated in the failure of Creditanstalt in 1931. The Creditanstalt crisis marked the beginning of a series of banking and currency crises worldwide, first in Germany, which then led to the exit of the United Kingdom from the gold standard. For Austria the failure of its largest bank proved dramatic. If an example of a systematically important, too big to fail institution were needed, the Creditanstalt would fit perfectly. Ultimately, the bank was reconstructed by using taxpayer money and significant resources provided by the Nationalbank. In the face of a deep economic slump, record unemployment and increasing political conflicts ultimately leading to a brief episode of civil war, however, the Nationalbank like many other central banks at this time followed a very conservative line of monetary policy, which aggravated the economic and social problems of Austria.

Thus, political unrest and unemployment made Austria an easy target for populist-nationalist Nazi propaganda. Austria was attractive for the German rulers. By 1936, due to massive re-armament, Germany's economy was running at full capacity, and foreign exchange reserves, which were needed for imports, were low. When German troops marched into Austria on March 12, 1938, one of the first targets were the substantial gold reserves of the Nationalbank, which were

quickly shipped to Berlin. The bank itself became part of the Reichsbank.

After seven long years, Austria was liberated in 1945. Even before the war officially ended on May 8, the Nationalbank started to operate again on April 14 on the basis of the pre-1938 law. The argument was made that the Nationalbank had in fact never ceased to exist but had only been prevented from operating because of German occupation. The challenges in 1945 were quite similar to those in 1918. Austria needed to be carved out of a larger, disintegrating monetary area, then the crown, now the Reichsmark. In a second step, money supply had to be brought into a reasonable relationship to the amount of goods available. While the setting was similar, this time – unlike after 1918 – the government and the Nationalbank together succeeded in managing the transition without hyperinflation. A monetary reform in 1947 reduced the money supply dramatically, while negotiations between employer and worker representatives allowed for a gradually engineered increase in the price level. Finally, the Marshall plan proved crucial, first, to receive food aid, and later, to receive necessary raw products and machinery. The following years saw a fantastic economic recovery, a veritable “Wirtschaftswunder.”

In 1955, the Nationalbank received new statutes. The objective set in the law was no longer a gold standard but to keep both the internal and external value of the schilling stable. When President Nixon closed the gold window in 1971 and the system of Bretton Woods disintegrated, Austria rather quickly opted for a peg to the German mark. After 1945 and until the early 1970s, foreign exchange policy had mainly served to encourage exports and keep the current account balanced. Now, foreign exchange policy became

the tool of choice to control domestic inflation. The peg was successful and could be kept until Austria adopted the euro in 1999. It thus became one of the longest stable pegs on record internationally. Sustaining the peg required careful policies. Austria's policy was built on a broad consensus between the two main political parties, the social partners and the Nationalbank. The social partners also sat in the General Council of the Nationalbank, which allowed coordinating general economic policies and monetary policy to achieve the overarching objective of low inflation and a stable exchange rate.

In 1995, the Austrian people voted with an overwhelming majority of two-thirds to join the European Community, soon to become the European Union. Membership of the European Union meant that Austria was also to be among the first round of countries to introduce the common currency, the euro, in 1999, followed by the introduction of banknotes and coins in 2002. Austria was now part of a large economic area dedicated to maintaining monetary stability. In this sense, joining the euro area was the logical final step and the crowning moment of the policies Austria had pursued over the previous quarter century.

At the same time, joining the Eurosystem brought significant changes to the role of the Nationalbank. Monetary policy in the Eurosystem is jointly decided by the presidents/governors of all member central banks. We are glad to bring in our expertise, both in general – and specifically also for the region of central Europe – to the work of the ECB. Furthermore, in Austria the Nationalbank is responsible for monetary policy operations, we manage the foreign reserve assets of our country, ensure the smooth operation of cashless payments, provide businesses and the

general population with high-quality secure banknotes and collect and provide crucial financial statistics. A relatively new task, which is also jointly operated with European institutions, is the supervision of banks. Last but not least, the Nationalbank serves as a link between the European level and the Austrian public, ensuring the legitimacy of the Eurosystem and our common monetary policy.



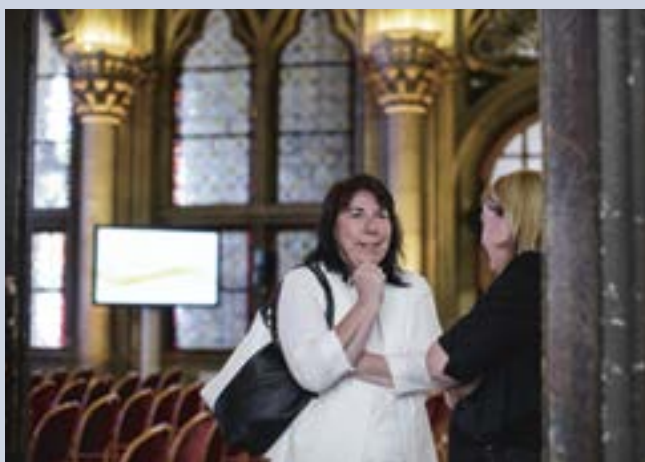
Looking back at two hundred years of central banking in Austria, it seems that few countries – and their central banks – have lived through as many exceptional and difficult experiences. But then Austria and the Nationalbank have also lived through some happy and peaceful years: In particular the past seventy years, which brought economic growth, high employment and stable prices. Yet, irrespective of the challenges the Nationalbank faced at different moments of its 200-year history, the overarching principles of its policy were always the same: the quest for stability, built on trust in the Nationalbank, which in turn is fundamentally linked to its independence.

It is these same principles of stability and independence which still guide our policy today as well as the policy of the European Central Bank and the other national central banks united in

the Eurosystem. I am therefore extremely glad that the OeNB has had the privilege to host the June meeting of the Governing Council of the ECB in Vienna this morning and that I can welcome so many dear colleagues and

friends to the commemoration of our bank's bicentennial today.

In particular I am very happy to be able to now welcome the President of the ECB, Mario Draghi...



Mario Draghi

President
ECB



Delivering a symmetric mandate with asymmetric tools: monetary policy in a context of low interest rates

Exactly 200 years ago today, Emperor Francis I issued two imperial decrees assigning the Oesterreichische Nationalbank the exclusive right to issue banknotes and to stabilise the finances of the empire. This was part of a growing realisation, across Europe, of the key role that central banks could play in securing monetary stability.

In 1816, monetary stability in Austria meant bringing the currency under control in the wake of the ruinous Napoleonic wars.

In the two centuries since then, the cost of not delivering stability has been painfully displayed: in the devastating effects of excessive inflation, such as the 1,400% annual increase in prices recorded here in the early 1920s; but also in the terrible consequences of deflation, as in the 1930s.

This is why most modern central banks have price stability mandates. And it is why legislators have made those mandates symmetric – central banks are expected to fight persistent inflation undershooting as vigorously as they fight persistent overshooting.

In the ECB's case, our aim is to keep inflation below but close to 2% over the medium term. Today, this means raising inflation back towards 2%. And the series of measures we have adopted in recent years – bringing policy rates into negative territory, engaging in large-scale asset purchases, and providing banks with long-term refinancing on conditional terms – are geared exactly to achieving that.

Why 2% inflation is the right objective for monetary policy

But if our aim is to avoid both excessive inflation and deflation, why do we not

set a 0% inflation objective? The answer is that the rate of inflation we aim for and our ability to stabilise prices are intertwined. Or put another way, a steady state inflation rate of 2% inflation is *itself* a shock absorber which allows us to deliver stability. There are several reasons for this, but let me highlight two in particular.



First, a moderately positive level of inflation facilitates the adjustment of relative prices, which helps prevent short-term shocks from morphing into longer-lasting disturbances. This stems from the fact that, even in the most flexible economies, nominal wages and prices are “sticky” and slow to adjust downwards.

In that context, when demand falls, 2% inflation allows real wages to adjust downwards even if nominal wages do not. That in turn helps keep unemployment lower than would otherwise be the case, and prevents the consequences of the downturn from lasting longer than they need to – for instance, by eroding the human capital of the jobless, leading to permanently higher structural unemployment.

What is true within economies is also true across regions – and this is particularly so in a multi-country monetary union like the euro area. A 2% inflation objective means that less competitive countries can lower costs and prices relative to the area average, which allows them to recover competitiveness without destabilising consequences.

The need for such a buffer was explicitly acknowledged by the Governing Council in 2003 when we clarified our definition of price stability.¹ It has since helped countries to adjust competitiveness when required. Initially, aiming at 2% allowed some core economies to lower relative prices in a fairly painless way, as other “catching up” economies had higher inflation rates and were pulling up the area average. Today, the positions of those groups have reversed. But the rationale remains exactly the same.

The second reason why a 2% objective helps absorb shocks is that it supports the implementation of monetary policy in adverse conditions. A small positive buffer creates more scope to support the economy through cutting nominal interest rates and reduces the likelihood of running up against the effective lower bound.

This is because, for a given equilibrium real interest rate, a higher inflation objective implies higher nominal rates over the cycle. In line with the results from a larger research literature, ECB simulations made in 2003 suggested that a 2% objective would substantially decrease the probability of

nominal rates reaching zero.² This was also recognised by the Governing Council as a reason for aiming closer to 2%.³

What was true then has become even more relevant now. The studies in 2003 assumed an equilibrium real rate of around 2%, so with a 2% inflation objective the equilibrium nominal rate would be around 4%. Evidence suggests, however, that demographics-induced high savings and low productivity growth have led equilibrium real rates to fall.⁴ Aiming for 2% inflation is hence even more crucial today to get nominal interest rates safely away from the lower bound.

Yet it is also important to stress that the fall in real rates is by no means predetermined. It can be reversed at least in part by structural reforms that raise productivity and participation rates. By increasing the potential for profitable investment opportunities, and by reducing the need for precautionary savings, such measures would raise the equilibrium real rate, all things being equal.

Why the objective should be symmetric

All this justifies the level of our inflation objective in the steady state. But it is equally important that we pursue our objective symmetrically.

Monetary policy operates to a large extent by guiding expectations, a process which sets in motion a series of automatic stabilisers in the economy. For instance, if markets expect central banks to react to negative shocks by

¹ See *Evaluation of the ECB's monetary policy strategy*.

² Coenen, G. 2003. *Zero lower bound: is it a problem in the euro area?* ECB Working Paper Series 269. September 2003.

³ *Evaluation of the ECB's monetary policy strategy*.

⁴ Draghi, M. 2016. *Addressing the causes of low interest rates. Introductory speech held at a panel on “The future of financial markets: A changing view of Asia” at the Annual Meeting of the Asian Development Bank. Frankfurt am Main. 2 May.*

increasing monetary accommodation, when a shock actually happens, it will immediately lead to lower real interest rates as the central bank's reaction function is taken into account. That will in turn result in higher consumption and investment, which helps offset the initial shock.

This mechanism hinges crucially on the central bank being credible on both sides – being just as committed to fighting too low inflation as too high inflation.

And while this is true generally, it is all the more so in the special circumstances we face coming out of the crisis – namely, where private debt stocks are high and policy interest rates are close to the lower bound. In those conditions, any perception that the central bank might tolerate persistent downward inflation misses would be especially costly.

It would lead first of all to a disanchoring of inflation expectations, which would cause real yields to rise mechanically. This would be contractionary and could not be offset by lowering policy rates even further. And with fixed nominal debts, lower inflation would trigger redistribution from borrowers to creditors, which would prolong the debt overhang and exacerbate the contraction due to the different propensities to consume and invest of those two groups. This is not an argument for raising inflation targets, as that would only create redistribution in the other direction. But it is an argument for central banks to fulfil their objectives.

However, while our mandate is symmetric, and our commitment to our mandate is symmetric, there is an asymmetry in the tools we can use to achieve it, which stems from the existence of a lower bound for interest rates.

When inflation is too high, we can always raise interest rates to a level that will rein in demand and eventually prices. And as this is widely understood from historical experience, our credibility relies only on one parameter: our *willingness* to fight excessive inflation. Our *ability* to do so is taken for granted.



When inflation is too low, however, there are limits to how far interest rates can be cut, because of the existence of a non-interest bearing substitute for bank deposits in the form of cash. And since we have no intention to do away with cash, central banks fighting too low inflation may have to resort to tools other than policy rates – what are often referred to as “unconventional” tools. This is necessary to deliver price stability, but it also comes with additional complications.

First, unconventional policies require us to operate in a broader range of markets, which means that the risk of unintended distortionary effects is inevitably larger than when using conventional tools. Does this imply we should refrain from using them when they are needed to restore price stability, as is the case today? The answer is clearly no, because we operate under a framework of monetary dominance. Our task is not to maximise the chances of price stability, under the constraint of

not creating side effects. There are always side effects to monetary policy. And we are not at liberty to choose to fail our mandate.

But in pursuing our mandate, we ought to try and minimise distortionary effects as much as possible. And this is exactly what we have done through the design of our measures. This is one reason, for instance, why we concentrated our asset purchases in the most “commoditised” markets, such as government bonds. It is also why we have shifted the relative weight from rates towards other tools, so as to avoid as much as possible unintended adverse consequences for the banking sector.



A second complication associated with unconventional policies is that the public inevitably knows less about their transmission channels and effects. This is understandable because there is only limited historical experience of using such policies. But the body of publicly available research on their effects is rapidly growing. Like other central banks we have carried out considerable empirical work to calibrate our monetary policy stimulus.

And I am confident that, over time, our experience with unconventional tools will fill the remaining knowledge gap. One should not forget that the ability of central banks to bring high

inflation under control was also doubted in the past, most famously in the 1970s, until empirical evidence put the debate to rest. But in the meantime, central banks have to demonstrate that there is no discontinuity when interest rates reach zero – unconventional measures can work as well as conventional ones.

How unconventional monetary policy works

Why is this the case? Conventional monetary policy operates by steering real money market rates below the prevailing equilibrium real rate, which in turn stimulates demand and inflation. But when the equilibrium rate is so low that the central bank cannot bring its policy rate sufficiently below it, the capacity to increase the degree of stimulus through moving short-term rates becomes limited. Unconventional tools can, however, still be effective in these conditions.

This is because, in reality, there is not just one interest rate which determines saving and investment in the whole economy. There is in fact a constellation of rates, which apply to different maturities, to different types of financial instruments, to different borrowers and lenders. So even without policy rates moving much, it is still possible for the central bank to stimulate the economy by lowering the level of all those interest rates. This can be effective in any circumstances, but particularly so when risk premia have risen due to market fragmentation or unwarranted uncertainties.

Reflecting this broader channel of monetary transmission, we have deployed a three-pronged strategy to inject additional stimulus into the euro area economy.

First, our forward guidance allows us to lower longer-term rates by steer-

ing expectations of future short-term rates. Having opened up the possibility that policy rates can turn negative has also contributed to flattening the whole yield curve, by removing the upward bias to yields that came from the perception that rates could only go up, not down. Indeed, we have stated unambiguously that policy rates would remain at current levels or lower for an extended period of time.

Second, our asset purchases help us further lower yields across maturities and asset classes by compressing risk premia in the markets where we intervene. That in turn triggers portfolio rebalancing out of those markets and brings down borrowing costs across the whole constellation of rates, thereby producing broad stimulating effect. This is complemented by the negative rate on our deposit facility, which speeds up the process of asset reallocation and reinforces the downward pressure on financing costs.

Importantly, this stimulus reaches the economy independently of whether financing is dominated by banks or capital markets. Just like any investor, banks have to judge the *risk-adjusted* return on capital when they allocate assets, and the benchmark that is typically used is the return available on risk-free government bonds. So as we purchase government bonds, we tilt the calculation in favour of loans to the real economy: by compressing the return on the securities we buy, and by improving the economic outlook, hence reducing risks on loans.

This is also supported by the third prong – our targeted longer-term refinancing operations (TLTROs) – which

is specifically aimed at galvanising bank lending to the private sector. While the initial goal of the TLTROs was to improve the monetary transmission process, further recalibrations have made it progressively more expansionary. Under the rules we introduced in March this year, banks that meet their lending benchmarks will be able to borrow ex post from the ECB at negative rates, which propagates the effects of our conventional policy more directly to the economy.

Monetary policy and the economic recovery

In the two years since our policy package was launched, we have seen the effects of these measures in practice.

Events studies conducted by ECB staff find that our measures have had a major impact on long-term sovereign bonds, and spillovers to yields of other asset classes have been significant, too, especially for euro area financial and non-financial corporate bonds.⁵ Our analysis also finds that our policy package has had a substantial direct effect on bank lending rates, as well as a substantial indirect effect on lending conditions through its marked impact on long-term government bond yields.⁶

Improved financing conditions have led in turn to higher growth and inflation. Eurosystem modelling shows that, without our policy measures, inflation would actually have been negative since 2015. In 2016 it would have been at least half a percentage point lower than we forecast currently, and around half a percentage point lower in 2017. And the impact of our measures on euro area GDP is also estimated to

⁵ For more on the methodology behind these estimations see ECB. 2015. *The transmission of the ECB's recent non-standard monetary policy measures. Box 2. Economic Bulletin 7/2015.*

⁶ Altavilla C., G. Carboni and R. Motto. 2015. *Asset purchase programmes and financial markets: lessons from the euro area. ECB Working Paper 1864.*

be sizeable, helping raise output by around 1.5% in the period from 2015-18.⁷

The latest data show that these positive effects are only gaining in strength as our measures work their way through the economy. The euro area continues to benefit from a domestic demand-led recovery, and we can see how our policy is supporting this by looking at the spending components that are especially sensitive to financing conditions, namely consumption of durables and investment.

Last year, after a multi-year contraction, consumption growth of durables in the euro area surged to a rate unseen since late 2006. The contribution of fixed capital formation to output growth, which had been extraordinarily sluggish since the start of recovery in 2013, also progressively strengthened. And in the last quarter of 2015 – the most recent observation for which we have a full composition breakdown – investment surpassed consumption as the main driver of growth.

The recovery has also withstood a decline in external demand linked to the major slowdown in world trade. Over the past 20 years, the growth rate of world trade has been lower than it was last year on only two occasions: in the aftermath of the dotcom bubble in the early 2000s, and again in 2009 following the collapse of Lehman Brothers. In both episodes there was a sharp fall in euro area growth to close to or below zero. In 2015, however, the steep drop in trade did not produce a slowdown in the euro area economy. In fact, year-on-year growth even picked up throughout 2015, despite the slump in world imports.

This was in part due to the increasing resilience of the domestic economy.

But euro area exporters, after a long spell of losses, were also able to regain market shares in world demand. Monetary policy was again a key factor in explaining this atypical resilience of euro area exports.

Importantly, these positive effects of our measures have not been accompanied by significant distortions that might start to tip the cost-benefit analysis – for instance, by excessively harming bank profitability and so damaging the main transmission channel of our policy. This is in part because of the way we have designed our tools, as I mentioned above. But clearly, the best way to ensure that it remains the case is to get back to our objective soon.

This point was captured well by Federal Reserve Chairman Paul Volcker after he hiked rates steeply in 1980, when he noted: *“I am worried about those financial institutions, and the worst thing that can happen to them is (for us to) fail to do the job and get the interest rate turn fairly soon. But the way to get the interest rate turned is not by hastening it prematurely.”*⁸

That is our position and, as the Governing Council underlined today, the momentum of the euro area’s economic recovery continues to be supported by our monetary policy. This fosters the return of inflation towards 2%.

We are on the right track, but we take nothing for granted either. The Governing Council will closely monitor the evolution of the outlook for price stability and, if warranted to achieve our objective, we will act – as we have always done – by using all the instruments available within our mandate.

⁷ For information on the methodology behind this analysis see Praet, P. 2016. *The ECB’s monetary policy response to disinflationary pressures. Speech at the ECB and Its Watchers XVII conference organised by the Center for Financial Studies. Frankfurt. 7 April.*

⁸ See the Transcript of the Federal Open Market Committee Meeting of March 18, 1980.



Barry Eichengreen

Professor

University of California, Berkeley



Remarks on the bicentennial celebration of the Oesterreichische Nationalbank

It is an honor and a pleasure to speak at this event marking the bicentennial of the Oesterreichische Nationalbank (OeNB). It is humbling for an American whose own central bank just finished celebrating its centennial (if “celebrating” is, in fact, the right word in this context). It is even more humbling when one recalls that the predecessor of the Federal Reserve System, the Bank of the United States, was euthanized after just 40 years, owing to less than universal admiration of its operation.

I will use my few minutes to reflect on central bank mandates. The central bank’s mandate is what gives its policy a focus. It is what defines the central bank’s core responsibilities. Thinking about the mandate reminds us, moreover, that the scope of central bank action has expanded enormously over the years. Central banks have taken on all manner of responsibilities, from crisis lender to deflation fighter, to credit market operator, to bank and financial market supervisor. It is not uncommon to hear the central bank described as the only policymaker left standing, or the “only game in town.” One could almost write a book about central banking with that title – if Mohammed El-Arian had not done so already.

Early central banks, starting with Sveriges Riksbank and the Bank of England, were organized to provide financial services to the state – which meant to facilitate and organize government borrowing – in return for which they received special privileges, such as a monopoly over note issue, the exclusive right to purchase and discount bills of exchange, the exclusive right to open multiple branches, or exemption from legal limits on the number of partners. The exclusive right to issue notes was often the key privi-

lege (as in the case of the OeNB), and this in turn made the central bank the natural agent to which to assign responsibility for the stability of the currency. The First Bank of the United States was established in 1791 not just to help the government regularize the government’s financial affairs, but also to issue a uniform currency – and to limit actions by other issuers that might undermine that uniformity. The OeNB was founded in 1816 in part to stabilize the currency after a period of inflation and depreciation; this was at least part of what Count of Stadion-Warthausen, Emperor Francis I’s foreign minister, and others had in mind.



Over time, one can see central bank mandates expand further to encompass financial stability. The term “lender of last resort” goes back, if I recall correctly, to Sir Francis Baring and his *Observations on the Establishment of the Bank of England* in 1797. There is an irony here in that the Bank of England’s most dramatic lender-of-last-resort or lifeboat intervention was on behalf of Baring’s Bank in 1890. Historians do not entirely agree on when central banks became cognizant of and first actively exercised their lender-of-last-resort responsibilities. I am with my

colleague Marc Flandreau in believing that the turning point was the Overend Gurney crisis of 1866 for the Bank of England, and somewhat later for other central banks. The Fed, of course, had to learn the hard way, in the 1930s, about the responsibilities of a lender of last resort. I can't help but recall that the OeNB also had a rather "interesting" experience in the spring and summer of 1931 in seeking to meet the liquidity needs of a systemic banking crisis.



In the 19th and early 20th centuries, banks were lightly regulated. Typically they were required only to hold a certain minimum amount of capital and to convert their note liabilities into specified quantities of gold or silver on demand. As central banks assumed lender-of-last-resort roles, they naturally became more involved in bank oversight and supervision. Bagehot's rule instructed them to lend only to institutions with good collateral, and the books had to be scrutinized to determine whose collateral was good. Last-resort lending created scope for moral hazard, and supervision was required to deter it. In the 20th century, as the financial stability mandate broadened and central banks became more active as emergency lenders, they naturally acquired supervisory and regulatory roles.

And then, to leap ahead more than a little, came the global financial crisis of 2008/09. Given the colossal growth of financial systems, stabilizing banks and credit markets required massive credit injections. Members of the public, if they had not asked before, were now led to ask: who are these anonymous central bankers capable of conjuring up such impressive quantities of money? Why is the central bank the only agency with the capacity to erect a firewall against deflation and depression? Why does the central bank have the right, perhaps in conjunction with other government agencies, to decide which banks are rescued and which are allowed to fail? Why is the central bank the entity now vested with responsibility for ensuring that the same financial follies don't recur in the future?

There are two answers. First, there has been a logical, organic expansion of the range of central bank responsibilities over time, as the Austrian case over the last two centuries serves to illustrate. Second, when politicians are unable to act, as they all too often are, the central bank, being an independent entity, is the only policymaker in town.

But there are also two worries. First, even experienced central banks have limited bandwidth. Load them up with responsibilities and it becomes more difficult for them to execute their core functions. Central banks sometimes create separate committees responsible for decision-making in these different issue areas, where coordination is "assured" by having the governor sit on each. But we do not yet have enough experience to be confident about the efficiency of this arrangement or to recognize its limits.

Second, the more complex and multidimensional the mandate, the harder it is for the politicians and the public to hold the central bank properly

accountable for its actions. If the mandate is complicated and the instruments are many, it becomes hard to understand what the central bank is doing, and why. In a democratic society, accountability is essential for sustaining the independence of a public agency. Independence is a valuable attribute of a central bank, we have learned from history, so there is a danger that independence and encompassing mandates may be at odds.

Central banks have sought to strengthen accountability by being more transparent, enabling politicians and the public to better understand what the central bank is doing and why. Many central banks now issue both financial stability reports and inflation reports, explaining and justifying their actions in these domains. They publish the results of their stress test exercises and inflation forecasts, not just in order to communicate smoothly with the markets but also as a way of strengthening their accountability.

Again, however, one wonders whether there are limits. Have some central banks reached the point where they are providing so much information through their communications strategy that they are confusing rather than reassuring the markets and making accountability more difficult, instead of less? Have some changed their deliberations, in the interest of communication and accountability, in ways that actually hinder efficient decision-making? Charles Goodhart and I have both written, separately, about this possibility in the case of the Bank of England.

We can also ask how important differences in the mandate are for the central bank's key function of delivering price stability. My colleague Nergiz Dincer and I have constructed measures of the nature of the mandate for 120 central banks annually since 1998.

We distinguish cases where no formal objective or objectives were stated, cases where there were multiple objectives without prioritization (as in the United States) and cases where there was one primary objective or else multiple objectives with explicit priority attached to one (as in the case of the ECB). In each case where a single objective or explicit priority was observed, the objective in question was price stability, broadly defined.

Dincer and I find that the share of central banks with a single or prioritized objective rises gradually until the global financial crisis, after which it declines. These trends plausibly reflect the increasing popularity of an inflation target as the single or prioritized objective in the first period and the renewed importance of other objectives, such as financial stability, once the crisis erupted and critics pointed to the shortcomings of inflation targeting.

Regression analysis suggests that a single mandate is more likely when the central bank is independent. This is consistent with the argument that one way of making such independence politically acceptable is by giving the agency in question a limited mandate; in the context of central banking that limited mandate can take the form of a single objective. In addition, central banks in more open economies are more likely to have a single objective. This is consistent with historical evidence that open economies like Canada, New Zealand and Sweden were among the very first countries to adopt a single objective in the form of a formal inflation-targeting regime.

Finally, one can use these regressions to group countries into treatment and control groups and analyze the implications of a single or primary objective for inflation performance. When doing so, there is no visible difference

in the average level of inflation. In contrast, we find strong evidence that inflation variability is lower when central banks have a primary objective (a low and stable rate of inflation). We conjecture that multiple objectives – high employment and financial stability as well as price stability, for example – do not prevent central banks from hitting their inflation targets on average (in normal times), but that they result in more variability insofar as the monetary authorities may have to abandon or at least modify their price stability targets when other objectives are seriously at risk (in abnormal times). More concretely, a multidimensional mandate is not an obstacle to the pursuit of price stability under normal circumstances, but it can lead to difficult policy tradeoffs in extremis.

To conclude, the central bank is an indispensable institution in modern society. Its range of responsibility and scope of activity have tended to grow

over the long run and most recently as a result of the global financial crisis of 2008/09. These facts raise difficult questions about independence, accountability and policy tradeoffs that we are only beginning to address. Many people, including central bankers themselves, would be more comfortable if less reliance was placed on the institution. They would be more comfortable if we were able to rely less on monetary policy because other branches of government were making more active use of countercyclical fiscal policy. They would be more comfortable if the central bank had to worry less about financial stability because other regulatory agencies, commercial bank managers and legislators were addressing and containing potential stability risks. But until the politicians get their act together, which is to say not anytime soon, central banks will remain the only game in town.



Charles A. E. Goodhart

Financial Markets Group
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Whither central banking?

The history of central banking can be divided into periods of consensus about the roles and function of central banks, interspersed with periods of uncertainty,

often following a crisis, in which central banks are searching for a new consensus. The time line is roughly as follows:

Table 1

History of central banks has swung between periods of consensus and uncertainty

	Consensus	Uncertainty
1873–1914	Gold standard, real bills doctrine, lender of last resort (LLR)	
1914–1933		Breakdown of gold standard, breakdown of real bills doctrine, unemployment and inflation
1934–1970	Fiscal (Keynesian) dominance, central bank subject to finance ministry, financial repression, interest rates used for balance of payments, otherwise low	
1971–1990		Stagflation, monetarism vs. Keynesianism, liberalisation and financial crises
1990–2007	Independent central banks, inflation targets, Great Moderation	
2008 to present		Great Financial Crisis (GFC), financial instability, deflation

Source: Author's compilation.

As shown in table 1, it is obvious that we are in the middle of a period of major uncertainty about the appropriate role and functions of central banks. Some conclusions have, however, been fairly clearly drawn from the Great Financial Crisis (GFC), including the assertion that the previous ideas were erroneous, as follows:



Table 2

Generally accepted myths pre-2007

- (i) Price stability, plus Basel capital adequacy ratios, would guarantee solvency.
- (ii) With solvency thus guaranteed, liquidity will always be available via wholesale markets.
- (iii) That maturity mismatch in the banking system can be ignored.

Source: Author's compilation.

But there are many uncertainties left:

1 The structure of the banking system

There is a historical regularity here. After each crisis, and in each period of

uncertainty, there is a search for rules that might have prevented the prior crisis. In each case there is a move towards the more radical proposals, but the actual outcome is a compromise.

Table 3

Crises and Reactions

Date	Crisis	Radical proposal	Compromise outcome
Early 1800s	Suspension of gold standard	Ricardo's currency board	Bank Charter Act 1844
1929–1933	Collapse of U.S. banking system	Chicago Plan	Glass-Steagall Act
1970s	Stagflation	Monetarism	Pragmatic monetarism
Now	Collapse of banking systems	Narrow banking	Ring-fencing and ...?

Source: Author's compilation.

2 The ability of macroprudential instruments to maintain financial stability

The following queries remain:

Table 4

Some queries about the use of macroprudential instruments

- (i) Are they intended to protect the economy from banks, or banks from the economy? What is their main purpose?
- (ii) Will they be used aggressively enough (Brainard caution)?
- (iii) What is the dividing line between macroprudential and other policies, e.g. fiscal?
- (iv) Since the dividing lines are fuzzier, who is responsible for controls?
- (v) How does one distinguish between sustainable and unsustainable financial developments, and how can one communicate that distinction to both politicians and public, both of whom enjoy being in a boom period?

Source: Author's compilation.

3 Do we need to rethink monetary policy?

Table 5

Some queries about current monetary policies

Question	Answer
A higher target?	No.
Lean vs. clean?	Try macroprudential instruments first.
Why so ineffective?	Weakness of banking sector.
How to communicate?	Base forward guidance on states, not dates. But even states are unpredictable.
What if another downturn happens?	Helicopter money? Negative interest rates?

Source: Author's compilation.

4 The technology of banking

Perhaps the main uncertainty is the rapidly changing technology of banking (and central banks). Banking is based on transactions and information technologies. Both of these are rapidly changing. Underlying queries relate to:

Table 6

Some queries about technology

- (i) Efficiency and state security vs. privacy and liberalism.
- (ii) Blockchain ledger transactions.
- (iii) Speed vs. equality of opportunity. High-frequency trading and frequent auctions.

Source: Author's compilation.



5 Where are central banks now?

Let us contrast the state of central banks in the Great Moderation (GM) with that now following the Great Financial Crisis (GFC).

with that now following the Great Financial Crisis (GFC).

Table 7

Contrast in the role of central banks

	Focus	Instruments	Confidence	Independence
GM	Narrow: Price stability	Single: Interest rates	High	Undoubted
GFC	Broader: Price stability Financial stability	Many: Interest rates Unconventional monetary policy (UMP) Macroprudential policy Stress tests Resolution	Groping	At some risk

Source: Author's compilation.

6 So whither central banking?

Central banks have now been awarded, and/or have assumed, far more power than previously, but have much less

confidence about how to use such powers. An unstable condition?

The future cannot – perhaps fortunately – be forecast.



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OESTERREICHISCHE NATIONALBANK
EUROSYSTEM

Part 2

Speeches at the conference on the
occasion of the 200th anniversary
of the OeNB, September 13 and 14

Central banking in times of change

Ewald Nowotny

Governor

Oesterreichische Nationalbank



Opening remarks: Central banking in times of change

Ladies and gentlemen,
It is a great pleasure for me to welcome you today to a very special event. The Oesterreichische Nationalbank (OeNB), which was founded in June 1816, celebrates its 200th anniversary this year. To mark this occasion, we organized a number of events. The high-level research conference that will take place today and tomorrow is a further milestone in this series of special events.

The OeNB organized this event in close cooperation with the Bank for International Settlements (BIS). Since its foundation more than 80 years ago, the BIS has provided a forum for the members of our large “family” of central banks to get together and exchange our views and experiences. This is why I was very happy when the occasion arose to join forces with the BIS and organize this high-level policy research conference together. Hopefully, it will provide plenty of opportunities today and tomorrow for policymakers and academics to discuss some of the most pressing questions in present-day monetary policy. I would like to thank Jaime Caruana from the BIS for having made this event possible, and I would like to extend a warm welcome also to Peter Zöllner, former OeNB Governing Board member and thus a former colleague of mine, who is now member of BIS Management— something that does not happen to Austrians every day.

The fate of the Nationalbank has always been closely entwined with the fate of Austria, for better and for worse. Central banks never operate in isolation. The most important lesson to be drawn from our 200-year history is that the greatest threat to financial and monetary stability has been, and still is, war. In fact, it was the twenty odd years of the Napoleonic wars which stood at

the origin of the Nationalbank in 1816, as Austria strove to stabilize a currency which had undergone strong inflation and depreciation. So the “privileged Austrian central bank” was founded as an independent institution with private shareholders. One of the first shareholders was Ludwig van Beethoven – and just for the record: this turned out to have been a very good investment for him.



World War I ended with the most dramatic period in Austrian monetary history, the hyperinflation period of the early 1920s. If we can look back on 70 years of prosperity today, this is because of the long period of peace that most of Europe has enjoyed since 1945. The most important ingredient in this success story has been the European integration process, culminating in the foundation of the European Union and the creation of Economic and Monetary Union. Even if the European project faces some headwinds today, we should never forget about these fundamental achievements of the past.

But central banks cannot rest. The world is changing, and so must central banking in order to make sure that we can continue to fulfill our stability mandate. When turning to our hopes

and plans for the future, I would therefore like to draw your attention to two developments which have shaped and will continue to shape the evolution of central banking. The first is globalization, the ever-increasing interconnectedness of our economies through the international movement of goods, capital, persons and ideas; a process which we have witnessed for some time now, but which is going to continue unabated. The second, more recent development is the broadening of central bank mandates to include financial stability concerns. Both developments are very closely entangled. And they are both also very much in the focus of the BIS.



Globalization has brought many opportunities, and many of the big challenges facing mankind, like global warming, can in fact only be dealt with at a global level. At the same time, the constraints and influences that result from the interconnectedness of our economies limit the room for domestic policies. The probably biggest change in monetary policy regimes in the past half century – the end of Bretton Woods and the move from fixed to floating exchange rates – resulted from this very tension between the wish to

manage domestic economies autonomously on the one hand and a world of increasing capital mobility on the other. But floating exchange rates do not mean that monetary policy is independent. Monetary policy decisions taken in other monetary areas affect our domestic economies and vice versa; more and more so as the global economy is becoming increasingly integrated. The unconventional monetary policies undertaken recently by a number of central banks have created policy challenges in some smaller advanced and emerging market economies. But spillovers concern the main currency areas as well, as exchange rates react nervously to expected changes in their relative monetary stance. As policymakers, we have to take care that the necessary stimulating effect of expansive monetary policies does not so much come from increased net exports but rather from a strengthening of domestic demand. In the present policy environment, which in many ways is still exceptional, it is important to keep the spirit of dialog and cooperation. The BIS has a crucial role to play here by providing a forum for the international community of central bankers. When the BIS was founded in 1930, some 20 central banks subscribed to BIS shares. Today, the BIS counts central banks of 60 countries among its members, representing 95% of world GDP.

A by-product of globalization, namely of financial liberalization and the opening-up of domestic economies and financial systems that we have witnessed over the past 50 years, has been the increasing frequency and severity of episodes of financial instability. Advanced economies had been largely spared by financial crises between 1945 and 1970, or during the “quiet period”

¹ Gorton, G. 2012. *Misunderstanding financial crises*. Oxford.

as Professor Gary Gorton of Yale University termed it.¹ With the end of financial repression and the forces of financial markets unleashed, central banks now have again to deal with volatile capital flows, booms and busts in credit and asset prices, and banking instability. Historically, it is not new that central banks assume responsibility for financial stability. The U.S. Fed, notably, was founded with the explicit aim to prevent the recurrence of banking crises. Also in the case of the Austrian central bank – even though it was initially founded with the primary objective of fostering monetary stability – financial stability considerations ranked high at a very early stage. Today it is clear – and has been at least since 2008 – that price stability alone is not sufficient to guarantee the stability of the financial system and that the instability of the financial system in turn can seriously undermine the effectiveness of monetary policy and become a threat to price stability.

As a result, we have seen the mandates of central banks evolve. On the one hand, there is the question of whether and how financial stability concerns should enter the monetary policy decision process. As we all know, this topic has received considerable attention at the BIS and will feature prominently in our discussions tomorrow morning. On the other hand, the financial crisis of 2008 has reinvigorated debates on the proper role of central banks in banking supervision and regulation. From the late 1990s onward, there has been a general movement toward creating unified supervisory agencies that would not only be

responsible for banks but also for insurance companies and other financial market actors like investment firms. The main advantage of these unified supervisory agencies is their ability to take account of the increasing integration within the financial sector. But who should become the unified supervisor? Some countries like the U.K. – the reform of the Financial Services Authority in 2001 was a landmark event in this respect – but also Germany and Belgium opted for a separate authority outside the central bank. Other countries, like Ireland, assigned unified prudential supervision to their central banks. Overall, however, before the financial crisis there seems to have been some preference for independent financial supervisory authorities, while after the financial crisis more countries went toward putting prudential supervision under the authority of their central banks. In this respect, the most radical changes took place in Hungary, and again in the U.K., where the prudential regulation of financial institutions was integrated back into the Bank of England in 2013.

Both approaches have their advantages and drawbacks. The issue is far from being settled, and in fact there are many reasons to think that there is not one-size-fits-all solution as every arrangement has to work within a specific economic and political context.

It is with these questions in mind that I would like to conclude my introductory remarks and hand over to Jaime Caruana. I wish all of us a successful conference with stimulating presentations and discussions.

Jaime Caruana

General Manager

Bank for International Settlements



The OeNB at 200: continuity and change in central banking

Ladies and gentlemen, it is a great pleasure and privilege for the BIS to co-organise this conference celebrating the 200th anniversary of the Oesterreichische Nationalbank. We congratulate our host on being one of the oldest central banks in the world. It is both amazing and humbling to see how the Austrian central bank has been able to navigate through times of extreme change – including war and peace, wealth and poverty, inflation and deflation, as well as currency reforms.

At a mere 86 years of age, the BIS is much younger. But our two institutions have worked closely ever since the BIS was established in 1930. Today, we continue to cooperate on many of the same issues of monetary and financial stability as in the early 1930s – which was also a challenging time.

The theme of our conference is precisely that of continuity and change. To set the scene, let me highlight two aspects of continuity and two aspects of change that have shaped our thinking about central banking over time.

Aspects of continuity

First, on continuity. Throughout their history, *central banks have been involved with government finances*. Early central banks were often called upon not only to stabilise debased currencies in the aftermath of wars, but also to help the government finance its debt.¹ This involved actively managing government debt – in particular, making it tradable.

For today's central banks, debt management is much less common a mandate than it used to be. Achieving price stability is the typical focus. Nonetheless, in the aftermath of the fi-

nancial crisis of 2008/09, with the shift to unconventional monetary easing to reflate the economy, some central banks find themselves having to buy and hold a lot of government debt. In effect, they are influencing the amount and composition of government bonds left available in the market.



The debt management flavour inherent in such balance sheet policies can blur the line between monetary and fiscal measures. Such policies thus carry high stakes for central banks' autonomy. Moreover, as governments, markets and the public at large have increased their dependence on – and their expectations about – what central banks can do, the stakes are getting higher. I hope the discussion on central bank mandates in the next session will address some of these very pertinent issues, including the importance of central banks' autonomy.

Throughout their history, *central banks have also been involved with the banking sector*. The early central banks held the deposits of other banks, and served as their bankers. In due course, central banks' large gold (and, later,

¹ See Jobst, C. and H. Kernbauer. 2016. *The quest for stable money. Central banking in Austria, 1816–2016*. Campus. Frankfurt. New York.

foreign exchange) reserves, and their networks of correspondent banks helped them become the lender of last resort in times of crisis.² Central banks have thus always had to consider financial stability issues in their quest for monetary stability.

During the gold standard era, the convertibility anchor helped deliver a good measure of price stability over longer horizons, but it was not enough to prevent waves of financial instability in the wake of credit booms, often accompanied by sharp asset price increases.³



Fast-forward to the post-Bretton Woods period: under fiat monetary regimes – but with a focus on price stability – central banks did achieve a measure of macroeconomic stability during the so-called Great Moderation. But as we subsequently learned, financial booms and busts remain very much untamed. This raises the question: *Where are we in the process of integrating central banks' monetary and financial stability mandates?* Again, I hope the forthcoming discussions will shed some light.

Aspects of change

What about the changes? One important aspect is the *greater economic and financial integration* of modern economies. To be sure, globalisation is not a new phenomenon. What is different today is the scale of integration. On the real side, the growth of global value chains has transformed international trade and production. Domestic production costs have come to depend much more on price movements abroad, through imported inputs and implicit competition. The question is, then, *how far does domestic inflation reflect global factors*, over which monetary policy has little control?

On the financial side, globalisation has increased the influence that monetary policy settings for key global funding currencies – notably the dollar and the euro – have on the rest of the world. Given such policy spillovers, the room for independent monetary policy in smaller economies has probably narrowed, and policy trade-offs have become tougher. *How could central banks in smaller economies manage the effects of spillovers? And what could central banks in the key currency areas do for their part?* These questions on policy independence will feature in the second session this afternoon.

A second aspect of change I want to highlight concerns *technological progress and other longer-term supply shocks*. Structural trends such as the spread of digital technology and increased price transparency and competition via the internet and e-commerce may have been factors behind the recent persistently low inflation. Central banks might therefore need a longer than

² Bordo, M. 2007. *A brief history of central banks*. Federal Reserve Bank of Cleveland. December.

³ Borio, C. 2014. *Monetary policy and financial stability: what role in prevention and recovery?* BIS Working Papers 440. January.

usual horizon to bring inflation back to target. *How could central banks take account of long-term structural influences on inflation?* This will be one of the issues for the session on inflation targets tomorrow morning.

In closing, let me thank you all for taking the time to join us here today.

Many thanks in particular to our speakers, discussants and session chairs. I wish everyone a productive time, with insightful discussions both on and off the podium. And thank you again, Governor Nowotny and colleagues of the OeNB, for your cooperation and hospitality.

Session 1

Evolving central bank mandates

Alan M. Taylor

Professor

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Central bank mandates in a perfect storm

A growing debate on evolving central bank mandates is extremely important and has been stoked by the financial crisis, the great recession, and the slow recovery. How can macrofinancial history speak to this issue?

I take a very long-run view of central bank mandates, and ask what has happened, how and why it happened – and where, if at all, we took a wrong turn on the road to where we are now.

First, I will discuss the three key mandates, their history and how they have evolved: the financial stability mandate, the price stability mandate, and the output (or employment) stability mandate. Second, I will suggest that we need three perspectives to understand how and why the current challenges for these mandates are especially acute: an historical perspective, an economic perspective, and a political perspective. Third, I will try to dig deeper and provide some analytical framing. Here I will bring up three themes or questions. What kind of narrative can we construct to explain how we got here? Alongside that, is there a quantitative story that illuminates the perfect storm of mandates we find ourselves in? And what will happen next in terms of the evolution, or possibly revolution, in central bank mandates?

Evolution of the three mandates

The three mandates in the long run cut both across time and across countries, and this forces us to think about how they have each received varying degrees of weighting over time.

Take the financial stability mandate, the oldest of all mandates. The birth of central banking in the 17th century was a way of creating a bankers' bank: a backstop, a lender of last resort to insure smaller private banks against disastrous crises. This mandate then remained at the core of what central

banks did through the 18th and 19th centuries. The history of the Bank of England provides many examples of crisis management – sometimes even at the expense of convertibility – in episodes like 1797, 1825, or 1866. And of course, famously, the US Federal Reserve was born as a response to the 1907 panic, to prevent such problems recurring in the future, or so they hoped.



And yet, given strange turns in the history of economic thought and political ideology, the expectation that central banks would be guarantors of financial stability virtually disappeared from view in the late 20th century. Ironically, this might have been because of, rather than in spite of, the lessons of the 1930s Great Depression. So firm was financial regulation, and so timid and delevered was the financial system after World War Two (WW2), that the crises witnessed over previous centuries were, for a long while, kept at bay, arguably leading to a sense of complacency about financial stability risks.

As for the price stability mandate, this is again, in many ways, an old mandate. This goal was supposedly subsumed under the gold standard commitment that most central banks maintained until the mid 20th century, when that anchor had failed.

But sometimes this mandate took a back seat during wars or financial crises, as in the UK in 1797 or 1914, or when depressions promoted other macroeconomic goals to greater prominence, as in the 1930s in many countries. Today price stability means goods prices, and our nominal anchors have no link to gold: we have inflation targets or currency pegs, or (potentially) price level targets or nominal gross domestic product (NGDP) targets.



Finally, the last of the three mandates to appear, though not in all central banks, is the output or employment mandate. The political economy origins are now broadly agreed: The Great Depression, in conjunction with the rise of democratic politics, made it impossible for policymakers to ignore recessions and unemployment as they had before.

The Fed's dual mandate is a good example of a monetary regime that took this sharp turn, but one sees this in almost all advanced economies after WW2. Of course, since then, some central banks no longer have this mandate, but the jury is out. And it remains an open question, perhaps for future economic historians, to judge whether the supposed divine coincidence that might allow one to safely merge this goal into inflation targeting really does

in fact hold and whether such a regime choice actually made sense.

Perspectives on the three mandates

Those are the three mandates we are talking about. I now turn to some analytical framing for thinking about them, before going on to look at some quantitative historical evidence. And the three frames are as follows: What can we say from the perspective of history, from the perspective of economics, and from the perspective of politics?

The main historical perspective, I claim, is that we are at a unique point in time when all three mandates have taken on extreme importance. And the reason for this unusual salience is obvious: the combination of a large financial crisis, the stagnation of output and employment, and the persistent failure to meet inflation targets in almost all of the advanced economies.

But an additional perspective is economic. Everyone is now looking for central banks to do not one job, but three jobs – and in a time when each job is proving harder to do. The current conjuncture of economic and financial conditions is a rare event and far “out of sample.” This makes the challenges of meeting each mandate, not to say all three, quite problematic. The pre-crisis policy tools and frameworks may not be up to the task, which is presumably why many have changed, expanded, and evolved so dramatically in the last few years. But they may have further to go, and even now it is unclear whether many of the past or prospective responses will ultimately be judged successful.

And that brings us to the last point, but by no means the least, the political perspective. Life going forward for the new triple-mandate central banks is not going to be so simple as in the past. It seems unlikely that we can return to

the clean, transparent, technocratic, and thus almost politically isolated world of the narrow, independent, inflation-target-focused central banks of recent times. Those days are almost certainly gone. But the new tools and the new goals are more opaque, ill-defined, subjective, distributional – and, hence, political.

Summing up, societies may now be asking more of the central banks, and the central banks will now have to try to find a way to serve those goals. Like it or not, central banks should therefore prepare to face a tough role that is less independent and more politicized. Indeed, this is to some extent already happening.

The perfect storm in a historical perspective

This has been a mostly descriptive and qualitative story so far. But I also want to provide some quantitative evidence to support these arguments. I especially want to reinforce one idea, and that is just how unusual present day macro-financial conditions are, once we look at them through the lens of history. Look now at some aspects of each of the three mandates, and consider the

long-run trends that make today's perfect storm so worrying.

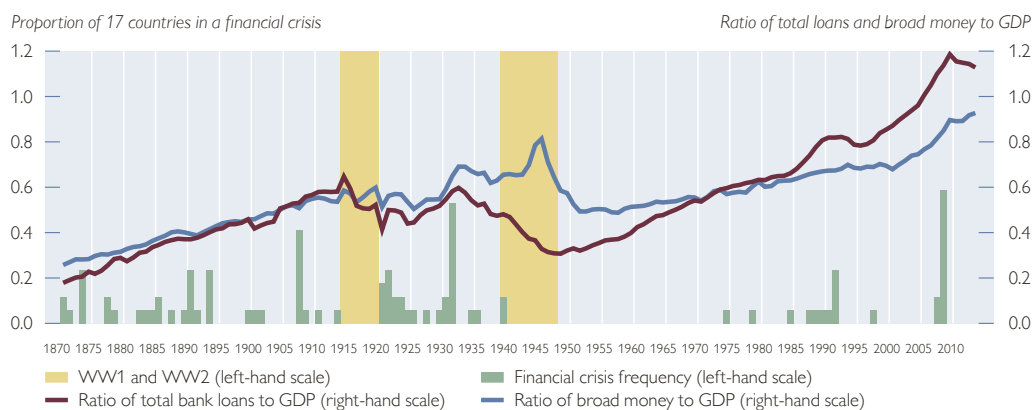
First, I show some evidence on financial stability, and here I draw on my work with Oscar Jordà and Moritz Schularick. Chart 1 shows two distinct trends in advanced economies. The frequency of financial crises is shown by the green bars. The evolution of private credit, proxied by bank lending, is shown by a red line, with broad money shown by a blue dashed line for reference (both relative to GDP).

Two things stand out. First, financial crises happen all the time, except for the post-war era from the late 1940s to the early 1970s. Second, economy-wide leverage (measured by bank lending relative to GDP) has shot up over time, what we call the “financial hockey stick” pattern. What do we mean by that? Bank lending-to-GDP ratios were broadly stable before the 1930s, plateauing around 50%. There was then a drop in the Great Depression. But from the 1940s until now then there was a ramp up from low to currently unprecedented levels over 100%.

The ebb and flow of aggregate credit matters because it can help predict crises, as our early work has shown. Both

Chart 1

Frequency of financial crises, bank lending and broad money

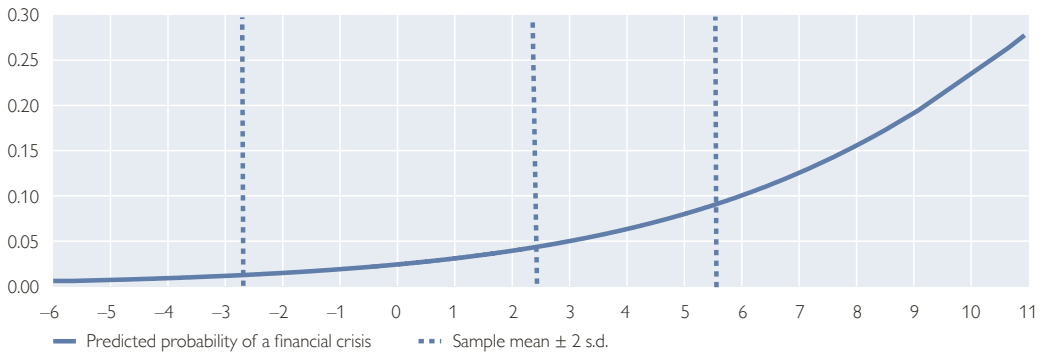


Source: Data from Jordà, Schularick and Taylor database. Bank lending is total loans to domestic private nonfinancial sector. Broad money is M2 or closest proxy.

Chart 2

Credit growth and the predicted probability of a financial crisis

Predicted probability of a financial crisis



Source: Data from Jordà, Schularick, and Taylor database. Fitted values from a logit model using lagged 5-year change in the ratio of bank lending to GDP.

the level and particularly the recent growth rate of bank credit affects crisis risk. In credit booms, and especially in highly-leveraged economies, we get much higher financial crisis risk. In more recent work, we disaggregate the data and show that most of the postwar rise in credit, and most of the associated financial crisis risk, has been associated with the rise of mortgage lend-

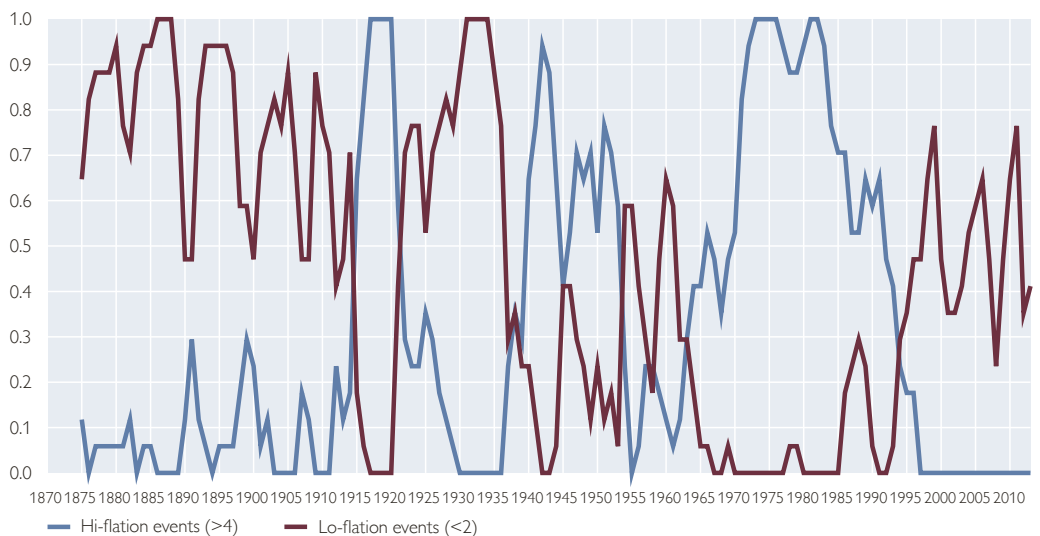
ing. Chart 2 shows a typical baseline result from a predictive regression model, showing just how crisis risk escalates as credit growth increases.

The major lesson is that in economies with high and volatile leverage, financial stability is much harder to achieve. And yet that is exactly where we – and the central bankers – find ourselves today. The financial stability

Chart 3

Frequency of lo-flation and hi-flation events

Fraction of countries



Source: Data from Jordà, Schularick, and Taylor database. Lo-flation means the 3-year lagged average CPI inflation rate is less than 2% per year and hi-flation means the 3-year lagged average CPI inflation rate is greater than 4% per year.

mandate is hard work at any time, but especially hard right now. This evidence also suggests how we got into this trouble. Models and policy frameworks that seemed to perform well based on data from the crisis-free 1960s and 1970s became increasingly unfit for use in the new macrofinance world emerging in the 1990s and 2000s. The neglect of the financial stability mandate after WW2 was a sign of complacent thinking; it was eventually found out as the world changed.

Now what about price stability, and how the present compares to the past? Chart 3 shows advanced economy inflation outcomes over the long run. The selected bins are labeled hi-flation for episodes above 4% per year, and lo-flation episodes below 2% per year. The plot shows the fraction of economies in each bin, for all years since 1870. Lo-flation can of course include less than zero, i.e., and the problems associated with getting near or into deflation make this a useful danger indicator. The lo-flation bin also brings into play the unpleasant possibility of the zero lower bound (ZLB) where conventional monetary policy loses traction.

The main message from these data needs little explanation for today's central bankers. From WW1 until the 1990s, with the exception of the disastrous deflations of The Great Depression, advanced economies have generally avoided the lo-flation outcome bin. A few years in the Bretton Woods era mark a rare exception. But since the 1980s we can see something quite striking happening. The two lines have gradually switched places. Hi-flation has become rare and from the late 1990s it was extinct. Lo-flation has become more common since the 1980s, and since 2000 has become a better-

than-even chance. The likelihood of sustained lo-flation outcomes in advanced economies has not been this high since the gold standard era.

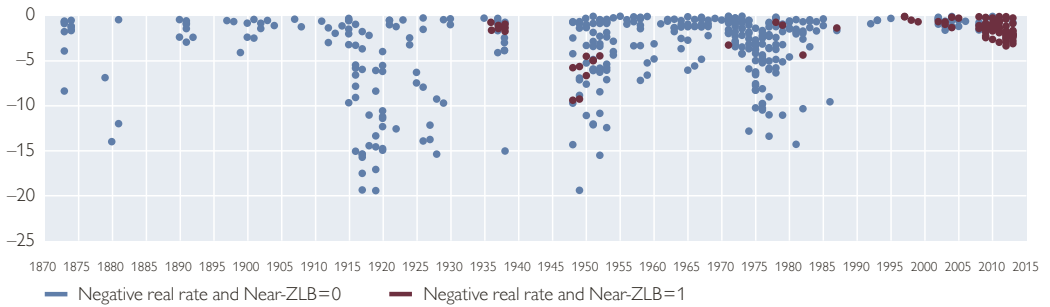


Now, why should we care? Well, I alluded to the ZLB a minute ago, but now I will make the link between the inflation environment and policy space. We can go back to history and look at r^* (the real rate), and “low r^* ” events, to use currently fashionable terminology. I will define a low r^* event as one with negative r^* , a simple metric.

History is fairly clear here, as shown in Chart 4. A low r^* has not been all that rare but the conjuncture of low r^* with near-ZLB events has been very rare indeed... until now. This strange couple appeared now and again in the late 1930s and 1950s, and idiosyncratically at other times. But they have been seen since the late 1990s in Japan and Switzerland, and increasingly everywhere else since the crisis. In other words, we are now living with a very rare outbreak of two freakish macroeconomic events: a negative real rate and the ZLB. In historical data covering more than 2,000 country-year observations since 1870, this has been seen just a few dozen times, mostly in the last 10 years.

Low- r^* and near-ZLB events

Real interest rate in % per year



Source: Data from Jordà, Schularick, and Taylor database. The real rate r^* is measured by the current year short-term nominal interest rate minus the 5-year lagged average CPI inflation rate. Near-ZLB means short-term (3-month) nominal interest rate below 150 bps. Only negative r^* events are shown. German hyperinflation years have been excluded from the calculations.

To sum up these observations on price stability, our current era could one day be referred to as a “third great mistake” in the history of nominal anchoring. The first two are very notable and nobody will forget them – the era of runaway deflation in the Great Depression of the 1930s, and the era of runaway inflation in the 1970s. Will the current period rank alongside those?

Low inflation, and the conjuncture of low r^* and the ZLB, may not yet be as destructive as the inflation and deflation mistakes were in those prior disasters. But they are causing serious policy problems in an era of subpar growth, and after eight years they still show no signs of abating. If we are still here in five or ten years, future economic historians may regard this era as another major malfunction of the macroeconomic and policy environment.

And there is reason to fear that it will persist. After all, nobody seems to have found an answer yet. In the policy space thus far open for consideration, there seem to be very few policies that have worked, and few ideas left to be tried. The phenomenon of a demanded depression with low- r^* and ZLB conditions turns out to be a difficult

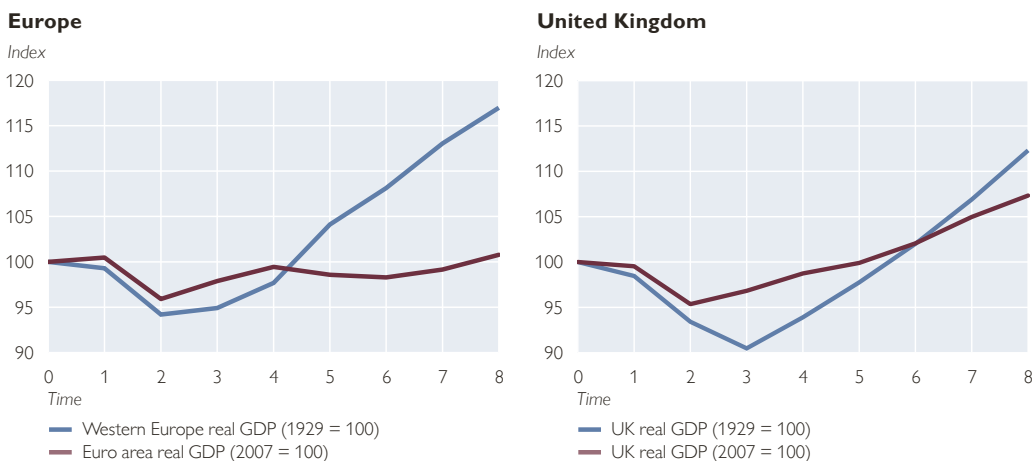
trap to escape from. Perhaps all we can say is that we won’t make that mistake again. But for this to be credible might mean contemplating new macro regimes going forward like higher inflation targets or NGDP targets, shifts that would make lo-flation, and bumping into the ZLB, less likely to happen. But it’s not clear when or if any of that takes hold, or whether it can help us escape the current predicament.

Finally, I will present a brief discussion of the output and employment mandate, and here again we see that the current cycle, the longer it continues, the more it starts to look like an unusual and aberrant period in history. In 19th century it was taken for granted that policymakers would not care about recessions and unemployment. After the 1930s and its massive political turmoil, this was no longer a tenable position, and since then there has been no downturn of comparable scale... until now.

Consider cyclical real GDP in each era, with worrying examples for the UK and Europe shown in Chart 5. (The post-2008 track in the US has been better.) In the UK, today’s track, as of 2015, has fallen below its post-1929 track, and lags it by 3 or 4% at the

Chart 5

UK and European real GDP growth compared post-1929 versus post-2007



Source: Data from Maddison database and IMF World Economic Outlook.

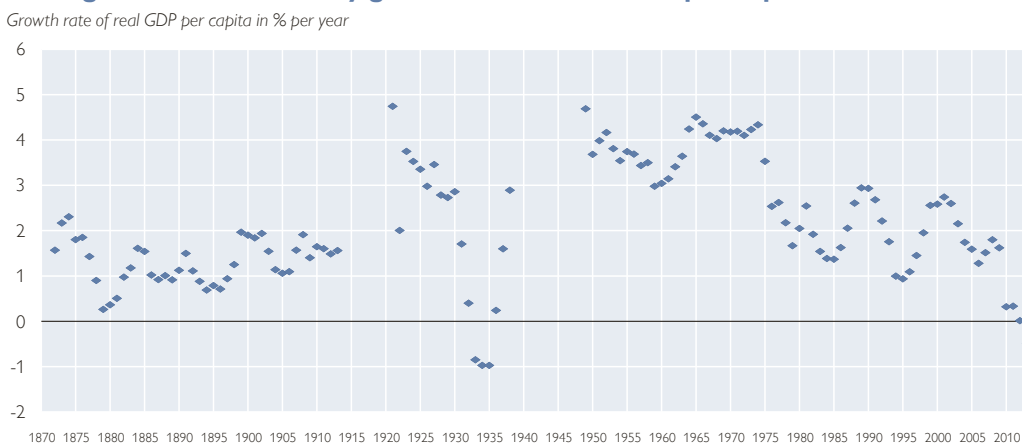
8-year horizon. In fact, some say this is the UK’s worst economic recovery in 300 years. But in the euro area the comparative performance is even more dismal, and today’s track for real GDP is basically flat post-2008. In terms of levels, it is now below the European post-1929 track by about 15% at the 8-year horizon.

Looking more broadly across time and space matters look just as discouraging. Chart 6 shows average per capita

real GDP growth over the long run in the advanced economies. This controls for changing population growth rates, which have drifted up and down over time. And we know the most recent observation of 2013 in these data has been followed by 3 more years of disappointing growth. It is thus clear that we have reached a new sustained low in growth by this yardstick – as low as in the 1930s, even. And so by this metric we are now in, on the brink of, the

Chart 6

Average advanced economy growth rate of real GDP per capita



Source: Data from Jordà, Schularick, and Taylor database. 5-year moving average growth of real GDP per capita for 17 countries.

worst advanced economy slowdown we have ever seen since the Industrial Revolution. (A quite shocking description – and words I never thought I would find myself writing.)

In some of our recent research, it is clear that some of this growth drag, perhaps up to five years out, can be attributed to a serious financial crisis. That kind of pattern is consistent with history. But I think this “crisis aftermath” story starts to wear a bit thin as an excuse once we get out to years 6, 7, 8 and beyond. In history, such after-shocks are typically gone by now and growth has resumed. But not this time, and that’s a key conundrum.



To sum up the perfect storm of mandates:

First, we have never seen such a convergence of all three mandates at the same time and with such force and importance. The financial stability mandate was important from the start of central banking, rose to prominence in the 19th century era of Bagehot, and faded from view after the 1930s crisis. The price stability mandate was thought to be embedded in the gold standard, but the fallacy was exposed by a brutal deflation in the 1930s. In the era of the great inflation this mandate was again mangled up badly, in the opposite direction – but since then perhaps be-

came, as a result, an almost obsessive compulsion, to the exclusion of one or both other mandates. The output and employment stability mandate was non-existent until the 1930s, dominated the post-war scene until the 1970s, but took an increasing backseat to obsessive inflation management in the years since.

Now we have a combination of one of the greatest financial crises of all time, plus the trap of low r^* and the ZLB, plus one of sharpest growth slowdowns, and these three events together have put every one of the three mandates simultaneously into play, with all of them jostling to be the center of attention and yet with many of their intellectual underpinnings subject to doubt and dispute.

What happens next?

I conclude with three conjectures, arguing that, in macroeconomics, the political economy equilibrium of recent decades is now clearly under severe strain, and that unless the current economic drag is methodically or miraculously lifted in the very near future, there will almost surely be further rapid evolution – or perhaps revolution – in central bank mandates.

Firstly, the crisis has meant there would be a need for more instruments, and also a need to work out how to use them, be it for hitting short-run targets or calibrating long-run frameworks.

On monetary policy we have seen, as a start, QE and negative rates already. What next? Broader asset purchases, attempts to abolish cash and go more negative, use of digital currency, helicopter money, more fiscal-monetary coordination? Not all of these sound attractive to economists and central bankers, but the fact that we are even having a conversation about some of them suggests how desperate times are.

On financial stability policy there were also bound to be more levers in play after the crisis. Capital buffers, loan-to-value (LTV) and loan-to-income (LTI) ratios are already up and running in some places, for example. But will they be enough? Should controls focus on banks or firms or households? Is housing and mortgaging special? Should bank capital be very high indeed, even at 100% narrow banking levels? Should crude caps on leverage be used? How intrusively should central banks act to direct or manipulate credit, in aggregate or by sector? These are, needless to say, all very controversial areas.

Secondly, we may need new policy frameworks because what just happened (the financial crisis, stagnation, the ZLB, etc.) was “not meant to happen” in old macro and policy models, but obviously did. So are economists and central bankers ready and willing to do things differently, and how? Will the old inflation targeting model survive, for example? At the very least will calls for a higher inflation target, like 4%, deflect us from the current arbitrary 2% choice. That’s one way to out-run a low r^* and the ZLB trap. But there are others like NGDP targets, which also wait in the wings.

There are also proposed even more complex and contingent policy rules, some of which entail more explicit linkages between fiscal and monetary policy, bringing in deficit and debt management, for example. These are not in play yet, but again the ideas are being debated. The longer the malaise, the more these debates will roll on.

But, thirdly, all of this begs a larger political question: who is it that will approve or decide what choices and what instruments and what goals the central banks should be taking on? With all the new mandates and frame-

works come larger and much more complex political questions. Often these are at root distributional questions, and inherently contentious.

We used to pretend that distributional questions didn’t matter much, or at all, in the nice old inflation targeting world, even if they did. Old-style conventional monetary policy was obviously not perfectly neutral, in the real world of imperfect insurance and heterogeneous agents. Shifts in yield curves, fluctuations in unemployment, and all manner of variations across the cycle created winners and losers. But perhaps in the normal business cycles of old, those effects were seen as small or short-lived enough that a difficult compromise could be maintained: to keep the central bank at a political distance, keep up the illusion that monetary policy was separate from fiscal policy and distributional concerns, and allow central banks to stake a claim to independence.



Now this could all change, given the massive and prolonged cyclical malaise we are now in. The redistributive effects of recent central bank policies have been larger, longer-lasting, and thus more controversial, than the usual swing of fortunes in a normal business cycle. There have been bigger winners and bigger losers in the strange macro-

economic universe of 2008–16 than we have customarily seen in business cycles in a very long time. The initial shock itself and the subsequent policy responses have provoked distributional angst and political argument.

As the crisis aftermath drags on central banks have had to tread new paths, adopting new tools and frameworks to meet their expanding mandates, taking them into new political waters, and calling into question their independence. Yet more controversy would attach to all the yet-to-be-tried exotic measures now being openly discussed: targeting credit, deeper reach into housing and mortgage policy, funding government with helicopters, buying private assets on a large scale, abolishing the cash in our pockets, and so on. A central bank that goes down these paths doesn't need to go far before the illusion of technocratic inde-

pendence is completely gone – and probably rightly so.

Central bank mandates continue to evolve in these unusual and fraught times. Some unexpected new paths have been followed already, and others could yet to be taken.

But care will be needed. Many paths could be unfruitful, some potentially damaging. To avoid repeating past mistakes, or making new ones, wise policymakers will seek lessons from history, avoid excessive theoretical introspection, and keep their eyes firmly on evidence-based macroeconomics.

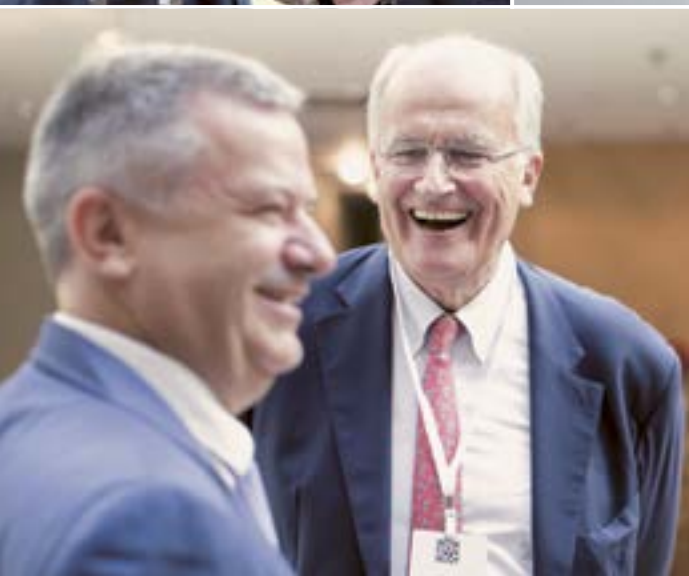
Will the right or wrong path be taken, to a better or worse macroeconomic policy regime? We leave that to future economic historians: Until we have another few decades of macroeconomic data, we will not have a good answer.



CENTRAL BANKING IN TIMES OF CHANGE



CENTRAL BANKING IN TIMES OF CHANGE



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Discussion:

Are wider central bank mandates sustainable?

In more actively tackling the financial stability and overall macroeconomic performance parts of their mandates (as they have been doing since the financial crisis of 2008/09), central banks will have to continue to use non-core policy tools in intrusive and controversial ways which demand greater attention to communication and accountability both vis-à-vis the general public and other arms of the state.

1 Introduction

Central banks moved centre stage during the financial crisis (FC) and have stayed there ever since. Described as “heroes” by some, yet vilified by others, they have assumed a much greater importance in the public eye, but have jealously protected their independence from government and politics.

As described by this session’s two speakers, Cecilia Skingsley and Alan M. Taylor, this greater perceived importance has reflected a welcome *de facto* expansion of central bank mandates. I agree that much of both, the rhetoric and the analysis of central banking over the past fifty years has focused on the inflation mandate. Indeed, this emphasis may have been a factor in the vulnerabilities that were allowed to build pre-crisis.

Still, central banks did not hesitate to act aggressively to restore financial stability. They were also cognizant of the need for economic output and employment recovery.

But are these recent trends sustainable? In particular, are current arrangements for governance and accountability of central banks sufficient, given the greater degree of intrusion entailed in the use of the additional policy instru-

ments that are now being employed by central banks in order to meet this operational widening of their mandates?

I would argue that survival of central bank independence needs careful attention to the design of the mandate, including the tools provided to deliver on that mandate and the governance around the exercise of those tools.



2 Goals

The case for exclusive central bank ownership is probably stronger and clearer for the inflation goal than for the other goals. The 1980s theoretical literature on time inconsistency of government policy on inflation convincingly confirmed what centuries of practical experience had illustrated in this regard. (Even Austria’s central bank has had its run-in with hyperinflation, albeit almost a century ago).

When it comes to financial stability and wider economic performance, there is no doubt that central banks have a big part to play, but to what extent should they also be the arbiter of the loss function over this wider set of goals, and what additional policy instruments

should be assigned to central banks to strengthen their capacity in this area? These are live, disputed questions and in general they do matter.

Under special circumstances of separability, it could be possible to optimise anti-inflation policy with one set of central banking tools, while targeting the other goals with alternative tools. In the early years of the crisis, 2008–11, some euro area policymakers discussed a “separation principle” between interest rate policy and policy with regard to the conditions for the availability of funding liquidity. Interest rate policy could continue be used in a single-minded way to control inflation, whereas the financial stability stresses (involving the effective strangulation of large parts of the interbank market) could be addressed separately by moving to a fixed-rate full-allotment liquidity provision combined with relaxed collateral rules. (It is worth contemplating the two European Central Bank (ECB) interest rate increases in 2011 through the prism of this principle).

More generally, the collection of public policy tools to deal with financial stability and wider macroeconomic performance interact in a less separable way and some of these tools are clearly not an appropriate part of the remit of the central bank. Can optimization be achieved in a fully non-cooperative game between the central bank, having some of these instruments, and other agencies of the state, having other instruments? I will return to this question later, exemplifying the complexities involved in the interesting example of helicopter money. There are arguably other important policy interactions requiring coordination between the central bank and other state agencies. But this must be achieved without compromising the central bank’s full

independence in regard to the core tools needed for inflation control.

3 Tools

For all of their policy responsibilities, central banks have first turned to one of the core tools of central banking for this: liquidity provision. Quantity, price and decisions about who receives liquidity define this core tool. During the crisis, undeniably dramatic and controversial decisions have been implemented in each of these dimensions. One only has to consider the scale of balance sheet expansion, the move to zero – and then negative – policy interest rates and the lending to nonbanks, and on much relaxed terms and conditions.

The extensive public discussion in recent years about the exceptional use of these core tools insofar as they affect the macroeconomy reflects both the public awareness of the measures employed and the adaptation of an already well-developed communication strategy by central banks around macroeconomic issues.

Central banks also stepped into new territory by widening the range of counterparties used for liquidity action, as well as increasing the range of assets purchased or taken as security in such loans. The specific case-by-case nature of these interventions departs from the traditional assumption that the impact of central bank actions usually has a broad systemwide effect on market prices and market conditions, rather than being specific to some narrow set of counterparties (though not, as Taylor correctly emphasizes, without distributional consequences). As such, some of these actions have introduced a new type of controversy for central banks, including some debates and even discussions of favouritism. A sophisti-

cated example is exemplified in recent discussions¹ about the decision *not* to make a lender of last resort loan to the weak bank Lehman Brothers. Emergency lending to the Cypriot bank Laiki in 2012–3 is another controversial example.

Even more controversy is courted by central banks in some of the actions they have had to consider when deploying non-core instruments which they have accreted as an increasingly necessary part of their toolkit, especially in regard to the financial stability part of their mandate. Indeed, central banks have increasingly been called upon to accept all or some responsibility for the prudential supervision of banks, both in respect of traditional microprudential regulation and the new (or rediscovered) set of macroprudential instruments.

Relatively smooth operation of financial markets in the advanced economies for many decades pre-crisis meant that the central bank interacted with its counterparties largely without controversy. Transactions with the banking system, such as repo and reverse repo operations, followed stable rules about such matters as collateral; emergency liquidity provision was scarcely employed.

Some elements of responsibility and powers with respect to prudential supervision of banks were given to some central banks over the years, though this responsibility was often shared with other agencies having more specific mandates for the task.²

Pre-crisis microprudential regulation of banks tended to be a relatively low-pressure area for all but a minority of banks. Now it is quite different. High-profile issues in bank supervision are constantly to the fore, including those demanding more capital (thereby diluting existing stockholders); vetoing management etc. If the central bank is the arbiter of such matters, it can potentially be distracted from its main mandate goals. Highly political and reputationally threatening examples in recent years include the cases of Northern Rock, Lehman Brothers, Anglo Irish Bank, SNS-Reaal, Bankia, Banco Espírito Santo (now Novo Banco), and Laiki Bank/Bank of Cyprus.



With the awareness of how accommodating central bank policy, including (though not at all limited to) financing of government deficits, had generated high and volatile inflation in numerous governments in the 1970s, the enhanced independence of central

¹ Cf. Ball (2016) and Cline and Gagnon (2013).

² The Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC) in the United States, the Federal Financial Supervisory Authority (BaFin) in Germany and the Financial Services Authority (FSA) in the United Kingdom. Even in France, licensing of banks was not a task for the Banque de France alone.

banks from government interference meant that a divorce between central banking and government debt financing was well established.³ But the eligibility of government debt as highly rated collateral in national banking markets was not questioned. Nor was the status of government debt as being free of default risk for the purpose of defining capital adequacy.

However, in the euro area, where a single central bank operates in 19 countries, issues around the eligibility of the debt of some national governments as collateral for central bank lending have recently produced considerable controversy. Suddenly, the intrusiveness of the central bank's relationship with some governments has ratcheted up considerably



The question of weighting government debt for default risk in capital adequacy calculations has also come to the fore, and not just in the euro area.

Pre-crisis, individual firms and households too were not made very aware of the existence of the central bank. Interest rates and the terms and conditions of loans were relatively unconstrained by central banks in advanced economies. But this too has

been changing. The introduction by central banks in an increasing number of countries of macroprudential limits on loan-to-value or debt-to-income ceilings on mortgage loans has meant a highly visible change for those wishing to borrow for homeownership. Many young households will have to plan on longer savings periods before they can access mortgage finance. Unable to secure a loan which, unconstrained by macroprudential regulation, the lender would have been willing to grant, they find themselves very directly and intrusively affected by central bank regulation.

4 Governance

Effective delivery of a wider-than-inflation mandate needs good governance design. The various parts of the central bank's policy toolkit need to be managed in an effective and sufficiently integrated manner (internal governance) and there needs to be adequate interaction with the rest of the policy agencies outside of the central bank, as well as a suitable framework for accountability (external governance).

4.1 Internal governance

Starting with internal governance, here we are in shifting sands. Despite many experiments in different countries, I doubt we can say that we really have much solid evidence on what works well for all of the tasks of the central bank.

- The Bank of England's new structure, entailing a network of overlapping policy committees, was carefully thought out and deserves special attention. It certainly seems cumbersome. By having separate decision-making bodies for monetary, microprudential and macro-

³ In the 19th century, Austria's central bank signified its distance from the government by never featuring a portrait of the Emperor on its notes (Jobst and Kernbauer, 2016).

prudential policy, as well as a separate board of directors of the bank as a whole, it may be effective in ensuring sufficient decision-making bandwidth to prevent important issues from falling through the cracks of a crowded agenda. But it remains to be seen whether as a whole it can be relied upon to generate overall coherence. Such an elaborate articulation of structure is probably not needed in countries with smaller and less complex financial sectors.

- The U.S. Federal Reserve (Fed) did not accumulate as many new responsibilities as did the Bank of England: its new governance issues are likely more in the area of external relations with other regulatory bodies in the U.S.A.
- The ECB has set up the Single Supervisory Board as a largely autonomous entity at most levels, with the most important exception being the fact that all decisions are finally taken by the ECB Governing Council. This model was driven by the constraints of the EU Treaty, and might not otherwise have been organizationally optimal.

Optimal internal governance arrangements may vary for different aspects of the mandate. Some issues need balance and the combined forces of different opinions. Some require clear avoidance of prejudice and bias. Some require great decisiveness. Thus, at the risk of oversimplifying, it may be that the company board of directors provides a reasonable template for a monetary policy committee and for macroprudential policy; microprudential decisions may be more suited to a judge-and-jury type of set-up; while crisis

management requires the sort of autocratic decision maker one finds in hospitals (consultant or attending physician model). This is an area that deserves further study.

4.2 External governance: (i) vis-à-vis society

With the increased level of intrusiveness, selectivity and the potential for the appearance of discrimination involved in the wider set of tools being actively used, a central bank risks losing the additional mandates, or even having its independence threatened, if it does not work hard to maintain the confidence of the general public, and of their parliamentary representatives. Visibility of its actions and explanatory communication are the main ways of doing this.

These days it would thus be unwise to rely on former Bank of England Governor Montagu Norman's motto "the dogs bark, the caravan moves on" when facing criticism. Explanations of actions and inaction must be comprehensive and comprehensible. This may not always be easy in a crisis, when a misstep in communication can exacerbate panic; and it may not always seem permissible, given the confidential conditions under which supervisory information is gathered.⁴

Furthermore, success is hard to measure in financial stability, whereas failure is very evident. This makes the central bank vulnerable to criticism of over-regulation in normal times, and of complacency when the crisis emerges.

On the whole I feel that, though useful as background, the lengthy and detailed financial stability reports that have come to be an expected output of the central bank in the past fifteen

⁴ *On the other hand, market transparency does require things to be communicated that the central bank in its financial stability role may find inconvenient: this is something that becomes more evident when the central bank is also the market conduct supervisor, as is the case in a few countries, including my own.*

years do not, on their own, deliver the goods in terms of ensuring that society knows and trusts what the central bank is doing to protect financial stability.

4.3 External governance: (ii) relations with government

Government is another key interlocutor of the central bank. For thirty years, independence of the central bank from government, especially in the matter of direct provision of liquidity, has defined the terms of this engagement. And indeed, even though fiscal excess and inflationary finance are not currently the highest-ranking policy problems, we must be careful to ensure that avoidance of fiscal dominance is entirely non-negotiable.

At the same time, given how active the non-inflation parts of the central bank's mandate are now, and given the wider range of instruments and responsibilities that have been conferred upon central banks, it is important to articulate and negotiate the relationship between the central bank and government more fully in order to ensure that socially optimal combinations of policy are attained.

It is probably necessary to have multiple channels of communication and coordination between central bank and government relating to different aspects; though in a small country (in my experience) a standing committee of a few very senior officials can probably act as an effective clearing house of the major issues that arise, whether they are in the area of macroprudential policy, quasi-fiscal costs of central bank actions or crisis management.

For macroprudential policy, the major risk is of policy inertia. Here the central bank, with less immediate vulnerability to populist criticism, should probably be in the driving seat. But it needs to discuss complementary policy

actions outside of its toolkit with other arms of the state to ensure full effectiveness of the macroprudential tools.

Many central bank policies may have an impact on the profitability of the central bank and as such an influence on the dividend going to the national budget. This can include monetary policy actions (e.g. interest rate paid on bank reserves), emergency liquidity assistance (e.g. risk of default), exchange rate policy (e.g. capital gains on forex reserves). Each of these has been mentioned as crucial to important decisions taken by central banks during the crisis.

- For example, Tucker (2014) notes the risk of losses to the Bank of England if it were to support Northern Rock: he argues for some “fiscal carve-out”—seemingly in effect an amount which the government would allow the central bank to lose in such operations, thereby providing legitimacy to actions that might impose costs on tax payers.
- The potential fiscal cost of a Lehman bailout also loomed large in the Fed's consideration of that matter in September 2008.
- Another prominent case is that of the Swiss central bank, where currency movements had a sizable and controversial impact on the distributable profit of the central bank. The fact that the distribution would in the Swiss case go to cantonal governments, whose autonomous capacity for revenue raising is limited, likely increased the sensitivity of this matter.
- Likewise in the euro area, some of these profit and loss (or more generally financial risk) issues are heightened by the question that arises as to which of these financial risks are to be shared across the euro area, and which absorbed by

the country where they arise. Even in the latter case, the absorption might be imperfect, for example in eventualities where the national sovereign's debt has become unsustainable.

Finally, it may be worth mentioning the case of helicopter money. This widely misunderstood type of policy entails ensuring that liquidity is put in the hands of cash-constrained agents. The design and implementation of any such policy must of course have the blessing and active support of the government. But how can this be achieved while retaining central bank independence? Is it possible to coordinate a fiscal policy expansion of this type (if and when needed), with a monetary policy stance that ensures no spillover into higher interest rates, without dismantling the existing solid protections against fiscal dominance? I think it would be possible, but not straightforward. In the euro area it might be easier to ensure that fiscal dominance is avoided, than to obtain the agreement of the nineteen governments to a need for joint fiscal action.

5 Conclusion

The major policy initiatives by the ECB (and the Fed) are by no means limited to their role in controlling inflation. Indeed, despite the stridently expressed fears of some critics, there is no evidence whatsoever of the huge expansion in central bank balance sheets and in base money even beginning to present an inflationary threat. Central banks may be more criticized for having failed to prevent substantial under-shooting of their inflation targets.

Instead, the major action of central banks has been in different dimensions: they have lent money in unusual circumstances and on unusual terms.

They have taken credit risks. They have distorted markets in unfamiliar ways.

Did they exceed their mandates or the expectations that the general public or the political system would have had of them in this regard?

On the whole, I think not. But I do believe that mandates of central banks and the governance arrangements surrounding central banks – and indeed around their relationships with government – may need to be rethought and amplified.



This could be especially true of the ECB, which has been given greater autonomy than others. However, amending the formal mandate of the ECB is no doubt greatly complicated by the requirement that formal amendment would typically require a treaty change. Still, ways were found to alter the practical implementation of the existing mandate, not only with the establishment of the Single Supervisory Mechanism, SSM.

By moving into more complex and controversial areas, the political consensus (that governments should not be allowed to debauch paper money through their short-termist political use of central banks) which generated the demand for independence could be eroded.

In considering whether mandates should be broadened in practice, I have suggested that three criteria need to be examined. First, is the central bank sufficiently well equipped with the legal and technical tools to do the job effectively? Second, is it best placed to either internalize potential conflicts or trade-offs that would result from handing it this mandate, or at least does the expanded mandate allow for a sufficient handling of such trade-offs (including by other agencies)? Third, are the governance arrangements sufficient to maintain the political underpinning needed for the new arrangement to be durable and effective?

Central banks must not shirk the wider mandates that have been in play since the crisis. No other entity has any hope of generating the convening power, broad and long-term vision, technical expertise and agency to achieve these goals.

Ensuring legitimacy (and thereby retention of the mandate) will require central banks to be better at communicating and at operating in a political environment. There needs to be an active relationship with government, even though this will inevitably create tensions that have to be managed.

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Session 2

Monetary independence in a financially liberalized world?

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Globalization in the periphery

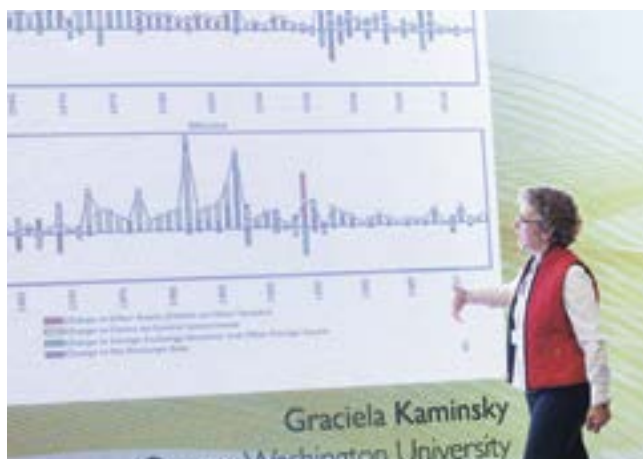
Monetary policy: What is gained, what is lost¹

1 Introduction

There is a long-standing debate on the benefits and drawbacks of financial globalization. Among the benefits, academics and practitioners emphasize that with globalization capital flows to its most attractive destination, increasing productivity and growth. Yet, since financial globalization spread around the world in the last three decades, many have brought to the attention that capital flows tend to be excessive and end up in crises. They also highlight that capital flows are mostly triggered by cyclical monetary policies in the financial center that lead to macroeconomic instability and procyclical monetary policy in the periphery, as well as high inflation in episodes of capital inflows.²

Most of the research on macroeconomic instability just focuses on the episodes of capital inflows.³ However, to examine the trade-offs of financial globalization we also need to look at the episodes of financial repression. To capture both episodes of financial repression and globalization, I look at a long sample spanning almost 60 years and study a group of selected countries in Latin America and Asia that during globalization have experienced large capital inflows. Most of the research on macroeconomic instability in episodes of financial globalization concentrates on the fluctuations of foreign exchange reserves. I will continue with this tradition, but with a twist. Instead of just focusing on foreign exchange reserves, I examine the evolution of the balance sheet of central banks and its composition, as well as its relationship with in-

flation during both episodes of financial repression and financial globalization. Using this data, I also examine whether central bank credibility is affected by financial globalization.



In section 2, I present evidence that indicates that the drivers of monetary growth and the evolution of inflation and credibility change across episodes of financial repression and financial globalization. The question is whether there is a causal relationship from globalization to monetary policy and credibility. While further research on a larger number of countries is needed, the evidence in section 3 suggests that globalization in the periphery unleashes forces towards better institutions, central bank independence, less monetization of the fiscal deficit, countercyclical monetary policy, and central bank credibility. Section 4 concludes.

2 Money growth fluctuations, inflation and credibility

To examine whether there is a time-varying pattern of inflation, money growth and credibility, I separate episodes of

¹ I would like to thank Rafael Lopez-Monti for excellent research assistance.

² See, for example, Reinhart and Reinhart (2008).

³ See, for example, Calvo, Leiderman, and Reinhart (1996).

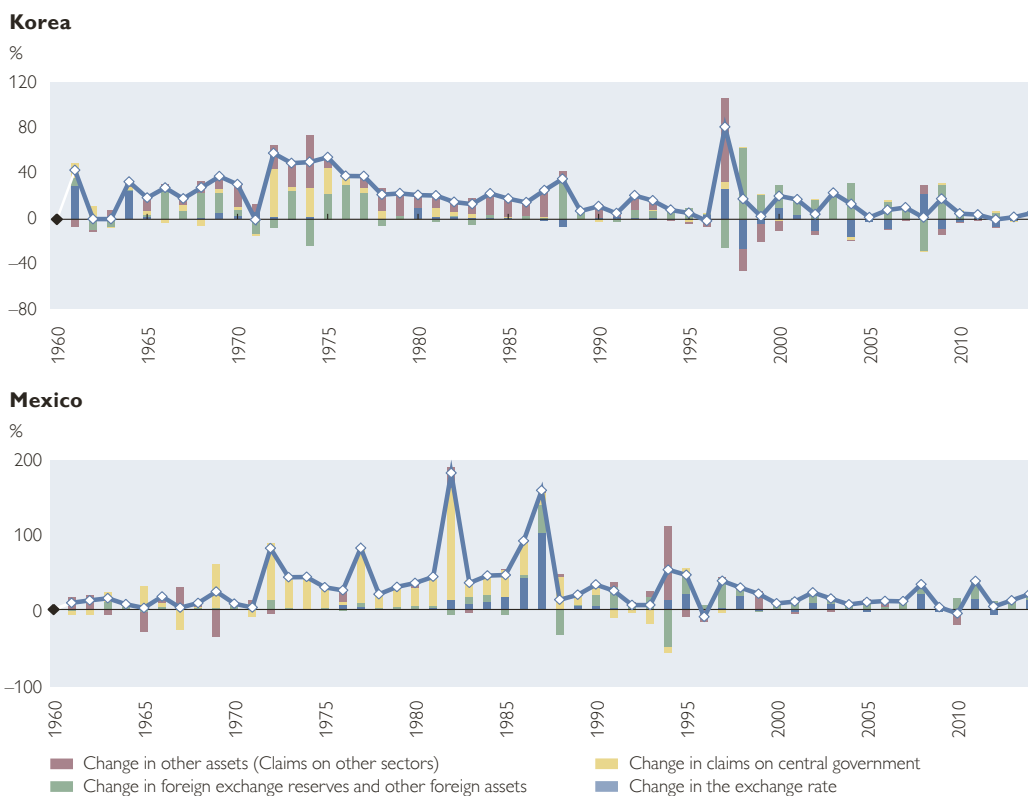
financial repression and financial liberalization (globalization) using a variety of *de jure* measures of deregulation. I use the database I collected jointly with Sergio Schmukler.⁴ This database creates a composite index of financial liberalization that captures the deregulation of the domestic financial sector, the capital account, and the stock market.⁵ I complement this database with the Chinn and Ito (2008) measure of financial integration that is based on information reported in the IMF's *Annual*

Report on Exchange Arrangements and Exchange Restrictions.

To examine the evolution of the composition of assets of central banks, I use data from the IMF's *International Financial Statistics* as well as data reported by the central banks of a group of nine emerging economies that have been recipients of large capital inflows. Since the sample spans almost 60 years, some of the original developing countries are now members of the selected group of OECD countries. The sample

Chart 1

Growth rate of central bank assets and its composition



Source: International Financial Statistics (IMF), World Development Indicators (World Bank) and author's calculations.

⁴ See Kaminsky and Schmukler (2008).

⁵ The liberalization of the capital account over the sample is evaluated by following the regulations on offshore borrowing by domestic financial institutions and non-financial corporations, multiple exchange rate markets, and controls on capital outflows. The liberalization of the domestic financial system is assessed by analyzing regulations on deposit and lending interest rates, allocation of credit, and foreign currency deposits. Since monetary authorities have frequently used changes in reserve requirements to control bank credit, the index of financial liberalization is also based on the evolution of reserve requirements as additional information to evaluate the degree of restrictions imposed on the banking sector. The liberalization of stock markets is assessed following the evolution of regulations on the acquisition of shares.

focuses on two regions, Latin America and East Asia. The countries in Latin America are Argentina, Chile, Colombia, Mexico, and Peru. The countries in East Asia are Korea, Malaysia, Philippines, and Thailand.

I decompose the gross assets of central banks into domestic and foreign currency assets. I also decompose domestic assets into government debt holdings and holdings of assets of banks and other non-financial institutions. The share of foreign assets in the balance sheet of central banks changes with fluctuations in the exchange rate. Thus, I also estimate the movements in central banks' gross assets due to exchange rate fluctuations.⁶ Chart 1 shows this decomposition for two of the countries in my sample: Korea and Mexico. This figure shows the annual growth rate of gross assets of the central bank, the blue line, as well as its composition, the stacked bars. Both

countries show higher growth rates in the earlier decades (the episode of financial repression). During these decades, the growth rate of assets is dominated by increases in the stock of domestic assets held by the central bank. For Korea, the most important component is loans to the financial and non-financial private sector, while for Mexico lending to the government predominates. Importantly, during the last decades, fluctuations in the growth rate the central banks' assets are dominated by movements in foreign assets. These are mostly the decades with financial globalization. The decomposition in chart 1 also shows the effects of exchange rate fluctuations on total assets. Since valuation effects do not influence the money base and only affect the capital of the central bank, I now examine the composition of the changes in assets of the Central Bank excluding the effects of exchange rate changes.

Table 1

The balance sheet of central banks and inflation

Country	Globalization				Financial repression			
	Assets growth	Foreign exchange reserves growth	Growth in lending to government, banks and non-financial institutions	Inflation	Assets growth	Foreign exchange reserves growth	Growth in lending to government, banks and non-financial institutions	Inflation
	%							
Asia	11.9	10.1	1.8	4.0	16.3	8.8	7.5	7.8
Korea	12.6	10.8	1.8	3.5	22.0	5.4	16.6	11.3
Malaysia	10.9	8.0	2.9	3.3	15.3	15.1	0.2	3.0
Philippines	10.3	10.1	0.2	5.3	16.5	7.2	9.3	11.9
Thailand	13.7	11.2	2.5	4.0	11.5	7.6	3.9	5.0
Latin America	16.0	8.0	8.0	21.7	92.6	5.5	87.1	155.1
Argentina	26.3	4.7	21.6	58.1	182.9	4.3	178.6	238.2
Chile	5.4	5.3	0.1	9.1	121.2	4.1	117.1	83.9
Colombia	9.9	8.8	1.1	11.2	21.0	6.4	14.6	18.4
Mexico	19.6	8.0	11.6	13.6	30.1	2.9	27.2	31.4
Peru	18.6	12.9	5.7	16.7	107.9	9.9	98.0	403.5
All countries	14.1	8.9	5.3	13.8	58.7	7.0	51.7	89.6

Source: International Financial Statistics (IMF), World Development Indicators (World Bank) and author's calculations.

Note: Growth rates of assets do not include valuation changes. All growth rates are changes measured as a proportion of total assets.

⁶ Central banks' foreign assets are valued at the exchange rate of the day on which gross assets are reported.

Table 1 shows this decomposition during episodes of financial repression and financial globalization for the selected countries in Asia and Latin America. The first four columns show the decomposition during financial globalization. The average growth rate of central banks' assets during this episode is 14% , of which 63% is explained by changes in foreign reserves (8.9% percent average annual growth rate), with the remainder being explained by loans to governments as well as domestic private financial and non-financial institutions. On average, the contribution of foreign reserves to the growth of assets is larger for our sample of East Asian countries. The higher contribution of domestic assets to the growth of the balance sheet of the Central Banks of Argentina and Mexico reflects the monetization of the deficits in the early episodes of liberalization in the 1970s and beginning of the 1980s, leading to the debt crisis in 1982 and the reversal of deregulation during the so-called lost decade of the 1980s.



The episode of financial repression is quite different. Overall, the rate of expansion of central banks' assets is far larger in Latin American countries, with overall rates of expansion almost six times higher than those during globalization. At the core of this expansion

is the monetization of fiscal deficits. Naturally, the dramatic monetary easing is accompanied by far higher levels of inflation and even hyperinflation in Argentina and Peru. With the exception of Thailand, monetary expansion is also higher in the Asian countries under financial repression. In Korea and the Philippines most of the monetary expansion is driven by financing the domestic sector: lending to the banking and non-financial sector in Korea and also financing the fiscal deficit in the Philippines. Only in these two countries, inflation is far larger during financial repression than during financial globalization. Inflation in Malaysia and Thailand is somewhat similar to that during globalization, with the growth of money accompanying the high growth rate of those countries in the earlier decades.

While table 1 indicates that on average inflation falls during financial globalization, it is still not clear whether this is just the product of the lower growth rate of the balance sheet of the central bank or whether lower inflation also reflects gains in the central bank's credibility. Unfortunately, there are no long-term series on inflation expectations for the countries in the sample. Thus, to assess whether there are gains in credibility during the episode of financial globalization, I take an indirect approach. I follow Sargent and Surico (2011) who examine the time-varying correlations between money growth and inflation for the United States in the sample 1900–2005. The question they want to examine is whether the quantity theory of money holds, that is whether money growth is reflected one-to-one into inflation. As in Lucas (1980), they use low-frequency correlations, since the quantity theory of money is only expected to hold in the long run. Naturally, for it to hold, it

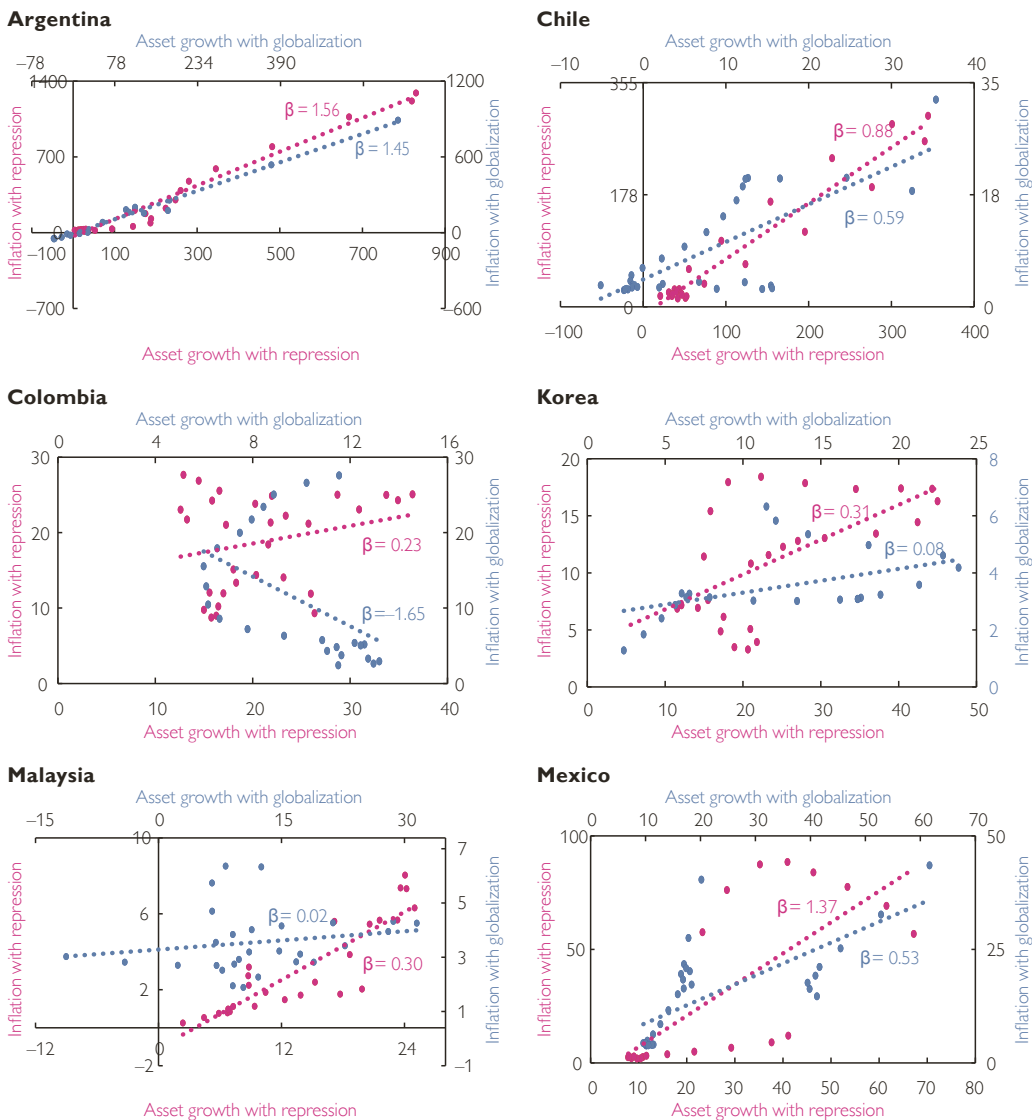
must be expected the maintenance of the monetary policy in place. They find that the regression coefficient of inflation on money growth is only close to one in the period 1955–1975, but is substantially larger than one during 1900–1928, smaller than one during 1929–1954 and even negative during 1984–2005.

They further ask what triggers these changes in slopes. To answer this question, they estimate a traditional

DSGE model with various exogenous shocks and monetary policy rules, and examine whether changes in monetary policy parameters can explain the changing slope. These simulations indicate that a credible future move to an anti-inflationary stance can bring these correlations close to zero or even negative. But if the monetary rule implies persistent increases in money growth, the correlation increases to one or even larger than one.

Chart 2

Money growth and inflation: breakdowns or continuity?

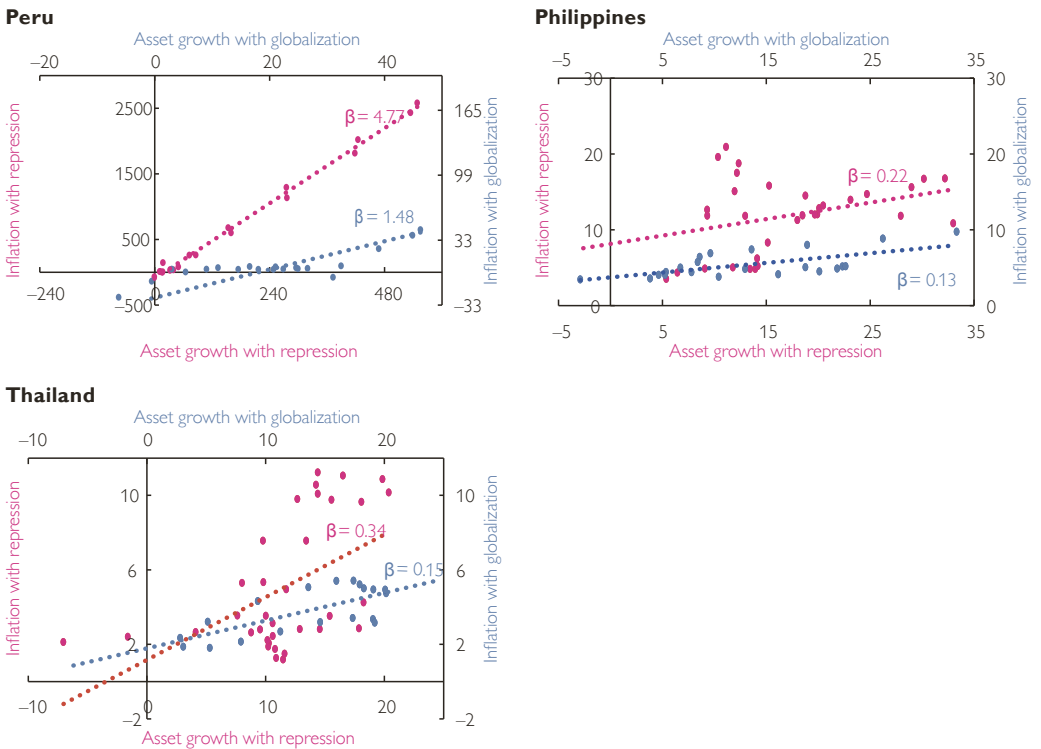


Source: International Financial Statistics (IMF), World Development Indicators (World Bank) and author's calculations.

Note: This chart shows scatter plots of filtered series of inflation and asset growth rates as well as the trending line of the regression of inflation on asset growth rates. β shows the coefficient of the regression.

Episodes of financial repression are shown in red and episodes of financial globalization are shown in blue.

Money growth and inflation: breakdowns or continuity?



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 Note: This chart shows scatter plots of filtered series of inflation and asset growth rates as well as the trending line of the regression of inflation on asset growth rates. β shows the coefficient of the regression.
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As in Sargent and Surico (2011), I estimate the regressions of inflation on money growth at low frequencies.⁷ However, I do not look at the broad monetary aggregates as in those articles. Instead, I estimate the links between inflation and the growth rate of the assets of the central bank. The results are shown in chart 2. This chart shows the scatter plots of filtered inflation and filtered growth of assets of the central bank for episodes of financial repression and episodes of financial globalization. The red circles show the combination of annual assets growth rate and inflation in episodes of financial repression, while the blue circles

show this relationship for episodes of financial globalization. The lines show the regression of inflation on growth rates of assets of the central banks. The red lines show the regression line for the episode of financial repression, while the blue lines show the regression for the episode of financial globalization. β shows the coefficient of this regression. Again, I use red to identify the coefficient during financial repression and blue to identify the coefficient during globalization. Almost all coefficients during episodes of financial globalization are significantly smaller than those during financial repression. In some cases, such as Colombia, the re-

⁷ To estimate the low frequency correlations, I apply the Hodrick-Prescott filter to both series.

gression coefficient is negative. These estimations suggest that in the midst of globalization, monetary authorities responded more strongly to inflationary pressures, with credibility increasing. Only the slope coefficients for Argentina under repression and globalization are quite similar. These slopes seem to reflect the frequent reversals in financial liberalization: Financial repression is eliminated in 1977, reintroduced in 1982 following the debt crisis in 1981, eliminated again in the early 1990s, and finally reintroduced in the 2000s following the 2001 crisis. In these reversals, monetary policy reverts to a regime of fiscal dominance that even seems to lead to a loss of credibility in the midst of financial deregulation as investors anticipate the return to financial repression and monetization of the deficit.

The question is whether in fact financial globalization triggers credibility and stabilizing monetary policy or whether reforms implemented prior to the deregulation of financial markets are at the core of low inflation policies and credibility. I examine these links in the next section.

3 The sequencing of reforms and financial globalization⁸

The links between financial liberalization and crises in emerging markets have prompted many to question the benefits of financial globalization and to recommend the imposition of capital controls. Overall, there is consensus that at the core of the link between crises and liberalization is the lack of good public and corporate governance. Thus, many conclude that governments should sequence reforms, first improving government institutions and better

regulating domestic financial institutions and only then deregulating the financial industry and opening the capital account, otherwise a crisis will follow (see, for example, Stiglitz, 2000).



Still, as we argue in Kaminsky and Schmukler (2008), the argument that liberalization should be preceded by institutional reforms may be irrelevant if the timing is such that reforms never predate liberalization, with institutional improvements happening mostly as a result of financial deregulation. In fact, there is an extensive literature on the obstacles for governments to promote reforms in countries with repressed financial sectors and on how financial globalization triggers reforms. For example, Rajan and Zingales (2003) argue that well-established firms (and therefore public officials) may in general oppose reforms that promote financial development because it breeds competition. These firms can even be hurt by financial development and liberalization, as they imply better disclosure rules and enforcement (reducing the importance of these firms' collateral and reputation) and permit newcomers to enter and compete away profits. However, opposition to re-

⁸ The discussion in this section is based on Kaminsky and Schmukler (2008).

forms may be weaker in more open economies with abundant trade and cross-border flows. In this case, free access to international capital markets allows the largest and best-known domestic firms to tap foreign markets for funds, with their support for the policies that favor financial development and liberalization becoming stronger. Also, Stulz (2005) shows that financial globalization can lead to a reduction in the importance of the twin agency problems, that is, the incentive of governments and corporate insiders to expropriate outside investors. For example, open borders can “shackle the government’s grabbing hand” as they give resident investors an exit. Financial globalization also creates incentives for firms to improve their governance: since these reforms are costly, firms will be more likely to do so when these costs are offset by less costly external finance.

These two opposing views suggest different interpretations on the changing behavior of monetary aggregates, inflation, and credibility. If governments introduce reforms prior to deregulating the financial sector and the capital account, the changes in monetary policy, credibility, and inflation could be the result of the overall im-

provement in institutions and not the effect of financial globalization. If changes in institutions do not predate financial globalization and, as suggested by Rajan and Zingales (2003), and Stulz (2005), are, in fact, promoted by the end of financial repression, then the changes in monetary policy, inflation, and credibility are fueled by financial globalization. To examine these alternative hypotheses, in my work with Sergio Schmukler (Kaminsky and Schmukler, 2008), we compare the timing of financial liberalization and institutional reforms. To do so, we collect data on the quality of institutions as well as on the laws governing the proper functioning of financial systems. In that article, the information on the quality of institutions is captured with the index of law and order published in the International Country Risk Guide (ICRG). This index assesses the strength and impartiality of the legal system as well as the popular observance of the law. Also, to better assess the functioning of the financial system, we use information on the existence and enforcement of insider trading laws constructed by Bhattacharya and Daouk (2002). Table 2 reproduces the results in that paper for fourteen emerging markets. It shows the proba-

Table 2

Financial liberalization and institutional reforms

Type of financial liberalization	Probabilities of liberalization conditional on		
	Insider trading laws existence	Insider trading laws enforcement	Improvement in law and order
Partial liberalization	62***	11	18
Full liberalization	77***	44**	64***
Hypothesis test (P-value)	0.17	0.08	0.02
Partial liberalization = Full liberalization			

Source: Reproduced from Kaminsky and Schmukler (2008).

Note: This table shows the probability of financial liberalization conditional on the existence and enforcement of insider trading laws and on permanent improvement in law and order. The sample includes 14 countries in Asia and Latin America: Hong Kong, Indonesia, Korea, Malaysia, Philippines, Taiwan, Thailand, Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. *, **, *** mean significance at 10%, 5%, and 1%, respectively.

bilities that financial liberalization occurs conditional on reforms having already been implemented. In particular, in that paper, we look at whether reforms to institutions occur prior to the *partial or full* liberalization of the financial sector. If governments improve the quality of institutions prior to start deregulating the financial sector, one would expect the probability of *partial* liberalization conditional on improvements in institutions to be close to one. In contrast, if liberalization triggers reforms, those probabilities would be close to zero. In this case, we would also expect the probabilities of *full* liberalization conditional on reforms to institutions to be close to one since *full* liberalization on average occurs after five and a half years following the start of financial deregulation.

Table 2 indicates that reforms to institutions occur mostly after financial liberalization starts. Institutions that protect property rights, as captured by the index of law and order, only improve in 18% of the cases prior to the partial liberalization of financial markets. Similarly, institutions that facilitate contracting between citizens, as captured by insider trading prosecution laws, seem to improve also after finan-

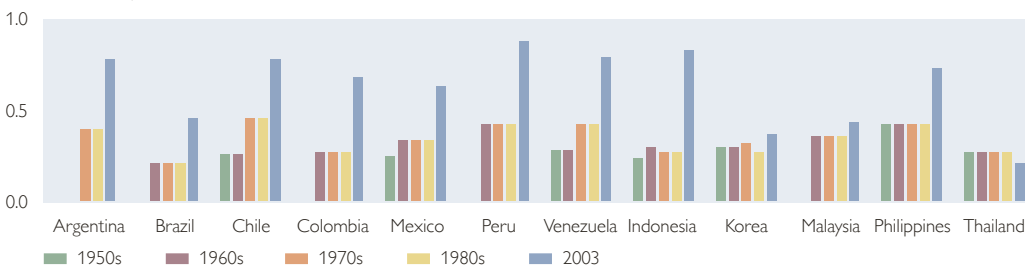
cial liberalization starts. For example, while in 62% of the cases laws prosecuting insider trading exist prior to the start of financial liberalization, insider trading starts to be prosecuted in only 11% of the cases. Interestingly, both the institutions that protect property rights and those that regulate contracting improve substantially following the partial liberalization of financial markets. By the time the financial sector becomes fully liberalized (on average about five and a half years from the beginning of the deregulation episode), law and order have improved in 64% of the cases and insider trading prosecution is enforced in 44% of the cases. This evidence casts doubts on the notion that governments in emerging markets tend to implement institutional reforms before they start deregulating the financial sector. On the contrary, the evidence suggests that liberalization fuels institutional reforms, as argued by Stulz (2005).

To complement this result, I also examine the timing of improvements in central bank independence. Chart 3 reports the evolution of central bank independence for a similar sample of countries used to study the sequencing of reforms and deregulation in table 2.⁹

Chart 3

The evolution of central bank independence

Central bank independence index



Source: This chart shows the index of central bank independence from Cuckierman Webb and Neyapti (1992) updated by Crowe and Meade (2007).

⁹ The only missing central banks' independence indices in chart 2 are those for Hong Kong and Taiwan. The sources I use do not report the evolution of those indices.

The indices of central bank independence are from Cukierman, Webb, and Neyapti (1992) and Crowe and Meade (2007). The so-called CWN index of central bank independence reflects legal independence, as captured by measures of independence of the governor of the central bank, its independence in policy formulation, its mandate, and the stringency of limits on its



lending to the government. The estimations for the 1950s, 1960s, 1970s, and 1980s are from Cukierman, Webb, and Neyapti (1992). Crowe and Meade (2007) extended this index for 2003. Unfortunately, there is no information for the 1990s. Still, this figure suggests that independence increased significantly in the 1990s for most of the countries in the sample after they deregulated financial markets and reduced capital controls.

4 Reflections

Globalization has been blamed for the loss of monetary policy independence and macroeconomic instability in the emerging periphery. It has also been argued that, with globalization, cycles of monetary easing and contracting in the financial centers trigger procyclical monetary policies in the periphery, thus exacerbating the underlying business cycle (the so-called “when it rains, it pours” phenomenon). Yet, the evidence presented above suggests that globalization has brought better institutions and policies in developing economies. Also, monetary policies in the periphery are now less tied to financing fiscal deficits. High and chronic inflation has disappeared in many countries and central banks’ credibility has improved. While during episodes of globalization, countries in the periphery are still affected by cyclical monetary policy changes in the financial center, many emerging market countries are not intervening in the foreign exchange market in a procyclical fashion any more. As shown in Vegh and Vuletin (2012), with better institutions, central banks have been able to overcome the fear of floating and are using policy interest rates for countercyclical purposes.

Still, after about 30 years of financial globalization, the wheels are turning again, with many supporting the re-introduction of capital controls. In a world that is moving more and more towards financial repression, we should not forget the lessons of emerging markets.

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Remarks on central banking in times of change

It is my great honor and privilege to be here with you tonight on this great occasion of the celebration of the 200th anniversary of the Austrian central bank. I am confident that when Emperor Francis I, established in June 1816, the *privilegierte oesterreichische National-Bank*, he could not have imagined the long journey and great achievements that the central bank would have during the subsequent 200 years. Indeed it has been an amazing journey. A fascinating and highly informative narrative of the evolution of the *Oesterreichische Nationalbank (OeNB)* can be found in the beautiful volume *Memories of a Central Bank. Oesterreichische Nationalbank. Since 1816*.

The original currency, the florin, went through different phases starting with the *Vienna Standard*, going through the *Convention Standard* and ultimately becoming the *Austrian Standard*. It then became the *crown* and subsequently became the Austrian schilling then came the difficult times of the second world war, when the crown was replaced by the German Reichsmark, and once the dark period was over the schilling returned and stayed in place until the introduction of the euro. Over the decades, the Austrian central bank was led by a sequence of able Presidents, and from 1998, when the Austrian central bank became an integral part of the Eurosystem; the OeNB has been led by its Governors.

Personally, over the past three decades I have been privileged to cooperate and interact with the late President Maria Schaumayer and with Governor Klaus Liebscher and with Governor Ewald Nowotny. I am especially indebted to Governor Nowotny for his kind invitation to address you in this celebratory conference. I recall nostalgically the 175th birthday of the OeNB, for which I

was also privileged to participate in and give the keynote speech. I must confess that when I received the invitation from Governor Nowotny 25 years later, I was wondering whether I was invited because my previous speech was so good to warrant yet another invitation or whether it was so bad, but through Governor Nowotny's generosity I was given a second chance. Be it as it may, I am pleased to discuss with you the subject of the conference *Central Banking in Times of Change*.



Over the past decades central banking theory and practice evolved. The economic system, the nature of markets, and the structure of economic policies, have resulted in fundamental changes in central bank structures and policies. The mandate of central banks has changed, the policy instruments have evolved the degree of accountability and transparency has changed, and eventually we arrived to the current state of affairs in which the central bank has become “the only game in town”. While this “distinction” is somewhat flattering, it is not desirable and is not sustainable.

A superficial observation of central bank policies today in comparison with policies a decade or two ago, may yield

the conclusion that at the present we are in a fundamentally different universe than we were in the past. Based on this superficial observation one may reach the conclusion that the “new world” requires a fundamentally new approach to central banking, that old concepts are obsolete and that we can throw away the old text books and make place for the new ones. I strongly believe that this would be the wrong conclusion. Even though the economic system has evolved, the basic premises and principles of central banking, which have been established on the basis of many decades of experience, remain robust.



Even though economic circumstances and legal frameworks differ across countries and over time, the general principals of central banking remain valid and intact. They include a specification of the mandate of the central bank, typically a focus on price stability and financial stability, a medium term perspective, independence from short-term political pressures, autonomy in executing the mandate, responsibility for the smooth operation of the payments system, and accountability. Modern central banking requires that the authority of the central bank is specified and protected by central bank law. These characteristics have evolved

through time and, by now, they have become universal. Specifically, the recognition that countries with strong central banks exhibit a better economic performance than those with weak central banks, have resulted in a convergence and a consensus about the role of central bank in a modern society.

The development of capital markets and the growing integration among such markets have introduced new characteristics to central banking. They resulted in an increased interdependence among economies, thereby increasing attention to international policy coordination and cooperation. In contrast with the markets for goods, capital markets adjust very quickly and reflect not only *current* policy actions, but also *expected* policy actions. As a result, the role of reputation, consistency, and credibility have become extremely important. The role of banks and the financial sector is enhanced, and thereby, bank supervision and regulation become a critical factor which governs the stability of the economic system. The Asian economic crisis and the Russian default during 1997/1998, served as a wake-up call and illustrated vividly the importance of capital markets and the critical role that financial stability (and instability) plays.

These lessons from the experience of the late 1990s, however, have not been fully learned. Many economies (especially the industrial economies) have neglected to apply appropriate risk management to the macroeconomic and financial conduct. An exceedingly rapid rise in debt and leverage and a mispricing of risk have increased the vulnerability of the economic system and have ultimately resulted in the financial crisis of 2007/2008. The results of this crisis which erupted as a “perfect storm” are still with us. They have illustrated the failure of banking super-

vision, the lack of enforcement of the regulatory framework, the deficiencies of the regulatory system, the vulnerability that arises from excess leverage, the distortions that arise from lack of flexibility of the economic system and the like.

In order to avoid a complete meltdown, budget deficits in most countries have increased dramatically (fueling further the excessive levels of debt) and interest rates all over the world have been lowered to unprecedented low levels. Thereby, *conventional* monetary policies reached their limit. Since the recovery has not yet been in sight, central banks needed to resort to *unconventional* measures. Central bank balance sheets expanded at a very rapid rate and the composition of assets in the central bank's budget sheet have also changed dramatically. Instead of holding short-term government treasury bills, most of the central banks have accumulated a wide range of lower-quality and less liquid securities such as mortgage base securities and the like. Clearly, unconventional challenges needed to be met by unconventional measures. However, I believe it is fair to say that nobody expected the period during which central banks have had to resort to unconventional measures, to be so long. This has created the risk that what was initially believed to be a *detour* might become the *new paradigm*.

There is a complete consensus that the initial response of monetary policies has been both essential and successful. Quantitative easing (QE) was clearly appropriate and effective. With the passage of time however, when the first round of Quantitative easing (QE1) did not bring about the full recovery, especially due to the fact that a large share of the burden of policy adjustment fell on the shoulders of the central banks, another round of QE was ad-

opted – QE2. Monetary policy became *overburdened* and when the desired recovery did not yet fully materialize, the next round of expansion took place: QE3. In retrospect, in the United States each round was productive, but its effectiveness diminished with each successive round. Across the Atlantic, in Europe, the European Central Bank (ECB) also engaged in its version of QE. The challenges in Europe were more severe, since there are many diverse governments, diverse economic conditions, labor markets that are less flexible, and banking union that is still not in place. A similar challenge characterized the situation across the Pacific in Japan. The economic strategy in Japan (Abenomics), has been based on the “three arrows” – monetary policy, fiscal policy, and structural policy – but all the burden fell on the shoulders of the Bank of Japan; only one of the three arrows was operational. In most of the industrial countries of the world, monetary policy has become overburdened and have become the “only game in town”.



Everyone recognized that it would be desirable to restore “normalization” and to bring about the conditions that would enable higher central bank interest rates. Much of the debate however, has been whether the economies are

strong enough to warrant the start of normalization. Since the macroeconomic situation differs significantly between the U.S., Europe and Japan, it is clear that normalization should not be initiated simultaneously. In this regard, the United States is best positioned to start the journey of normalization. Economic growth clearly improved, unemployment has declined dramatically, the duration of unemployment has also declined and inflation (net of energy prices) is also on the rise. An excessive focus on the cost of normalization increases the risk that such normalization will be initiated too late.

In order to balance the discussion, it is important to recognize that maintaining an exceedingly low interest rate and delaying the process of normalization entails economic cost. In what follows, I list some elements of such cost:

1. The low-interest rates induce investors to seek alternative ways to generate returns. By chasing after yield, investors end up assuming higher risk, which might be mispriced.
2. The low-interest rates bring about an inflation of stock prices and may generate a financial bubble.
3. Corporations divert their efforts towards stock buy-backs instead of allocating their resources to investment in plant and equipment.
4. The inflated financial markets create a disconnect between the real and the financial sectors of the economy; thereby eroding the informational value of market data.
5. The low-interest rates encourage excessive leverage and thereby increase the vulnerability of the financial system.
6. The low-interest rates and the flat yield curve result in negative consequences for the financial-services industry. This includes: banks, insurance companies, and pension systems.
7. The transmission of the effects of monetary policy through the economy operates through the financial system; a weakened financial system reduces thereby, the effectiveness of monetary policy.
8. The low-interest rates provide an artificial stimulus to interest-sensitive sectors, such as housing. Since this sector is typically a low-productivity sector, it results in an overall reduction in the productivity of the economy.
9. The excessive reliance on monetary policy enables governments to postpone the necessary fiscal and structural measures. The postponement of these measures reduces the flexibility of the economy, and thereby reduces productivity and growth.

This partial list of the negative consequences of excessively low rates of interest, suggest that a delayed normalization is costly and that one should always balance these costs against the cost of normalization. Obviously, the central banks are fully aware of these considerations, but on balance it seems that the public debate of these issues puts greater weight on the cost of normalization than on the cost of delayed normalization. If such a bias exists, it is likely that when normalization does take place, it will be implemented too late.

My concern with the possibility that normalization might be excessively delayed is enhanced by the fact that all the major central banks put extraordinary emphasize on achieving their inflation target of 2%. This is true of the Federal Reserve, the Bank of England, the European Central Bank, the Bank of Japan and others. There are many reasons (many of them not under the control of the central bank) why, in spite of the extraordinary efforts, the rates of inflation in the industrial world have been very low and below the 2%

target. If interest rates are to be maintained at exceedingly low levels, as long as the rate of inflation is below 2%, then there is a significant possibility that financial stability might be at risk. This concern has been forcefully voiced by the Bank for International Settlements (BIS) and I believe that it would be prudent to pay a significant attention to this concern.

Recently, there have also been proposals that the Federal Reserve should raise its inflation target above 2%. The logic of the proposal rests on the fact that *real* interest rates have declined to very low levels and that with the existing 2% inflation targets, the resultant levels of *nominal* rates (the sum of the real rate of interest and expected inflation) are too low. Hence, so the argument goes, a higher level of inflation targets would permit higher *nominal rates* of interest even though the *real rates* of interest are at historically low levels.

I have several reservations regarding this policy recommendation. First, before considering raising the inflation target we should have a better understanding as to the reasons for the decline in the real rate of interest. Specifically, among the factors responsible for the low real rates are demographic factors, uncertainty, a lower level of productivity, and the like. By raising the inflation target, we would imply that the exceedingly low level of the real rate of interest is there to stay; the higher inflation target in fact would validate the low real rate. I believe that this verdict is premature. Some sources of the uncertainty are policy induced and should be removed; furthermore, the low level of productivity should also not be taken as a given, and policy efforts should be directed towards raising productivity. These efforts should typically be affected through the implementation of *structural* policies that

remove distortions and increase the flexibility of the economic system, through improved infrastructure, education, and tax incentives that promote an innovative culture.

In addition to these points of principle, there is a practical issue. Most of the major central banks such as the Fed, the ECB, the Bank of Japan, the Bank of England, have been struggling for a while to raise their corresponding inflation rates from a near zero levels towards their inflation targets of about 2% per year. What good would it make to raise the inflation target above its current level of 2% when the level of actual inflation is stuck below 2%?



Furthermore, there are still many countries especially in emerging economies which suffer from high inflation. For such countries, the challenge is to *lower* inflation towards its target. The credibility of the inflation targeting strategy, which is the main strategy adopted by this group of countries, would be seriously eroded by changing the inflation target. If the industrial countries were to raise the inflation target as proposed, it would damage the efforts of the emerging markets who are still struggling to adhere to their inflation targeting strategy in an effort to achieve price stability.

Let me conclude by reiterating my strongly held view that in spite of the changing circumstances and the new challenges faced by policy makers, it is important to maintain the fundamental principles of central banking. The medium term focus on stability, both price stability and financial stability, are the key objectives of the central bank. In order to achieve these objectives, the central bank must be granted operational independence (autonomy). Furthermore, a strong financial system is fundamental for the maintenance of stability, and such stability is the precondition for the attainment of sustainable growth. In fact, the best way that the central bank can contribute to sustainable growth is through delivering price stability and financial stability. A strong banking system is key for such stability as well as for the effective transmission of monetary policy. High capital ratios, low leverage, and high liquidity, characterize a strong banking system. In order to discharge the central bank's responsibilities, it must have the authority and the tools to bring about a strong financial system. Hence, in most cases it would be desirable that the responsibility for bank supervision rests in the hands of the central bank. Furthermore, the central bank should also be granted the authority and the instruments to secure the smooth operation of the payment system. This is especially the case during financial turmoil.

These objectives represent a very heavy list of tasks and it should be clear that the central banks cannot do it alone. There should be a full cooperation from the other branches of government that will secure fiscal responsibility, open trade, structural policies, and the like. Without such cooperation,

monetary policy will be overburdened, the central bank will be the only game in town, and economic performance will be below potential.

Crises are a typical phenomenon of the modern economic and financial systems. The role of policy is to design effective mechanisms for crisis *prevention*, crisis *management*, and crisis *resolution*. Occasionally, the appropriate policy response to a crisis entails a departure from typical norms of policy. These are the occasions that the credibility of the policy strategy plays a critical role in the restoration of stability. For such credibility to be maintained it is important that such departures from the norm be viewed as a *temporary* detour rather than a *permanent* new paradigm. The medium term perspective of the conduct of policy provides the compass that ensures that the long term objectives are achieved.

The recent experience has resulted in very creative drafting of new and important chapters that are to be added to the corpus of central bank theory and practice. They should be added to the old text books. We should definitely not throw away the old text books, which summarize lessons from the experience from many decades past. At the same time, the new chapters contain important lessons that should definitely not be forgotten once the crisis is over.

The 200th anniversary of the Oesterreichische Nationalbank provides an excellent occasion to look back, reflect, and appreciate the critical role that the central bank can play in an economy that undergoes fundamental changes. Let's remember: The basic principles are robust and they stood the test of time and space.



Session 3

2% forever? Sticky price stability target
in a changing environment

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¹ We should like to thank Mr. Gabriel Fagan (Central Bank of Ireland) for agreeing at short notice to present Professor Mishkin's contribution at the conference.

2% forever?

Rethinking the inflation target²

Over the last twenty years, central banks in advanced countries had come to a remarkable consensus that they should adopt an inflation target of around 2%. However, in the aftermath of the recent global financial crisis, many economists have suggested that inflation targeting needs to be rethought, with some advocating a rise in the inflation target to well above the 2% level.²

In this paper, I first discuss the key lessons from the global financial crisis that could affect our thinking about inflation targets and whether they should be 2% forever. Then I address three questions about inflation targets: (1) Should the long-run inflation target be raised above 2%? (2) Should central banks be afraid of going over the inflation target? And (3) Should central banks try to overshoot the inflation target?

1 Key lessons from the global financial crisis

There are two key lessons from the global financial crisis that have important implications for the inflation target.

1.1 The zero lower bound constraint on policy interest rates binds more often than expected

The constraint that policy interest rates cannot be driven much below zero means that conventional expansionary monetary policy becomes ineffective when a sufficiently negative shock hits the economy, so a negative policy rate would be needed to stimulate the economy. This has become known as the

zero lower bound problem. In this situation, central banks need to resort to nonconventional monetary policy measures such as large-scale asset purchases to stimulate the economy. Research before the crisis took the view that as long as the inflation objective was around 2%, then the zero lower bound constraint on policy interest rates binds infrequently and is likely to be short-lived (Reifschneider and Williams, 2000; Coenen, Orphanides and Wieland, 2004).



Events since the beginning of the global financial crisis have thoroughly discredited this view. Not only does the zero lower bound problem occur far more frequently than this research suggested, but it can also be long-lived. For example, the Federal Reserve has had to resort to a nonconventional monetary policy rate twice in the last 15 years (2003–2004 and starting in 2008) and kept the federal funds rate at the zero lower bound for seven years, until it raised the federal funds rate target by 25 basis points in December

² Thanks to Ethan Harris for discussions about this topic. The views expressed here are those of the author and not necessarily those of Columbia University, the National Bureau of Economic Research or the OeNB. Disclosure of the author's outside compensated activities can be found on his website at www0.gsb.columbia.edu/faculty/fmishkin/.

of 2015. Indeed, in Europe and Japan, the zero lower bound constraint is still binding, with both the ECB and the Bank of Japan even resorting to a negative interest rate policy of charging banks for keeping deposits at the central bank.

The flaw with this past research is that it was conducted with models that were essentially linear, and yet the global financial crisis revealed that the economy is likely to be very nonlinear (Mishkin, 2011). The second reason why the zero lower bound problem is more serious than previously thought is that we now recognize that contractionary shocks from financial disruptions can be far greater than previously anticipated. Sufficiently large contractionary shocks therefore result in the zero lower bound constraint occurring more frequently. The zero lower bound on policy rates has therefore become of much greater relevance to central banks than was anticipated before the recent financial crisis.

1.2 Once the zero lower bound constraint occurs, it is much harder to stimulate the economy and raise inflation

Before the global financial crisis, economists believed that even if the zero lower bound constraint was reached, monetary policy tools would still be effective with the use of nonconventional monetary policy tools. These nonconventional monetary policy tools – such as large-scale asset purchases to lower risk and term premiums, forward guidance about the future policy rate so that it would be viewed as staying low for an extended period, and exchange rate interventions to lower the value of the domestic currency – would be able to take the place of con-

ventional monetary policy to provide sufficient stimulus to the economy (see e.g. Svensson, 2001 and Bernanke, 2004). Although there is research showing that nonconventional monetary policy does work to stimulate the economy (see e.g. the survey in Williams, 2014), the fact remains that central banks throughout the world have struggled to return their economies to full employment or to get inflation to rise to their 2% inflation targets.

2 Should the long-run inflation target be raised to above 2%?

The two lessons above raise the question of whether the optimal inflation rate for a central bank target should be higher than the typical 2% level. With a higher long-run inflation target, the zero lower bound constraint would be less likely to occur, and the real interest rate can be driven down to lower levels in the face of adverse aggregate demand shocks. Prominent economists, such as Olivier Blanchard, Paul Krugman and Lawrence Ball have suggested that the inflation target be raised from the 2% to the 4% level.³ With expectations of inflation anchored to this long-run target, when the nominal interest rate is lowered to zero, the real interest rate would be reduced to as low as -4%, rather than -2% with the 2% inflation target. Conventional monetary policy, which involves setting the nominal interest rate, would then be able to ease monetary policy to a greater extent than it could with the lower long-run inflation target. Another way of stating this is to say that the zero lower bound on the policy rate would be less binding with a higher long-run inflation target.

Although the logic of this argument for a higher inflation target is correct, I think that the answer to the question,

³ See e. g. Blanchard, Dell'Ariccia and Mauro (2010), Krugman (2014) and Ball (2014).

“Should the long-run inflation target be raised to above 2%?” is “No.” We have to look not only at the benefits of a higher inflation target, but also the costs. If it were no more difficult to stabilize the inflation rate at a 4% level than at a 2% level, then the case for raising the inflation target to 4% would be much stronger. However, the history of the inflation process suggests that this is not the case. Inflation rates that accord with the Greenspan definition of price stability,⁴ i.e. “the state in which expected changes in the price level do not effectively alter business or household decisions,” seem to be below the 3% level. Once inflation starts to rise above this level, the public is likely to believe that price stability is no longer a credible goal of the central bank and then the question arises, “if a 4% level of inflation is OK, then why not 6%, or 8%...?” and so on.

This was the experience in the United States from the 1960s to the 1980s. At the beginning of the 1960s, the inflation rate was below 2% and policymakers believed that they could lower the unemployment rate if they were willing to tolerate inflation rates in the 4% to 5% range. However, when the inflation rate began to rise above the 3% level, it kept on rising, leading to the so-called Great Inflation period. Getting inflation back down to the 2% level was then very costly. No central banker wants to go through that again. Indeed, one of the great successes of central banks in the last twenty years is the anchoring of inflation expectations to around the 2% level. Raising the inflation target to 4% could jeopardize this hard-won success, with the result that there no longer would be a credi-

ble nominal anchor so crucial to the health of the economy.

A second argument against raising the long-run inflation target is that although raising the target might have benefits in the short run, the costs of higher inflation in terms of the distortions it produces in the economy are ongoing. Thus, although they may not be large in any given year, these costs add up, and in present value terms might outweigh the intermittent benefits obtained from the zero lower bound not being binding in periods such as those we have recently experienced.



3 Should central banks be afraid of overshooting the inflation target?

One of the key benefits of an inflation target is that it anchors inflation expectations at the level of the target, say 2%. However, if a central bank treats the inflation target as a ceiling, that is, it sees an actual inflation rate sometimes exceeding this target level as a failure, then because there are negative shocks to inflation as well as positive ones, its actions will lead to actual inflation outcomes that will on average be less than the target. This implies

⁴ Greenspan apparently first expressed this definition in the July 1996 Federal Open Market Committee (FOMC) meeting (page 51 of the transcript, which can be found at www.federalreserve.gov/monetarypolicy/files/FOMC-19960703meeting.pdf). This definition was later made public in numerous speeches.

that inflation expectations will be below the 2% target. Another way of describing the problem of central banks' fear of sometimes exceeding the inflation target is that it makes the inflation target asymmetric, that is, central banks are more troubled by overshoots of the inflation target than undershoots.

This fear of exceeding the inflation target is undesirable for two reasons. First, it results in inflation expectations not being anchored at the target level, which is one of the key purposes of an inflation target. Second, the lower level of inflation expectations that results from an asymmetric inflation target makes the zero lower bound constraint more likely to occur, with the undesirable consequences discussed above.



Is this fear of sometimes exceeding the inflation target an important factor in the conduct of monetary policy? Unfortunately, I think the answer is yes. Central bankers have a tendency to be more worried about inflation being too high rather than it being too low. I think this stems from their fear that if inflation ever goes above the set target, this might unhinge inflation expectations in the upward direction. This asymmetric view was particularly held by the Bank of Japan prior to the appointment of Haruhiko Kuroda as cen-

tral bank governor in 2013. Indeed, Masuro Hayami, during his tenure from 1998 to 2003 as governor of the Bank of Japan, continually expressed concerns about the dangers of inflation, despite the fact that the Japanese economy was experiencing prolonged deflation. The lack of concern about inflation being too low led to overly tight monetary policy by the Bank of Japan, as exemplified by the raising of the Bank of Japan's policy rate in 2000, a disastrous policy mistake that ensured prolonged deflation.

I would argue that the European Central Bank (ECB) has also had an inflation target that is asymmetric. This asymmetric target is reflected in the language that the ECB has used to describe its inflation objective, which is "inflation rates of below, but close to, 2%". The emphasis on "below" suggests that undershoots of the target are less problematic than overshoots. The ECB's actual monetary policy decisions in recent years are also consistent with an asymmetric inflation target. Not only has ECB monetary policy easing been too little too late in the face of both a weak economy and inflation that is below 2%, but also the monetary policy tightening when the policy rate was raised in 2011 was clearly a mistake and occurred at the same time that the Fed decided to ease monetary policy by strengthening forward guidance that it would not raise the federal funds rate for several years. The ECB's fear of inflation rising to above 2% has led to monetary policy that has been much too tight and helps explain the difficult situation the euro area is now in, where inflation is too low and the economy is still very weak.

The Federal Reserve has been much less susceptible to asymmetry in its inflation objective. The Fed's monetary policy has been far more accommoda-

tive in recent years than the ECB's. But even here, market participants have been concerned that many Federal Reserve officials have not been sufficiently worried about the continuing undershoot of the Fed's 2% inflation objective. In order to allay these concerns, in January 2016 the Fed's Federal Open Market Committee (FOMC) modified its *Statement on Longer-run Goals and Monetary Policy Strategy* by affirming that its inflation goal of 2% is symmetric.

The bottom line is that central bankers have a tendency to be more afraid of overshooting rather than undershooting the inflation target, a phenomenon that I like to label as "inflation phobia." This has led not only to monetary policy that has been too tight in recent years, but to a drop in inflation expectations that is very problematic. So the answer to the question, "Should central banks be afraid of going above the inflation target?", is "No." However, this answer is conditional on central banks continuing to commit to a long-run inflation target of say 2%, implying that overshoots of the target will be temporary. Fear of sometimes exceeding the inflation target can be dangerous, leading to inflation that is too low and a possible unanchoring of inflation expectations to below the 2% level.

4 Should central banks try to overshoot the inflation target?

I have argued that central banks should have a symmetric inflation target, overshooting the target as often as they undershoot the target. However, the United States, Europe and Japan are currently in a situation in which inflation has undershot the 2% inflation target for a number of years. Should the Federal Reserve, the ECB and the Bank of Japan commit to try to overshoot the

2% inflation goal? I strongly believe the answer is "Yes," as long as there continues to be a commitment to the 2% long-run inflation objective.

A traditional inflation-targeting regime treats bygones as bygones and so tries to achieve the inflation target, say 2%, no matter what has happened in the past. Woodford (2003) has provided a compelling theoretical argument that monetary policy should, in contrast, be *history-dependent*, that is, if the inflation target has been undershot in the recent past, monetary policy should strive to overshoot it in the near future. Researchers such as Svensson (1999), Dittmar, Gavin and Prescott (1999, 2000) Vestin (2000, 2006) and Woodford (2003) have shown that a price level target displaying this type of history dependence produces less output variance than an inflation target. The reasoning is straightforward. A negative demand shock that results in the price level falling below its target path of, say, 2% growth, requires monetary policy to try to raise the price level back to its 2% target growth path, so that inflation will temporarily rise above 2%. The rise in expected inflation then lowers the real interest rate, thereby stimulating aggregate demand and economic activity. Hence a history-dependent price level target is an automatic stabilizer: a negative demand shock leads to stabilizing expectations, which in turn stabilize the economy. The mechanism is even more effective when the negative demand shock is so large that the zero lower bound on interest rates becomes binding, as Eggertsson and Woodford (2003) point out.

Another history-dependent policy that is quite similar to a price level target is a nominal GDP target. Eggertsson and Woodford (2003, 2004) argue for a target criterion of an output-adjusted price level which is the log of a price

index plus the output gap, multiplied by a coefficient (which reflects the relative weight on the output gap versus inflation stabilization). Because this concept of an “output gap-adjusted price level” might be hard for the public to understand, Woodford (2012) suggests that a simpler criterion that would work nearly as well would have the target criterion be a nominal GDP path which grows at the inflation target (e.g. 2%) plus the growth rate of potential GDP. (If potential annual GDP growth was estimated at 2%, this would imply a 4% growth rate of the nominal GDP path.)



There are formidable challenges to the adoption of either a price level or a nominal GDP target. First, it is more difficult to explain to the public and financial market participants that the central bank is aiming to hit a price level or nominal GDP path where the actual price level or nominal GDP level is changing over time. Targeting a level of inflation such as 2% is much more straightforward, because this 2% number is kept constant. Second, when inflation temporarily rises above 2% as intended, the central bank needs to make sure that the public understands that it is not weakening its commitment to the long-run 2% inflation target.

A nominal GDP target presents an additional difficulty because it requires

that the central bank take a stance on the number for the growth rate of potential GDP, a number on which there is a great deal of uncertainty. This problem would be particularly severe if the central bank ignored what was actually happening to inflation in estimating potential GDP and the output gap, a mistake that the Federal Reserve made in the 1970s (see e.g. Orphanides, 2001).

The challenges described above help explain why central banks have not adopted either a price level or a nominal GDP target. However, there is a way to “skin the cat” to obtain the benefits of a history-dependent monetary policy with an approach that can be readily explained to the public and the markets. This involves stipulating that the 2% inflation target should be for an *average* over a particular period rather than for a particular future date, such as two years ahead. This modification is one that would make the inflation target history-dependent and yet would be easy to explain. If inflation had been running at a rate of 1.5% for several years, then the central bank would explain that to meet the 2% inflation target on average, it would have to shoot for an inflation rate of 2.5% for several years. However, this in no way weakens the commitment to the 2% long-run inflation objective. This policy would be particularly effective when the zero lower bound constraint is binding, because the higher inflation expectation of 2.5% would lower the real interest rate, thereby providing more stimulus to the economy. This modification to the inflation target would also have the benefit of encouraging a central bank to actually pursue a more expansionary monetary policy in the face of negative aggregate demand shocks.

This modification to the inflation target is not a theoretical curiosity. In-

deed, it has been adopted by the Reserve Bank of Australia when, starting in the mid-1990s, it used the following language to describe its inflation target: “The Governor and the Treasurer have agreed that the appropriate target for monetary policy in Australia is to achieve an inflation rate of 2–3%, on *average* [my italics], over the cycle.” With this type of inflation target, Australia has arguably had the best monetary policy outcomes of any advanced economy in the world, with an average inflation rate since 1995 of 2.7%, which is very close to the 2.5% midpoint of its inflation target range, while the Australian economy has not had a recession in over 25 years. (Of course, luck and other policies may have played an important role in producing these excellent outcomes.)

The empirical case for the benefits of a central bank aiming to overshoot the 2% inflation target has been provided by Curdia (2016). This paper conducts an exercise asking what would be the evolution of the U.S. economy starting in 2016 if monetary policy was based on optimal control, in which the policy rate is set to maximize an objective function where inflation is stabilized around 2% and output is stabilized around potential output, while avoiding excessive interest rate volatility. Under this optimal control policy, the inflation rate rises as much as 0.4 percentage points above the 2% target and stays above 2% for five years. The paper thus provides empirical support for a history-dependent monetary policy that overshoots the inflation target of 2% temporarily after the inflation rate has been below 2% for a number of years. Note that this policy is exactly what would transpire if the Fed committed to an inflation target that is for an *average* over a particular period, which could either be over the cycle, as

has been adopted by the Reserve Bank of Australia, or alternatively could be for a particular period, say a moving average over ten years.



Given that inflation has been below 2% for a number of years in the United States, Europe and Japan, the analysis here suggests that the Federal Reserve, the ECB and the Bank of Japan should commit to a more expansionary monetary policy to achieve inflation above the 2% level for the next several years. However, this should be done with a continuing commitment to a long-run inflation target of 2%, although one that is modified to reflect average inflation over a given period, such as the business cycle.

5 Concluding remarks

The recent global financial crisis has taught us that not only can the zero lower bound constraint bind frequently, but also that once the zero lower bound occurs, it can be very difficult to stimulate the economy and raise inflation to the 2% inflation target. These lessons require a rethinking of the inflation target and whether it should be 2% forever. I come to the following answers to three questions.

1. *Should the long-run inflation target be raised to above 2%?* There are benefits to a higher long-run inflation

target because the zero lower bound constraint would be less frequent and when negative shocks hit the economy, there would be more room to lower the real interest rate before the zero lower bound constraint is reached. However, there are drawbacks to raising the long-run inflation target. The first is that a higher inflation target of, say, 4% would jeopardize the hard-won success of central banks of anchoring inflation expectations. Second, the higher inflation in the long run that would result from raising the inflation target produces distortions that are ongoing and so might be amplified over time. Because I believe that the costs of raising the long-run inflation target are higher than the benefits, I believe the answer to the question above is “No.”

2. *Should central banks be afraid of going above the inflation target?* Here the answer is a clear “No.” An inflation target should be symmetric, with overshoots as common as undershoots, and this is even more important given the problems created by the zero lower bound constraint. Central banks have had a tendency to be more afraid of exceeding the 2% objective rather than under-

shooting it. This has led to monetary policy that has been too tight and to potential unanchoring of inflation expectations in the downward direction. Fear of overshooting the 2% inflation objective must be avoided.

3. *Should central banks try to overshoot the inflation target?* In the current situation, I believe the answer is “Yes.” Given the zero lower bound problem, the inflation target should be modified to be for an average over a particular period. Given past undershoots of the 2% inflation target for many central banks, this would require them to aim to exceed the 2% target temporarily. The result would be a commitment to even more expansionary monetary policy for the Federal Reserve, the ECB and the Bank of Japan, which I believe would produce more desirable economic outcomes.

The bottom line: “2% forever” makes sense for the long-run inflation target, but in the current economic environment, not only should central banks not be afraid of exceeding the 2% inflation objective, but should actually aim to exceed this objective for the next couple of years.

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Towards a financial stability-oriented monetary policy framework?¹

It is a great pleasure and honour for me to be at this conference celebrating the 200th anniversary of the Oesterreichische Nationalbank (OeNB). Two centuries is no mean feat! It is testimony to the success of central banking as an institution – an institution that has become indispensable for the well-being of our societies.

But as the title of the conference indicates, continued success requires change. Any cursory look at the history of central banking will indicate that the institution has evolved dramatically since its inception, constantly adjusting to evolving economic, political and intellectual cross-currents. The history of the OeNB is no exception, from its creation to tackle serious monetary instability, through the serious banking instability in the interwar period, marked by the famous failure of Credit-Anstalt, to the present day as part of the Eurosystem.

So, an obvious question arises: what next for central banking?

Today I shall argue that the next step is to seek to incorporate financial stability considerations more systematically into monetary policy frameworks. I will also sketch out how this might be done.

There has been intense debate during the last decade or so over whether monetary policy should take financial stability into account rather than focus exclusively on price stability.² The question has gained further prominence recently because of the economic backdrop and new research.

The economic backdrop has highlighted tensions between price stability and financial stability (BIS, 2016). Many countries have been struggling with strong credit and asset price booms and possibly solid growth combined with very low, or even negative, inflation. Think of Sweden, Switzerland and China, just to name a few. These symptoms are eerily familiar: low and stable inflation prevailed in the run-up to the Great Financial Crisis (GFC) and many previous crises, too.



By contrast, other countries have been facing the legacy of the financial bust, i.e. anaemic credit and GDP growth combined with the side effects of exceptionally and persistently low interest rates, notably on the profitability and soundness of financial institutions. These symptoms are less common, the closest equivalent being the experience of Japan in the 1990s.

Meanwhile, new research has concluded that a “leaning against the wind” (LAW) strategy – tightening monetary

¹ I would like to thank Piti Disyatat, Dietrich Domanski, Mathias Drehmann, Andrew Filardo, Mikael Juselius, Luiz Pereira da Silva, Phurichai Rungcharoenkitkul and Hyun Song Shin for helpful comments and Magdalena Erdem and Alan Villegas for their excellent assistance with the charts. Any remaining errors are my sole responsibility.

² For a recent survey, see Smets (2013).

policy to head off financial stability risks – provides little or no benefits in terms of output and inflation. This analysis has been taken to support a sort of “separation principle”, according to which monetary policy should deal exclusively with near-term output and inflation (the business cycle, for short) while macroprudential policy should deal on its own with financial instability (the longer-duration financial cycle).

There is no way I could do full justice, in the time available, to the complex issues involved. Many of you will know that at the BIS we have been arguing for many years that monetary policy needs to take a more proactive role. What I can do is to take a thin slice of this question and present some new evidence from recent BIS research, itself part of a longer-term effort.

I will suggest that a financial stability-oriented monetary policy can yield net benefits. But for this to be the case, it would need to keep an eye on financial stability, broadly defined, all the time, during both booms and busts, i.e. during the whole financial cycle. The objective would be to ensure that the economy never strays too far away from “financial equilibrium”. In other words, I shall argue that it would be unwise to interpret a LAW policy narrowly as one whereby the central bank pursues its standard policy 90–95% of the time and then deviates from it only when the signs of the build-up of financial imbalances become evident. This prevailing interpretation would fall short of the mark.

I will first explain the key reasons for the conflicting conclusions by comparing the similarities and differences in the analytical approaches to the ques-

tion. I will then zoom in and summarise the main results of ongoing BIS work in more detail. Finally, I will zoom out again and draw some broader implications of the analysis, combining it with further reflections on the inflation process and monetary policy frameworks.

1 The two basic approaches: similarities and differences

What is the standard way of evaluating empirically the costs and benefits of a financial stability-oriented monetary policy?³ The basic idea is to trade off the output costs of leaning today with the possible output benefits that would arise tomorrow if leaning helps reduce the likelihood and/or the costs of future banking crises.

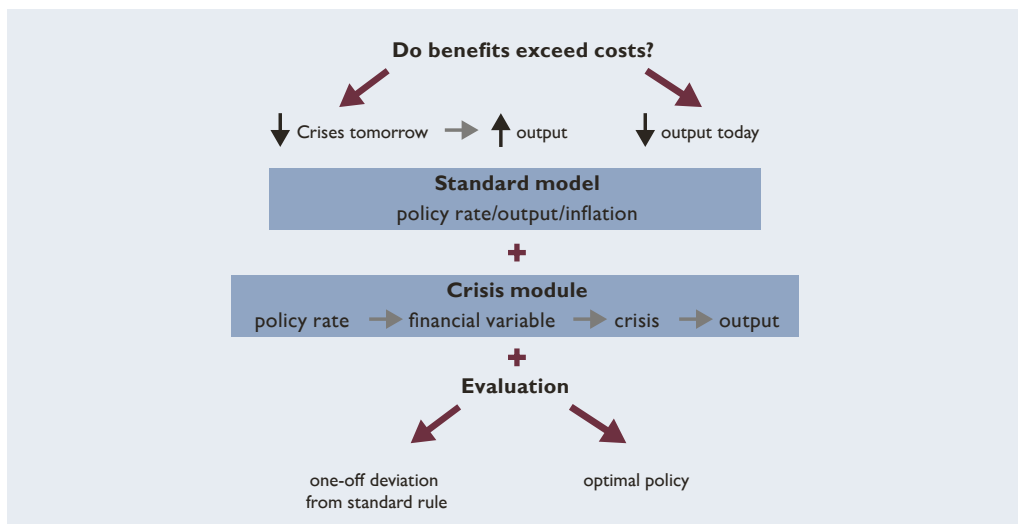
Implementing this thought experiment involves a number of steps (chart 1). First, you take a traditional model embedding relationships between the policy rate, output and inflation. Then you augment it with a “crisis module”. The module describes the relationship between a financial variable and banking crises, links this variable to the policy rate and assumes something about the costs of banking crises. The variable most commonly used is the growth rate of (private sector) credit, which some work has found to be a reliable leading indicator of banking crises. Finally, you estimate the resulting net benefits in terms of output and (possibly) inflation by adjusting policy, either as a one-off deviation from traditional policy rules or as the optimal response given the model.

The conclusion of much of this analysis is that, for typical parameter values, an LAW strategy does not generate sig-

³ *The focus here is on the empirical work, as opposed to the theoretical studies that typically find that there may be a role for monetary policy; for two examples among many, see Woodford (2012) and Gambacorta and Signoretti (2014). See also Smets (2013), Borio (2014a) or IMF (2015) for references.*

Chart 1

Costs and benefits of LAW: standard approach



Source: Author's compilation.
 Note: LAW = leaning against the wind.

Table 1

Costs and benefits of LAW: assumptions

	Standard	BIS
Permanent output losses	NO	NO/YES
Cleaning is costly	NO/YES	YES
LAW reduces crisis costs	NO	YES
Benefits possible without crises	NO	YES
Risks build up	NO	YES

Source: Author's compilation.
 Note: LAW = leaning against the wind.

nificant net benefits and may be counterproductive.⁴ In general, the work that derives optimal policy finds some small benefits. But the conclusion that has been taken for policy is that the benefits are too small.

This type of analysis is clearly sound and the findings plausible, but there are a number of reasons why it might underestimate the potential net benefits.

These have to do with the assumptions and with the calibration (table 1). Let me elaborate.

The crises do not result in permanent output losses, so that eventually output returns to its pre-crisis trend. But empirical evidence suggests that this is typically not the case.⁵ Output may indeed regain its previous long-term growth rate, but it typically ends up following a parallel and lower path. Thus, if we assume that actual and potential output converge, this also means that potential output is also permanently lower.

In some cases, monetary policy can even “clean up” at no cost, in the sense that the central bank can cut rates and make up for any demand shortfall as it would with any other normal recession. But the GFC experience clearly suggests otherwise: Monetary policy has a harder time dealing with balance

⁴ See, in particular, Ajello et al. (2015), Svensson (2014, 2016) and IMF (2015).

⁵ See the BCBS (2010) survey and, in particular, Cerra and Saxena (2008) and, more recently, Ball (2014). Blanchard et al. (2015) find that other recessions too may have a similar effect.

sheet recessions, as agents are overindebted and balance sheets impaired. There is indeed a consensus that this is a lesson to be drawn from the financial crisis of 2008/09.

Leaning may affect the probability of a crisis but does not affect its cost. But one might expect that the bigger the initial imbalance, the larger the costs will be. So, if policy can help to restrain the build-up, it would also limit the damage of any strains that might arise.



Financial variables have no (or limited) impact on output other than through crises. And even if they do, this is not considered part of the analysis. But this means that benefits can only arise if crises occur, which is very restrictive. It couches the problem exclusively in terms of rare events rather than of the potential for financial fluctuations to do damage to the economy more generally.

Finally, another underappreciated key assumption concerns the evolution of financial risks. In prevailing approaches, risks do not grow over time. By that I mean that if no action is taken, then any “shocks” that may occur in normal times will die away. This im-

plies that there is little or no cost to waiting. Importantly, this encourages the view that a financial stability-oriented monetary policy is one that follows a traditional policy most of the time and then deviates from it only once the signs of financial imbalances become evident. But the risk of this strategy is obvious: it could end up doing too little too late or, worse, it could be seen as precipitating the very crisis it is intended to prevent.

Our work relaxes some of the more restrictive assumptions in the standard approach, thereby finding higher potential benefits.⁶ While the specifics differ, the common elements of this research are that it allows risks to build up over time as the economy evolves – and here the notion of the financial cycle is key – and monetary policy to play a bigger role in influencing both the probability and costs of financial busts, even without crises. In other words, crises are not necessary for net benefits to be possible.

2 Two complementary studies

Let me now turn to the two BIS studies in more detail.

Study 1

The first study follows the standard approach most closely (Filardo and Rungcharoenkitkul, 2016). It takes as its starting point a traditional and intentionally very stylised model of the economy, but it makes a key change in the “crisis module”. Specifically, it allows the economy to exhibit realistic recurrent financial cycles or booms and busts. The cycles are measured by a combination of the behaviour of credit, property prices and the credit-to-GDP ratio (Drehmann et al., 2012; Borio,

⁶ For a recent analysis that relaxes some of these assumptions and also finds higher benefits from a leaning strategy, see Adrian and Liang, 2016.

2014b). This follows previous work done at the BIS, which has been part of a broader and rapidly growing literature seeking to characterise the financial cycle, especially within central banks.⁷ Crucially, this is the variable that causes banking crises or, more generally, financial busts with serious output costs.

The difference with prevailing approaches is illustrated most starkly in chart 2, based on U.S. data as one example. Chart 2 shows the difference between the financial cycle (blue line) and credit growth (red line). The financial cycle exhibits clearly defined booms and busts, whereas credit growth shows no such pattern. Taking this boom-bust pattern into account provides the key to capturing the benefits of leaning.

This simple model does exactly that. Once the model is estimated and an optimal policy is derived, the results suggest that it is desirable to lean against financial booms; that the larger the size of the imbalance, the higher the benefit from leaning (as the bust will be larger);

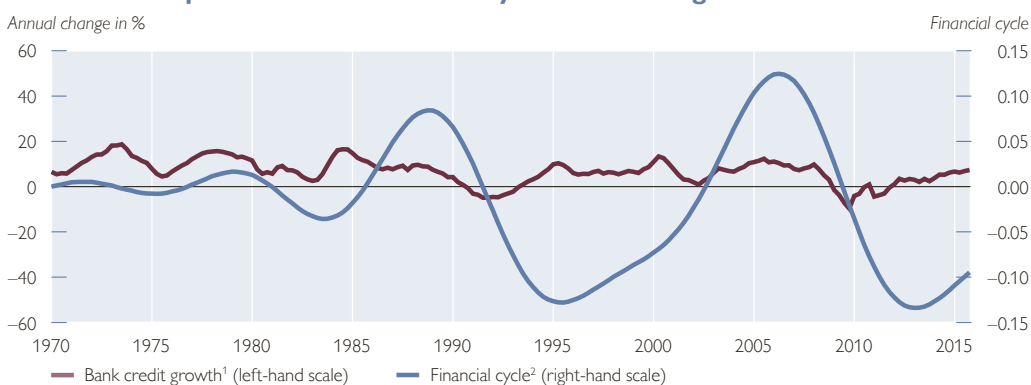
and, critically, that it is important to lean early, even when the probability of a crisis is still negligible.

Understanding the intuition for this third point is essential. If the authorities wait, the problems become bigger as the boom gathers momentum. You may not know when the bust will come, but if the process is such that risks build up over time, then it is not desirable to wait before adjusting your policy. This result would even be strengthened if one also assumed, say, costs to making large adjustments to the instruments: policymakers would have to smooth out the adjustment and hence start earlier.

Importantly, this result does not hinge on the specific measure of the financial cycle. The one chosen in the study is especially useful to highlight the point. But the result would also hold for the more familiar credit gap leading indicator used, for example, in the Basel III framework to set the countercyclical capital buffer (Drehmann et al., 2011; Borio and Drehmann, 2009),

Chart 2

Two different processes: the financial cycle and credit growth



Source: BIS calculations; based on U.S. data.

¹ Bank credit to the private non-financial sector.

² Measured by frequency-based (bandpass) filters capturing medium-term cycles in real credit, credit-to-GDP ratio and real house prices.

⁷ For examples, see Aikman et al. (2015), Claessens et al. (2011), De Bonis and Silvestrini (2014), Hiebert et al. (2015), Einarsson et al. (2016) and Rünstler and Vlekke (2016).

Borio and Lowe, 2002).⁸ As you may recall, this variable measures the deviation of private sector credit from its long-run trend. All that is needed is that the process has sufficient inertia. Stock variables, such as the ratio of credit to GDP, typically do; flow variables, such as the change in credit, typically do not. The question, therefore, is essentially empirical: what kind of process matters for financial instability- or financial sector-induced output costs?

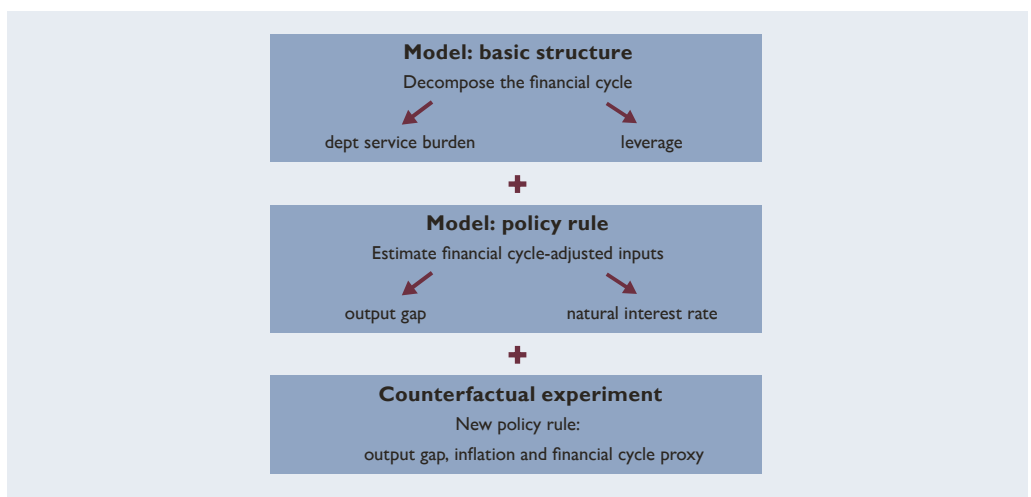
Study 2

The second study delves further into this question (Juselius et al., 2016). Compared with the first, it is based on a much more granular estimated econometric description of the economy, again drawing on data for the United States as an example. The analysis proceeds in three steps (chart 3).

The first step is to decompose the financial cycle into two sets of variables that in the data are found to have very stable long-run relationships (Juselius and Drehmann, 2015).⁹ One is a proxy for the private sector (households and firms) debt service burden, i.e. the ratio of the sum of interest payments and amortisation to income (or GDP); the other is a proxy for “leverage”, linking the debt-to-income ratio to property and equity prices. Deviations of these variables from their long-run relationships (“gaps”) interact and, when embedded in a richer econometric system, are found to have a sizeable impact on private sector expenditure and output fluctuations. This is intuitive. Heavier debt service burdens depress spending, not least as they squeeze cash flows. And higher asset prices in relation to credit can boost both spending and

Chart 3

Costs and benefits: an alternative approach



Source: Author's compilation.

⁸ For instance, Borio and Lowe (2002), Drehmann et al. (2011), Detken et al. (2014) and Drehmann and Juselius (2014), among others, also find that the credit gap outperforms credit growth as a leading indicator of banking crises. For the impact of credit booms on subsequent recessions, see Borio and Lowe (2004), Jordà et al. (2013) and, for household debt in particular, Mian et al. (2015).

⁹ In technical terms, these are known as “co-integration” relationships.

credit growth. There are many stories and simple models that capture these mechanisms, although none that as yet fully explains their interaction.¹⁰

The system has a couple of interesting properties, which set it apart from the previous studies. For one, it can result in financial busts with permanent output losses. In fact, the interaction between the two financial gaps can help trace the Great Recession quite well out of sample, though not quite its depth – the financial crisis clearly has an additional effect. But the possibility of permanent losses does not depend on the GFC: It is a more general property.¹¹ In addition, the system does not rely on a separate crisis module: The financial cycle is fully integrated in the dynamics of the economy. The system gives rise to “endogenous” fluctuations in which the financial and real sectors interact, but not to crises as such.

The second step is to use the two financial gaps to derive estimates of the typical unobservable variables in any policy rule. These are economic slack (or the output gap) and the natural rate of interest. In traditional models, the natural rate of interest (or “neutral rate”) is the rate that would prevail when output is at potential and inflation is on target – the time-varying intercept in a Taylor rule.

Estimates of the output gap and natural interest rate are derived by adding the two financial gaps to a very standard macroeconomic setup.¹² Thus, the natural rate now requires not just output at potential and inflation on target,

but also closing of the financial gaps – the concrete definition of “financial equilibrium” in this approach.

Note that the financial gaps are *allowed* to have an impact on the output gap and the natural rate, but it is the data that decide. This richer system nests the standard model, and the data are allowed to tell us which one is a better characterisation of the evolution of the economy.

The third step is to carry out a counterfactual experiment – moving to a parallel universe, so to speak. This is done by adding the financial gaps¹³ to a traditional Taylor rule, in which the interest rate is adjusted in response to the output gap and the deviation of inflation from target (Taylor, 1993), and then seeing how the economy would evolve under this different rule. Thus, the aim is not to respond only once the signs of an impending crisis emerge, but to steer the economy throughout the financial cycle. The financial gaps simply *complement* the variables traditionally included in the policy rules, which retain their role.

A number of findings emerge from the exercise.

First, responding systematically to the financial cycle proxies in addition to output and inflation can result in significant output gains (chart 4). Taking the results at face value, if the counterfactual experiment starts in 2003, the economy would grow roughly 1% more per year, or 12% cumulatively. This exceeds the near-term cost when leaning (0.35 % per year).

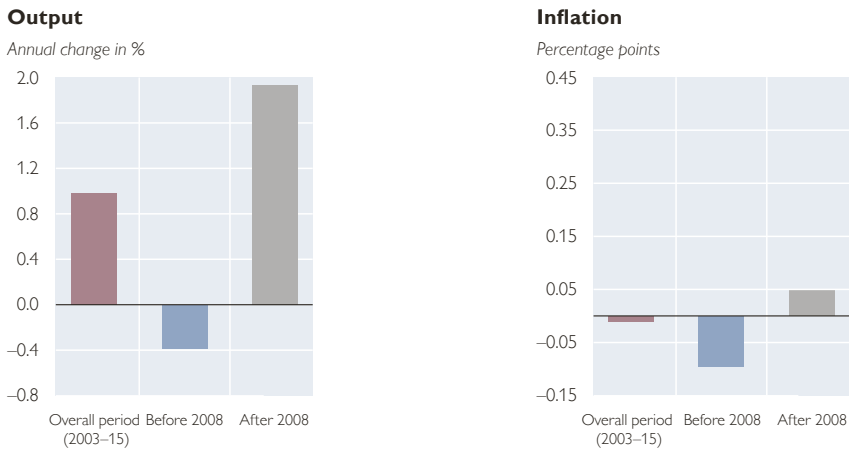
¹⁰ See Juselius and Drehmann (2015) for references to this work.

¹¹ That said, Drehmann and Juselius (2014) also find that, over horizons of around one year, the debt service ratio outperforms also the credit gap as a leading indicator of banking crises; the credit gap performs better over longer horizons.

¹² The standard model follows Laubach and Williams (2003, 2015).

¹³ The specific rule in the study includes explicitly only the debt service gap, but the leverage gap conveys crucial information about the output gap and, as noted, is in turn closely influenced by the debt service gap.

An illustrative experiment: higher output and similar inflation



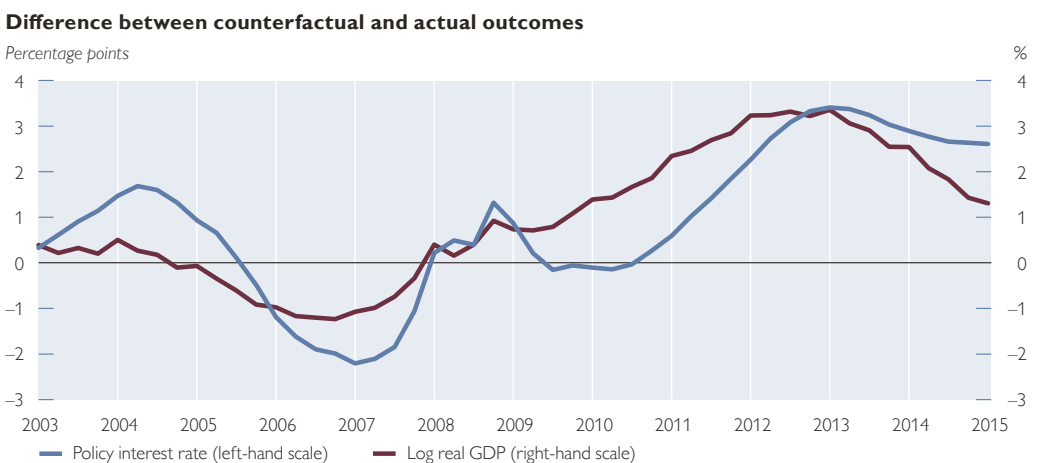
Source: Juselius et al. (2016); based on U.S. data.

Second, there need not be much cost in terms of inflation. In fact, on average, inflation is effectively unchanged: It is a bit lower pre-crisis, reflecting the tightening phase, and higher post-crisis, as economic slack is smaller then.

Third, and consistent with the previous study, leaning early is key, and this can gain considerable room for manoeuvre in the bust. The point is illustrated in chart 5, which shows the

difference between the counterfactual and actual policy rate (blue line) and, for background information, the corresponding difference for output (red line). The policy rate is some 1 percentage point higher until mid-2005; it can then afford to decline earlier, starting roughly when asset prices peak (not shown) and is normalised more quickly after the recession, as output recovers faster.

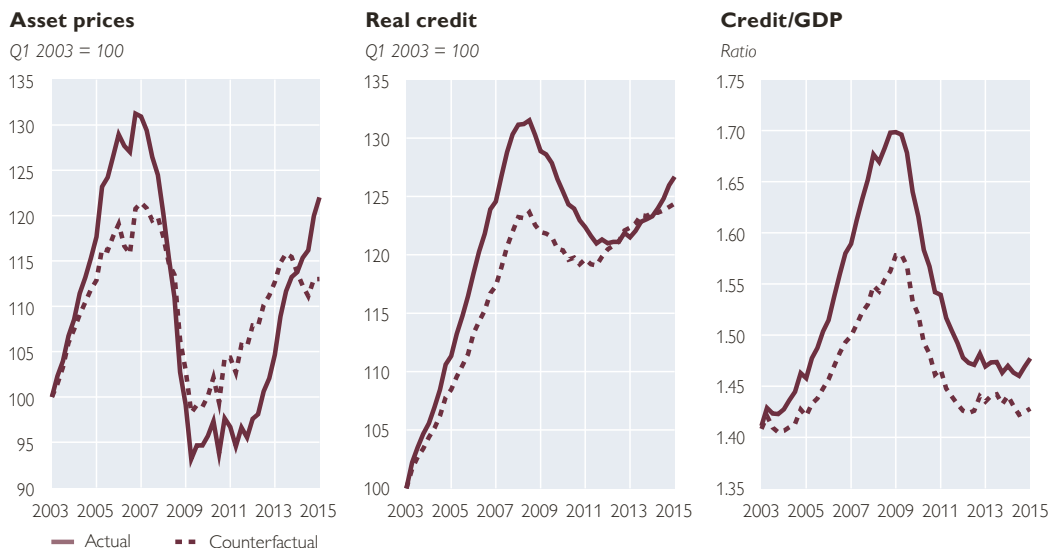
An illustrative experiment: output and interest rate paths



Source: Juselius et al. (2016); based on U.S. data.

Chart 6

An illustrative experiment: smoothing the financial cycle



Source: Juselius et al. (2016); based on U.S. data.

The source of the gains is that the policy helps to smooth out the financial cycle. This is shown in chart 6, with the dotted line indicating the counterfactual and the continuous line the historical behaviour of various variables. One can easily see the smaller amplitude in the cycle in asset prices, real credit and the credit-to-GDP ratio in the counterfactual.

Naturally, the performance of the economy improves further if the counterfactual experiment begins earlier (not shown). The reason is that the policy has more time to work and hence gets more traction.

The results also shed light on the natural rate of interest (chart 7). They suggest that the natural rate is higher than indicated by the standard estimate, which does not take into account the financial cycle. Here we are back in our universe, as the estimate of the nat-

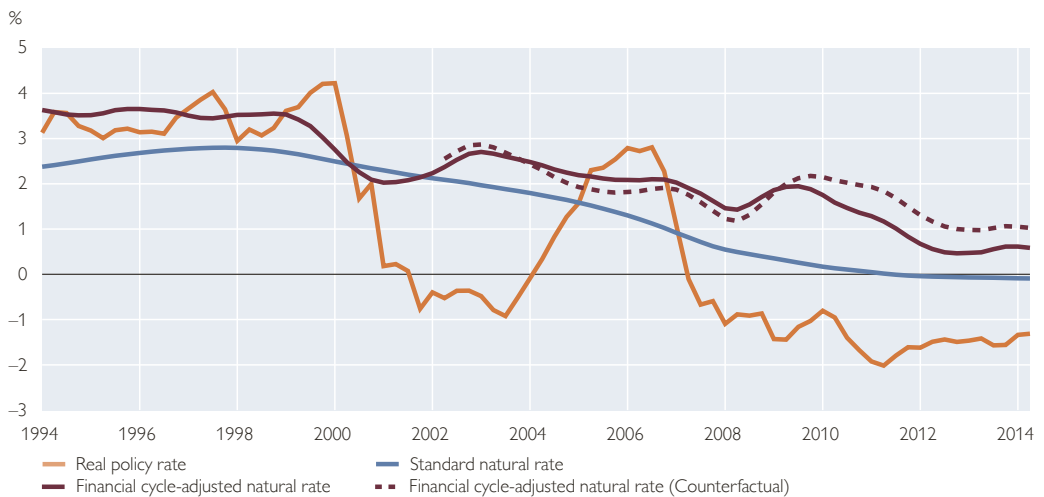
ural rate is based on the actual history of events, not the counterfactual. The real policy rate (orange line) is generally below a standard natural rate estimate (blue line), which falls to zero towards the end of the sample; by contrast, the financial cycle-adjusted natural rate (red line) is generally higher. As it turns out, the intuition is that it is the financial cycle proxies, rather than inflation, that provide most of the information about the behaviour of output and its potential. This confirms previous work,¹⁴ and is the mirror image of the well-known empirical finding that for a long time inflation has proved quite insensitive to measures of domestic economic slack.¹⁵ If it is insensitive, its evolution cannot tell us much about how much slack there is in the economy.

In fact, taking the financial cycle systematically into account can actually

¹⁴ See Borio et al. (2013, 2014), Arseneau and Kiley (2014), Blagrove et al. (2015) and Melolinna and Tóth (2016).

¹⁵ See, among others, Stock and Watson (2007), Ball and Mazumder (2011) and Faust and Leeper (2015).

Comparing interest rates: standard and financial cycle-adjusted



Source: Juselius et al. (2016); based on U.S. data.

help mitigate the decline in the natural rate (dashed purple line). The rate is, on average, some 40 basis points higher after the 2009 recession, pointing to greater resilience in potential output growth. As standard models imply, the higher the estimated growth rate of potential output over the relevant period, the higher the natural rate of interest.

Moreover, once financial factors are allowed to play a big role, stabilising the economy sometimes requires sizeable deviations of the policy rate from the natural rate in response to the financial gaps. This is necessary so as to keep the economy close to financial equilibrium. The deviations tend to be larger than those in a standard Taylor rule.

3 Policy considerations

What conclusions could one draw from this analysis, all things considered? Let

me first highlight a few caveats before turning to some broader reflections concerning policy.

Clearly, *all* exercises of this kind face serious analytical and econometric challenges.¹⁶ The findings need to be taken with more than a pinch of salt – more like a spoonful, in fact. Moreover, they are partial in nature. They simply take existing empirical work as benchmark. They simplify the uncertainty facing policymakers and the mechanisms at work in the economy. For instance, neither the BIS study, just as the most recent ones described earlier, explicitly includes the exchange rate and the complications that this may create when implementing a more financial stability-oriented monetary policy.¹⁷ They also omit the role of alternative policies, first and foremost macroprudential policy, but also fiscal and even structural policies.

¹⁶ See, in particular, Juselius et al. (2016) for a discussion of the econometric issues involved in the study.

¹⁷ See Bruno and Shin (2015) and Hofmann et al. (2016) for the link between currency appreciation and risk-taking; Rey (2013), Obstfeld (2015) and BIS (2016) for the constraints on monetary policy; and Borio (2014c), Rajan (2014) and BIS (2015) for the implications for the global stance of monetary policy and the international monetary and financial system.

Forming a judgment on these key issues requires going well beyond the specific findings. As argued extensively elsewhere, to my mind monetary policy should be an integral part of a macrofinancial stability framework designed to tackle financial booms and busts systematically (Borio, 2014a,b; 2016). The information challenges it faces are not qualitatively different from those of macroprudential measures, which have been extensively adopted internationally. And the complications that result from exchange rates and capital flows are best regarded as affecting the relative reliance on different policies rather than justifying either/or-type solutions (BIS, 2016). Financial cycles have proved too powerful historically. Not surprisingly, the extensive deployment of macroprudential tools in emerging market economies since the GFC has not prevented the re-emergence of the typical signs of financial imbalances.

If this argument is correct, what does it imply for the trade-off between price stability and financial stability and hence for the features of monetary policy frameworks?

The second study suggests that the trade-off may partly reflect the monetary policy in place. To the extent that monetary policy can help avoid the large losses linked to balance sheet recessions, it may also help stabilise inflation over the longer run. The horizon here is key: what may appear as a trade-off in the short run disappears in the longer run. From this perspective, price and financial stability are best seen as two sides of the same coin.

Even so, it is quite possible that a financial stability-oriented monetary policy may require greater tolerance for persistent deviations of inflation from target. This is especially the case for small open economies, as a tighten-

ing to keep the financial side of the economy on an even keel could easily induce a currency appreciation. This is especially likely during financial booms, when capital inflows may be in full swing.



Hence, it is important to understand the sources of downward pressure on inflation. They are likely to be benign when reflecting a currency appreciation during a financial boom and sustained economic expansion. And the same holds if they reflect positive supply side forces, such as globalisation or technological advances. Not all disinflations, or indeed periods of falling prices (deflation), are born equal and hence amenable to the same treatment. Indeed, there is a risk that by fighting too hard against benign disinflation, or even deflation, a central bank may be sowing the seeds of malign disinflation in the future. This would occur if in the process it fuelled the build-up of financial imbalances.

The historical record is consistent with this view. It suggests that the link between deflation and output growth is weak, that it stems largely from the Great Depression, and that, even then, it is overshadowed by the debilitating effect of asset price declines. Moreover, the record also indicates that the more damaging nexus is not between defla-

tion and debt, but between property price declines and debt (Borio et al., 2015).¹⁸ The GFC has confirmed this once more. All this would suggest that the balance of current monetary policy frameworks has shifted too far towards focusing on near-term price stability at the expense of longer-term macroeconomic stability.



These considerations acquire greater force in light of another key finding of the studies – the need not to stray too far away from financial equilibrium. If the finding is correct, then there is a risk that policymakers may be lulled into a false sense of security when they see no signs of unsustainable financial booms and, as a result, press freely on the accelerator in order to bring inflation back to near-term targets. As debt stocks accumulate, by the time they start tightening policy, they may end up being well behind the curve. This is even more problematic if they become the main support for asset prices and

are highly sensitive to the inevitable tensions that normalising policy would induce.

It is worth pausing and exploring a possible hypothetical scenario resulting from the interaction between changes in the inflation process and a traditional monetary policy response. Imagine, for the sake of argument, that globalisation and technology exert downward pressure on inflation and, together with a history of price stability, inhibit second-round effects.¹⁹ The bargaining power of labour and the pricing power of corporations are no longer what they used to be in a much more fragmented world. If so, easing policy would tend to have mainly a one-off impact on the price level and hence boost inflation only temporarily. As the effect wanes, inflation will be back where it started, but the real interest rate will be lower. The central bank, then, would be encouraged to try again, and so on.

It is easy to see what this process would yield: a progressive reduction in inflation-adjusted (real) interest rates and, if large-scale asset purchases are also used, a trend expansion in central bank balance sheets.²⁰ In the meantime, the economy would drift further away from financial equilibrium and the debt-to-GDP ratio would keep rising or fail to adjust. A debt trap would threaten and make it hard to raise interest rates without causing damage to the economy (Borio and Disyatat, 2014; Borio, 2016). The mix of balance sheet recessions and a stubborn disin-

¹⁸ For previous evidence on this, see Atkinson and Kehoe (2004), Bordo and Redish (2004) and Borio and Filardo (2004). For a recent study reaching different conclusions, see Eichengreen et al. (2016).

¹⁹ On the role of globalisation in driving inflation, see Borio and Filardo (2007), BIS (2014) and Auer et al. (2016). That said, there is no consensus on this point. While some empirical studies have reached similar conclusions (e.g. Bianchi and Civelli (2013), Ciccarelli and Mojon (2010) and Eickmeier and Moll (2009)), others have not (e.g. Ihrig et al. (2010) and Martínez-García and Wynne (2012)).

²⁰ Together with the asymmetrical response to financial booms and busts, this provides a different explanation of the decline in real interest rates that emphasises the role of saving-investment imbalances: see e.g. Bernanke (2015) and Bean et al. (2015).

flation process can be toxic. Now, I am not saying this is what is happening, although the passing resemblance to the conditions several economies have been facing is noteworthy. I am saying, however, that this hypothesis deserves further examination.

This analysis suggests that, at a minimum, it would be important to exploit the available flexibility in current frameworks to the full, tolerating persistent deviations of inflation below targets as needed to keep the financial side of the economy on an even keel. This would call for close attention to the factors driving disinflation and for a more critical evaluation of the likelihood of downward spirals and the costs of negative inflation.²¹ The term “deflation” appears to instil angst and to raise emotions that a more detached look at the historical record does not seem to justify. This also calls for a consistent communication policy, which argues against fine-tuning inflation and emphasises that the costs of falling prices depend on the prevailing circumstances.

Such a policy does not require changing mandates. A close reading suggests that the room for interpretation is often considerable. But it may require at least refinements in how the mandates are put into practice, including the horizon for achieving inflation objectives,²² the width of target bands and the role that financial factors play (e.g. through novel standard reaction functions and explicit escape clauses). Revising mandates, especially if enshrined in legislation, should not be taboo: they are a means to an end (BIS, 2015). But that is a delicate and unpredictable process. The outcome may be quite different from the initial intention. And, at the end of

the day, for good policy the analytical framework used to interpret the workings of the economy is more important than the mandate.

4 Conclusion

In this presentation, I have argued that recent empirical work sceptical of the merits of a financial stability-oriented monetary policy tends to underestimate its potential benefits. This is because of specific assumptions and calibration. Analysis at the BIS that weakens some of the restrictions used in the empirical models finds considerably larger benefits. In essence, this work allows monetary policy to play a bigger role in influencing both the probability and the costs of financial busts, even without crises. Importantly, it also stresses the idea that risks build up over time as the financial cycle evolves, so that waiting has a cost.



Clearly, given the complexity of the issues involved and inevitable limitations of any such type of analysis, this work represents just one contribution to the bigger debate. Personally, though, I would conjecture that two conclusions will survive further scrutiny: there are likely to be potential

²¹ On this, see also Rajan (2015).

²² This point has been stressed for a long time; see e.g. Borio and Lowe (2002) and Bean (2003).

gains from a more financial stability-oriented monetary policy; and any such policy, if it is to produce gains, would need to take financial developments into account systematically, in both good and bad times. A policy of “selective attention”, whereby monetary policy reacts only when the signs of financial imbalances become all too evident, would fall short of the mark.

Operationally, shifting towards a more financial stability-oriented monetary policy would call for adjustments to current frameworks. These would include rules of thumb that add financial variables to benchmark policy responses (our work points to some possibilities), strengthening the medium-term orientation of policies, and making the most of the existing flexibility in tolerating possibly persistent deviations of inflation from target. This would need to be complemented by a more critical assessment of the costs of

falling prices, depending on the factors that drive them, and of the likelihood of downward spirals. Changing mandates is not taboo, but should be a last resort.

Is it possible to change? If the history of central banking tells us anything, it is that change is inevitable. The real questions are under what circumstances and to what. It typically takes a major event for change to happen: for all sorts of reasons – intellectual, behavioural and political – institutions have a lot of inertia. The bar is set very high. But the changes proposed here are an evolution, not a revolution. They are comparatively small steps along a familiar path, not a jump into untrodden territory. In many ways, they would move central banking closer to its historical origins. We should not lose sight of that.

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Discussion: 2% inflation forever?

Let me begin my discussion of these two valuable contributions with some remarks on context. Ahead of the financial crisis 2008/09, simulations with macroeconomic models suggested that periods when interest rates were constrained by their zero lower bound (ZLB) were likely to be infrequent and short-lived (see, e.g. Reifschneider and Williams, 2000). As Rick Mishkin points out, subsequent experience suggests they are anything but. Mishkin blames both larger adverse shocks and economic non-linearities, but while these are both certainly relevant, even more important to my mind has been the remorseless decline in the “natural” real rate of interest over the past couple of decades. For instance, the world ten-year risk-free real interest rate, estimated from indexed government debt, appears to have fallen from around 4% to around zero, with half that fall pre-dating the financial crisis (Bean, Broda, Ito and Kroszner, 2015). For a given inflation target, such a fall in the real rate translates into 400 basis points less policy headroom before hitting the ZLB.

Federico Sturzenegger’s contribution to this conference discusses some of the possible causes of this decline in the natural real interest rate. On the one hand, the propensity to save has been pushed up by demographic developments, the integration of China into the world economy, and attempts to delever following the crisis. On the other hand, the propensity to invest has been weakened by slower productivity and population growth and heightened uncertainty. To those forces, I would

add an increased preference for safe assets, coupled with a reduction in their relative supply; the yield on equities, for instance, has fallen by much less than real safe rates. The key point is that many of these factors are likely to persist¹, so the natural real rate is likely to remain low beyond the medium term. That means the ZLB will remain a live issue for central banks.



What should central banks do in such circumstances? And, in particular should they target a higher inflation rate in order to create more headroom for cutting policy rates, as suggested by Blanchard, Dell’Ariccia and Mauro (2010)? As raising the inflation target has several drawbacks, the answer depends in part on what the alternatives are.

The first thing to be said is that zero is evidently not the lower bound to policy rates, as several central banks, including the European Central Bank (ECB), have been charging commercial banks interest on their reserve deposits. At some point, though, negative interest rates will encourage banks to

¹ *Though it is important to note that the present bulge of high-saving middle-aged is beginning to pass through into retirement, when they can be expected to start running down their savings. That is one factor that should raise the natural real rate in the future (Bean, Broda, Ito and Kroszner, 2015).*

substitute into cash. The reason they do not do this at zero is simply the carrying costs of cash (security, etc.). Some work we did at the Bank of England shortly before I retired suggested that, for the UK banks, this point lies somewhere between -0.5% and -1% . So rates may be able to fall a little further, particularly if it is only temporarily.

It is, however, important to bear in mind that the efficacy of such rate cuts may be low because the associated squeeze on bank profitability arising from the downward stickiness of customer deposit rates will inhibit credit supply (and in extreme cases even threaten banks' survival). While such effects can be mitigated by offering tiered rates on reserve deposits (as the Bank of Japan has done) or else combining a rate cut with a central bank lending programme (as the Bank of England has recently done), it does suggest there is not a lot more mileage on this front.



More exotic options have been suggested, such as increasing the opportunity cost of holding cash by levying an interest charge (Gesell, 1916) or even eliminating cash altogether so that the option of substitution is removed (Rogoff, 2016). However, to my mind these strike at the very idea of money as a store of value and are likely to lack public support.

What about other monetary tools, in particular asset purchases financed by reserve issuance (*quantitative easing*, or *QE* for short)? Event studies suggest that the asset purchase programmes undertaken by the U.S. Federal Reserve and the Bank of England during the Great Recession reduced longer-term bond yields by slightly less than 100 basis points. However, the evidence also suggests the effects may be weaker when markets are functioning more normally. Moreover, large-scale asset purchases have some notable drawbacks. First, by driving up asset prices, they particularly benefit the already wealthy. Second, the acquisition of assets takes the central bank into politically contentious territory. If the central bank buys government debt, then it raises questions about fiscal dominance. If the central bank buys private credit instruments, it exposes the taxpayer to the associated risk of default, while the acquisition of equities also involves the acquisition of control rights, i.e. it is equivalent to part-nationalisation. Third, the effect on exchange rates and international capital flows is a likely source of international tension (“currency wars”). Fourth, QE works in part by encouraging investors to move into higher-yielding riskier assets and the resulting “search for yield” may raise financial stability risks further down the road. All this means that the cost-benefit ratio associated with QE tends to deteriorate the more it is used.

Given that both further rate cuts and more asset purchases have their drawbacks, should we raise the inflation target to, say, 4% instead? That would generate another 200 basis points of policy headroom for when the next adverse shock hits. This seems like a bit of “no-brainer”, but raising the inflation target is not innocuous. Higher inflation implies bigger distortions to

relative prices and the need for more frequent price adjustment. But, more importantly, at 2%, households and businesses can pretty much stop worrying about inflation. That is not the case at 4%. Although not present in economists' models, I believe this "stable prices heuristic" has considerable social value. Moreover, a 4% inflation world

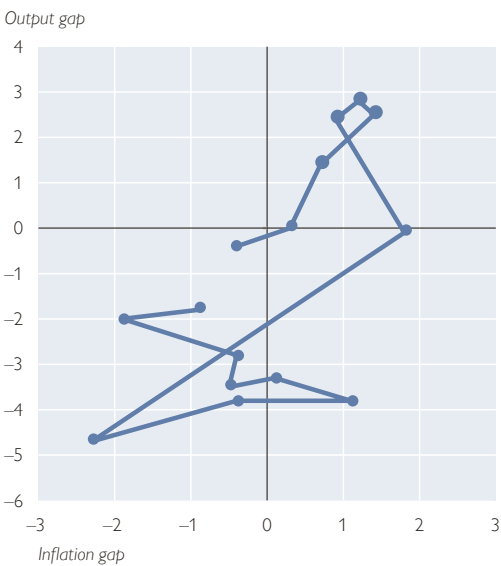
is likely to lead to more indexation and thus the replacement of nominal rigidities by real rigidities, so reducing the efficacy of monetary policy.

Even if a 4% inflation target were a good idea in the longer run, surely now is not the best time to make the shift. First, central banks are struggling to achieve even their existing targets.

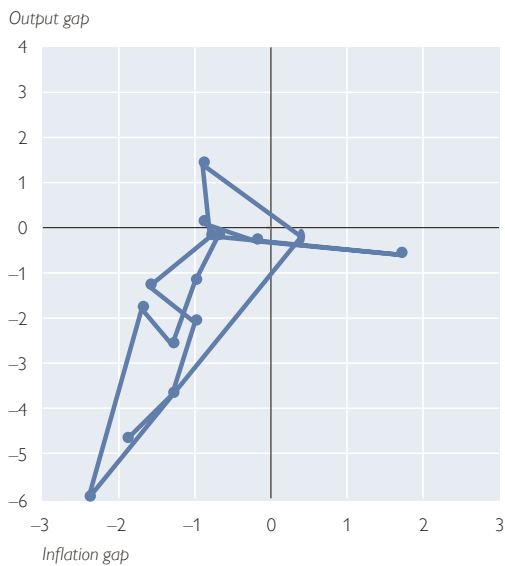
Chart 1

Inflation gaps versus OECD output gaps from 2002 to 2016

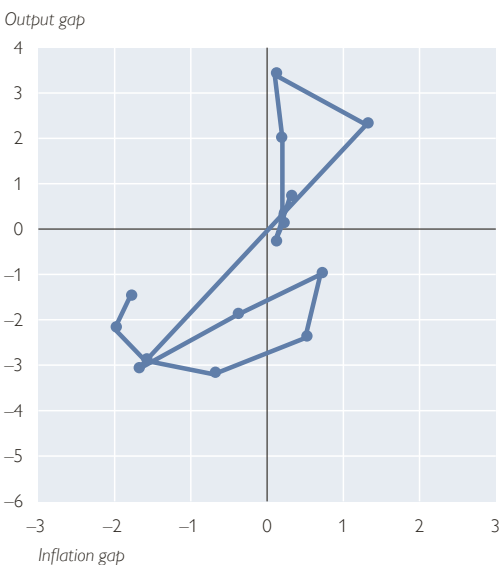
United States



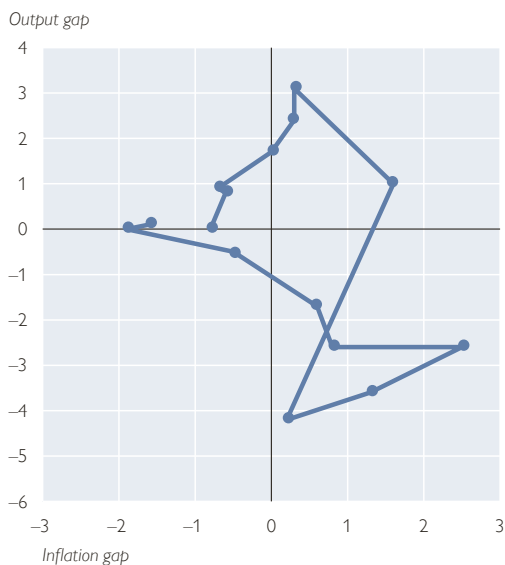
Japan (1% target)



Euro area



United Kingdom



Source: Author's calculations.

Even larger undershoots are unlikely to do much for a central bank's credibility. Second, it may invite investors to believe that this is an attempt to inflate away the value of debt. They may therefore expect further increases once policymakers have started down this slippery slope, so leading to an unhelpful rise in the inflation risk premium. If the choice is nevertheless made to raise the inflation target, it seems better to do it opportunistically, i.e. when inflation is above target. All in all, I agree with Mishkin.

While Mishkin is not a fan of raising the long-run inflation target, he does believe that central banks have been too worried about exceeding the target temporarily, and that consistently low inflation in Japan and the euro area reflect such inflation aversion. Is this a fair assessment?

To put a bit of structure around the discussion, consider the following very simple optimal stabilisation problem. Let π be the deviation of inflation from target (the inflation gap) and x be the output gap. The central bank's task is to set the output gap so as to minimise the expected value of a conventional quadratic loss function, $E[\pi^2 + \lambda x^2]$, subject to a Phillips curve, $\pi = ax + u$, where u is a supply disturbance and a and λ are parameters. The associated optimality condition is then $aE[\pi] + \lambda E[x] = 0$. So an optimal policy setting has the property that the expected inflation gap and expected output gaps are of opposite signs; if the central bank expects to run negative (positive) output and inflation gaps, then it could get both inflation and output closer to target by pursuing a more (less) expansionary policy.

Chart 1 shows the scatter of inflation gaps and output gaps for the four major advanced-economy central banks since 2002 (I take 1% as the target for the Bank of Japan and 2% for the rest).

Most of the outturns lie in the north-east and south-west quadrants, rather than north-west and south-east quadrants, as would be the case with an optimal policy setting. Note, this is the case for the United States, as well as Japan and the euro area. The exception is the United Kingdom, though I admit that is more a reflection of the serendipitous depreciation of sterling during 2007/08, rather than the brilliance of the Bank of England's Monetary Policy Committee!

Why are inflation and output gaps positively, rather than negatively, correlated? The most natural explanation is that policy was less effective, and the headwinds from the financial crisis worse, than expected. Such control errors would then lead to the data tracing out the upward-sloping Phillips curve. I am sure that this must be part of the story. There may be something in Mishkin's explanation of excessive inflation aversion for Japan, but I am less convinced for the euro area, where I think the issue is more that it has been *politically* difficult both to push inflation in the core above target to accommodate the necessary deflation in the periphery, and to deploy the tool of quantitative easing.

I should note that the same constellation of outturns could result if central banks had chosen to "lean against the wind" (LAW) of emerging financial imbalances as Claudio Borio advocates, though I doubt very much that is the explanation. Borio summarises the findings of recent Bank for International Settlements (BIS) work that seeks to challenge the results of Lars Svensson (2014), which claims the costs of LAW substantially outweigh the expected benefits. Borio notes two shortcomings to Svensson's analysis. First, LAW reduces not just the magnitude of a future crisis but also its likelihood.

Second, Svensson’s calibration of the costs of crises – drawing on the work of Moritz Schularick and Alan Taylor (2012) – assumes the losses from crises are temporary rather than permanent; Borio argues that there is some evidence that the latter is the case. Here, I would simply note that the hysteretic mechanisms generating such permanent effects on supply should equally apply to the costs generated through LAW as well as the benefits, so the net impact on the cost-benefit calculus is unclear.

Turning to the empirical analysis itself, I have a few issues with the exercise. First, what exactly is the theoretical counterpart to “financial equilibrium”? I know what potential output is meant to represent, even if it is hard to measure. But the measure of financial equilibrium going into constructing the financial cycle is a purely statistical measure. This limits its usefulness for policymaking. Second, one needs to understand the properties of such statistical constructs in real time, not just with hindsight when the full histories of the series are available. Third, are the counterfactual exercises immune to the Lucas critique? The bottom line is that I would like to see this type of analysis repeated in a structural, rather than purely statistical, model.

The lack of a structural model also rears its head when one moves to thinking about the policy response. In the analysis there are two “gaps” (real and financial) to be managed, but only one policy instrument. The inefficiencies and market failures that justify intervention to moderate excessive financial cycles are left unspecified, but the first-best is surely to address those directly through appropriate Pigouvian taxation or regulatory actions. Macroprudential policies should be the second line of defence. While I can see a case for LAW

in principle, it surely ought to be only the last line of defence, when the first two are deemed insufficient.



Despite espousing LAW, Borio is not in favour of amending central bank mandates, preferring instead to rely on the central bank’s room for “constrained discretion”. I think it is worth noting that the financial stability case for deviating from target was introduced into the Chancellor’s monetary policy remit for the Bank of England in 2013. I think it is useful to acknowledge upfront that such concerns may result in a deliberate deviation from target, in the same way that central banks are open about “looking through” the temporary effects on inflation of exchange rate and commodity price movements. It all helps market participants get a better fix on the central bank’s reaction function.

Finally, I should say a few words about committing to overshoot the inflation target temporarily in the future by promising to keep the policy rate “lower for longer” as espoused by Woodford (2012) and endorsed by Mishkin. Such a policy lowers the long-term real rate of interest both by depressing future nominal short interest rates and by raising future inflation – that is “committing to be irresponsible”. This enables the central bank to boost

demand today even when short rates are at their lower bound. The problem is that such a policy is time inconsistent. Once one gets to the future, there is no reason to go through with the promised period of excess inflation and there is no mechanism that enables today's central bankers to bind their successors. A promise of such future "irresponsibility" is thus incredible.



Woodford's suggestion of a price-level or nominal GDP target aims to get round this objection by hard-wiring in the required history dependence in policy. Thus, with a price-level target, a period of unduly low inflation in the recent past will need to be offset by a period of unusually high inflation in the future. But this just relocates the time-inconsistency problem to whoever sets the target. Once one gets to the future, why can't the target just be changed again? There has to be something that makes this difficult if a price-level or nominal GDP target is to be credible.

In any case, actual forward guidance by central banks has surely been more about communicating reaction functions (so-called *Delphic* guidance) than implementing a time-inconsistent policy (*Odyssean* guidance).

Let me conclude with a more general observation. While central banks are not quite out of ammunition, the cost-benefit analysis for both further cuts in policy rates and more quantitative easing is becoming progressively less favourable. Raising the long-run inflation target is less attractive than it seems and I have doubts about the feasibility of long-range forward guidance to hold expected future short rates down. So what else can be done?

To me the time has come (indeed long since passed) for other policies – fiscal and structural – to play a bigger role. Such policies would include discouraging excessive (private and public) savings, raising public investment and taking steps to encourage private investment. The scope for such actions varies across countries and jurisdictions but, were they to be taken, the underlying natural real rate of interest in the world economy would increase, too. That would not only be a good thing in itself, but it would also create more headroom for conventional interest rate policy. In my view, we would be better off spending more time thinking how to do this and less on trying to squeeze even more out of the monetary policy toothpaste tube.

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