

Monetary policy spillovers in a financially integrated world

Conference proceedings

Joint Danmarks Nationalbank – BIS conference to mark the 200th anniversary of Danmarks Nationalbank, Copenhagen, 7-8 September 2018



DANMARKS
NATIONALBANK
200 YEARS



2018



CONTENT

Introduction to the conference	4
Programme	5
Opening remarks	7
Opening remarks by Lars Rohde.....	8
Opening remarks by Agustín Carstens.....	12
Session 1:	
From the Great Moderation to the Great Recession and beyond – how did we get here and what lessons have we learned?	16
Keynote speech by Kenneth Rogoff.....	17
Discussion by Frank Smets.....	29
Discussion by Donald Kohn	37
Summary of issues addressed in the general discussion in session 1	42
Session 2:	
Coping with the current challenges for central banks	43
Keynote speech by Axel A. Weber.....	44
Discussion by Mohamed A. El-Erian	50
Discussion by Charles R. Bean	54
Summary of issues addressed in the general discussion in session 2	58
Dinner speech	59
Dinner speech by Stanley Fischer.....	60
Session 3:	
Life in the periphery	64
Keynote speech by Stephen S. Poloz.....	65
Discussion by Veerathai Santiprabhob	81
Discussion by Hélène Rey	91
Summary of issues addressed in the general discussion in session 3	92
Panel discussion:	
The future of central banking from a small open-economy perspective	93
Summary of issues addressed in the panel discussion	94
Short speaker biographies	95

INTRODUCTION TO THE CONFERENCE

Danmarks Nationalbank celebrated its 200-year anniversary in 2018. As part of the anniversary celebrations, Danmarks Nationalbank and the Bank for International Settlements organised this high-level conference on "Monetary policy spillovers in a financially integrated world".

The conference provided a forum for global central bankers and leading academics to discuss key monetary policy issues of the day:

- What lessons were learnt about the main forces that drove the global economy into the era of unconventional monetary policies and unprecedented monetary policy spillovers?
- What monetary policy and macroprudential challenges still face central banks in the current economic and political environment? What more should be done?
- How has our understanding of exchange rate regimes evolved over time, especially in the light of trends in economic and financial globalisation? Is the concept of the classical exchange rate "trinity" obsolete?
- What role should exchange rates play in monetary policy frameworks, including consideration of shortcomings in the international monetary system? Is exchange rate stability a precondition for lasting price and financial stability?

The conference concluded with a policy panel with particular focus on the special challenges facing central banks in small, open economies.

These proceedings contain speeches, background papers and slides behind the interventions delivered at the conference as well as brief summaries of issues addressed at the general discussions and the panel discussion.

PROGRAMME

6 September 2018

19:00 – 21.30 **Pre-conference dinner**
Venue: Vækst, Sankt Peders Stræde 34, DK-1453 Copenhagen K
Dress code: Business casual

7 September 2018

12:00 – 12:30 **Registration**
Venue: The Hans Christian Andersen Castle in Tivoli,
H.C. Andersens Boulevard 20-22, DK-1553 Copenhagen V

12:30 – 13:30 **Buffet lunch**
Venue: Gemyse in Tivoli

14:00 – 18:00 **Conference – Day 1**
Venue: The Hans Christian Andersen Castle in Tivoli
Dress code: Business attire

14:00 – 14:30 **Opening remarks**
Lars Rohde, Danmarks Nationalbank
Agustín Carstens, Bank for International Settlements

14:30 – 15:50 **Session 1**
*From the Great Moderation to the Great Recession
and beyond – how did we get here and what lessons
have we learned?*
Chair: **Claudia M. Buch**, Deutsche Bundesbank
Keynote (20 min.): **Kenneth Rogoff**, Harvard University
Discussants (40 min.): **Frank Smets**, European Central Bank
Donald Kohn, Brookings Institution
General discussion (20 min.)

15:50 – 16:30 **Coffee break**

16:30 – 18:00 **Session 2**
Coping with the current challenges for central banks
Chair: **Peter Praet**, European Central Bank
Keynote (20 min.): **Axel A. Weber**, UBS
Discussants (40 min.): **Mohamed A. El-Erian**, Allianz
Charles R. Bean, London School of Economics
General discussion (30 min.)

19:30 – 22:30 **Reception and dinner**
With partners
Venue: Danmarks Nationalbank, Havnegade 5, DK-1093 Copenhagen K
Dress code: Business attire

Dinner speech

Exchange rate regimes in a globalised economy:
challenges and prospects

Chair: **Niels Thygesen**, University of Copenhagen
Dinner speaker (15 min.): **Stanley Fischer**, MIT
Questions (5 min.)

8 September 2018

- 8:30 – 9:00** **Registration and coffee**
Venue: The Hans Christian Andersen castle in Tivoli
- 9:00 – 12:30** **Conference – Day 2**
Venue: The Hans Christian Andersen castle in Tivoli
Dress code: Business attire
- 9:00 – 10:20** **Session 3**
Life in the periphery
Chair: **Øystein Olsen**, Norges Bank
Keynote (20 min.): **Stephen S. Poloz**, Bank of Canada
Discussants (40 min.): **Veerathai Santiprabhob**, Bank of Thailand
Hélène Rey, London Business School
General discussion (20 min.)
- 10:20 – 11:00** **Coffee break**
- 11:00 – 12:15** **Panel discussion**
The future of central banking from a small open-economy perspective
Chair: **Lars Rohde**, Danmarks Nationalbank
Panelists: **Mar Gudmundsson**, Central Bank of Iceland
Philip Lowe, Reserve Bank of Australia
Stefan Ingves, Sveriges Riksbank
Thomas Jordan, Swiss National Bank
Karnit Flug, Bank of Israel
Format: 5-10 min. introduction by each panelist followed by panel discussion and general discussion
- 12:15 – 12:30** **Closing remarks**
Lars Rohde, Danmarks Nationalbank
- 12:45 – 13:15** **Doorstep press/media event**
- 13:15 – 14:45** **Lunch, with partners**
Venue: Groeften in Tivoli
- 14:45 – 17:00** **Social event**
With partners
(Canal tour. Dress code: casual dress and practical shoes)

OPENING REMARKS



Lars Rohde



Agustín Carstens

OPENING REMARKS BY LARS ROHDE

Dear colleagues and guests,

It is a great pleasure for me to welcome you to this joint Danmarks Nationalbank - BIS conference to mark the 200th anniversary of Danmarks Nationalbank. I am very pleased and honoured that all of you accepted our invitation to join us in this event.

We will have plenty of time to discuss some of the most pressing current and future challenges for monetary policy in a globalised world during the next two days.

But an anniversary of a central bank is also always an opportunity to reflect on the historical developments. So let me offer a few insights from our history.

Fundamentally, the primary objectives of Danmarks Nationalbank have remained unchanged since its establishment in 1818. Our job has always been to focus on price stability, financial stability and well-functioning payment systems.

Annual inflation has averaged 1.7 per cent over the last 200 years – below but close to 2 per cent (figure 1).

At Danmarks Nationalbank's 175th anniversary in 1993, Royal Bank Commissioner Marianne Jelved, then Minister of Economic Affairs, said:

"My hope is that the governors and Royal Bank Commissioner who celebrate the Nationalbank's 200th anniversary in 25 years' time will be able to look back on more than three decades of low inflation."

This has been achieved, and a firm fixed-exchange-rate policy has been an important part of the monetary-policy strategy. Denmark's tradition for a fixed-exchange-rate policy goes actually a long way back in history. In

the 19th century, we followed the silver and gold standards. Later, a fixed exchange rate was maintained against the pound sterling, the dollar, the D-mark and now the euro.

Low inflation has been the order of the day the past 200 years, except in periods of war. The notable exception was the 1970s and early 1980s, when inflation reached double-digit rates, government budget deficits were massive and Denmark took any opportunity to devalue the krone. This is not so long ago and reminds us that a stability-oriented economic policy regime should not be taken for granted.

We have seen several banking and financial crises the past 150 years (Figure 2). Banking crises are costly for the economy and many studies have been conducted to try to understand why banking and financial crises occur from time to time. They point at many different reasons due to the complex interaction between the real economy and the financial system.

Banking crises are therefore very hard to predict. This stresses the need for a robust financial sector that is able to absorb large losses during a severe economic downturn. The most recent financial crisis revealed that many financial institutions were insufficiently capitalised. Since then, capital requirements have been enhanced, both internationally and in Denmark. This has contributed to a more robust financial system. We have also established mechanisms for controlled resolution of large banks. One of the aims has been to ensure that the key functions of a distressed bank can be continued without any major inconveniences for the customers. Another aim has been to ensure that the owners and investors bear the losses in connection with resolution – not the taxpayers.

Danmarks Nationalbank issued its first series of banknotes in 1819. The largest note in the series was the 100 rigsbankdaler note (Figure 3). This denomination corresponded to between a half and a full year's pay! Very few banks existed in 1819, and cheques had not yet emerged, so banknotes were used by both households and firms for large financial transactions and as saving instruments in line with large silver and later gold coins.

It has always been important that banknotes are difficult to counterfeit. On Danmarks Nationalbank's first banknotes, the signature was the most important security element. Since then, many more elements have been added to the banknotes, and banknotes are undoubtedly better protected against reproduction today than ever before.

Nowadays, households and firms prefer electronic payment solutions offered by private banks over physical cash. As a result, providing secure IT systems for interbank payments has become a cornerstone of Danmarks Nationalbank's work. Today, the entire financial sector

is heavily dependent on complex IT systems, and it is important in relation to upholding trust in the financial system that they always work and are secure. Only a few decades ago, physical bank robberies were at the top of the agenda in any debate on security in the financial sector. Today, cybersecurity is on the top of the list.

I could tell you much more from our first 200 years. But let me stop for now.

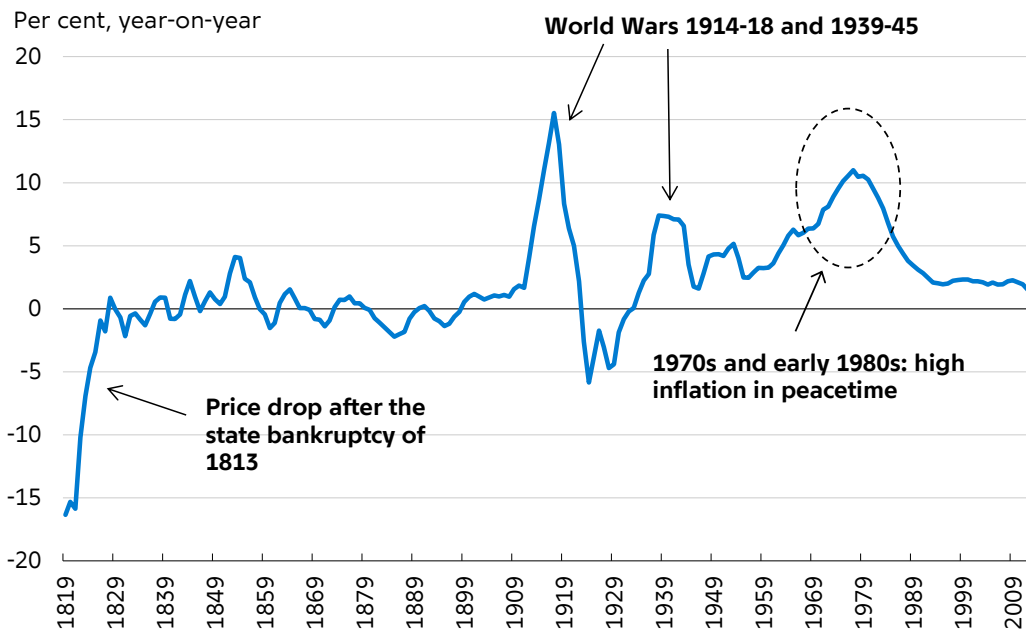
I will just conclude my opening remarks by extending a special welcome and thanks to all our distinguished speakers and to the BIS for taking part in organising this conference.

I will also remind you that we follow the Chatham House Rules at this event – you are free to refer to the information received at the conference but without identification of the individual speaker or any other participant.

Thank you for the attention and welcome to Copenhagen.

Figures

Figure 1: Consumer price inflation in Denmark since 1819



Note: 7-year centred moving average of annual inflation rates.

Source: Abildgren, Kim (2010), *Consumer Prices in Denmark 1502-2007*, *Scandinavian Economic History Review*, Vol. 58(1), pp. 2-24; and Statistics Denmark.

Figure 2: Staff from Danmarks Nationalbank carrying cash across the street to a bank in financial distress in the 1920s



Source: Bank staff with bags containing valuables in front of Nationalbanken i Kjøbenhavn, 1923?, Europeana / Royal Danish Library / Holger Damgaard (http://www.europeana.eu/portal/da/record/92023/BibliographicResource_2000068834980.html), CC BY-NC-ND 4.0 (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Figure 3: One of Danmarks Nationalbank's first banknotes



Source: Danmarks Nationalbank

OPENING REMARKS BY AGUSTÍN CARSTENS

Rising to the occasion: central banking in a financially integrated world

Introduction

Good afternoon, ladies and gentlemen,

It is a great pleasure to welcome you to this policy conference marking a historic milestone for the Danmarks Nationalbank – the 200th anniversary of its founding. To put this in perspective, the BIS is looking forward to celebrating its 90th anniversary later this decade. Ninety might be an impressive age but, truly, it pales in comparison with the anniversary that we are celebrating today.

I would like to give special thanks to Governor Lars Rohde and his colleagues for including the BIS in this celebration. In many ways, our collaboration reflects the excellent long-term relationship between the Danmarks Nationalbank and the BIS in pursuit of enhanced central bank cooperation.

In this type of event, we naturally look to the past to help us navigate the future. And, let me note that the Danish central bank's history is a long and remarkable one.¹ Established just after the Napoleonic Wars, the Bank was charged with one of the enduring mandates of central banking – to establish public trust in the monetary system after an episode of runaway inflation.

Today, of course, the world is a very different place, but trust remains an essential – if not foundational – principle of central banking. It is, after all, a precious commodity that can never be taken for granted. History has taught

us that building trust takes time and hard work. And, once broken, it is difficult to earn back.

In my remarks today, I'd like to highlight the importance of building on past successes. I will argue that price and financial stability is the best way central banks can preserve trust and confidence, but delivering this will continue to be challenging in an increasingly financially integrated world.

Looking back

Looking back, it is important to remember that greater financial integration has delivered significant benefits. Yet, it must also be recognised that greater openness has created challenges for central bankers. Globalisation has exposed economies – especially small open economies – to policy spillovers.

While I was at the Bank of Mexico, we faced many difficult situations relating to capital flows, exchange rate pressures, financial stability and inflation, especially ones arising from developments in our large neighbour to the north. As in other emerging market economies, non-linear exchange rate dynamics arose at times, resulting in global capital flows that threatened to overwhelm the short-run absorptive capacity of domestic financial markets. And this despite the best efforts of monetary policy.

Mexico's experience is certainly not unique. In Europe, banking and sovereign stresses earlier in the decade had serious consequences for the euro area and its neighbours. The situation called for bold ECB actions in the form of unconventional monetary policies, efforts that are still paying off. At the same time, smaller, non-

¹ See K Abildgren, *Danmarks Nationalbank, 1818–2018*, Danmarks Nationalbank, July 2018.

euro economies were not immune to these developments in the form of policy spillovers.

In particular, both Denmark and Switzerland faced strong exchange rate appreciation pressures, as international investors sought less risky environments. Strong capital inflows left these economies facing unfamiliar monetary policy trade-offs. In 2012, for example, the Danmarks Nationalbank found it challenging to maintain its peg to the euro with positive interest rates, and eventually took a truly innovative decision to implement negative policy rates. This Danish experience led many to fundamentally rethink what we used to call the “zero lower bound” on nominal interest rates.²

In the case of Switzerland’s flexible exchange rate system, capital inflows contributed to rapid currency appreciation, taking the exchange rate to levels not reached in previous decades and threatening price stability.³ The Swiss National Bank surprised market participants in 2011 when it set a floor on the franc/euro rate, a policy that was eventually dropped.

These experiences highlight the spillover challenges that central banks from small open economies can face from their larger neighbours in a financially integrated world. So the policy environment has become more complex. But central banks have responded flexibly, creatively and effectively. In doing so, central banks have continued to build trust and confidence despite the difficult times in the past decade.

Current challenges

Looking at the current policy environment, it is important first to remember how far the global economy has come since the dark days of the

Great Financial Crisis. It has been a long and winding road, but central banks should take some comfort from successes over the last decade. The revival of global economic activity can be seen as the dividend for a decade of supportive macroeconomic policies, aided by unconventional monetary policies.

Now, major central banks face an unprecedented policy normalisation challenge. How smooth will it be? Well, it is difficult to predict. But in my view, “so far, so good”. The transparent, gradual approach has helped markets adapt and has kept the global economy by and large on track, while at the same time addressing the negative side effects that can accumulate when policy rates are kept too low for too long.

Of course, this does not mean the normalisation will be uneventful – either for those normalising policy or for economies on the receiving end of the effects of those decisions. It is important not to underestimate the potential for financial markets to act as triggers or amplifiers of stress. Macro-financial stresses from monetary policy spillovers may increase and be intensified by financial markets. We have already seen some of these effects in Turkey and Argentina. These risks will remain elevated during the normalisation process, and be particularly relevant when the major advanced economies find themselves normalising at different speeds.⁴ Also, disruptive snapback risks cannot be ruled out, especially in economies with prolonged compression in spreads due to persistent capital inflows.

Indeed, recent BIS research suggests that monetary policy spillovers via exchange rates and cross-border financial flows are a significant risk, especially for emerging and small

² See M Bech and A Malkhozov, “How have central banks implemented negative policy rates?”, *BIS Quarterly Review*, March 2016, pp 31–44.

³ See <https://stats.bis.org/statx/srs/tseries/EER/M.R.N.CH?t=i2&c&m=N&p=201807&i=55.16>.

⁴ See C Buch, M Bussière, L Goldberg and R Hills, “The international transmission of monetary policy”, *Federal Reserve Bank of New York Staff Reports*, no 845, March 2018.

open economies.⁵ For the latter, non-linear exchange rate dynamics and capital flows may make it difficult at times for them to decouple their monetary policy from that in the advanced economies, even when domestic fundamentals call for policy rate divergences.

Our research also indicates that spillover dynamics do not lend themselves to simple one-size-fits-all policy prescriptions. They will depend on, among other things, investors' perception of country risks, domestic economic and financial conditions, and policy frameworks. Whatever the case, it will be important to monitor financial stability and capital flow developments closely, especially when the wedges between domestic and policy rates at major central banks widen.

In addition to the normalisation challenge, I would just note that the threat to global trade is another key risk for the global recovery. I recently discussed this at the Federal Reserve Bank of Kansas City's Jackson Hole Symposium.⁶

Looking beyond normalisation

As we look further into the future – that is, beyond monetary policy normalisation – it is not too early to focus our eyes on the ultimate prize: sustainable, stability-oriented growth. This requires consideration of the policy frameworks that are well adapted to the evolving policy environment.

One way to make economies resilient to spillovers is to put one's own house in order. In this respect, central banks have been strengthening

their stability-oriented frameworks. Considerable progress has been made by most central banks in adopting sound, credible monetary policies focused on price and financial stability.

Similarly, significant progress has also been made in terms of improved supervisory and regulatory frameworks – not least because of the efforts of the Basel-based standard-setting bodies, such as the Basel Committee on Banking Supervision and the Committee on Payments and Market Infrastructures. Of course, as the financial system evolves and becomes even more integrated, regulatory frameworks must evolve too. The impact of technology on financial integration will be critical, as recent discussions of digital currencies and fintech suggest.⁷

But central banks and regulatory agencies cannot do it alone. Other national policymakers also have key roles to play. Fiscal policy must be a priority. Policymakers should take advantage of the stronger global recovery to bolster fiscal sustainability.

Microeconomic and structural policies also need strengthening. The list of reforms is long but certainly must include (i) boosting investment in human capital; (ii) enhancing competition; and (iii) nurturing the open multilateral trading system. More needs to be done.

And, of course, greater international cooperation is critical. In this respect, the BIS and its members have essential roles to play. Our mission of promoting global monetary and financial stability through international cooperation is a tried and true one. And it is as relevant now as when the BIS was first established.

Let me conclude. If we want to foster an environment in which 200-year anniversaries for

⁵ See Bank for International Settlements, *BIS Economic Report*, 2018. BIS research finds that an increase in global risk appetite, as measured by the VIX, predicts an increase in EME sovereign yields. There is evidence that a US dollar appreciation also produces the same effect, arising from these countries' foreign currency borrowing and global investor balance sheets.

⁶ See A Carstens, "Global market structures and the high price of protectionism", Overview panel remarks at the Federal Reserve Bank of Kansas City's 42nd Economic Policy Symposium, Jackson Hole, Wyoming, 25 August 2018.

⁷ See Chapter V in *BIS Economic Report*, 2018; and Committee on the Global Financial System, "Fintech credit: Market structure, business models and financial stability implications", report prepared by a Working Group established by the CGFS and the Financial Stability Board, 2017.

central banks become the norm rather than the exception, we have some work to do. We need to strengthen the ability of central banks to respond to the type of spillovers that arise in a financially integrated world by building on the successes and learning from the lessons of the past. But we also have to be humble. To quote a famous American saying “we need to accept the things that cannot be changed, courage to change the things which should be changed, and the wisdom to distinguish the one from the other”.⁸ Luckily, we have brought together here a distinguished group of the world’s experts to help us think through the challenges ahead.

⁸ *Bartlett’s Familiar Quotations*, 18th edition, Little, Brown and Company, 2014.

SESSION 1: FROM THE GREAT MODERATION TO THE GREAT RECESSION AND BEYOND – HOW DID WE GET HERE AND WHAT LESSONS HAVE WE LEARNED?



Participants in session 1, from the right: Claudia M. Buch (chair), Kenneth Rogoff (keynote speaker), Frank Smets (discussant) and Donald Kohn (discussant).

The business cycle became substantially less volatile during the "Great Moderation" from the mid-1970s to the mid-2000s. Explanations span from good practices (better inventory management, improved possibilities for consumption and investment smoothing due to new information technology combined with broader and deeper financial markets and more flexible labour markets) over good policy (more skilful monetary policy and macroeconomic stabilisation policy in general) to good luck (a reduction in the frequency and severity of exogenous economic shocks). Then came

the financial crisis followed by the Great Recession, and the view on the Great Moderation became subject to revision. Focus turned to discussions on "secular stagnation" and whether the Great Moderation contained some of those seeds that fueled the outbreak of the recent financial crisis, including the too loose monetary policy in the early 2000s ("The Greenspan put"). ***Session 1 focused on the broad macroeconomic developments during the recent decades and a deeper understanding of the main forces that drove the economy into the era of unconventional monetary policy.***

KEYNOTE SPEECH BY KENNETH ROGOFF

Thank you for the opportunity to speak at the 200th anniversary of the founding of Central Bank of Denmark. It is a curious moment in the debate over the global economy. Despite a powerful surge in populism in the global political debate, much of the debate in modern financial policy circles increasingly takes as given seemingly very benign post-crisis trends, at least in advanced economies. Although few policymakers voice the idea, many are undoubtedly wondering whether we have returned to the goldilocks era of the early 2000s, with high growth and low inflation. Back then, the view was that vastly improved central bank policy frameworks (more importantly central bank independence), combined with better diversification through financial markets and the spread of market capitalism, promised a long era of high growth with low and stable inflation.

Of course, the 2008 financial crisis temporarily disrupted this blissful state of affairs, but a decade on, global growth appears restored, market volatility is again low, and there remains high confidence in central bankers. Although debt crises are unfolding in a few emerging markets and the Eurozone is a perpetual work in progress, there does not appear to be any great concern in markets about another systemic global financial crisis in the foreseeable future. In fact, returns on “safe” advanced country bonds remain at near historic lows outside periods of financial repression, and long-term inflation expectations are remarkably aligned with central bank targets. Against a backdrop of rising inequality, some economists argue that perhaps government debt to GDP levels should be allowed to considerably expand, not just to the 100% plus levels that the IMF has started again warning about, but to Japan-like levels of 200% and beyond. The idea that any advanced country – even in Europe – could ever again experience a

sovereign debt problem, much less very high inflation, is considered as mildly hysterical.

Indeed, if today’s extremely low global real interest rate environment continues, it is far more difficult to conjure up a crisis that in a world of higher “normal” interest rates. As long as borrowers can tap credit markets at extremely low rates, indeed lower than growth rates, it is difficult to have a significant macroeconomic crisis of any type, at least in an advanced economy.

Yet, there is another way to look at the data that ought to bear more weight in the policy world. Economic volatility goes in cycles. The world is in a low volatility cycle now, but there is a distinct chance of a return to much higher volatility at some point over, say, the next five years or less. Moreover, apparently low short-term macroeconomic and financial volatility may be masking a post-financial crisis rise in tail risk. Indeed, after an extraordinary period of easy monetary policy and very low real interest rates, a wide range of asset and debt markets are all extremely vulnerable to an unexpected rise in long-term global equilibrium real interest rates. Is this a serious risk? While hardly a central scenario, such a shift is hard to rule out given policymakers’ uncertainty about just why global real interest rates have fallen so dramatically, especially at very long horizons and especially since the financial crisis.

There are, of course, a host of explanations of the trend fall in real interest rates over the past fifteen years (demographics, low productivity growth, rising inequality, increased fear of rare disasters, global savings glut, the rise of Asia, quantitative easing). There is, however, little agreement on which factors are the dominant ones, and which ones are permanent as opposed to temporary. For example, as Reinhart, Reinhart and Rogoff (2015) show, closely hew-

ing to a framework developed by Robert Barro, a relatively modest rise in global perceptions of rare disaster risk (say from 2% to 3%) can more or less fully explain the drop in real interest on “safe” bonds observed since the financial crisis. If (and of course this is a big if), strong US growth continues and is followed by similar growth in large swathes of the rest of the world, fear of tail risk may fade. If this leads to sharply higher real interest rates on safe bonds, it could lead to massive problems in many asset classes, and a much worse version of what emerging markets are experiencing now. Other factors that could raise long-term equilibrium real interest rates include an upward revision of global productivity trends (I will have more to say on this later), or perhaps a crisis in emerging markets that leads to a sharp reversal of capital flows from developing world to the United States. A rise in equilibrium global interest rates could also put enormous pressure on the Eurozone, where extraordinarily low equilibrium rates have been a major factor in helping contain and stabilize some of the more vulnerable economies, for example high debt Italy.

A second source of risk concentration is the growing dominance of the dollar in the global economy, which in turn places increasing reliance on the United States as the caretaker of global financial stability. Yet, the US is in a political upheaval not usually seen outside emerging markets, and there must be at least a tail risk that politics drives the United States into unsustainable populist policies just as so many emerging market economies have experienced. Thus, as benign as the current scenario is, the concentration of risks in virtually all asset classes around the outside prospect of a rise in global interest rates and/or a destabilization of the dollar creates concerns that ought to have the attention of policymakers even if they seem to be dismissed by markets.

Indeed, the central point of Rogoff (2006), presented at Kansas Fed Jackson Hole symposium, was exactly that volatility goes in cycles, and that the “Great Moderation” could be illusion. First, let’s look at some of the more benign trends.

Figure 1 illustrates the trend decline in global real interests for the benchmark inflation-indexed ten-year US Treasuries. Although these have risen more than 150 basis points from “peak secular stagnation” in 2013 (coinciding with Lawrence Summers’ famous IMF speech), rates remain low by historical standards, at least outside periods of financial repression. Although I do not include a figure for the 30-year inflation indexed treasury bond, that indicator is perhaps even more striking, showing an imputed real interest rate is around one percent, far below the or even from the 2.2 percent level earlier in this decade, much less the very long-term average closer to 3 percent. As noted earlier, this trend has many explanations, but none are remotely definitive. One explanation that perhaps receives too little attention, is that fact that, in principle, a small increase in fear of tail risk can explain the drop of real interest rates since the financial crisis and is also consistent with the post-financial crisis rise in the equity premium. The basic intuition (from Barro) is that tail risk acutely affects the value market participants attach to safe assets that have payoffs even in extremely bad states of nature.

Figure 2 is particularly interesting, it shows the 30-year inflation expectations derived from the difference between prices on inflation-indexed bonds. These now stand at just over 2 percent. Survey data show slightly higher long-term inflation expectations but the basic downward trend is the same. Now, for central bankers, the fact people have long-term inflation expectations very close to the stated monetary policy target may seem heartwarming, but it might also reflect an underestimate of long-term mac-

roeconomic risks. Do markets seriously believe that governments will no longer resort to inflation even in the event of a catastrophe that puts profound pressure on budgets, a financial crisis, a very large-scale conflagration, a cyberwar, a pandemic, etc.? Those who argue that US debt is free of default risk point to the fact that US can always let steam off any budget problem by inflating (which of course amounts to a partial default in real terms, but it not a technical default). If so, shouldn't there be a large premium in long-term inflation expectations, of at least 1% as there was before the financial crisis? Some might answer that strengthened central bank independence makes partial default through inflation impossible. But then is it reasonable to assume zero default risk? Another explanation of figure 2 is that markets do recognize the possibility that a crisis may force high inflation, but they now view the risks of deflation to be just as high, possibly because central banks are hampered by the zero bound (although that is completely solvable program as for example, Rogoff, 2016, illustrates.)

The combination of lower real rates and lower inflation expectations have both dramatically pushed down estimates of neutral short-term policy rates although to say the least, there is great uncertainty about exactly where these may land.

What about the great moderation which, prior to the financial crisis, was a dominant theme in markets and policy analysis. Figure 3 from Rogoff (2006) shows the trend decline by decade in output volatility, from the 1960s to the early 2000s for a select group of countries (for other countries, see Rogoff, 2006). The pattern of significant decline in output volatility across decades holds for a most countries, albeit the great moderation started somewhat later in emerging markets. A large literature prior to the financial crisis gave a variety of alternative explanations for the Great moderation: better

and more predictable central bank policy, deeper financial markets, demographics, better techniques for inventory management, a higher percent of economic activity in services and the government, globalization, to name a few (see Rogoff, 2006). Of course, there was a massive increase in volatility around the global financial crisis. But as Figure 5 shows, volatility has returns to low levels since, and indeed even appears to be trending down. It is difficult to look at the volatility cycles in Figures 4 and 5 without concluding that the Second Great Moderation will not last forever. To paraphrase Minsky, the periods of low market volatility induces behavior that lays the seeds of the next round high volatility.

Indeed, when it comes to asset prices, which are forward looking, the great moderation was much more moderate for output. Figure 6, again from Rogoff (2006), is based on formal structural break tests. There are a couple significant structural breaks but as is evident from the figure, these are much smaller than for output. Again, updating the analysis to incorporate the recent period, Figure 7 shows the big surge in stock volatility around the crisis followed by the recent lull in volatility. Figures 6 and 7 for stock prices, even more than figures 4 and 5 for output, are almost impossible to reconcile with the view that we are safely ensconced in a long second Great Moderation. Exchange rate volatility, like stock price volatility, shows a slight downward trend, but is highly volatile, as illustrated in figure 8. (Ilzetski, Reinhart and Rogoff, 2018 show that there has been a more significant and longer-lasting downward trend across the major anchor currencies). For long-term bond returns, however, the great moderation was never a trend at all, but just a return to the lower volatility levels from before the sharp rise late in the 1970s, and in fact, volatility remains higher than in the 1960s; see Figure 9.

In fact, since the financial crisis, markets have arguably become much more concerned about tail risk, which Barro (2006) has shown to be a major potential driver of asset price volatility and low real interest rates. Figure 10 is taken from Kozlowski, Veldkamp and Venkateswaran, (2015) (updated courtesy of the authors), who measure tail risk by using out-of-the-money options on the S&P. The rise is quite significant and, if viewed to be long-lasting, enough to explain virtually all the fall in the riskless real rate of interest observed since the financial crisis (as Reinhart, Reinhart and Rogoff (2015) show). Interestingly, Kozlowski et al. find that rise in tail risk can explain a broad range of other post-crisis trends including the drop-off in investment and temporarily slower output growth.

Another long-term trend that has received much attention is the trend decline in productivity, illustrated in figure 11. The basic data are well-known, and I will not repeat discussion here. Is this a permanent trend because human invention has reached diminishing economic returns as Robert Gordon (2016) has argued (his is more an “end of an era” argument than an end of history argument). Elsewhere (Rogoff, 2015), I have argued that pessimistic extrapolations of short-term trends conflate underlying long-term trends with the debt supercycle that the world has experienced in the run-up and aftermath of the financial crisis. As Reinhart and I showed in our 2009 book *This Time is Different*, the quantitative history of deep systemic financial crises suggests that recessions associated with deep financial crises tend to be far longer lasting and have far slower recoveries than ordinary recessions. In Reinhart and Rogoff (2014), which looks the 100 most severe financial crises of the 150 years, the median time to recovery (in the sense of returning to pre-crisis per capita GDP) tends to be on the order of 8 years, when in a typical recession the norm is 9 months to a year. So, both the poor economic performance in the

years after the crisis, as well as improving global growth a decade on, is perhaps not so surprising, and secular stagnation pessimism a bit overdone. That said, Rogoff (2015) argues that the debt supercycle is likely not over, with a final round of crises in emerging markets and China still quite possible.

Regardless, in general, it can be very misleading to extrapolate long-term productivity trends from current trends, especially in an era of exploding AI. If global productivity rises significantly, the overall impact for the global economy should be distinctly positive, but if higher growth leads to higher investment and interest rates, it is easy to imagine that there will be significant areas of distress, especially where debt is high and asset prices are especially elevated.

Of course, higher productivity growth would be good overall for the global economy, but if it leads a significant rise in global real interest rates, then there can still be severe problems in countries that have high debt but lingering slow growth. For example, if productivity growth in high debt Italy were to significantly lag (as it has for the past 20 years), a general rise in global interest rates could create sustainability doubts that could produce a classic self-fulfilling crisis.

In addition to low real interest rates, another area where risk maybe concentrated stems around the rise in dollar dominance in the global economy. A large developing literature, summarized in Ilzetski, Reinhart and Rogoff (2018), shows that in many ways, the US dollar has become even more important in the global economy than it was under the Bretton Woods system. Indeed, a greater share of countries implicitly use the dollar as an anchor or reference currency than in the 1950s. (One factor is that the many of the countries that were previously outside the core global financial system, for example, China and the former Soviet Un-

ion, have now entered it, and use the dollar as a reference currency. Gopinath (2015) shows that over 60% of global manufactures trade is in dollars, and of course a much larger fraction of global commodity trade is in dollars. Another measure is the share of the dollar in global central bank reserves, where close to 2/3s is in dollars (Ilzetski, Reinhart and Rogoff, 2018). A number of papers, most recently Farhi and Maggiori (2018) have argued that the inconsistency between the falling share of advanced economies in global GDP, and the rising share of advanced economies in global debt, present risks of Triffin dilemma, with today's apparent benign equilibrium being more fragile than appearance suggest. This does not mean an "accident" needs to happen, but as Farhi and Maggiori point out, there is a great temptation for hegemon to push the limits of debt and inflation risk, and earlier eras of similar hegemony have tended to blow up. Again, there is a concentration of global risks, and a tendency by markets not to appreciate how difficult these risks are to diversify.

In sum, is the global economy at a Fukayama type "end of history" moment when it comes to major global financial, debt and inflation crises? Perhaps, but sweeping extrapolations of trends are far more likely just another "This Time is Different" moment. Rogoff (2006) argued that the First Great Moderation was a period of low volatility, not a trend. Although volatility for macroeconomic variables did fall significantly over a couple decades, the fact that asset price volatility did not fall by nearly as much suggested that the macro volatility decline might not be permanent – asset prices are forward looking variables. Indeed, the 2008 financial crisis unleashed a period of very high volatility. A decade on, there is now a "second great moderation," but updating the evidence again suggests this is likely to be temporary. Volatility goes in cycles, and we are likely in one. Indeed, it is quite possible that the current lull is merely a phase in a longer debt supercycle that

first began in the United States, then passed to Europe, and will eventually play out in emerging markets and China.

Central bankers must not only be vigilant about the possibility of the next recession (which more likely than not will be a "normal" one, not a deep systemic financial crisis, even with the rapidity of financial deregulation in the US. Regardless, it is important to sharpen policy monetary policy tools to prepare for even bigger challenges ahead, whether it be responding to another financial crisis or a new-age cyberwar shock. True, finding ways to make fiscal policy faster acting and more effective would certainly help, though the blunt and very political nature of fiscal policy means that it can only be supplement to monetary policy. Making macro prudential regulation countercyclical instead of procyclical would also be very helpful, though again this is difficult to achieve politically, and much work is needed to sharpen forecasting as needed to make these tools effective. In any event, this is a tool that in most countries, monetary policymakers share with other parts of government.

Given constraints on all the alternatives, it is also important to think about how to prepare monetary policy itself to better deal with very large shocks, especially in light of downward trending neutral policy rates, and the zero bound. I have treated this issue elsewhere (Rogoff, 2016, 2017), in particular how central banks can move faster into the digital era as well as make the regulatory and institutional changes needed for fully effective negative interest rate policy. The current uptick in the global business cycle, which in part reflects catchup after the typical long slow recovery after financial crises, together with a still unusually benign real interest rate environment, offers opportunities for bold thinking about how to strengthen policy instruments. It must not be squandered.

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Figures

Figure 1

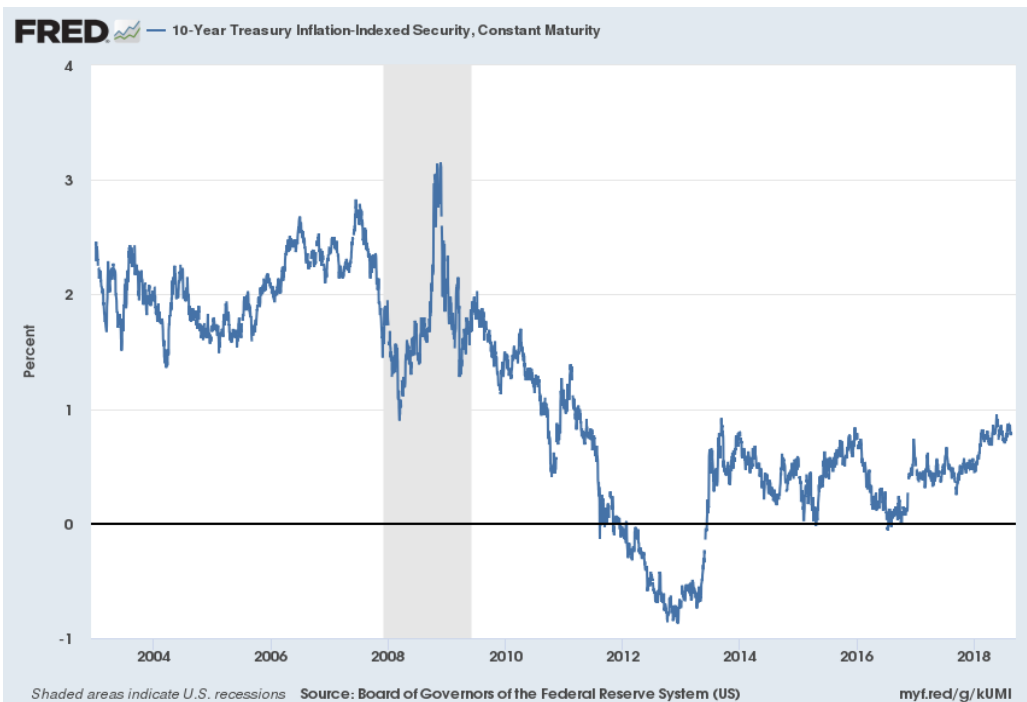


Figure 2

Markets increasingly view long-term risks of inflation and deflation as symmetric

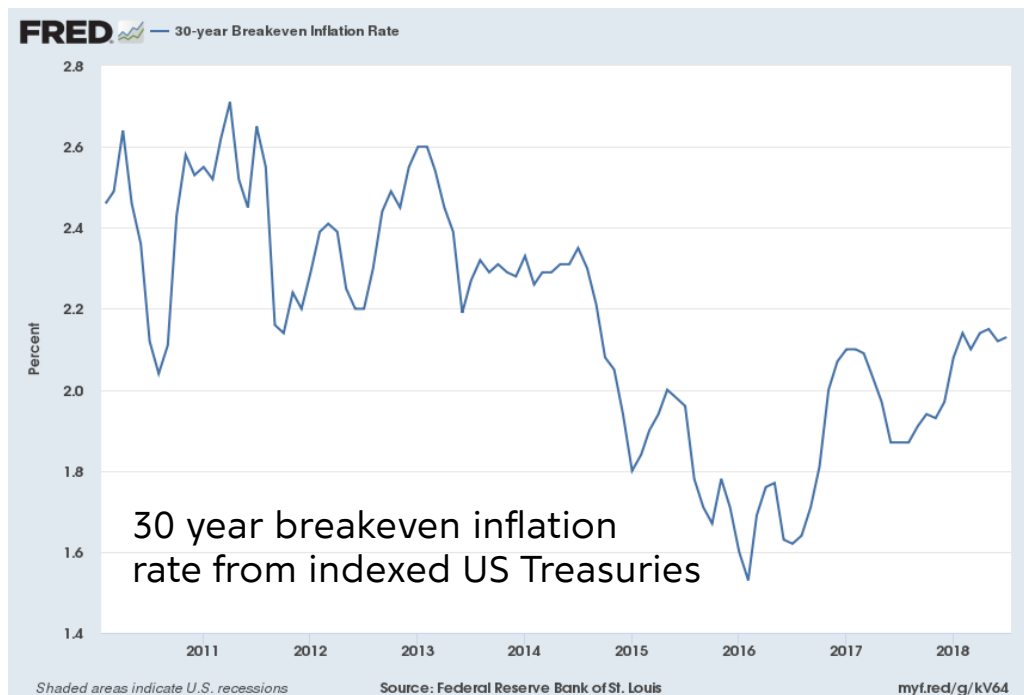
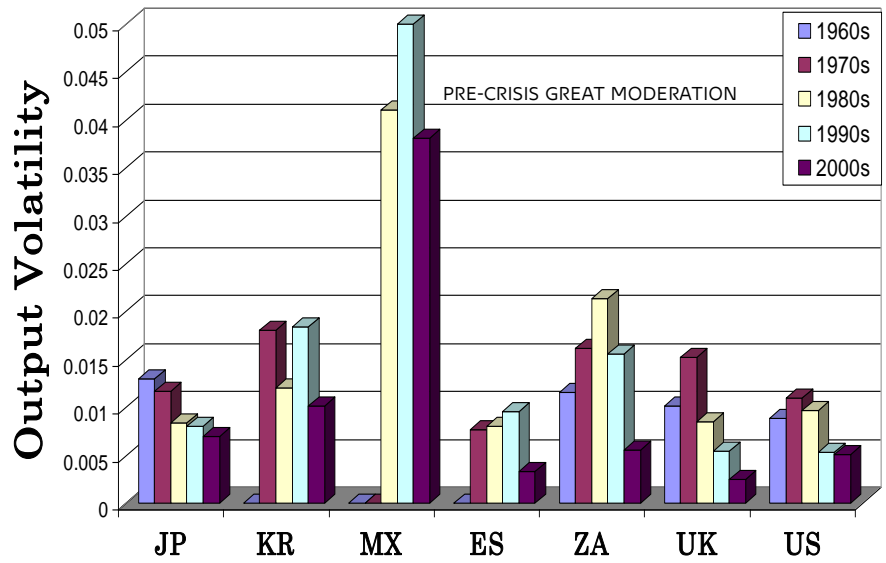
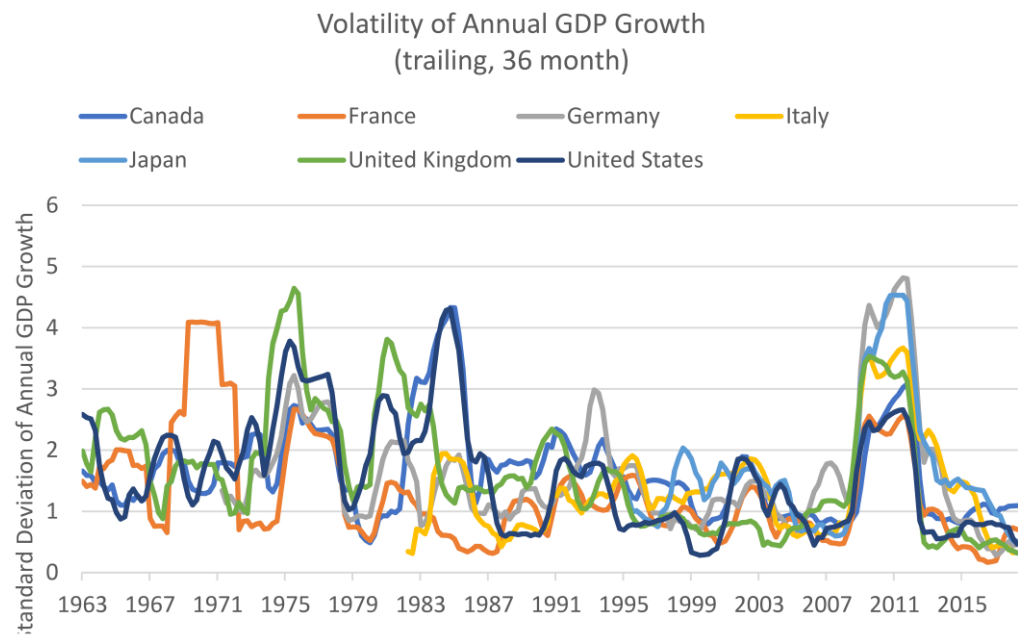


Figure 3



Output Volatility is measured as the standard deviation of the change in natural log of real GDP for the given decade. All of the time series begin in 1960 or 1970 and end in 2005Q4 or 2006Q1. Source: Rogoff (2006).

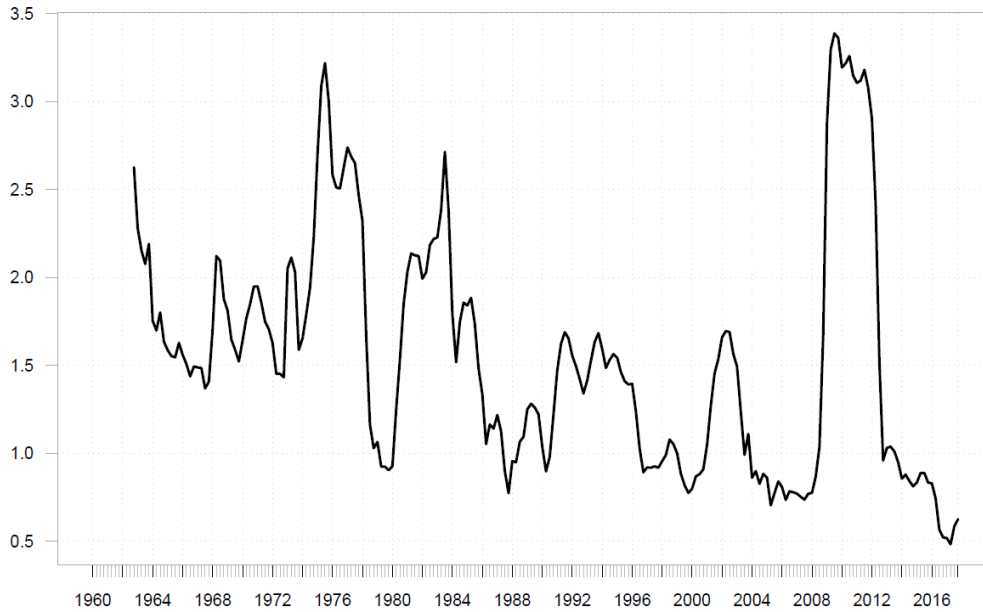
Figure 4



Data source: FRED

Figure 5

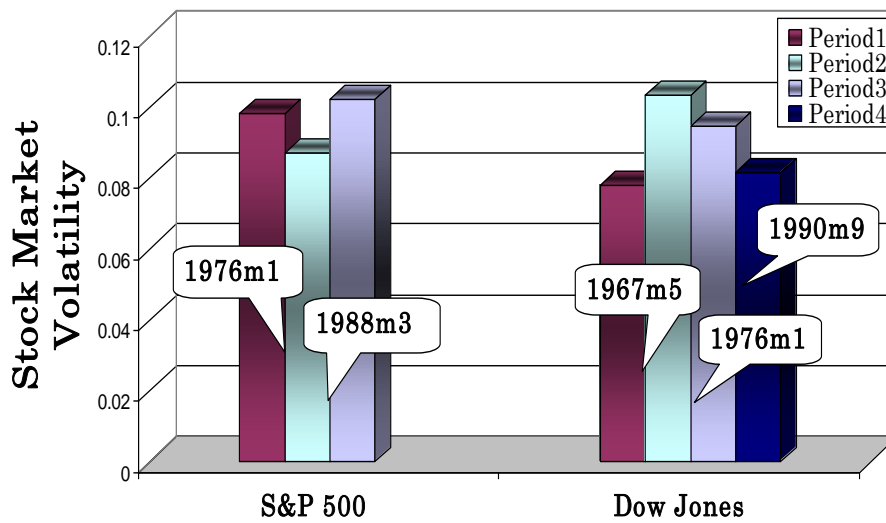
GDP Growth Volatility (median 3 year rolling average USA, Italy, France, Germany UK, Japan, Canada)



Data source: FRED

Figure 6

Even before crisis, fall in asset price volatility much less pronounced than in output.



Volatility is measured as the standard deviation of the deviation of the natural log of the stock market index from its HP-filtered trend. Breaks determined endogenously using Peron (1991) test. Source: Rogoff (2006).

Figure 7

After Crisis, Stock Market Volatility is very low, but is this a trend or a pause?

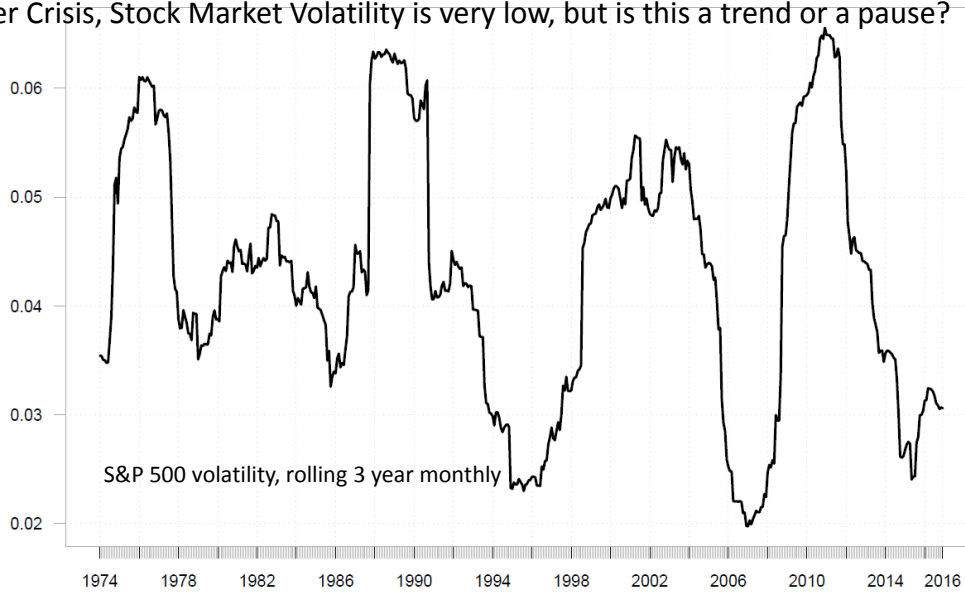
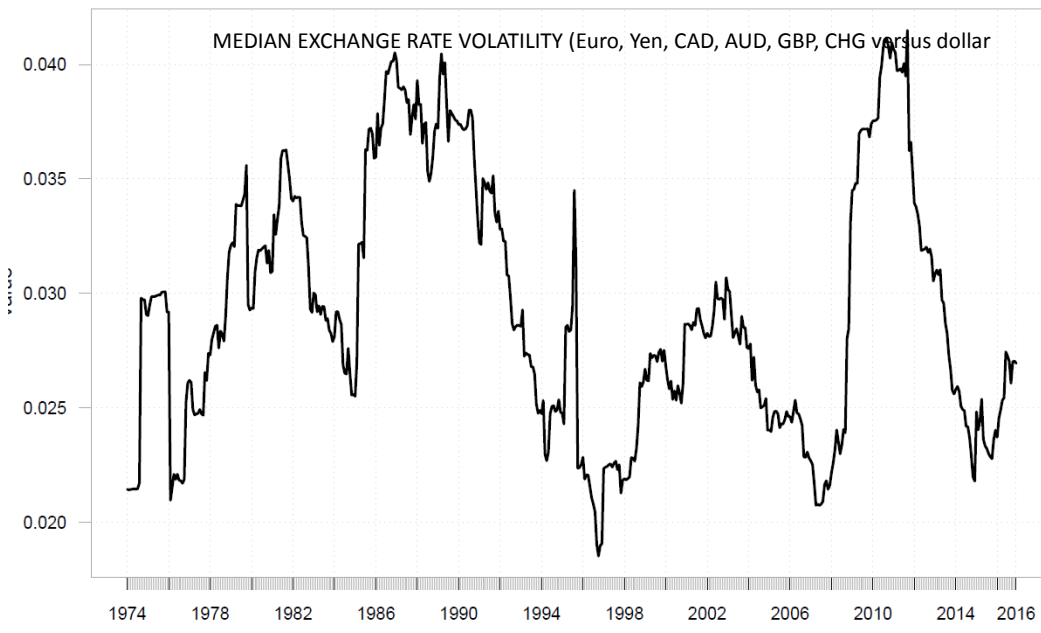


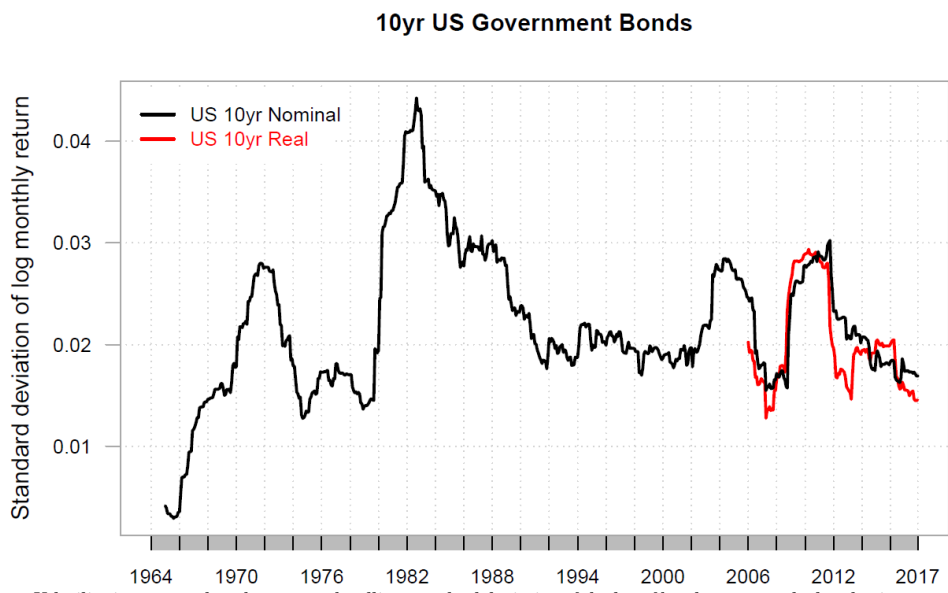
Figure 8



Three year rolling average

Data source: FRED

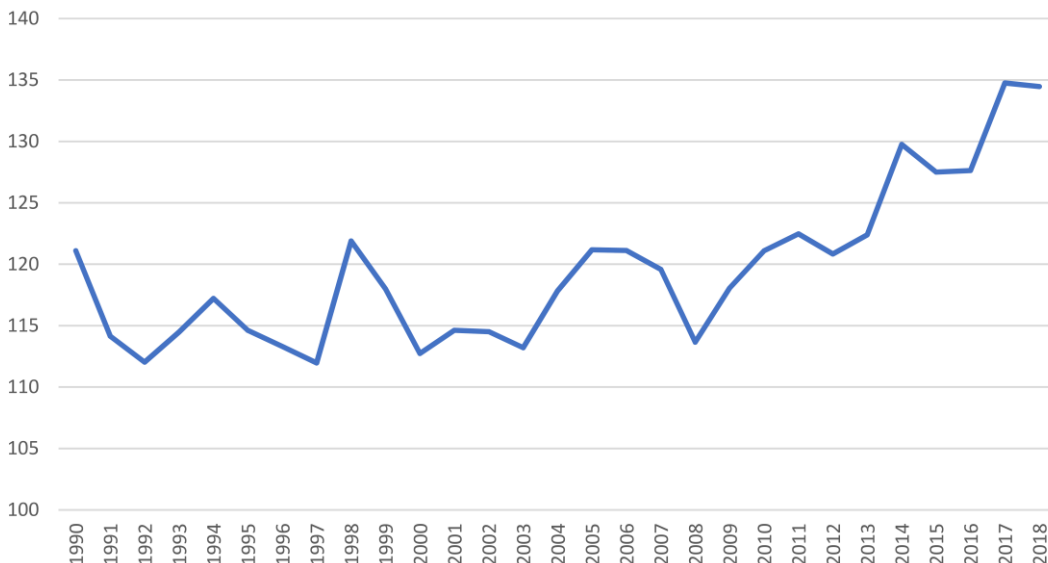
Figure 9



Rogoff, 2018. Volatility is measured as the 36-month rolling standard deviation of the log of bond returns calculated using formula 10.1.19 from Campbell, Lo and MacKinley (1997).

Data source: FRED

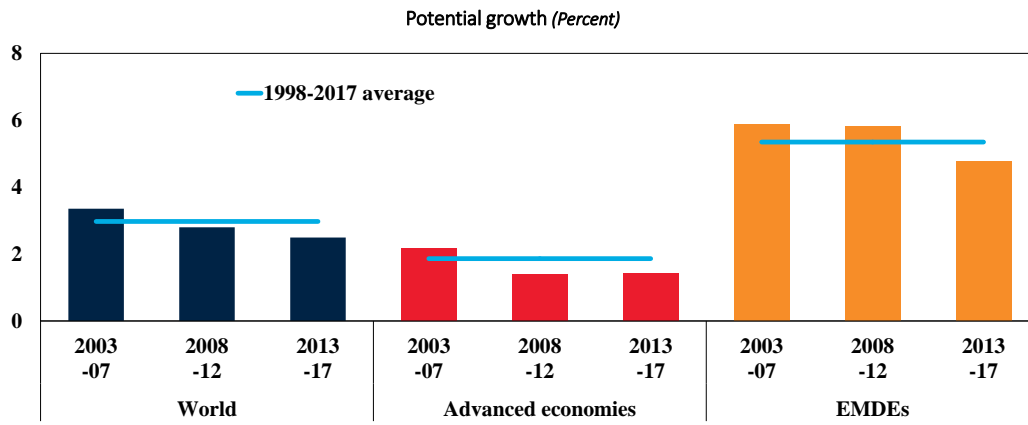
Figure 10



Vertical axis is the skew index, a measure of the market price of tail risk on S&P 500, constructed using options prices
Source: Updated from Kozlowski, Veldkamp and Venkateswaran, 2015, courtesy of authors, using their data and calculations

Figure 11

Potential Growth: Consensus Projections



Sources: World Bank, Kose et. al

Note: Based on potential growth derived using production function approach. Left Panel. GDP-weighted averages for a sample of 30 advanced economies and 50 EMDEs. Right Panel. Share of economies among 30 advanced economies and 50 EMDEs with potential growth in each period below the longer-term average (1998-2017) and these economies' share in global GDP. The horizontal line indicates 50 percent.

DISCUSSION BY FRANK SMETS

Slide presentation


EUROPEAN CENTRAL BANK
EUROSYSTEM

<p>Frank Smets European Central Bank</p> <p>Views expressed are my own and should not be attributed to the ECB.</p> <p>I would like to thank (1) Desislava Tartova and Bela Szörfi, (2) Thomas Kostka, Roland Beck and Adam Cap, and (3) Johannes Gräßl and Arnaud Mehl for discussions and help with the preparation of this presentation</p>	<p>Discussion From the Great Moderation to the Great Recession and beyond. Ken Rogoff</p> <p>Copenhagen, 7 September 2018 200th Anniversary Danmarks Nationalbank</p>
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Outline

Some complementary observations to Ken Rogoff's excellent key note

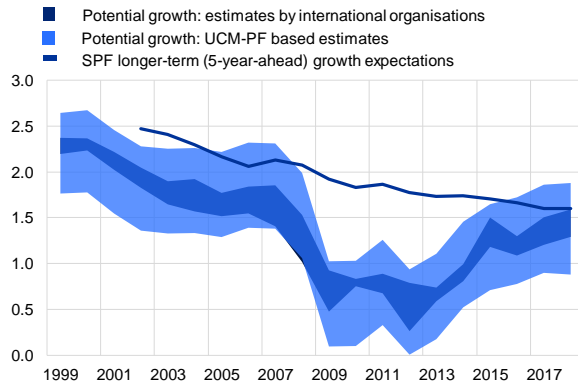
1. Potential growth in the euro area
2. Corporate dollar debt in EMEs
3. International role of the euro

2

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1. Potential output growth in the euro area

Potential growth in the euro area before and after the financial and sovereign debt crisis



Source: Malin Andersson, Bela Szörfi, Máté Tóth and Nico Zorell (2018), "Potential output in the post-crisis period", ECB Economic Bulletin, Issue 7/2018.

3

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1. Potential growth in the euro area

- Most estimates of euro area potential output growth have fallen since 1999 by about 1 percentage point ...
- ... and show a pronounced procyclicality during the financial and sovereign debt crisis
- Why? Three hypotheses:
 - Mismeasurement (end-of-sample bias problem; flattening of the Phillips curve due to downward nominal rigidity that is unaccounted for; ...) - Implication: the true potential growth rate is higher as, for example, reflected by the longer-term growth expectations and the output gap is higher
 - Hysteresis: The fall in demand has affected supply, for example, by reducing investment and the capital stock, by eroding human capital and by detaching unemployed workers from the labour force – Implication: Strong demand policies can bring back positive supply
 - Financial crisis and the need for deleveraging has led to a misallocation of resources and lower productivity growth – Implications: Need recapitalization of the financial sector and structural policies to address negative supply effects
- These hypotheses have different implications for stabilisation and structural policies

4

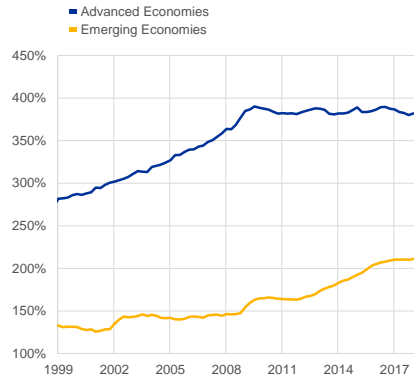
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2. Corporate dollar debt in EMEs

EME debt on the rise...

Global debt AEs vs EMs

(in % of GDP; quarterly data.)



Sources: IIF Global Debt Database; all sectors
Latest observation: 2018 Q1.

5

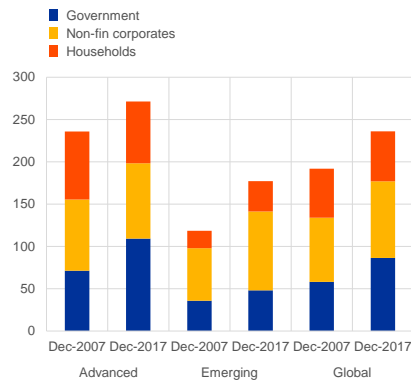
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2. Corporate dollar debt in EMEs

The biggest component of the rise in EME debt is corporate debt

Global debt as percent of GDP

(in percent of GDP in 2007 vs 2017; by sector)



Sources: IIF Latest observation: 2017 Q4

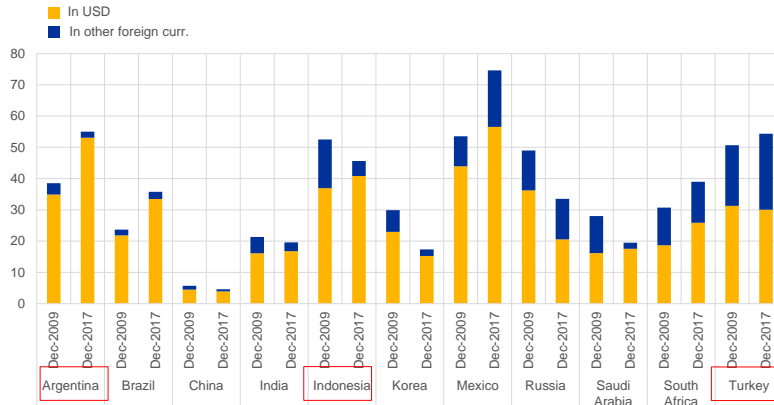
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2. Corporate dollar debt in EMEs

Several EMEs have issues large amounts of USD corporate debt

Share of foreign currency debt in non-financial corporate debt
(share in 2009 and share in 2017)



Sources: IIF; highlighted countries are those with current account deficits

7

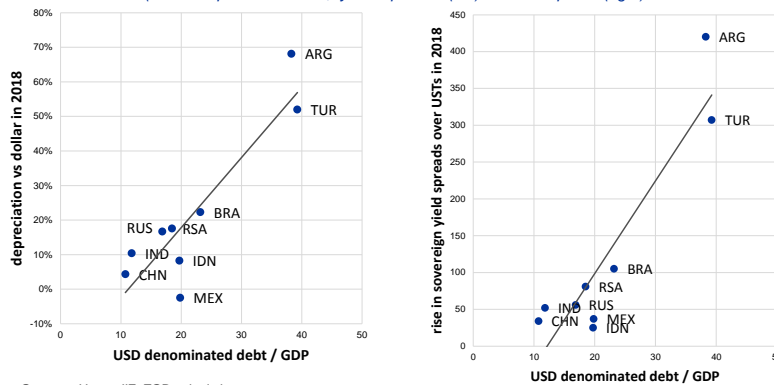
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2. Corporate dollar debt in EMEs

Recent market movements among EMEs have been commensurate to USD exposure

Dollar depreciation (left) and rise in spreads (right) vs dollar debt over GDP

(x-axis: in percent of GDP; y-axis: percent (left) and basis points (right))



Sources: Haver, IIF, ECB calculations.
Latest observation: 31 Aug 2018

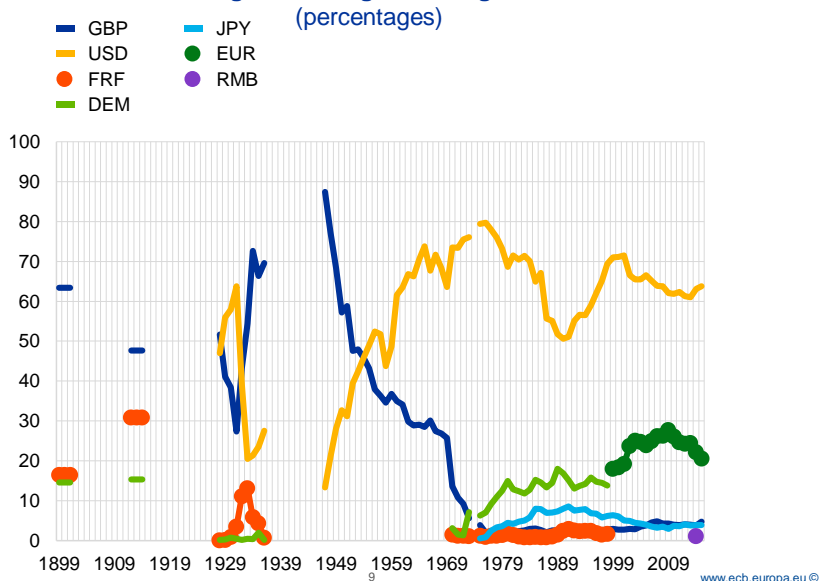
8

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3. The international role of the euro

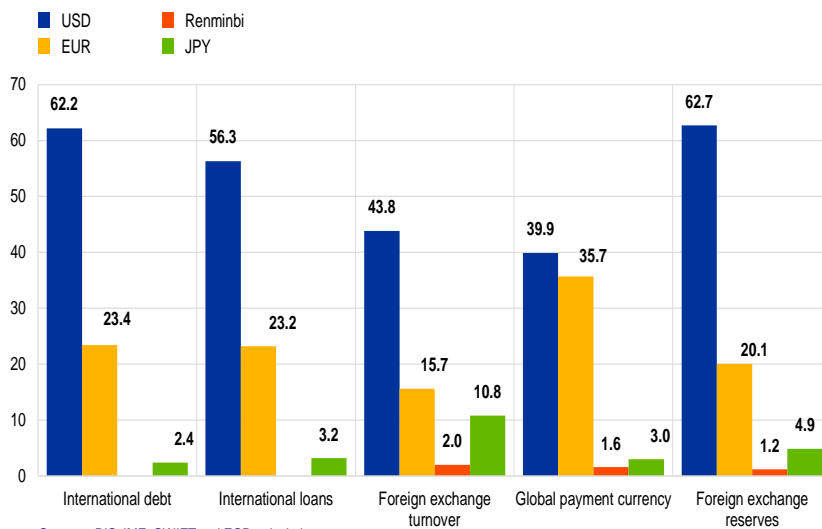
120 years of international currencies

Share of global foreign exchange reserves (percentages)



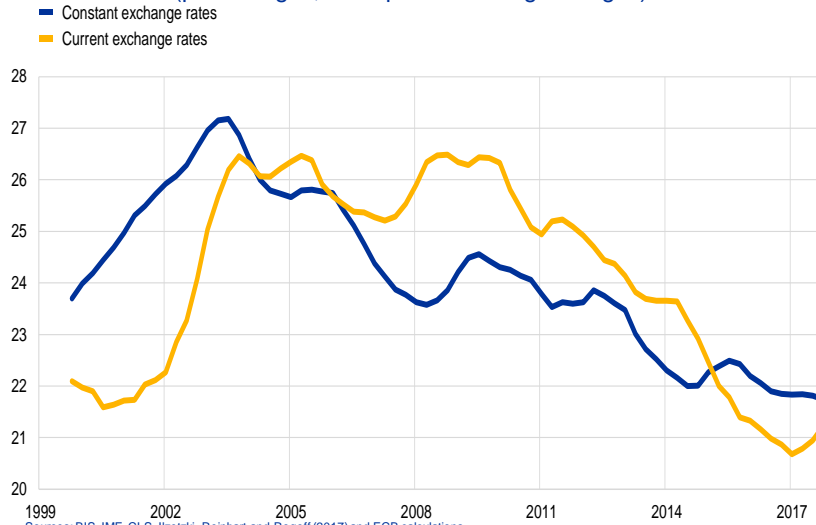
The euro is today the 2nd most important international currency

Snapshot of the international monetary system (percentages)



The euro's international role stands at historical lows

Index of the euro's international role
(percentages; four-quarter moving averages)

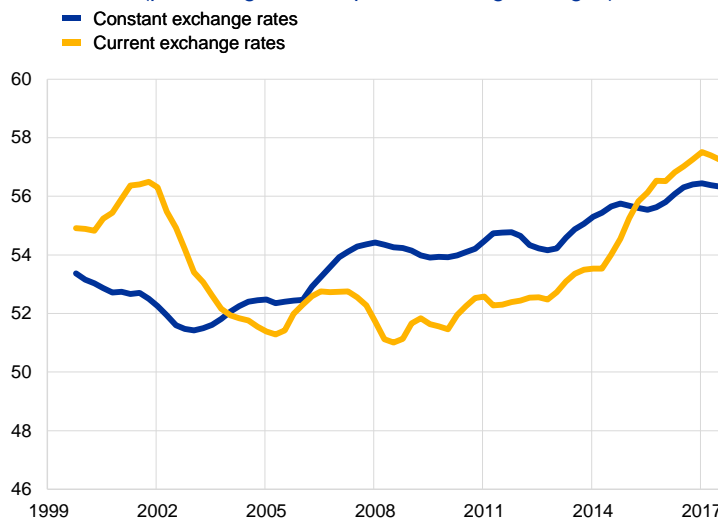


Sources: BIS, IMF, CLS, Iizetzi, Reinhart and Rogoff (2017) and ECB calculations.

Notes: Simple arithmetic average of the shares of the euro at constant (current) exchange rates in stocks of international bonds, cross-border loans, cross-border deposits, foreign exchange settlements, global foreign exchange reserves and exchange rate regimes. Data at constant exchange rates were not available for foreign exchange settlements. Iizetzi, E., Reinhart, C.M. and Rogoff, K.S., "Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?", NBER Working Paper No 23134, February 2017. www.ecb.europa.eu ©

The US dollar's international role stands at high levels

Index of the US dollar's international role
(percentages; four-quarter moving averages)



Sources: BIS, IMF, CLS, Iizetzi, Reinhart and Rogoff (2017) and ECB calculations.

Notes: Simple arithmetic average of the shares of the euro at constant (current) exchange rates in stocks of international bonds, cross-border loans, cross-border deposits, foreign exchange settlements, global foreign exchange reserves and exchange rate regimes. Data at constant exchange rates were not available for foreign exchange settlements. Iizetzi, E., Reinhart, C.M. and Rogoff, K.S., "Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?", NBER Working Paper No 23134, February 2017. www.ecb.europa.eu ©

3. The international role of the euro

The ECB's policy line on the international role of the euro: "Neither hinder nor foster"

"The Eurosystem will accept the international role of the euro as it develops as a result of market forces" (Wim Duisenberg, 14 January 1999)

"Since the internationalisation of the euro, as such, is not a policy objective, it will be neither fostered nor hindered by the Eurosystem" (ECB Monthly Bulletin, August 1999)

13

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3. The international role of the euro

The balance of economic costs and benefits

Benefits

- Seigniorage
- Lower transaction costs, efficiency gains
- Exorbitant privilege

But...

- **Blurrier money signals**
- **Capital flow volatility**
- **Exorbitant duty**
(wealth transfer, countercyclical appreciation in crisis times)

Also...

- Lower exchange rate pass-through
- Responsibility burden for global financial stability *(swap lines)*
- Hedge against reach of US extraterritorial legislation

14

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3. The international role of the euro

What could be done to foster the euro's standing?

- **Determinants of international currency use**
 - ✓ Size
 - ✓ Stability
 - ✓ Liquidity
 - ✓ Geopolitical outreach

- **Standard ECB policy line**
 - ✓ Sound macroeconomic policies
 - ✓ Completing Banking and Capital Market Unions

15

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Panel evidence: easier to hinder than to foster

Determinants of global FX shares, 1945-2015

	(1) Full Sample	(2) Pre-1973	(3) Post-1973	(4) Full Sample	(5) Pre-1973	(6) Post-1973
Inertia	0.917*** (0.010)	0.789*** (0.078)	0.940*** (0.018)	0.916*** (0.015)	0.801*** (0.087)	0.952*** (0.016)
Network effects	1.855*** (0.273)	6.513*** (1.130)	1.305*** (0.331)	1.969*** (0.347)	5.392*** (1.572)	1.097*** (0.323)
Credibility	0.021 (0.059)	-0.746 (1.760)	0.046 (0.045)	0.127*** (0.043)	-1.238 (1.244)	0.104* (0.056)
IMF art. VIII compliance	0.036*** (0.007)	-0.068 (0.065)	0.030* (0.016)			
Capital flow restrictions				0.023*** (0.004)	-0.012 (0.039)	0.008 (0.007)
Official position (supportive)	-0.368 (1.222)	0.000 (0.000)	-0.592 (1.160)	-0.294 (1.217)	0.000 (0.000)	-0.559 (1.159)
Official position (restrictive)	-3.044*** (0.885)	-3.424 (3.693)	-2.112*** (0.592)	-3.298*** (0.860)	-4.637 (4.414)	-2.164*** (0.561)
Exchange rate regime (supportive)	-0.073 (0.827)	0.000 (0.000)	0.487 (0.818)	-0.060 (0.871)	0.000 (0.000)	0.564 (0.844)
Exchange rate regime (restrictive)	-2.053** (0.936)	-2.597 (4.922)	-2.588*** (0.536)	-2.058* (0.924)	-2.194 (4.795)	-2.644*** (0.510)
Other measures (supportive)	-0.098 (0.384)	-1.794** (0.844)	0.839+ (0.600)	-0.180 (0.368)	-1.874* (1.025)	0.694 (0.630)
Other measures (restrictive)	-5.755*** (0.824)	-10.644*** (4.337)	-3.969*** (0.425)	-5.769*** (0.847)	-10.006*** (4.121)	-3.880*** (0.422)
Country effects	YES	YES	YES	YES	YES	YES
Time effects	YES	YES	YES	YES	YES	YES
Observations	271	42	229	271	42	229
No. of groups	8	4	8	8	4	8
R ² (overall)	0.994	0.991	0.996	0.994	0.991	0.996
R ² (within)	0.904	0.828	0.864	0.902	0.828	0.863
R ² (between)	1	1	1	1	0.999	1

Sources: Eichengreen, Mehl and Chitu (2016).

16

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DISCUSSION BY DONALD KOHN

It is an honor to be participating in this celebration of the 200th anniversary of the Danmarks Nationalbank.

The title of this session implicitly asks about the relationship of the good inflation and economic performance of the 1990s and early 2000s to the other key goal of central banks – financial stability, the distinct absence of which resulted in the great recession. Many lessons have been learned from the global financial crisis and slow recovery – including lessons for crisis management and for monetary policy at the effective lower bound for interest rates. But in my short time, I am going to reflect on the buildup of vulnerabilities during the good economic times and how to protect against that in the future. I fear memories may be fading; banks in the United States are profitable and well capitalized, and their requests for regulatory relief are falling on sympathetic ears in some quarters. Regulations can undoubtedly be made more efficient and effective, but now would seem a propitious time to review the lessons of the years before the crisis so as to avoid the trap of forgetting and repeating history.

Lesson 1: Hyman Minsky was right: long periods of prosperity contain the seeds of their own destruction, operating through the financial system.

Many types of financial vulnerabilities have been identified as the proximate “causes” of the global financial crisis (GFC) – increases in leverage, greater maturity mismatches, migration away from banks to lightly regulated “shadow banks”, opaque and mispriced derivatives. But the underlying cause was complacency mixed with hubris. That mindset led the private sector to take what turned out in hindsight to be misunderstood and inadequately compensated risks, and it led regulators to be far too relaxed about what was happening.

The complacency was an understandable response to a long period of expansion with minor and infrequent recessions and low and stable inflation – the great moderation. The reasons for this good performance were many and some are permanent. Financial innovations allowed more sophisticated risk sharing and consumption smoothing; private nonfinancial businesses were tracking sales and managing inventories much better; central banks had improved policy frameworks to focus on price stability; and luck played an important role.

Surely the good times would last. Real estate prices could only rise; default probabilities could be forecast from recent benign history, so mortgage risk could be sliced and diced into tranches that would behave in a predictable way – a judgment validated by the credit rating agencies; compensation could be based on short-term profitability because the long-term held no special risks; euro zone countries would not default on their sovereign debt.

Complacency extended to the public sector watchdogs who were lulled by the reported rude health of financial institutions and came to believe that the private sector had the knowledge and incentives to police itself. In those circumstances, light-touch, principles-based regulation would facilitate private sector innovation and be sufficient to limit any macro risks.

We economists were complicit. We built models in which financial frictions played no serious role. The influence of financial variables on the economy could be summarized in a few interest rates and asset prices that were determined in efficient markets that incorporated all available information.

Sadly, we had to relearn what Minsky had taught us many years ago.

Finance matters. When vulnerabilities mount in financial structures – what Minsky called speculative and Ponzi finance – cycles can turn quickly and downturns build on themselves.⁹ Negative developments for finance and spillovers to the economy are much more likely when tail risk – the unanticipated drop in real estate prices, the threatened default on the debt of a Eurozone government – materializes in the context of easy credit conditions and extended balance sheets following a period of rapid credit growth. In those circumstances, seemingly small shocks can result in very adverse feedback loops between finance and the real economy. Fear and uncertainty about the scale and incidence of the losses undermine access to funding, forcing fire sales of assets by lenders and sharp reductions in credit availability.¹⁰

These financial developments can have substantial externalities – collateral damage to households and businesses, most of whom are innocent bystanders in the preceding financial exuberance. Private sector participants in financial markets will not price these externalities.

Notably, in this story, the culprit is regulatory and private market failure, not too-easy monetary policy. In the US we experienced a small overshoot of our inflation target in 2006/07. Policy perhaps could have been a little tighter and less predictable, but the main problem in my view was the private and public decision-making that resulted in a Minsky cycle.

⁹ See <https://www.economist.com/economics-brief/2016/07/30/minskys-moment> for a nice summary of Minsky's thought.

¹⁰ This is similar to the message of recent work at the IMF on GDP at risk: Looser financial conditions can raise growth in the near term but also increase the likelihood of a significant slowdown or even recession in the medium-term, a tradeoff that is amplified when there has been a credit boom. <https://www.imf.org/en/Publications/WP/Issues/2018/08/02/The-Term-Structure-of-Growth-at-Risk-46150>

Lesson 2: John Donne also was right: “No man is an island.” In a globalized financial system, developments readily cross national lines. What happens in the US, Eurozone, or Chinese financial markets will have effects far beyond the borders of the nation or the currency area.

One example is the global saving-investment imbalances that contributed to the buildup of risks. The other side of large current account surpluses and rising levels of reserves in China and other Asian countries in the first part of the 2000s was increasing debt and current account deficits in the US and elsewhere. And extra global saving put downward pressures on interest rates that encouraged leverage and rising asset prices.¹¹

Moreover, the risk of the subprime mortgage loans originated in the US, partly in response to these incentives, was widely shared as was the risk of default by euro area governments. When those risks crystallized, when instability emerged, the effects also were shared globally – often through interconnections and interdependencies that were opaque or even invisible beforehand.

The sharp reduction in credit availability as lenders rushed to save themselves spread the cutback in spending around the world.

But when it came to responding to instability and protecting from the consequences, countries generally acted in their own self-interest. They took account of potential adverse spillovers on other countries largely because they saw those spillovers as affecting their ability to achieve domestic objectives.

Lesson 3: Still, the great moderation and globalization had important benefits.

¹¹ Some of these thoughts were developed by Ben Bernanke in: <https://www.federalreserve.gov/boarddocs/speeches/2005/200503102/>.

Compared to an environment of frequent recessions and variable inflation, steady growth and low predictable inflation, by reducing macroeconomic uncertainty, help households better plan their lifetime consumption and saving and judge the risks they can take. Businesses can invest and plan for medium and longer-term with more confidence. The implication of market price signals for shifts in supply and demand can be more easily interpreted. Predictable and more stable economies should foster better allocation of capital and faster productivity growth.

Greater openness in global product and financial markets, in turn, has lifted millions out of poverty and has promoted more efficient resource allocation and faster growth.

Some of the commentary around the tenth anniversary of the GFC of late has remarked on how little fundamental change has been made to the structure of economies and finance since the crisis. Rather the focus has been on fixing the existing system – to make it more resilient and much less crisis prone. Perhaps that’s because people have seen the benefits, I’ve just been reviewing.

We need to find ways to save the gains while reducing the costs – protecting against the downside consequences of increasing complacency in growing economies in a globalized financial system.

Lesson 4: Macroprudential policy is a promising addition to the regulatory toolkit that should help to mitigate the risks of Minsky-type financial cycles, enabling us to retain the benefits of monetary policy focused on sustaining the price and economic stability experience of the great moderation.

Good microprudential policy – institution-by-institution oversight – is the basic building block of financial system safety and soundness.

Supervisors can assess the risk-management capabilities of an institution as well as the adequacy of its capital, liquidity and earnings prospects relative to its particular risks.

But microprudential policy is not a sufficient tool for preventing the speculative and Ponzi finance Minsky warned us about and sustaining financial stability. For that we also need macroprudential policy – a policy that looks at the whole financial system with its interconnections, correlated positions, and vulnerabilities to economy wide and system wide tail risks – to make sure that enough resilience is built in to compensate for effects and externalities that are not apparent on an institution by institution basis. Macroprudential policy tries to assure that the financial system itself does not amplify shocks and will continue to deliver its essential services, even after severe, unexpected developments.

Some of those systemic externalities arise from structural factors – for example, institutions supplying very large amounts of services that can’t readily be replicated in failure, or market utilities that facilitate flows among many institutions, such as central clearing. These institutions must be held to higher standards for capital, liquidity and risk management, commensurate with the greater potential spillover from their failure. In the US, Dodd-Frank was very much focused on strengthening these SIFIs to make the financial system more resilient and less likely to need taxpayer assistance to safeguard the access to financial services for households and businesses.

But the lesson of the great moderation is that countercyclical macroprudential policy is also required to damp the potentially destabilizing increases in vulnerability that build during good times. Capital in financial institutions should be required to increase in those good times as risks of complacency and stretched financial positions rise. That capital might not

do much to damp the asset cycles themselves, but it will help to mitigate risks from the natural human tendency to project that recent good times will continue, constraining the speculative and Ponzi finance on the upside so that institutions and markets can continue to lend and offer opportunities to manage risks when asset cycles turn down. At that point, the extra capital can be released to support lending.

This, of course, describes the countercyclical capital buffer (CCyB) of Basel 3. And increases in this buffer have come to be used in a number of jurisdictions as economies and banking systems have recovered from the GFC, including in Denmark and in the UK where I serve on the Financial Policy Committee that sets the CCyB.

Setting this requirement does have its challenges, including identifying and scaling vulnerabilities in environments in which, as is often the case, indicators are giving mixed signals, and then calibrating the appropriate CCyB setting. A second challenge to macroprudential policy more generally is identifying and dealing with financial vulnerabilities outside the banking system where they could be lodged in lightly regulated entities and markets. And a third is avoiding arbitrage across geographical jurisdictions that simply pushes risk around globally integrated financial markets. We have made progress on all three of these fronts since the GFC, but more remains to be done.

Despite these challenges, global financial stability would be better assured, in my view, if more jurisdictions, including the US, adopted more active use of the CCyB – made sure that banks and other intermediaries retained enough capital in the upswing now going on to safeguard their ability to deliver essential services at reasonable prices in the next downswing.

Stress tests are a critical building block for gauging the appropriate level of countercyclical capital. To construct stress scenarios, policy makers must assess the risk environment and build explicitly countercyclical explorations of tail risks – embodying larger falls as incomes and asset prices reach higher levels. Transparent and credible results are essential to maintaining public confidence and bank access to funding when buffers are released.

Stress tests should be a key input into a decision about the CCyB, but they are not a substitute for explicitly setting countercyclical capital buffers. The CCyB is a highly visible measure of the assessment of the authorities about the system-wide risk environment; in many jurisdictions it applies more widely than just to the subjects of the stress tests; and it can be increased or decreased on short notice when the risk environment changes rapidly and unexpectedly.

However, the CCyB alone will not be the most efficient or even a sufficient way to mitigate many financial stability risks. For example, mortgage lending against residential real estate has been the culprit in quite a few financial sector problems in many jurisdictions. And the externality from troubled housing markets can come from the cutbacks in spending by borrowers who are struggling to service their debt as well as from lenders. The ability to set minimum standards for mortgage lending should be in the tool kit of every macroprudential authority and that authority should be willing to use it countercyclicly. Here again, I'm afraid that the US falls short of even having the typical macroprudential tools for protecting against risky practices in real estate lending, much less of an intention to use what controls there are to foster financial stability.

Active use of macroprudential policies should enable monetary policy to remain focused on price and economic stability in the medium run.

Under most circumstances, macroprudential tools of the sort we have been discussing are likely to be far more effective dealing with financial stability risks than would be the interest rate tools of monetary policy, whose comparative advantage is countering real and price shocks. With two goals – price and financial stability – and two sets of tools, we should be able to come close to having our cake and eating it too – sustained expansion at low stable inflation rates uninterrupted by periodic financial crises.¹²

Lesson 5: Public understanding and support is critical to sustaining effective policy – and that includes countercyclical macroprudential policy.

Public distrust of technocrats has greatly increased since the GFC. Many factors have contributed to that, but a sense that the crisis response favored the financial sector over the general public has surely played a role. We didn't do as well as we needed to connecting the actions to stabilize the financial system and encourage the recovery to the welfare of individual households and businesses.

Tightening regulation in good times when the financial system is perceived to be strong, and easing requirements when developments threaten to weaken it, will not be intuitive to many people. Banking lobbies will be opposed to increases in capital requirements or greater restrictions on loan terms, and they will try to rally the public to their perspective by citing increased costs of credit. People worried about protecting taxpayers and deposit insurance funds will be hesitant to buy into any relaxation when the cycle turns.

We need to be active now in explaining to the general public as well as to their elected repre-

sentatives the public benefits of countercyclical macroprudential policy and reminding them of the lessons learned about increasing complacency in good times leading to the kinds of serious economic deprivations we experienced not so many years ago.

¹² See Kohn
<https://www.bankofengland.co.uk/speech/2017/cooperation-and-coordination-across-policy-domains> for a discussion of macroprudential and monetary policy tools.

SUMMARY OF ISSUES ADDRESSED IN THE GENERAL DISCUSSION IN SESSION 1

- Volatility in economic growth and on the financial markets is currently low. Is this a trend or just the bottom of a cycle? Does it reflect complacency and how can one distinguish between complacency and fundamentals?
- Is the slow economic growth in the aftermath of the recent financial crisis the result of a permanent slowdown of productivity growth or a (temporary) debt overhang?
- Strong growth in credit increases the probability of a financial crisis but how good are we at forecasting financial crises? Should we rather rely on a well-capitalised banking sector combined with hard tail-risk stress tests?
- Are we done with the post-crisis regulatory reforms or are there still areas where we need new and better regulation? Are there areas where we should ease recent regulations due to unintended consequences?
- How large are the distributional effects of macroprudential policy compared to monetary policy? Is macroprudential policy too "political" to be left in the hands of the central banks?
- Can we rely on fiscal policy to be timely or do we need to strengthen the automatic fiscal stabilisers?

SESSION 2: COPING WITH THE CURRENT CHALLENGES FOR CENTRAL BANKS



Participants in session 2, from the right: Peter Praet (chair), Axel A. Weber (keynote speaker), Mohamed A. El-Erian (discussant) and Charles R. Bean (discussant).

During the "Great Moderation" there was a significant global transformation towards both de jure and de facto central-bank independence. Furthermore, the liberalisation of the financial sector and the switch to market-oriented monetary-policy implementation led to depolitisation of monetary policy. Central banks focused on controlling inflation by managing the short-term interest rates within conventional frameworks, and decisions regarding interest-rate adjustments as well as the choices of monetary-policy instruments became of a more technical and less political nature than previously, when exchange controls and lending restrictions, etc., had been part of the central-bank toolbox. After the recent financial crisis, the central banks have gained a stronger role – implic-

itly or explicitly – within the macro- and micro-prudential areas with high political attention. It has been debated whether (and if so, how?) financial-stability objectives should take on a more prominent role in the conduct of monetary policy. Questions have also been raised about the adequacy of untested macro-prudential instruments. The post-crisis environment has also been the era of unconventional monetary policy with negative interest rates and "quantitative easing", etc. The latter has raised the issue of whether large-scale central-bank purchase of government bonds will affect the independence and credibility of central banks. ***Session 2 focused on the monetary-policy and macro-prudential challenges facing central banks within the current economic and political environment.***

KEYNOTE SPEECH BY AXEL A. WEBER

Introduction

The Great Financial Crisis of 10 years ago has (once again) shown that financial stability is a necessary precondition for economic stability and, in particular, for price stability. Neglecting credit and financial markets when targeting macroeconomic variables such as inflation, unemployment or output may have worked many decades ago when the capital stock was much smaller and financial markets were insulated from each other. However, financialization and globalization have boosted the role of credit and financial markets in the economy. Today, credit and financial markets are definitely no longer just a reflection of the economy, but they are major drivers of the economy. Consequently, the interest and involvement of central banks in regulation and supervision has grown significantly since the Great Financial Crisis.

In my contribution, I will take stock of the current regulatory and supervisory framework from the point of view of a central bank: Are the changes in banking regulation since the Great Financial Crisis suitable to curb credit and financial markets and have they made the financial system more stable? I will in turn consider microprudential regulation, macroprudential regulation, and issues concerning international harmonization and cooperation.

The microprudential view

Before the Great Financial Crisis, the main focus of regulators and supervisors was on microprudential regulation and supervision. The crisis showed that the existing microprudential framework was not sufficient to ensure financial stability in the context of highly globalized and interconnected markets.

Through a number of key regulatory reforms, the microprudential framework has been

strengthened in recent years and financial stability has improved substantially. Most notably, the finalization and still ongoing implementation of Basel III, new resolution frameworks across various jurisdictions and the introduction of a comprehensive framework for global systemically important banks (G-SIBs) to address the issue of “too big to fail” have contributed to this end.

The Basel III capital reforms have improved the safety and stability of the system, with banks holding more and higher-quality capital against various asset classes and against activities specifically identified post-crisis. While the finalization of Basel III in December 2017 was an important milestone for the post-crisis policy development agenda, a number of policy initiatives are still ongoing and the holistic implementation of Basel III should be finalized in a timely and globally consistent manner as a matter of priority. In addition, consistent implementation of Basel standards will foster a level playing field for internationally active banks.

The Financial Stability Board (FSB) has put in place a comprehensive set of principles to help ensure the orderly resolution of systemically important banks (SIBs) along with minimum loss absorption requirements for G-SIBs. Together, they represent considerable progress in mitigating the too-big-to-fail problem. Furthermore, banks have significantly improved their liquidity positions and strengthened their resilience by enhancing recovery and resolution capabilities as well as total loss-absorbing capacity resources to reduce the probability of having recourse to public funds in idiosyncratic bank crises and to help mitigate disruption to the broader financial system, if resolution were to become necessary.

In the area of crisis management, a substantial body of finalized standards and guidance has established the major legal, financial and structural foundations of orderly G-SIB resolution at the international level. Their focus on enhancing the operational readiness of resolution authorities to execute a resolution transaction is key in addressing the major issues in cross-border resolution. Fully recapitalized operating entities that themselves are not in resolution should have access to ordinary central bank lender-of-last-resort facilities and payment and settlement systems if they otherwise meet all of the conditions for access. The Bank of England has also recently led the way in converting this notion of an international best practice into stated central bank policy.

While the effects of the regulatory reforms have been generally positive, the reforms have also resulted in some adverse unintended consequences.

There has been a stark increase in the number of regulations. Regulations have enforced a reduction in leverage, materially raised the financial costs of risk-prone business models and led to large implementation and running costs due to the expanded control and regulatory framework. International banks now need to monitor and implement 200 regulatory revisions per day, which represents a more than threefold increase from the 2011 level (Boston Consulting Group, 2018). These additional costs are a significant drag on bank margins and profits and also increase the cost of financial services, in particular of lending. Rising fixed costs (due to regulation) and declining variable costs (due to new technologies) also increase the optimal size of financial institutions and favor a potentially undesirable increase in concentration in the financial sector.

Low profitability of financial institutions in advanced economies may have even become a systemic risk. Only profitable banks are safe

banks. Sarin and Summers (2016) have argued that, despite major changes in the regulation of large banks, market measures of risk have not declined. They argue for a dynamic view of capital that recognizes future profits as a source of capital, and they conclude that due to the new regulation, the franchise value of financial institutions may have declined, which makes them more vulnerable to adverse shocks. While we share the authors' concerns about regulatory actions eroding banks' earning power, we do not agree with the authors that banks are not safer now than before the crisis. We rather think that markets may have underestimated bank risk in the years leading up to the crisis.

Regulatory reform may also reduce market liquidity, in particular during downturns. This is evidenced by contracting bank trading balance sheets. For instance, the widening of the LIBOR OIS spread in early 2018 may have been caused by reduced market liquidity due to new regulatory requirements.

Tightening regulation may also cause more aligned behavior: the increasing standardization in risk measurement and product trading could result in market players acting in a more aligned way and increasing correlation, which may increase systemic risk.

There is also a general concern that regulation may have become too complex. More complex regulation does not ensure that the financial system will become safer. Recent cases have shown that governance, conduct and culture as well as prudent risk management are equally important in enabling a stable financial system. As Haldane (2012) has eloquently argued, when finance becomes more complex, it could be wrong to make regulation more complex – instead, regulation must become simpler, but more robust.

Lastly, regulation may also stifle innovation. The advent of technology into financial services – i.e., the growth of fintech – is a challenge to be overcome by regulators as they seek to balance stability and innovation.

The macroprudential view

Microprudential regulation has increasingly been supplemented with macroprudential regulation since the Great Financial Crisis. While microprudential regulation is concerned with the stability of individual financial institutions and their responses to exogenous risks, macroprudential regulation involves the analysis of the interdependence between the financial system as a whole and the economy and also incorporates endogenous risks. Macroprudential measures, such as countercyclical buffers, loan-to-income or loan-to-value ratios in real estate lending, or margin requirements for specific loans, differ from microprudential measures insofar as they fluctuate over time in accordance with the assessment of the situation of the macroprudential authority.

Switzerland has been successfully applying macroprudential measures for several years, as raising interest rates has been no option given the strength of the Swiss franc and the focus of monetary policy on the exchange rate. An anti-cyclical capital buffer has been available since 2012. The capital buffer can be set at a maximum level of 2.5% of a bank's total domestic risk-weighted assets. The buffer was activated in 2013 at a level of 1.0% for mortgages for domestic residential property and was increased to 2.0% in 2014. In order to further reduce the risk of a buildup of imbalances in the real estate market, the risk weights (and thus the capital requirements) for mortgage lending with a high loan-to-value ratio have been increased, and the banks' self-regulation rules for granting mortgage loans have been revised.

Macroprudential measures were probably a major reason for the slowdown of the Swiss housing market in recent years. Nominal house price appreciation is down to 1.5% (y-o-y) from 5.5% just before the imposition of the capital buffer, and residential domestic mortgage growth is down to 2.8% from 5.8%, notwithstanding the fact that mortgage rates are much lower now than in 2013 and the economic outlook is much brighter.

Despite the success of macroprudential measures in Switzerland to date, I warn against an undue reliance on macroprudential measures – macroprudential measures are no panacea. First, the success of macroprudential measures hinges on the assumption of an omniscient regulator that analyzes, decides and adopts the right measures in real time and without any delay. Second, macroprudential policy is only a second-best solution: the price mechanism is suppressed by switching from a market-determined capital allocation to a command-and-control determined capital allocation. This may have redistributive effects (for example, from would-be buyers of real estate with low equity and income to buyers of real estate with plenty of equity and income). It may also cause significant efficiency losses. Monetary policy is preferable for setting the universal price of leverage and reaches into all of the cracks.

And third, on their own, macroprudential measures cannot tame financial markets sufficiently, being vulnerable to regulatory arbitrage and losing effectiveness over time, as individuals increasingly learn how to circumvent or live with these measures.

The importance of a level playing field

A level playing field is a key prerequisite for a competitive financial sector that rewards the most efficient business models and not the

most risky ones or those protected by implicit guarantees. While the introduction of new regulatory standards is an important step in addressing pre-crisis issues, it is just as important to ensure a level playing field by implementing them in a consistent and timely manner across national jurisdictions.

According to a recent estimate (International Federation of Accountants 2018), financial institutions are spending 5% to 10% of their annual revenue dealing with a patchwork of divergent regulations – much of it introduced since the financial crisis – which shows the need for more globally aligned policymaking. The Basel process illustrates well that regulatory and supervisory cooperation at the international as well as sectoral level is needed to ensure a level playing field both from a geographic, but also from a product and market perspective, so that the same economic functions are treated in a comparable way.

A level playing field is also important when it comes to new technologies. Regulators should provide for a level playing field for all market participants and balance innovation and stability. Lack of a level playing field may for example expose some players to different regulatory regimes with respect to the collection and processing of customer data, which may lead to innovative business models shifting from highly regulated regimes into less regulated ones. I see increasing risks emerging from shadow banks and other parts of the financial system that perform bank-like functions, but which are not equally covered by conventional supervision and regulations and operate in areas such as leveraged lending and covenant-lite loans. The latest FSB monitoring report on shadow banking (FSB 2018) shows that the aspects of shadow banking considered to have contributed to the global financial crisis have declined significantly. However, a rise in assets held in certain investment funds has increased the risks from liquidity transformation and illus-

trates the continued need to address structural vulnerabilities from asset management activities. The FSB also finds that the shadow banking sector grew by nearly 8% globally to more than USD 45 trillion or 13% of total global financial assets on a conservative measure, with China – included in the assessment for the first time – representing 16% of global shadow bank assets.

We are currently still fighting the last crisis. However, the next crisis will be different from the previous one, and we must prepare for it. I am afraid the next crisis could arise outside the banking system. Our current focus is mainly on banks, but gaps remain in handling the failure of a non-bank financial institution, a market-based shadow banking activity or a threat from cyberattacks or massive fraud. We should therefore enhance our resolution mechanisms to also include large non-bank financial institutions to increase our ability to fight crises that are centered outside of traditional banks. Central banks will need to do their homework in better understanding the non-regulated sector and its potentially disruptive potential for financial markets and the real economy to avoid the next crisis emanating from the non-regulated sectors of the financial systems.

Concerning emergency mechanisms in crises, a recently published Group of Thirty report (Group of Thirty 2018) concludes that the prudential safeguards put in place in the past 10 years make the financial system more resilient and stable. However, they are incomplete and have not yet been tested in a crisis. In addition, new resolution and restructuring regimes provide a more effective strategy for managing the failures of large complex financial institutions, but they have not been tested either. Furthermore, the authors of the report are concerned that the tools available to fight extreme crises have been weakened, especially in the United States. The weakening of some central banks' authority and ability to respond swiftly and ef-

fectively when a systemic crisis occurs may pose a real and present danger when – not if – another crisis precipitates.

Who should engage in regulation and supervision?

Who should regulate and supervise banks? It is often argued that central banks have great expertise in all matters concerning the financial system, and that consequently they should play a prominent role in safeguarding financial stability at the microprudential as well as at the macroprudential level. However, this is not the main argument for central banks to get involved in regulation and supervision. If financial stability is a prerequisite for macroeconomic stability – and I would argue that it is – then the financial stability mandate should lie with the central bank or the central bank should at least be closely involved in macroprudential regulation and monitoring.

I do not believe that the main risk to financial stability stems from shortcomings of the regulatory or supervisory system. The main risk to financial stability stems from the fact that many central banks do not acknowledge the interrelations between financial markets and their macroeconomic stability target, usually defined as CPI inflation close to 2%. The single-minded pursuit of a short-term inflation target, notwithstanding potentially devastating long-term side effects of extended periods of ultra-low interest rates and of QE on financial markets and the economy, is not conducive to financial stability nor to price stability in the longer term.

While in the long run, tensions between the price stability mandate and the financial stability mandate abate, conflicts and trade-offs may arise in the short run. However, these conflicts or trade-offs are not solved by monetary policymakers ignoring financial stability concerns. It may be preferable to bring conflicts to light.

That's why I think it is desirable that a central bank should have an explicit financial stability mandate rather than subsuming the financial stability mandate under the price stability mandate.

In order to safeguard long-term price stability, the monetary policy framework has to allow for trade-offs between long-term financial stability and short-term price stability. Frameworks that do not allow for such a comprehensive view, such as the majority of today's narrow inflation targeting frameworks, are not conducive to price stability and financial stability in the long term.

By getting involved more strongly in macroprudential regulation and surveillance and assuming responsibility for financial stability, the political exposure of central banks, questions about their legitimacy and accountability, and risks to central bank independence are increasing. Again, I think it is better to face these issues and bring them into the open by setting up adequate institutional arrangements and procedures and a legal framework than to muddle through by solely focusing on a short-term inflation target.

Conclusions

No comprehensive set of preventive measures – although they are essential – can completely eliminate all threats to financial stability. The history of financial crises shows that the next crisis may emerge in unexpected ways and from unexpected sources. Post-crisis microprudential and macroprudential initiatives have remedied some of the weaknesses of the pre-crisis regulatory framework, but they have shortcomings. While microprudential tools are complex, costly and may have idiosyncratic risks, macroprudential policy is only a second-best solution and may not be getting in all the cracks. Furthermore, we have to ensure that regulatory reforms not only address issues

identified in the last crisis, but also consider risks emanating from the non-regulated sector. Central banks need to increase their awareness of these risks and also be in a position to employ emergency powers not only to deal effectively with failures of individual institutions and modest shocks to the financial system, but also to handle a systemic crisis that raises doubts about the solvency of the entire financial system. Last, but not least, the single-minded pursuit of a short-term inflation target may be the greatest risk of all to financial stability.

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DISCUSSION BY MOHAMED A. EL-ERIAN

It is such a great pleasure and an honor to be in Denmark and participate in this conference on the occasion of the 200th anniversary of the Danmarks Nationalbank. I would like to thank Lars Rohde and Agustin Carstens for the kind invitation, and for also giving me the chance to catch up with good friends and colleagues, some of whom go back over 30 years – not quite the 200 years of the Danish central bank, but slowly converging!

It is a double honor and pleasure to be provided with the opportunity to serve on this panel with Axel, Charles and Peter. In the his elegant paper we are discussing, Axel takes stock of the changes in the regulatory and supervisory framework since the global financial crisis with a view to assessing whether they have made the financial system more stable. In doing so, he considers both macro and micro-prudential issues. His main conclusions include the observation that, within a generally positive outcome for regulatory reforms – the banking system in particular is now a lot safer than before the crisis – there have also been some adverse unintended consequences. Chief among them:

- The excessive proliferation of regulations and, with that, a notable increase in banks' compliance expenses that has contributed to a "low profitability of financial institutions in advanced economies [that] may have become a systemic risk" in future as "only profitable banks are safe banks."
- A reduction in market liquidity, especially during periods of market stress where traditional intermediaries are less able and willing to provide balance sheet;
- More correlated behaviors by banks based on the increasing standardization in risk measures and trading, increasing the risk of disruptive herding causing market overshoots; and

- The spread of greater complexity that risks stifling innovation.

Axel also warns us about undue reliance on macro-prudential regulations, worrying about the ability to analyze risks appropriately.

My own brief remarks will be aimed at soliciting comments from Axel and others both on what's in the paper and on what attracts less focus.

Turning first to what's in the paper, I agree that significant progress has been made in many advanced economies to strengthen the banking system. Is it perfect? No. In particular, there are still gaps in the proper alignment of internal incentives and behaviors. And not all individual banks and national jurisdictions have done enough. But it's certainly a lot safer and, notably for the United States, no longer constitutes a major risk for a systemic crisis.

I also agree with Axel that this does not mean that financial risks as a whole are notably lower. Here, the paper references shadow banks -- which I take as shorthand for what has been a morphing of risk, and its migration to non-banks that, to quote the paper, "are not equally covered by conventional supervision and regulations."

That speaks too to a particular liquidity transformation process, that, to put it simply, has led the system as a whole to overpromise in its ability to provide liquidity during periods of market stress. This is not just about banks' unwillingness to provide balance sheets at times of a sudden change in the ruling market paradigms (as we have seen play out over the last few months in some sectors, including emerging markets – something that I will return to).

It's also about ability given new regulatory requirements and specifications.

As regards the point on profitability, I agree that the scope for profits has been generally reduced for this sector. But they are still sizeable. Moreover, rather than see this as contributing to higher systemic risks, it speaks to a multi-year process of shifting the banking system closer to the utility model. Indeed, we could think of this not just as a consequence of policy but also as a de facto tool of policy.

As to what attracts less focus in the paper, a consequence of the comprehensive regulatory efforts of recent years has been to evolve the structure of the financial sector.

In the banks' segment, this has taken the form of greater concentration. It's a topic that attracted attention at the Jackson Hole meeting a few weeks ago and raises many interesting questions, including about the crowding out of small borrowers. And it assumes more dimensions given Stanley Fischer's comments in the prior panel about political economy, including the impact of the banking lobby.

For the industry as a whole, it's about a slow move from a normal distribution to more of a bi-modal one, albeit an imbalanced one with two very different wings; and as the belly of the distribution is gradually being hallowed out. It's as true for banks as it is for asset managers where the growing importance of mega firms has been accompanied by a greater proliferation of small participants, including new entrants.

Interestingly, this is a phenomenon that we have seen play out gradually in many other economic, political and corporate areas. It's an issue because typically, the belly tends to stabilize distributions.

Lots has been said and written about the fatter tail of large institutions. The other tail involves small companies that, due to technological innovations, are able to do more with less. It speaks, for example, to the growing influence of fintech – albeit still small in absolute terms – and the expanded space for small niche player. Among the things to watch here is the reaction of the large firms in future, including their operational choices between co-existence, partnership and either direct or indirect take overs.

This is an intriguing development in terms of, to use Ben Bernanke's famous 2010 phrase, "benefits, costs and risks." My sense is there is a need for more work on this, including regulatory and supervisory aspects. And it will relate naturally to how the accelerating technological advances – particularly in big data, AI and mobility – are changing not just what we do, but also how and who does it.

Their interactions accelerate the rightward moves in both supply and demand curves. With that comes the enabling of a larger set of state and non-state actors, and not just good ones, opening the issue of cyber risk and bringing into sharper focus that of consumer protection.

Then there is an additional element associated with the overpromise of liquidity I referred to earlier. Established during the prolonged period of unusually low financial volatility and ample liquidity injections, this has been structurally embedded in the system through the proliferation of certain products. The resulting risk of illiquidity pockets, and the contagion threat that comes with that, could also expose central banks to a wider balance of risks.

If they overtighten, rather than risk of de-anchoring inflationary expectations, they risk de-anchoring huge sellers of volatility. But if they under-tighten, they encourage the continued excessive sale of volatility, in all its form,

and the excessive risk taking for the system that comes with that.

This is part of the larger question of what has happened due to persistently low interest rates and the intriguing question of what has been labeled in the marketplace as the “fast star.” It accentuates the uncertainties associated with what Chairman Powell’s called at Jackson Hole the [more traditional] celestial stars that reflects that “the economy has been changing in ways that are difficult to detect and measure in real time.” The basic question here, and it’s a very important one, is whether the neutral rate consistent with the Fed’s dual mandate is consistent with financial stability.

The final aspect in the list of challenges to central bank is the scope for international coordination – or, to be exact, the eroding scope for this recently. This comes at a time not just of considerable structural fluidity, but also of increased cyclical need for it, especially as we enter a period of increased divergence in economic performance and in economic policies within the advanced world.

With that comes greater dispersion in equity markets, significant interest rate differentials between the two bond benchmarks (for example, currently over 250 bps for the 10-year difference between the German Bunds and US Treasuries), dollar appreciation, and greater financial volatility overall. And I suspect that there is more divergence to come in the months ahead.

We have already seen isolated cases (fortunately) where this can easily lead to increasing pressure on technically and structurally vulnerable asset classes, including those such as emerging markets that have attracted excessive interest from flighty cross-over investors and now have to cope with their exits. It is a painfully familiar phenomenon, and one that is still far from playing out fully.

All this before we talk about another big elephant in the room, and what Agustin Carsten referred to in his remarks as “the unprecedented process of policy normalization” – that is, what happens when more than one systemically important central bank stops its large-scale asset purchase program, raises interest rates, and allows its balance sheet to slowly shrink.

We know from the experience of the Fed that one is in the process of delivering, to adapt a phrase used years ago by Ray Dalio in a different context, a “beautiful normalization” – that is, a normalization that does not derail growth and excessively destabilizes financial markets. We do not know what happens when several attempt this.

I suspect that, should this materialize, it could well open the way for more self-feeding cycles and multiple equilibria. The related issues of financial stability could well become as important as how inflation proceeds. And, again, this involves two-sided risks. Things can break if financial conditions tighten too rapidly. But it’s also problematic if they remain too loose for too long.

Allow me to conclude that all this is happening in a rather fluid operating environment due to a long list of ongoing structural uncertainties and changes. They start with questions about how basic elements of economies operate, including the behavior of productivity and wages, together with the relationship between unemployment and inflation. Then there is the impact of technology, including the accelerating shift from the physical to the physical and virtual.

Recall the increasing feeling in Silicon Valley that we are “entering the second half of the chess board” – that means an accelerating and even less predictable of even more rapid inno-

vation. And all this in the context of the emergence of two poles globally, the US and China, with very different approaches to the interactions between their governments and their big tech.

Technology is one of the three T's mentioned by David Lipton, the IMF's First Deputy Director, at the multilateral's spring meeting last April in Washington DC. The other two, trust and trade, have also become more fluid, thereby heightening the sense of unusual uncertainty. They can also increase vulnerability of central banks to political interventions as well as amplify the challenges to regulatory and supervisory harmonization.

Many of us had hoped that, having stepped up and taken on enormous policy burdens and showing great courage and innovation in using experimental measures, central banks would be able to complete a successful policy handoff and go back to being – well – more boring and

less in the spotlight. While we should continue to hope for this, the reality is the world still poses a number of challenges to them. These will require a continued skillful combination of resilience and agility, and not just with regard to economic and financial issues. Needless to say, open and adaptable mindsets will be key.

I thank Axel for pointing out some of the main reasons for all this, and I regret that I had to add to his list.

Thank you for your kind attention.

DISCUSSION BY CHARLES R. BEAN

It is a great pleasure to be here to celebrate the bicentenary of the Danmarks Nationalbank and also a great pleasure to be invited to discuss Axel Weber's views on some of the current challenges for central banks. Axel focusses largely on the consequences of the myriad of post-crisis reforms for financial stability, but I will take the liberty of adding a few remarks about monetary policy at the end.

Micro-prudential policy

On the micro-prudential front, as Axel notes, there has been a substantial increase in the loss-absorbing capacity of banks as a result of the Basel III reforms, with the aim of reducing the incidence of future crises. In addition, there has been significant progress in developing a fit-for-purpose regime for handling the resolution of failing banks, especially large multinational ones – though here one should recognise that the regime still has to be tested by events. And the crisis has also prompted some central banks to give a makeover to their methods of providing emergency liquidity assistance. As an example, the Bank of England's liquidity support facilities now allow for borrowing – both on demand and through market-wide auctions – against a much broader range of assets, including illiquid raw loans whose quality have been pre-evaluated by the Bank, on pre-specified terms, while the range of potential counterparties has also been greatly expanded, including to central clearing houses.

Axel observes, however, that a side effect of these reforms has been to raise banks' costs of doing business and that the resulting squeeze on profit margins itself may create financial stability risks. Could the reforms actually have gone so far as to make the system less stable? Axel dismisses the sceptical piece by Sarin and Summers (2016), correctly so in my view. But I

do have sympathy with the general argument that we need to be alert to the impact of the regulatory environment on banks' profitability, for if banks cannot make adequate profits through their plain vanilla business, then they are more likely to move into riskier activities in order to boost them. I have always been struck by the fact that Australia and Canada suffered much less from the crisis than other countries and in part that seems to have been because their banks had been less driven to look for new ways to generate profits. Furthermore, if bank profitability is too low, it encourages banking activities to migrate outside of the regulatory perimeter. So I am sympathetic to looking at ways to make regulation and supervision more efficient: smart supervision is surely better than stifling supervision.

Have the reforms gone far enough? The consensus in the official sector is that the key elements have all been decided and that is mainly now about completing the implementation and maybe adding a few tweaks here and there. That view is not shared universally outside, however. Some academics (e.g. Admati, 2016; Vickers, 2016) would like to see even higher capital requirements. Here, I think the issue lies more with the unreliability of risk weights than with the mandated capital ratios themselves. Banks' own models often ascribe wildly different risk weights to the same asset class and we saw in the last crisis that assets that were thought to be safe – such as highly rated mortgage-backed securities or euro-area periphery debt – may quickly turn out not to be. For that reason, I am very much in favour of the leverage ratio as a complementary backstop.

Some other critics would like to see structural reforms pushed further, with greater separation between the 'utility' and 'casino' aspects of banking. If we suffer another financial crisis like

that of 2007-8, then I believe the public pressure for more fundamental changes to the way the banking system operates will become irresistible.

Macro-prudential policy

Let me now turn to macro-prudential policy. While this may seem like the new kid on the block, it is really more like an old wine in a new bottle, as such direct intervention in the financial intermediation process was the norm in many countries in the two decades after World War II and has continued to be deployed in emerging economies since.

Axel sounds a warning that we should not expect too much from macro-prudential policies. I agree, though not for quite the same reasons. Axel's first qualification is that it requires omniscient macro-prudential authorities. But while we would obviously like policy makers to make wise and informed choices, macro-prudential policy surely is no different in its demands than monetary or fiscal policy. All we can expect is that policy makers do their best.

Second, he argues that macro-prudential policy is only a second-best policy because it distorts price signals and that monetary policy would be preferable as it sets the price of leverage. This I really don't agree with. The reason we need macro-prudential policies in the first place is because some decisions taken by financial intermediaries potentially generate significant future negative externalities for other agents, including in the real economy. Moreover, those decisions may relate to specific parts of financial markets, rather than their entirety. A well designed macro-prudential intervention can target the specific decisions generating the externalities, thus bringing us closer to the first best. It is entirely analogous to the use of tax policy to internalise externalities (indeed, it raises the question as to whether fiscal inter-

ventions might sometimes be a more natural way to curb risk-generating activities).

I also think Axel's suggestion that monetary policy is an instrument that is particularly well-suited to restraining the build-up of leverage is mistaken. Raising policy rates may restrain the growth in credit but it also has numerous other effects on the level of activity. If there is a credit boom and the real economy is also overheating, then there may be no conflict. But there will be times when credit growth needs to be restrained but the real economy needs more stimulus. This was exactly the circumstances we faced at the Bank of England around the time that Mark Carney arrived. At the same time as the Monetary Policy Committee was providing guidance that policy rates would remain 'low for long' in order to sustain the recovery, the Financial Policy Committee was introducing limits on banks' ability to extend home loans with a high loan-to-income ratio. That attempt to make the demand growth mix less credit-rich seemed to me exactly the right thing to do in the circumstances. More generally, I think constantly clobbering the real economy in order to contain the excesses of the financial sector is simply politically unsustainable.

I do agree with Axel that sometimes risks may develop that are outside of the reach of macro-prudential policies and also that activities may migrate outside the regulatory perimeter in order to circumvent them. But my real concern over macro-prudential policies is whether there is the sufficient democratic support for them. Unlike monetary stability where we have the inflation target, we lack an objective and agreed measure of the latent risks to financial stability. Consequently it will often be contentious whether or not action is warranted. That will particularly be the case after a long period of steady expansion, such as the latter stages of the Great Moderation, when people may tend to underestimate risks, claiming that "this time is different". Moreover, because macro-

prudential policies, especially loan-to-income and loan-to-value ceilings, impinge directly on a particular set of potential borrowers there may be quite strong public push back. In short, I am not sure that the public argument for an independent macro-prudential policy has yet been won. We need to work harder to make the case.

Monetary policy

Axel did not say a lot about monetary policy, but he does state his concern that the single-minded pursuit of an inflation target may generate risks to financial stability and that financial stability concerns therefore need to be explicitly integrated into the monetary policy regime.

Of course, even before the crisis there was a debate as to whether monetary policy should attempt to 'lean against the wind' of an asset price or credit boom, deliberately undershooting the inflation target for a while in order to reduce the risk or severity of any subsequent correction and that debate has been given extra vigour by the crisis (see e.g. White, 2009). From what I have already said, you will be able to guess that I do not think that monetary policy should be the weapon of first resort for addressing incipient financial stability risks, as that task is better assigned in the first instance to macro-prudential policies which can be targeted directly on the source of the problem.

But there may be a role for monetary policy should those policies prove ineffective. Indeed, such a lexicographic ordering of policies has been formally part of the Chancellor's remit to the Bank of England's Monetary Policy Committee since 2013: if the Financial Policy Committee decides that it lacks effective tools to contain the risks, then it communicates that to the Monetary Policy Committee. The Monetary Policy Committee may then decide to deliberately undershoot the inflation target for a while in

order to mitigate the financial stability risks, thereby also enhancing the likelihood of meeting its inflation target in the longer term.

That said, the hurdle for such action may be quite high. In particular, Svensson (2017) has pointed out that not only do the uncertain future gains from leaning against the wind need to be weighed against the near-term costs of higher unemployment but taking action today may also weaken the economy enough to raise the future costs of a crisis should one occur. His cost-benefit analysis suggests that even when macro-prudential policies are powerless, leaning against the wind may not be the optimal strategy.

Let me conclude with a few more general remarks on the challenges facing monetary policy makers. For me, the biggest concern is a potential lack of monetary firepower should there be a fresh downturn in activity. While the factors behind the apparent decline in the natural safe real rate of interest over the past twenty-five years are still a matter of debate, it would be prudent for central banks to operate on the assumption that it is unlikely to revert soon to the 2 to 3 per cent that we were previously accustomed to. That implies more frequent episodes of very low policy rates and the potential need for further bouts of quantitative easing.

This is an uncomfortable place to be. Not only do such policies heighten financial stability risks by encouraging a search for yield, they also raise awkward political economy issues. Quantitative easing works in large part through raising asset prices, but this benefits the asset-rich – typically the old – at the expense of those who plan to acquire them in the future – typically the young. Such distributional effects may be tolerated by the public if they are short-lived, but not when the purchases are sustained over a long period. Moreover, the expansion of central bank balance sheets also raises issues. If the central bank buys public

debt, then it may raise concerns that it is engaged in financing the government. If, on the other hand, it buys private assets, then it exposes the public sector to the private sector's credit risks and thus drifts into territory that really ought to be the domain of fiscal policy.

There have been suggestions for creating more room for conventional monetary policy such as raising the inflation target from 2 per cent to, say, 4 per cent (Blanchard, Dell'Ariccia and Mauro, 2010) or else moving to targeting the level of prices (or nominal GDP) which would serve to depress expected future policy rates once the effective lower bound on policy rates binds (Woodford, 2012). Neither of these solutions is without cost, but in any case continuing to rely solely on stimulatory monetary policy to sustain aggregate demand in the face of an adverse cyclical shock risks further boosting private sector debt levels, which in some countries remain uncomfortably high. In my view, it would be better if governments took on more of the responsibility for maintaining aggregate demand, especially where there is still plenty of fiscal space available.

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SUMMARY OF ISSUES ADDRESSED IN THE GENERAL DISCUSSION IN SESSION 2

- How robust is the banking sector now compared to the pre-crisis world (with respect to e.g. capitalisation, liquidity and leverage)?
- Should we be concerned about risk shifting towards unregulated shadow banks and non-bank sectors?
- What are the benefits and costs of further financial regulation? Is there a need for increased international harmonisation of regulation to ensure a level playing field and lower implementation costs in cross-border banking groups?
- What is the impact of regulation on profitability, concentration and risk taking in the banking sector?
- How effective are the various macroprudential instruments (countercyclical capital buffers, loan-to-income ratios, loan-to-value ratios, etc.)? Are we fighting macroprudential problems with microprudential tools?

DINNER SPEECH



Niels Thygesen (chair)



Stanley Fischer (dinner speaker)

DINNER SPEECH BY STANLEY FISCHER

Danmarks Nationalbank at 200

It is an honor and a pleasure to be in Denmark celebrating the 200th birthday of Denmark's central bank, Danmarks Nationalbank, and I would like to thank Governor Lars Rohde and his colleagues for inviting us to join the party – and congratulate them on reaching the age of 200 in good health, despite some difficulties at the early stages of the Great Financial Crisis.

Of course, the invitation brings with it certain questions, prime among them, "What do you give an historical institution for its 200th birthday?" In this case, the answer is simple because the Nationalbank has already sent its suggestion for an appropriate gift. What it wants is a speech that is short and to the point. How short? The instructions are "15 minutes". What is the point? In the case of the 300th birthday of the Bank of England in 1994, the birthday party was designed to suggest that after 300 years, the time had come for the Bank of England to become independent. And that indeed came to pass. In this case, the 200th birthday of the Danish central bank, there are two potentially critical questions: the first is the question already asked in six referenda, "Should Danmarks Nationalbank join the ECB?", or more precisely at this time, "Should Denmark use the Euro as its currency?"

After six negative referendum results, the popular answer to that question seems to be an overwhelming "No". But interestingly, the two speeches by Governors of the National Bank that were distributed to us, one by Nils Bernstein, the other by the present Governor, Lars Rohde, each presented strong arguments in favor of joining the Euro Zone.

The second major issue emerges from the fact that in the Great Financial Crisis, the Danish government had to extend a guarantee of fi-

nancial assets amounting to 250% of GDP. As stated by Kim Abildgren, on p. 139 of his excellent history of the National Bank, "Historical events clearly emphasize the importance of having a stable financial system if we want a robust economy" – and that is a lesson learned by many countries over the years. Or, as explained in Governor Rohde's speech, "... the financial crisis was an example of how the foundation for bad times is laid in good times.¹³ ... We do not lift our heads and see the flames building up on the horizon."

And then, to cheer us up, the Governor said "Right now – in 2018 – the economy is booming again." And, perhaps concerned that he should not seem to be too optimistic for a Danish governor, he added "I suppose we should be pleased ..."

Outline of the story of the Nationalbank. Now to the substance. We begin with a rapid guided tour of the history and structure of the Nationalbank, based on Kim Abildgren's history of the institution. That book starts with a short statement of the Nationalbank's goals. "Since [1818], [the Nationalbank's] objective has been to ensure stable prices, a stable financial system and safe and secure payments." From the modern viewpoint, say as seen by someone used to the Fed's dual mandate, it is notable that neither employment nor growth are mentioned among the three goals.

The book is broken down into five parts and 11 chapters, which tell the history of monetary policy in Denmark, and many other relevant things.

- **"Part I – Birth of Danmarks Nationalbank".**
The history of the Nationalbank starts as

¹³ In the private sector, one says "Bad loans are made in good times."

the histories of other central banks have started. This section consists of two chapters: the title of the first chapter is "State bankruptcy and a chaotic monetary system", a frequent starting point for the creation of a central bank, and the second chapter – reached after only twelve pages of text and over a century of time that includes the Great Depression – is "The Denmark's Nationalbank Act of 1936."

- **"Part II – Price Stability"** has three chapters that relate largely to the period after 1936: Chapter 3 is the story of monetary policy in brief, "Low inflation for 200 years – with a few exceptions"; Chapter 4 explains the mechanism that produced that outcome, "A fixed exchange rate has provided for stable prices"; and Chapter 5 has an equally interesting heading, "Denmark's Nationalbank's toolbox: Interest rates and foreign exchange reserves".

There is no chapter heading devoted to moral suasion, nor price controls, nor exchange controls, nor even forward guidance. But there is a relatively lengthy section – over a page – headed "When the toolbox included lending caps" that starts "... extensive exchange control was introduced during the crisis in the 1930s, and it took more than 50 years to roll it back again." That appears to have inoculated the policymakers and the public against further use of exchange controls.

One gets the impression reading this part of the book that the Nationalbank has very much stuck to its knitting in running monetary policy, and that fiscal policy has stuck to its knitting to a greater extent than a devotee of the finer points of Tinbergen's work on the assignment of policies to goals would have preferred.

- **"Part III – The Stability of the Financial System"** has three chapters: Chapter 6 is entitled "From savings banks to financial supermarkets"; Chapter 7 "When history repeats itself: banking and financial crises",

and Chapter 8 is on "Credit and house price bubbles". Chapter 8 includes a cartoon showing someone standing and speaking. It comes with an explanatory note, entitled "Adviser or salesman", whose first sentence is "Experience shows that the most serious crises, with major implications for financial stability, frequently follow in the wake of loan-financed property price bubbles". Enough said. But it is noteworthy that the central bank explicitly includes financial stability as its secondary goal, the first being stable prices, and the third being "safe and secure payments".

- **"Part IV – Safe and secure payments"** has two chapters. Chapter 9 is entitled "From coins to mobile apps – means of payment over 200 years" and Chapter 10 covers "From counterfeiting to cybercrime". This section is modern and interesting, and also important.
- **"Part V – A robust economy"** consists of only one chapter, 11, which is headed "200 years with a rising standard of living – despite fluctuations". It is summarized by this statement: "In the longer term, the trend in real income does not depend on monetary policy but on how efficiently the economy can produce goods and services. The standard of living has improved notably over the last 200 years, reflecting a rise in productivity. But the economy has also fluctuated, and the deepest or longest downturns have been seen in periods with banking crises."

The economic case for joining the euro zone. The January 2009 statement by Governor Nils Bernstein to the European Affairs Committee of the Danish parliament emphasizes that by joining the ECB, Denmark – more specifically the Nationalbank and its chairperson – would have a say in the determination of a number of decisions that are highly relevant to Denmark, but on which they currently have no say.

Of course, by keeping an almost constant exchange rate against first the Deutschmark, and then the Euro, Denmark has already in practice agreed to accept several of the decisions that the ECB makes. But by not joining the ECB, the Nationalbank retains the option not to accept future interest rate decisions the ECB may make. My sense is that this is an option that could be exercised only once or very rarely – for once the Nationalbank elects even once to set its interest rate at a level significantly different from that of the ECB, the premium between short-term interest rates in Denmark and in the Eurozone would rise, and – almost like capital controls – take a long time to decline to its previous level.

It could occasionally happen that there would be an attack on the krone that is a result of some decision of the Danish central bank or the Danish fiscal authorities, or an adverse or positive shock to the Danish economy. If that were to happen, it could take a long time to restore the closeness of the link between the euro and krone short and longer-term interest rates.

In addition to the interest rate, Governor Bernstein mentions several other decisions, mostly regulatory, that are made by the ECB's Governing Council and "have a direct impact on us – and yet we have no influence on these decisions, or even insight into the rationale behind them". However he adds "I am aware that our opportunities to exert influence should not be exaggerated", even though the press sometimes suggests that Denmark fights above its weight in the making of intra-EU decisions. I will return to this issue at the end of this speech.

In his speech to the Queen of Denmark and others celebrating the 200th anniversary of the National Bank on July 4 this year, Governor Rohde allowed his sense of humor to show through. Talking about the founding of the Nationalbank, he asked how the country had got into the difficult situation that it faced in 1818. I quote: "The British bombardment of Copenhagen. The state bankruptcy. We remember these events from our history lessons. Denmark had been at war. That was expensive. We had lost. That made matters even worse".

He asked "... who are the greatest losers when the economy is in a shambles? Ordinary people. There was every reason to establish a central bank. Tasked with ensuring that the value of money remains stable. ... Trust in the value of money is a cornerstone of all societies at all times."

Which would be better in practice, fixed or floating? This question could be answered by analyzing the implications of various shocks to the economy of Denmark, and examining to what extent the size of the disturbance to the Danish economy is affected by whether the exchange rate is fixed or floating.¹⁴ Another approach would be to say that getting rid of the krone would remove a potential source of divergences from optimality that would be created by unifying the markets of Denmark with those of the remainder of the euro zone.

But those are not the considerations that would decide the next referendum if there is to be one. Rather, it would be decided on political grounds, the grounds of how important it will be to Denmark to retain as much of its special character and histo-

¹⁴ This analysis can be found on pp. 582-86 of *International Economics* by Paul Krugman, Maurice Obstfeld, and Mark Melitz, eleventh edition, Pearson, New York, NY.

ry as it can. That having been said, I believe it likely that if the euro survives much longer, the euro area will become larger and the euro more accepted.

Financial stability. Although I gave this issue a big buildup when I introduced it earlier, I shall leave the topic for the 300th anniversary, at which – if it takes place – the financial stability problem will have been solved. But we should all consider the likelihood after the Great Financial Crisis, and its aftermath of signs of a retreat from Dodd-Frank, that many central banks should be focusing much more seriously on the risks of financial instability than at this time appears likely to happen. After all, the greater source of damage to the United States economy during the Great Financial Crisis came from its damage to the financial sector. We should also recognize the difficulty of dealing with this issue in light of the problems for financial stability posed by the political power of large financial institutions.

The last words go to The Economist (of September 23-29, 2000): [Tell the story of my organizing my files and coming across two articles on Denmark's euro vote in 2000].

The first article is entitled "No from the Danes", and makes the case that a Danish no in the September 28th, 2000 referendum on Denmark's joining the ECB would provide a welcome jolt in favor of a multi-system Europe. Well, the Danes provided the jolt. The world awaits the welcoming of the jolt, though it does appear that at present the more impressive jolts are being provided by a non-member of the Euro area.

The second article is called "Those awkward Danes". Here are its two final paragraphs.

"Since the end of the cold war, Denmark in its geo-politics, has come closer to "Europe" while being a leading proponent of bringing the Balts into both the EU and NATO. Relations with Germany have got steadily warmer, while Denmark's sense of Nordic solidarity has grown weaker. German reunification, the move of Germany's capital back to Berlin, and Poland's renaissance have all tugged Denmark, quite happily, towards a new centre of European gravity.

If it joins the euro, it will still feel more comfortable with that shift. If not, it will still have a special place as a north European hub. And it will retain its reputation as the EU's most awkward member – Britain, perhaps, excepted."

I was going to conclude by saying that you will now have first place in the awkward contest that the Economist describes. However, a look around the EU suggests that you may lose that position, and probably decline even further in the contest than according to the Economist you were in the year 2000.

My fifteen minutes must be up, and so I will not go further into these difficult issues and their implications. Thank you again, Lars and colleagues, for inviting us, and thanks to all of you for your attention.

SESSION 3: LIFE IN THE PERIPHERY



Participants in session 3, from the right: Øystein Olsen (chair), Stephen S. Poloz (keynote speaker), Veerathai Santiprabhob (discussant) and Hélène Rey (discussant).

According to the classical "open-economy tri-lemma" it is impossible for a country to have both a fixed exchange rate, free cross-border capital movements and an independent monetary policy at the same time. If a country chooses to fix its exchange rate and have free capital movements, it will have no scope for using monetary policy as a tool to stabilise the domestic economy. If a country chooses an independent monetary policy as well as free capital movements, the exchange rate will have to float. However, in recent years it has been subject to debate whether these policy options really are available or whether countries in a globalised world are actually facing a dilemma: If one wants to have free capital movements, there is no scope for an independent monetary policy

– with free cross-border financial flows, domestic interest-rate and credit conditions will mirror the global financial conditions (the "global financial cycle"). A corollary of this is that unconventional monetary policy measures in the large economies may have strong spill-over effects on the central banks in the periphery. In addition, exchange rate developments appear to deviate significantly from textbook models that justify the conclusion that exchange rates act as stabilisers rather than amplifiers. ***Session 3 focused on the role of exchange rates and the implications of globalisation for monetary-policy frameworks, including consideration of international policy coordination in times of unconventional monetary policy to address the shortcomings of the international monetary system.***

KEYNOTE SPEECH BY STEPHEN S. POLOZ

Abstract

Investing in Monetary Policy Independence in a Small Open Economy

This paper will explore the limitations that global financial cycles bring to monetary policy in small open economies, even under a flexible exchange rate. It will then suggest ways of overcoming those limitations to buttress monetary policy independence.

The argument that global financial integration has reduced the ability of central banks to pursue independent monetary policy is surely self-evident by now, at least episodically. This amounts to a shortage of policy instruments, and this paper will develop a menu of ways in which small open economies can invest in strengthening policy independence. Having a menu of policy instruments available permits customization of responses to the circumstances that arise. The paper will focus on three sets of instruments, which may not fall under the purview of central banks.

The first set of instruments comes under the rubric of macroprudential policy. For example, adjusting countercyclical capital buffers in both directions can dampen the procyclicality of capital flows. Similarly, tightening or easing rules around mortgages – leverage or debt service restrictions, in particular – can blunt foreign interest rate shocks passing through the domestic bond market. These tools have so far been used only for macroprudential purposes, but if authorities were willing to adjust them in both directions, they could serve as a powerful tool to buttress the independence of interest rate policy.

A second set of instruments is based on direct public sector financial intermediation. Public

sector financial intermediation – such as providing export credit, small business lending, or mortgage underwriting – is generally designed to address credit gaps left by an oligopolistic banking sector. But they may also be used to counter procyclicality in credit creation, even if it is being driven globally. Tapping these tools was one key reason why Canada was able to weather the global financial crisis as well as it did, as public sector institutions were able to offset considerably the credit crunch that emerged. In turn, this allowed the central bank to maintain its focus on inflation.

A third promising avenue is the development of additional automatic fiscal stabilizers. It is widely recognized that fiscal policy becomes relatively more powerful when monetary policy is approaching its limits. Calibrating fiscal parameters to become more active at that time, and less so in normal times, can promote an appropriate mix of fiscal and monetary policies, reduce output volatility and help preserve monetary policy independence.

In all three areas, it is not possible to simply flip a switch in the heat of the moment. The paper will argue that these instruments all require upfront investment and a demonstrated willingness to adjust them in both directions for them to become effective policy tools. The benefits of doing so are clear – the risk of losing the domestic monetary policy independence generally associated with a floating exchange rate can be significantly reduced.

Background paper

Investing in Monetary Policy Sovereignty: Ideas from the Periphery

by Cesaire A. Meh, Senior Research Officer, Bank of Canada, and Stephen S. Poloz, Governor, Bank of Canada¹⁵

Introduction

It is generally accepted that a country cannot have an independent, or sovereign, monetary policy, a fixed exchange rate and free capital flows all at the same time. Canada began wrestling with this issue in the early years of the Bretton Woods system, and was the first to float its currency, in 1950. We tried a fixed exchange rate regime again starting in 1962, but returned to a float in 1970.

This history, and Canada's economic and financial proximity to the United States, motivates Canadians to stay at the forefront of thinking around monetary policy sovereignty. Indeed, early thinking around this "impossible trinity" or "trilemma" came from Robert Mundell, a Canadian.

More recently, the issue has attracted international interest. H el ene Rey and others have argued that Mundell's trilemma may be even more restrictive than previously thought.¹⁶ This is because global financial cycles can weaken or even neutralize the ability of a floating exchange rate to insulate sovereign monetary policy from external financial forces. In extreme cases, the trilemma may even become a dilemma.

It is important to point out at the outset that this has not been the experience so far in Canada. Perhaps this is because Canada has repeatedly found exchange rate flexibility essential to adjust to external forces – commodity price fluctuations, in particular. A decline in oil prices, for instance, leads naturally to a depreciation of the Canadian dollar against the US dollar, because Canada is a net exporter of oil while the United States is a net importer. Attempting to fix our exchange rate through such an episode would mean a significant and possibly prolonged drop in Canada's inflation rate. Markets have come to understand this adjustment process and to appreciate the anchoring of inflation that results from allowing the exchange rate to facilitate adjustment.

This underscores Mundell's original insight, that an area with a common currency will function well only if the counterparties have much in common. We do not need to look far for an alternative example: Denmark's fixed exchange rate with the euro seems to have functioned quite well. This suggests that the commonalities of the economic structures in that pairing are much greater than the differences.

Generally, though, policy-makers need to take seriously the possibility of the trilemma collapsing into a dilemma, even if the risk is only episodic. This issue could grow in importance if we saw more divergence in inflation targets in the future. Today, 2 per cent inflation is a goal that a wide range of central banks share, but the experience since the global financial crisis in 2008–09 has some considering the merits of higher inflation targets (Blanchard, Dell'Ariccia and Mauro 2010). The ability to choose an optimal domestic inflation target could be eroding over time.

¹⁵ This work benefited from discussions with Markus Brunnermeier, Gino Cateau and participants from the joint Danmarks Nationalbank–Bank for International Settlements conference for the 200th anniversary of Danmarks Nationalbank. We would like also to thank Jos e Dorich and Claudia Godbout for simulations in the Bank of Canada projection model, and Thibaut Duprey, Timothy Lane, Larry Schembri, Alexander Ueberfeldt, Carolyn Wilkins and Yaz Terajima for comments. Minnie Cui and Salman Hasham provided excellent research assistance. All remaining omissions and errors are those of the authors.

¹⁶ See Adrian (2018), Obstfeld (2015) and Rey (2013).

We explore the issue of sovereign monetary policy further in this paper. We use the term “sovereign” to describe independence from international developments, which translates into a central bank having the ability to pursue a specific domestic inflation target, designed for its own circumstances, independent of the monetary policies of other countries. This is to avoid any overlap with the literature on monetary policy independence from fiscal authorities. Indeed, we argue that the risk of the trilemma becoming a dilemma could be reduced through enhanced collaboration between the central bank and the fiscal authority, among other things.

The paper is organized as follows. We start with theoretical considerations that provide a menu of policy measures to bolster central bank sovereignty. We argue that because many of the instruments in this menu of options are not normally under the purview of the central bank, some form of coordination mechanism is required – in the limit, automaticity. Next, we discuss the practical application of this menu of options by touching on the Canadian experience. We then conclude.

Theoretical considerations

Let us begin with a few theoretical considerations. At the heart of the analysis is the assumption that monetary policy is conducted using a single instrument, the short-term interest rate. In effect, whether we believe we face a trilemma or a dilemma, we are talking about a shortage of policy instruments. We consider a menu of possible supplemental policy instruments, investing in which may help to buttress monetary policy sovereignty in critical episodes.

In principle, any policy instrument with macroeconomic effects could be considered a means of reinforcing monetary policy sovereignty.

Fiscal policy. The simplest example that comes to mind is fiscal policy. When monetary policy is constrained by external conditions, or by the effective lower bound, fiscal policy may be used to achieve the same macroeconomic outcomes.

The immediate reaction to this suggestion is often that fiscal policy is less than optimal because it is generally discretionary rather than rules-based and takes time to deploy. This issue may be addressed in three ways.

First, as is the case in Canada, inflation targets can take the form of a formal agreement between the central bank and the fiscal authority. This means that the inflation target may enjoy the unqualified support of government and increases the likelihood that, should monetary policy find itself constrained in some way, the fiscal authority would bring discretionary fiscal action to the table. These occasions are likely to be extraordinary and episodic, hence less likely to weaken the independence of the central bank.

Second, one can make the fiscal mechanism automatic, as modelled in the automatic fiscal stabilizer literature. Examples of automatic stabilizers are provided in Figure 1, and the channels through which they alleviate cycles are presented in Box 1. In this case, the fiscal mechanism becomes part of the economy’s structure and therefore helps ground expectations. Importantly, it is not necessary that all fiscal policy be driven by a rule, only that there be a significant fiscal channel that operates automatically.

Third, even without an automatic fiscal mechanism, some degree of fiscal predictability could still be established through repeated use. This would require a demonstrated willingness to adjust fiscal policy, in both directions, depending on the economic situation. Repeated use of the instrument is a form of investment – estab-

lishing a track record that will help ground expectations during an adverse episode.

What matters is that markets – and the central bank – come to rely on the independent actions of fiscal policy in certain circumstances. This builds more room to manoeuvre for monetary policy.

Macroprudential policies. Other possible supplementary policy instruments can have the same effect. In particular, it makes sense to consider policies that can influence financial intermediation, which lies at the heart of monetary policy transmission (Figure 2). Macroprudential policies are generally thought of as tools to make the financial system more resilient against possible future crises. For instance, disclosure requirements from financial intermediaries can be strengthened, or the capital requirement on banks permanently increased to make the financial system more structurally sound.

However, macroprudential policies can also be allowed to vary systematically with the cycle through time. In this way they can be viewed as a supplement to traditional monetary policies. For example, recent research by Aoki, Benigno and Kiyotaki (2016) suggests that cyclical macroprudential tools provide more support to monetary policy than time-invariant macroprudential tools, and can improve welfare and lead to more stability in the face of global financial cycles. They conclude that “...inflation targeting alone without macroprudential policy could reduce welfare.”

Public sector financial intermediation. A related possibility is to deploy public sector financial intermediation. Typically, public sector financial institutions exist to address specific market failures, such as a shortfall of small business financing. But if lending by these public financial institutions expands and contracts around the global financial cycle – filling credit gaps

during credit crunches, but yielding ground to private sector financial intermediaries after the crunch is over – they, too, can be seen as an additional instrument of policy.

Limits on foreign-currency borrowing and capital controls. Because foreign-currency borrowing by businesses and financial intermediaries can lead to financial instability, policies that encourage a switch away from foreign currency debt – while keeping the dynamics of the overall debt sustainable – would limit financial stability risk. As well, targeted and temporary capital controls could also be helpful in mitigating the impact of financial cycles. Research from Harvard and MIT (Farhi and Werning 2012) shows that capital controls used countercyclically are quite effective, especially in response to risk-premium shocks. But they may be subject to regulatory arbitrage, which could reduce their effectiveness.

This is not an exhaustive list, but it does provide a sense of the scope of what may be possible. Many of these additional policy instruments do not fall under the purview of the central bank. This means that a coordinating mechanism – of which outright automaticity is an extreme form – might also need to be developed.

We recognize that empirical evidence on these tools would be nice to have, especially on countercyclical macroprudential tools. We assert that these tools need to operate with some regularity through time for people to acknowledge their existence and build them into their expectations. This will also generate empirical evidence that supports their use.

Let us now illustrate how some of these instruments have been deployed in Canada and consider how they may help to buttress monetary policy sovereignty.

Macroprudential policies

The growth-at-risk framework and macroprudential policies

Researchers at the Bank of Canada have adapted the International Monetary Fund's growth-at-risk framework (Adrian, Boyarchenko and Giannone, forthcoming, and IMF 2018) to quantify the trade-offs involved in using monetary and macroprudential policies. The growth-at-risk framework models the distribution of possible gross domestic product (GDP) growth outcomes. The part "at risk" is the portion that falls below the fifth percentile. In their model, easier monetary policy results in higher expected GDP growth, but it also leads to the accumulation of financial stability risks. This alters the distribution of possible GDP growth outcomes, fattening the tails of the distribution. The consequence is that the bottom 5 per cent of the distribution is bigger—expected GDP growth is higher due to easier monetary policy, but the growth at risk from a bad scenario increases at the same time. Box 2 provides a detailed description of the growth-at-risk framework.

Using this framework, Duprey and Ueberfeldt (2018a) conduct a hypothetical counterfactual experiment in which they examine trade-offs between financial stability and macroeconomic stability emanating from monetary policy in an economy with and without macroprudential policy.¹⁷ To this end, they start with a base-case policy rate profile (green line in Chart 3a) but also consider a faster-normalization policy rate path (red line in Chart 3a) and a policy path that stays lower for longer (blue line in Chart 3a). They then analyze what those different paths would imply for macroeconomic and financial stability risk in a world with and without macroprudential policy. Three key points emerge from the analysis.

¹⁷ Although insightful, this work has been carried out so far in a reduced-form environment in which a welfare analysis cannot be undertaken. In a work in progress, Duprey and Ueberfeldt (2018b) build a simple structural model that provides a foundation for the trade-offs observed in Chart 3.

The first point is that, without macroprudential policy, increasing the policy rate faster than in the base case reduces financial stability risk but increases the risk to macroeconomic stability. This can be seen by the movement from the green dot to the red triangle in the top panel of Chart 3b. In this counterfactual exercise, the decline in financial stability risk from faster normalization of the policy rate is equivalent to about 0.10 percentage points of GDP growth (the vertical difference between the green dot and the red triangle), but this comes at the expense of an increase in macroeconomic stability risk of about 0.05 percentage points in GDP growth space (the horizontal difference between the green dot and the red triangle). In contrast, the lower-for-longer path would increase both financial and macroeconomic stability risk by 0.10 and 0.15 percentage points, respectively (movement from green dot to blue square). Therefore, in a world without macroprudential policy, a lower-for-longer path would be riskier than a faster normalization path from a macroeconomic and financial stability risk management perspective (Poloz 2014).

The second point is that macroprudential policy is more effective than monetary policy at reducing financial stability risk. This can be seen by the vertical shift of the green dot in the top panel to the green dot in the bottom panel of Chart 3b. Indeed, for the same base-case policy rate path scenario, the introduction of macroprudential tightening reduces the average financial stability risk by about 0.30 percentage points of GDP growth. Notice that this is significantly larger than the decrease in financial stability risk emanating from tighter monetary policy when macroprudential policy is not active.

The final point is that when macroprudential policy is tighter, changes in monetary policy have larger effects on macroeconomic risk and

smaller effects on financial stability risk. As can be seen from Chart 3b, with macroprudential tightening, a faster increase in the policy rate increases macroeconomic risks four times more than it decreases financial stability risks. In contrast, without macroprudential tightening, the increase in macroeconomic stability risk is about half as large as the decrease in financial stability risk. This suggests that the ability of monetary policy to stabilize the macroeconomy is reinforced by the presence of an active macroprudential policy that targets financial stability risks, implying a more sovereign monetary policy.

Countercyclical buffers

Bank of Canada researchers analyze the interaction of countercyclical capital buffers and monetary policy in a structural model that links bank, household and business balance sheets (Alpanda, Cateau and Meh 2014). In particular, they analyze a scenario where an exogenous easing in global financial conditions reduces mortgage rates. They assume that monetary policy is conducted via a typical Taylor rule and, as we show in Chart 4, compare two scenarios: a baseline with no macroprudential policy (red line) and an alternative with a countercyclical capital buffer ratio (blue line). The key message from the analysis is that if households, businesses and banks anticipate tighter macroprudential policies when credit grows too fast, they automatically adjust their borrowing and lending decisions. This has a stabilizing effect on consumption, investment and output, and ultimately requires less adjustment in monetary policy to control inflation.

Indeed, in the baseline economy without capital buffers, the shock pushes up the stock of house prices, household debt and residential investment by 15 per cent, 13 per cent and 13 per cent, respectively (Charts 4a–c). This causes an increase in output and boosts inflation by about 0.5 percentage points at peak. In con-

trast, when countercyclical capital buffers are active, the capital requirement increases by an average of 5 percentage points over four years. The higher capital requirement leads households to reduce their borrowing and demand for housing and consumption, which in turn dampens the increase in output and inflation. The policy rate needs to increase by only 0.3 percentage points compared with 0.8 percentage points when there is no countercyclical capital requirement policy (Chart 4f).

This suggests that monetary policy sovereignty, in the face of external financial shocks, is enhanced by the presence of countercyclical buffers. The enhancement is likely to be more important when macroprudential tools are targeted and aimed at the source of the imbalances.

Rules-based vs. discretionary macroprudential policies

For any policy to be effective and credible as a stabilizer, it needs to be designed and used as such. In most cases, this implies that the policy is likely to be more effective if it is systematically put in a rules-based framework, rather than enacted in a discretionary fashion. A rules-based approach makes implementation automatic, not arbitrary. This can help eliminate adverse implementation incentives, such as inaction bias by policy-makers, and the potential for negative market reactions.

To quantitatively illustrate the importance of credible macroprudential policy, Aikman et al. (2018) construct a counterfactual experiment to see if a rules-based capital buffer could have prevented or mitigated the 2008-09 crisis. Their results suggest that a buffer of 3 per cent in the United States would have delivered the same level of resilience as the US\$200 billion Troubled Asset Relief Program (TARP). This would have brought forward the capital raising that ultimately proved necessary, with the added benefit of using private instead of public re-

sources. Moreover, they estimate that a buffer of 4.7 per cent would have mitigated any effects that TARP on its own was unable to avoid, because it would have permitted banks to continue lending at historical rates of credit growth.

These capital requirements may sound large. However, data suggest that banks had sufficient capacity to meet them through a combination of additional retentions and new issuance (Hirtle 2016). The key point is that a rules-based approach would have helped the buildup during the upswing, by eliminating signalling effects and the inaction bias of policy-makers. And the release of this buffer would have reduced the severity of the crisis and credit crunch. A recent practical example can be seen in the United Kingdom regarding the Brexit vote. The average countercyclical capital buffer in the United Kingdom was set at 1 per cent and released following the Brexit shock. This release was viewed as an important factor that contributed to mitigating the financial stress associated with the Brexit shock, and hence helped increase the credibility of the UK buffer.

What this all means is that multiple macroprudential tools are available that could create more room to manoeuvre for a central bank. The main requirement is that they be predictably countercyclical, whether they are automatic or discretionary. If there is any concern over inaction bias, then making a single instrument automatic, or perhaps giving the central bank control over one instrument, could be a useful option.

Public sector financial intermediation

We will turn now to the use of public sector financial institutions. Many countries have such agencies, usually with the aim of correcting one or more market failures in financial intermedia-

tion. International trade finance is one such area, as is small business lending.

The need for such public agencies is often debated. We will not delve into the issue here.¹⁸ But tapping into these tools was one key reason why Canada weathered the global financial crisis as well as it did. These institutions also allowed the central bank to maintain its focus on inflation through the crisis and the aftermath.

There were two main tracks to Canada's crisis response in this area: public sector lending to businesses that were finding their credit restricted, and programs aimed at banks to ensure they had ongoing access to funding at a reasonable price in order to continue lending to consumers and businesses.

Business Credit Availability Program

The first track was implemented through Export Development Canada (EDC) and the Business Development Bank of Canada (BDC). EDC provides credit insurance and political risk insurance for exporting companies, and lending to foreign buyers of Canadian exports. BDC is primarily a lender to small businesses.

In the wake of the crisis, the government boosted the capital and borrowing limits of both EDC and BDC, and temporarily increased the scope of activities they could perform. One way in which BDC and EDC made use of these additional flexibilities and resources is the Business Credit Availability Program (BCAP) introduced in 2009.¹⁹ Through this program, EDC and BDC provided at least Can\$5 billion in additional loans and other forms of risk management to enhance credit at market rates to businesses with viable business models, but

¹⁸ For further discussion, see the IMF work by Ratnovski and Narain (2007), which provides a detailed discussion of the benefits and risks of public sector financial institutions in advanced economies.

¹⁹ For additional information, see Canada's Economic Action Plan (<https://budget.gc.ca/2009/plan/bptoc-eng.html>) in the 2009 federal budget.

whose access to financing would otherwise be restricted. As a result, lending soared at both institutions, often in partnership with private sector banks. In fact, as of the end of March 2011, both institutions reported total activity under BCAP of over Can\$11 billion, aiding more than 10,000 firms across the country and in all sectors of the economy, with a focus on small businesses.²⁰ When conditions returned to normal, the institutions reverted to their usual operations.

Insured Mortgage Purchase Program

The second track was the Insured Mortgage Purchase Program (IMPP). It was aimed at large Canadian commercial banks, which faced elevated funding costs during the crisis, and Canadian consumers, who found it more difficult to get mortgage financing. Under the plan, the Canada Mortgage and Housing Corporation (CMHC), which typically offers mortgage insurance to financial institutions, purchased large pools of mortgages outright. In exchange, financial institutions received cash that they could use to make new loans to consumers and businesses. Over Can\$70 billion, equal to almost 5 per cent of GDP, was used during the program's operation. The IMPP, along with other Bank of Canada facilities, allowed Canadian banks to reduce their use of term funding by more than 30 per cent below normal levels.²¹

With the benefit of hindsight, these steps helped the Bank of Canada's monetary policy provide appropriate stimulus while the policy interest rate was at the level then considered to be the effective lower bound. Even at the worst of the crisis, the Bank was able to keep

monetary policy grounded in its inflation outlook. In this way, public sector financial intermediation was used to help support monetary sovereignty.

Automatic fiscal stabilizers

Let us turn now to the use of automatic fiscal stabilizers. Most countries, including Canada, already have some automatic fiscal stabilizers in place (IMF 2015). The key question, however, is whether the automatic fiscal stabilizers in Canada are strong enough to deliver the necessary stabilization needed to provide timely support to monetary policy and the macroeconomy.

To address these issues, we conduct a policy experiment using ToTEM (Terms-of-Trade Economic Model),²² the Bank of Canada projection model, to determine the power of existing Canadian stabilizers. We consider a foreign demand shock that causes the output gap to fall to a trough of 1 per cent in a baseline scenario where automatic stabilizers are in place (blue lines in Chart 5). We then compare responses against a counterfactual that abstracts from these stabilizers (red line in Chart 5). The stabilizers being captured are both government purchases and transfers.

This experiment suggests that the automatic stabilization properties of the Canadian system are not very strong. They are strong enough to lean into a negative demand shock, but not to counteract it meaningfully. Specifically, in the example considered, the key monetary policy rate has to fall by 175 basis points (bps) to keep inflation on target (blue line in Chart 5c). Having automatic fiscal stabilizers operating reduces the required decline in the policy rate by only about 20 bps (moving from the red line to the blue line in Chart 5c).

²⁰ The amount of financing provided to Canadian businesses through the program easily surpassed the target of at least Can\$5 billion that was set out in Budget 2009.

²¹ Complementing the IMPP were several steps taken by the Bank of Canada to support financial market liquidity, including the introduction of term repos and repos for private sector instruments. Taken together, these steps were instrumental in keeping markets functioning and allowing the monetary policy transmission mechanism to continue to work. See Zorn, Wilkins and Engert (2009) and Nadeau (2009) for further discussion.

²² See Murchison and Rennison (2006), Dorich et al. (2013) and Bank of Canada (2017) for a description of ToTEM.

This difference is not very large – it is only about one-tenth of what is actually required. However, imagine a scenario in which the automatic fiscal stabilizers were about four times as powerful. This would mean that monetary policy would be able to keep inflation on target without adjusting the policy rate as aggressively. If 75 bps of the adjustment were to come from fiscal policy, then monetary policy would have had to respond only by 100 bps.

To sum up, to significantly reduce the burden on monetary policy, automatic fiscal stabilizers would need to be enhanced greatly from current levels. This means that a coordinating mechanism – of which outright automaticity is an extreme form – might also need to be developed.

These results are in line with McKay and Reis (2016), who show that reducing the scope of all the stabilizers would have had a small impact on the volatility of the US business cycle in recent decades. This, however, depends on how monetary policy is conducted. When monetary policy is constrained by the effective lower bound (and hence far from optimal), the stabilizers have a more important role in aggregate stabilization and they affect social welfare substantially via the provision of social insurance.

Consistent with insights from the work of McKay and Reis discussed earlier, Eichenbaum (2018) proposes a rules-based approach to have fiscal policy assume more of a stabilizer role during stress times. His asymmetric approach would see stabilizer programs ramp up, through either traditional programs such as unemployment insurance or adjustments to tax rates, when monetary policy reaches the effective lower bound. The fiscal policy would be recalibrated when the central bank policy rate returned to a predetermined, normal policy setting. If such an approach is intended to anchor expectations, its credibility would be enhanced by being enshrined in law and clearly

communicated to the public and market participants.²³

Designing fiscal stabilizers that ramp up during crisis periods would also be helpful in maintaining an appropriate mix of monetary and fiscal policies. The policy mix matters to the economy's debt load: if fiscal policy dominates the effort, government debt builds up, whereas if monetary policy leads the effort, household debt builds up. In either case, excessive debt creates a vulnerability that makes the economy less resilient over time.

This was seen in Canada in the mid-1990s, when relatively easy fiscal policy paired with relatively tight monetary policy led to government debt levels that drew unwelcome attention from international investors. And in the years following the crisis, relatively tight fiscal policy and relatively easy monetary policy led to a historic buildup of household debt. Bank of Canada staff have explored this trade-off between public sector and private sector debt using our central policy model (Poloz 2016). This has helped us put the recent rise in private sector indebtedness into context—that in the circumstances it was not feasible to avoid a buildup of some kind of debt. Finding an optimal point along that trade-off between private and public sector debt remains a subject for further research.

Conclusion

We must acknowledge that the traditional monetary policy trilemma can become a dilemma in certain conditions, although in Canada we have not experienced this. We have offered a menu of possible options for small,

²³ This can raise questions of fiscal dominance and monetary dominance. An interesting interpretation is that Canada's inflation-control agreement is one possible solution to this issue because both the monetary and fiscal authorities have agreed on a joint commitment to the inflation target. The central bank has operational independence, but when it becomes constrained by the effective lower bound on the interest rate, fiscal policy would then assist monetary policy to support the economy. Hence, the inflation agreement represents an elegant coordinating mechanism between the two authorities.

open economies to choose from to bolster the central bank's ability to conduct a sovereign monetary policy. Most of these involve instruments that do not traditionally belong to the central bank. Developing those tools would require up-front investment – in coordinating mechanisms, in demonstrated willingness to use the policies when needed and perhaps in outright automaticity.

That is all well and good on a theoretical level. In practice, of course, the world can look completely different, and institutional arrangements can vary greatly from one country to another.

With all the possibilities we have mentioned, implementation is more complicated than simply flipping a switch once a difficult episode arises. These policies cannot be like Sleeping Beauty, who could be awakened in a moment. Rather, they need to operate with some regularity through time for people to acknowledge their existence and build them into their expectations. Since many of the instruments discussed here are not normally under the purview of the central bank, some form of coordination mechanism is required—at the extreme, automaticity. The bottom line is, the more present the policies are, the more effective they can be in improving the trade-offs faced by central banks, and the greater the ability of the central bank to pursue a sovereign monetary policy, regardless of the conditions they face. And that is a very worthwhile investment.

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Figures and Charts

Figure 1: Examples of automatic stabilizers

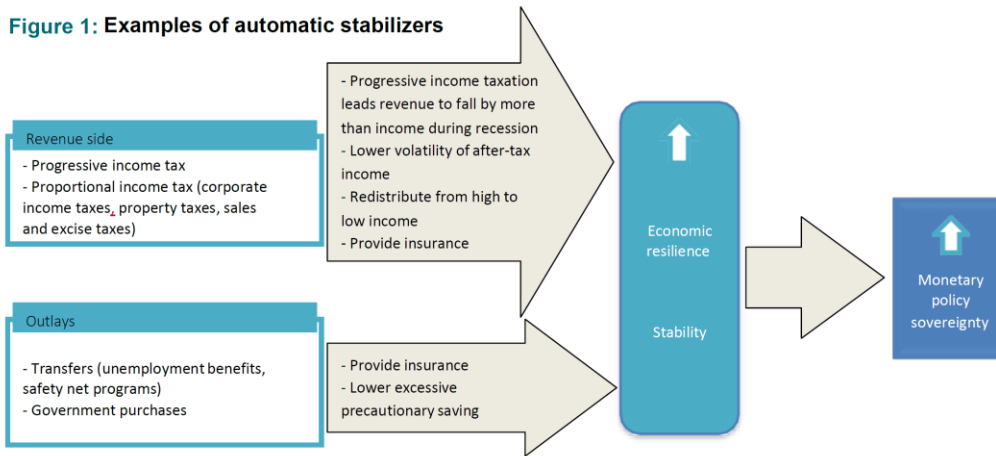
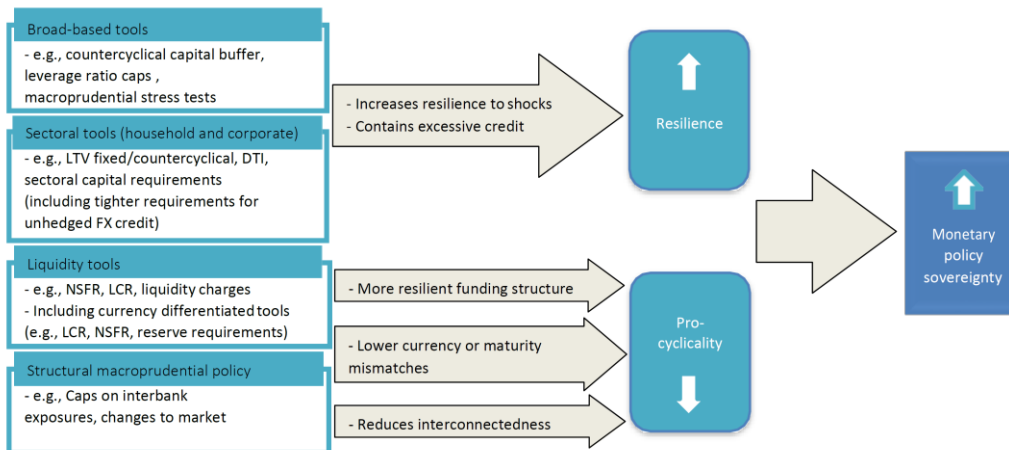


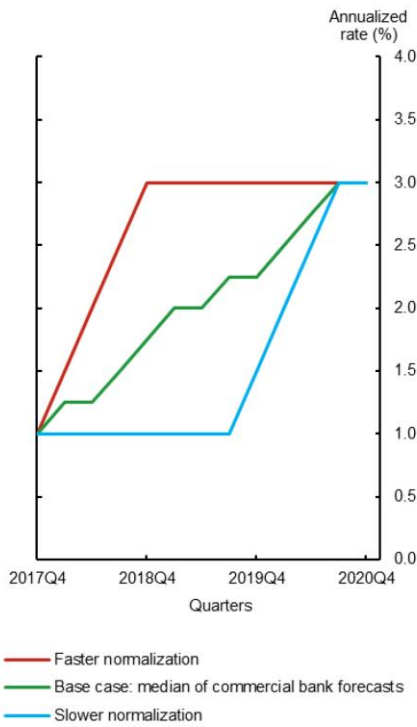
Figure 2: Examples of Macroprudential Policy



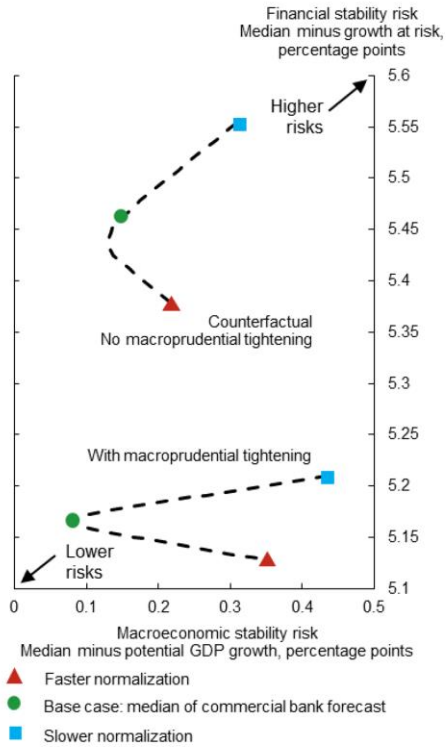
Note: LTV – loan-to-value ratio; DTI – debt-to-income ratio; FX – foreign exchange; NSFR – net stable funding ratio; LCR – liquidity coverage ratio
 Source: Adapted from Adrian (2018)

Chart 3: Growth at risk and the trade-offs of using macroprudential and monetary policies to mitigate financial stability risks

a. Alternative scenarios with faster or slower



b. Financial stability vs. macroeconomic risk trade-offs with and without macroprudential policy



Notes: The median path of the interest rate in **Chart 3a** is the average of the forecasts realized by Canadian commercial banks over 2018–19. Financial stability and macroeconomic risks use quarterly annualized input and are averaged until 2022 in **Chart 3a**. The circles/triangles/squares correspond to the economy simulated with the policy path of the same colour in **Chart 3b**. Moving along the black line corresponds to picking an interest rate path closer to the dashed red or to the dotted blue lines in **Chart 3b**. Financial stability and macroeconomic risks use quarterly annualized input and are averaged over 2018–2022 in **Chart 3b**.

Source: Duprey and Ueberfeldt (2018a)

Chart 4: Effects of monetary policy in the presence of countercyclical capital buffers following an unexpected fall in mortgage rates

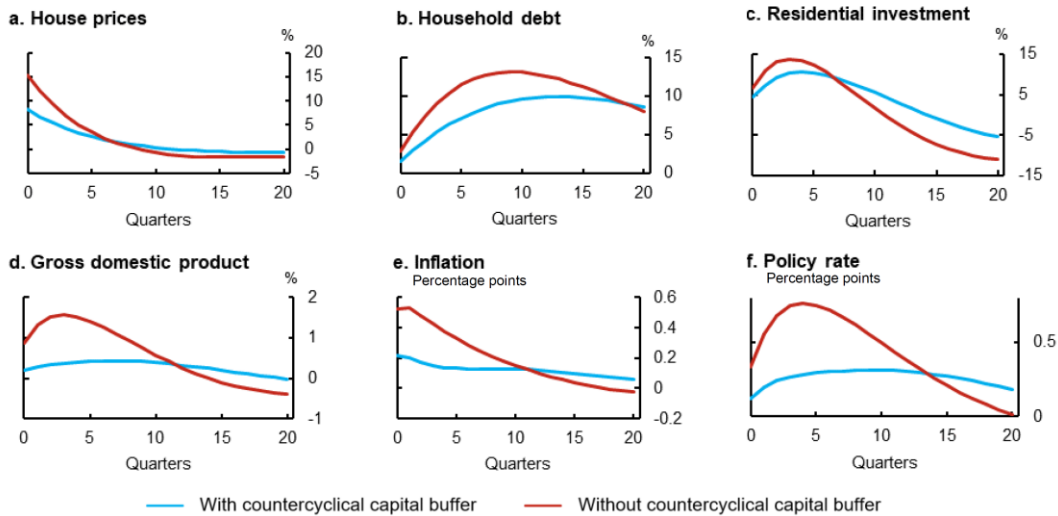
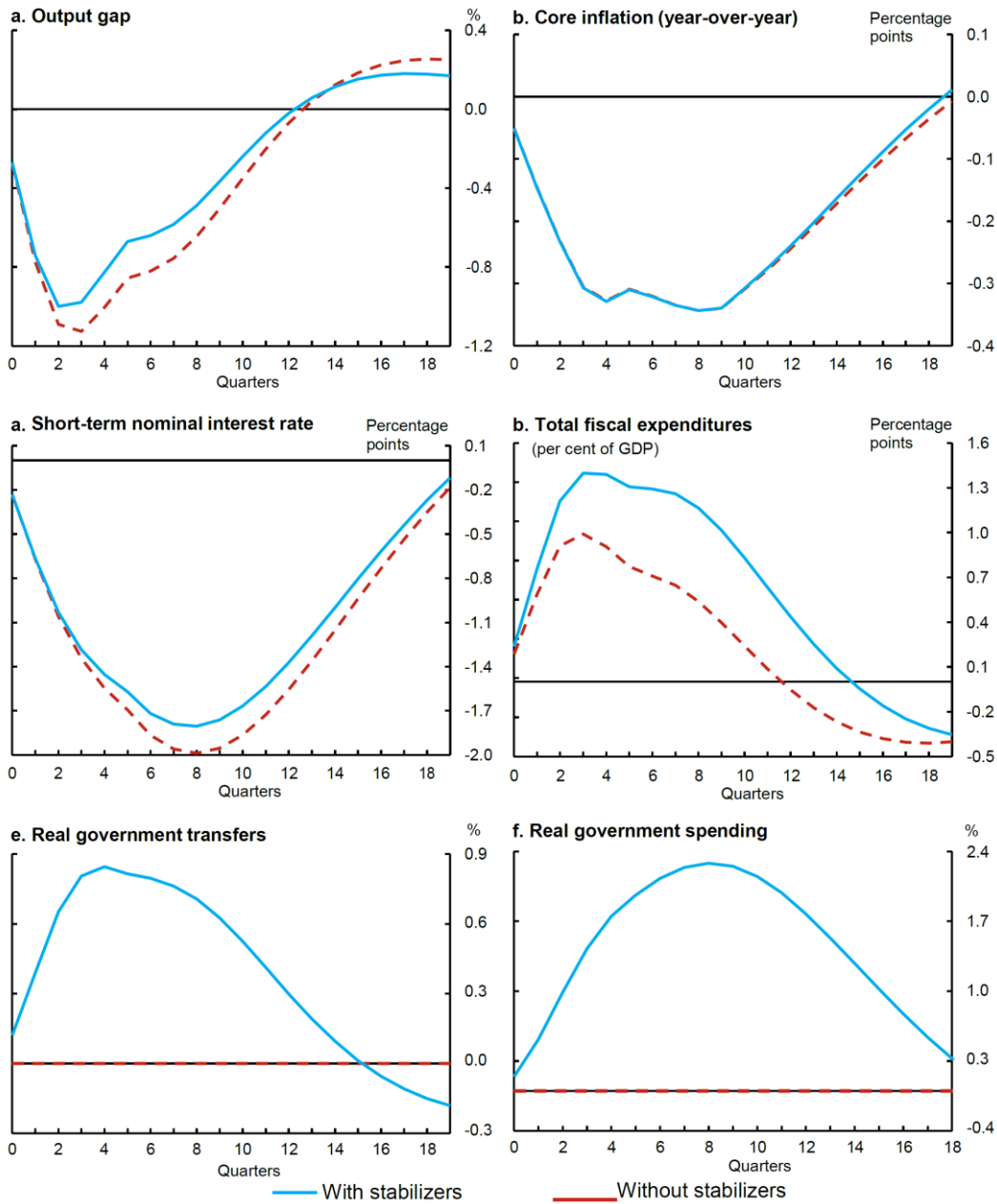


Chart 5: Assessing the strength of fiscal automatic stabilizers in Canada



Box 1: Channels through which automatic fiscal stabilizers reduce cycles

There are generally four primary theoretical channels through which automatic fiscal stabilizers may lessen cycles. These channels, in turn, provide support to monetary policy (McKay and Reis 2016).

1. **The disposable income channel.** This is the traditional channel underscored in the automatic stabilization literature. To the extent that a fiscal instrument, like an income tax, decreases the fluctuations in disposable income, it will reduce the volatility of consumption and investment, thereby stabilizing aggregate demand. When nominal rigidities exist, this channel will stabilize the business cycle.
2. **The marginal incentives channel.** For instance, in a progressive personal income tax system, the tax rate facing workers is procyclical—that is, it increases in booms and drops in recessions—hence encourages intertemporal substitution of work effort away from booms and into recessions.
3. **The redistribution channel.** If households that receive funds (transfers) have a higher propensity to spend than those that contribute the funds, aggregate consumption and demand will increase with redistribution. Similarly, if the receivers are at a corner solution with respect to their choice of hours to work while the payers work more to offset their drop in income, aggregate labour supply will increase with redistribution. Even in the case where aggregate disposable income and marginal tax rates are fixed, the distribution of this income can affect aggregate demand and marginal incentives and thereby stabilize economic activity.
4. **The social insurance (or wealth distribution) channel.** Such policies provide insurance to households against income and unemployment risks, with implications for precautionary savings and the distribution of wealth.

Even though automatic fiscal stabilizers can be a powerful stabilization tool through their predictability and timeliness, automaticity may have some side effects. For example, generous unemployment insurance could reduce individuals' incentives to work, and automaticity in general could delay the necessary reallocation of productive resources following a persistent supply shock.

McKay and Reis (2016) provide a quantitative assessment of these channels of stabilization in the United States, using a state-of-the-art model (combining New Keynesian models, incomplete markets and heterogenous-agent models). Their findings suggest that the disposable income channel commonly used to support automatic stabilizers is quantitatively weak, and that the role of precautionary savings and social insurance was largely more important.

Box 2: Illustration of the growth-at-risk framework

Information contained in this box was drawn from the June 2018 issue of the Bank of Canada's *Financial System Review*, (Box 2, page 19). It provides a description of the growth-at-risk framework.

In assessments of financial system risks, considering the range of possible economic outcomes is as important as looking at the most likely path for the economy. Lower interest rates, for example, boost expected economic growth in the short run, but can also lead to a buildup in financial system vulnerabilities by increasing indebtedness. When vulnerabilities in the economy are elevated, adverse shocks can have a larger negative impact on gross domestic product (GDP). For example, if households cannot service their debt when their income falls or financial conditions tighten, larger downside risks to GDP can materialize.

Chart 2-A illustrates how statistical tools can be used to model the impact of increased vulnerabilities, such as indebtedness, on possible outcomes for GDP growth. Greater indebtedness increases median GDP growth, but also amplifies downside risks.

The downside risks can be summarized using growth at risk.¹ This is a measure of the worst-case scenario for GDP growth: the rate of GDP growth over one year that should be exceeded in all but the worst 5 per cent of possible outcomes (i.e., the fifth percentile of GDP growth). Financial system vulnerabilities make the worst-case outcome for GDP growth even worse.

Growth at risk is influenced by both macroeconomic performance and financial vulnerabilities (Chart 2-B). For example, growth at risk worsened in 2015, mostly because of the macroeconomic implications of a collapse in oil prices. But in the period since 2016, the growth in household indebtedness and housing market imbalances has weighed on growth at risk, even while macroeconomic performance has improved.

By constraining vulnerabilities, financial sector policy may improve growth at risk. For example, recent policy actions are expected to slow the accumulation of household debt and dampen house price growth. These macroprudential policies tend to reduce median GDP growth, but they should also reduce the chances of a severe contraction of GDP, as measured by growth at risk. Analyzing policy changes in this framework helps in understanding and quantifying economic and financial stability trade-offs.²

Chart 2-A: Financial system vulnerabilities increase downside GDP risks

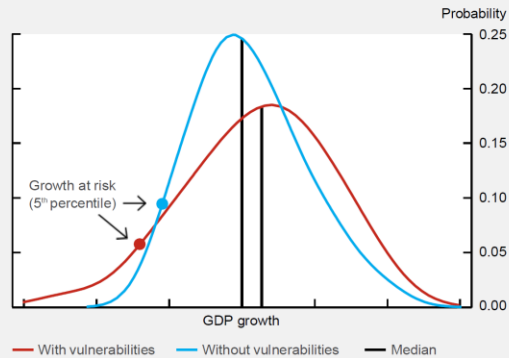
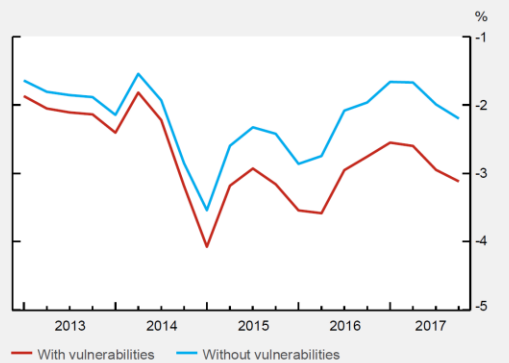


Chart 2-B: Financial vulnerabilities have contributed increasingly to growth at risk

One-year-ahead forecast of the 5th percentile of GDP growth



Source: Bank of Canada calculations


Last observation: 2017Q4

¹ T. Adrian, N. Boyarchenko and D. Giannone, "Vulnerable Growth," *American Economic Review* (forthcoming).

² This framework is discussed in T. Duprey and A. Ueberfeldt, "How to Manage Macroeconomic and Financial Stability Risks: A New Framework," Bank of Canada Staff Analytical Note No. 2018-11 (May 2018).

DISCUSSION BY VEERATHAI SANTIPRABHOB


Slide presentation



(1942-2017)
BANK OF THAILAND

Life in the Periphery: Perspectives from an EM Central Bank

Veerathai Santiprabhob
Bank of Thailand
8 September 2018



BANK OF THAILAND

Outline

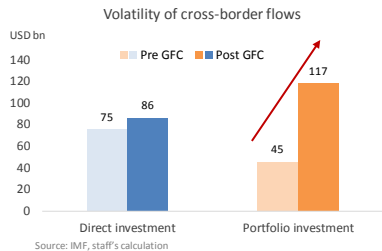
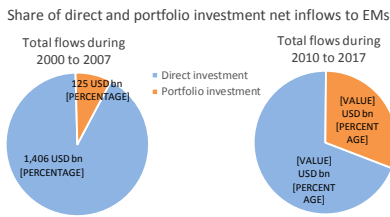
- I. How did the unconventional monetary policy of AEs complicate life in the periphery?
- II. How could central banks in the periphery deal with reduced ability to pursue independent monetary policy?
- III. How could international coordination help minimize unintended consequences on EMs?
- IV. Challenges ahead for central banks in the periphery

2

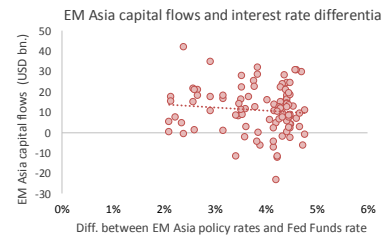
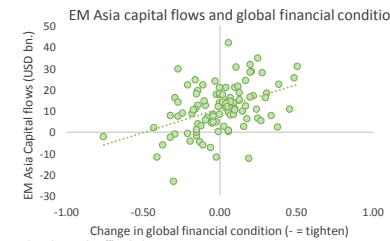
I. How did the unconventional monetary policy of AEs complicate life in the periphery?

I.1 Excessive global liquidity changed the nature of capital flows to EMs

- Capital flows to EMs became more volatile and portfolio flows increased markedly post GFC



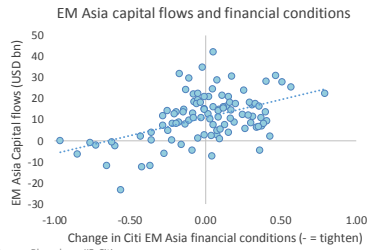
- Capital flows appear to be more sensitive to global financial conditions than interest rate differentials



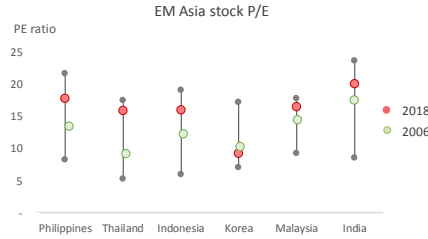
Source: Bloomberg and staff's calculation
 Note: Global financial condition index comprises a set of cross-market measures of risk sentiment, hedging demand and investors' flows in the global financial system.
 Interest rate differentials are defined as a difference of average policy rates of India, Indonesia, Korea, Malaysia, Philippines, Thailand, and Vietnam and The Fed Funds rate.



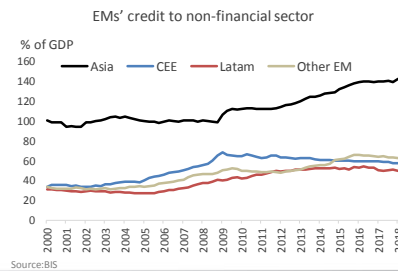
I.2 Capital flows to EMs led to asset prices surge, underpricing of risks, and credit growth that could pose financial stability risks in the future



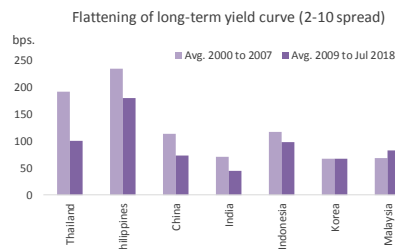
Source: Bloomberg, IIF, Citi
 Note: Citi EM Asia financial conditions index comprises a set of EM Asia's cross-market prices (Money market, Bond market, Credit market and FX market) and measures of risk sentiment in stock and FX market, and external variables



Source: Bloomberg, staff's calculation



Source: BIS



Source: Bloomberg, staff's calculation

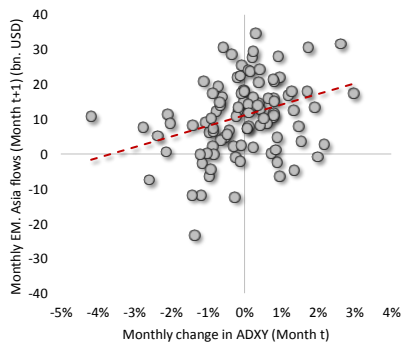
5



I.3 Due to capital flow dynamic, exchange rate at times served as “amplifier” as opposed to “stabilizer” of capital flows, especially in EMs with strong external position

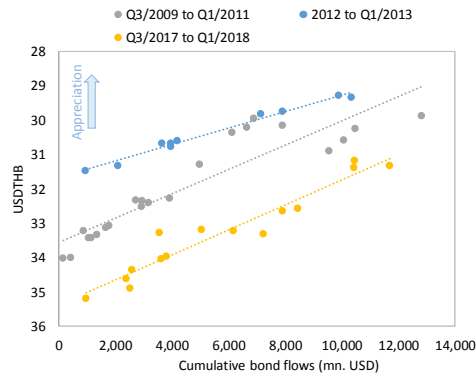
- Exchange rate appreciation invited more inflows, which led to more pressure on the exchange rate

Monthly change of EM Asia currencies and capital flows in the following month



Source: Bloomberg and IIF

Capital flows and THB movements during appreciation episodes



Source: BOT

6



II. How could EM central banks in the periphery deal with reduced ability to pursue independent monetary policy?

7



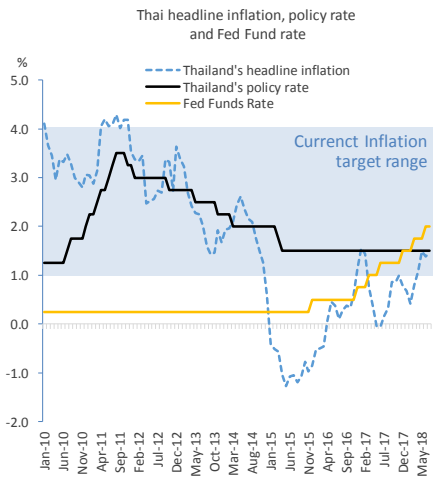
Bank of Thailand's operating environment during 2013 - 2017

- **Fragile domestic recovery: unbalanced growth, lower growth rate than potential, and lowest growth rate among East Asian EMs. Growth became close to potential level only in 2017-2018**
- **Large current account surplus (10.8% of GDP in 2017) owing to low investment, low oil prices, and surge in tourism revenue**
- **Inflation below the lower bound of the target range since 2015 mainly due to supply-side factors**
- **Financial stability risks continued to increase:**
 - high household debt,
 - expanded shadow banking activities,
 - unrated corporate bond bubble,
 - declining quality of mortgage loan portfolio, and
 - rapid expansion of real estate supply

8



Bank of Thailand's conduct of monetary policy during 2013 - 2017



- Despite volatile capital flows, the BOT has retained a certain degree of monetary policy autonomy. With strong external positions, there is no imminent need to increase the policy rate
- However, conducting monetary policy has proven to be more difficult thus far:
 - Lowering interest rate could not disincentivize capital inflows when investors' risk appetite was influenced by excessive global liquidity
 - Limited policy space when interest rate was close to the effective lower bound, which was higher than the zero lower bound
 - Further interest rate cut might not get transmitted into higher inflation but could lead to adverse impacts on financial stability

9



Sound economic fundamentals, especially robust external positions, help insulate the country from external shocks, and THB is deemed as a regional safe haven currency

Country	Index	External financing	Money supply	Industrial prod.	Exports	Loan-to-deposit	Short-term debt	Implied FX vol	CDS spread	Equities	Eco surprises	Global risk	REER
Venezuela	74.7%	100%	99%	99%	100%	2%	64%	0%	99%	41%	0%	48%	100%
Turkey	71.7%	94%	53%	97%	19%	88%	100%	69%	86%	33%	99%	42%	81%
South Africa	64.9%	78%	45%	62%	73%	70%	95%	85%	33%	83%	51%	48%	48%
Colombia	61.4%	52%	55%	95%	20%	100%	36%	90%	64%	17%	95%	27%	86%
Saudi Arabia	59.7%	100%	49%	53%	76%	47%	0%	0%	63%	87%	0%	39%	73%
Ukraine	56.4%	14%	38%	76%	80%	85%	29%	43%	0%	91%	63%	29%	33%
Nigeria	56.4%	75%	47%	89%	61%	11%	32%	100%	0%	99%	0%	39%	1%
Egypt	55.9%	87%	90%	28%	34%	0%	84%	0%	95%	31%	0%	27%	80%
Brazil	55.1%	37%	41%	89%	14%	59%	44%	93%	87%	1%	67%	30%	100%
Argentina	53.9%	63%	81%	65%	9%	0%	77%	99%	93%	17%	100%	42%	2%
Czech Republic	53.8%	95%	27%	99%	86%	33%	9%	3%	1%	61%	98%	68%	68%
India	52.4%	60%	58%	82%	49%	20%	46%	27%	58%	27%	95%	37%	70%
Mexico	51.4%	70%	64%	73%	30%	25%	35%	95%	63%	47%	50%	54%	12%
Chile	51.3%	18%	41%	44%	42%	92%	85%	70%	20%	14%	53%	48%	90%
Russia	51.0%	12%	55%	59%	92%	58%	2%	82%	79%	8%	36%	37%	92%
Kazakhstan	49.7%	37%	64%	96%	95%	26%	4%	0%	75%	14%	0%	58%	0%
Romania	48.6%	96%	50%	56%	60%	53%	49%	8%	30%	43%	0%	51%	50%
Indonesia	48.1%	70%	42%	15%	50%	38%	75%	58%	55%	2%	27%	64%	82%
Uganda	47.6%	80%	51%	0%	51%	24%	24%	4%	0%	69%	0%	41%	85%
Singapore	47.1%	16%	41%	75%	23%	51%	95%	23%	0%	27%	66%	39%	66%
Croatia	46.7%	100%	65%	43%	6%	25%	89%	15%	75%	9%	0%	39%	57%
Philippines	46.5%	74%	51%	6%	86%	84%	14%	35%	37%	22%	73%	37%	38%
Serbia	46.5%	100%	98%	1%	19%	35%	55%	0%	74%	65%	0%	39%	0%
Malaysia	45.8%	39%	28%	30%	81%	52%	74%	64%	38%	25%	27%	40%	53%
Hungary	45.2%	11%	65%	92%	63%	28%	44%	18%	37%	4%	91%	25%	65%
Pakistan	44.0%	70%	53%	45%	73%	0%	14%	1%	93%	17%	0%	48%	68%
Poland	42.8%	43%	39%	14%	50%	60%	47%	25%	13%	53%	83%	50%	38%
South Korea	41.3%	32%	44%	45%	69%	80%	0%	71%	0%	10%	19%	28%	82%
Peru	41.0%	55%	66%	17%	7%	63%	69%	46%	30%	3%	59%	38%	39%
Bulgaria	35.5%	14%	29%	14%	41%	21%	16%	0%	46%	43%	0%	44%	58%
Kenya	35.1%	79%	40%	3%	38%	35%	61%	1%	0%	42%	0%	40%	0%
China	33.7%	48%	78%	18%	57%	7%	15%	13%	31%	53%	30%	36%	18%
Israel	33.4%	21%	44%	63%	34%	16%	1%	21%	12%	38%	0%	56%	59%
Taiwan	25.5%	6%	88%	10%	45%	14%	23%	9%	0%	13%	17%	38%	56%
Thailand	23.5%	19%	10%	38%	9%	47%	9%	17%	19%	13%	22%	31%	46%

Legend:
 Risk index below 50% (green)
 Risk index between 50-55% (yellow)
 Risk index between 55-65% (orange)
 Risk index above 65% (red)

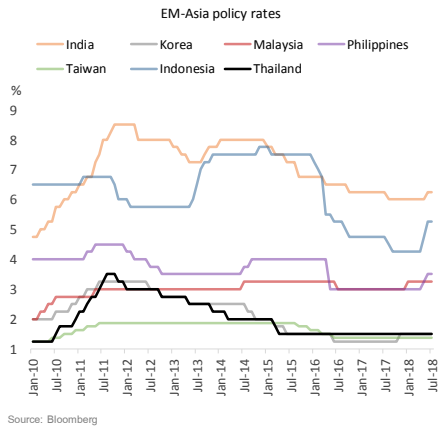
Source: Citi
 Note: Data as of Oct 2016
 * - Latest hedge signal for long EM currency exposure
 ** - Latest hedge signal for short EM currency exposure

10



II.1 “Leaning against the wind” monetary policy with macroprudential measures has proven to be effective

- ‘Leaning against the wind’ policy and macroprudential measures are needed to help safeguard financial stability
- For EMs, macroprudential measures are complements, rather than substitutes, to monetary policy stance



Macroprudential measures

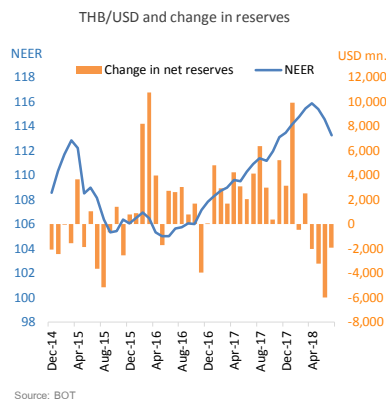
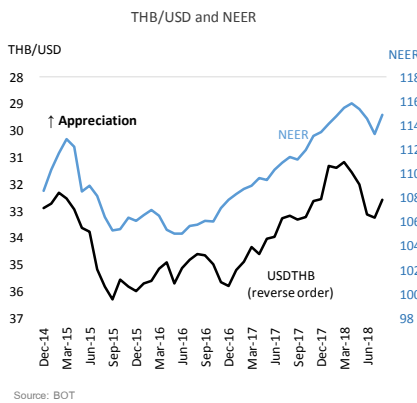
- **Credit card:** raising minimum income of card holders
- **Personal loan:** strengthening borrower qualifications and capping credit limits
- **Unrated bond:** tightening underwriting standard and narrowing scope and eligibility of unrated bond investors
- **LTV:** imposing 70% LTV on high-value residential property
- **Saving cooperative:** tightening regulations and supervision

11



II.2 Allowing exchange rate movements with foreign exchange intervention to address unintended consequences of capital flows

- Two-sided foreign exchange intervention helps limit the amplifying impacts of exchange rate on capital flows
- Building reserve buffers in anticipation of capital flow reversal caused by AE’s normalization helps increase ability to ride out the waves



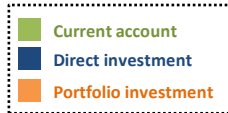
12



II.3 Increasing private sector's ability to handle capital flows and their impacts: capital account liberalization and improving FX risk management capability

Recent developments of capital flow liberalization

- 2003**
 - Relax outward portfolio investment for institutional investors
- 2008**
 - Allow residents' hedging on estimated obligation (<1y) for goods and services
 - Expand FX retention period to 360 days before repatriation
 - Relax outward portfolio investment for retail investors through intermediary
 - Raise limit on outward direct investment from 50 USD mn to 100 USD mn per year
- 2010**
 - Remove limit on outward direct investment for Thai companies
- 2012**
 - Remove limit on outward direct investment for all individuals
- 2015**
 - Allow qualified individuals to invest abroad directly
- 2017**
 - Raise limit on external portfolio investment via local asset management companies from 75 USD bn to 100 USD bn
- 2018**
 - Launch the qualified company scheme with limited foreign exchange supervision

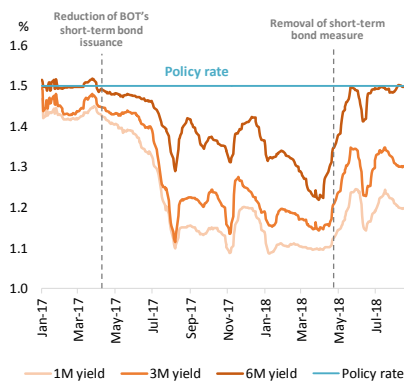


13



II.4 Reducing incentives and "throwing sand in the wheels" for hot money

Short-term yield movement



Source: BOT

- Reducing short term BOT bond supply to limit ability of non-residents to place short-term money
 - Market-based measure
 - Size of bond issuance can be adjusted on a monthly basis in response to capital flow conditions
 - Unintended consequences: short-term rates became lower than policy rate and domestic investors took more risks via foreign investment funds
- "Sand in the wheels" measures for non-residents
 - Create friction on offshore THB liquidity management
 - Disclosure of end beneficiary investors in Thai bonds

14

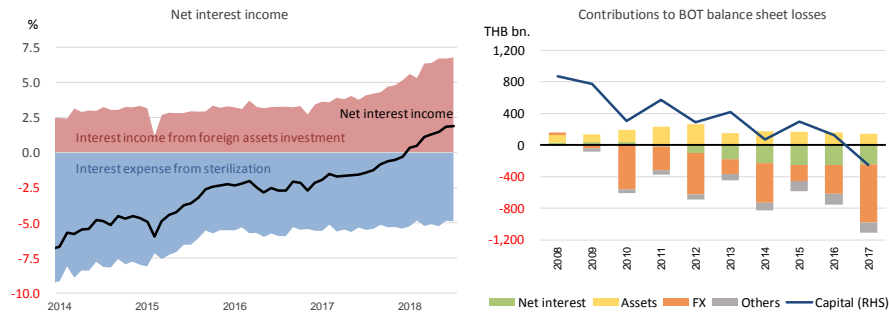


II.5 Calculating and utilizing “limited policy space” wisely

Multiple dimensions of policy space

- Due to financial stability concerns, EMs’ effective lower bound tends to be higher than zero
- Limited policy space needs to be preserved for future adverse incidents
- Public confidence in central bank balance sheet needs to be safeguarded
- Navigating risks of being classified as a currency manipulator

BOT’s balance losses from sterilization intervention



Source: BOT

Source: BOT

15



III. How could international coordination help minimize unintended consequences on EMs?

16



III. Possible areas of coordination

- **Coordination of monetary policy framework that takes into account financial stability risks more explicitly might reduce excessive global liquidity**
- **Increase consideration on EMs' conditions and constraints when developing IFIs' institutional views**
 - While AEs were able to undertake unconventional monetary policy with little resistance from the global policy community, EMs in the periphery are often restricted and reproached in their response to the side effect
 - Burden of adjustments needs to be proportionately shared by the source and recipient countries of capital flows
 - Capital flow management measures need to be sufficiently flexible to allow EMs to navigate volatile capital flows (and if needed, allow backtracking of too early liberalization)
 - External Balance Assessment (EBA) and assessment of currency valuation need to take into consideration implications of capital flows and country specific context and circumstances

17



IV. Challenges ahead for central banks in the periphery

18

IV. Challenges ahead for central banks in the periphery

- **Increasing comovements between domestic and foreign variables and financial integration, partly due to rapid advancement in technology and reduced significance of national borders, are challenges to central bank's autonomy**
 - Low global inflation and flattening of yield curve
 - Global asset price procyclicality and comovements
 - Fintech and new types of financial service providers
- **Increased vulnerability coming from unpredictable trade policy**
- **Increasing need to better incorporate financial stability into the monetary policy framework**
- **How should distributional impact of monetary policy be considered in policy decision?**

19

“Monetary policy is like juggling six balls... it is not 'interest rate up, interest rate down.' There is the exchange rate, there are long term yields, there are short term yields, there is credit growth.”

Raghuram Rajan
Former Governor, Reserve Bank of India

“If you don't pay attention to the periphery, the periphery changes and the first thing you know the periphery is the center.”

Dean Rusk
Former U.S. Secretary of State

20

DISCUSSION BY HÉLÈNE REY

The discussion by H  l  ne Rey focussed on the importance of Global Financial Cycles, the role of the US dollar for global supply chains, early warning indicators and the menu of macroprudential tools.

SUMMARY OF ISSUES ADDRESSED IN THE GENERAL DISCUSSION IN SESSION 3

- How large is the scope for an independent monetary policy in a world with large cross-border financial flows? How and to what extent can countries try to isolate themselves from global financial factors? Can we expand the range of policy tools to enhance monetary-policy independence?
- Does the concept "financial cycle" add value or should we just rely on the "business cycle" concept? Do we know enough about the drivers of the (global) financial cycle?
- Is the exchange rate a shock absorber or a shock creator in open economies?
- To what extent do advanced countries and international organisations take adverse policy spillovers to emerging markets into account?
- What is the future potential of "big data" and "machine learning" in policy-supporting analyses? What is the right mix of data scientists and economists when trying to learn from big data? How do we evaluate the return on investment of resources in "big data" analyses versus investment in more traditional methods such as forecasting the business cycle (especially the downturns)?

**PANEL DISCUSSION:
THE FUTURE OF CENTRAL BANKING FROM A
SMALL OPEN-ECONOMY PERSPECTIVE**



Participants in the panel, from the right: Lars Rohde (chair), Mar Gudmundsson, Philip Lowe, Stefan Ingves, Thomas Jordan and Karnit Flug.

SUMMARY OF ISSUES ADDRESSED IN THE PANEL DISCUSSION

- Are the challenges facing small open economies different from those faced by large economies?
- Is a flexible exchange rate sufficient for the conduct of independent monetary policy in a small and open economy? Can the resulting volatility of the exchange rate call for additional instruments in order to preserve financial stability?
- How do the low global interest rates affect the conditions for small open economies?
- Do small open economies need to have more sizable buffers (in the financial sector and among firms and households), larger fiscal space and more flexible economies than large economies to absorb shocks to the economy?
- What are the pros and cons and trade-offs of the different policy tools used in the aftermath of the recent financial crisis (negative interest rates, forward guidance, quantitative easing, FX intervention, macroprudential instruments, capital flow management measures)?
- What is the appropriate level of FX reserves in small open economies?
- How much can we expect from macroprudential policy? Can it only throw "sand in the wheels" and is that enough?
- Is macroprudential policy only second best compared to monetary policy? Should financial stability be included as one of the goals of monetary policy besides price stability?

SHORT SPEAKER BIOGRAPHIES



Lars Rohde

Danmarks Nationalbank

Lars Rohde took office as Governor by Royal Appointment and Chairman of the Board of Governors of Danmarks Nationalbank in 2013. Lars Rohde has an MSc in Economics from Aarhus University. He has served as Chief Executive Officer of The Danish Labour Market Supplementary Pension Scheme, ATP, from 1998 to 2013. ATP is one of Europe's largest pension providers. The ATP Group is responsible for the management of assets of more than kr. 748 billion. Lars Rohde was a member of the Executive Board of the mortgage bank Realkredit Danmark from 1992 to 1997 and Deputy Chief Executive Officer from 1997 to 1998. Among other things Lars Rohde has also been a board member of Copenhagen Stock Exchange and part-time lecturer at Copenhagen Business School.



Agustín Carstens

Bank for International Settlements

Agustín Carstens became General Manager of the BIS on 1 December 2017. Mr Carstens was Governor of the Bank of Mexico from 2010 to 2017. A member of the BIS Board from 2011 to 2017, he was chair of the Global Economy Meeting and the Economic Consultative Council from 2013 until 2017. He also chaired the International Monetary and Financial Committee, the IMF's policy advisory committee from 2015 to 2017. Mr Carstens began his career in 1980 at the Bank of Mexico. From 1999 to 2000, he was Executive Director at the IMF. He later served as Mexico's deputy finance minister (2000-03) and as Deputy Managing Director at the IMF (2003-06). He was Mexico's finance minister from 2006 to 2009. Mr Carstens has been a member of the Financial Stability Board since 2010 and is a member of the Group of Thirty. Mr Carstens holds an MA and a PhD in economics from the University of Chicago.



Claudia M. Buch

Deutsche Bundesbank

Professor Claudia M Buch is the Vice-President of the Deutsche Bundesbank. She is responsible for Financial Stability, Statistics and Internal Audit. Professor Buch is the accompanying person of the President of the Bundesbank on the ECB Governing Council and a member of the German Financial Stability Committee (FSC). Prior to joining the Bundesbank in May 2014, she was the President of the Institute for Economic Research (IWH) in Halle (2013-2014), Professor of Economics at the Otto von Guericke University Magdeburg (2013-2014), and Professor of Economics for "International Finance and Macroeconomics" at the University of Tübingen (2004-2013). From 2012 to 2014, she was a member of the German Council of Economic Experts. She was Scientific Director at the Institute for Applied Economic Research (IAW) in Tübingen (2005-2013), and worked at the Institute for World Economics in Kiel (IfW) from 1992 until 2013. She habilitated at the University of Kiel (2002) after receiving her doctorate there in 1996. Between 1985 and 1991, she studied Economics at the University of Bonn and she graduated from the University of Wisconsin (Eau Claire) with a Master of Business Administration degree in 1988. Her fields of specialisation are financial stability, international banking, international finance and macroeconomics, and financial integration.



Kenneth Rogoff

Harvard University

Kenneth Rogoff is Thomas D. Cabot Professor at Harvard University. From 2001–2003, Rogoff served as Chief Economist at the International Monetary Fund. His widely-cited 2009 book with Carmen Reinhart, *This Time Is Different: Eight Centuries of Financial Folly*, shows the remarkable quantitative similarities across time and countries in the run-up and the aftermath of severe financial crises. Rogoff is also known for his seminal work on exchange rates and on central bank independence. Together with Maurice Obstfeld, he is co-author of *Foundations of International Macroeconomics*, a treatise that has also become a widely-used graduate text in the field worldwide. Rogoff's 2016 book *The Curse of Cash* looks at the past, present and future of currency from standardized coinage to crypto-currencies. The book argues that although much of modern macroeconomics abstracts from the nature of currency, it is in fact at the heart of some of the most fundamental problems in monetary policy and public finance. His monthly syndicated column on global economic issues is published in over 50 countries. Rogoff is an elected member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the Group of Thirty, and he is a senior fellow at the Council on Foreign Relations. Rogoff is among the top ten on RePEc's ranking of economists by scholarly citations. He is also an international grandmaster of chess.



Frank Smets

European Central Bank

Frank Smets is Director General Economics at the European Central Bank since February 2017. Previously he was Adviser to the President of the European Central Bank since December 2013 and Director General of the Directorate General Research from September 2008. He is professor of economics at UGent and an honorary professor in the Duisenberg chair at the Faculty of Economics and Business of the University of Groningen. He is a Research Fellow of the Centre for Economic Policy Research in London and CESifo in Munich. He has written and published extensively on monetary, macroeconomic, financial and international issues mostly related to central banking in top academic journals such as the *Journal of the European Economic Association*, the *American Economic Review*, the *Journal of Political Economy* and the *Journal of Monetary Economics*. He has been managing editor of the *International Journal of Central Banking* from 2008 till 2010. Before joining the European Central Bank in 1998, he was a research economist at the Bank for International Settlements in Basel, Switzerland. He holds a PhD in Economics from Yale University.



Donald Kohn
Brookings Institution

Donald Kohn holds the Robert V. Roosa Chair in International Economics and is a senior fellow in the Economic Studies program at the Brookings Institution. He also currently serves as an external member of the Financial Policy Committee at the Bank of England. Kohn is a 40-year veteran of the Federal Reserve system, serving as member and then vice chair of the Board of Governors from 2002-2010. Kohn is an expert on monetary policy, financial regulation, and macroeconomics and has written extensively on these issues. Prior to taking office as a member of the Board of Governors he served in a number of staff roles at the Board, including secretary of the Federal Open Market Committee (1987-2002) and director of the Division of Monetary Affairs (1987-2001). He has also served as chairman of the Committee on the Global Financial System (CGFS), a central bank panel that monitors and examines broad issues related to financial markets and systems. He advised Federal Reserve Chairman Ben Bernanke throughout the 2008-2009 financial crisis and served as a key adviser to former Fed Chairman Alan Greenspan. He was awarded the Distinguished Achievement Award from The Money Marketeers of New York University (2002), lifetime achievement awards from The Clearing House (2012) and Central Banking magazine (2017), the Distinguished Alumni Award from the College of Wooster (1998), and the Honorary Degree, Doctor of Laws, from the College of Wooster (2006). In 2016, he was made honorary Commander of the British Empire. Kohn was born in November 1942 in Philadelphia. He received a B.A. in economics in 1964 from the College of Wooster and a Ph.D. in economics in 1971 from the University of Michigan.



Peter Praet
European Central Bank

Peter Praet joined the European Central Bank as Member of the Executive Board in 2011. He is responsible for the Directorate General Economics. Before joining the ECB, Peter Praet was Executive Director of the National Bank of Belgium (2000-2011). Here he was responsible for International Cooperation, Financial Stability and Oversight of Financial Infrastructures and Payments Systems. Between 2002 and 2011, he was also a Member of the Management Committee of the Belgian Banking, Finance and Insurance Commission (CBFA), where he was responsible for Prudential Policy for banking and insurance. Peter Praet served as Chief of Cabinet for the Belgian Minister of Finance from 1999-2000, as Chief Economist of Générale de Banque and Fortis Bank from 1988-1999, as Professor of Economics at the Université Libre de Bruxelles from 1980-1987, and as Economist at the International Monetary Fund from 1978-1980. He earned a Ph.D. in Economics from the Université Libre de Bruxelles in 1980. Peter Praet served on several high-level international committees, including the Basel Committee on Banking Supervision, the Committee on Payment and Settlement Systems, the Committee on the Global Financial System, and the European Banking Authority. He was First Alternate of the Board of Directors of the Bank for International Settlements from 2000-2011.



Axel A. Weber
UBS

Chairman of the Board of Directors, UBS Group AG. Axel A. Weber was elected to the Board of Directors (BoD) of UBS AG at the 2012 AGM and of UBS Group AG in November 2014. He is Chairman of the BoD of both UBS AG and UBS Group AG. He is chairman of the Institute of International Finance, a board member of the Swiss Bankers Association and the International Monetary Conference, and a member of the Group of Thirty as well as the Trilateral Commission, among others. Mr. Weber was president of the German Bundesbank between 2004 and 2011, during which time he also served as a member of the Governing Council of the European Central Bank, a member of the Board of Directors of the Bank for International Settlements, German governor of the International Monetary Fund and as a member of the G7 and G20 Ministers and Governors. He was a member of the steering committees of the European Systemic Risk Board in 2011 and the Financial Stability Board from 2010 to 2011. Mr. Weber's academic career includes professorships at the Universities of Cologne, Frankfurt / Main, Bonn and Chicago. He holds a PhD in economics from the University of Siegen, where he also received his habilitation. He graduated with a master's degree in economics at the University of Konstanz and holds honorary doctorates from the universities of Duisburg-Essen and Konstanz.



Mohamed A. El-Erian
Allianz

Dr. Mohamed A. El-Erian is Chief Economic Advisor at Allianz, the corporate parent of PIMCO where he formerly served as chief executive and co-chief investment officer (2007-14), a columnist for Bloomberg Opinion, a contributing editor at the Financial Times, and a member of several non-profit boards. From December 2012 to January 2017, he chaired President Obama's Global Development Council. He has written two New York Times bestsellers: "When Markets Collide" (2008) and "The Only Game in Town: Central Banks, Instability and Avoiding the Next Collapse" (2016). Named to Foreign Policy's list of "Top 100 Global Thinkers" for four years in a row, he has served on the jury for the annual for the Financial Times/McKenzie Book of the Year award since 2015 and has received numerous awards and recognition for his economics, financial industry and philanthropic activities. He holds a master's degree and doctorate in economics from Oxford University and received his undergraduate degree in Economics from Cambridge University. He is an Honorary Fellow of Queens' College, Cambridge University.



Charles R. Bean
London School of Economics

Charles Bean is a Professor of Economics at the London School of Economics and a member of the Budget Responsibility Committee at the Office for Budget Responsibility. From 2000 to 2014, he served at the Bank of England as, successively, Executive Director and Chief Economist, and then Deputy Governor for Monetary Policy, serving on both the Monetary Policy and Financial Policy Committees. He also represented the Bank in international fora, such as G7 and G20. Before joining the Bank, he was a member of faculty at LSE and has also worked at HM Treasury. He has served as Managing Editor of the Review of Economic Studies, was President of the Royal Economic Society from 2013 to 2015, and is Chairman of the Centre for Economic Policy Research. He was knighted in 2014 for services to monetary policy and central banking and recently undertook a major review of the quality, delivery and governance of UK economic statistics on behalf of the UK government. He holds a PhD from MIT.



Niels Christoffer Thygesen
University of Copenhagen

Niels Thygesen is Professor of Economics (emeritus). Trained at the universities of Copenhagen, Paris and Harvard, and having worked for the governments of Denmark and Malaysia, he was at the University of Copenhagen 1971-2005. He has worked primarily on European monetary and financial integration, serving on official and academic expert groups. He is the author of three books, notably of "European Monetary Integration: From the EMS to EMU" (with Daniel Gros), London 1992 and 1998, and of app. 100 articles. He has been a Visiting Professor at Institut d'Etudes Politiques, Paris, at the European University Institute, Firenze, and a Visiting Senior Fellow at the Brookings Institution. He was an independent member of the group, mostly of central bank governors, which prepared Economic and Monetary Union in Europe ("Delors Committee") 1988-89. He was Adviser to the Governor of Danmarks Nationalbank, to the Danish and Swedish governments, to the European Commission, and to the IMF (on the effectiveness of surveillance). He was Chairman of the OECD's Economic and Development Review Committee 2000-8. In October 2016 he became the first Chair of the European Fiscal Board advising the European Commission on implementing the rules for national fiscal policy and on reforming fiscal governance. Niels Thygesen was President of the Danish Economic Association 1974-9; Member of the Executive Committee of the Trilateral Commission (Paris) 1981-2005; of the Steering Committee for the Euro50 Group (Paris) since 1999; and Adviser of the Institute for New Economic Thinking (INET), New York 2012-16.



Stanley Fischer
Massachusetts Institute of Technology

Professor Emeritus, Massachusetts Institute of Technology. Former Vice Chairman and member of the Board of Governors of the Federal Reserve System. Previous positions also include governor of the Bank of Israel, vice chairman of Citigroup, World Bank Chief Economist and first deputy managing director of the International Monetary Fund. Dr. Fischer has published extensively in top-ranking economic journals and is the author several scholarly books.



Øystein Olsen
Norges Bank

Mr. Øystein Olsen was re-appointed Governor of Norges Bank and Chair of the Executive Board on 1 January 2017 for a second six-year term. Mr Olsen has held this post since 1 January 2011. Mr Olsen's previous work experience includes posts as Director General of Statistics Norway and Director General at the Ministry of Finance. He has also chaired or been a member of several government-appointed commissions. Mr Olsen holds a postgraduate degree in economics (Cand. oecon.) from the University of Oslo.



Stephen S. Poloz
Bank of Canada

Mr. Poloz has been Governor of the Bank of Canada since 3 June 2013. Born in Oshawa, Ontario, Mr. Poloz has over 30 years of public and private sector experience. An economist by training, he first joined the Bank of Canada in 1981 and occupied a range of increasingly senior positions over a 14-year span. Mr. Poloz then spent four years at BCA Research as managing editor of its flagship publication, The International Bank Credit Analyst. Mr. Poloz joined Export Development Canada in 1999 as Vice-President and Chief Economist. From 2008 to 2010, he was responsible for all of EDC's lending programs, as well as the Economics and Corporate and International Trade Intelligence groups. He became EDC's President and CEO in January 2011, a position he held until his appointment at the Bank of Canada. Mr. Poloz resides in Ottawa with his wife Valerie. He has two children, Jessica and Nicholas, and he is a grandfather.



Veerathai Santiprabhob
Bank of Thailand

Veerathai Santiprabhob has been the Governor of the Bank of Thailand since October 2015. He also currently serves as a member of the Securities and Exchange Commission Committee, the National Economic and Social Development Board and the State-Owned Enterprise Policy and Supervisory Committee. Veerathai is a macroeconomist, strategist, and financial professional with more than 20 years of experiences in economic policy design, commercial banking, and capital market. He began his career as an economist at the IMF before serving as a co-director of Policy Research Institute of Thai Ministry of Finance during the 1997 Asian financial crisis. He had spent most of his career in the private sector serving as a senior executive of Siam Commercial Bank, PCL and The Stock Exchange of Thailand. He had also served as an advisor of Thailand Development Research Institute and a board member of various leading corporations. Veerathai received his B.A. (first class honors) in Economics from Thammasat University in 1988 and A.M. and Ph.D. in Economics from Harvard University in 1994, sponsored by H.M. the King Bhumibol Adulyadej's Anandamahidol Foundation. He was awarded the Eisenhower Fellowship in 2013.



H el ene Rey
London Business School

Professor at London Business School. Member of The Haut Conseil de stabilit e financi re (the French High Council for Financial Stability). Winner of several prestigious awards, including the 2006 Bern acer Prize and the 2012 Birgit Grodal Award of the European Economic Association. Dr. Rey has published widely on international finance and the international monetary system in top-ranking journals.



M ar Gu omundsson
Central Bank of Iceland

M ar Gu omundsson has been Governor of the Central Bank of Iceland since August 2009. From 2004 until his appointment as Governor, he served as Deputy Head of the Monetary and Economic Department (MED) at the Bank for International Settlements. From 1994 to 2004 he was Chief Economist and Director of the Economics Department at the Central Bank of Iceland. He joined the department as an economist in 1980 and later held the position of Manager and Head of Research. From 1988 to 1991 he served as economic adviser to the Minister of Finance in Iceland. M ar Gu omundsson has a BA-honours degree in Economics from the University of Essex and an M Phil degree in Economics from the University of Cambridge. He has published several articles in books and economic journals on macroeconomics, monetary policy, exchange rate regimes, financial stability, and pensions and has served on the editorial boards of economic journals in Iceland, at the BIS, and in the UK.



Philip Lowe
Reserve Bank of Australia

Philip Lowe is Governor of the Reserve Bank of Australia. Mr Lowe holds a PhD from the Massachusetts Institute of Technology and a B.Comm (Honours) in Economics/Econometrics from the University of New South Wales. He has authored numerous papers, including on the linkages between monetary policy and financial stability. He commenced as Governor on 18 September 2016. He is Chair of the Reserve Bank Board and Payments System Board, and Chair of the Council of Financial Regulators. He is a member of the Financial Stability Board. Prior to his current role, he held the positions of Deputy Governor, Assistant Governor (Economic) and Assistant Governor (Financial System). He also spent two years at the Bank for International Settlements working on financial stability issues. Mr Lowe is Chair of the Financial Markets Foundation for Children and a director of The Anika Foundation. He is also Chair of the Committee on the Global Financial System of the Bank for International Settlements. Mr Lowe is a signatory to The Banking and Finance Oath.



Stefan Ingves
Sveriges Riksbank

Stefan Ingves is Governor of Sveriges Riksbank and Chairman of the Executive Board. He was appointed Chairman of the Basel Committee on Banking Supervision in June 2011. Mr Ingves is also chairman of the BIS Banking and Risk Management Committee (BRC) and a member of the Board of Directors of the BIS. Chairman of the Toronto Centre for Global Leadership in Financial Supervision, Member of the General Board of the European Systemic Risk Board (ESRB), Member of the General Council of the ECB, Governor for Sweden in the IMF and Board Member of the Nordic-Baltic Macroeprudential Forum (NBMF). Mr Ingves has previously been Director of the Monetary and Financial Systems Department at the International Monetary Fund, Deputy Governor of the Riksbank and General Director of the Swedish Bank Support Authority. Prior to that he was Under-Secretary and Head of the Financial Markets Department at the Ministry of Finance. Stefan Ingves holds a PhD in economics.



Thomas Jordan
Swiss National Bank

Thomas J. Jordan was appointed Chairman of the Governing Board of the Swiss National Bank (SNB) in 2012. From 2010 to 2012, Thomas J. Jordan was Vice-Chairman of the Governing Board of the SNB. From 2007 to 2010, he was Member of the Governing Board of the SNB. He was Chairman of the Board of Directors of the SNB's 'StabFund', the stabilisation fund, from its foundation in 2008 until it was wound up in 2013. Thomas J. Jordan is a member of the Board of Directors of the Bank for International Settlements (BIS) in Basle and the Steering Committee of the Financial Stability Board (FSB). He is the Governor of the International Monetary Fund (IMF) for Switzerland, and Chairman of the G10 Central Bank Counterfeit Deterrence Group (CBCDG). Thomas J. Jordan has published numerous articles on monetary theory and policy in leading international journals. In 1998, the University of Berne appointed him lecturer (Privatdozent) and in 2003 honorary professor. Thomas J. Jordan was born in Bienne, Switzerland. He received his Ph.D. in economics from the University of Berne in 1993. He wrote his post-doctoral thesis (Habilitation) during a post-doctoral research visit at the Department of Economics at Harvard University.



Karnit Flug
Bank of Israel

Dr. Karnit Flug was appointed Governor of the Bank of Israel by the President of Israel on November 13, 2013. Dr. Flug previously served as Deputy Governor of the Bank of Israel from July 2011, when she was appointed to the post by the Israeli Government. From July 2013 until November 2013, Dr. Flug served as Acting Governor of the Bank of Israel. Dr. Flug received her M.A. (cum laude) in Economics from the Hebrew University in 1980, and her Ph.D. in Economics from Columbia University in 1985. In 1984, Dr. Flug joined the IMF as an economist. In 1988, she returned to Israel and joined the Research Department of the Bank of Israel, where she worked and published papers on topics including macroeconomics, the labor market and social policies. In 1994-96, while on leave from the Bank of Israel, Dr. Flug worked at the Inter-American Development Bank as a senior research economist. In 1997, upon return to the Bank of Israel, she was appointed Deputy Director of the Research Department, and in June 2001 she was appointed Director of the Research Department and a member of the Bank's senior management — a position she held for 10 years. Dr. Flug has served on a number of public and government committees, including the Committee on Increasing Competitiveness in the Economy, the Committee for Social and Economic Change ("the Trajtenberg Committee"), the Committee for the Defense Budget ("the Brodet Committee"), and the Committee to Study Raising the Retirement Age for Women.

