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Basel iii News, January 2018

The recent Basel III reforms **complement** the initial phase of the Basel III reforms announced in 2010.

The 2017 reforms seek to restore credibility in the calculation of risk weighted assets (RWAs) and improve the comparability of banks' capital ratios.



					
2010	<p>Increase the level and quality of capital</p> <p>Banks required to maintain more capital of higher quality to cover unexpected losses. Minimum Tier 1 capital rises from 4% to 6%, of which at least three quarters must be the highest quality (common shares and retained earnings). Global systemically important banks (G-SIBs) are subject to additional capital requirements.</p>	<p>Enhance risk capture</p> <p>Capital requirements for market risk rise significantly. Requirements are calculated based on 12 months of market stress. Credit Valuation Adjustment risk is now included in the framework.</p>	<p>Constrain bank leverage</p> <p>A leverage ratio constrains the build-up of debt to fund banks' investment and activities (bank leverage), reducing the risk of a deleveraging spiral during downturns.</p>	<p>Improve bank liquidity</p> <p>The Liquidity Coverage Ratio requires banks to hold sufficient liquid assets to sustain them for 30 days during times of stress. The Net Stable Funding Ratio encourages banks to better match the duration of their assets and liabilities.</p>	<p>Limit procyclicality</p> <p>Banks retain earnings to build up capital buffers during periods of high economic growth so that they can draw them down during periods of economic stress.</p>
2017		<p>Revisions to the standardised approaches for calculating credit risk, market risk, Credit Valuation Adjustment and operational risk mean greater risk sensitivity and comparability. Constraints on using internal models aim to reduce unwarranted variability in banks' calculations of RWAs.</p> <p>An output floor limits the benefits banks can derive from using internal models to calculate minimum capital requirements.</p>	<p>Global systemically important banks (G-SIBs) are subject to higher leverage ratio requirements.</p>		

RWAs are an estimate of risk that determines the minimum level of regulatory capital a bank must maintain to deal with unexpected losses.

A prudent and credible calculation of RWAs is an integral element of the risk-based capital framework.

To read more:

www.bis.org/bcbs/publ/d424_inbrief.pdf

Also, an underlying cause of the global financial crisis was the build-up of **excessive** on- and off-balance sheet leverage in the banking system.

In many cases, banks built up excessive leverage while reporting strong risk-based capital ratios.

At the height of the crisis, financial markets forced the banking sector to **reduce** its leverage in a manner that amplified downward pressures on asset prices.

This deleveraging process exacerbated the feedback loop between losses, falling bank capital and contracting credit availability.

The Basel III framework introduced a simple, transparent, non-risk-based leverage ratio to act as a credible supplementary measure to the risk-based capital requirements.

The Basel Committee is of the view that a **simple** leverage ratio framework is critical and **complementary to the risk-based** capital framework, and that the leverage ratio should adequately capture both the on- and off-balance sheet sources of banks' leverage.

Read more at page 140 of the Basel III reform paper (12/2017) at:

<https://www.bis.org/bcbs/publ/d424.pdf>

Progress report on supervisory colleges published by the Basel Committee



The Basel Committee on Banking Supervision has issued a [Progress report](#) on the implementation of principles for effective [supervisory colleges](#). Supervisory colleges play an important part in the effective supervisory oversight of international banking groups.

The report concludes that the effectiveness of colleges [has improved](#) since 2015 in the areas of information-sharing, coordinated risk assessment and crisis preparedness. Yet [challenges still remain](#), including those related to legal constraints on information-sharing, supervisory resource constraints and expectation gaps between home and host supervisors.

To overcome these challenges, the report sets out sound [practices](#) that include placing emphasis on the work between (or outside) formal college meetings, and encouraging home and host supervisors to reach out to each other to clarify expectations.

The Basel Committee's Principles for effective supervisory colleges were first published in 2010 and updated in 2014. The Committee [monitors member jurisdictions' adoption of these principles](#), and identified three areas to improve the effectiveness of colleges as noted above in its July 2015 Progress report on the implementation of principles for effective supervisory colleges.

To read the report:

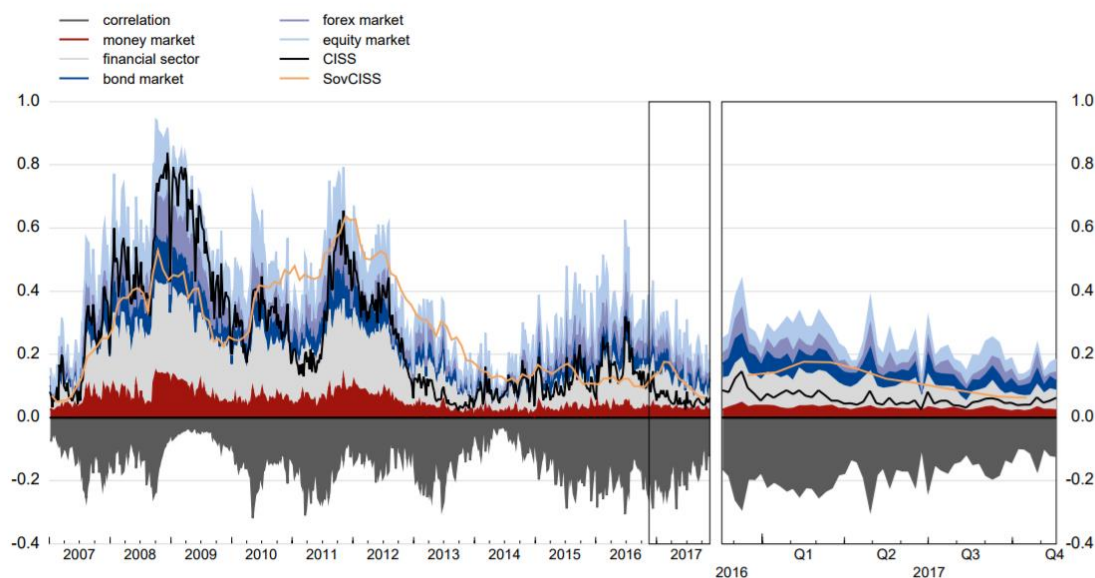
<https://www.bis.org/bcbs/publ/d430.pdf>

ESRB risk dashboard



1.1 Composite indicator of systemic stress

(Last observation: 17 Nov. 2017)



Sources: Thomson Reuters, ECB and ECB calculations.

Notes: The CISS is unit-free and constrained to lie within the interval (0, 1). See Hollo, D., Kremer, M. and Lo Duca, M., "CISS - a composite indicator of systemic stress in the financial system", Working Paper Series, No 1426, ECB, March 2012. The Sovereign CISS applies the same methodological concept of the CISS.

The ESRB risk dashboard is a set of quantitative and qualitative indicators of systemic risk in the EU financial system.

The composition and the presentation of the ESRB risk dashboard have been reviewed in the first quarter of 2017.

Unless otherwise indicated:

- a) all EU indicators relate to the 28 Member States of the EU (the EU28).
- b) all data series relate to the Euro 19 (i.e. the euro area) for the whole time series.

For statistics based on the balance sheet of the MFI sector, as well as statistics on financial markets and interest rates, the series relate to the composition of the EU/euro area in the period covered (changing composition).

Statistics based on the balance sheet of the MFI sector are unconsolidated.

To read it:

https://www.esrb.europa.eu/pub/pdf/dashboard/esrb.risk_dashboard171220_22.en.pdf?cd83d22fbe20c78eeefa20bf0954eb28

Argentina to host over 45 G20 meetings in 2018

Around 20,000 people will visit Argentina in 2018 for the G20. The final event will be the Leaders' Summit on 30 November and 1 December.



Argentina took over the presidency of the G20 on 1 December 2017, with the forum's main activities taking place over the course of 2018: more than 45 meetings in 11 cities across the country.

Argentina will play host to over 20,000 participants from abroad, mainly officials from G20 member governments and international organizations, and members of the press.

The G20 meetings will cover a number of issues, including [agriculture, the digital economy, education, employment, energy, finance, trade & investment, amongst others](#).

The [three main priorities](#) of the Argentine presidency – the future of work, infrastructure for development and a sustainable food future – are themes that will cut across the entire G20 agenda, as will other important transversal issues, such as gender equality.

The Argentine presidency's objective is to [build consensus](#) amongst the world's major powers for development that is both fair and sustainable, and that will generate opportunities for everyone.

It is closely in line with the concerns and aspirations of the region of Latin America and the Caribbean to harness its populations' great economic potential and boost efforts to eradicate poverty.

The first G20 meeting of the year is on the Data Gaps Initiative (DGI) and will take place on [29 and 30 January](#) in Buenos Aires.

Organized by the National Institute of Statistics and Census of Argentina (INDEC), the meeting will address issues relating to collecting and disseminating comparable, integrated and standardized statistics of high quality to craft public policies.

The G20 agenda includes a further five meetings in February, also in the Argentine capital. On 12-13 March, the city of Rosario will become the third city after Bariloche and Buenos Aires to host a G20 meeting, in this case, the first meeting of Agriculture Deputies.

In the lead up to the annual Leaders' Summit, numerous meetings will take place at [technical \('working group'\), deputy minister, and minister levels](#).

The latter is the most important of these, attended by ministers of G20 countries and their equivalents in G20 partner organizations. [The first minister-level meeting](#) of the year will be the first of five meetings of Finance Ministers and Central Bank Governors, taking place on 19-20 March in Buenos Aires.

Other cities across Argentina will host G20 ministerial, deputy and working group meetings. These are Salta, San Salvador de Jujuy and San Miguel de Tucumán in the northwest; Puerto Iguazú in the northeast; Mendoza in the west; Rosario and Córdoba in the centre; Mar del Plata and Buenos Aires in the east; and Bariloche and Ushuaia in the south.

The G20 working year concludes in Buenos Aires with the Leaders' Summit on 30 November and 1 December, which will [close with a joint declaration](#) of the G20 heads of state and government.

The calendar:

<https://www.g20.org/en/calendar>

A blind spot in today's macroeconomics?

Panel remarks by Mr Claudio Borio, Head of the Monetary and Economic Department of the BIS, at the BIS-IMF-OECD Joint Conference on "Weak productivity: the role of financial factors and policies", Paris.



A standard presumption in today's macroeconomics is that when making sense of first-order macroeconomic outcomes we can treat the economy as if its output were a single good produced by a single firm.

This means that issues of [resource misallocation can be safely ignored](#).

But the link between resource misallocations and macroeconomic outcomes may well be tighter than we think.

This speech illustrates the point with reference to [two examples](#) that highlight the link between finance and macroeconomics: the [impact of resource misallocations induced by financial booms and busts](#) on productivity growth, and [an intriguingly close relationship between the growing incidence of "zombie" firms and declining interest rates](#) since the 1980s.

To read more:

<https://www.bis.org/speeches/sp180110.pdf>

Current developments in the area of financial stability in Switzerland

Introductory remarks by Mr Fritz Zurbrügg, Member of the Governing Board of the Swiss National Bank, at the Media News Conference of the Swiss National Bank, Berne.



In my remarks today, I would like to address some of the developments currently taking place in the field of financial stability.

I shall look at the big banks first before turning to the domestically focused banks. I will conclude with a few words on the new banknote series.

Big banks

As Thomas Jordan has already noted, the international economic environment has continued to improve since the last news conference in June.

Conditions on the financial markets have remained stable.

Premia for bank credit default swaps, for instance, have barely changed since June. Premia have thus settled at lower levels again following the turbulence in 2016.

Against this positive backdrop, both of Switzerland's big banks remain on track to meet the requirements of the 'too big to fail' regulations with respect to resilience.

This first pillar of the regulations covers requirements pertaining to the going-concern loss-absorbing capacity of systemically important banks. Both Credit Suisse and UBS already comply fully with the final, risk-weighted requirements.

However, further improvement is needed with respect to the leverage ratio. Both of the big banks have also made progress on the second pillar of the regulations, 'resolution', which covers the orderly restructuring and

wind-down of a bank that can no longer function as a going concern and is thus deemed to have become a gone concern.

With a view to managing such a crisis scenario, Credit Suisse as well as UBS have increased their gone-concern loss-absorbing capacity by issuing further bail-in instruments, which can be converted into equity in the event of impending insolvency.

As we explained in our Financial Stability Report published in June, since the ‘too big to fail’ regulations came into force, Credit Suisse and UBS have also taken important organisational steps to improve their resolvability.

Despite these positive developments, the two big banks still need to make further progress if they are to fully comply with the second-pillar requirements.

This applies both to their gone-concern loss-absorbing capacity and their resolution planning. Full compliance with all of the ‘too big to fail’ requirements will further strengthen the big banks’ going and gone-concern loss-absorbing capacity as well as improve their resolvability in a crisis.

Both of these sets of requirements must be addressed if Switzerland’s ‘too big to fail’ problem is to be solved. Domestically focused banks I would now like to turn to the domestically focused banks. These institutions’ biggest risks continue to stem from the mortgage and real estate markets.

I will make three points in this regard.

First, imbalances on the mortgage and real estate markets persist. Although mortgage growth has remained relatively low in 2017 – as in the previous year – developments on the real estate market show a somewhat different picture: price growth in the residential property segment had been falling since 2013, but recently transaction prices have started to pick up again.

Moreover, with the exception of a few quarters (including the third quarter of 2017), prices in the residential investment property segment have risen markedly since 2013.

As prices over this period have increased more strongly than fundamentals such as rents, risks have accumulated in this segment; it is thus especially vulnerable to a substantial correction in the medium term.

This situation is compounded by brisk construction activity in the rental apartments segment, which could lead to oversupply. Signs of this can already be seen in rising vacancy rates.

Second, the risk appetite of domestically focused banks remains high. This is particularly evident from the affordability risk data. The share of new mortgages with high loan-to-income ratios has risen significantly in recent years and has reached a historical high.

The interest rate risk of domestically focused banks likewise remains high, while their interest margin continued to decline in the first half of 2017. As long as there is pressure on margins, incentives for domestically focused banks to increase risk-taking will remain substantial.

Third, notwithstanding the risks in the macroeconomic environment and the banks' high risk appetite, SNB stress tests continue to suggest that, overall, domestically focused banks' resilience remains adequate.

Thanks to robust capitalisation, most of these banks would be able to absorb the losses likely to be incurred in adverse scenarios; given the risks I have outlined, this is welcome.

In the future, too, it will be decisive for the stability of the financial system that banks hold sufficient capital to cover the risks on their books – irrespective of ongoing margin pressure.

Central banks as risk managers

Speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the 53rd SEACEN Governors' Conference/ High-Level Seminar and the 37th Meeting of the SEACEN Board of Governors, Bangkok.



It is a great pleasure for me to be here today.

Before I comment on this panel's topic, let me express my gratitude and satisfaction with the strategic partnership between the ECB and SEACEN, which got off to a successful start this year.

Many cooperation activities, ranging from seminars on macroprudential analysis to central bank governance, have already been launched and more is being planned for 2018. I look forward to strengthening our cooperation over the coming years.

The topic of this panel deals with [the implications of political risks for central banks](#). Given the independence of central banks and their legal separation from the political dimension, this is obviously a complex issue – and one where monetary policymakers need to tread very carefully.

For this reason, I would first like to spell out [how the ECB generally incorporates different kinds of risk](#) into its monetary policy strategy, and how this has influenced our actions over the last few years. I will argue that every central bank is to a considerable extent a risk manager, reflecting the forward-looking nature of monetary policy.

I will then explain [why political risks cannot be addressed in the same way as economic risks](#). Central banks should not prejudge political outcomes through their actions. Rather, they should address their effects if and when they become visible in the economic and financial data that are relevant for their price stability mandates.

Monetary policy and risk management

My starting point is that monetary policy works with long and variable lags.

In the euro area, for example, the full transmission of interest rate decisions to output has been estimated to be between one and two years, and even longer for inflation.

So, if we were to decide policy on the basis of past outcomes, we would always be behind the curve. Monetary policymakers therefore have to look at the economy [in a forward-looking way](#).

To do this, we produce forecasts, on a regular basis, that indicate our central expectations for the economy – the baseline. In principle, this should be enough to form a view on how policy should be designed today. But we all know that this would be a bad idea. Policymakers are typically poor forecasters, and central bankers are no exception.

This is nothing to be ashamed of. It merely testifies to the fact that the past is often a poor predictor of the future.

You can see this quite clearly for the euro area on my first slide. We call it [the “spaghetti chart”](#). It shows the repeated inflation forecast misses over the past few years. On each and every occasion there were good reasons to assume the economy would go the predicted way. But on each and every occasion unpredictable shocks hit our economy that made our central forecast redundant.

The implication is that we would likely have made severe policy mistakes if we had based our policy decisions entirely on our baseline.

And bear in mind that the economy can be more or less elastic to different types of shock. A tail risk, if it materialises, may cause the economy to react in a non-linear and potentially disruptive way – [hyperinflation and deflation being typical examples of risks central banks want to avoid](#).

For all these reasons, central banks usually augment their forecasts with an assessment of the risks surrounding them. This comprises a distribution of risks – the range of possible outcomes and the likelihood of their happening – which, in turn, allows us to form a view on the balance of risks, i.e. whether they are overall tilted to the upside or downside, and on the probability of tail events.

Such risk assessments are not an exact science and there is no automatic link between them and policy decisions. But [we do at times apply what Alan](#)

Greenspan famously called a “risk management” approach to monetary policy.

If the balance of risks is tilted very strongly in one direction, or if the distribution of risks is especially wide, there might be a case for us to act.

For example, we might need to provide forward guidance, i.e. specifying how we would react to particular risks. Alternatively, we might need to change our policy stance pre-emptively, especially in situations where tail risks are material and it becomes cost-efficient to truncate that part of the distribution.

The ECB’s monetary policy since mid-2014 illustrates these two aspects well.

Around that time, we saw the balance of risks to the inflation outlook shift decisively downwards, while the distribution of risks widened to encompass outright deflation, as you can see by comparing the blue and red lines on my second slide. If they had materialised, those risks **would have fundamentally compromised** medium-term price stability, and so our strategy required us to respond – even though our central forecast at that time was for a low but positive rate of inflation in the years ahead.

We responded in two main ways.

First, we clarified our reaction function to the main risks we saw and the instruments we would use if each of those risks materialised.

This sent a clear signal to observers that we were ready to respond in the case of adverse contingencies.

Then, when those contingencies arose, we followed through with our forward guidance and introduced a set of policy measures that was designed **to cover the full downside distribution of risks** – that is, a very accommodative policy stance to combat disinflationary forces, and an option to be even more accommodative if the situation deteriorated into outright deflation.

Thanks to these policy interventions, the distribution of risks has narrowed considerably over time – as you can see from the yellow line – and we no longer see a meaningful probability of deflation. The balance of risks has also shifted upwards as the economic recovery has gathered steam. The

current economic expansion in the euro area is stronger than it has been for a decade and broader than for two decades.

This improving picture is the main reason for our recent decision to recalibrate our policy by reducing the pace of our monthly asset purchases from €60 billion to €30 billion, starting in January.

Of course, risks emanate not only from our own jurisdiction, the euro area, where we can respond with our monetary policy, but also from the rest of the world. Indeed, while the ECB's Governing Council currently sees the risks surrounding the euro area's growth outlook as broadly balanced, it sees downside risks relating primarily to global factors.

But here too we can manage risks effectively by cooperating closely with other central banks.

This does not mean that we decide jointly on policy actions. It rather means that through our regular bilateral contacts, and dialogues in multilateral fora such as the IMF, the BIS and the G20, we can achieve a better understanding of global risks and their channels of propagation. And when risks do turn into shocks, this cooperation allows us to [build up readiness and have the tools in place to react](#).

Perhaps most importantly, since 2011, the ECB has operated a permanent network of swap lines with the [Bank of England, the Bank of Japan, the Federal Reserve and others](#), allowing all participating central banks to obtain foreign currency in the event of a liquidity squeeze. In 2013, the ECB also established a swap agreement with the People's Bank of China in recognition of its growing systemic importance as well as the rapidly growing bilateral trade and investment between the euro area and China.[7]

Factoring in political risks

So how do we factor political risks into our decision-making?

I would argue that central banks cannot process political risks in the same way as economic risks, for two reasons.

The first relates to the degree of uncertainty that surrounds political risks.

Here it is useful to recall Frank Knight's classic distinction between risk and uncertainty.

Risk is present when future events occur with measurable probability. Uncertainty arises when the likelihood of future events is indefinite or incalculable. In conditions of uncertainty, it is not possible to manage risk in the sense of quantifying a range of outcomes. Decision-making then depends on qualitative judgement.

To be sure, this is sometimes the situation central banks find themselves in when surveying the economic outlook. The economy is always characterised by both risk and uncertainty, and there are certain situations – for instance, financial crises – in which models fail and uncertainty prevails. In these cases, central banks still have to take decisions and judgement is the only basis we have.

Yet, I would venture that economic risks are, on the whole, more quantifiable than political ones, and hence more conducive to active risk management. This is because we have [workable models](#) of the economy with broadly established parameters and regularities. And even when the parameters of those models appear to change – like the Phillips curve today – they still provide us with a framework to think about those deviations and attempt to explain what we are seeing.

[For politics, however, we rarely have such tools.](#)

We may be able to gauge from opinion polls the likelihood of a political change of course happening. We may even be able to weigh up political parties' manifestos and estimate some of the economic consequences of their coming to power.

But fundamentally, we know little about how consumers and firms will react to political developments, and especially to the types of seismic political change that are macroeconomically relevant. Indeed, for such events to be considered a risk they are usually unprecedented.

This means that if we were to engage in managing political risks ex ante, most of the time we would be operating in uncertain circumstances and making judgement calls. I would question whether this could really be called risk management at all. [Worse still, it would project us into the political domain on very shaky analytical foundations.](#)

This brings me to the second reason why economic and political risks have to be treated separately, and it relates to the endogeneity between monetary policy and risks. In the economic realm, such endogeneity has been

recognised as desirable and is a key reason why central banks have become much more transparent over the past two decades or so.

A clear understanding by the public of how the central bank will react to economic risks automatically reduces the likelihood of such risks materialising.

For instance, if markets expect central banks to react to adverse shocks by providing monetary accommodation, easier financial conditions will immediately follow. Such anticipation effects can increase the effectiveness of monetary policy.

For political risks, however, establishing such expectations would not be desirable. If we were to communicate that **we will take decision “X” in response to political outcome “Y”**, financial conditions would move as the probability of that outcome rose, and this would potentially prejudice the result. That would be controversial in the case of global political risks. For domestic ones, it would be unacceptable.

Even if the central bank had perfect foresight of the economic consequences, such a reaction function would be seen as undue interference in the political process and it could undermine the effectiveness of monetary policy, instead of increasing it.

And since our assessment would be largely based on judgement not analysis – for the reasons I mentioned – we would find ourselves being accused of political meddling. This is a position that no independent central bank would want to be in.

So when it comes to political risks, we have to be data-driven. We do not prejudge political outcomes. And **we do not try to risk-manage** their effects on the economy, since we can rarely predict those effects accurately – and worse, we may end up influencing political developments and thereby compromising our independence.

The only way in which we can include political risks in our policy framework is by responding to their visible impact on economic and financial conditions. This does not mean being complacent: we can and must plan for all eventualities. But we react to data, not to political events themselves.

In some ways, this is analogous to the debate about “leaning versus cleaning” of financial bubbles: faced with so much uncertainty about what

constitutes a bubble, most of the time it is more efficient for central banks to use macroprudential tools to prick bubbles, or to ease policy after they burst, rather than to try and identify bubbles in advance and deflate them by hiking rates. [The risk of false positives is just too high.](#)

Two episodes in the recent history of Europe illustrate our data-dependent reaction function: the threat of a break-up of the euro area in 2012; and the threat of a country leaving the European Union in 2016, namely the United Kingdom.

In the first case, we had plenty of data showing that political risks were spilling over dangerously into the economy and financial system. Markets began pricing in redenomination risk. Financial conditions tightened significantly in some Member States.

Bank lending contracted and the euro area entered a second recession. Uncertainty in the euro area, as measured by the VStoxx, was on the rise – as the grey shaded area on my third slide shows.

Although at this point inflation was still being buoyed up by energy prices and indirect taxes, it was plain to see that [political risks had become economic ones](#), and were in turn endangering the medium-term outlook for price stability.

We therefore responded by launching a new monetary policy programme – Outright Monetary Transactions (OMTs) – which brought this episode of market turmoil to an end.

We did this, however, in a way that did not pre-empt political decisions. We took stock of the clear commitment of European leaders to hold our monetary union together and make it more solid by establishing a banking union. And we made the OMT programme conditional on countries participating in an assistance programme with the European Stability Mechanism.

In the case of the UK's vote to leave the EU, the situation was different, however. Various forecasts predicted severe market turbulence and macroeconomic fallout, so we had contingency plans in place for a range of outcomes. But as the slide illustrates, there were few signs of uncertainty in euro area financial markets in the run-up to the vote or after it. And, so far, there [turned out to be no economic consequences with medium-term impact.](#)

So our policy stance remained consistent with the data: unchanged. And the same logic, incidentally, can be applied to the recent political crisis in Catalonia. Though we monitored the situation very closely, we saw no changes in financial conditions or the economy that would have warranted a monetary policy shift.

Conclusion

Let me conclude.

Monetary policy is a forward-looking enterprise and policymakers always have to think in terms of risks. On several occasions in recent years the ECB has changed its monetary policy in response to emerging tail risks, even when our central forecasts for inflation painted a less alarming picture.

This can be seen as applying a risk management approach to monetary policy, in which we prioritised truncating the most dangerous tails of the distribution rather than targeting our policy at the modal point. The frequent central forecast misses we experienced suggest we were right to do so and we avoided much worse outcomes as a result.

When it comes to political risks, however, central banks cannot be risk managers, since this would bring us too close to being political actors. We can monitor political risks, and we can put in place plans for responding to them – but we can only act when the data justify such a step, and in a way that does not pre-empt political decisions.

Our actions during the crisis clearly demonstrated this reaction function.

Thank you.

Early Observations on Improving the Effectiveness of Post-Crisis Regulation

Vice Chairman for Supervision Randal K. Quarles, at the American Bar Association Banking Law Committee Annual Meeting, Washington, D.C.



It is a pleasure to be here with you at the American Bar Association banking law committee annual meeting.

Thank you to Meg Tahyar, my longtime friend and colleague, for inviting me to speak today. These are still the early days of my tenure at the Federal Reserve--last weekend marked my first three months as the first Vice Chairman for Supervision.

In those three months, people have had a lot of questions for me, but the most frequently asked question has been: What's next? Today I hope to give you some insights into how I am approaching the work of evaluating and improving the post-crisis regulatory regime and to outline some specific areas that are emerging as areas of focus early in my tenure.

Some of those areas are closer to being ready for action, while others are topics that I believe are important and would benefit from more attention and discussion. My hope is that you will come away from our time together with a better sense of my preliminary thinking for charting a course forward on financial regulation.

Efficiency, Transparency, and Simplicity of Regulation

Before I delve into specifics, let me say a few words about the principles that are guiding my approach to evaluating changes to the current regime. The body of post-crisis financial regulation is broad in scope, complicated in detail, and extraordinarily ambitious in its objectives.

Core aspects of that project have resulted in critical gains to our financial system: [higher and better quality capital, an innovative stress testing regime, new liquidity regulation, and improvements in the resolvability of large firms.](#)

We undoubtedly have a stronger and more resilient financial system due in significant part to the gains from those core reforms. These achievements are consistent with the responsibility of the Federal Reserve to be a steward of a safe financial system, and with the goal of maintaining the ability of banks to lend through the business cycle.

That said, the Federal Reserve and our colleagues at other agencies have now spent the better part of the past decade building out and standing up the post-crisis regulatory regime. At this point, we have completed the bulk of the work of post-crisis regulation, with an important exception being [the U.S. implementation of the recently concluded Basel III "end game" agreement on bank capital standards at the Basel Committee.](#)

As such, now is an eminently natural and expected time to step back and assess those efforts. It is our responsibility to ensure that they are working as intended and--given the breadth and complexity of this new body of regulation--it is inevitable that we will be able to improve them, especially with the benefit of experience and hindsight.

In undertaking this review and assessment, in addition to ensuring that we are satisfied with the effectiveness of these regulations, I believe that we have an opportunity to improve the efficiency, transparency, and simplicity of regulation.

[By efficiency I mean](#) the degree to which the net cost of regulation--whether in reduced economic growth or in increased frictions in the financial system--is outweighed by the benefits of the regulation. In other words, if we have a choice between two methods of equal effectiveness in achieving a goal, we should strive to choose the one that is less burdensome for both the system and regulators.

Efficiency of regulation [can be improved](#) through a variety of means. For example, it can mean achieving a given regulation's objective using fewer tools. It can mean addressing unintended adverse consequences to the industry and the broader public from a regulation or eliminating perverse incentives created by a regulation. It can mean calibrating a given regulation more precisely to the risks in need of mitigation.

It can also mean simpler examination procedures for bank supervisors, or less intrusive examinations for well managed firms. In our approach to assessing post-crisis regulation, we should consider all of these ways of improving efficiency.

Transparency is an objective that ought to particularly resonate with this audience. [As lawyers, we were all trained to view transparency as a necessary precondition](#) to the core democratic ideal of government accountability--the governed have a right to know the rules imposed on them by the government. In addition, as any good lawyer also recognizes, there are valuable, practical benefits to transparency around rulemaking; even good ideas can improve as a result of exposure to a variety of perspectives.

Finally, simplicity of regulation is a principle that promotes public understanding of regulation, promotes meaningful compliance by the industry with regulation, and reduces unexpected negative synergies among regulations. Confusion that results from overly complex regulation does not advance the goal of a safe system.

Common Ground Areas of Improvement

When I arrived at the Federal Reserve, the early stages of reflection on how to improve the cost-benefit balance of post-crisis regulation had already begun, mainly in a few narrow areas of focus.

These were areas of low-hanging fruit in which relatively broad consensus was reached that efficiency enhancements were available with no material cost to the resiliency or resolvability of the banking system.

My colleague and Chairman-nominee Jay Powell spoke about five of these areas last summer when he served as the Board's oversight governor for supervision and regulation: [small bank capital simplification, burden reduction in resolution planning, enhancements to stress testing, leverage ratio recalibration, and Volcker rule simplification.](#)

I wholeheartedly support these initiatives, and I am pleased that some of them have progressed even in the months since the summer.

The banking agencies recently proposed changes to the capital rules for smaller firms, consistent with last year's Economic Growth and Regulatory Paperwork Reduction Act report, which is a positive step toward meaningful burden relief for smaller banks.

The Federal Reserve, along with the Federal Deposit Insurance Corporation, extended the upcoming resolution planning cycles for the eight most systemic domestic banking firms and for foreign banks with limited U.S. operations in order to allow for more time between submissions.

I believe we should continue to improve the resolution planning process in light of the substantial progress made by firms over the past few years, including a permanent extension of submission cycles from annual to once every two years and reduced burden for banking firms with less significant systemic footprints.

And, most recently, the Federal Reserve released a package of [proposed enhancements to the transparency of our stress testing program](#), which is currently out for comment.

The progress you have seen in those areas represents constructive early steps.

[Leverage ratio recalibration](#) also is among the Federal Reserve's highest-priority, near-term initiatives. We have made considerable progress on that front in the past few months, and I expect that you will see a proposal on this topic relatively soon.

Finally, the relevant agencies have begun work on a proposal to streamline the Volcker rule. This project is a quite comprehensive and substantial undertaking as well as a five-agency endeavor.

As such, it will naturally take a bit of work for the agencies to congeal around a thoughtful Volcker rule 2.0 proposal for public review. Volcker rule reform remains a priority in the Federal Reserve's regulatory efforts.

[Emerging Areas for Review](#)

With that update on the familiar, I will turn to my own impressions of what is next for post-crisis regulation. In my early days as the Vice Chairman for Supervision, I asked our staff to conduct a comprehensive review of the regulations in the core areas of reform that I outlined earlier--capital, stress testing, liquidity, and resolution.

The objective is to consider the effect of those regulatory frameworks on resiliency and resolvability of the financial system, on credit availability and economic growth, and more broadly to evaluate their costs and benefits.

This is a comprehensive and serious process, and work is still underway. I should note, however, that I have already formed views on a few areas that warrant more focus, and that I will be working with my colleagues on the Board to constructively consider.

I will start with the issue of tailoring supervision and regulation to the size, systemic footprint, risk profile, and business model of banking firms.

The Federal Reserve has devoted considerable energy in its post-crisis regulatory work to incorporate the tailoring concept in its regulation and supervision across the spectrum of small, medium, and large firms.

A recent example of this approach is our late 2017 proposal to simplify capital requirements for small- and medium-sized banking firms. In my view, there is further work for the Federal Reserve and the other banking agencies to do on the tailoring front.

I would emphasize that tailoring is not an objective limited in scope to a subset of the smallest firms. As my colleagues and I have said before, the character of our regulation should match the character of the risk at the institution.

Accordingly, we should also be looking at additional opportunities for more tailoring for larger, non-Global Systemically Important Banks, or non-G-SIBs.

In this regard, I support congressional efforts regarding tailoring, whether by raising the current \$50 billion statutory threshold for application of enhanced prudential standards or by articulating a so-called factors-based threshold.

Irrespective of where the legislative efforts land, I believe we at the Federal Reserve have the responsibility to ensure that we do further tailoring for the institutions that remain subject to our rules to ensure that regulation matches the risk of the firm.

Take for example large non-G-SIBs whose failure would not individually pose a risk to U.S. financial stability.

Even without financial stability implications, the distress or failure of these firms still could harm the U.S. economy by, for example, significantly disrupting the flow of credit to households and businesses.

In my view, this tranche of the U.S. banking system ought to be subject to regulations that are generally stricter than those that apply to small banking firms, but that are also meaningfully less strict than those that apply to the G-SIBs.

The Board has effected this sort of G-SIB versus non-G-SIB tailoring among large banks in many areas of the regulatory framework.

Most notably, each of the risk-based capital requirements, leverage requirements, [stress testing requirements](#), and [total loss-absorbing capacity \(TLAC\) requirements](#) is calibrated substantially more strictly for G-SIBs than for large non-G-SIBs.

However, in some key regulations, there is no distinction between the requirements for large non-G-SIBs and G-SIBs.

Liquidity regulation, for example, does not have a G-SIB versus non-G-SIB gradation.

In particular, the full liquidity coverage ratio (LCR) requirement and internal stress testing requirements of enhanced prudential standards apply to large, non-G-SIB banks in the same way that they apply to G-SIB banks.

I believe it is time to take concrete steps toward calibrating liquidity requirements [differently for large, non-G-SIBs than for G-SIBs](#).

And I see prospects for further liquidity tailoring in that the content and frequency of LCR reporting are the same for the range of firms currently subject to the modified LCR as they are for the large non-G-SIBs that are subject to the full LCR.

We should also explore opportunities to apply additional tailoring for these firms in other areas, such as single counterparty credit limits and resolution planning requirements.

Another area that I think we should revisit are the "advanced approaches" thresholds that identify internationally active banks.

These thresholds are significant not only for identifying which banking firms are subject to the advanced approaches risk-based capital requirements, but also for identifying which firms [are subject to various](#)

other Basel Committee standards, such as the supplementary leverage ratio, the countercyclical capital buffer, and the LCR.

The metrics used to identify internationally active firms--\$250 billion in total assets or \$10 billion in on-balance-sheet foreign exposures--were formulated well over a decade ago, were the result of a defensible but not ineluctable analysis, and have not been refined since then.

We should explore ways to bring these criteria into better alignment with our objectives.

A third area in which I will be working with my Board colleagues is a [meaningful simplification of our framework of loss absorbency requirements](#).

There are different ways to count the number of loss absorbency constraints that our large banking firms face--which is perhaps in itself an indication of a surfeit of complexity if we can't be perfectly sure of how to count them--but the number I come up with is 24 total requirements in the framework.

While I do not know precisely the socially optimal number of loss absorbency requirements for large banking firms, I am reasonably certain that 24 is too many.

Candidates for simplification include: elimination of the advanced approaches risk-based capital requirements; one or more ratios in stress testing; and some simplification of our TLAC rule.

I am not the first Federal Reserve governor to mention some of these possibilities, and we should put them back on the table in the context of a more holistic discussion of streamlining these requirements.

Let me be clear, however, that while I am advocating a simplification of large bank loss absorbency requirements, [I am not advocating an enervation of the regulatory capital regime applicable to large banking firms](#).

Although not a post-crisis regulation, the Board's complex and occasionally opaque framework for making determinations of control [under the Bank Holding Company Act \(BHC Act\)](#) is another area that is ripe for re-examination through the lenses of efficiency, transparency, and simplicity.

As you know, a determination of control under the BHC Act is significant because even remote entities in a controlled group can be subject to the BHC Act's restrictions on activities and a host of other regulatory requirements.

Under the Board's control framework--built up piecemeal over many decades--the practical determinants of when one company is deemed to control another are now quite a bit more ornate than the basic standards set forth in the statute and in some cases cannot be discovered except through supplication to someone who has spent a long apprenticeship in the art of Fed interpretation.

The process can be burdensome and time-consuming both for the requester and Federal Reserve staff. We are taking a serious look at rationalizing and recalibrating this framework.

Finally, as I mentioned earlier, [an enhanced stress testing transparency package was released for public comment last month](#). I personally believe that our stress testing disclosures can go further.

I appreciate the risks to the financial system of the industry converging on the Federal Reserve's stress testing model too completely, so I am hesitant to support complete disclosure of our models for that reason.

However, I believe that the disclosure we have provided does not go far enough to provide visibility into the supervisory models that often deliver a firm's binding capital constraint.

It is important in any proposal to receive comments, and I can say that I and my colleagues on the Board will be paying particularly close attention to your comments on how we might improve this current proposal.

Concluding Remarks

To conclude, I hope that these remarks give you a sense of our approach to analyzing and improving post-crisis regulation.

As I mentioned earlier, the areas of core reform--capital, liquidity, stress testing, and resolution--have produced a stronger and more resilient system and should be preserved.

We have made great progress, but there is further work to do. Some clear improvements are in the offing in the relatively near future.

Other areas will benefit from longer term discussion. I look forward to engaging with you and the public more broadly as I help to chart a course for the important work ahead.

Undisclosed cryptocurrency mining software reported on apps downloaded from third-party app store



CPU-based [cryptocurrency-mining malware](#) significantly increased in 2017. A recent open source report suggested that [hundreds of malicious Android apps](#) containing a hidden Coinhive cryptocurrency miner were available for download on the third-party app store, [androidapk.world](#).

Coinhive uses website visitors' CPU resources to mine the cryptocurrency Monero, providing website owners with a legitimate alternative to advertising for monetising their websites.

In October 2017, Coinhive acknowledged they had underestimated the extent of service misuse and launched a new version, AuthoredMine, with an [opt-in](#) screen which asked users for permission to borrow their computing power. Nevertheless, [the original version of the service is still reportedly in circulation](#).

Cryptocurrencies rely on 'miners' to carry out a large number of calculations to verify transactions. In exchange for contributing computing power, miners are rewarded with cryptocurrency.

A miner running in the background can [significantly reduce](#) the performance and battery life of a computer or device, and cause it to overheat.

The NCSC recommends that users [only install apps from the official application store](#) for their device. Malicious apps in official stores are more likely to be detected and subsequently removed from the store or device.

To count or not to count - the future of internal models in banking regulation

Dr Andreas Dombret, Member of the Executive Board of the Deutsche Bundesbank, at the EBA Policy Research Workshop "The future role of quantitative models in financial regulation", London.



1. Introduction

Ladies and gentlemen

Dear Andrea Enria

Thank you for the invitation and your kind introduction. After I accepted to give the keynote at this risk modelling conference, a colleague shared with me an [unflattering comparison of financial risk modellers with weather forecasters](#). He asked: Why do you think weather forecasters like financial risk modellers so much? His answer: [Because the only kind of storm less well predicted than hurricanes and tornadoes are financial storms](#).

In my keynote today, I will frame this conference in a more positive tone, as I see a lot of merit in financial risk modelling - and in weather forecasting, too, for that matter.

Yet during and after the financial crisis we witnessed severe instances of risk model failure - where internal calculations of many banks grossly underestimated actual risks.

Remember for example the [systematic underestimation](#) of a market freeze or a price bubble before the sub-prime crisis broke. The many unexpected lawsuits pointed to further blind spots - all of which suddenly led to capital cushions melting away.

However, focusing on these failures alone misses the fact that, overall, financial risk modelling has improved risk measurement substantially. It

has inspired us to reconsider the role and the liberties of internal modelling.

And this is partly why you are at today's EBA workshop - to **improve internal models**. Your agenda includes challenging topics. My aim is far more modest. In my statement this morning I will take stock of risk modelling and the "lessons learned" from the financial crisis.

I will highlight both the limitations and the strengths of internal modelling. Second, I will present general principles that should guide future work. And, third, I will outline my take on where current and future EU projects on internal models should be heading.

2. Financial crisis, regulatory reform and internal models

But first, let's take a step back. **Fifteen years ago, internal risk models were considered the gold standard** for optimising capital allocation. What made them so successful was the efficient use of capital and their high risk sensitivity - which was made possible by granting banks substantial freedom in using their internal models for regulatory capital calculation.

Even though Basel II limited the freedom of banks by setting several parameters for the **internal ratings-based (IRB) approaches**, IRB banks had substantial room for manoeuvre when calculating their capital ratios.

This made internal risk models **prone to abuse**. But those who pointed to these shortcomings, or just to their unrealistic assumptions, have frequently been called unscientific and opposed to innovation.

Then the financial crisis erupted, changing almost everything in finance. Models played their part in contributing to the turmoil. **Risk modelling moved from panacea to placebo or even steroid**. Individual calculations of many banks were not crisis-proof, as their assumptions were way too optimistic. In fact, some models even fostered herding behaviour.

In 2010, the Basel Committee decided to take a closer look at the root problems of internal models. The core question was whether differences in capital ratios of banks were due to differences in portfolios or due to illegitimate differences in modelling practices.

In three studies we assessed the risk-weighting of banking and trading book assets. Material variances in regulatory capital ratios were found. Only a part of these could be explained by differences of risk profiles.

But another substantial part of the variation arose not from differences in the riskiness of bank portfolios, but instead from other factors that are due to modelling problems - for example, some banks gamed model weaknesses, and some of the terms specified by supervisors proved to be problematic.

[One of the main reasons](#) for these unwarranted differences is that models were even applied to portfolios where the statistical presumptions are violated. For example, in low default portfolios you simply do not have enough historical cases of default to calculate a reliable credit default figure.

Another prominent example is that extreme events, meaning crises, occur more often in real life than the distribution of most models assumes.

But there is an even bigger threat when applying modelling techniques. The big mistake is to believe that financial risk models can ever be fully accurate or even close to it. The point is fundamental, yet simple: risk models have [fundamental limits](#) that can never be fully remedied - which is why strong regulatory boundaries and supervisory controls are indispensable.

To make my point, I have to get a bit philosophical. There are two types of limits, and let us turn to a great economist to define their nature. [In 1921, Frank Knight differentiated between risk and uncertainty.](#)

Uncertainty describes the unexpected events. [The first limit](#) of models is that [they cannot capture uncertainty](#). Uncertainty is fundamental, because we do not know what the future will bring - it is hardly manageable. It is quite substantial when it comes to financial risk modelling.

That's because financial risk modelling is a [social science](#). The models can only provide a simplified heuristic of real social interaction, but it is impossible to fully grasp the complexity.

[The second limit](#) of models concerns how Knight defined risk. Risk is what we can somehow manage, thanks to the law of large numbers, with a margin of error. Risk is what we can model. Yet, even in this comfort zone of risk models some limitations exist: real events can only be forecasted, like weather, but cannot be predicted - data as well as methods face natural limitations.

All in all, this means: Modelling is probably as scientific as it can get in banking regulation. However, models can never get a calculation fully right.

To limit mis-measurement, we have to deal with risk and uncertainty:

- **First**, close gaps in the regulation of risk measurement. This includes data limitations: we can only model where sufficient data are available. Defaults in sovereign bonds, for example, clearly do not fulfil this condition.
- **Second**, work is needed on methodological shortcomings: we have to insist on robustness checks and need to limit the degrees of freedom for financial institutions, for example with regard to assumptions about distributions.
- **Third**, one has to accept Knightian uncertainty and protect regulation against it - human behaviour changes, irrational exuberance prevails, extreme events like herding behaviour repeat themselves, and market actors will always test the limits of models. We cannot model these challenges away. That's why we need backstops. Models need checks and balances, since a sole focus on model-based capital minimisation would be dangerous for financial stability.

3. Benefits of internal models

So, internal risk modelling for regulatory purposes clearly has its weaknesses. Nevertheless, I am convinced that the benefits very much outweigh the drawbacks.

The first advantage of risk models doesn't sound very encouraging, but it is nevertheless quite important. Their strength is that they get it less false than any other approach we have.

For as long as we work on the approach of risk-based regulation, we have to somehow quantify risks; and there is no way we can do without educated guessing. Any minimum capital requirement we impose on institutions requires more or less uncertain assumptions about the riskiness involved.

This holds true not only for internal models, but also for standardised approaches to risks. Even the rather conservative regulatory risk weights of standardised approaches may result in over-optimistic capital charges - just look at sovereign bonds.

Moreover, institutions using standardised approaches can engage in "risk shifting" - that is the search for the most profitable, but also the most risky assets among equal risk weights.

Thus, even if we banned models entirely from regulation, we would still end up with a vulnerable way to measure risk. Risk models are the better imperfect options.

The [second strength](#) of models actually is their variation. For not all of the variability of internal models is necessarily undesired. There may be good reasons for divergent capital requirements based on similar credit portfolios, for instance because of dissimilar effectiveness of risk management in banks or given a different legal environment in which banks are operating.

Also, model variability reduces the risk of herding behaviour, which would arise if every bank were to use the same standardised approach.

The [third](#) - and in my view most important - strength of risk models is their high degree of risk sensitivity. For each type and each category, capital requirements calculated by an institution's own models is typically a lot more in line with historically observed risk.

And this, in turn, has positive consequences. For example, it incentivises risk-adequate behaviour in financial institutions in general. From a supervisory point of view, we are especially interested in the additional incentives it offers to banks to develop and maintain a thorough risk assessment approach - which also supports and strengthens the internal risk management.

[4. To count or not to count: internal models after regulatory reform](#)

So far I have reminded us why internal model-based capital calculation - despite its weaknesses - remains a worthwhile regulatory tool. Accordingly, the post-crisis regulatory agenda still builds on the principle of risk-based regulation and still encourages the use of internal modelling techniques.

The [Basel Committee](#) has decided to remove only one internal approach in its entirety - the Advanced Measurement Approach for operational risk, AMA for short. Apart from that, models still play an important role in the Basel III finalisation package. And as I have mentioned, there are good reasons for that.

Yet, moving forward, we need to incorporate the "lessons learned" into regulation and into supervisory processes.

We have done this by installing additional constraints and backstops to close gaps that internal models cannot close - most prominently the leverage ratio and the output floor.

Further safeguards are implemented by more rigorous methods, data rules and input floors. This means that regulation has become multi-polar - supervisors rely on various, complementary requirements.

But at the same time there is also a need to support the benefits of internal models. On the Basel Committee, the German representatives resolutely argued in favour of maintaining risk sensitivity in regulation, because this is the best way to capture the actual risks of a financial institution and to set the right incentives, thereby discouraging excessive risk-taking.

This especially concerns the subject of calibrating the output floor, which is - as most of you know - a limit to internal model calculations based on the standardised approaches.

With the advantages of internal modelling in mind, this topic is understandable. And for me, the current state of negotiations - an output floor of 72.5 per cent - is too high; but it is still enough for models to remain an attractive tool. While risk sensitivity will be diminished by setting the output floor at this level, it still represents a far better outcome than the originally envisioned output floor of 80 per cent.

Basel III is better than its critics claim: While some countries may gold-plate their national regulations through a ban of internal models - the new standard also enables the Basel countries to continue the use of internal models. And this is an important outcome.

5. You can count on that: better models for the future

Now we have to look ahead. We should take the Basel III reforms and implement them in a manner that improves risk models further.

Banks have to build better models, models that not only focus on the efficient use of capital but also ensure that a bank can weather future storms. Both goals must weigh equally, meaning that the storm-forecasting part has to be given much more attention.

Authorities like the SSM and EBA on the other hand will have to roll up their sleeves and build a regulatory and supervisory framework for the future of risk measurement.

This will be challenging not only for the sheer technical complexity, but also because we have to strike two balances at once:

- **The first balance** is to maintain the incentives for fine-tuned risk measurement and management on the one hand, while improving the checks and balances on risk models on the other.
- When pursuing this balance, we obviously have to do this **on EU level**. In that context, we need to strike the second balance: in order to guarantee the same high standards in the entire SSM, we have to achieve EU- and SSM-wide harmonisation on the one hand; on the other hand, however, we should not go too far, meaning that we cannot achieve an exhaustive list for each and any model decision. While we need harmonisation of definitions and supervisory procedures - in order to close relevant gaps - supervisory agencies should not be condemned to taking a box-ticking approach. Since every model is different, the box-ticking approach would only undermine a critical review of a bank's model.

I believe it to be important that we keep these balances in mind when we come to design new rules or redesign old ones.

Let me now outline the priorities for future work on improving internal models in the EU from the Bundesbank's point of view.

With regard to **credit risk** and the boundaries for the IRB approaches, it's important that we implement the Basel III compromise in a rigorous way. This means that input and output floors will prevent the internal calculations of regulatory capital requirements from going too low. But at the same time, it maintains the internal modelling approach and, with that, substantial freedoms for banks to calculate regulatory capital.

Another important point concerns credit risks, but also other risk type models. The targeted review of internal models, the TRIM project, by the SSM should be conducted in a responsible and considered manner - it needs to strike the two balances that I highlighted. This means specifically:

- **The biotope of risk modelling approaches** must be kept diverse. A right understanding of harmonisation means not only treating equal things equally, but also treating unequal things unequally. TRIM must ensure, that the playing field for banks is levelled, but not create a monoculture of models driven by supervisory rules.

- Furthermore, it means that **we have to balance conservatism and precision**. Supervisors will always be tempted to make risk estimates more conservative - which is, of course, prudent. Being too conservative, however will make risk models less attractive for banks to use it not only as a regulatory instrument but also as an effective internal risk management tool.
- Finally, changes that we will introduce through the TRIM project must be implemented in a reasonable manner. Banks need a transitional period to adopt the new standards.

Let me close these policy guidelines with a clear statement: Throughout all regulatory and supervisory projects to finalise the reform agenda for internal modelling, the Bundesbank will advocate the retention of risk sensitivity.

6. Conclusion

Ladies and gentlemen

You have a full agenda of challenges in risk modelling ahead of you. Moreover, during the coming years you hopefully will help to make financial risk models better.

My key take-aways for these one and a half days and your future work are:

- **First**, internal models have rightfully lost their sacrosanct status, as they revealed big weaknesses during the last financial crisis. Models will never be perfect. We always have to be aware of the underlying assumptions and their shortcomings.
- **Second**, after regulatory reform, internal models rightly continue to play a big role, but now a complementary one. Limits have been set. But we shouldn't overreact. It is also important to maintain incentives for banks with regard to a risk-sensitive framework. This is why, on the Basel Committee, German authorities have resolutely argued in favour of sufficient incentives for internal models.
- **Third**, on the basis of the limits set by the Basel III reforms, we have to look forward now, and NCAs, EBA and SSM have to set about improving internal models further so that they can contribute to efficient and stable financial markets - at the service of the real economy.

Again, many thanks for inviting me - I wish all of you a fruitful workshop.
Thank you for your kind attention.

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