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**Have the main advanced economies become more resilient to
real and financial shocks?**

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The global economy is currently in good shape, and valuations on financial markets are high. Global GDP has been growing for nine consecutive years now, and output has surpassed the levels prior to the financial crisis (IMF 2017). Growth has not only been sustained for a number of years, it is also relatively broad based. And, according to recent estimates by the International Monetary Fund (IMF), growth is expected to continue in the coming years (IMF 2018). Projections suggest that the world economy will expand by 3.9% in 2018, compared with 3.7% in 2017. These favorable economic outlooks, together with inflation and interest rates that remain below their historical averages, contribute to high valuations on financial markets.

As regards the regulation of financial markets, much progress has been made since the financial crisis. G20 reforms that have been agreed upon post crisis aim at enhancing the resilience of the financial system, ending too-big-to-fail, reforming derivatives markets, and transforming shadow banking into a resilient source of finance. Many of the reforms are well under way, and a first assessment of their effects becomes feasible.

Does this mean that all is well and that markets are resilient with regard to future shocks? I will argue in the following that it is not the time to be complacent:

1. Favorable economic prospects may lead to an underestimation of risks to financial stability.
2. Resilience should be assessed against the ability of the financial system to deal with unexpected events.
3. There is the risk of a roll back of reforms.

1 Favorable economic prospects may lead to an underestimation of risks to financial stability.

Market participants are currently quite optimistic. This reflects that the European economy is in good shape and that the global economy, too, is expanding at a brisk pace. Market participants, bolstered by the current growth forecasts, are expecting interest rates to

slowly start picking up again. And not only are market participants optimistic, the range of expectations has also narrowed down. Yet, this optimism and convergence of expectations may harbor risks for financial stability.¹

Assuming that the current outlook will be sustained, risks to financial stability will be limited. A gradual upturn in interest rates would strengthen the stability of the financial system. Banks may see their interest margins recover – in particular if interest rates stay out of negative territory. Life insurers and pension institutions would find it easier to generate returns and to honour promised payments to customers.

But how would markets respond to an unforeseen economic slowdown? What if interest rates stay low for much longer? What if political risks materialize and risk premiums increase abruptly? Such unexpected events may affect many market participants at the same time – thus potentially threatening the functioning of the entire financial system.

A resilient financial system needs to be in a position to weather also unexpected, but by no means unrealistic, scenarios. During the extended spell of low interest rates, risk has been growing in the global financial system. Low interest rates and strong growth might cause risks to be underestimated. These risks can be mutually reinforcing in the financial system. Therefore, the resilience of the financial system might be overstated.

The good economic conditions might lead market participants to ignore the risks of scenarios involving heavy losses. Gazing into the rear view mirror for too long increases the risk of overlooking hazards on the road ahead. The longer booms persist, the greater the inclination to extrapolate current trends, and the weaker are incentives to take precautions against unforeseen events. If the real economy takes a worse path than expected, that would also drive up credit risk.

In Germany, for example, the number of insolvencies has almost halved in the past years, dropping from just over 39,300 in the year 2003 to a little more than 20,000 in the year 2017 (Federal Statistical Office of Germany 2018).² To put that number into perspective: There are just over 11,000 municipalities in Germany. Hence, there has been an average of less than two insolvencies per municipality. Reflecting these numbers, credit risk provisioning for German banks is currently at record lows. Moreover, we know from empirical

studies that entry and exit of firms is an important mechanism behind innovation and, ultimately, economic growth (Foster, Grim, Haltiwanger, and Wolf 2018).

Yet, low default rates on loans are a backward-looking indicator and do not provide a good proxy for future risks. Larger banks use their own risk models to assess risks as a basis for their capital requirements. These banks might underestimate the risks which might arise if economic activity unexpectedly worsens. This might, in turn, also lead to an underestimation of how much capital is needed to provide sufficient buffers against losses.

There are, in fact, scenarios which could hit the financial system hard. One risk scenario is a faster-than-expected upturn in interest rates. For instance, risk premiums in international financial markets might increase unexpectedly. A rapid increase in interest rates would drive up short-term funding costs and hit particularly those financial institutions that have invested into low rate, fixed term assets. In Germany, for instance, 44% of housing loans are fixed-rate mortgages with a maturity of more than ten years, this number being up from 26% at the beginning of 2010.³ An abrupt increase in interest rates would put pressure on banks – their funding costs would go up, and their interest income would, initially, rise at a slower pace. An abrupt rise in interest rates would also send valuations down from their current high levels and thus cause losses.

A second risk scenario is that of persistently low interest rates which would incentivize a search for yield. Empirical results for the US show that risk-taking by banks intensifies if interest rates are low for long (Buch, Eickmeier, and Prieto 2014; Dell’Ariccia, Laeven, and Suarez 2017). Also, life insurers and pension institutions would find it increasingly difficult to generate sufficient income to cover the returns that some of them have promised to pay.

2 Resilience should be assessed against the ability of the financial system to deal with unexpected events.

The resilience of a financial system has two key components – buffers against risks and the risks themselves. Notwithstanding difficulties with the definition of capital and liquidity buffers, these can be measured with a reasonable degree of certainty. On average, banks' capital ratios have increased since the crisis. Within the euro area, the Tier 1 capital ratio, which is measured in relation to banks' risk-weighted assets, increased from 8.8% in the year 2008 to 14.7% in 2016 (CGFS 2018). This raise has been achieved by a decline in total assets, a decrease in average risk-weights, and by a strengthening of banks' capital positions. Measured relative to banks' total assets, bank capital has increased to a lesser extent, from 3.7% in the year 2008 to 5.8% in 2016.

Banks have also built up buffers against liquidity shocks. By the end of 2016, the Liquidity Coverage Ratio (LCR) was 130% on average in an international sample of around 90 large banks (CGFS 2018).⁴ More than 90% of those banks had already met the regulatory requirement of the LCR set at 100%. Banks' long-term resilience against liquidity shocks has also substantially improved. In particular, the Net Stable Funding Ratio (NSFR) has increased significantly from 43% in 2012 to 115% in 2016 (CGFS 2018).⁵

Notwithstanding higher levels of capital in the banking sector, global debt levels remain elevated. At 144% of GDP, private non-financial sector debt has been higher in late 2017 than its pre-crisis level of 125% in 2007 (BIS 2018). This trend is explained, not least, by increased leverage in the corporate sector, particularly in emerging market economies. Complacency with regard to the resilience of the financial system is thus a risk, and assessment of debt sustainability might be overly positive.

Moreover, measuring risks and the associated losses when these risks materialize is difficult. Risks to global financial stability are genuine uncertainties, rather than well-defined risk scenarios with estimates of probabilities and losses-given-default attached to them. Writing contracts that describe all relevant contingencies and that condition the responses of the contractual parties on these outcomes is typically not feasible.

In addition, risks are highly endogenous and depend on the ability of the financial system to adjust to shocks. Seemingly small shocks can propagate in the financial system and become contagious (Allen and Gale 2000). Contagion effects can arise in the financial system whenever market participants are contractually highly interconnected or if investment strategies are very similar. In that situation, a relatively minor shock can affect the functioning of the entire financial system – with negative implications for the real economy.

The financial system needs to have sufficient buffers to be able to absorb even unexpected events, which can become mutually reinforcing in the system. Two examples can illustrate such systemic events:

First, risks stemming from an interest rate hike, revaluations in markets and increased credit losses could materialize simultaneously. Asset values might plunge; write-downs would erode equity. And, in particular, credit risk could increase if economic activity unexpectedly declines.

Second, common exposures to the same risk factor can trigger systemic risks. Take one example based on the German financial system. One of the German banking system's strengths is its large number of smaller credit institutions operating directly within the regions in which they are based. Yet, the bulk of Germany's smaller credit institutions – its credit cooperatives and savings banks – are highly exposed to interest rate risk. This might undermine stability precisely when interest rates climb more briskly and more strongly than anticipated. Small though these institutions may be individually, together they account for a significant share – roughly 50% – of lending to domestic enterprises and households (Deutsche Bundesbank 2018).⁶ If those institutions were to run into difficulties, the repercussions for the economy as a whole could be severe.

Generally, resilience with regard to such systemic events should be measured with regard to the mechanisms that are in place to deal with losses. Equity capital, for example, provides an ex ante insurance mechanism. Whenever risks materialize, the value of equity adjusts, and dividend payments can be suspended. Thereby, equity investors bear upside and downside risks. Standard debt contracts, in contrast, are insensitive to the borrower's

situation. Risks are not shared unless the debtor enters insolvency proceedings and unless risk sharing occurs through haircuts. Insolvency proceedings, however, are often inefficient, may create distortions if investments are postponed, and may lead to the liquidation of viable parts of businesses.

Market participant needs to hedge against negative scenarios – by making sure that they put enough capital into any investment and basing expectations on the most realistic scenarios possible. But what happens when risk materializes that the individual cannot readily grasp, when risks become mutually reinforcing in the system?

At the system level, the credibility of regimes for the recovery and resolution of financial institutions is a crucial element of resilience. In 2011, the Financial Stability Board published an international standard for sound resolution regimes: the “key attributes of effective resolution schemes for financial institutions” (FSB 2011). Their overall aim is to establish a framework that allows for systemically important financial institutions to exit the market without endangering financial stability. In particular, the burden of losses should be shifted from taxpayers to shareholders and creditors. This reduces moral hazard and funding advantages due to public bail-outs.

While the “key attributes” are applicable to all kind of financial institutions, their implementation has so far advanced mostly for banks. In the European Union, the attributes have been transposed via the Bank Recovery and Resolution Directive (BRRD) for all EU members as of 2015. For euro area countries, the Single Resolution Mechanism was established in 2016 with the Single Resolution Board as a common resolution authority. The new rules were applied for the first time in 2017. These first applications highlight shortcomings that need to be addressed (Deutsche Bundesbank 2017). For example, the decision that failing banks have reached their point of non-viability should be based on more specific criteria in order to avoid (costly) delays of the “failing or likely to fail” decision. Moreover, the first applications of the BRRD revealed discrepancies in bail in rules according to the European resolution framework, state aid rules, and national insolvency laws. Finally, contagion risks that might emerge from banks’ cross-holdings of each other’s liabilities can be mitigated by implementing holding restrictions.

3 There is the risk of a roll back of reforms.

Fading memory of the crisis and a favorable economic environment intensify pressure to relax financial regulations. The risk of a roll back of reforms is particularly acute when business models of incumbent financial institutions are under pressure as a combination of excess capacity in some markets, changing patterns of globalization, and technological change.⁷

Since the financial crisis, reforms have been initiated – the impact of which is now gradually making itself felt in the markets. Higher capital and resilience of the financial system are a stated objective of these reforms. We can now begin evaluating the effects of the reforms. Have they achieved their objectives? Do the reforms bring with them unintended side-effects?

Under the German presidency in 2017, the G20 have agreed on a framework for a structured evaluation of the reforms (FSB 2017). A structured evaluation is needed to gauge the costs and benefits of reforms. Such an analysis needs to take the perspective of society as a whole because not all the costs being discussed in the public arena are in fact costs to society. The costs of failures in the financial system should be borne by those who cause them – the shareholders and potentially also the creditors of financial institutions – rather than by the taxpayer. Technically speaking, the reforms aim at cutting implicit subsidies for systemic institutions. For the private sector, funding costs are thus going up. Yet, society benefits because costs of financial distress are shifted from society to the originators. Also, if financial crises occur less often and are less severe, reforms carry a lower economic and social price tag. Finally, benefits of the reforms can only be reaped over the longer term, whereas higher funding costs tend to be recognized immediately.

Evaluation, therefore, means making the costs and rewards of the reforms for society as a whole more transparent and disclosing any unintended side-effects. So far, there are no indications that the reforms have impaired the ability of the financial system to provide services and to lend to the real economy. The evaluation of the reforms should not be used as a pretext to water them down or weaken the resilience of the financial system. UI-

timately, a stronger, better capitalized, and more resilient financial system promises a “double dividend” in terms of growth and stability.

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¹ For example, empirical results for the US show that monetary policy shocks affect output and investment more strongly in times of low financial market volatility than during spells of heightened volatility (Eickmeier, Metiu, and Prieto 2016). Similar results were found for the euro area (Pellegrino 2017).

² These numbers are based on data from the Federal Statistical Office of Germany available at <https://www.destatis.de/EN/FactsFigures/Indicators/LongTermSeries/Insolvencies/lrins01.html>.

³ These numbers are based on data from the Bundesbank's MFI interest rate statistics and calculated as a share of domestic banks' credit volume with a respective fixed interest rate of the total volume (measured by the volume of new business). The time series is part of the *system of indicators for the German residential property market* that is available at www.bundesbank.de/residential_property.

⁴ The liquidity coverage ratio (LCR) is a supervisory minimum ratio of short-term liquidity that banks have to hold. In order to achieve the required LCR of at least 100%, a bank's available liquid assets have to surpass its expected cumulative net cash outflows over a period of at least 30 days. This is designed to ensure that banks are able to withstand a severe stress scenario, such as the coincidence of a partial run on customer deposits and the drying-up of unsecured funding. The LCR entered into force in January 2018.

⁵ The net stable funding ratio (NSFR) is a prudential ratio that measures the extent to which a bank has medium to long-term funding for its exposures. The NSFR standard is designed to ensure sustainable and stress-resistant funding of a bank's asset-side business as well as its off-balance sheet activities. It is defined as the ratio of sustainable funding (including equity capital and long-term liabilities) over the required stable funding. The minimum ratio is 100%. The NSFR rule is scheduled to enter into force in 2020.

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- ⁶ This number is based on data from the Bundesbank's monthly bank balance sheet statistics as of January 2018 (latest data: November 2017). It was calculated as the amount of loans by savings and cooperative banks to domestic non-financial firms and households relative to the total amount of loans by all monetary financial institutions (MFIs) to the same sector. Further information are available at https://www.bundesbank.de/Navigation/EN/Statistics/Banks_and_other_financial_institutions/Banks/Monthly_balance_sheet_statistics/monthly_balance_sheet_statistics.html
- ⁷ Historically, changes in financial regulations have indeed often been driven by interests of incumbent firms and the political impact of "insiders" (Rajan and Ramcharan 2016, Rajan and Zingales 2003).