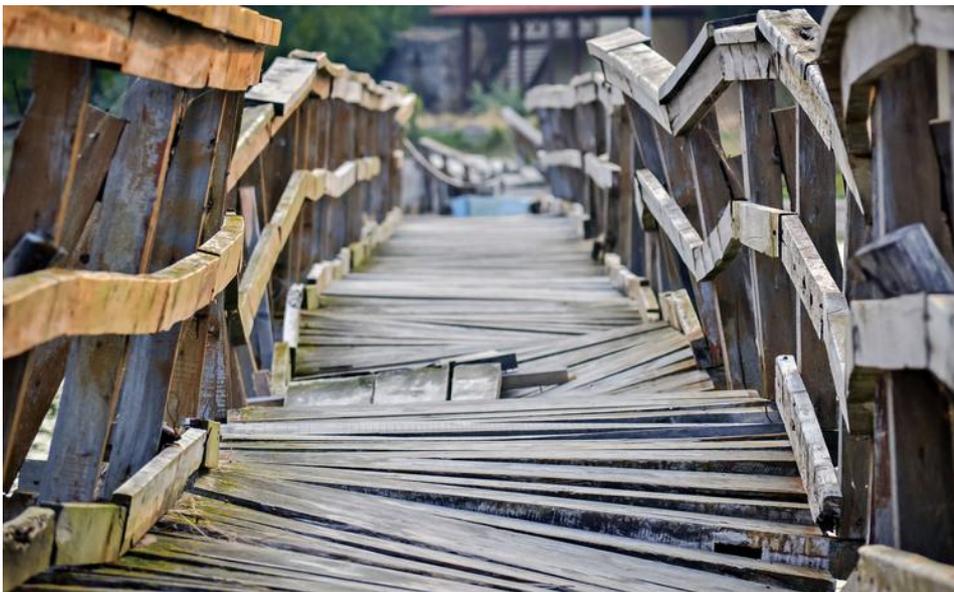


CENTRAL BANKING

A dangerous unknown: interest rate risk in the financial system

Urgent action is needed to tackle the little-understood build-up of interest rate risk in the global financial system; macro-pru tools still inadequate to tackle the issue



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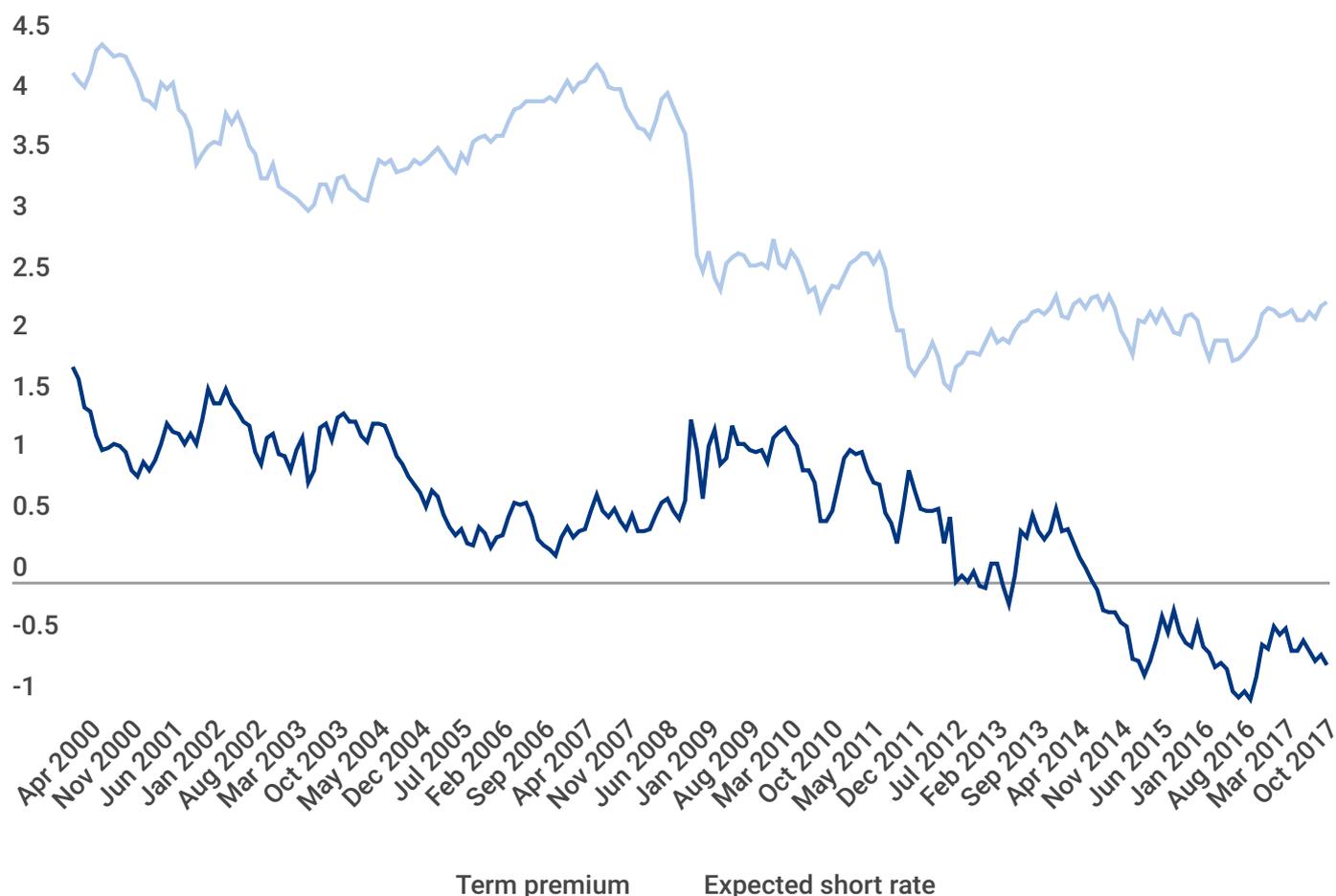
Conventional wisdom about the risk-free yield curve, which is the basis for the pricing of all long-term assets, has been shaken by recent monetary and regulatory policies. Policy rates in the major currencies have been zero or even negative for years. Massive and prolonged central bank purchases of bonds have made it harder to define an equilibrium long-term interest rate. New rules have induced banks and other regulated financial institutions to hold more government bonds. Neither officials nor markets can know what will happen once the effects of these policies fade. But the evidence points to such policies as having increased interest rate risk in the financial system. This represents a threat to financial stability, which regulatory and macro-prudential policies are ill-equipped to handle.

British economist John Hicks famously estimated that from 1750 to the 1950s, the yield on

consols – the perpetual bonds that were then the best approximation to the world real long-term interest rate – fell outside a narrow 3.0–3.5% range only during time of war. John Maynard Keynes was well aware of this constancy during these two centuries of tumultuous economic change. But he nevertheless argued strongly in the 1930s that the major central banks should buy bonds “to the point of saturation” to get the long-term rate down. Central banks at that time ignored this advice, so economists at the time never found out whether such radical policies would have worked. But now we know they do work. Massive central bond purchases after the global financial crisis produced a big and sustained cut in interest rates along the whole yield curve.

Large purchases of bonds by all major central banks contributed to driving the world term premium from about plus 100 basis points in 2009 and 2010 to around minus 100bp by early 2015 (see figure 1). No-one has made the point better than [Mohamed El-Erian](#), chief economic adviser at Allianz and former Pimco chief executive: because central banks have a “highly elastic balance sheet subject to few constraints, central banks can stick with a ‘losing trade’ much longer than most hedge funds can bet against it”.

1. Decomposition of 10-year bond yield – world (%)

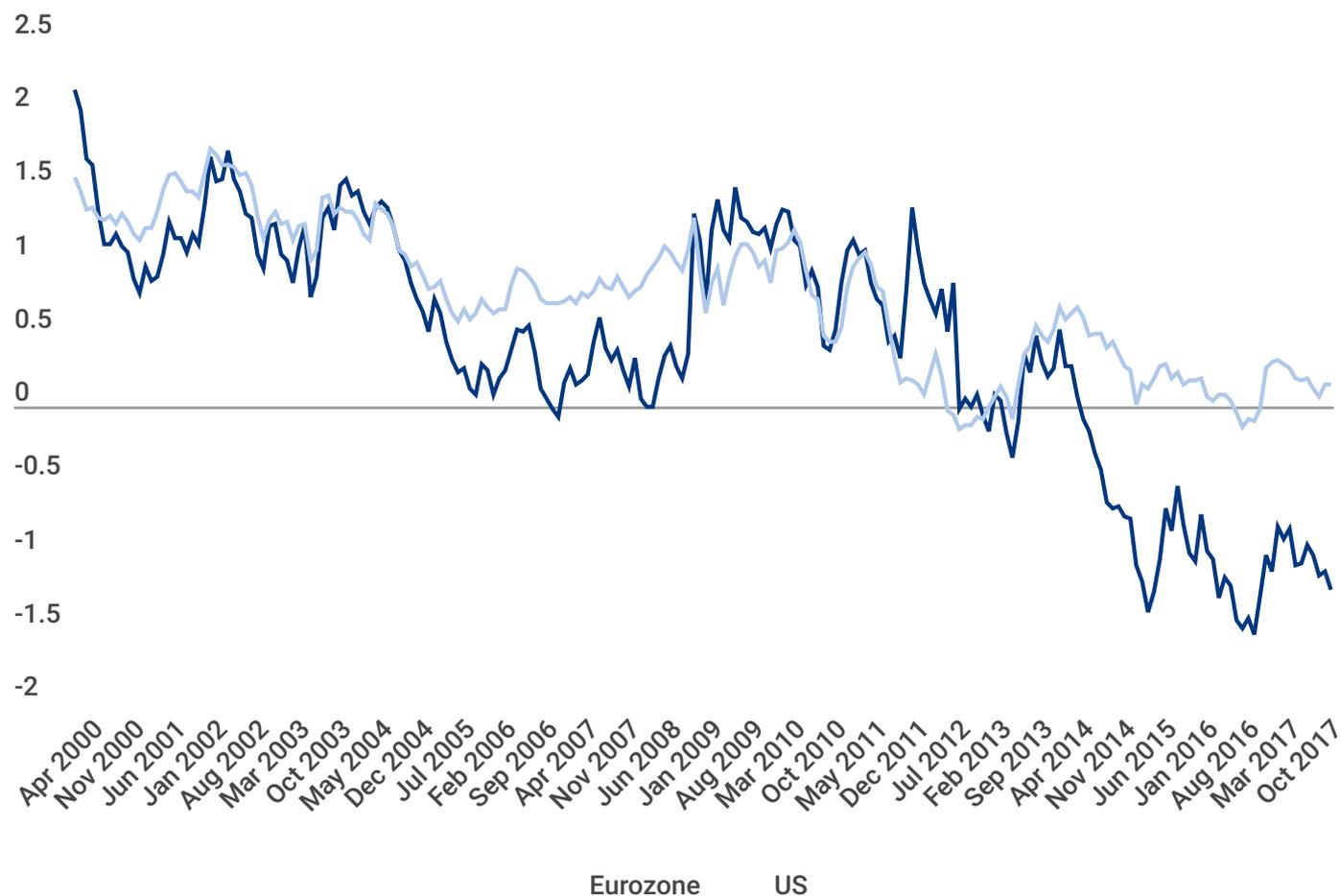


Source: Hördahl, Peter, Sobrun, Jhuvesh and Philip Turner, *Low long-term interest rates as a global phenomenon*, Working Paper No 574, Bank for International Settlements, August 2016 (data updated to October 2017).

This drop in the term premium reflects a fall in the real interest rate risk premium, rather than a lower inflation risk premium. Markets have apparently become more confident that low real long rates reflect the new normal. A sustained decline in the term premium based on this confidence has boosted asset values globally. At the time of writing (January 2018), the term premium on euro-denominated bonds was more negative than on dollar-denominated bonds (see figure 2). One reason for this difference is that central bank purchases in the eurozone have been a much larger proportion of outstanding government bonds than in the US. And such purchases particularly helped the peripheral countries. A large proportion of the European Central Bank's offering of 36-month financing for banks under the long-term refinancing operations from December 2011 was taken up by Italian and Spanish banks. In what became known as the 'Sarko trade', named after the French president, Nicolas Sarkozy, who explained this logic to the world's press. This policy helped eurozone peripheral countries get their own banks to borrow cheaply from the ECB to buy more domestic government bonds, which

increased those banks' net interest income. These radical and imaginative monetary measures helped to bring a deep recession to an end and aided a strengthening of banks in the eurozone. With stronger banks able to lend more, the recovery has strengthened.

2. 10-year term premia – eurozone and US (%)



Source: Hördahl, Peter, Sobrun, Jhuvesh and Philip Turner, Low long-term interest rates as a global phenomenon, Working Paper No 574, Bank for International Settlements, August 2016 (data updated to October 2017).

The world real long-term interest rate has been oscillating around zero since early 2012. Apart from a short-lived bounce in 2013 (during the 'taper tantrum', caused when Ben Bernanke, then chairman of the US Federal Reserve Board, signalled that the US was looking to reverse its extraordinarily loose monetary policies), the long-term rate has remained low in the face of progressive Fed tightening. Many now believe this is the new normal. But could such confidence be misplaced, and therefore pose a new threat to the financial system?



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An even more worrying question is whether or not regulators have made matters worse. Recall the poorly understood risks in securitised debt products that brought the financial system down in 2008. Srichander Ramaswamy explains in [Financial crisis and regulatory reforms](#) how inadequate Basel II risk weights gave rise to a massive increase of such products. Has [Basel III](#) similarly increased the demand for government bonds from banks, and failed to do enough to ensure banks manage interest rate risk? Other new regulations – for example, Solvency II for insurance companies in Europe – have increased the demand for government bonds from non-bank financial institutions. Such policies help to lower long-term rates. The rise in public debt since the global financial crisis has made governments all the keener on cheap finance. Through new rules, governments have induced regulated lenders to limit credit risk from lending to the private sector, but increased interest rate risk exposure from larger holdings of longer-maturity government bonds. Hervé Hannoun and Peter Dittus denounced this as “financial repression” in [Revolution required](#).

But such fiscal, monetary and regulatory linkages cannot be analysed in a definitive one-size-fits-all way. International financial regulation is complex, and accounting standards still vary across jurisdictions. And those negotiating agreements must often withstand fierce opposition from governments wishing to obscure the weaknesses of their own banks. Regulators, therefore, have become adept at designing *ad hoc* arrangements to fix the problems that regulation has itself created.

New regulations and accounting practices

As mentioned, new regulations are encouraging financial firms to hold more government bonds. There are [two channels](#) in particular. One is the use of long-term government bonds as a liquid asset to meet the liquidity coverage ratio. In the past, when central banks relied heavily on liquid asset ratios for monetary and prudential control, liquid assets had to be short-dated paper to avoid the interest rate risk from holding bonds (which tend to have maturities of one year or more).



The Bank for International Settlements, Basel

But the biggest impact stems from the lack of a global Pillar 1 capital charge on interest rate risk on bonds held in the banking book. The Basel Committee on Banking Supervision has struggled with this since the 1990s. No capital charge was incorporated in Basel II, although, in 2001, it [said](#) “the committee remains convinced ... [this is] ... a potentially significant risk, and one that merits capital”. In preparing Basel III, it tried – but again failed – to get agreement on a capital charge. The sharp divergence in the views of national supervisors played a part in this, as Donald van Deventer said in a 2017 [blog post](#). The Basel Committee, therefore, fell back on supervisory guidance under Pillar 2. It also made more explicit the disclosure requirements under Pillar 3. It stressed that interest rate risk in the banking book was “material”, particularly when interest rates normalise from historically low levels (see [BIS standards](#), published in 2016). Those who invest in banks should be aware of this.

In almost all countries, the value of bonds held in the banking book has risen substantially since the financial crisis. At the end of 2016, US commercial banks, for instance, held investment securities equivalent to 14.3% of GDP in their banking book, up from 5% of GDP at the end of 2007. Their holdings of total federal government obligations (Treasuries plus US agency debt) amounted to around \$2.3 trillion, compared with \$950 billion at the end of 2007.



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It is true that alternative tools to limit interest rate risk do exist. One such tool is stress tests. For example, the Fed's rigorous test involved a 300bp shift/steepening in the yield curve. Not all supervisors are as rigorous: sovereign debt exposures held in the banking book were simply ignored in the European Union's stress test in 2010. Another tool is limits on maturity mismatches under the new liquidity regulation. Constraining the gap between the average maturity of assets and typically short-term liabilities will tend to reduce holdings of all long-term assets. This has led to a dramatic improvement in the short-term liquidity position of banks, which has been further supported by large reserve balances held with central banks.

Nevertheless, recall that government bonds in local currency still carry a zero risk weight, irrespective of market assessments of credit or, in the case of the eurozone, redenomination risk. Even if the redemption value of a government bond on maturity is usually assured, its market value – which determines what it is worth when pledged as collateral – will decline when market interest rates rise. The market value will also matter for a bank in resolution. Capital is needed to cover these risks. The absence of a simple capital charge leaves supervisors even more open to pressures from a government to allow banks to cheaply finance the government and turn a blind eye to interest rate risk in banks.

Another example of regulation favouring government bonds (and corporate bonds with A or better rating) is the European Solvency II directive for insurance companies. In an effort to reduce credit risks, this directive pushes European insurers to hold fewer equities and low-grade corporate bonds through a risk capital charge. To generate adequate returns as they reduce credit-risk exposures, firms tend to increase the duration of their government bond portfolios. Such regulation-induced substitution of interest rate risk for credit risk on their financial assets can lead to destabilising market dynamics. What is most worrying is the evidence that some institutional investors have recently increased in a procyclical way the duration of their assets in response to a fall in long-term rates. It hardly helps price discovery or market stability if a rise in price increases the demand for bonds.



The European Central Bank, Frankfurt

A thornier question is how should accounting conventions be adapted when the long-term interest has been temporarily depressed by monetary policy. A very important rule is International Accounting Standard 19, which requires the calculation of the present value of defined-benefit pension liabilities, typically using a discount factor linked to a bond yield. Life insurers apply a similar formula. Lower bond yields mean an increase in the present discounted value of liabilities. The net asset position of the pension fund will decline unless the fund holds bonds with the same maturity as its liabilities.

This rule, designed to protect policyholders and the entitlements of pensioners, has a clear justification at the level of the individual firm, which adjusts its position to the long rate. But the aggregate reaction of rational individual responses can still produce irrational results. If pension funds in aggregate all respond to a decline in the long-term interest rate by buying more longer-dated bonds, they will collectively magnify the initial interest rate shock. The feedback effects could further increase the present value of their liabilities – which most would not welcome. Such a dynamic may well have magnified the downward pressure from quantitative easing (QE) on long rates in recent years. Conversely, once QE is reversed, the snapback could be violent, even if central banks' sales have been only moderate.

In any event, the long process in the pension fund industry of more closely matching their liabilities by increasing their holdings of government bonds (particularly in the UK) may be near

completion. If so, another “captive” source of demand for government bonds would also decline.

Gaps in macro-pru policy

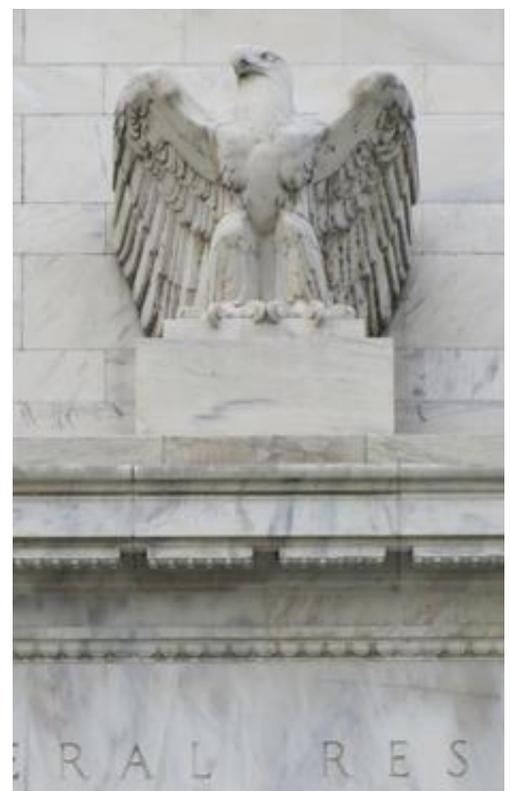
Those responsible for designing prudential rules and accounting conventions can rightly say that their mission is to put in place systems that ensure banks and other financial institutions remain safe as they navigate the industry’s perennial problems. It is not for them to tailor such rules to the exceptional monetary and financial conditions that the world’s central banks have created. That is the job of macro-prudential policies.

Years of extraordinarily low interest rates on core government bond markets mean that bond investors carry increasing interest rate risk. This situation has also provided a great opportunity for higher credit risk borrowers to tap international bond markets, and this has probably increased liquidity risks in global bond markets. How well do current macro-prudential policies deal with these new risks? The [short answer](#) is: “well for mortgage lending; work-in-progress for bank liquidity; and poorly for non-banks”.

First, a number of countries have introduced limits on debt-to-income ratios for [housing loans](#). Such ratios protect households and banks from sharp increases in interest rates better than debt service ratios calculated using current low rates.

Second, maturity transformation within banks – which is a core function of banking – has been for the first time subject to quite demanding liquidity ratios agreed at international level under Basel III. But one neglected problem is that these rules do not change over the economic cycle – quite unlike capital rules (which incorporate a countercyclical buffer). Ideally, what is needed is some form of contingent, pre-positioning scheme to allow banks to swap their less liquid assets into high-quality liquid assets during a crisis. Just storing large volumes of such assets (often government bonds) is wasteful, and may contribute to a mispricing of bonds.

Third, macro-prudential policies with respect to non-banks are not well-developed. This is very serious when macro-prudential policies aimed at banks divert risks to non-banks (eg, as appears to have been the case with US leveraged



The US Fed

loan issuance in recent years). This is an important matter that was raised in 2017 by ECB vice-president [Vítor Constâncio](#). He said the macro-prudential policy toolkit must be expanded to cover maturity mismatches and leverage in non-bank financial institutions if another financial crisis is to be avoided.

Finally, the familiar issues of market functioning may come to the surface in a major correction in bond markets. Much has been written about the risks created by exchange-traded bond funds, which offer daily liquidity even when the markets for the underlying bonds are illiquid. The number and diversity of such bond funds have increased greatly over the past decade. How the reactions of large asset managers could destabilise markets remains an unresolved question.

Clearer focus on rate risks

Policy influences on demand that have pushed long-term bond yields lower are now fading. Banks will not further increase their stock of government bonds once they have met their regulatory requirements for liquidity. The adjustment to new accounting rules will run its course. Bond purchases under QE programmes have ended in the US: net sales over the next three years might add 100bp to 10-year dollar yields. In the eurozone, new purchases are being reduced. The demographic and other secular forces that led to a global saving glut are likely to weaken over the next decade.



William Dudley, Federal Reserve Bank of New York

Macroeconomic developments seem likely to push long-term rates higher. Growth forecasts for 2018 have been revised upwards. With unemployment falling, financial markets extraordinarily buoyant and commodity prices strong, inflation may begin to surprise on the upside. The president of the Federal Reserve Bank of New York, William Dudley, [said](#) in January 2018 that the added stimulus from tax cuts could raise

the risk of “economic overheating” in 2019 and 2020. If so, policy rates would have to rise further over the next two to three years than markets currently expect. An outsized reaction of bond markets as interest rate expectations shift is a possibility. And we know from the global financial crisis that market sentiment can change abruptly.

Interest rate risk in banks and other financial institutions should therefore be high on the list of concerns of regulators and of those who invest in these companies. The increase in advanced-

economy government and other official debt held outside the issuer's central bank and the rise in its average maturity suggest that interest rate risk has increased. With general government debt outstanding in developed countries amounting to \$40 trillion, taking an average maturity of the debt to be five years would mean that a 100bp rise in interest rates would cause a \$1 trillion fall in market values. The proportional losses from holdings of lower-quality bonds are likely to be higher. Many of these losses will accrue to financial institutions.

Given the scale of the problem, and its rapid growth during the past five years, we need better data on such exposures. The new Basel Committee disclosure requirements for interest rate risk coming into force this year will generate new firm-level data. It is important to find ways of interpreting and aggregating such information (and, if necessary, supplement it) to track changes in the volume and maturity of bonds held by banks in the banking book. This is especially true for the eurozone, where the exposures to the government debt of some countries are likely to create particular problems. We also need to know where interest rate exposures lie in the financial system as a whole. The regular publication of stress tests on financial firms would help. Which firms would sink if the long-term real rate were to rise to 3%, the lower end of Hicks's famous range?

New regulations and supervisory oversight for banks under Pillar 2 may well fail to adequately cover interest rate risk. Actual experience about how the new rules are working in practice should be reviewed as soon as practicable. There is also a need to extend macro-prudential policies to cover interest rate risk. Macro-prudential policies aimed at banks should not just shift the exposure to non-banks. Policy needs to address not only maturity mismatches and excessive leverage in non-banks, but also the threat that bond markets become illiquid in a crisis. Because policies have so distorted the long-term rate, interest rate risk in financial institutions matters more than almost ever before.

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