



BANK OF ENGLAND

# Speech

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## **Moonwalking bears and underwater icebergs: Hidden risks in markets**

Speech given by

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This speech draws heavily on:

Brazier, A. (2018), 'Market finance and financial stability: will the stretch cause a strain', *Brevan Howard Centre for Financial Analysis, Imperial College Business School, London*, February, available [here](#);

Cunliffe, J. (2018), 'Market-based finance: a macroprudential view', *Asset Management Derivatives Forum, Dana Point, California*, February, available [here](#).

## **Moonwalking bears and underwater icebergs: Hidden risks in markets**

The theme of today's session is hidden risks.

Since this is the Investment Management Club, I want to focus on hidden risks in markets.

In my view there are generally two types of such hidden risk. Let's call them bears and bergs (slide 2).

### **The bears are the risks that hide in plain sight.**

These are risks that, after the event, are obvious. Some people are able to see them in real time. Others, because of very human traits, don't.

They are the moonwalking bear in the viral [Transport for London Cyclist Awareness video](#).

For those who haven't seen it, amidst a frenetic basketball game, a person dressed as a bear moonwalks across the screen.

When you know it's there, it's obvious. But when, as instructed, people are engrossed in the highs and lows of the basketball game, many fail to notice the bear.

The risk of adjustment in the stretched prices (and compressed yields) in corporate debt markets are my moonwalking bear, hidden in plain sight.

### **The icebergs can lurk beneath the surface of the system.**

They make navigation of markets uncertain and hazardous. Assessment of them requires diving into the cold, murky depths of the financial system.

Excessive leverage and liquidity mismatches were the bergs of the financial crisis.

They forced investors into firesales of assets, magnifying market adjustments, and sometimes even disrupting market functioning. In other words, they compromised market resilience.

Those risks have been addressed. But we must stay alert to any possible new bergs of the future. To spot them emerging we need to dive into the detail of the system, to look at the incentives and constraints facing the participants.

We'll don our diving equipment later. **Before we do, it's worth asking who should care about hidden risk?**

Any manager focussed on risk and return will be interested in these bears and bergs.

Failure to acknowledge them can damage performance.

But while the risks mean some investors can have a bad day and others a good one, the ups and downs of asset markets don't necessarily concern policymakers.

Our focus is on the macro prudential; on ensuring the financial system serves the wider economy in bad times as well as good.

And risks in markets do not translate automatically into risks to that.

So our objective is not to protect investors from ups and downs in financial markets or to target some level for asset prices.

The objective is to protect the wider economy from disruption if market risks materialise.

The nature of corporate finance has shifted decisively in the past decade. Since the crisis, nearly all of the increase in debt of companies in the UK can be accounted for by bond issuance. The scale of business borrowing through markets is now on a par with their borrowing from banks.

This shift in the balance of corporate finance should be positive for stability. A more diverse system can be a safer system. Bond finance has been the spare tyre that kept credit flowing while the banking system was punctured after the crisis.

So these markets are clearly delivering for the economy.

But conditions could develop in which they have the potential to disrupt: <sup>1</sup>

If debt levels of companies, particularly banks, were to come to rely on stretched credit markets and those markets were then to adjust.

Or if credit markets were to prove lacking in resilience so that they amplified any market adjustment, driving overshooting and tightening conditions for businesses.

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<sup>1</sup> The circumstances in which financial markets can affect the real economy were covered in my speech: 'Market finance and financial stability: will the stretch cause a strain?' (February 2018).

So as we consider the bear of stretched valuations in credit markets and the bergs of leverage and liquidity that could affect the resilience of those markets, I'll look at whether each is an issue just for market risks or also of relevance to the wider economy too.

**Let's begin with the moonwalking bear in debt markets.**

Consider this:

The yield on a basket of dollar-denominated corporate bonds is now closer to the expected average short-term risk-free rate over the life of those bonds than at any time in the past twenty years (see slide 3).

The premium investors earn for taking interest rate and credit risk is squeezed.

On the face of it that suggests an unusual degree of investor confidence about the interest rate outlook and corporate prospects generally.<sup>2</sup>

This compression of the premium has meant that – unusually – dollar corporate bond yields haven't risen, even as the US risk-free rate has. (slide 4)

Perhaps companies, globally, have become less risky? That seems to be the view in the market for credit default swaps at least.

Two years ago, the average annual premium of insuring against investment-grade corporate default was 85bp of the amount insured. Today, it is 50bp.

For nearly 20% of companies the premium was more than 150bp. Today, in almost no case is it more than 150bp. (slide 5)

But according to the models used by banks to assess creditworthiness, based on company balance sheet characteristics, default probabilities have barely changed.<sup>3</sup>

**In global debt markets, investors seem to be willing to take the same risk for less compensation. Appetite for risk taking has increased.**

Now, coming closer to home, consider this:

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<sup>2</sup> That confidence is also apparent in measures of interest rate volatility implied by options and in the pricing of credit default swaps.

<sup>3</sup> These model assessments are submitted to Credit Benchmark, to whom I am grateful for permission to use the data ([www.creditbenchmark.com](http://www.creditbenchmark.com))

As I noted back in February, the premium on a basket of sterling-denominated investment grade bonds is close to zero.<sup>4</sup> (slide 6)

While the average sterling-denominated investment-grade corporate bond has got riskier in recent years, with a longer duration and lower credit rating, this basket has a fixed composition.

And the compression of the yield premium has been even more pronounced at the riskier ('high yield') end of the market.

**The focus of explanations of these developments, globally and in the UK, is often on QE.**

Numerous studies have looked at the impact of central bank asset purchases on a range of market prices, including through the 'portfolio balance' effect of the private sector rebalancing its asset holdings as the central bank removes bonds and injects money.<sup>5</sup>

While there is a range of – uncertain – estimates, it's clear that QE has had some effect on a spectrum of asset prices, including corporate bonds. That was, of course, its intention.

But while QE was the basketball game getting the attention, might a bear have walked through the game too?

Some simple, albeit imperfect, facts reinforce that it might.

Only a tenth of the compression in the premium for taking interest rate risk and credit risk on sterling corporate bonds, since QE began, took place on announcements of the Bank's intention to purchase assets. And more than a third happened outside periods when any assets were being purchased by the Bank. (Slide 7)

The moves outside QE periods are enough to explain the current difference between the premium and its long-run average.

So what else could be going on?

The developments in risk appetite are suggestive of a search for yield.

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<sup>4</sup> This measure adjusts for changes over time in the typical credit rating and duration of the basket of bonds. Credit ratings have on average fallen and duration has increased in recent years.

<sup>5</sup> See, for instance, Haldane, A., et al., (2016), 'QE: the story so far', *Bank of England Staff Working Paper*, no. 624, October, and references therein.

With returns on a range of assets so low by historical standards, any signs that risks have declined and traditionally higher yielding assets are safer are tempting.

And anyone looking for confirmation of such a bias can find it in recent performance. With low corporate default rates and low market volatility, portfolios of corporate bonds have outperformed cash and sovereign bonds (slide 8).

But of course we know from the small print that the past is not always a good guide the future.

**So, as the Bank of England's Financial Policy Committee stated in March: "...there are material risks associated with interest rate volatility. The principle risks are in debt markets."**<sup>6</sup>

**But are these a risk to the wider economy?**

It's reassuring that easy conditions in markets have not led the corporate sector to take on an unusually high level of leverage. As a multiple of earnings, corporate debt in this country is around its long term average level.

Nevertheless, developments in corporate debt bear close scrutiny, because we cannot take for granted that it will stay this way.

The United States, where corporate debt levels have been testing previous highs, shows this to be more than a hypothetical possibility.

The UK's largest companies – those with access to capital markets – report that credit has become easily available.<sup>7</sup>

Corporate debt in the UK has been growing at a not insignificant annual rate of 6.2%.

And notably, riskier forms of debt – those most sensitive to a change in market conditions – have recently been growing most rapidly.

Issuance of leveraged loans and high yield bonds reached a record level last year.<sup>8</sup>

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<sup>6</sup> Paragraph 5 of 'Record of the Financial Policy Committee Meeting on 12 March 2018', available [here](#).

<sup>7</sup> See Chart 11 in Deloitte (2018), 'The Deloitte CFO Survey Q1 2018', available [here](#).

<sup>8</sup> Leveraged loans are loans to companies that typically display some of the following characteristics: high levels of indebtedness, a non-investment grade credit rating or ownership by a private equity sponsor. The latter is defined as bonds rated below investment grade.

Last year more than half of the issuance was used to refinance existing debts more cheaply. In the early stages of this year, however, there are signs of that changing. Issuance has been higher than in the same period last year and less is being used to refinance.<sup>9</sup> (slide 9)

These forms of debt accounted for around only 10% of bond and bank loans issued to UK companies last year. But if the pattern of the first 3 months of the year were to continue, they would still – alone – add 3% to the overall stock of corporate debt this year.

So recent developments demand careful scrutiny. If they continue, we'll need to assess, in particular, whether they increase the risks faced by banks.

Banks have demonstrated in recent stress tests their resilience to a sharp adjustment in credit market, and markets, rather than banks, have been the driving force behind recent growth.<sup>10</sup>

But recent IMF work shows how rapid growth of corporate debt overall, and any skewing of corporate debt towards riskier firms can – by creating a debt overhang – add to medium term risks to economic growth.<sup>11</sup>

The jury is out on whether what we have seen in the UK is material in this respect. But to keep the wider economy protected from financial disruption, it's important that banks are resilient to these risks if they do become material.

And that's one reason why (as the Financial Policy Committee said in the Record of its March meeting) the FPC intends to "re-consider the adequacy [of capital levels] in June, with a focus on the evolution of domestic risk appetite."

### **Let's move on to the other hidden risks: the underwater bergs that can make markets less resilient**

There were certainly plenty of these lurking under the surface of the system of 2008, making it fragile and amplifying market adjustments.

They help to explain how \$300bn of losses on subprime mortgages turned into well over \$2.5trn of write-downs in the global banking system.

The post-crisis reform programme has dealt with them. But our duty is not just to prevent the last crisis, it is to keep up with new risks as the financial system evolves and, where needed, take action to address them.<sup>12</sup>

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<sup>9</sup> See paragraph 17 of 'Record of the Financial Policy Committee Meeting on 12 March 2018', available [here](#).

<sup>10</sup> The test included a sharp adjustment in corporate credit markets and commercial property markets. Sterling investment grade corporate bond yields were assumed to snap up almost 800bps as long-term gilt yields rose by over 500bps and credit spreads blew out.

<sup>11</sup> International Monetary Fund (2018), 'Global Financial Stability Report' (April).

So let's look at some of the icebergs present in 2008, what's been done to deal with them, and where dives into the deep are now warranted – by investors and policymakers – to assess whether new – albeit smaller – bergs may be lurking.

**The first of these icebergs is leverage. Specifically, leverage arising from use of derivatives.**

Cast your minds back to 2008 and AIG (see slide 10).

It had written \$400bn of credit default swaps on mortgage-backed securities. It had in effect taken its insurance business to mortgage bonds.

Because of its triple-A credit rating, few of those buying the insurance asked AIG for any collateral.<sup>13</sup>

That had two consequences.

First, as its prospective losses on mortgage bond insurance increased and its own credit downgraded, AIG was suddenly required to put up \$40bn of collateral.

As it scrambled to find that collateral, it was forced into firesales of assets.

Second, as doubts grew about AIG's creditworthiness, questions were raised about who had bought the insurance and was therefore now exposed to uninsured losses on mortgage bonds. The confidence effect rippled through the system.

Today, these problems have been dealt with.

Complex networks of derivative exposures have been stripped back through increased use of central counterparties.

No longer must doubts about one counterparty raise questions about many others.<sup>14</sup>

And derivative exposures must be collateralised properly every day.<sup>15</sup> Over \$1trn more collateral is now held against derivative exposures than it was before 2008.

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<sup>12</sup> Cunliffe, C. (2018), 'Market-based finance: a macroprudential view', *Asset Management Derivatives Forum, Dana Point, California*, February, available [here](#).

<sup>13</sup> McDonald, R. and Paulson, A. (2014), 'AIG in Hindsight', *Federal Reserve Bank of Chicago Working Paper*, no. 2014-07, October.

<sup>14</sup> This is an example of how concentrating risk in a network can actually reduce aggregate risk. See Financial Stability Report, November 2017.

<sup>15</sup> For centrally cleared derivatives that requirement is in place today. Requirements for margin on uncleared derivatives are currently being introduced and will be completed by 2020.



No longer must questions about a counterparty's creditworthiness lead to a sudden increase in its collateral requirements. It is not something that is called for suddenly in a stress.

Collateral is always there to compensate not just for the market value of the derivative position at the time of the default but also additional losses that may be incurred in closing out or replacing the position.

But consistent with our duty to consider the future as well as the past, we are now diving to search for new hazards that could lurk beneath the surface in this area.

With collateral now dealing with questions about the solvency of counterparties, our focus is on what its much greater use means for resilience of markets.

As Governor Carney has observed: "Collateral management is a cornerstone of resilient markets".<sup>16</sup>

Greater reliance on collateral today means that although changes in counterparty credit quality are not met with collateral calls, market adjustments prompt much greater flows.

The avoidance of asset fire sales rests on those from whom the collateral is called having the means to meet the call.

So we are investigating how market adjustments could translate into calls for additional collateral from market participants.

Perhaps we should term this the sister of Value at Risk: collateral at risk or 'CaR'.<sup>17</sup>

And we are investigating how those calls would be met. Do participants have liquid assets to meet them or would they need to sell less liquid assets to get them? (slide 11).

Regulations are in place that require banks to hold a buffer of liquid assets to be able to meet derivative margin calls – and other outflows – over a 30 day window.

So our focus is on non-banks; on insurance companies, pension funds and investment funds of all sorts.

The jury is out here too. I do not start from the presumption that there is an iceberg here. Our duty is to assess whether they could be one.

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<sup>16</sup> Carney, M. (2013), 'The UK at the heart of a renewed globalisation', available [here](#).

<sup>17</sup> Even a user of derivatives to hedge another exposure – and thus having limited 'VaR' – could find themselves with significant 'CaR'. It is the potential mismatch in liquidity, between the collateral called for and the assets held that is a source of firesale risk. In addition, as the IMF reports for a sample of funds, the majority of derivative exposures are entered into in order to boost returns rather than hedge existing risks. This would boost both VaR and CaR.

But in order to assess properly the risks in this area we need much better diagnostic tools. So we are developing them.

We are fortunate in being able to draw on data from Trade Repositories which now record all new derivative trades between counterparties and report each day on the outstanding positions between them.

We are fortunate that these issues are the topic of international collaboration, with the International Organisation of Securities Commissions leading work to develop consistent measures of leverage – that incorporate derivatives usage – for investment funds.

We are fortunate that - as I told the Treasury Committee of the House of Commons last week – we and the FCA are able to work closely together on these issues.

And we are fortunate that the Bank of England's wider programme of intelligence gathering allows us to explore these issues alongside market participants.

For while only policymakers may end up going the final step to assess what all this could mean for the real economy, everyone has an interest in continuing to think about what collateral management means for the resilience of markets.

**The second possible iceberg is the liquidity mismatch in investment funds.**

The 2008 variant of this was egregious. Many of you will recall looking on in horror as \$400bn of redemptions by their investors forced money market mutual funds into fire sales of their assets, including commercial paper.

These funds had offered redemption of each \$1 share at par. They walked like a bank and quacked like a bank. They were shadow banks.

So when the Reserve Primary Fund, which held \$785m of Lehman Brothers' commercial paper, announced it would no longer be able to meet its offer and 'broke the buck', a run developed on these funds (slide 12).

Corporate funding markets, particularly for banks, went into meltdown. The United States government stepped in to guarantee redemption at par from money market funds— effectively a form of deposit insurance.

That iceberg has now melted. A series of measures are eliminating toxic forms of shadow banking like these 'constant net asset value' money market funds.<sup>18</sup>

As a result, markets are safer to navigate. Shadow banking of old is transforming to more resilient market-based finance of today.

So what need is there to dive into liquidity mismatch in investment funds?

It's certainly the case that any remaining risks are much smaller and more subtle than those around money market funds.

Since the crisis, funds have flowed into open-ended investment funds that make no promise of redemption value: the investor bears the risk from the outset. They have few of the problems of the crisis money market funds.

But these funds are increasingly invested in less liquid assets while continuing to offer next day redemption to investors. The share of corporate bonds held in open-ended funds in the UK and the Euro Area has increased by 70% since the crisis (slide 13).

And their structure may create incentives for their investors to redeem in a stress, forcing fire sales of illiquid assets.

I emphasise 'may' because we have not seen this on large scale in the past. Nevertheless, our duty is to ask whether we could see it in the future.

The possibility at least arises because the price offered to redeeming investors is the 'net asset value' of the fund, calculated from quoted market prices of the assets they hold.

Such quotes normally reflect standard trade sizes and prevailing market conditions. But a fund selling material amounts of less liquid assets in one day to meet redemption pressures could find itself receiving less than these quoted prices.<sup>19</sup>

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<sup>18</sup> In the US, structural reforms in 2014 preserved 'constant NAV' status for institutional funds only where they invest in government bonds. Any fund offering constant NAV must have the ability to implement a redemption liquidity fee and gates during times of stress. In Europe, reforms of 2017 preserved constant NAV for funds invested in sovereign securities.

<sup>19</sup> As part of its *Financial Sector Assessment Programme* for Ireland, the IMF estimated that it could take a high-yield credit fund up to three days to meet redemptions worth 10% of its assets. To ensure redeeming investors would not benefit at the expense of remaining investors, the fund manager would need to know exactly how much selling three days' worth of assets in one day would move the price and adjust its quoted NAV accordingly, which is highly uncertain.

Without other measures, redemptions from funds invested in less liquid assets can transfer economic value from remaining to redeeming investors. That could create an incentive to be on the side of the redeemers. It could create a first redeemer advantage.

This isn't much of an issue for funds invested in liquid equity markets, where large amounts can be sold at quoted prices at short notice.

But for funds investing in corporate bonds and even less liquid assets, it could be. So perhaps it should be no surprise that funds holding corporate bonds see redemptions that are seven times more sensitive to price moves than in equity funds and twice as sensitive as in sovereign bond funds.<sup>20</sup> (slide 14)

Fortunately – as many of you know – there are normally other measures in place, from swing pricing and dilution levies to gates and suspensions.

But, in a severe market stress it is not at all clear that such measures can be calibrated with the necessary precision or (to echo Jon Cunliffe) “whether their activation would dampen or amplify redemption pressures across the market generally”

Moreover, the impact of greater selling pressure under stress could be magnified by the coincident decline in corporate bond market liquidity more generally.

Market-makers have become less active in their market making. Our analysis suggests that, in response to asset sales by high-yield bond funds, the extent to which dealers are willing to see their inventories of corporate bonds increase has shrunk by a factor of about seven.<sup>21</sup> (slide 15)

The flipside is that market prices respond twice as much to asset sales as they did, in order to draw in other buyers in a short timeframe.<sup>22</sup>

As with derivatives and collateral, we need better diagnostic tools to assess these risks (slide 16).

That's why we're investing in simulation models to test what it would take for there to be material market impacts.

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<sup>20</sup> Baranova, Y., et al. (2017), 'Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment funds', *Bank of England Financial Stability Paper*, no. 42, (July)

<sup>21</sup> Baranova, Y., et al. (2015), 'Has corporate bond market liquidity fallen?', *Bank Underground*, available [here](#).

<sup>22</sup> See the December 2015 edition of the Financial Stability Report issued by the Bank of England. Also see 'Has corporate bond market liquidity fallen?' <https://bankunderground.co.uk/2015/08/27/has-corporate-bond-market-liquidity-fallen/>

Our work here explores the depths of how open-ended funds, hedge funds, dealers, insurance companies, unit-linked funds and pension funds might, through responding separately to their incentives and constraints, together amplify market shocks.

These are only simulations and the work is still at the development stage.

None of the developments I have listed is conclusive of a problem but we have a duty to take the possibility seriously.

With markets and funds having evolved so much, the absence of problems in the past is no guarantee for the future. There is enough here to be of concern not just to investors but also the wider economy and macroprudential authorities.

**I'll allow you now to re-surface and decompress.**

But rest assured, we'll be diving again to keep track of any new icebergs developing below the surface that could one day compromise the resilience of markets.

Just as we'll be working to ensure the moonwalking bears do not disrupt the wider economy.

So that market finance can continue to deliver for the economy in bad times, as well as a good.

Thank you.