

# WORLD COMMERCIAL REVIEW

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RE



MARK CARNEY CONSIDERS  
THE GROWING CHALLENGES  
FOR MONETARY POLICY

MONEY AND TRUST. YVES  
MERSCH REFLECTS ON  
LIBRA

DIRK NIEPELT BELIEVES THAT  
LIBRA PAVES THE WAY FOR A  
CBDC

## THE GLOBAL TRADE PLATFORM

# Foreword

The letters 'WCR' are rendered in a bold, dark blue, sans-serif font. The 'W' and 'R' are significantly larger than the 'C', which is positioned between them. The letters are solid blue with no outlines or shadows.

Welcome to the latest *WCR* Finance ePub. This publication has been prepared in response to readership demand for an overview of the financial sector in these turbulent and unique times.

All aspects of the sector are examined, with the most respected authors providing the reader with the most comprehensive information available. Our brief is to provide all the data necessary for the readership to make their own informed decisions. All editorials are independent, and content is unaffected by advertising or other commercial considerations. Authors are not endorsing any commercial or other content within the publication. ■

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A silhouette of a person pushing a large ball up a hill, symbolizing a challenge or struggle. The background is a gradient from blue to black.

# The growing challenges for monetary policy

Mark Carney considers the challenges posed by the international monetary and financial system for the conduct of monetary policy across the world

## Introduction

Before turning to the focus of my remarks, I would like to begin with a few comments on the UK outlook. A snapshot suggests the UK economy is currently close to equilibrium, operating just below potential with inflation just above its target.

Both headline and core inflation are around 2%, and domestic price pressures have been picking up notably. In particular, the labour market is tight. Growth in wages and unit wage costs have strengthened considerably as slack has been absorbed, with both now running at their highest rates in over a decade. The strength of the labour market is supporting consumer spending, which is rising broadly in line with real incomes. But pictures can deceive; two large, volatile forces could push the UK economy far from balance.

Until the start of this year, the UK economy had been growing around its trend rate. Since then, the intensification of Brexit uncertainties and weaker global activity have weighed heavily on UK activity. Global momentum remains soft, despite the broad-based easing in monetary policy expectations. In part this reflects a significant spike in economic policy uncertainty and the related risk that protectionism could prove more pervasive, persistent and damaging than previously expected.

As I will discuss in a moment, these headwinds are now restraining business investment globally and could push down on the global equilibrium interest rate, exacerbating concerns about limited monetary policy space. Long-term government bond yields have fallen sharply alongside the falls in expected policy rates. US 10-year yields are near three-year lows, and 10-year gilt yields and German 10-year bund yields are their lowest ever. Around \$16 trillion of global debt is now trading at negative yields.



As material as these global developments are, the UK outlook hinges on the nature and timing of Brexit. The UK economy contracted slightly last quarter and surveys point to stagnation in this one. Looking through Brexit-related volatility, it is likely that underlying growth is positive but muted. The biggest economic headwind is weak business investment, which has stagnated over the past few years, despite limited spare capacity, robust balance sheets, supportive financial conditions and a highly competitive exchange rate.

*Let's end the malign neglect of the international monetary and financial system and build a system worthy of the diverse, multipolar global economy that is emerging*

There is overwhelming evidence that this is a direct result of uncertainties over the UK's future trading relationship with the EU, and it serves as a warning to others of the potential impact of persistent trade tensions on global business confidence and activity. The UK economy could follow multiple possible paths depending on how Brexit progresses with material implications for the stance of monetary policy.

In recent weeks, the perceived likelihood of No Deal has risen sharply as evidenced by betting odds and financial market asset pricing (the UK now has the highest FX implied volatility, the highest equity risk premium and lowest real yields of any advanced economy).

In the event of a No Deal No Transition Brexit, sterling would probably fall, pushing up inflation, and demand would weaken further, reflecting lost trade access, heightened uncertainty and tighter financial conditions. Unusually for an advanced economy slowdown, there would also be a large, immediate hit to supply. The Monetary Policy Committee (MPC) would need to assess to what extent that reflects temporary disruption to production, with limited implications for inflation in the medium term, or a fundamental destruction of supply capacity because of the abrupt change in the UK's economic relationship with the EU.

As the MPC has repeatedly emphasised, the monetary policy response to No Deal would not be automatic but would depend on the balance of these effects – on demand, supply and the exchange rate – on medium term inflationary pressures. In my view, the appropriate policy path would be more likely to ease than not, using the flexibility in the MPC's remit to lengthen the period over which inflation is returned to target.

But much would depend on the exact nature of No Deal and its impact. In the end, monetary policy can only help smooth the adjustment to the major real shock that an abrupt No Deal Brexit would entail, but even its ability to do that would be constrained by the limits to the MPC's tolerance of above target inflation.

While the possibility of No Deal has increased, it is not a given. Along another path, it is possible that domestic political events or negotiations with the EU could lead to a longer period of uncertainty over the eventual future relationship, even in the event that an agreement is struck. On past performance, the longer these uncertainties persist, the more likely it is that growth will remain below potential raising the prospect of both softer domestically generated inflation and resurgent imported inflation if recent sterling weakness were to endure. Once again, the MPC would need to weigh the opposing forces when setting policy.

Finally, some form of agreement remains possible. After all, that is the avowed preference of both the UK and EU. In this event, consistent with the MPC's most recent projections, as details of the future relationship gradually emerge, business investment recovers and household spending picks up, resulting in excess demand and inflationary pressures gradually building. In the Committee's judgment, this path for the economy would likely require limited and gradual interest rate increases.

The coming months could be decisive. If there are material Brexit developments, the MPC will transparently assess their implications and set policy to achieve the 2% inflation target in a sustainable manner.

### **Challenges for monetary policy in the current IMFS**

When Ben Bernanke was retiring from the Fed, his closing remarks to central bank governors at the BIS set us the task of sorting out the deep flaws in the international monetary and financial system (IMFS). Six years later, with my demise as governor on the horizon, I'm going to 'pay it forward' by focusing on how the nature of the IMFS challenges monetary policy.

For decades, the mainstream view has been that countries can achieve price stability and minimise excessive output variability by adopting flexible inflation targeting and floating exchange rates. The gains from policy

coordination were thought to be modest at best, and the prescription was for countries to keep their houses in order<sup>1</sup>.

This consensus is increasingly untenable for several reasons. Globalisation has steadily increased the impact of international developments on all our economies. This in turn has made any deviations from the core assumptions of the canonical view even more critical. In particular, growing dominant currency pricing (DCP) is reducing the shock absorbing properties of flexible exchange rates and altering the inflation-output volatility trade-off facing monetary policy makers. And most fundamentally, a destabilising asymmetry at the heart of the IMFS is growing. While the world economy is being reordered, the US dollar remains as important as when Bretton Woods collapsed (Figure 1).

The combination of these factors means that US developments have significant spillovers onto both the trade performance and the financial conditions of countries even with relatively limited direct exposure to the US economy. These dynamics are now increasing the risks of a global liquidity trap. In particular, the IMFS is structurally lowering the global equilibrium interest rate,  $r^*$ , by:

- feeding a global savings glut, as EMEs defensively accumulate reserves of safe US dollar assets against the backdrop of an inadequate and fragmented global financial safety net;
- reducing the scale of sustainable cross border flows, and as a result lowering the rate of global potential growth; and
- fattening of the left-hand tail and increasing the downside skew of likely economic outcomes.

In an increasingly integrated world, global  $r^*$  exerts a greater influence on domestic  $r^{*2}$ . As the global equilibrium rate falls, it becomes more difficult for domestic monetary policy makers everywhere to provide the stimulus necessary to achieve their objectives.

These dynamics are directly relevant to the current risks of a global slowdown. At present, there are relatively few fundamental imbalances in terms of capacity constraints or indebtedness that would of themselves portend a recession<sup>3</sup>. However, the combination of structural imbalances at the heart of the IMFS itself and protectionism are threatening global momentum.

The amplification of spillovers by the IMFS matters less when the global expansions are relatively synchronised or when the US economy is relatively weak. But when US conditions warrant tighter policy there than elsewhere, the strains in the system become evident.

These conditions emerged last year. US fiscal policy had boosted growth at a time when the US economy was near full employment. US monetary policy had to tighten consistent with the Fed's dual mandate. The resulting dollar strength and financial spillovers tightened financial conditions in most other economies by more than was warranted by their domestic conditions (two thirds of the global economy was growing at below potential rates at the start of 2019, and that proportion has since risen to five sixths). More recently, the dramatic increase in trade tensions (Chart 1) has reinforced their effects by increasing risk premia.

Today, the combination of heightened economic policy uncertainty (Chart 2), outright protectionism and concerns that further, negative shocks could not be adequately offset because of limited policy space is exacerbating the disinflationary bias in the global economy.

What then must be done? In the short term, central bankers must play the cards they have been dealt as best they can. That means using the full flexibility in flexible inflation targeting. To retain the essential credibility of their frameworks, this is best done *transparently* with central bankers explaining their reasons for targeting specific trade-offs between price stability and output volatility.

Those at the core of the IMFS need to incorporate spillovers and spill backs, as the Fed has been doing. More broadly, central banks need to develop a better shared understanding of the scale of global risks and their consequences for monetary policy.

We cannot all export our way out of these challenges. In a global liquidity trap, there are gains from coordination, and other policies – particularly fiscal – have clear roles to play. And acting earlier and more forcefully will increase their effectiveness.

In the medium term, policymakers need to reshuffle the deck. That is, we need to improve the structure of the *current* IMFS. That requires ensuring that the institutions at the heart of market-based finance, particularly open-ended funds, are resilient throughout the global financial cycle. It requires better surveillance of cross border spillovers to guide macroprudential and, in extremis, capital flow management measures. And it underscores the premium on re-building an adequate global financial safety net.

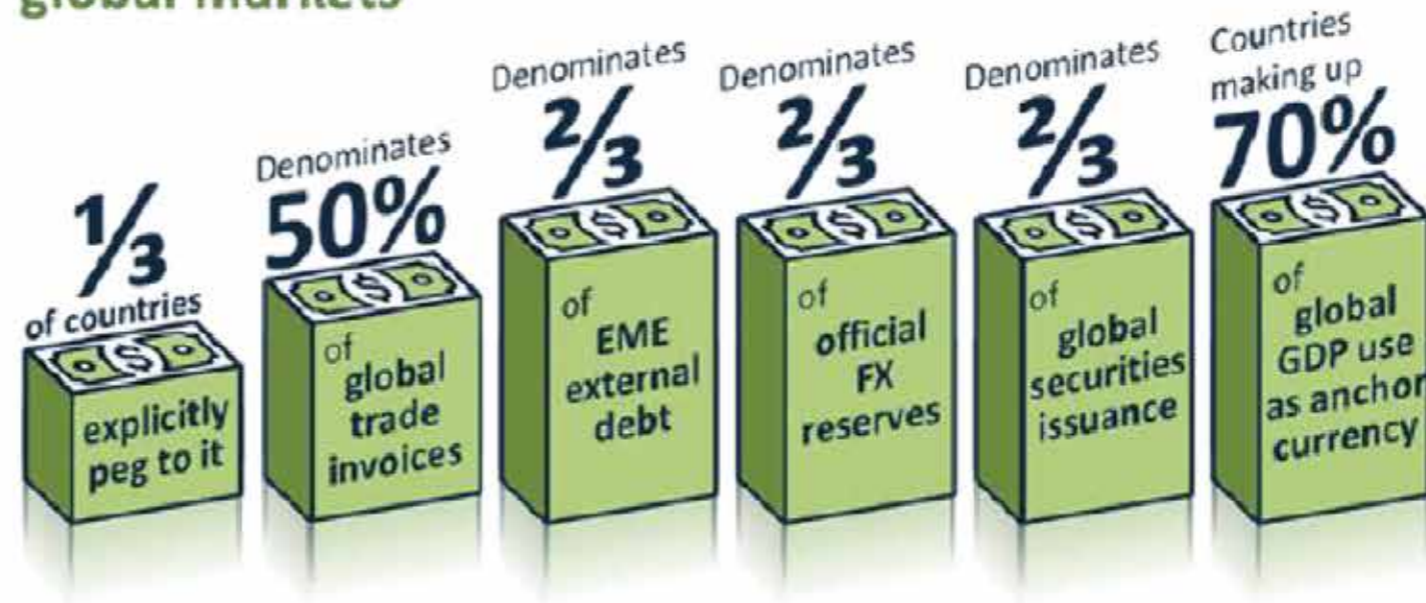
In the longer term, we need to change the game. There should be no illusions that the IMFS can be reformed overnight or that market forces are likely to force a rapid switch of reserve assets<sup>4</sup>. But equally blithe acceptance of the status quo is misguided. Risks are building, and they are structural. As Rudi Dornbusch warned, *“In economics, things take longer to happen than you think they will, and then they happen faster than you thought they could.”*

Figure 1. The US dollar continues to be as important today as it was during the Bretton Woods era

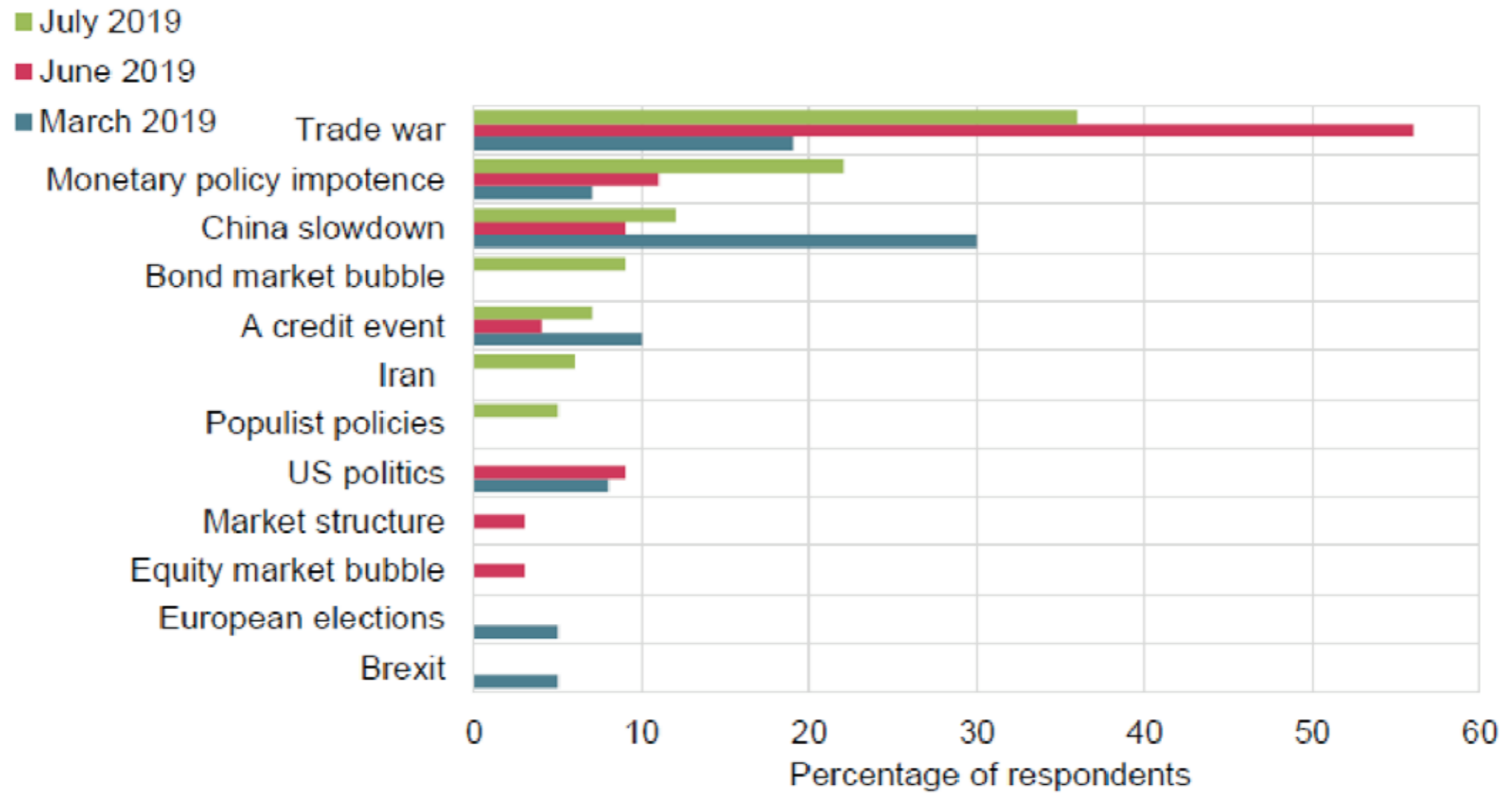
### US share of the global economy



### US dollar share of global markets



**Chart 1. Trade war is the top tail risk affecting global investors**

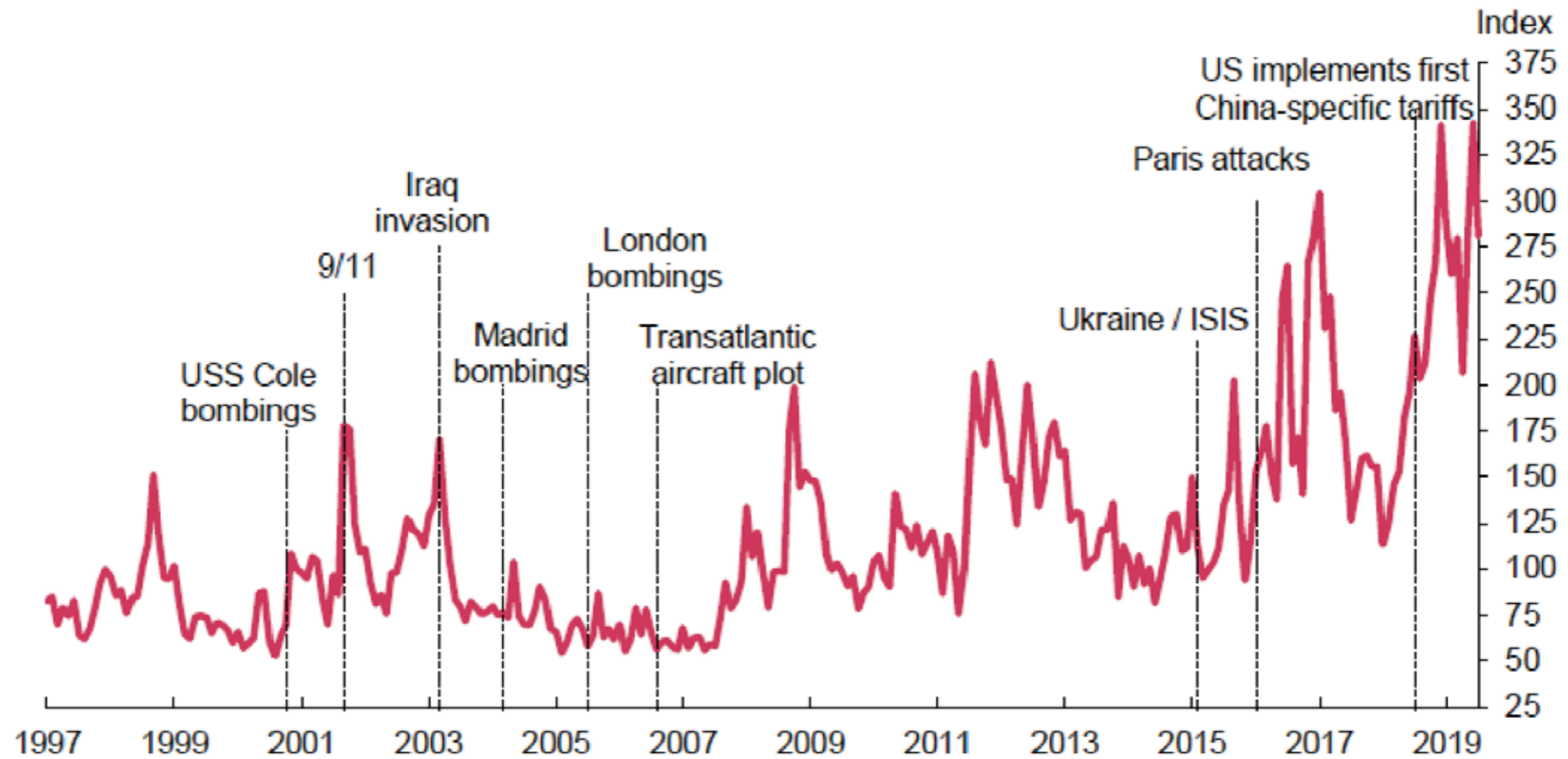


Sources: Bank of America Merrill Lynch Global Fund Manager Survey.



**Chart 2. Global economic policy uncertainty has reached record highs**

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Source: Baker, S, Bloom, N and Davis, S (2015), 'Measuring economic policy uncertainty', NBER Working Paper No. 21633.

When change comes, it shouldn't be to swap one currency hegemon for another. Any unipolar system is unsuited to a multi-polar world. We would do well to think through every opportunity, including those presented by new technologies, to create a more balanced and effective system.

### **Growing challenges in the current IMFS**

The structure of the current international monetary financial system is making it increasingly difficult for monetary policy makers to achieve their domestic mandates to stabilise inflation and maintain output at potential. According to the mainstream view, these objectives are best achieved through operationally independent central banks adopting flexible inflation targeting and allowing their exchange rates to float.

That view rests on two pillars. The first is that floating exchange rates are effective absorbers of global shocks, insulating domestic employment and output from developments abroad. If import prices are fully flexible and international financial markets are complete, then changes in exchange rates pass through fully to import prices, and the optimal monetary policy response is to accommodate the effect on inflation, keeping output close to potential and the price of domestic output stable<sup>5</sup>.

That leads directly to the second pillar – that there are only modest gains from international policy cooperation and coordination in such circumstances. This long-standing and widely held view reflects beliefs that any externalities that might exist are almost trivially small and that trying to address them would be fine-tuning to the n<sup>th</sup> degree.

The mainstream view is increasingly anachronistic for several reasons. First and foremost, international linkages have risen dramatically over the past few decades, increasing the importance of cross border spillovers<sup>6</sup>. Growing cross border trade means external demand has greater effects on domestic resource allocation and therefore inflation. The integration of low-cost producers into the global economy has imparted a steady disinflationary

bias through its direct effect on prices. The expansion in global value chains has increased the synchronisation of producer prices across countries. Financial linkages have increased leading to a faster and more powerful transmission of shocks across countries. And globalisation has increased the contestability of markets, weakening the extent to which slack in domestic labour markets influences domestic inflationary pressures<sup>7</sup>.

Second, the changing nature of trade invoicing is affecting import price pass through and changing the inflation-output volatility trade-off facing monetary policy makers.

Dominant currency pricing is widespread (partly due to the growth of supply chains), leading to deviations from the law of one price and misalignments in countries' terms of trade<sup>8</sup>. The dollar represents the currency of choice for at least half of international trade invoices, around five times greater than the US's share in world goods imports, and three times its share in world exports<sup>9</sup>.

The resulting stickiness of import prices in dollar terms means exchange rate pass-through for changes in the dollar is high regardless of the country of export and import, while pass-through of non-dominant currencies is negligible. As a result, import prices do not adjust efficiently to reflect changes in relative demand between trading partners, in part because expenditure switching effects are curtailed<sup>10</sup>, and global trade volumes are heavily influenced by the strength of the US dollar<sup>11</sup>.

This is less of a problem when all boats are rising with the global tide of synchronised growth. But when the tide is rising in America while receding elsewhere, those authorities face more difficult trade-offs between price stability and output volatility – a situation that could create large potential gains from policy coordination that independent policymakers would not address.

Third, a growing asymmetry at the heart of the IMFS is putting the global economy under increasing strain. Huge network effects mean the dollar has remained dominant in the IMFS despite the transformation of the global economy.

At the time of the Latin American debt crisis, EMEs made up a little more than one third of global GDP. Since the last Fed tightening cycle, their share of global activity had risen from around 45% to 60%. By 2030, it is projected to rise to around three quarters.

As well as being the dominant currency for the invoicing and settling of international trade, the US dollar is the currency of choice for securities issuance and holdings, and reserves of the official sector. Two-thirds of both global securities issuance and official foreign-exchange reserves are denominated in dollars<sup>12</sup>. The same proportion of EME foreign currency external debt is denominated in dollars<sup>13</sup> and the dollar serves as the monetary anchor in countries accounting for two thirds of global GDP<sup>14</sup>.

The US dollar's widespread use in trade invoicing and its increasing prominence in global banking and finance are mutually reinforcing. With large volumes of trade being invoiced and paid for in dollars, it makes sense to hold dollar-denominated assets. Increased demand for dollar assets lowers their return, creating an incentive for firms to borrow in dollars. The liquidity and safety properties encourage this further<sup>15</sup>.

In turn, companies with dollar-denominated liabilities have an incentive to invoice in dollars, to reduce the currency mismatch between their revenues and liabilities. More dollar issuance by non-financial companies and more dollar funding for local banks makes it wise for central banks to accumulate some dollar reserves.

Given the widespread dominance of the dollar in cross border claims, it is not surprising that developments in the US economy, by affecting the dollar exchange rate, can have large spillover effects to the rest of the world via asset markets. As H el ene Rey has put it<sup>16</sup>, and as Arvind Krisnamurthy and Hanno Lustig echo in their paper for this symposium, the global financial cycle is a dollar cycle.

In part, that arises because movements in the US dollar significantly affect the real burden of debt for those companies (especially in EMEs) that have borrowed unhedged in dollars, and tend to reduce the dollar value of companies' collateral<sup>17</sup>. Both result in tighter credit conditions and, in the extreme, defaults.

Fluctuations in the dollar also significantly affect the risk appetite of global investors. As discussed by  ebnem Kalemli- zcan, these risk spillovers can have a significant impact on receiving economies, especially in EMEs where global risk perceptions interact with country-specific risks.

For EMEs, this manifests in volatile capital flows that amplify domestic imbalances and leave them more vulnerable to foreign shocks (Charts 3 and 4). One fifth of all surges in capital flows to EMEs have ended in financial crises, and EMEs are at least three times more likely to experience a financial crisis after capital flow surges than in normal times<sup>18</sup>. While the typical EME receiving higher capital inflows will grow 0.3 percentage points faster, all else equal, the typical EME with higher capital flow volatility will grow 0.7 percentage points slower<sup>19</sup>.

Following their experience of successive crises, EMEs have responded to these pressures by following the conventional wisdom to 'keep their houses in order'. Over the past two decades, inflation targeting has been widely adopted, fiscal policy is generally improved, and macroprudential policy is increasingly active.

Bank analysis finds that, for EMEs as a whole, reforms to these domestic institutional 'pull' factors have substantially increased the sustainability of capital flows, all else equal (Chart 5)<sup>20</sup>. But unfortunately for EMEs, all else is not equal. Their efforts have not been sufficient because of the consequences of the growing asymmetry between the importance of the US dollar in the global financial system and the increasingly multi-polar nature of global economic activity.

Monetary policy and financial stability shocks in advanced economies have become more prevalent and more potent, increasing the importance of 'push' factors in driving capital flows. Bank research suggests that the spillover from tightening in US monetary policy to foreign GDP is now twice its 1990-2004 average, despite the US's rapidly declining share of global GDP.

Financial instability in advanced economies also causes capital to retrench from EMEs to 'safe havens', as it did during the 2008 financial crisis and the 2011 euro area crisis (Chart 6). Connally's dictum 'our dollar, your problem' has broadened to 'any of our problems is your problem'.

Moreover, the structure of the global financial system – or the 'pipes' – is increasingly amplifying capital outflows from EMEs when these push shocks occur. For EMEs, market-based finance has accounted for all the increase in foreign lending since the crisis, as bank lending has declined and FDI has stayed fairly constant (Chart 7)<sup>21</sup>. While this shift has brought welcome diversity to the financial system, it also reduces the sustainability of capital flows, as market-based flows are particularly sensitive to changes in global risk appetite and financial conditions. Investment fund flows are particularly flighty (Chart 8), especially under stress.

The increasing role of 'push' factors and the 'pipes' of the system means fast-reforming EMEs could soon be running to stand still in their quest for more sustainable capital flows (Chart 9). Bank researchers estimate that the growing

shares of FX-denominated debt and market-based finance have increased the sensitivity of 'Capital Flows-at-Risk' to push factors by 50% since the crisis, largely using up the self-insurance purchased by EMEs.

All told, this means that in the face of foreign shocks, EMEs are forced to compromise their monetary sovereignty, temporarily diverting monetary policy away from targeting domestic output and inflation and instead using it to try to stabilise capital flows.

While this strategy is the best EMEs can do given the current structure of the international monetary financial system, outcomes for them are a distant second best when compared to those advanced economies that are less exposed to international financial spillovers. The deficiencies of the IMFS affect EMEs more directly than advanced economies, but their consequences influence everyone because they reduce the global equilibrium interest rate.

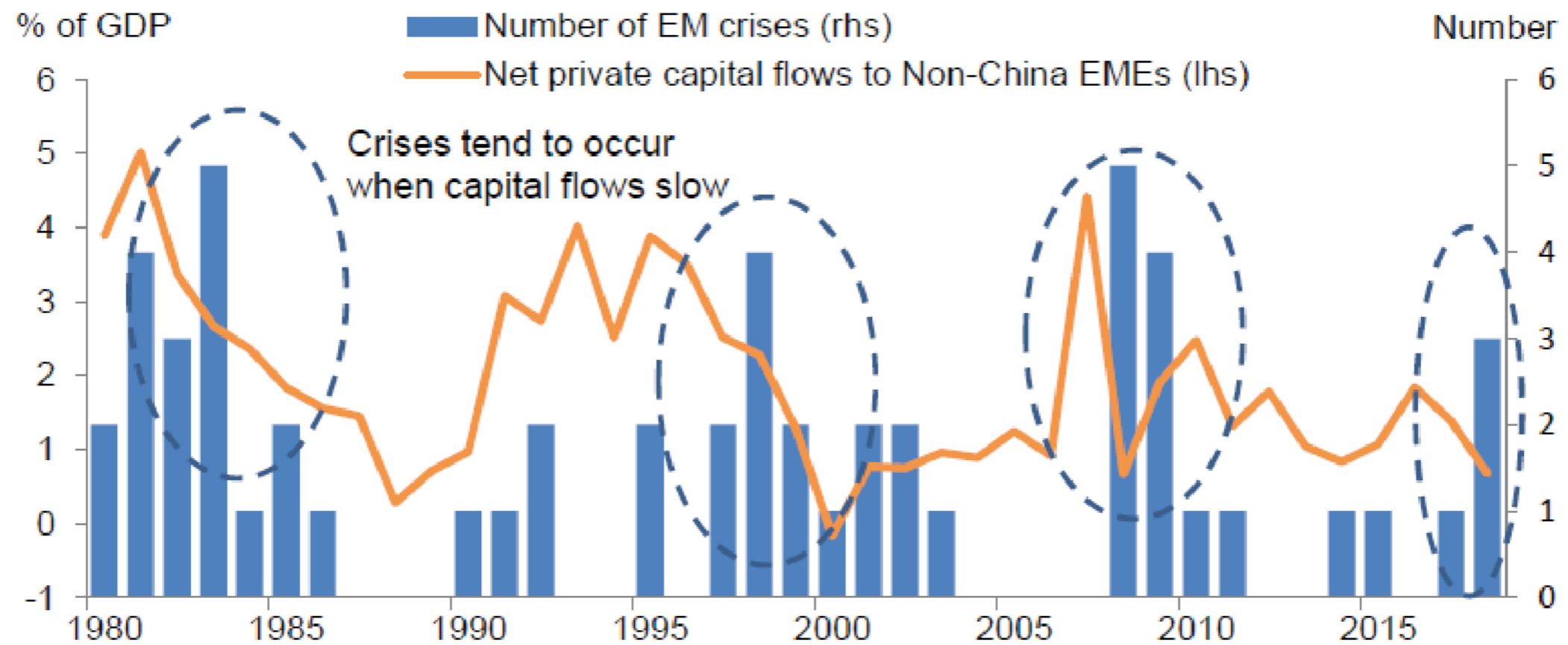
Against the current backdrop of an inadequate and fragmented global financial safety net, EMEs have chosen to self-insure against capital flow volatility by accumulating reserves of safe assets, contributing to Ben Bernanke's 'global savings glut'. Given the importance of the US dollar in trade, debt issuance by the non-financial corporate sector in EMEs, and funding for their domestic banks, most of these reserves are dollar-denominated.

As well as coming at a domestic high cost to EMEs<sup>22</sup>, this vast accumulation of safe assets has pushed down the global equilibrium interest rate – the rate that central banks must deliver in order to balance demand with supply and so achieve stable inflation<sup>23</sup>.

More fundamentally, by making the world a riskier place, the flaws inherent in the IMFS are reinforcing the downward pressure on global  $r^*$ .

### Chart 3. Volatile capital flows amplify domestic imbalances in EMEs

Net private capital flows to emerging market economies and incidences of crises

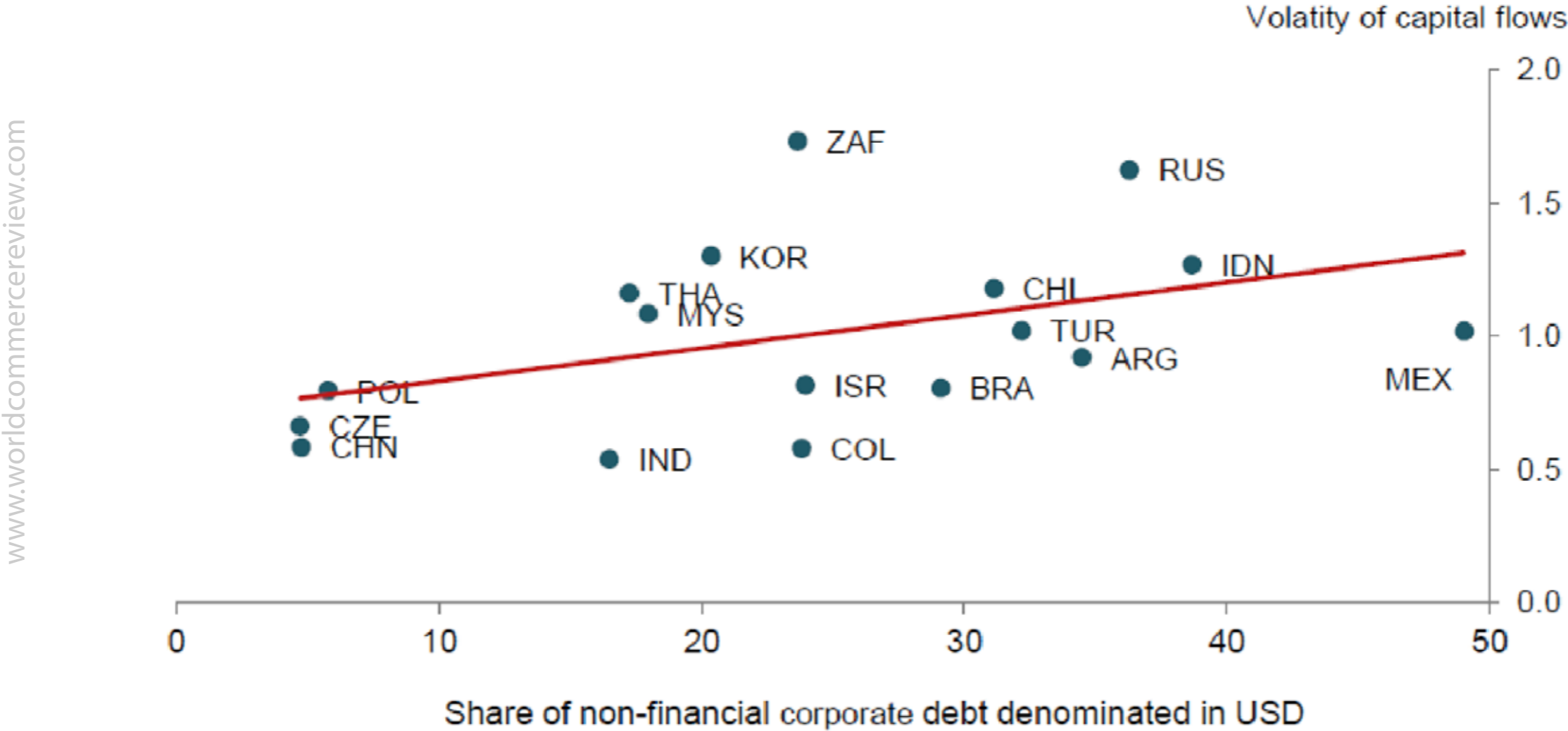


Source: IMF.  
Notes: Excludes China



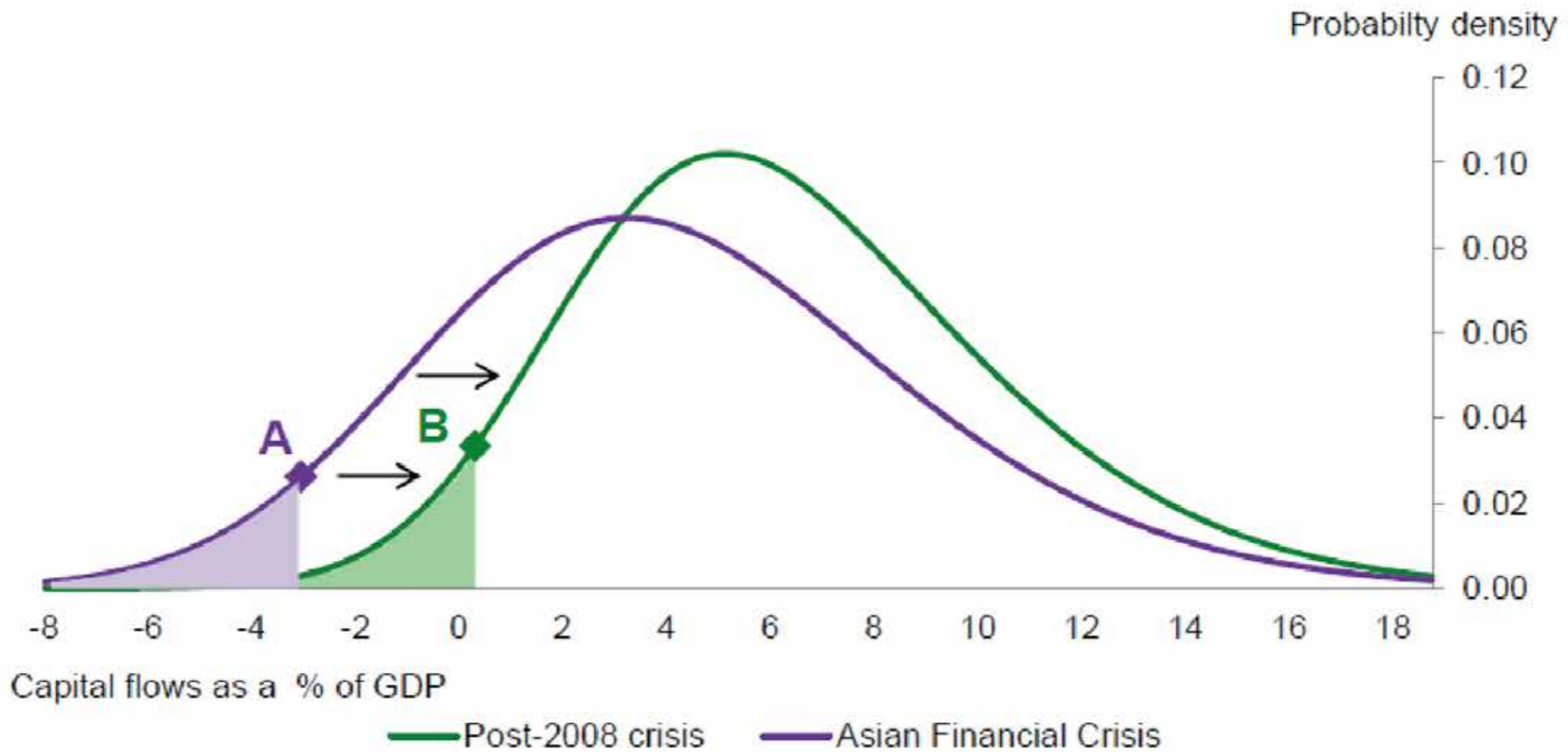
### Chart 4. Greater reliance on foreign investors increases capital flow volatility

Correlation of capital flow volatility and the share of FX-denominated corporate debt



Notes: Measured as coefficient of variation of gross inflows scaled by external liabilities.

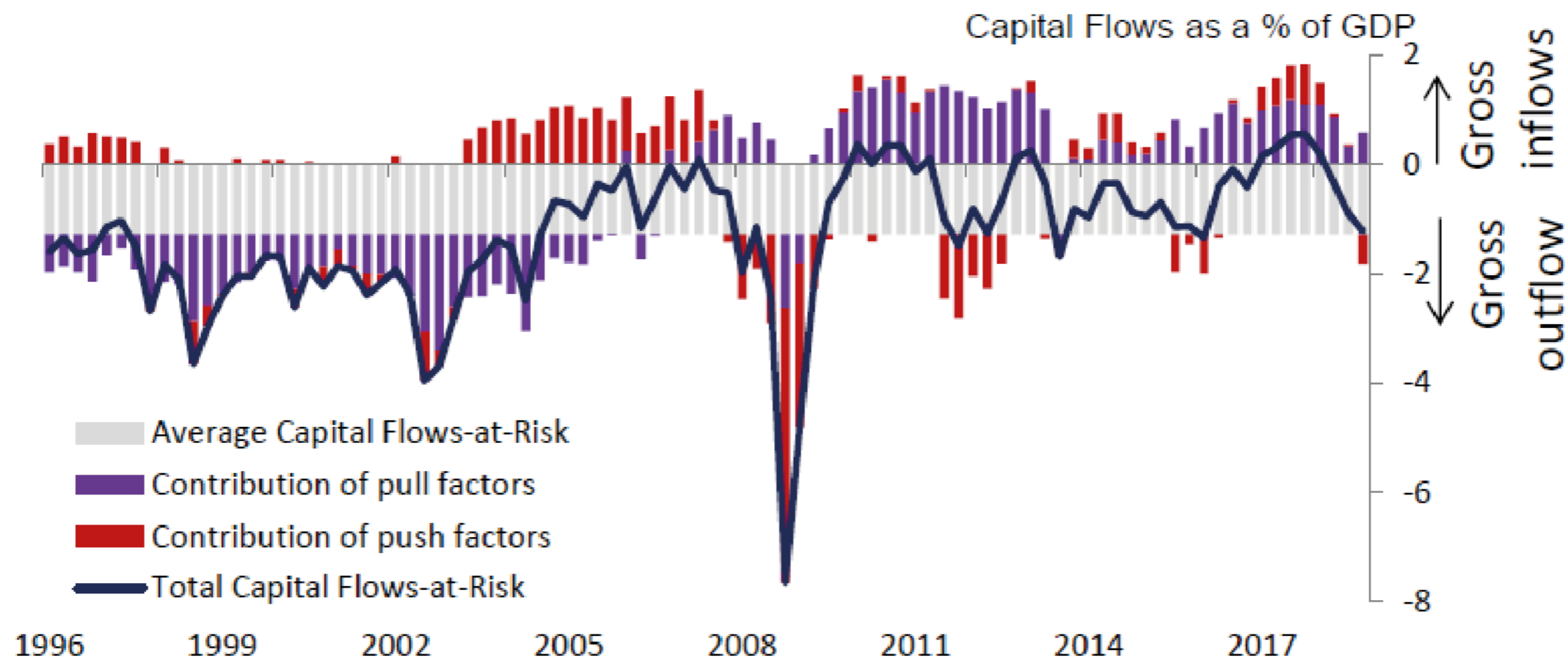
**Chart 5. Pull factors have reduced Capital Flows at-risk for EMEs since the Asian Financial Crisis**



Sources: IMF and Bank staff calculations.

Notes: Chart shows the contribution of pull factors to capital flows to EMEs during the Asian Financial Crisis (purple), and since 2008 (green). The diamonds highlight the fifth percentile, which is our preferred measure of Capital Flows-at-Risk. In both distributions push factors are held at their sample average, so only pull factors are changing.

**Chart 6. Push shocks have offset some of the improvements in the ‘pull factors’**

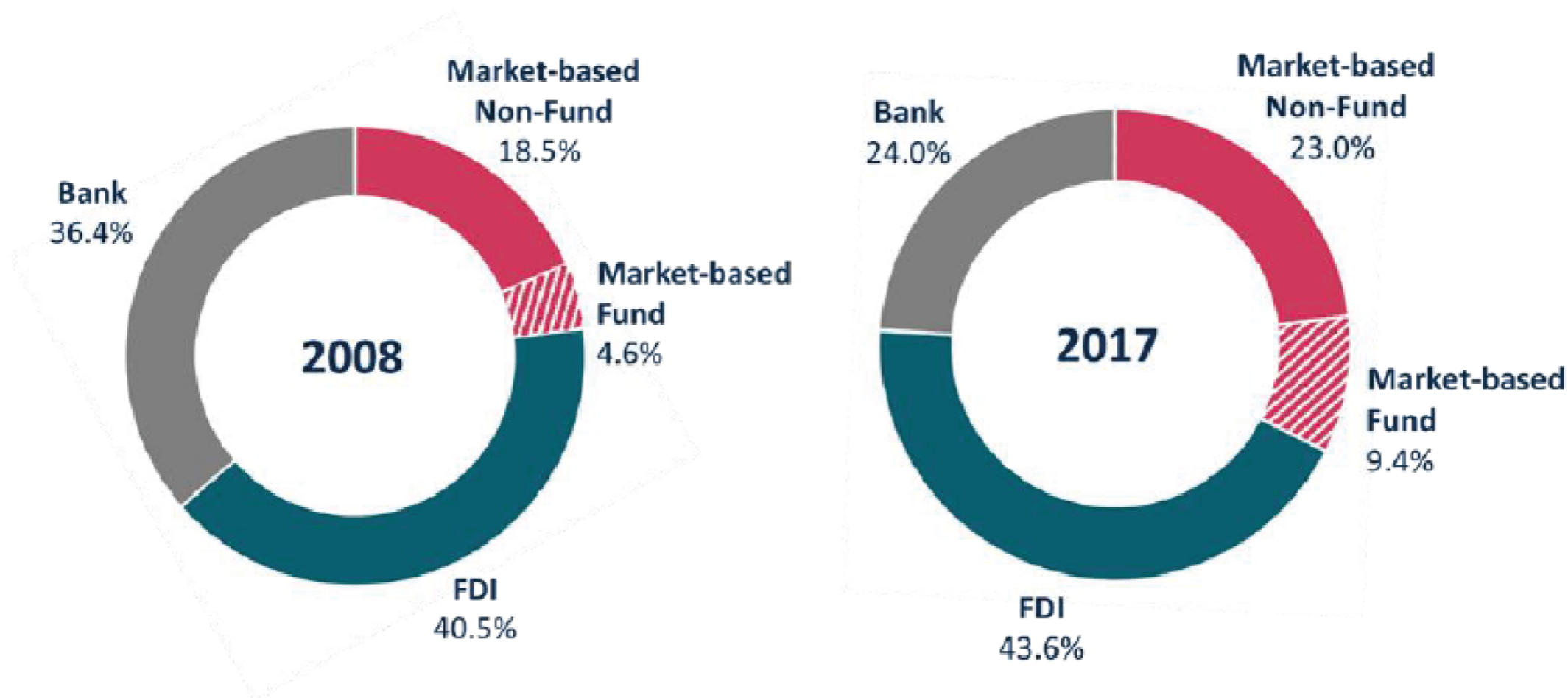


Sources: IMF and Bank staff calculations.

Note: The grey bars on this chart show the unconditional 5th percentile of the distribution of capital flows in a panel of 13 EMEs since 1996. The purple bars build on the contribution of pull factors to the conditional 5th percentile of capital flows in the current quarter and two quarters ahead. Pull factors are proxied by domestic financial condition indices (DFCIs), which are mean-orthogonalised by a global financial conditions index (GFCI). The coefficient on the DFCIs is estimated by panel quantile regressions. Push factors are proxied by the Bank of England's global financial conditions index. The chart shows PPP-weighted averages across the 13 EMEs in our panel.

**Chart 7. For EMEs, market-based finance accounted for all the increase in foreign lending since the crisis**

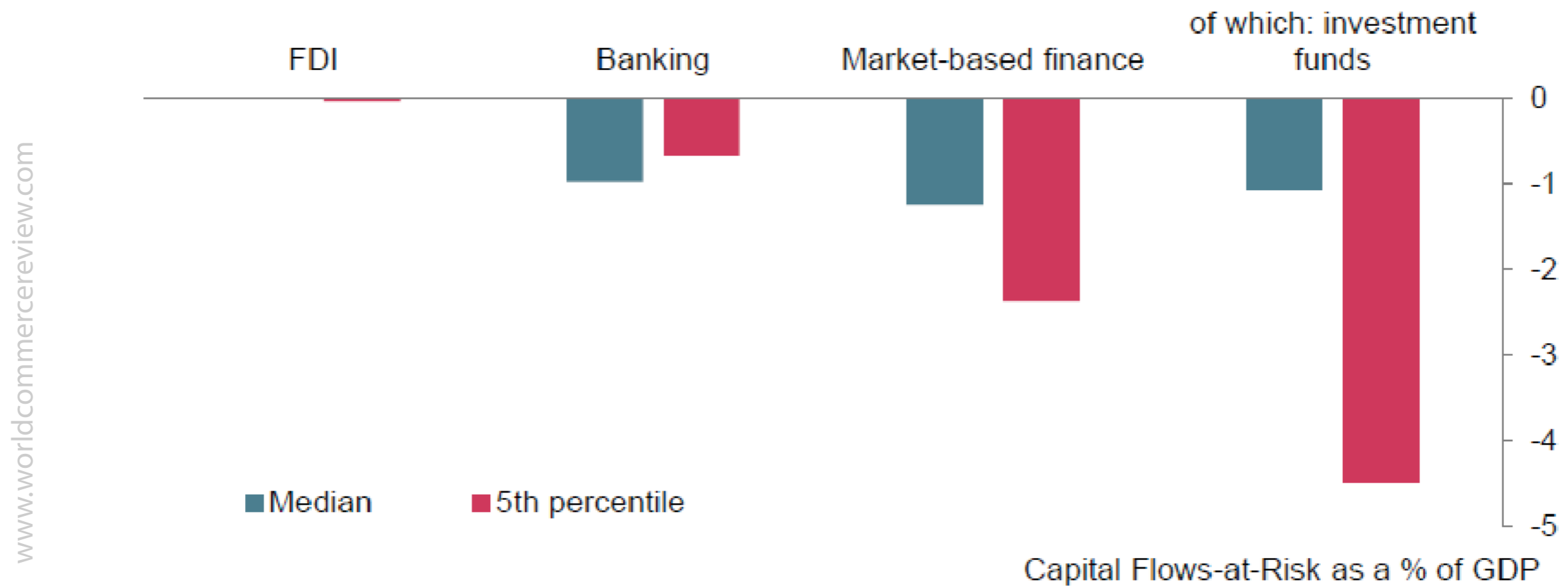
Structure of external liabilities for emerging market economies



Sources: IMF, EPFR and Bank of England calculations

## Chart 8. Market-based finance flows are particularly sensitive to push shocks

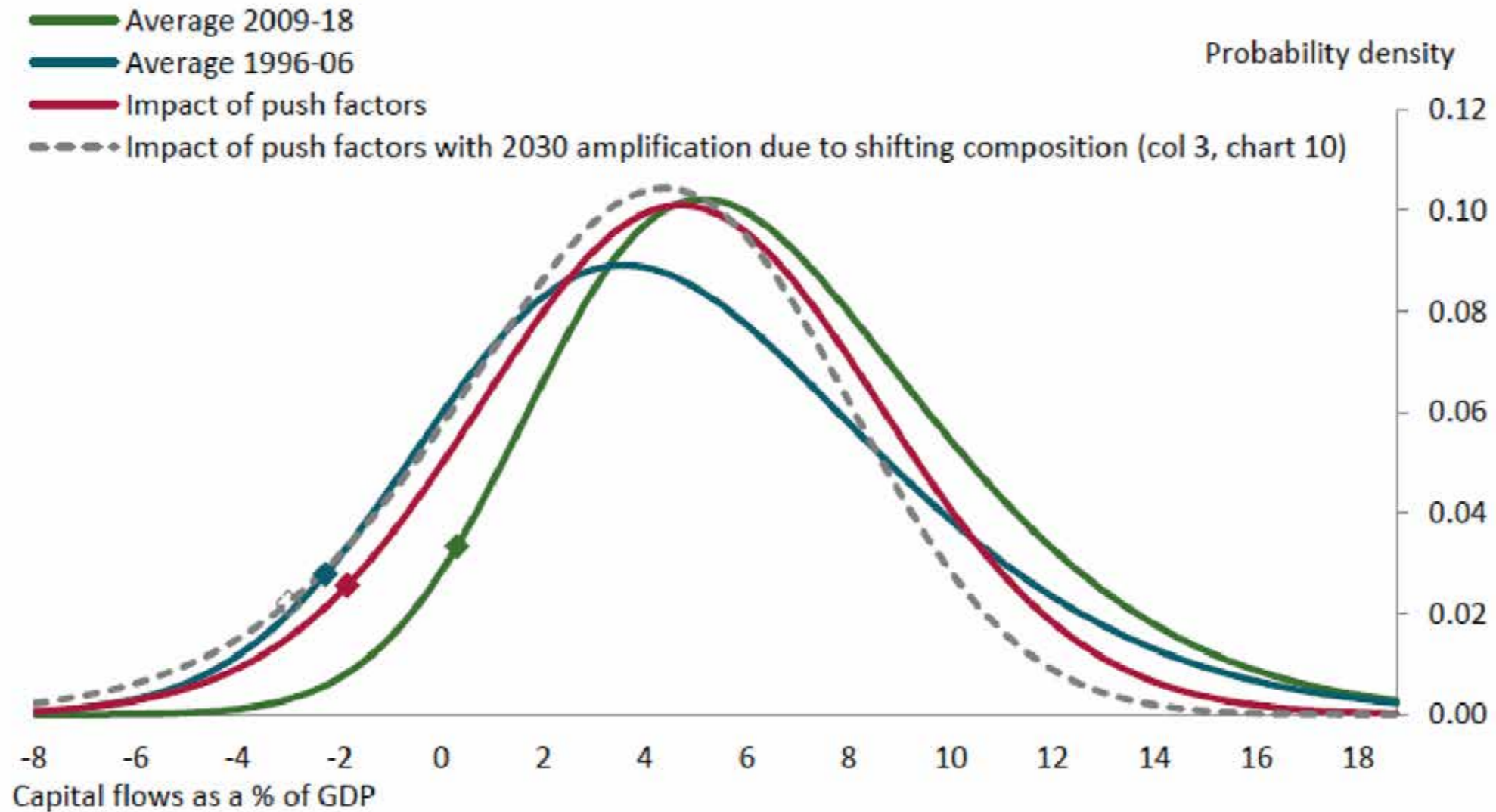
The sensitivity of Capital Flow-at-Risk to push factors, by source of capital flow



Sources: IMF, EPFR, Bank calculations.

Notes: Chart shows the sensitivity of different capital flows to a negative 'push' shock. Coefficients are standardised by each component's share of total flows e.g. the red MBF bar shows how total Capital Flows-at-Risk would respond to a one standard deviation tightening in global financial conditions if all capital flows were accounted for by MBF.

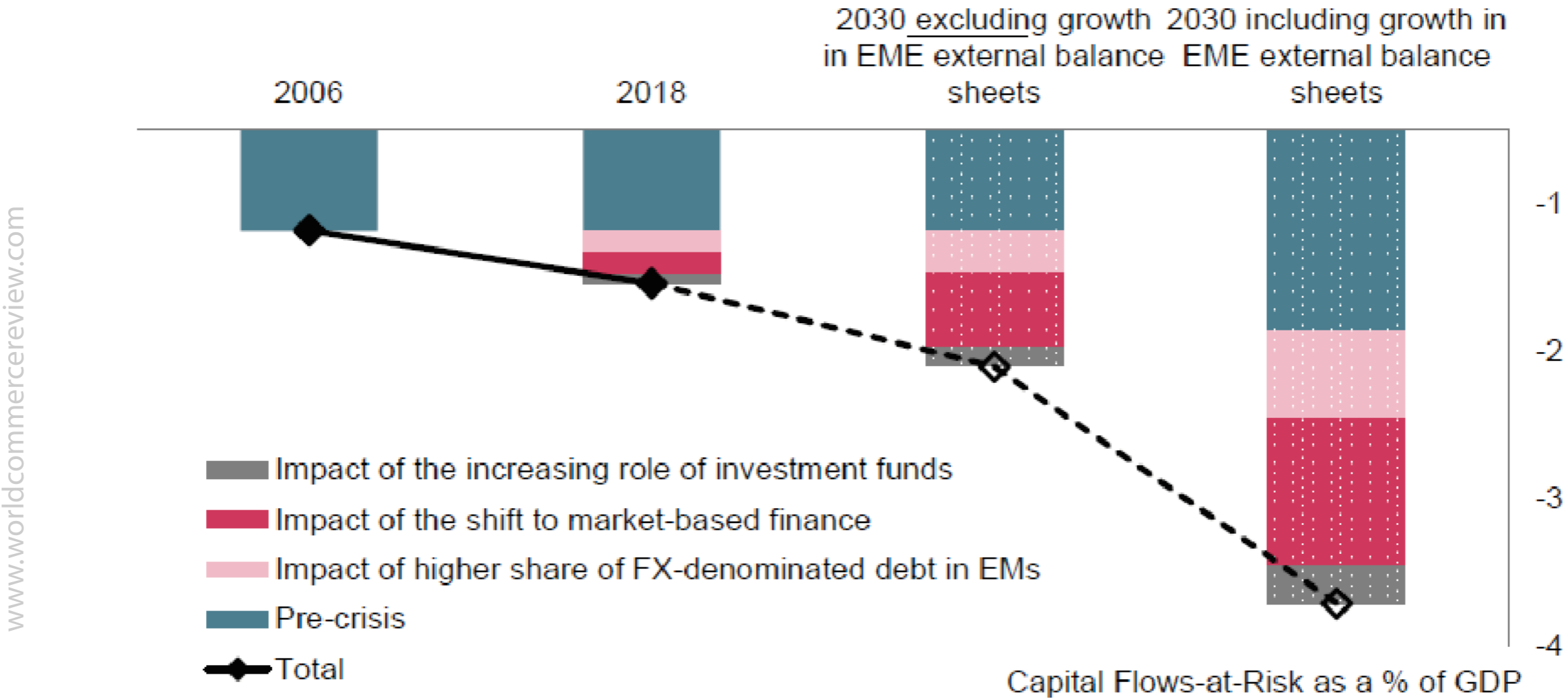
## Chart 9. Emerging market economies could be running to stand still in the future



Sources: IMF, EPFR, IIF and Bank staff calculations.

Notes: This chart shows conditional distributions of capital flows to EMEs post-the 2008 crisis (green), and conditioning on a one standard deviation negative 'push shock' (red), as proxied by our global financial conditions index. The diamonds highlight the fifth percentile, which is our preferred measure of Capital Flows-at-Risk. The dotted grey distribution results from increasing the sensitivity of the distribution to push shocks in line with the scalar in the third column of chart 10, assuming they apply through the distribution (rather than only to 5th percentile). Estimating the impact of these vulnerabilities on the full distribution is a rich area for future work. The teal distribution conditions on average push and pull factors 1996-06.

**Chart 10. Major structural changes are increasing the sensitivity of Capital Flows-at-Risk to push shocks**



Sources: IMF, EPFR, IIF, Bank calculations.  
 Notes: This chart shows estimates and projections for the sensitivity of Capital Flows-at-Risk to negative push shocks at different points in time. The chart is based on separate panel quantile regressions for FDI, banking, market-based finance and investment fund flows. We use the global FCI (push), country-specific FCIs (pull), and the share of NFC debt denominated in foreign currency as regressors. The third bar combines regression results with projections for the composition of flows and the role of FX-denominated debt in 2030. The fourth bar also takes into account projected growth in EM's external balance sheets.

The IMFS is not only making it harder to achieve price and financial stability but it is also encouraging protectionist and populist policies which are exacerbating the situation. This combination reduces the rate of global potential growth, increases its downside skew, and bolsters the likelihood of an extreme downside event (a fatter left tail).

As my colleague on the MPC Jan Vlieghe has illustrated, such a change in the distribution of economic outcomes reduces the global equilibrium rate of interest<sup>24</sup>. Past instances of very low rates have tended to coincide with high risk events such as wars, financial crises, and breaks in the monetary regime.

Whether the last happens is still within our control, but for now the lower global equilibrium interest rate is reducing monetary policy makers' scope to cut policy rates in response to adverse shocks to demand, and increasing the risk of a global liquidity trap. And left unattended, these vulnerabilities are only likely to intensify<sup>25</sup>.

### **Policy implications**

How should monetary policy makers respond to these challenges? In the short term, they must play the hand they've been dealt. The prevalence of dollar invoicing means using the flexibility in inflation targeting.

In theory, the increases in both DCP and capital flows at risk suggest a greater focus on targeting the bilateral exchange rate against the dollar (through adding terms involving terms of trade misalignments and deviations from the law of one price to central banks' monetary policy objective functions, and tools such as capital flow management measures (CFM))<sup>26</sup>.

In practice, either could be highly destabilising. It is far better as a first response to focus on core price stability objectives, and to explain transparently if foreign shocks are altering the trade-off required to best achieve it.



Monetary policy makers' mandates are necessarily parsimonious, focusing on a small set of macroeconomic variables – price stability and maintaining output around potential. While some shocks drive inflation and output in the same direction, others push inflation away from target without proportional effects on activity, confronting monetary policymakers with a trade-off between these two objectives. Fluctuations in the exchange rate can be an important source of such trade-offs, as they can exert pressures on consumer price inflation without proportional effects on activity<sup>27</sup>.

A simple way to represent formally how the policymaker optimises the trade-off is in 'linear-quadratic' form – a set of linear constraints describing the behaviour of the economy, and quadratic preferences that penalise deviations of inflation from its target and output from its potential. The relative weight the policymaker places on output stabilisation, relative to inflation stabilisation, is often denoted  $\lambda$  – or 'lambda'.

A lambda of zero would imply no weight on the stabilisation of real activity – so-called 'inflation nutter' preferences. A positive lambda implies a willingness to strike at least some trade-off between output and inflation stabilisation; a higher value indicates that relatively more weight is given to output stabilisation, so that more of the effects of any shock flows through to inflation.

In this framework, the value of lambda should vary over time in light of the nature and persistence of the shocks hitting the economy and features of the economy. The MPC's remit explicitly builds in such flexibility. It recognises that in exceptional circumstances, when shocks to the economy may be particularly large, persistent or both, the MPC is likely to be faced with more significant trade-offs. In these circumstances, the Committee can extend the horizon over which it returns inflation to target if doing so achieves a better balance between the scale and duration of the deviation of inflation from target and the variability of output.

This same framework can be used to think through the implications of the dominance of the US dollar in international trade and invoicing. In particular, in a DCP world with sticky dollar prices, a depreciation driven by strength in the dollar will tend to result in additional imported inflation.

Rather than tightening monetary policy to offset fully that exogenous increase in imported inflation through lower domestic inflationary pressures, policymakers would do better to trade off inflation and output volatility, accepting some increase in imported inflation to achieve a smaller reduction in domestic demand below potential. The ability of new exporters to benefit from the depreciation by undercutting existing dollar contracts would provide some boost to exports and help lessen the trade-off facing the monetary policy maker.

A similar strategy could be pursued in the face of large financial spillovers. The ability to do this depends heavily on the credibility of the monetary policy framework and the transparency with which the strategy is pursued. As I will go on to discuss, both can be reinforced by explicit recognition of the spillovers of the IMFS, particularly if recognised in IMF surveillance.

The growing risk of a global liquidity trap puts a high premium on getting more than just monetary policy right. Limited space for monetary policy to respond to adverse shocks means more of the burden for supporting jobs and activity will fall to fiscal policy. Though some may be tempted to resort to protectionism, such policies would merely serve to make the problem worse.

Those at the core of the IMFS need to incorporate spillovers and spill backs, as the Fed has been doing. More broadly, central banks need to develop a better shared understanding of the scale of global risks and a recognition that concerted, cooperative action may sometimes be necessary.

That doesn't mean that monetary policy makers in advanced economies must internalise fully spillovers from their actions on emerging market economies, given their mandates are to achieve domestic objectives. They must, however, increasingly take account of effects that spill back on their economy as well as shifts in the global equilibrium interest rate that their actions can spur<sup>28</sup>.

As the weight of EMEs in the global economy has steadily risen, the size of the spillbacks from a tightening in US financial conditions has tripled relative to its 1990 - 2004 average. With EMEs projected to account for three quarters of the global economy by 2030, these spillbacks will only continue to grow (Chart 10).

### **Medium term: reshuffling the deck by reforming the existing system**

In the new world order, a reliance on keeping one's house in order is no longer sufficient. The neighbourhood too must change. There can be innocent bystanders but there should be no disinterested observers. We are all responsible for fixing the fault lines in the system.

### **Addressing pull factors in EMEs**

EMEs can increase sustainable capital flows by addressing 'pull' factors including:

- reinforcing monetary policy credibility including safeguarding the operational independence of central banks;
- building the resilience of their banks;
- deepening their domestic capital markets to reduce the reliance on foreign currency debt; and

- expanding the scope and application of their macroprudential toolkits to guard against excessive credit growth during booms. Bank of England research finds that tightening prudential policy in EMEs dampens the spillover from US monetary policy by around a quarter<sup>29</sup>.

### Moderating push factors and fixing the pipes in advanced economies

At the same time, it is in the interests of advanced economies to moderate push factors, including risks in their markets and institutions. Their local financial stability are global public goods.

Consider a modern example of the Connally dictum: investment fund flows to EMEs. These flows now account for around one third of total portfolio flows to EMEs, compared to around one tenth pre-crisis. \$30 trillion of global assets are held in investment funds that are particularly flighty, reflecting their promise of daily liquidity to investors despite investing in potentially illiquid underlying assets, such as EME debt<sup>30</sup>.

This structural mismatch means that these funds can behave particularly pro-cyclically. Bank of England work finds that redemptions by EME bond funds (with large structural mismatches) in response to price falls are five times those for EME equity funds (with lower structural mismatch). In turn, EME equity funds are twice as responsive as advanced economy equity funds. Under stress, investment funds may need to fire sell assets, magnifying market adjustments and triggering further redemptions – a vicious feedback loop that can ultimately disrupt market functioning and the availability of finance to the real economy.

The vast majority of these funds are managed out of the US and Europe, including the UK. As is the case for banks, it is a global public good to ensure that investment funds prudently manage their leverage and liquidity. The Bank of England is acutely conscious of these responsibilities, given the City's role as the world's leading international financial centre. That's one reason why we have transformed the resiliency of UK-based banks, why we are well on

the path to ending too big to fail, and why we have fundamentally overhauled our liquidity facilities to support continuously open markets.

And it's why the Bank of England's Financial Policy Committee has supported the FSB's 2017 recommendation that funds' assets and investment strategies should be consistent with their redemption terms. The Bank is now working with the FCA to assess how funds' redemption terms, including pricing and notice periods, might be better aligned with the liquidity of their assets in order to minimise financial stability risks<sup>31</sup>.

### More effective and impactful IMF surveillance

The deficiencies in the current IMFS mean that the IMF should play a central role in informing both domestic and cross border policies. In particular, discussions at the Fund can identify those circumstances when spillovers from the core are particularly acute. This in turn can help guide central banks' use of the flexibility inherent in their monetary policy frameworks, the deployment of macroprudential tools and, in extremis, capital flow management measures<sup>32</sup>. In these regards, transparent, evidence-based discussions convened by the IMF can both discipline policy and avoid potentially antagonistic misunderstandings that could lead to de-stabilising tit-for-tat retaliations.

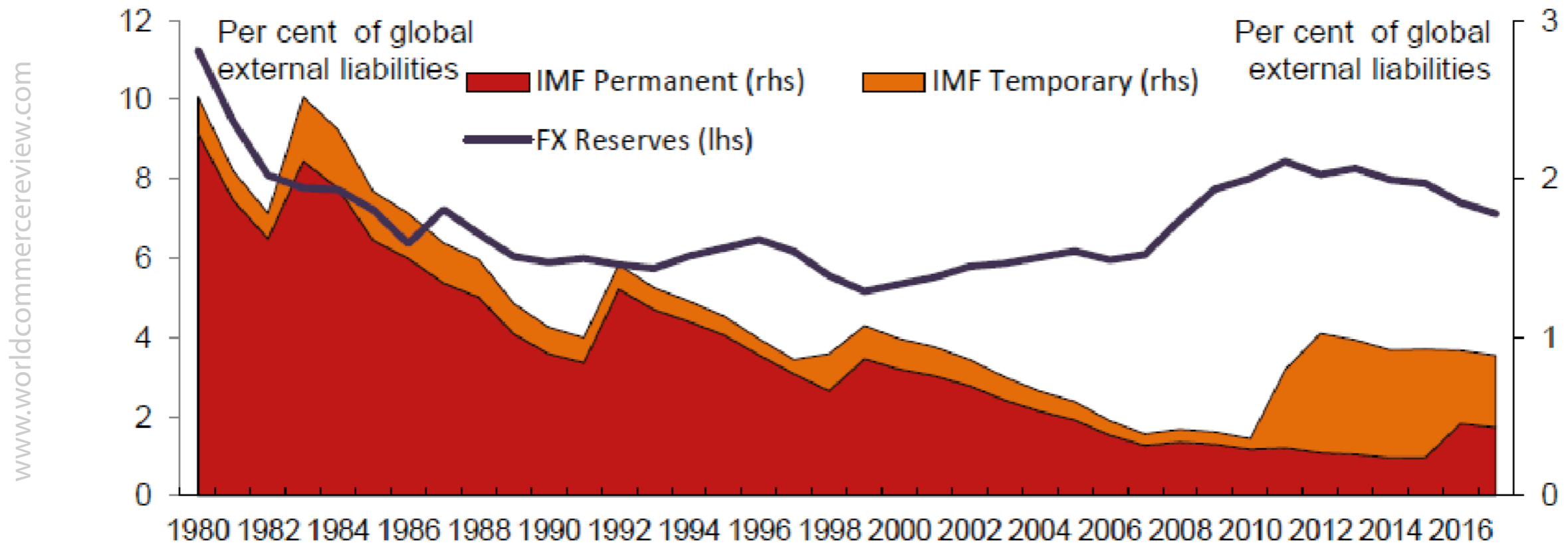
### Reinforcing the GFSN

The IMF's core liquidity function can also play a more important role. Collective action should improve the adequacy of the global financial safety net (GFSN) to reduce the need for EMEs to accumulate reserves of safe assets as insurance against less sustainable capital flows. Over the past two decades, the GFSN has become more fragmented and its core – IMF resources – has shrunk relative to the size of the global financial system (Chart 11).

Pooling resources at the IMF, and thereby distributing the costs across all 189 member countries, is much more efficient than individual countries self-insuring. To maintain reserve adequacy in the face of future larger and more

## Chart 11. IMF resources, the core of global financial safety net, has shrunk relative to the size of the global financial system

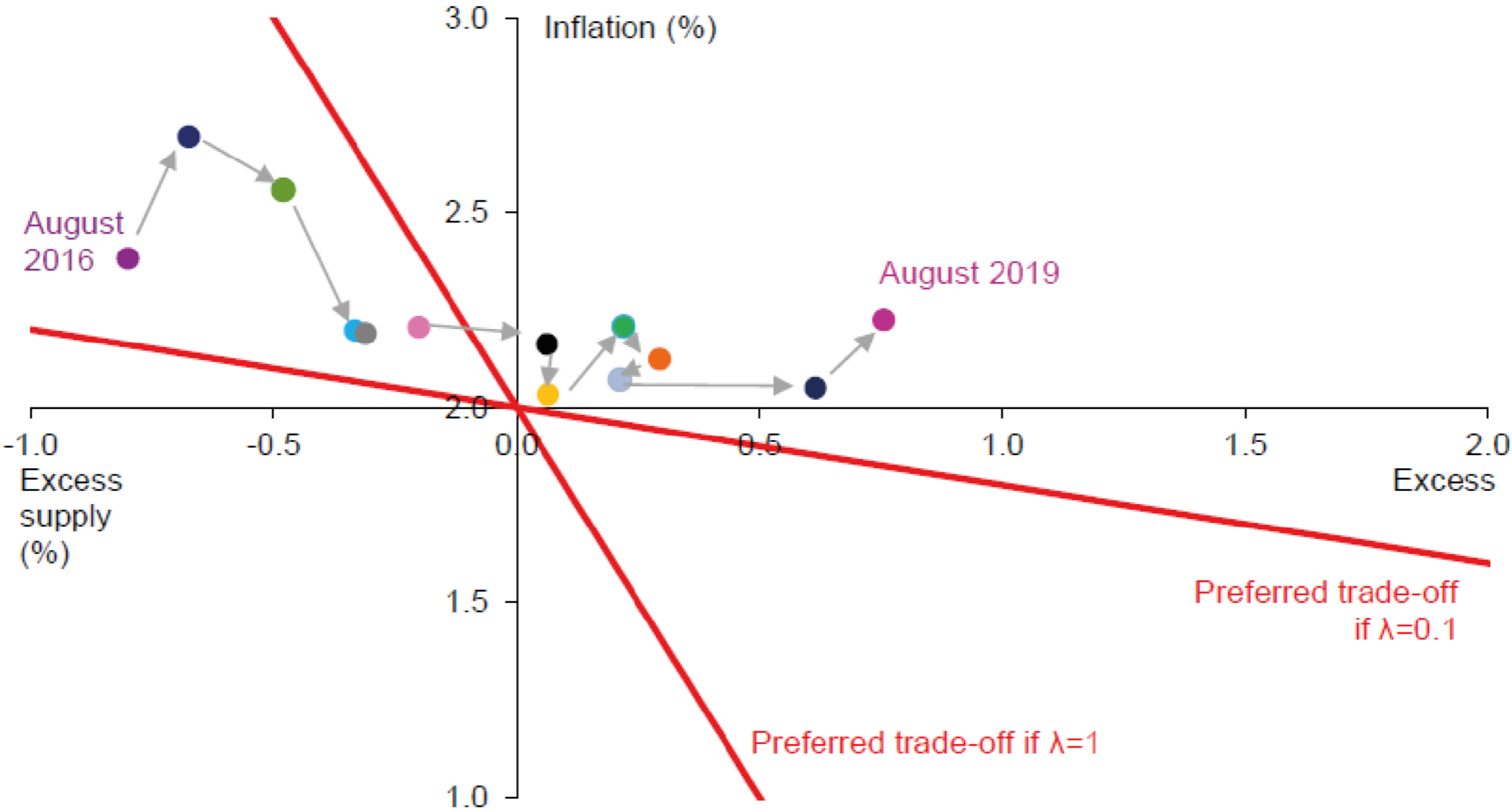
Components of the global financial safety net as a per cent of global external liabilities



Sources: IMF, central bank websites, Lane Milesi-Ferretti (2007) External Wealth of Nations dataset and Bank calculations.  
 Notes: FX reserves exclude gold.

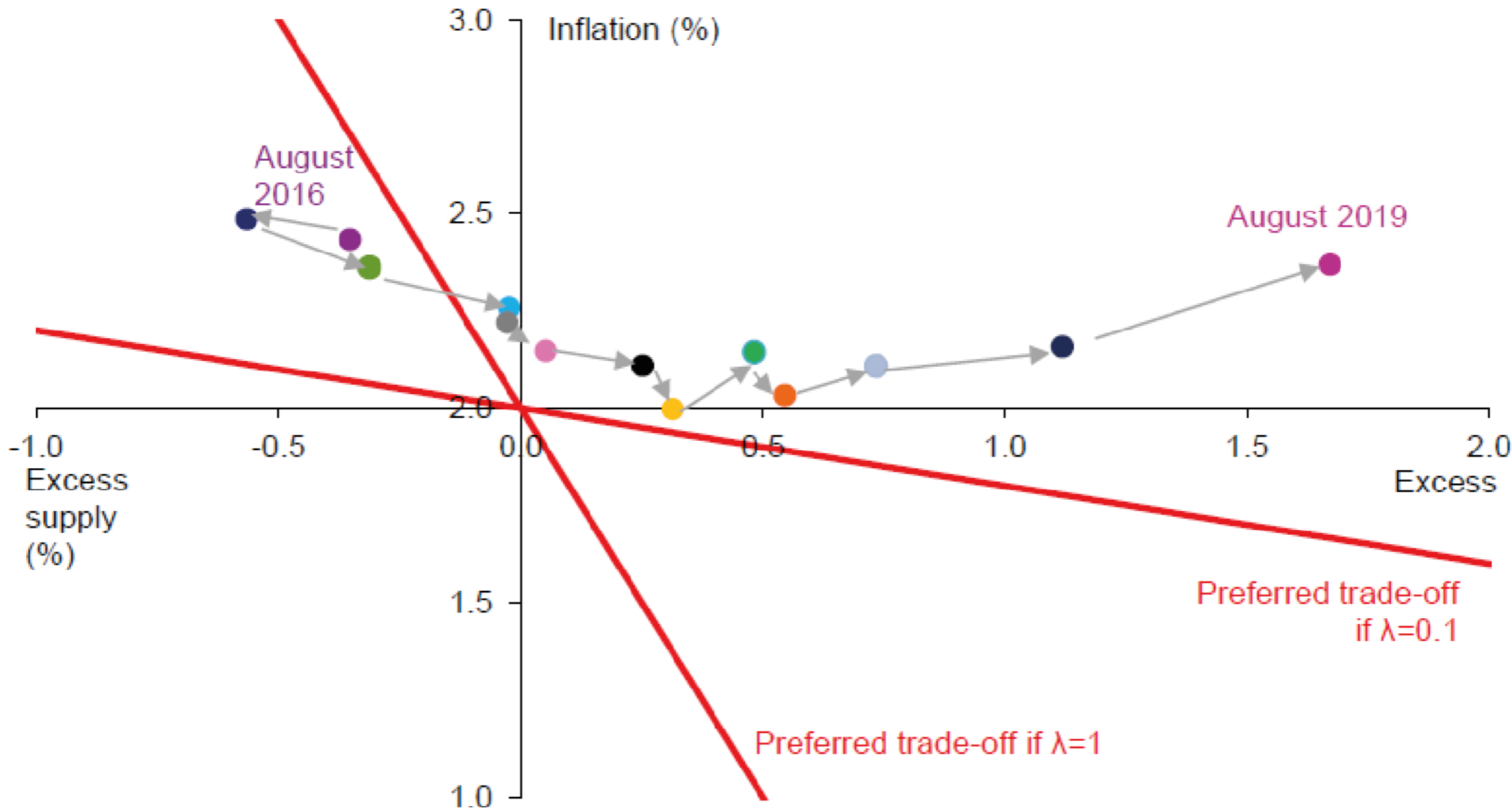
**Chart 12a. UK monetary policy trade-offs in successive 3-year ahead Inflation Report projections**

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Notes to Chart 12: Each observation shows the central projection for spare capacity or excess demand at the end of the second / third year of the forecast period (the 'Year 2' or 'Year 3' point) on the horizontal axis against the central projection for four-quarter CPI inflation at Year 2 / Year 3 on the vertical axis from successive Inflation Reports. See 'Lambda', speech by Mark Carney, 16 January 2017, for further details and discussion.

**Chart 12b. UK monetary policy trade-offs in successive 3-year ahead Inflation Report projections**



www.worldcommercereview.com

Notes to Chart 12: Each observation shows the central projection for spare capacity or excess demand at the end of the second / third year of the forecast period (the 'Year 2' or 'Year 3' point) on the horizontal axis against the central projection for four-quarter CPI inflation at Year 2 / Year 3 on the vertical axis from successive Inflation Reports. See 'Lambda', speech by Mark Carney, 16 January 2017, for further details and discussion.



risky external balance sheets, EMEs would need to double their current level of reserves over the next 10 years – an increase of \$9 trillion. A better alternative would be to hold \$3 trillion in pooled resources, achieving the same level of insurance for a much lower cost. This would imply a tripling in the IMF's resources over the next decade, enough to maintain their current share of global external liabilities<sup>33</sup>.

One of the many advantages of this approach is it would reduce the demand for safe assets and with it, the downward pressure on  $r^*$ .

### **Long term: changing the game**

While such concerted efforts can improve the functioning of the current system, ultimately a multi-polar global economy requires a new IMFS to realise its full potential. That won't be easy.

Transitions between global reserve currencies are rare events given the strong complementarities between the international functions of money, which serve to reinforce the position of the dominant currency. And the most likely candidate for true reserve currency status, the Renminbi (RMB), has a long way to go before it is ready to assume the mantle.

The initial building blocks are there. Already, China is the world's leading trading nation, overtaking the US at the start of this decade<sup>34</sup>. And the Renminbi is now more common than sterling in oil future benchmarks, despite having no share in the market prior to 2018<sup>35</sup>.

The greater use of the Renminbi in international trade is also leading to its growing use in international finance. This has been enabled by reforms to China's monetary, foreign exchange, and financial systems that have liberalised and improve its financial market infrastructure, making the Renminbi a more reliable store of value<sup>36</sup>. The Belt and

Road Initiative could foster further take up of the Renminbi in both trade and finance. However, for the Renminbi to become a truly global currency, much more is required. Moreover, history teaches that the transition to a new global reserve currency may not proceed smoothly.

Consider the rare example of the shift from sterling to the dollar in the early 20<sup>th</sup> Century – a shift prompted by changes in trade and reinforced by developments in finance<sup>37</sup>. The disruption wrought by the First World War allowed the US to expand its presence in markets previously dominated by European producers. that was priced in sterling switched to being priced in dollars; and demand for dollar-denominated assets followed. In addition, the US became a net creditor, lending to other countries in dollar-denominated bonds.

Institutional change supported the role of the dollar, with the creation of the Federal Reserve System providing, for the first time, a market-maker and liquidity manager in US dollar acceptances. This was particularly helpful for promoting the use of the dollar in trade credit, reinforcing its use as a means of payment and invoicing currency.

Yet the US was, at least at first, an unwilling hegemon. Under the gold standard, the Fed's absorption of gold inflows exported significant deflationary pressures to the rest of the world<sup>38</sup>. Europe was dependent on the recycling of capital flows by the US, which lent much of its surplus back to Europe to enable payments of war reparations and debt. Europe suffered severely when this stopped in 1928.

Moreover, the increase in price levels that occurred as a result of the First World War left the global economy with too little gold in total to sustain money supply at the level consistent with full employment. Supplementing gold reserves with foreign exchange to boost money supply led to competition between the UK and the US to provide that service to other countries.

The resulting world with two competing providers of reserve currencies served to destabilise the international monetary system, and, some would argue, the lack of coordination between monetary policy makers during this time contributed to the global scarcity in liquidity and worsened the severity of the Great Depression<sup>39</sup>. The experience of the interwar period is a cautionary tale.

When it comes to the supply of reserve currencies, coordination problems are larger when there are fewer issuers than when there is either a monopoly or many issuers. While the rise of the Renminbi may over time provide a second-best solution to the current problems with the IMFS, first best would be to build a multipolar system.

The main advantage of a multipolar IMFS is diversification. Multiple reserve currencies would increase the supply of safe assets, alleviating the downward pressures on the global equilibrium interest rate that an asymmetric system can exert. And with many countries issuing global safe assets in competition with each other, the safety premium they receive should fall<sup>40</sup>.

A more diversified IMFS would also reduce spillovers from the core and by so doing lower the synchronisation of trade and financial cycles. That would in turn reduce the fragilities in the system, and increase the sustainability of capital flows, pushing up the equilibrium interest rate.

While the likelihood of a multipolar IMFS might seem distant at present, technological developments provide the potential for such a world to emerge. Such a platform would be based on the virtual rather than the physical.

History shows that the rise of a reserve currency is founded on its usefulness as a medium of exchange, by reducing the cost and increasing the convenience of international payments. The additional functions of money – as a unit of account and store of wealth – come later, and reinforce the payments motive.

Technology has the potential to disrupt the network externalities that prevent the incumbent global reserve currency from being displaced. Retail transactions are taking place increasingly online rather than on the high street, and through electronic payments over cash. And the relatively high costs of domestic and cross border electronic payments are encouraging innovation, with new entrants applying new technologies to offer lower cost, more convenient retail payment services.

The most high profile of these has been Libra – a new payments infrastructure based on an international stablecoin fully backed by reserve assets in a basket of currencies including the US dollar, the euro, and sterling. It could be exchanged between users on messaging platforms and with participating retailers<sup>41</sup>.

There are a host of fundamental issues that Libra must address, ranging from privacy to AML/CFT and operational resilience. In addition, depending on its design, it could have substantial implications for both monetary and financial stability<sup>42</sup>.

The Bank of England and other regulators have been clear that unlike in social media, for which standards and regulations are only now being developed after the technologies have been adopted by billions of users, the terms of engagement for any new systemic private payments system must be in force well in advance of any launch.

As a consequence, it is an open question whether such a new Synthetic Hegemonic Currency (SHC) would be best provided by the public sector, perhaps through a network of central bank digital currencies. Even if the initial variants of the idea prove wanting, the concept is intriguing. It is worth considering how an SHC in the IMFS could support better global outcomes, given the scale of the challenges of the current IMFS and the risks in transition to a new hegemonic reserve currency like the Renminbi.

An SHC could dampen the domineering influence of the US dollar on global trade. If the share of trade invoiced in SHC were to rise, shocks in the US would have less potent spillovers through exchange rates, and trade would become less synchronised across countries<sup>43</sup>. By the same token, global trade would become more sensitive to changes in conditions in the countries of the other currencies in the basket backing the SHC.

The dollar's influence on global financial conditions could similarly decline if a financial architecture developed around the new SHC and it displaced the dollar's dominance in credit markets. By reducing the influence of the US on the global financial cycle, this would help reduce the volatility of capital flows to EMEs.

Widespread use of the SHC in international trade and finance would imply that the currencies that compose its basket could gradually be seen as reliable reserve assets, encouraging EMEs to diversify their holdings of safe assets away from the dollar. This would lessen the downward pressure on equilibrium interest rates and help alleviate the global liquidity trap.

Of course, there would be many execution challenges, not least the risk of fragmentation across Digital Currency Areas<sup>44</sup>. But by leveraging the medium of exchange role of a reserve currency, an SHC might smooth the transition that the IMFS needs.

## **Conclusion**

20 years ago, the theme of this symposium was *New Challenges for Monetary Policy*, and my predecessor, Mervyn King, was one of the speakers. His reflections were on the merits of inflation targeting and flexible exchange rates. The applications of his insights have contributed greatly to improved economic outcomes around in the world in the intervening years.

But during that same period, the deficiencies of the IMFS have become increasingly potent. Even a passing acquaintance with monetary history suggests that this centre won't hold. We need to recognise the short, medium and long term challenges this system creates for the institutional frameworks and conduct of monetary policy across the world. Given the experience of the past five years, I will close by adding urgency to Ben Bernanke's challenge. Let's end the malign neglect of the IMFS and build a system worthy of the diverse, multipolar global economy that is emerging. ■

## Mark Carney is Governor of the Bank of England

### Endnotes

1. This view is summarised in a speech by John Murray, *'With a Little Help from Your Friends: The Virtues of Global Economic Coordination'*, 29 November 2011.
2. See *'[De]Globalisation and Inflation'*, 2017 IMF Michel Camdessus Central Banking Lecture given by Mark Carney, 18 September 2017.
3. See *'The Global Outlook'*, speech by Mark Carney, 12 February 2019.
- 4 The analysis of Gita Gopinath, Emmanuel Farhi, Matteo Maggiori and Jeremy Stein, amongst others, emphasises the persistence in the structure of the current IMFS.
- 5 See Corsetti, G, Dedola, L, and Leduc, S (2010), 'Optimal Monetary Policy in Open Economies', *Handbook of Monetary Economics*, Vol. 3, Chapter 16, pp. 861-933; and Benigno, G and Benigno, P (2006), 'Designing targeting rules for international monetary policy cooperation', *Journal of Monetary Economics*, Vol. 53(3), pp. 473-506. In the standard welfare-based analyses of optimal monetary policy in an open economy, a key consideration is the extent to which sticky prices in different currencies lead to deviations from the law of one price (LOOP) for different goods. The first-best

*(efficient) outcome is for goods to sell for the same price when converted into different currencies. If this is not the case, demand is misaligned internationally, which in turn creates an inefficient allocation of factor inputs. Under PCP, the full flexibility of import prices means the exchange rate can act as an efficient shock absorber, adjusting to ensure that the LOOP holds.*

*6. World trade as a share of global GDP has doubled since 1970. Over the past two decades, 80% of the increase in total trade has come from intermediates goods trade, driving up the value added of imports as a share from 10% of exports in 1990 to around 20% in 2015. Cross-holding of countries' assets and liabilities increased almost fourfold since 1990, and measures of stock market integration are at their highest ever (see Bastidon, C, Bordo, M, Parent, A, and Weidenmier, M (2019), 'Towards an Unstable Hook: The Evolution of Stock Market Integration Since 1913', NBER Working Paper No. 26166.*

*7. For more detail on these changes, see ['\[De\]Globalisation and Inflation'](#), *ibid*.*

*8. Dominant currency pricing refers to the widespread use of a single currency – the US dollar – in trade invoicing, in place of the currency of either the producer or the importer. Import prices will therefore depend on changes in the bilateral exchange rate between the local and the dominant currency, rather than that between the local and producer currency. For evidence, see Goldberg, L and Tille, C (2009), 'Macroeconomic interdependence and the international role of the dollar', *Journal of Monetary Economics*, 56 (7), pp. 990-1003; and Gopinath, G(2016). "The International Price System," *Jackson Hole Symposium Proceedings*.*

*9. Gopinath (2016), *ibid*, and Ito, H, and Kawai, M (2016), 'Trade Invoicing in Major Currencies in the 1970s-1990s: Lessons for Renminbi Internationalization', *Journal of the Japanese and International Economies*, Volume 42, pp. 123–145.*

*10. For a country with a large share of trade invoiced in dollars, a depreciation against the dollar raises the domestic price of imports, causing domestic households and firms to switch their expenditure away from foreign goods. But it leaves the (dollar) price of exports in the markets in which they are sold unchanged, albeit making them more profitable for domestic exporters in terms of home currency. Because imports would fall straight away and it would take time for the export sector to expand to take advantage of the higher profits, it is therefore likely that a rebalancing of the economy*

*from imports to exports would be slower than if traded goods were priced in the currencies of their production. In addition, other things equal, the rise in import prices would lead to a pick-up in imported inflationary pressure.*

11. *Boz, Gopinath and Plagborg-Moller (2017) show that a 1% appreciation of the dollar leads, all else equal, to a 0.6% contraction in trade volumes in the rest of the world.*

12. *Gopinath, G and Stein, JC (2018), 'Banking, Trade, and the Making of a Dominant Currency', Working paper, Harvard University. The euro is in second place at 20% and the yen is in third at 4% (ECB Staff (2017)).*

13. *Gourinchas, P, Rey, H Sauzet, M (2019), 'The International Monetary and Financial System', NBER Working Paper No. 25782.*

14. *Ilzetzki, E, Reinhart, C and Rogoff, K (2017), 'Exchange arrangements entering the 21st Century: Which anchor will hold?', forthcoming in the Quarterly Journal of Economics.*

15. *See Krugman (1980).*

16. *Rey, H (2013). "Dilemma not trilemma: the global cycle and monetary policy independence," Proceedings - Economic Policy Symposium - Jackson Hole, Federal Reserve Bank of Kansas City.*

17. *Reflecting the fact that most of the assets of EME companies are priced in local currency. See Bruno, V and Shin, HS (2015), 'Cross-Border Banking and Global Liquidity', Review of Economic Studies, Oxford University Press, Vol. 82(2), pp. 535-564 and Cesa-Bianchi, Ferrero, Rebucci (2018), 'International Credit Supply Shocks', Journal of International Economics, Vol. 112, 2018, pp. 219- 237.*

18. *Ghosh, AR, Ostry, JD, and Qureshi, M (2016), 'When do capital inflows surges end in tears?', American Economic Review. Surges are defined as a net capital flow observation that lie in the top thirtieth percentile of both the country-specific and the full sample's distribution of net capital flows, expressed in percent of GDP.*

19. *See 'Pull, Push. Pipes', speech by Mark Carney, Institute of International Finance Spring Membership Meeting, Tokyo, 6 June 2019.*

20. *Within the Bank's Capital Flows-at-Risk framework, these actions are estimated to have Capital Flows-at-Risk (that is, capital outflows as a percent of GDP in the fifth percentile of the distribution) by 3% of GDP.*



21. *Within this, investment funds are growing, accounting for the bulk of the growth in asset management over the last decade. In parallel, investment fund flows to EMEs now account for around one third of total portfolio flows, compared to around one tenth pre-crisis.*
22. *In addition to the direct costs of financing these reserves, there have been indirect costs including the crowding out of domestic investment.*
23. *Rachel, L and Smith, T (2015), 'Secular drivers of the global real interest rate', Bank of England Staff Working Paper No. 571, estimate that the savings glut has lowered global real rates by 25 basis points over the past 30 years.*
24. *See '[Real interest rates and risk](#)', speech by Gertjan Vlieghe given at the Society of Business Economists' Annual conference, 15 September 2017.*
25. *If history serves as a guide, EMEs' external liabilities could double as a share of GDP by 2030: market-based finance could then account for half of external liabilities and investment funds could represent 40% of market-based finance flows to EMEs. By 2030, the reduction in sustainable capital flows arising from push factors could completely cancel out the positive impact stemming from domestic reforms in EMEs over the past two decades. To offset this reduction in the sustainability of EME capital flows, their reserves would have to double over the next ten years. [This is made more challenging by the increasing weight of EMEs in the global economy, and the declining share of the US, which means demand for US-denominated safe assets is likely rise faster than their supply.]*
26. *On the implications of DCP for optimal monetary policy, see Egorov, Konstantin and Dmitry Mukhin, "Optimal Monetary Policy under Dollar Pricing," March 2019. mimeo Yale University; and Casas, C, Diez, FJ, Gopinath, G and Gourinchas, PO (2017), 'Dominant Currency Paradigm: A New Model for Small Open Economies', IMF Working Papers 17/264.*
27. *For more detail, see '[Lambda](#)', speech by Mark Carney, 16 January 2017.*
28. *For example, as Chair Powell noted in his speech 'Monetary Policy in the Post-Crisis Era' (July 2019), "since the crisis policymakers are even more keenly aware of the relevance of global factors to our policies. The global nature of the financial crisis and the channels through which it spread sharply highlight the interconnectedness of our economic,*

financial, and policy environments. US economic developments affect the rest of the world, and the reverse is also true." The Federal Reserve's recent Conference on Monetary Policy Strategy, Tools and Communications Practices devoted a session to the global dimension of US monetary policy.

29. Coman, A, and Lloyd, S (forthcoming), 'In the Face of Spillovers: Prudential Policies in Emerging Economies'.

30. Estimates are based on the FSB's measure of 'collective investment vehicles with features that make them susceptible to runs'; see FSB Global Monitoring Report on Non-Bank Financial Intermediation 2018.

31. The review will also assess the effectiveness of measures that are already used to deal with misalignment of redemption terms and asset liquidity, such as swing and fair value pricing and suspensions.

32. For example, limits on foreign currency borrowing and restrictions on the activities of open-ended investment funds. History has shown that capital flow management measures can be both addictive and highly distortionary. That is why the IMF's Institutional View makes clear that CFM should not substitute for domestic institutional reforms or warranted macroeconomic adjustments.

33. The design of the GFSN is also important. Positive steps have been made in recent years by introducing precautionary liquidity facilities so countries can borrow to prevent crises, as well as mitigate their impact. This should also reduce stigma of drawing on the facilities. But so far, only a few countries have taken them up. It is important to do everything we can to normalise use of these precautionary facilities.

34. World Bank.

35. Taken from [The International Role of the Euro June 2019](#), ECB.

36. Initiatives include trade settlement programs, RMB offshore clearing banks, offshore RMB denominated bond market in Hong Kong, and a network of central bank RMB swap lines.

37. For more details, see Eichengreen, BJ (2008), 'Globalizing capital: A history of the international monetary system', Princeton: Princeton University Press; and Eichengreen, B, Mehl, A, and Chițu, L (2018), 'How Global Currencies Work: Past, Present, and Future', Princeton University Press.

38. For a comparison with the UK as a hegemon in the period 1870-1914, see van Hombecq, C (2017), 'An exorbitant

*privilege in the first age of international financial integration', Bank of England Staff Working Paper No. 668.*

*39. Investors switched between pound and dollar depending on their perception of each country, leading to increased volatility in currency flows. Countries were forced to raise policy rates in an attempt to attract scarce gold reserves, dampening domestic spending – a position that ultimately proved unsustainable. These coordination problems led to lower issuance of safe assets in total and meant the potential benefits from competition between alternative providers of reserve currencies were not realised. In retrospect, a more cooperative solution would have allowed countries to cut policy rates in a coordinated manner, providing support to domestic demand without affecting pressures on gold flows.*

*40. Farhi, E, and Maggiori, M (2018), 'A Model of the International Monetary System', Quarterly Journal of Economics 133 (1): 295-355.*

*41. See <https://libra.org/en-US/>*

*42. For more details, see 'Enable, Empower, Ensure: A New Finance for the New Economy', speech by Mark Carney, at the Lord Mayor's Banquet for Bankers and Merchants of the City of London at the Mansion House, London, 20 June 2019.*

*43. This requires that the other currencies included in the basket backing the global currency are not perfectly correlated with the dollar, which seems likely to be the case given countries face idiosyncratic shocks.*

*This article is based on a speech [delivered](#) at the Jackson Hole Symposium 2019, 23 August*



# Challenges for monetary policy

The US economy is in a favourable place. Jerome Powell describes how the Fed is working to sustain these conditions in the face of significant risks

**F**or the Federal Reserve these challenges flow from our mandate to foster maximum employment and price stability. From this perspective, our economy is now in a favourable place, and I will describe how we are working to sustain these conditions in the face of significant risks we have been monitoring.

The current US expansion has entered its 11<sup>th</sup> year and is now the longest on record<sup>1</sup>. The unemployment rate has fallen steadily throughout the expansion and has been near half-century lows since early 2018. But that rate alone does not fully capture the benefits of this historically strong job market. Labour force participation by people in their prime working years has been rising. While unemployment for minorities generally remains higher than for the workforce as a whole, the rate for African Americans, at 6 percent, is the lowest since the government began tracking it in 1972.

For the past few years, wages have been increasing the most for people at the lower end of the wage scale. People who live and work in low- and middle-income communities tell us that this job market is the best anyone can recall. We increasingly hear reports that employers are training workers who lack required skills, adapting jobs to the needs of employees with family responsibilities, and offering second chances to people who need one.

Inflation has been surprisingly stable during the expansion: not falling much when the economy was weak and not rising much as the expansion gained strength. Inflation ran close to our symmetric 2 percent objective for most of last year but has been running somewhat below 2 percent this year.

Thus, after a decade of progress toward maximum employment and price stability, the economy is close to both goals. Our challenge now is to do what monetary policy can do to sustain the expansion so that the benefits of the strong jobs market extend to more of those still left behind, and so that inflation is centred firmly around 2 percent.

I will explore what history tells us about sustaining long, steady expansions. A good place to start is with the passage of the Employment Act of 1946, which stated that it is the *“continuing policy and responsibility of the Federal Government ... to promote maximum employment, production, and purchasing power.”*<sup>2</sup>

Some version of these goals has been in place ever since. I will divide the history since World War II into three eras organised around some well-known ‘Greats’. The first era comprises the postwar years through the Great Inflation. The second era brought the Great Moderation but ended in the Great Recession. The third era is still under way, and time will tell what ‘Greats’ may emerge.

*As we look back over the decade since the end of the financial crisis, we can again see fundamental economic changes that call for a reassessment of our policy framework*

Each era presents a key question for the Fed and for society more generally. The first era raises the question whether a central bank can resist the temptations that led to the Great Inflation. The second era raises the question whether long expansions supported by better monetary policy inevitably lead to destabilising financial excesses like those seen in the Great Moderation. The third era confronts us with the question of how best to promote sustained prosperity in a world of slow global growth, low inflation, and low interest rates. Near the end of my remarks, I will discuss the current context, and the ways these questions are shaping policy.

### **Era I, 1950–1982: policy breeds macroeconomic instability and the Great Inflation**

The late 1940s were a period of adjustment to a peacetime economy. As the 1940s turned to the 1950s, the state of knowledge about how best to promote macroeconomic stability was limited. The 1950s and early 1960s saw the economy oscillating sharply between recession and growth above 6 percent (figure 1, panel A). Three expansions and contractions came in quick succession. With the benefit of hindsight, the lack of stability is generally attributed to ‘stop and go’ stabilisation policy, as monetary and fiscal authorities grappled with how best to modulate the use of their blunt but powerful tools<sup>3</sup>.

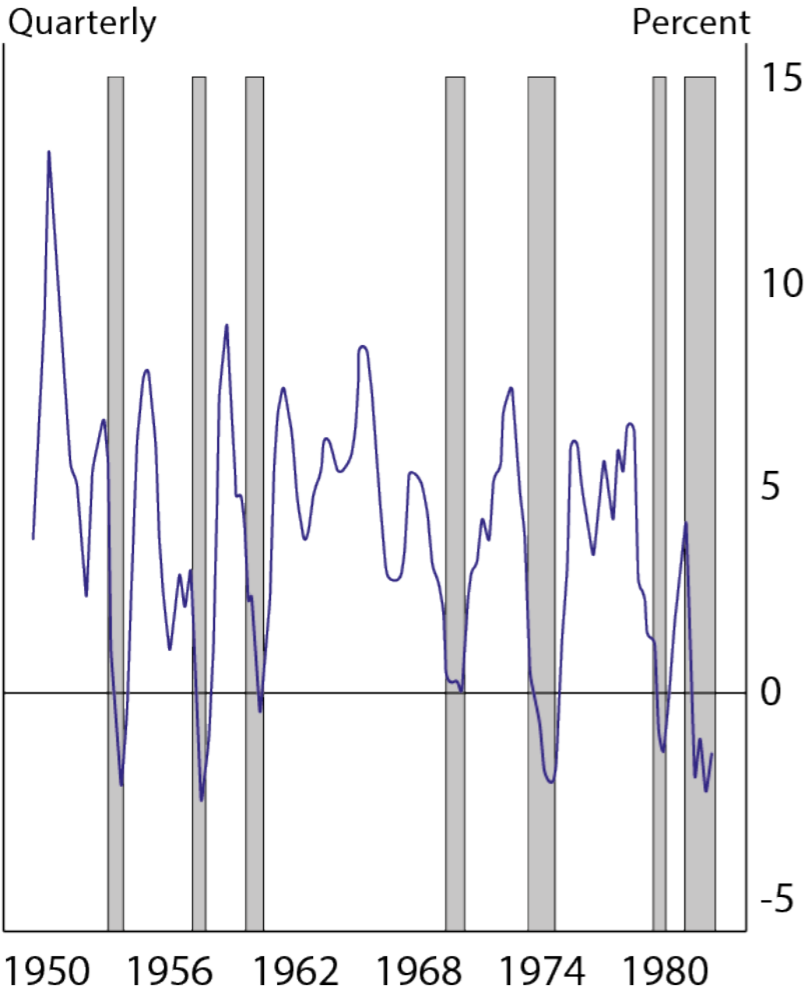
Beginning in the mid-1960s, ‘stop and go’ policy gave way to ‘too much go and not enough stop’—not enough, that is, to quell rising inflation pressures. Both inflation and inflation expectations ratcheted upward through four expansions until the Fed, under Chairman Paul Volcker, engineered a definitive stop in the early 1980s (figure 1, panel C). Each of the expansions in the Great Inflation period ended with monetary policy tightening in response to rising inflation.

Policymakers came out of the Great Inflation era with a clear understanding that it was essential to anchor inflation expectations at some low level. But many believed that central bankers would find it difficult to ignore the temptation of short-term employment gains at the cost of higher inflation down the road<sup>4</sup>.

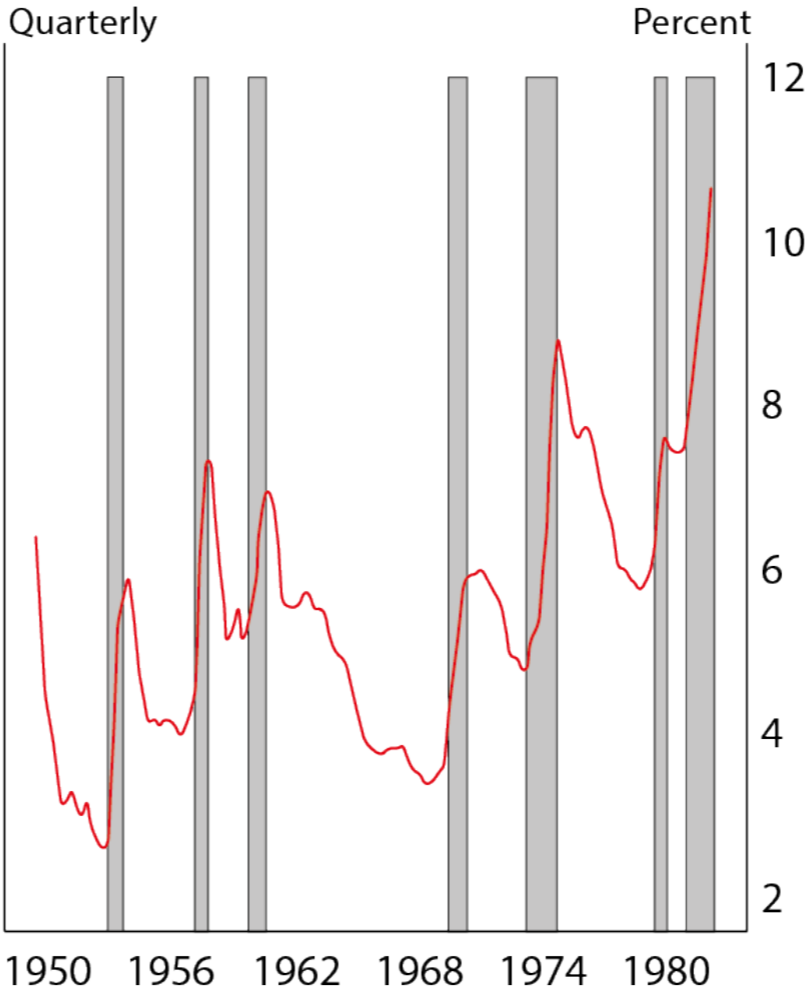
**Figure 1. Era 1: 1950-82**

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**A. Real GDP growth**



**B. Unemployment rate**

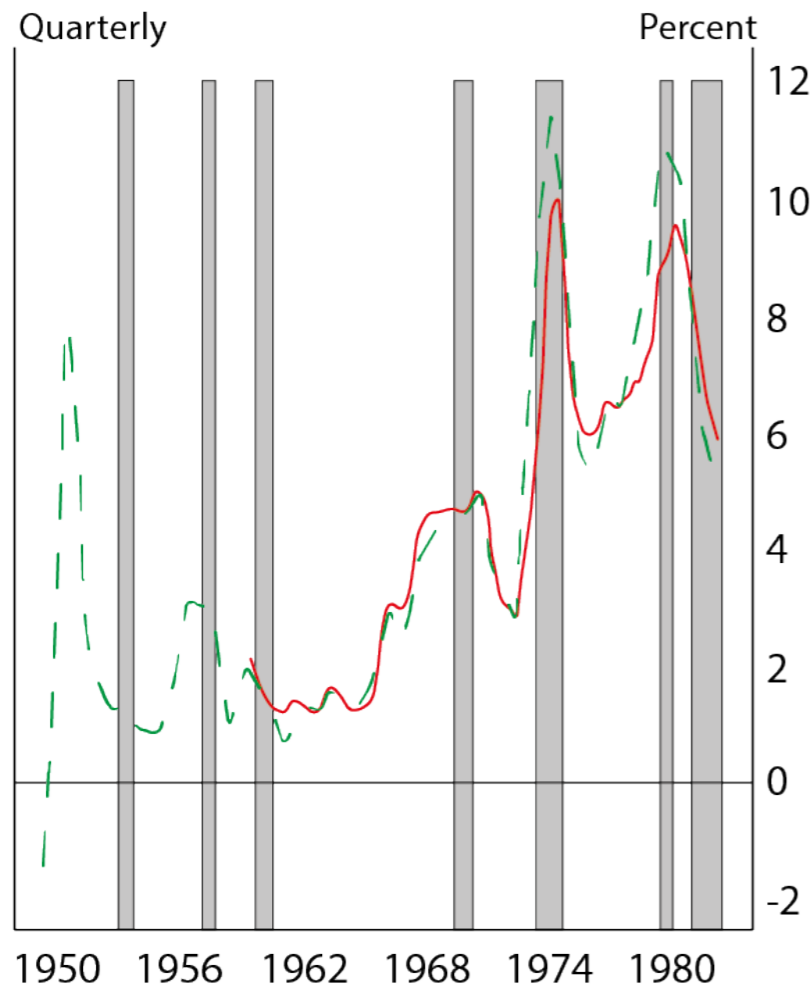


*Note: Unemployment and federal funds data are quarterly averages; overall personal consumption expenditures (PCE) are the four-quarter change in the PCE price index; core PCE is the four-quarter change in the PCE price index less food and energy; real gross domestic product (GDP) growth is the four-quarter change in the level of real GDP; federal funds data start in July 1954; core PCE data start in January 1960; all data extend through 1982:Q4. Shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research: 1953:Q2-1954:Q2, 1957:Q3-1958:Q2, 1960:Q2-1961:Q1, 1969:Q4-1970:Q4, 1973:Q4-1975:Q1, 1980:Q1-1980:Q3, and 1981:Q3-1982:Q4.*

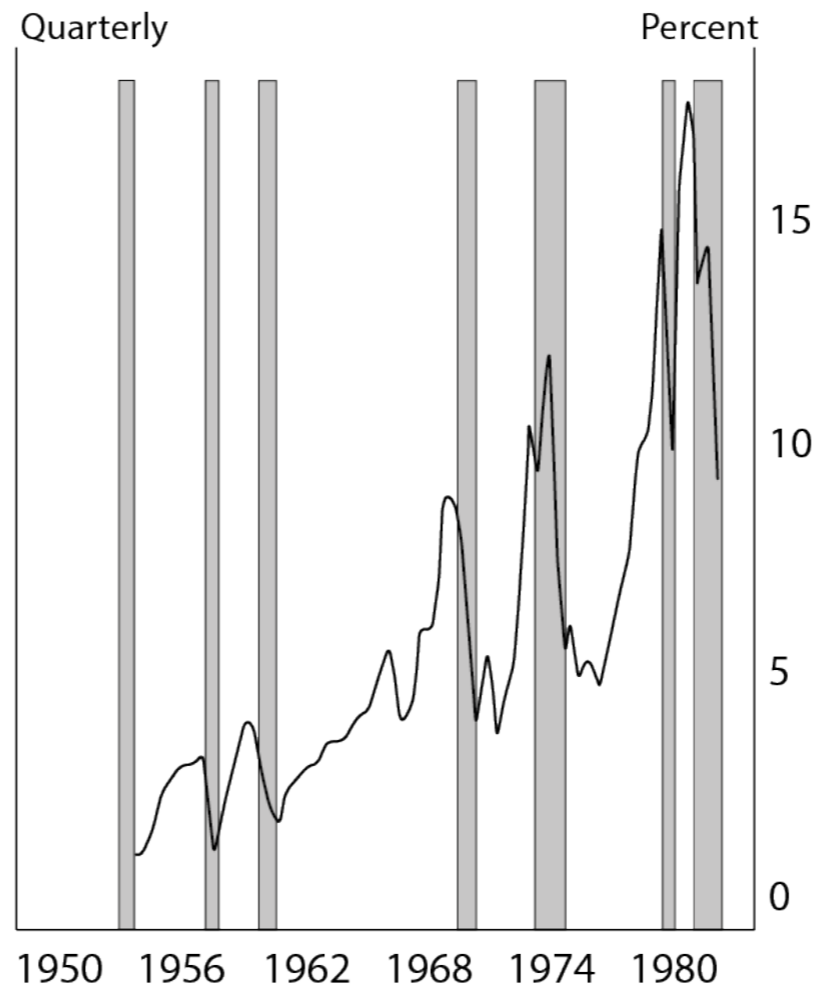


**Figure 1. Era 1: 1950-82 continued**

C. PCE inflation



D. Federal funds rate



Source: For overall PCE, core PCE, and real GDP growth, the Bureau of Economic Analysis; for the unemployment rate, Bureau of Labor Statistics; for the federal funds rate, Board of Governors of the Federal Reserve System; all series retrieved from the Federal Reserve Bank of St. Louis, FRED.

## **Era II, 1983 through 2009: the Great Moderation and Great Recession**

As the second era began, inflation was falling, and it continued to fall for about a decade (figure 2, panel C). In 1993, core inflation, which omits the volatile food and energy components, first fell below 2.5 percent, and has since remained in the narrow range of 0.9 percent to 2.5 percent<sup>5</sup>. Greater success on price stability came with greater success on employment. Expansions in this era were longer and more stable than before (figure 2, panel A). The era saw two of the three longest US expansions up to that point in history<sup>6</sup>.

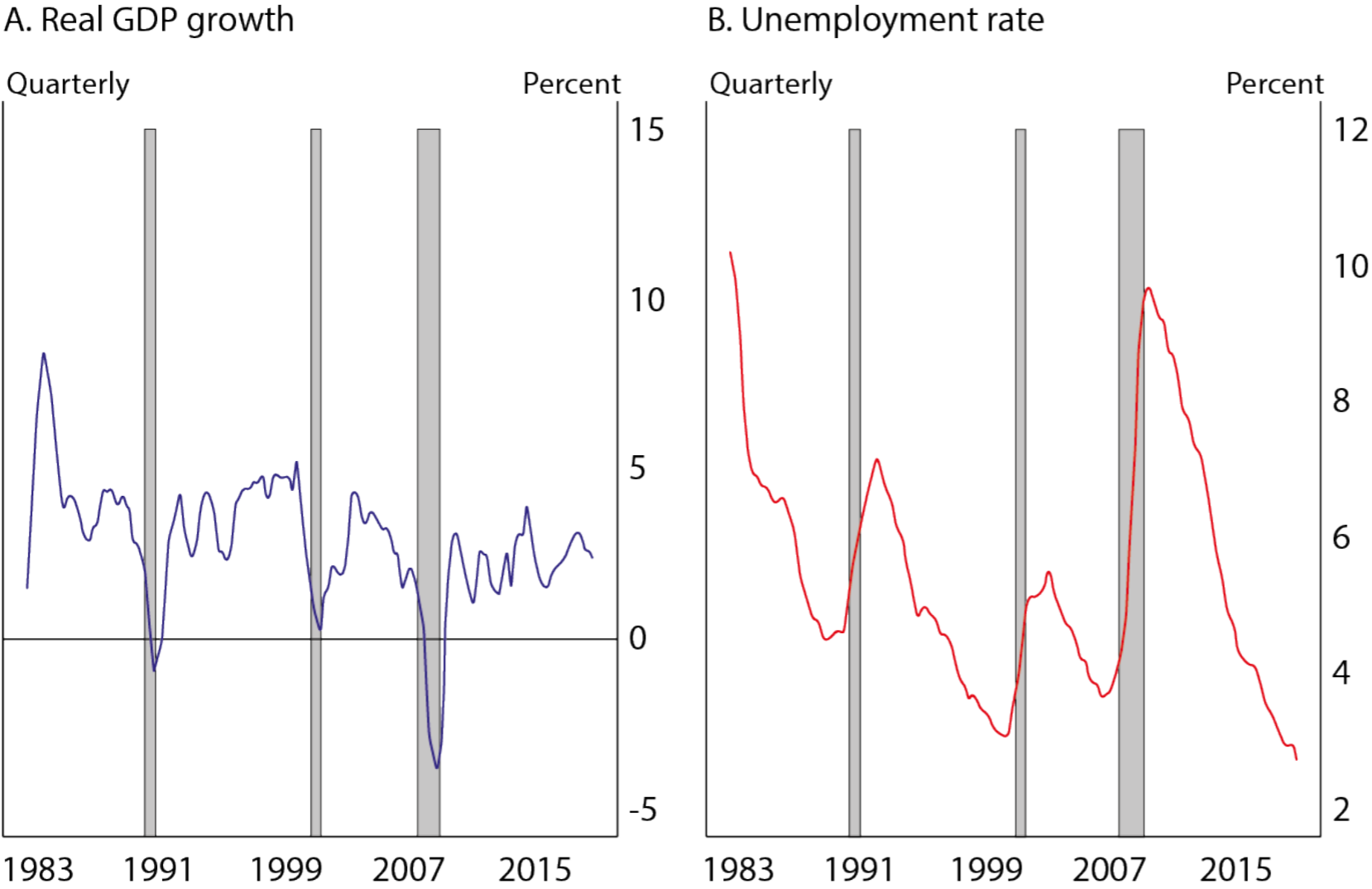
Anchored inflation expectations helped make this win-win outcome possible, by giving the Fed latitude to support employment when necessary without destabilising inflation. The Fed was cutting, not raising, rates in the months prior to the end of the first two expansions in this era, and the ensuing recessions were mild by historical standards. And twice during the long expansion of the 1990s, the Federal Open Market Committee (FOMC) eased policy in response to threats to growth.

In 1995, responding to evidence of slowing in the United States and abroad, the FOMC reduced the federal funds rate over a few months. In 1998, the Russian debt default and the related collapse of the hedge fund Long-Term Capital Management rocked financial markets that were already fragile from the Asian financial crisis. Given the risks posed to the US economy, the FOMC again lowered the federal funds rate over a period of months until events quieted. The 10-year expansion weathered both events with no discernible inflation cost<sup>7</sup>.

By the turn of the century, it was beginning to look like financial excesses and global events would pose the main threats to stability in this new era rather than overheating and rising inflation. The collapse of the tech stock bubble in 2000 and the September 11, 2001, terrorist attacks played key roles in precipitating a slowdown that turned into a recession<sup>8</sup>.

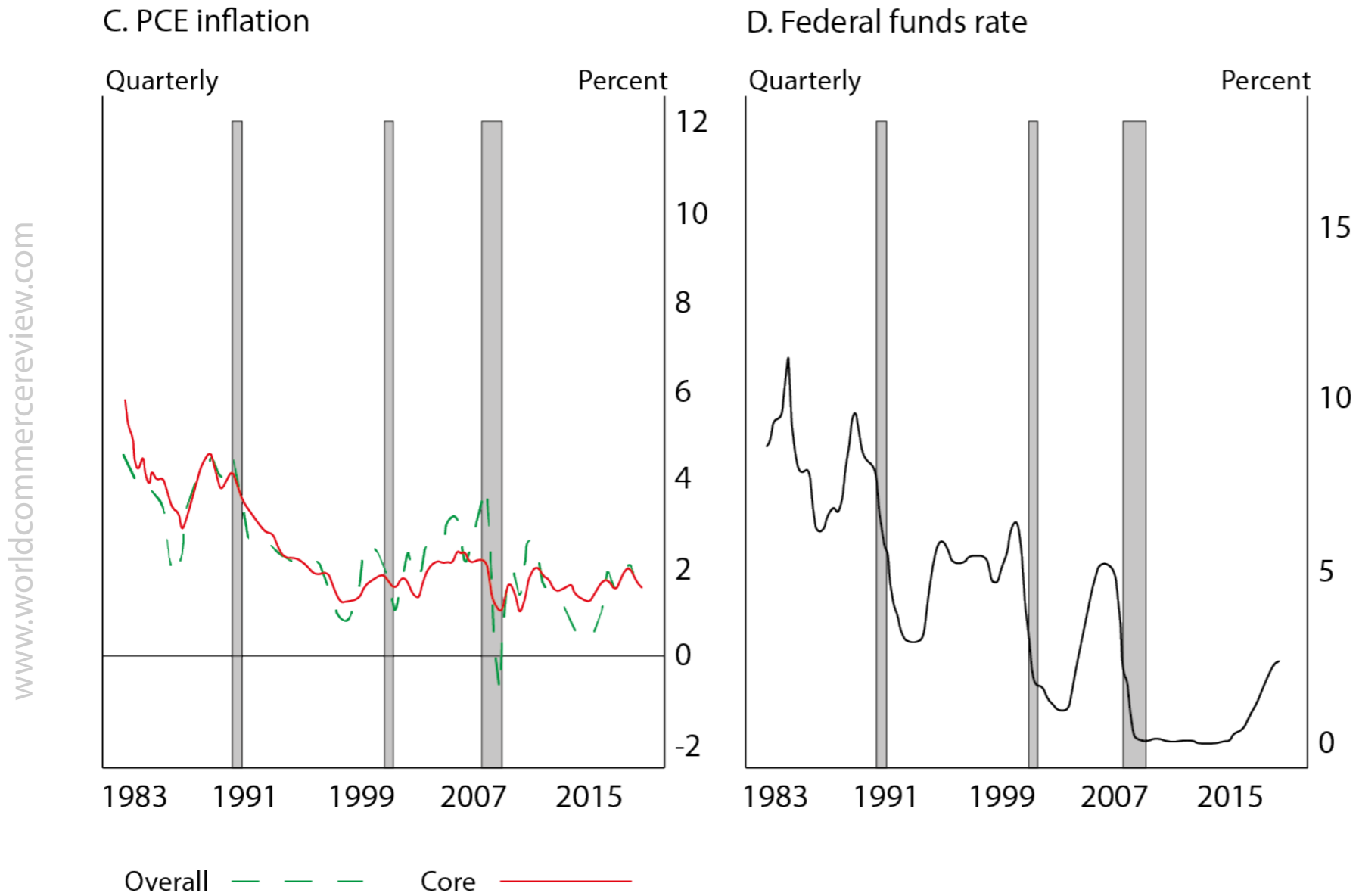
**Figure 2. Eras 2 and 3: 1983-2009 and 2010-present**

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*Note: Unemployment and federal funds data are quarterly averages; overall personal consumption expenditures (PCE) are the four-quarter change in the PCE price index; core PCE is the four-quarter change in the PCE price index less food and energy; real gross domestic product (GDP) growth is the four-quarter change in the level of real GDP; all data extend through 2019:Q2. Shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research: 1990:Q3-1991:Q1, 2001:Q1-2001:Q4, and 2007:Q4-2009:Q2.*

**Figure 2. Eras 2 and 3: 1983-2009 and 2010-present continued**



Source: For overall PCE, core PCE, and real GDP growth, the U.S. Bureau of Economic Analysis; for the unemployment rate, Bureau of Labor Statistics; for the federal funds rate, Board of Governors of the Federal Reserve System; all series retrieved from the Federal Reserve Bank of St. Louis, FRED.

And the next expansion, as we are all painfully aware, ended with the collapse of a housing bubble and the Global Financial Crisis. Thus, this second era provided good reason for optimism about the Fed's ability to deliver stable inflation, but also raised a question about whether long expansions inevitably lead to destabilising financial excesses.

### **Era III, 2010 and after: monetary policy and the emerging new normal**

The third era began in 2010 as the recovery from the Great Recession was taking hold. My focus in discussing this era will be on a 'new normal' that is becoming apparent in the wake of the crisis. I will fast-forward past the early years of the expansion and pick up the story in December 2015<sup>9</sup>.

The unemployment rate had fallen from a peak of 10 percent to 5 percent, roughly equal to the median FOMC participant's estimate of the natural rate of unemployment at the time. At this point, the Committee decided that it was prudent to begin gradually raising the federal funds rate based on the closely monitored premise that the increasingly healthy economy called for more-normal interest rates.

The premise was generally borne out: growth from the end of 2015 to the end of 2018 averaged 2.5 percent, a bit above the 2.2 percent rate over the previous five years (figure 2, panel A). The unemployment rate fell below 4 percent, and inflation moved up and remained close to our 2 percent objective through much of 2018 (figure 2, panels B and C).

That brings us to 2019. Before turning to issues occupying centre stage at present, I want to address a long-running issue that I discussed at Jackson Hole last year: tracking the 'stars' that serve as guideposts for monetary policy<sup>10</sup>. These include  $u^*$ , the natural rate of unemployment, and  $r^*$ , the neutral real rate of interest. Unlike celestial stars,

these stars move unpredictably and cannot be directly observed. We must judge their locations as best we can based on incoming data and then add an element of risk management to be able to use them as guides.

Since 2012, declining unemployment has had surprisingly little effect on inflation, prompting a steady decline in estimates of  $u^*$  (figure 3)<sup>11</sup>. Standard estimates of  $r^*$  have declined between 2 and 3 percentage points over the past two decades. Some argue that the effective decline is even larger<sup>12</sup>.

Incorporating a lower value of  $u^*$  into policy-making does not require a significant change in our approach. The significant fall in  $r^*$ , however, may demand more fundamental change. A lower  $r^*$  combined with low inflation means that interest rates will run, on average, significantly closer to their effective lower bound.

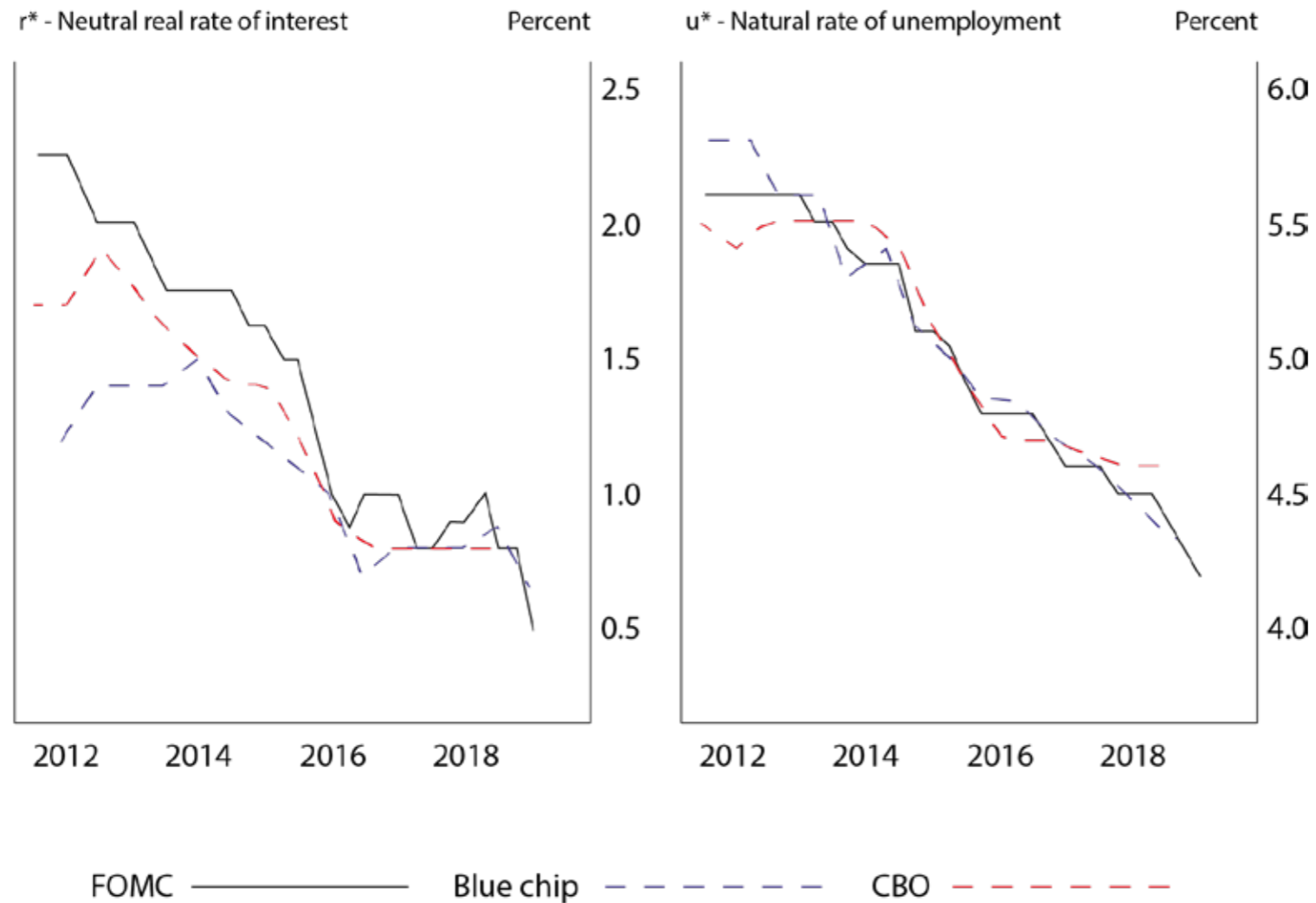
The key question raised by this era, then, is how we can best support maximum employment and price stability in a world with a low neutral interest rate.

### **Current policy and the three key questions**

Let me turn now to the current implications for monetary policy of the questions raised by these three eras. The first era raised the question of whether the Fed can avoid excessive inflation. Inflation has averaged less than 2 percent over the past 25 years, and low inflation has been the main concern for the past decade. Low inflation seems to be the problem of this era, not high inflation. Nonetheless, in the unlikely event that signs of too-high inflation return, we have proven tools to address such a situation.

The second era's question—whether long expansions inevitably breed financial excesses—is a challenging and timely one. Hyman Minsky long argued that, as an expansion continues and memories of the previous downturn

**Figure 3. Real-time estimates of  $r^*$  and  $u^*$**



Note: The Federal Open Market Committee (FOMC) data are quarterly, extend through June 2019, and are projections of longer-term normal. The Blue Chip data are biannual, extend through June 2019, and are projections for 6 to 10 years in the future. The Congressional Budget Office (CBO) data are biannual and extend through January 2019. For the left panel, the projections are for 10 years in the future; the right panel shows the natural rate projection for the current quarter at the time of the projection. The neutral real interest rate is the 3-month Treasury bill rate projection (CBO) or the federal funds rate projection (FOMC and Blue Chip) minus the source's inflation projection.

Source: For FOMC, Summary of Economic Projections, available on the Board's website at <https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>; for Blue Chip, Wolters Kluwer, Blue Chip Economic Indicators and Blue Chip Financial Forecasts; for CBO, Congressional Budget Office (The Budget and Economic Outlook) and Federal Reserve Bank of St. Louis (ALFRED).

fade, financial risk management deteriorates and risks are increasingly underappreciated<sup>13</sup>. This observation has spurred much discussion.

At the end of the day, we cannot prevent people from finding ways to take excessive financial risks. But we can work to make sure that they bear the costs of their decisions, and that the financial system as a whole continues to function effectively. Since the crisis, Congress, the Fed, and other regulatory authorities here and around the world have taken substantial steps to achieve these goals. Banks and other key institutions have significantly more capital and more stable funding than before the crisis.

We comprehensively review financial stability every quarter and release our assessments twice a year to highlight areas of concern and allow oversight of our efforts. We have not seen unsustainable borrowing, financial booms, or other excesses of the sort that occurred at times during the Great Moderation, and I continue to judge overall financial stability risks to be moderate. But we remain vigilant.

That leaves the third question of how, in this low  $r^*$  world, the Fed can best support the economy. A low neutral interest rate presents both near-term and longer-term challenges. I will begin with the current context. Because today's setting is both challenging and unique in many ways, it may be useful to lay out some general principles for assessing and implementing appropriate policy and to describe how we have been applying those principles.

Through the FOMC's setting of the federal funds rate target range and our communications about the likely path forward for policy and the economy, we seek to influence broader financial conditions to promote maximum employment and price stability. In forming judgments about the appropriate stance of policy, the Committee digests a broad range of data and other information to assess the current state of the economy, the most likely outlook for the future, and meaningful risks to that outlook.



Because the most important effects of monetary policy are felt with uncertain lags of a year or more, the Committee must attempt to look through what may be passing developments and focus on things that seem likely to affect the outlook over time or that pose a material risk of doing so. Risk management enters our decision-making because of both the uncertainty about the effects of recent developments and the uncertainty we face regarding structural aspects of the economy, including the natural rate of unemployment and the neutral rate of interest.

It will at times be appropriate for us to tilt policy one way or the other because of prominent risks. Finally, we have a responsibility to explain what we are doing and why we are doing it so the American people and their elected representatives in Congress can provide oversight and hold us accountable.

We have much experience in addressing typical macroeconomic developments under this framework. But fitting trade policy uncertainty into this framework is a new challenge. Setting trade policy is the business of Congress and the Administration, not that of the Fed. Our assignment is to use monetary policy to foster our statutory goals.

In principle, anything that affects the outlook for employment and inflation could also affect the appropriate stance of monetary policy, and that could include uncertainty about trade policy. There are, however, no recent precedents to guide any policy response to the current situation.

Moreover, while monetary policy is a powerful tool that works to support consumer spending, business investment, and public confidence, it cannot provide a settled rulebook for international trade. We can, however, try to look through what may be passing events, focus on how trade developments are affecting the outlook, and adjust policy to promote our objectives.

This approach is illustrated by the way incoming data have shaped the likely path of policy this year. The outlook for the US economy since the start of the year has continued to be a favourable one. Business investment and manufacturing have weakened, but solid job growth and rising wages have been driving robust consumption and supporting moderate growth overall.

As the year has progressed, we have been monitoring three factors that are weighing on this favourable outlook: slowing global growth, trade policy uncertainty, and muted inflation. The global growth outlook has been deteriorating since the middle of last year. Trade policy uncertainty seems to be playing a role in the global slowdown and in weak manufacturing and capital spending in the United States. Inflation fell below our objective at the start of the year. It appears to be moving back up closer to our symmetric 2 percent objective, but there are concerns about a more prolonged shortfall.

Committee participants have generally reacted to these developments and the risks they pose by shifting down their projections of the appropriate federal funds rate path. Along with July's rate cut, the shifts in the anticipated path of policy have eased financial conditions and help explain why the outlook for inflation and employment remains largely favourable.

Turning to the current context, we are carefully watching developments as we assess their implications for the US outlook and the path of monetary policy. The weeks since our July FOMC meeting have been eventful, beginning with the announcement of new tariffs on imports from China. We have seen further evidence of a global slowdown, notably in Germany and China. Geopolitical events have been much in the news, including the growing possibility of a hard Brexit, rising tensions in Hong Kong, and the dissolution of the Italian government.

Financial markets have reacted strongly to this complex, turbulent picture. Equity markets have been volatile. Long-term bond rates around the world have moved down sharply to near post-crisis lows. Meanwhile, the US economy has continued to perform well overall, driven by consumer spending. Job creation has slowed from last year's pace but is still above overall labour force growth. Inflation seems to be moving up closer to 2 percent.

Based on our assessment of the implications of these developments, we will act as appropriate to sustain the expansion, with a strong labour market and inflation near its symmetric 2 percent objective.

### **The three questions in the longer run**

Looking back over the three eras, monetary policy has evolved to address new challenges as they have arisen. The inflation targeting regime that emerged after the Great Inflation has led to vastly improved outcomes for employment and price stability around the world.

One result has been much longer expansions, which often brought with them the build-up of financial risk. This new pattern has led us to understand that assuring financial stability over time requires much greater resilience in our financial system, particularly for our largest, most complex banks.

As we look back over the decade since the end of the financial crisis, we can again see fundamental economic changes that call for a reassessment of our policy framework. The current era has been characterised by much lower neutral interest rates, disinflationary pressures, and slower growth. We face heightened risks of lengthy, difficult-to-escape periods in which our policy interest rate is pinned near zero.

To address this new normal, we are conducting a public review of our monetary policy strategy, tools, and communications—the first of its kind for the Federal Reserve. We are evaluating the pros and cons of strategies

that aim to reverse past misses of our inflation objective. We are examining the monetary policy tools we have used both in calm times and in crisis, and we are asking whether we should expand our toolkit. In addition, we are looking at how we might improve the communication of our policy framework.

Public engagement, unprecedented in scope for the Fed, is at the heart of this effort. Through Fed Listens events live-streamed on the internet, we are hearing a diverse range of perspectives not only from academic experts, but also from representatives of consumer, labour, business, community, and other groups. We have begun a series of FOMC meetings at which we will discuss these questions. We will continue reporting on our discussions in the FOMC minutes and share our conclusions when we finish the review next year.

I will conclude by saying that we are deeply committed to fulfilling our mandate in this challenging era, and I look forward to the valuable insights that will, I am confident, be shared. ■

## **Jerome H Powell is Chair of the Board of Governors of the Federal Reserve System**

### *Endnotes*

1. The National Bureau of Economic Research (NBER) has classified business cycle turning points back to 1854 (see <https://www.nber.org/cycles.html>).
2. See Declaration of Policy, section 2 of the Employment Act of 1946, Pub. L. 79-304, ch. 33, 60 Stat 23 (1946), available at [https://fraser.stlouisfed.org/scribd/?title\\_id=1099&filepath=/files/docs/historical/congressional/employment-act-1946.pdf](https://fraser.stlouisfed.org/scribd/?title_id=1099&filepath=/files/docs/historical/congressional/employment-act-1946.pdf). A modified version of those goals formally became the Fed's dual mandate in 1977. For further discussion, see "Full Employment and Balanced Growth Act of 1978 (Humphrey-Hawkins)" on the Board's website at <https://www>.

[federalreservehistory.org/essays/humphrey\\_hawkins\\_act](https://federalreservehistory.org/essays/humphrey_hawkins_act).

3. Romer and Romer (2002) document that the Federal Open Market Committee understood the essence of sound policy. Nonetheless, as Nelson (2013) discusses, many authors argue that the way those principles were applied contributed to the fluctuations of the time.

4. As discussed by Faust (1996), the structure of FOMC governance was motivated by the traditional view that governments are tempted to resort to inflation in times of stress. With the post–World War II emphasis on full employment and understanding the role of inflation expectations, this tendency was reformulated as seeking near-term gains on employment at the cost of long-term inflation (Kydland and Prescott, 1977; Barro and Gordon, 1983).

5. Overall inflation, which is the subject of our symmetric 2 percent objective, has been somewhat more volatile, but it is neither practical nor wise to try to smooth purely transitory inflation fluctuations. As such transitory fluctuations are frequently driven by volatile food and energy prices, I am citing the stability of core inflation on a four-quarter basis as a proxy for Fed performance in achieving the relevant sense of stability.

6. Analysts debate the role that monetary policy and other factors, such as luck and structural change in the economy, played in bringing about the Great Moderation. For example, Ahmed, Levin, and Wilson (2004) find an important role for luck. Stock and Watson (2003) attribute much of the change to an unexplained improvement in the tradeoff between inflation and output variability. Like Bernanke (2004), I believe that better policy was an important factor behind the better outcomes, perhaps allowing other factors to show through.

7. Indeed, as I noted at this symposium last year, inflation ran surprisingly low in the second half of the 1990s (Powell, 2018).

8. This was an odd recession to classify. The collapse of the tech bubble was followed by several quarters of generally slow positive growth. Regarding declaring the 2001 recession, the NBER Business Cycle Dating Committee stated, “Before the [September 11] attacks, it is possible that the decline in the economy would have been too mild to qualify as a recession” (NBER, 2001, p. 8).

9. Ben Bernanke (2012) surveyed the early years of the recovery at this symposium in 2012.

10. Powell (2018).

11. The fact that inflation did not react much to changing unemployment also led some to reassess other structural features such as the slope of the Phillips curve.

12. As discussed in Rachel and Summers (2019), many factors combine to determine the normal growth rate of the economy and  $r^*$ . Persistent movements in longer-term interest rates in a stable inflation environment are one indicator of  $r^*$  movements.

13. See, for example, Minsky (1991).

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This article is based on a speech [delivered](#) at the 'Challenges for Monetary Policy' symposium, sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 23, 2019



# The incoming payment revolution and the future of central banking

Maylis Avaro and Vincent Bignon consider the lessons from the history of the Banque de France on financial instability and the payment revolution



**T**he payment landscape is changing. This column goes back to late 19<sup>th</sup> century France to explore the implications of this more decentralised and less banked landscape for the design of central banks' interventions when fighting financial crises. The Banque de France operated a very wide discount window and used a variety of risk management techniques to effectively subdue risk-taking behaviours and to protect its balance sheet from taking any loss. This helped it to stabilise the economy and to overcome the consequences of negative income shocks.

The payment landscape is changing. Rapidly. More payment operators are non-banks who propose e-solutions to make payments both online and in real life. Some are big players, such as the 'Big Four' tech companies, and others are much smaller start-ups (Committee on Payments and Market Infrastructures 2015). These changes are creating a more decentralised payment landscape, qualified by some as a revolution in payments (Coeuré 2019, Mersch 2019).

Technologies have changed, but the pattern looks strikingly familiar to the students of European monetary history. To them, there is no natural law tying the payment instruments with their operation by the banking system. From the Middle Ages to WWI, the most common payment instrument outside coins and banknotes was operated by both banks and non-banks (Van der Wee 1977).

Similarly, banks and non-banks alike will operate e-payments. This makes history an interesting source of inspiration to search for institutional solutions in order to fix the impact of the payment revolution on financial instability caused by a lack of access to emergency liquidity assistance.

In [recent work](#) (Avaro and Bignon 2019), we explored the implications of this more decentralised and less banked payment landscape for the design of central banks' interventions when fighting financial crises. We take the example of the Banque de France because Bignon and Flandreau (2018) show that it was especially successful

in taming financial and banking panics. We add that this was achieved in a situation of significantly unbanked payments in which non-banks represented half of the borrowers at the Banque de France discount window.

### **Payment instruments, non-banks, and financial stability**

One of the most radical transformations is observed in China, where payments with mobile phones using Quick Response code systems operated by new fintech giants Alipay and WeChat Pay reached \$41 trillion in 2017 (eg. Klein 2019). The number of Chinese merchants refusing cash is [taking off](#), forcing the People's Bank of China to issue a formal notice stating that renminbi cash is legal tender.

*With the ongoing change in day-to-day payment habits towards more digital and unbanked solutions, central banks are not without weapons. They can turn to their own history to adapt their refinancing policy to the new environment*

In India, where the yearly digital payment flows are expected to reach \$1 trillion in a decade, the **competition is raging** among local start-ups and fintech giants. Outside Asian markets, the big tech players are also investing massively in digital payment technologies – Facebook and Telegram are running a **close race** to issue their own digital payment solutions.

Yet payment operators can fail when they do not have the liquidity required to meet payment ends. In such a case, users of those payment instruments will be unable to use them to pay, thus spreading the liquidity stress across the payment system. This was not a big deal in the 20<sup>th</sup> century during which payments were traditionally operated by banks. The institutional fix was the lender-of-last-resort lending by a central bank (sometimes called the 'discount window'). When injecting liquidity, a central bank swaps money against illiquid means of payments, thus cooling down financial stress, and reducing the number of fire sales and failures, and the interest rate at which people borrow.

The new solutions for digital payments are challenging this model. The new operators are outside the traditional scope of intervention of central banks, as a central bank is the bank of the other banks and not the bank of all payment operators. This is directly influencing the ability of central banks to fulfil their mandate of financial stability.

History can help us to think about solutions fit for the new system. Before 1914, the central bank opened up access to the central bank discount window to all payment operators, in an effort to limit the systemic cost related to the default of non-banks. This facility was widely used.

Many companies had secured access to the discount window, with about 5% of French companies eligible in 1898. Yet allowing access did not mean that everybody used it. In 1898, 0.05% of non-bank companies had effectively used it, which compares to 27% of banks which did.

## **Width of the discount window and the moral hazard issue**

Theory suggests that operating a widely accessible discount window may expose the central bank to greater risks (Jensen and Meckling 1976, Rochet and Tirole 1996). The certainty of the access to the discount window may bring issues of moral hazard and induce financial intermediaries to increase their exposure to credit risk in the hope of selling the risky assets to the central bank when the crisis comes, in a mechanism akin to a risk-shifting strategy.

Yet the Banque de France was a very profitable central bank, suggesting that something prevented the theoretical fantasy to materialise. As suggested by theory, three mechanisms were effective in mitigating agency issues arising from the operation of a wide discount window:

- the pledging of collateral that was seized in case of default;
- the screening and monitoring of the risk appetite of the borrowers, and its use in the central bank decision to lend; and
- the use of some form of relationship lending by which the Bank tends to reward the building of a long-term reputation by the use of the discount window.

The screening of risk appetite by the Banque de France follows a review process similar to what rating agencies are doing today. It consists of an analysis of the risk culture, the credit risk and the internal governance of the entity. The central bank acquires and processes proprietary soft information to grade risk appetite and uses it to discriminate against different types of counterparties.

Very few non-banks were rated as risk-takers. With banks, the Banque de France uses its risk assessment to prioritise lending to risk averse counterparties, in a mechanism akin to the use of haircuts that differs depending on the ratings of the financial assets.

### **Cooling down stress in crisis times**

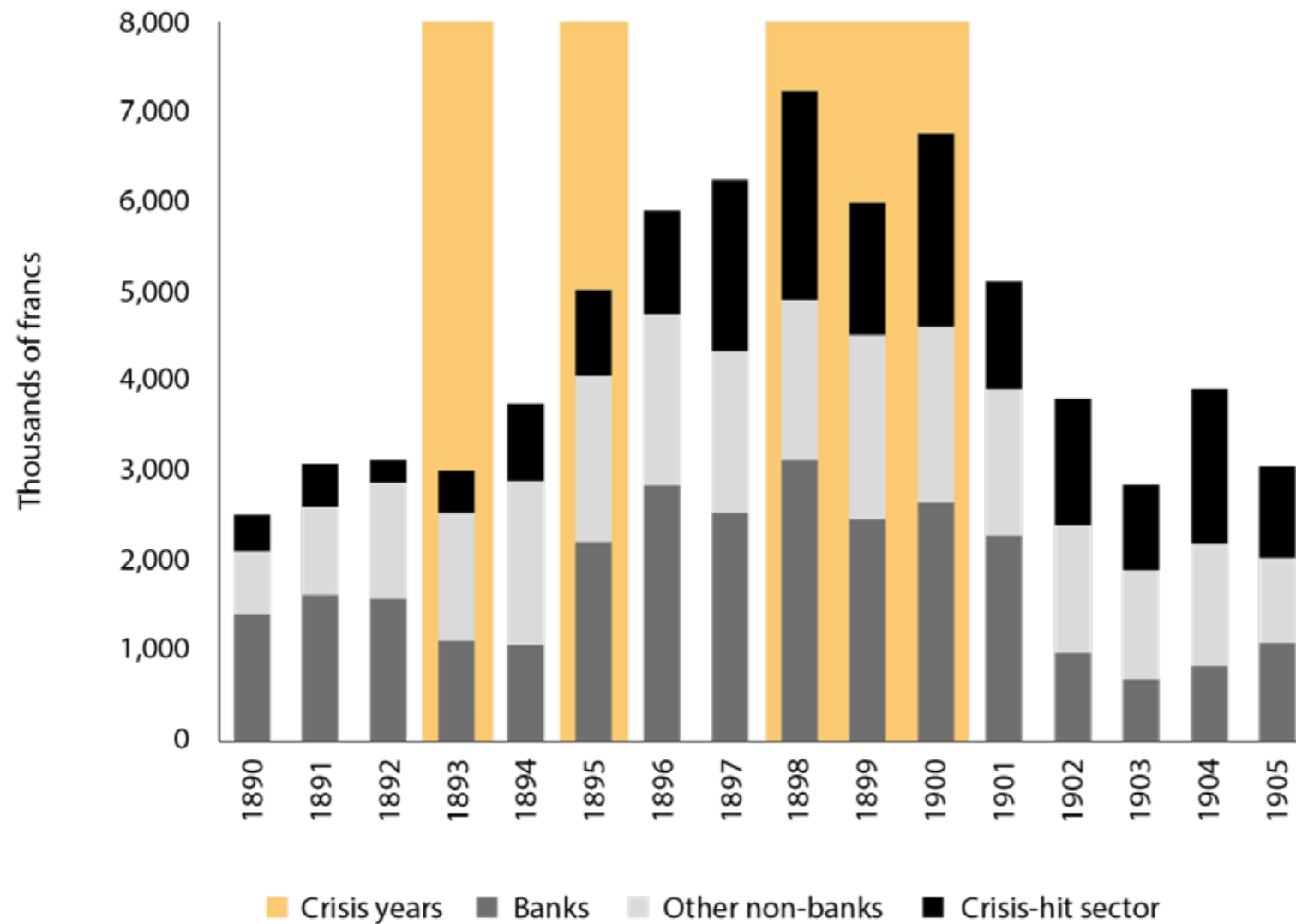
The central bank used all those risk management tools when it had to extend its discount operations to smooth negative local economic shocks. This was true both at the intensive and extensive margin. To show this, we study how crisis stress – such as the war in Cuba between Spain and the US, a cattle disease, or a bank run – impacted the discount activity in the 20 regional economies.

In crisis times, the Banque de France increases its liquidity support more to risk averse agents and to agents that had the ability to pledge more collateral. During a crisis, the central bank values more relationship lending and discounts with agents who had already used the discount window a year before.

The rationale is that the Banque de France had accumulated a backlog of information on them, most often because they use the discount window to transfer funds within France through the national payment system operated by the central bank.

Crises also bring new users to the discount window. In regional economies hit by a crisis, most newcomers to the discount window were non-banks. The region around Moulins in the centre of France – where young calves were fed to grow – exemplifies the case. Two droughts and a cattle disease had put a strain on the farmers. With the unfolding of the financial distress, the discount activity with banks had increased significantly, but a notable development was the discount to the landlords of grass fields who increased credit to their clients, the cattle farmers (see Figure 1).

**Figure 1. Volume of liquidity provided by the Bank of France in Moulins, 1890-1905, by category of presenter**



Source: Archives of the Banque de France, Banque de France supervisory report of Moulins (1890-1905).

Reading: In 1898, Banque de France counterparties borrowed 3,120,000 francs, the suppliers of the crisis-hit sector borrowed 2,320,000 francs and the other non-bank counterparties received 1,800,000 francs.

Note: The category crisis-hit sector features mostly local landlords and some cattle farmers whose activity was hit by weather shocks and a cattle disease. 'Other non-banks' includes non-banks whose activity was not directly impacted by the crises. Shaded columns represent crisis years (weather shocks and a cattle disease).

To make sure that access to the discount was effectively opened to a diverse set of counterparties, the Banque de France accepted a broad and diverse set of guarantees to the discount operations. On top of marketable securities, it also accepted credit default swap-type instruments such as sureties, a special contractual form whereby the issuer promised to pay in lieu of the debtor in case of a failure.

Figure 2 shows that this was especially useful in crisis-hit regions where the proportion of discount operations guaranteed by credit default swap-type guarantees was more than twice the level of that in non-crisis regions.

Finally, our study indicates that the Banque de France made special use of its screening of risk appetite in distressed times. At the same time, new non-bank counterparties increased their probability of accessing the discount window in crisis times if the central bank deemed them to be risk averse.

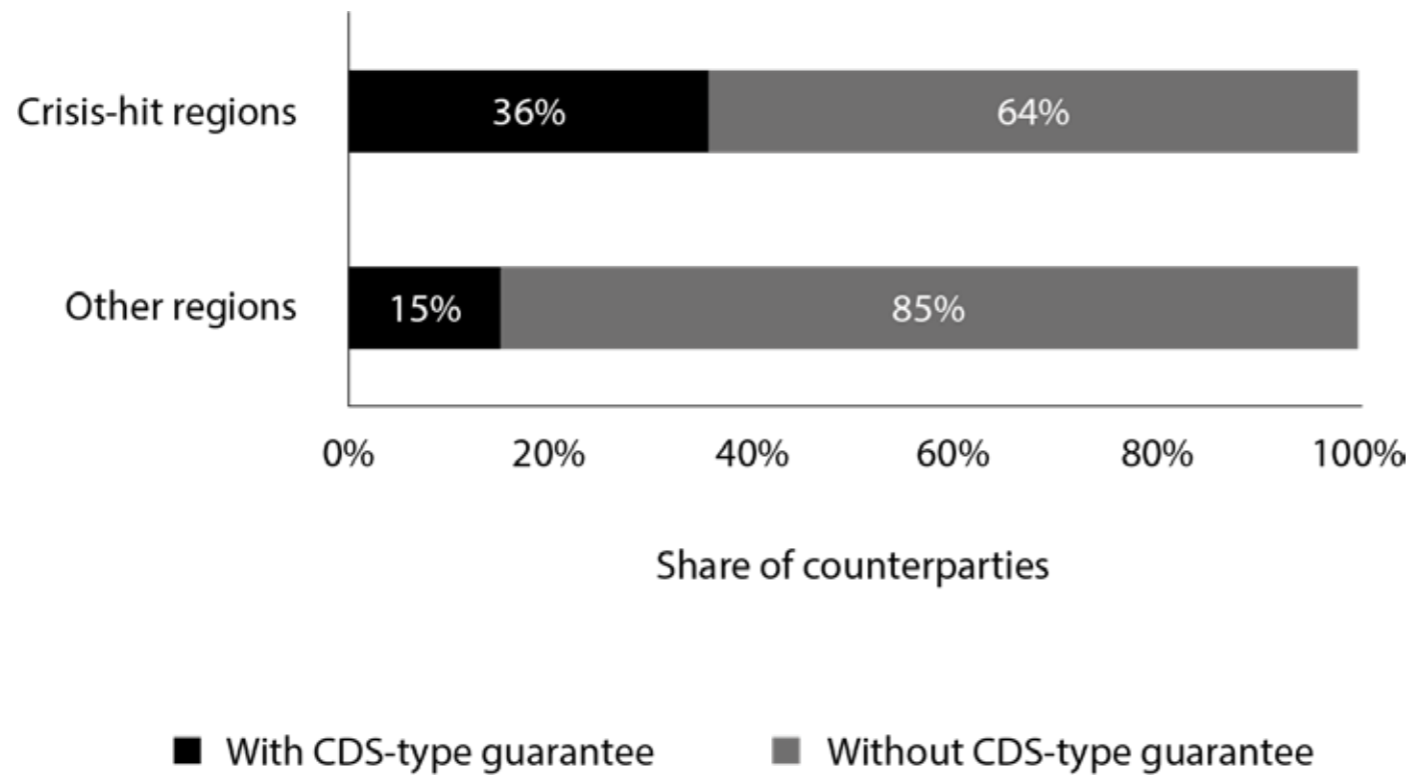
Although operating this risk management framework requires a lot of information gathering by front, middle, and back offices, it is worth noticing that the Banque de France did not lose money in crisis-hit regions despite an increased discount activity and a more diverse set of counterparties.

This illustrates how the central bank mastered the risk-taking channel of a wide discount window by adopting the right set of risk management tools, thus endowing it with a tool which was efficient in reducing payment system stress.

### **Lessons from the history of the Banque de France**

With the ongoing change in day-to-day payment habits towards more digital and unbanked solutions, central banks are not without weapons. They can turn to their own history to adapt their refinancing policy to the new

**Figure 2. Use of credit-default-swap type of guarantees among counterparties in districts hit or not hit by a crisis**



Source: Archives of the Banque de France, rapports d'inspection 1898.

Reading: In 1898, 36% of counterparties from the regions hit by a crisis pledged a credit-default-swap type of guarantee.

Note: The category 'crisis' groups 20 regions – out of 94 – that were hit by an economic crisis triggered either by trade reduction caused by the Spanish-US war of 1898, by an agricultural disease or by a bank run.



environment. This may help them to adapt their toolkit to address potential additional risk to financial stability without requiring them to increase their risk load. ■

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The background of the slide features a dark blue world map. In the lower-left foreground, a hand is holding a tablet. The tablet screen displays the 'libra' logo in a light blue circle, with the word 'facebook' in smaller text below it. The overall aesthetic is professional and tech-oriented.

# Money and private currencies: reflections on Libra

The link between money and trust has lost none of its relevance. Yves Mersch considers Libra and calls for a global regulatory and supervisory response to mitigate risks

In 1787, during the debates on adopting the US Constitution, James Madison stated that “[t]he circulation of confidence is better than the circulation of money.” It’s telling that Madison chose to use public trust in money as the yardstick for trust in public institutions – money and trust are as inextricably intertwined as money and the state. Money is an “indispensable social convention” that can only work if the public trusts in its stability and acceptability and, no less importantly, if the public has confidence in the resolve of its issuing authorities to stand behind it, in bad times as well as in good.

Madison’s 18<sup>th</sup> century remark on the link between money and trust has lost none of its relevance in the 21<sup>st</sup> century. The issue of trust in money has resurfaced in the public debate on privately issued, stateless currencies, such as bitcoin, and their promise to serve as reliable substitutes for public money. This is neither the place nor the time for me to repeat my past statements on the shortcomings of cryptocurrencies<sup>1</sup> and why they do not fulfil the basic tests of what constitutes ‘money’.

Instead, I will talk about Libra, Facebook’s newly announced private currency. It is scheduled for release in the first half of 2020 by the very same people who had to explain themselves in front of legislators in the United States and the European Union on the threats to our democracies resulting from their handling of personal data on their social media platform.

There are three key questions here. First, how does Libra differ from other private currencies and from public money? Second, what legal and regulatory challenges does it pose? And third, in the light of its mandate, what position should a central bank like the ECB take towards Libra?

The remainder of the article will be dedicated to these three questions, not with a view to conclusively answering them, but merely to raise awareness of some of the risks of Libra, to question its main premises and, in the process,

to highlight the perils of entrusting the smooth processing of payments, the savings of citizens and the stability of the global monetary and financial systems to unaccountable private entities with a questionable track record in matters of trust.

So let me turn to my three questions. First, how is Libra different from other private currencies and from public money?

*I sincerely hope that the people of Europe will not be tempted to leave behind the safety and soundness of established payment solutions and channels in favour of the beguiling but treacherous promises of Facebook's siren call*

Despite the hype surrounding it, Libra is, in some respects, no different from other, established private currencies. Similar to cryptocurrencies, Libra will be issued through a public ledger running on a form of blockchain technology. And similar to e-money, Libra will be distributed to end users electronically in exchange for funds denominated in fiat currencies.

But there are some notable differences that are extremely concerning. Libra's ecosystem is not only complex, it is actually cartel-like. To begin with, Libra coins will be issued by the Libra Association – a group of global players in the fields of payments, technology, e-commerce and telecommunications.

The Libra Association will control the Libra blockchain and collect the digital money equivalent of seignorage income on Libra. The Libra Association Council will take decisions on the Libra network's governance and on the Libra Reserve, which will consist of a basket of bank deposits and short-term government securities backing Libra coins. Libra-based payment services will be managed by a fully owned subsidiary of Facebook, called Calibra.

Finally, Libra coins will be exclusively distributed through a network of authorised resellers, centralising control over public access to Libra. With such a set-up, it is difficult to discern the foundational promises of decentralisation and disintermediation normally associated with cryptocurrencies and other digital currencies. On the contrary, similarly to public money Libra will actually be highly centralised, with Facebook and its partners acting as quasi-sovereign issuers of currency.

You may be wondering what the problem is with Libra's centralisation. If public money is also centralised, why should Libra be any different?

What the advocates of Libra and other private currencies conveniently gloss over is that, because of its nature as a public good, money has traditionally been an expression of state sovereignty. It is no coincidence that, throughout history, sovereign actors have underpinned all credible and durable currencies.

This historical fact, affirmed in GF Knapp's state theory of money and in the Chartalist school of economic thought, has had a lasting impact on orthodox perceptions of the concept of money as a public good and has found its way into statutory definitions of legal tender.

When it comes to money, centralisation is only a virtue in the right institutional environment, which is that of a sovereign entity and a central issuance authority. Conglomerates of corporate entities, on the other hand, are only accountable to their shareholders and members. They have privileged access to private data that they can abusively monetise. And they have complete control over the currency distribution network. They can hardly be seen as repositories of public trust or legitimate issuers of instruments with the attributes of 'money'.

The high degree of centralisation that is Libra's hallmark, and the concentration of its issuance and distribution networks, are not the only features inhibiting trust. Despite its audacious global currency aspirations, Libra lacks a global lender of last resort. Who will stand behind it in a liquidity crisis situation?

Libra is also devoid of the equivalent of a deposit guarantee scheme to protect its holders' interests during a crisis. Moreover, the limited liability of the Libra Association members raises serious questions about their resolve to satisfy the claims of Libra holders with their full faith and credit, as central banks do with public money.

Finally, the fact that Libra is backed by a basket of sovereign currency-denominated assets appears to defeat the very purpose of its issuance as a private currency. Why bank on a proxy when one can put one's trust in the genuine

article? And how will the potential volume of payment transactions settled in Libra affect the monetary aggregates of its underlying currencies, their objectives and intermediate targets?

Let me now turn to my second question, on some of Libra's legal and regulatory challenges. By straddling the divide separating currencies from commodities and payment systems, digitalised private currencies inevitably raise legal and regulatory questions. Libra is no exception. For brevity I will only address three of these challenges, but rest assured that there are many more.

The first challenge concerns Libra's fundamental legal nature. The choice is, essentially, whether to treat Libra as e-money, as a financial instrument or as a virtual currency. Libra does not appear to qualify as e-money, as it does not embody a claim of its holders against the Libra Association.

If Libra were to be treated as a transferable security or a different type of financial instrument, both the Libra Association and any other entities engaged in providing investment services through Libra coins would fall within the remit of the Markets in Financial Instruments Directive (MiFID II).

Alternatively, if Libra were to qualify as a virtual currency then, under the Fourth Anti-Money Laundering Directive, both Calibra and its authorised resellers would become subject to the Directive's anti-money laundering and counter-terrorism financing obligations, and to its registration requirement.

Given the different regulatory implications of Libra's legal characterisation, regulatory intervention is essential, to either confirm Libra's classification under one of the existing legal and regulatory frameworks, or to create a dedicated regime adjusted to its specificities.



A second challenge is to ensure that the relevant EU and member state regulatory and supervisory authorities can assert jurisdiction over Libra and its network. But how can this be done when the entities behind Libra are located outside the EU? One way would be to require national custody of a share of the Libra Reserve funds equivalent to the amount of Libra in circulation in any given EU member state.

But there may be other ways to ensure effective public control over Libra and its network, and these are worth exploring. Ensuring that payment systems are safe and accessible and exercising control over the financial market infrastructures that underpin our economies will remain public good objectives. And the conditions under which collateral or settlement finality are accepted will remain prerogatives of the regulatory or legislative authorities.

The third challenge is the need for cross-border cooperation and coordination. Because Libra will be used across borders, it is a matter of international interest. Its global nature would also call for a global regulatory and supervisory response to avoid regulatory arbitrage, ensure consistency of outcomes and guarantee the efficiency of public policy responses to Libra.

There are welcome signs that the global community is already working together to mitigate Libra's risks. Both the G7 and the Committee on Payments and Market Infrastructures have evaluated Libra, with an emphasis on its potential use in money laundering and terrorist financing. Further work is expected by the G20, the Financial Stability Board and other fora with a stake in the stability of the global monetary and financial system.

Finally, I would like to say a few words about the ECB's general stance towards financial innovations such as Libra. The ECB's Treaty-based tasks include defining and implementing the single monetary policy and promoting the smooth operation of payment systems. In the context of monetary policy, the ECB takes a close interest in market

innovations that could directly or indirectly affect the Eurosystem's control over the euro or shift some of its monetary policy to third parties.

Depending on Libra's level of acceptance and on the referencing of the euro in its reserve basket, it could reduce the ECB's control over the euro, impair the monetary policy transmission mechanism by affecting the liquidity position of euro area banks, and undermine the single currency's international role, for instance by reducing demand for it.

In the context of the smooth operation of payment systems, the ECB takes a close interest in market innovations that seek to replace the euro with alternative settlement currencies or create new and autonomous payment channels. Although some of Libra's aims are legitimate, reductions in cross-border fund transfer costs and other efficiency gains can also be obtained through established instant payment solutions.

The Eurosystem recently launched the TARGET Instant Payment Settlement service, or TIPS – a pan-European, 24/7 settlement service for instant payments. By operating in central bank money, and by being embedded in TARGET2, TIPS provides a high-performance payment solution that is safer and more economical than questionable, market-based retail payment innovations.

Let me conclude. In the field of money, history bears testament to two basic truths. The first is that, because money is a public good, money and state sovereignty are inexorably linked. So the notion of stateless money is an aberration with no solid foundation in human experience.

The second truth is that money can only inspire trust and fulfil its key socioeconomic functions if it is backed by an independent but accountable public institution which itself enjoys public trust and is not faced with the inevitable

conflicts of interest of private institutions. Of the various forms that money has taken throughout history, those that have best fulfilled their purpose and proven the most credible have invariably benefited from strong institutional backing. This backing guarantees that they are reliably available, that their value is stable and that they are widely accepted.

Only an independent central bank with a strong mandate can provide the institutional backing necessary to issue reliable forms of money and rigorously preserve public trust in them. So private currencies have little or no prospect of establishing themselves as viable alternatives to centrally issued money that is accepted as legal tender.

The stance of central banks towards modern forms of money is bound to evolve with time, and central bankers have embraced technological developments in the field of money and will continue to explore helpful new innovations. But the rise of cryptocurrencies and other forms of privately issued instruments that can only fulfil some, but not all, of the functions of money is unlikely to fundamentally upset the two truths I just described.

If anything, it will serve as a useful reminder of central banks' pivotal role as responsible stewards of public trust in money, and stress the need for vigilance towards phenomena capable of undermining public trust in the financial system. I sincerely hope that the people of Europe will not be tempted to leave behind the safety and soundness of established payment solutions and channels in favour of the beguiling but treacherous promises of Facebook's siren call. ■

**Yves Mersch is a Member of the Executive Board of the ECB**

## Endnotes

1. See Mersch, Y (2018), "[Virtual or virtueless? The evolution of money in the digital age](#)", lecture at the Official Monetary and Financial Institutions Forum, London, 8 February.

*This article is based on a speech [delivered](#) at the ESCB Legal Conference, Frankfurt am Main, 2 September 2019*

# Possible risks in Facebook's pursuit of a 'stablecoin'



Facebook's new cryptocurrency has the potential to be attractive to those countries that do not have strong sovereign currencies. Maria Demertzis and Jan Mazza write that regulators have so far treated cryptocurrencies as a minor risk to national economics, but Libra could change everything

Facebook recently unveiled its plan ([white paper](#)) to launch a new digital currency, called Libra, in the first half of 2020. The company's scale as the largest social media service in the world coupled with its failure to appreciate its influence over [modern democracies](#), led to more fears of global dominance following the announcement.

The project is powered by the Libra Association, composed of 28 founding members, including large corporations active in payment systems aiming to reach 100 members by the date of the launch. The white paper also discusses the creation of Calibra, the digital wallet on which Libra will operate.

The Libra Association is set up as a non-profit Swiss-based foundation and is in charge of the management and policy of the whole infrastructure. Businesses can become members, insofar as they meet [specific criteria](#) and contribute with an initial investment of at least \$10 million. In return, members are entitled to voting rights in the Libra Association Council (one vote each \$10 million investment, up to a limit) and run a validator node of the permissioned blockchain. While the white paper discusses the broad philosophy of the new product, it is not a detailed description of how it will operate, leaving therefor a lot still quite open.

One important point revealed, however, is that the Libra aims to be a *stablecoin*. This is one of the most important [problems](#) of other cryptocurrencies like bitcoin. The value of the Libra will be based on a basket of stable assets. The composition of such a basket could vary over time in response to *"significant changes in market conditions."*

Libra creation should work as follows. Initial investors will create a pool of assets, the reserves. The Association then decides on the composition of the basket and pegs the Libra to it. For any Libra created (minted), there needs to be a unit of the corresponding basket of assets. Authorised resellers purchase Libra coins from the Association by

providing in exchange fiat assets to fully back such coins that are added to reserves. Users then can request Libras from the authorised resellers.

Reserves will then be fully invested in low-risk short-dated interest-bearing assets, the revenues of which will serve to cover operating costs and pay out dividends to founding members. The reserves and the promise to have a stable and thus well sought out currency is at the heart of Libra's business model.

*The global regulatory environment had taken the view till now that the value of crypto assets in circulation is not sufficiently sizable to pose financial stability risks*

But can Libra really be a stable coin? If the underlying assets are stable, the Libra will also tend to be stable. And yet, the price of the Libra will also depend on the commitment to supply coins at the speed demanded. This is not a trivial matter as the Association will have to back new coins with the underlying assets.

Consider an occasion in which a Libra hype leads to a very high demand for coins (not unlike what we have seen for bitcoins). To preserve the value of one Libra, the Association will have to mint new coins at the rate demanded and back them up by buying the assets in the underlying composition.

It is not obvious that suppliers will be willing to do that for any level demanded. Then one of two things can happen: either supply will not match the increased demand, in which case prices will go up. This by itself implies that Libra can be subject to bubbles. Or, the Association increases the value size of the underlying basket by changing the composition, equivalent to a currency appreciation in order to reduce demand.

Either way, the value of one Libra depends crucially on the Association's commitment to keeping it stable. But unlike central banks that have a public function, it is not clear that the Association has the same function and thus the same level of commitment.

[Barry Eichengreen](#) argues that *"...the Fed can raise and lower interest rates and thereby affect the value of the dollar. But what prevents Facebook and its 28 corporate partners — the likes of Uber — from changing the composition of the Libra basket and altering its value as they see fit? What prevents them from changing the rules of the game midstream?"* We will come back to this point further down again.

But what about risks? The fact is that we will not understand the risks in full until the Libra is up and operating. For the moment, the biggest risks that arise are also the features that make it potentially a big success: *scale* and



*accessibility*. There are 2 billion Facebook users worldwide that will be the potential user-base at Libra's disposal (Figure 1).

By comparison, Bitcoin owners were estimated in 2017 to be **7.1 million** worldwide. Given such a scale, as indeed the Governor of the Bank of England Mark Carney said in the Monetary Policy Forum in June this year, the Libra could become "*instantly systemic*" on launch day and should, therefore, be put under tight regulatory scrutiny<sup>1</sup>.

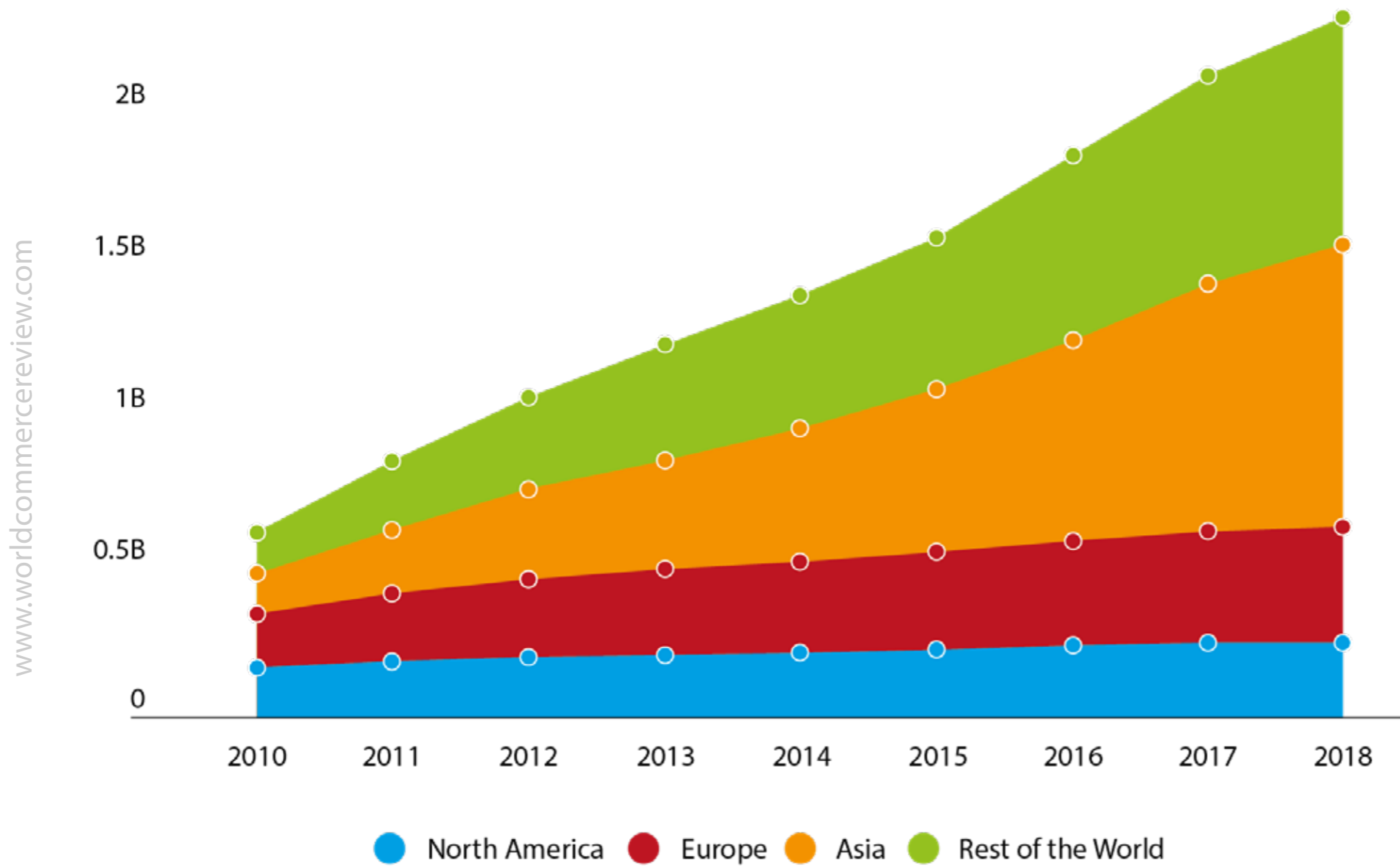
In a recent report, the BIS has discussed the complex trade-offs that will arise "*between financial stability, competition and data protection.*" One such complex case arises from Calibra, the digital wallet (cryptocurrency exchange) on which Libra will be stored. Currently, there are around 200 **cryptocurrency exchanges** on which more than 1,600 cryptocurrencies are bought and sold. Libra has the power to push its users to apply its own digital wallet, just like Amazon had the power to push their Kindle ebook reader to all its customers that used its other services.

The potential for a massive user base can lead to monopoly power for the issuer, but can also lead to severe financial vulnerabilities from system failures (either deliberate and fraudulent or simply erroneous).

Furthermore, the white paper argues that users who store their Libras at Calibra will share no information with other Facebook extensions (such as Whatsapp or Instagram) about the content of outgoing and incoming transactions.

However, the single most important concern voiced in all reactions since the Libra announcement has been about distrusting the way Facebook operates, and particularly with regards to data privacy. Libra, therefore, appears to start with a sizable trust deficit that may hinder its promised popularity. There is substantial scope for regulation to prevent either unfair competition or indeed protect the consumer.

Figure 1. Monthly active Facebook users



Source: Bloomberg

But an important ambition outlined in the white paper is also increasing access. This payment service, the paper argues, will promote financial inclusion by *“banking the unbanked.”* The paper describes the role Libra can play in third world countries by mentioning the vast pool of people sending or receiving remittances as one of the key targets of the venture, along with *“1.7 billion adults globally... outside of the financial system with no access to a traditional bank, even though one billion have a mobile phone and nearly half a billion have internet access.”*

Can the Libra deliver this ‘access’ by becoming a global currency, and still remain a stablecoin? We do not believe that cryptocurrencies are good candidates of replacing sovereign currencies, in particular in the developed world.

By contrast, such currencies, and in particular stablecoins, like the Libra, could be a good candidate for replacing (or at least running in parallel to) national money in countries with unstable and weak sovereigns. And in fact, since the intention according to the white paper is very much to reach those that are unbanked and stimulate financial inclusion, they may become quickly popular in developing countries.

We see three problems here. The first adds again to the possibility of reducing competition. There exist already a number of successful providers of mobile phone payments systems. However, while this industry is booming in Africa, the potential for scale might wipe out any competition, thwarting local financial innovation initiatives.

The second problem relates to the stability of the Libra. Can the authorised resellers accumulate third world currencies and provide basket assets to the Association in order to acquire Libras? The more popular Libras become in the developing world, the more difficult it will be to issue new coins against the stable basket. Or will profits generated in the developed world help subsidise payments in the developing world? All of these issues will still need to be clarified<sup>2</sup>.

The third stems from the ambition to improve the [user experience](#) by making transactions easier and quicker. Libra should be used for *“paying bills with the push of a button, buying a cup of coffee with the scan of a code or riding your local public transit without needing to carry cash or a metro pass.”*

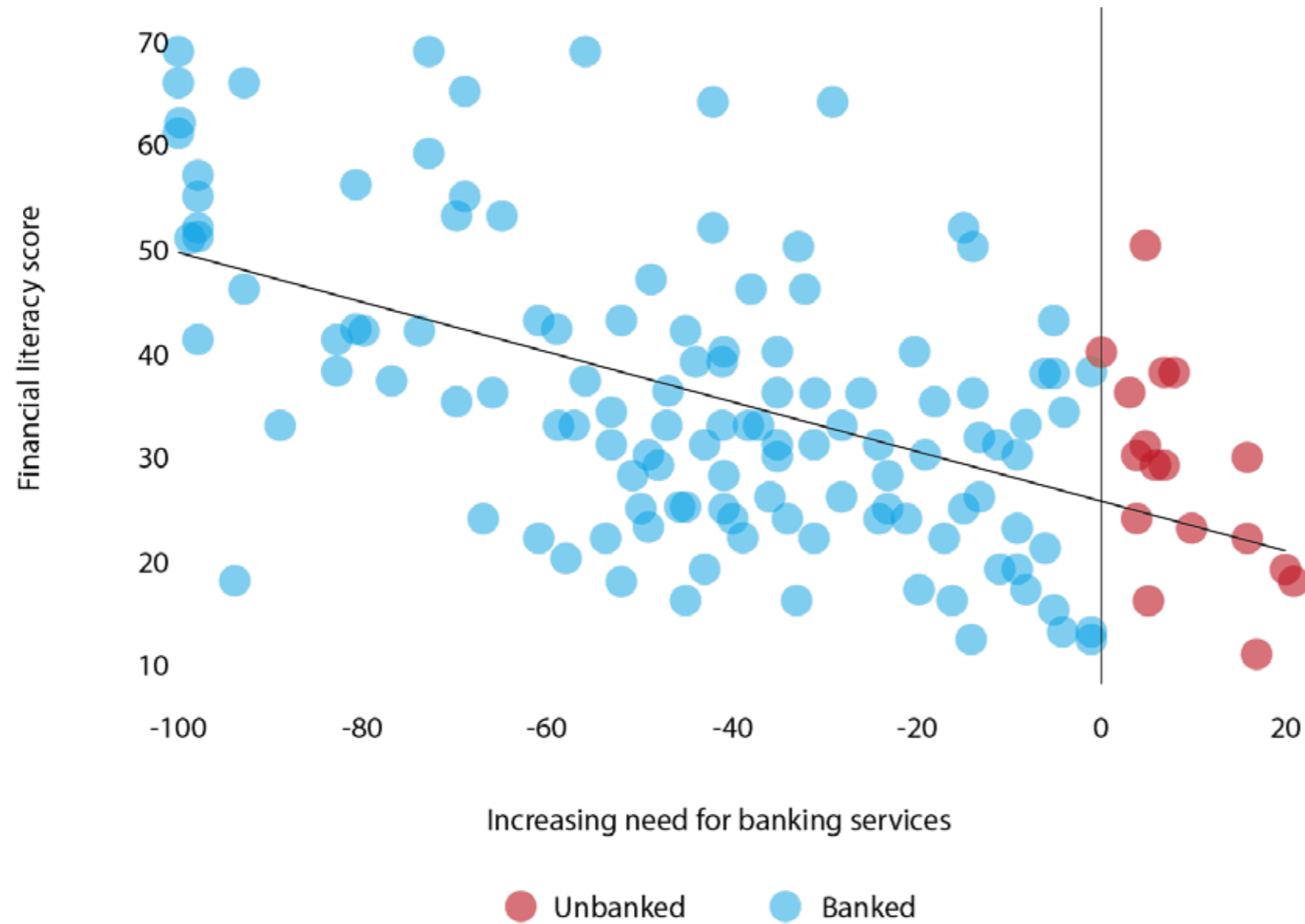
But the ease of transactions, comfortable though it is, comes with important risks. A [recent study](#) based on US survey data done at the Global Financial Literacy Excellence Centre, *“... show(s) that Millennials who use mobile payments are at a greater risk of experiencing financial distress and engaging in financial mismanagement.”*

In fact, *“those who use mobile payments are nearly 16 percentage points more likely to overdraw their checking account and 23 percentage points more likely to turn to alternative financial services.”* Annamaria Lusardi, one of the authors of this report, argues that *“Those who use mobile payments show lower levels of financial literacy and worse financial management practices than non-users.”*

Therefore, reducing the threshold in terms of easiness of digital transactions may actually increase financial vulnerability, in particular amongst those that are the most financially illiterate. Libra needs to rethink how easy it wants transactions to be when the levels of financial literacy are very different within and between countries.

This is a particularly pertinent point as those who are likely to be attracted to the Libra, namely those who do not have a bank account and need to transfer or receive remittances, are also the most likely to be the least financially literate. Indeed figure 2 below shows that countries that have increasing needs to access banking services are also those that are the least financially literate.

**Figure 2. Financial literacy and potential Libra users**



Source: Bruegel based on S&P Global FinLit Survey and Global Findex dataset (World Bank).  
Notes: "Increasing need for banking services" is measured as the difference between the % of people sending/receiving remittances in the previous year and the % of people that have a bank account.

One needs to be very cautious about drawing conclusions. There is ample **evidence** that developing countries have increased financial inclusion and have empowered many by providing simple financial solutions in mobile appliances.

However, these are very **targeted solutions** to specific problems. The uniformity of Libra may fail to capture the specific needs of various developing countries while exposing them to risks that relate to poor financial understanding.

The global regulatory environment had taken the view till now that the value of crypto assets in circulation is not sufficiently sizable to pose financial stability risks. They are, however becoming increasingly **vigilant** of the potential regulatory gaps that might need to be addressed.

The FSB Chair Randal K Quarles **referred** to the need to contain the risks that arise from financial innovation and particularly, “...*(a) wider use of new types of crypto-assets for retail payment purposes would warrant close scrutiny by authorities to ensure that that they are subject to high standards of regulation.*” The issuance of the Libra may just accelerate that. ■

**Maria Demertzis is Deputy Director and Jan Mazza is a Research Assistant at Bruegel**

#### *Endnotes*

- 1. And recently even President Trump **talked** about the need for regulating cryptocurrencies.*
- 2. There is also the issue as to whether the Libra is convertible to all developed world currencies. If it is not then the issue of*

*financial inclusion is stopped in its tracks.*

*Facebook is a corporate member of Bruegel and contributes less than 1% to our annual budget. Facebook has not been involved in the writing of this post. This article was originally published on [Bruegel](#)*

# Libra paves the way for central bank digital currency

Dirk Niepelt argues that while we may be witnessing a seismic shift in the monetary system, Libra's role in that shift will be an indirect one



**P**lans by Facebook and its partners to launch a global digital currency have the fintech sphere buzzing with rumours, and regulators, central banks, and 'old finance' worried. This column, part of the Vox debate on the future of digital money, argues that while we may be witnessing a seismic shift in the monetary system, Libra's role in that shift will be an indirect one.

By taking the status quo option off the table, Libra or its next best replica will force monetary authorities and regulators to choose between central bank-managed digital currency and riskier private digital tokens.

These plans by Facebook and its partners to launch Libra, a global digital currency, are at an early stage but they have focused minds. 'Old finance' frets about the prospective new competitor; the fintech sphere is buzzing with rumours; and regulators, central banks, and legislators alike are worried. Lack of detail in the Libra [whitepaper](#) adds to the nervousness.

Are we witnessing a seismic shift in the monetary system? Probably, but Libra's role in that shift is going to be an indirect one. Rather than the protagonist, Libra will be a catalyst for monetary change – a change that is driven, *nolens volens*, by regulators, central banks, and traditional financial intermediaries.

### **Digital currencies**

What is a global digital currency of the type the Libra consortium wishes to issue? It is helpful to distinguish two aspects of such a 'stablecoin' (ie. an asset-backed digital token). The first relates to use: the token constitutes a versatile and efficient medium of exchange for domestic and international payments, both retail and wholesale.

Its digital nature keeps transaction costs low, thereby shifting bargaining power from existing payment service providers to their customers and offering the unbanked affordable access to basic finance.

It also allows payment and settlement systems to be better integrated. A successful digital currency exploits network externalities to their fullest extent, gaining stature due to its versatility and user base and broadening the user base because of its stature.

The second aspect relates to the assets that back the digital token. In Libra's case, these assets are to include securities and bank deposits denominated in the currencies of a few advanced economies. In other cases, stablecoins are backed by securities denominated in a single currency.

*Libra will be a catalyst for monetary change – a change that is driven, nolens volens, by regulators, central banks, and traditional financial intermediaries*

In their purest form, the latter stablecoins constitute claims on central bank money of a single monetary authority. If the claims are direct, then the tokens are central bank digital currency (CBDC) or 'Reserves for All' (Niepelt 2015). If they are indirect – ie. mediated by a bank or a fund – then they constitute 'synthetic CBDC' (Adrian and Mancini-Griffoli 2019)<sup>1</sup>.

### **Inherent tradeoffs**

Beyond the benefits for individual users, digital currencies can have wide-ranging macroeconomic implications. For a start, their introduction may affect banks in their role as issuers of money; if mismanaged, this can have repercussions for financial intermediation and stability. At the global level, a widely adopted digital currency alters the relative standing of national currencies.

Carney (2019) emphasises the upside of such an unravelling of the current international financial architecture with its outsized role of the US dollar. But there are also risks, at least for those countries that would see demand for their national currencies fall and capital flee. For them, a successful new digital currency would have similar macroeconomic implications as conventional dollarization (Niepelt 2016, Hamilton 2019, Adrian and Mancini-Griffoli 2019).

With any global digital currency of note, policymakers confront new tradeoffs: financial inclusion of the unbanked and enlarged financial choice sets for citizens suffering from financial repression come at the cost of lower government revenues (in the countries whose citizens benefit), possibly more volatile capital flows, and lower rents in the banking sector.

The benefits that arise from large network externalities are the mirror image of increased financial stability risks as well as the danger that transaction data are monopolised and consumer sovereignty curtailed. And a payment

system that aims at convenience and hassle-free cross-border payments likely compromises on the prevention of illicit transactions<sup>2</sup>.

### **Inferior Libra**

But with Libra, these tradeoffs are less favourable than with 'Reserves for All' or a synthetic CBDC, for several reasons. First, because central banks and regulators can more easily guarantee consumer protection, ensure privacy standards, and check the legitimacy of payments when they are directly engaged in the provision of a digital currency.

In principle, a private currency issuer such as the Libra consortium can be regulated and monitored to the same effect. But as experience shows (certainly in the case of Facebook), this is hard in practice when interests are sufficiently misaligned.

Similarly, tradeoffs that involve macroeconomic effects of a digital currency (and their international repercussions) can better be managed if the authorities traditionally in charge of macroeconomic and financial stabilisation – central banks, financial regulators, and finance ministries – are active players rather than passive bystanders<sup>3</sup>.

In fact, central bank control over a digital currency lets the monetary authority effectively eliminate all macroeconomic downside risks that arise from the currency's introduction. Under general conditions, a central bank can always ensure, at a minimum, that a swap of CBDC for deposits does not have negative macroeconomic consequences (Brunnermeier and Niepelt 2019a, 2019b, 2019c).

Third, Libra would also offer smaller benefits to consumers and businesses than CBDC because the portfolio composition of the 'Libra Reserve' would expose them to excessive exchange rate risk. A means of payment is

particularly useful when it is denominated in the local unit of account<sup>4</sup>. This is why consumers and businesses in the US prefer to transact in US dollars, the currency everybody else in their neighbourhood uses, rather than in euros.

And it explains why, according to Koning (2019), global monies have a miserable track record. Libra according to current design would not offer the local-unit-of-account advantage because the 'Libra Reserve' would be invested in multiple currencies.

Even if the circulating Libras were always fully backed, their exchange rate relative to national currencies thus would fluctuate, exposing users to unwarranted risks<sup>5</sup>.

Finally, the institutional setup behind Libra could put the currency's liquidity at risk, exposing users to additional uncertainty that a (synthetic or not) CBDC would not bring about. According to the [whitepaper](#), only resellers, who stand between users and the 'Libra Reserve', were to redeem Libras against assets in the reserve; that is, only resellers could provide liquidity in times of falling aggregate Libra demand.

But whether resellers would actually have an incentive to provide this liquidity is unclear. Since Libras would constitute claims to the assets in the 'Libra Reserve' but not to the returns on those assets (which the Libra consortium plans to pocket), resellers might want to redeem at the earliest possibility and keep the assets for themselves (Zellweger-Gutknecht and Niepelt 2019).

## **Conclusion**

Many other aspects of the proposed Libra architecture remain in the dark<sup>6</sup>. What is clear, however, is that CBDC dominates a Libra-type stablecoin in almost all respects<sup>7</sup>.

When confronted with the choice between the status quo and a new financial architecture with CBDC, most central banks have responded cautiously. But Libra or its next best replica will take this choice off the table – the status quo ceases to be an option.

The new choice for monetary authorities and regulators will be one between central bank managed CBDC on the one hand and – riskier – private digital tokens on the other. Central banks have a strong interest to maintain control over the payment system as well as the financial sector more broadly and to defend the attractiveness of their home currency.

*Nolens volens*, they will therefore introduce ‘Reserves for All’ or promote synthetic CBDCs. In economics, things take longer than one thinks they will, as Rudi Dornbusch quipped, but then they happen faster than one thought they could. ■

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#### *Endnotes*

- 1. See also Brunnermeier et al. (2019) on the prospect of ‘digital currency areas’ as compared to traditional, geographically delimited currency areas.*
- 2. For a discussion of some of these risks, see BIS (2019), Adrian and Mancini-Griffoli (2019), Cecchetti and Schoenholtz (2019), or Fatás and Weder di Mauro (2019).*
- 3. See also Adrian and Mancini-Griffoli (2019) on the benefits of narrow-bank like synthetic CBDCs compared with money-market-fund like institutions akin to shadow banks.*

4. However, see Brunnermeier et al. (2019).

5. Cecchetti and Schoenholtz (2019) and Fatás and Weder di Mauro (2019) offer an estimate of the magnitude of this risk and assess the welfare implications. Note that investors seeking to diversify their currency exposures do not need Libra. They can directly choose the currency composition of their portfolios, in a world with digital currencies for example by holding the CBDCs issued by different central banks.

6. These aspects include the database structure and actual technical implementation (eg. Lopp 2019) and legal questions regarding licensing in Switzerland (Zellweger-Gutknecht and Niepelt 2019). See also Eichengreen (2019) and Williamson (2019).

7. There is one factor that favours a private-sector, Libra type arrangement over a public sector solution, namely, political economy. For a discussion, see Niepelt (2018, 2020).

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# The rise of digital currency

The image features a blue background. In the center, a black laptop is open. On its screen, there is a green icon of a classical building with four columns and a triangular pediment. A hand in a black suit sleeve is shown from the right, holding a green banknote with a Bitcoin symbol on it. The hand is positioned as if about to place the banknote on the laptop screen. The text 'The rise of digital currency' is overlaid on the top half of the image.

Digital payments can bring significant benefits to customers and society. Tobias Adrian and Tommaso Mancini-Griffoli argue that accompanying risks should also be tackled

**N**ew entrants are vying to occupy the space once used by paper bills. This column, part of the [VoxEU debate](#) on the future of digital money, proposes a simple framework to make sense of who is attempting to pry our wallets open. It argues that the adoption of new digital means of payment could be rapid and bring significant benefits to customers and society, but that the risks must be tackled with innovative approaches and heightened collaboration across borders and sectors.

One approach is for central banks to engage in a public–private partnership with fintech firms to provide a safe, liquid, and digital alternative to cash: synthetic central bank digital currency.

A battle is raging...for your wallet. With sharp elbows, new entrants are vying to occupy the space once used by paper bills, or that reserved for your debit card.

Alipay, Libra, M-Pesa, stablecoins – we first need to make sense of just who is attempting to pry our wallets open. We propose a simple framework to do so.

We then argue that the adoption of new, digital means of payment could be rapid. It could bring significant benefits to customers and society, including efficiency gains in payments, greater competition, financial inclusion, and innovation in related sectors. But risks are also paramount to financial stability and integrity, monetary policy transmission, and anti-trust. These must be tackled with innovative approaches and heightened collaboration across borders and sectors.

Policymakers will not be able to remain bystanders. In fact, their actions will influence the adoption of new means of payment, and their design. One approach is for central banks to engage in a public–private partnership with

fintech firms to provide a safe, liquid, and digital alternative to cash – synthetic central bank digital currency, or sCBDC for short – which comes with its own benefits and risks.

The literature is quickly picking up on the potential disruption caused by new means of payment (eg. Duffie 2019, BIS 2019).

*... existing players will be induced to offer new and more attractive services in the payments – and especially cross-border payments – space. From desktop publishing, the digital revolution has finally reached the shores of consumer finance too*

## A framework of analysis

To help make sense of the plethora of new entrants in the payments space, we offer a simple classification scheme that we call the 'Money Tree' (Adrian and Mancini-Griffoli 2019). At its heart are four key features that help distinguish different forms of money: type, value, backstop, and technology.

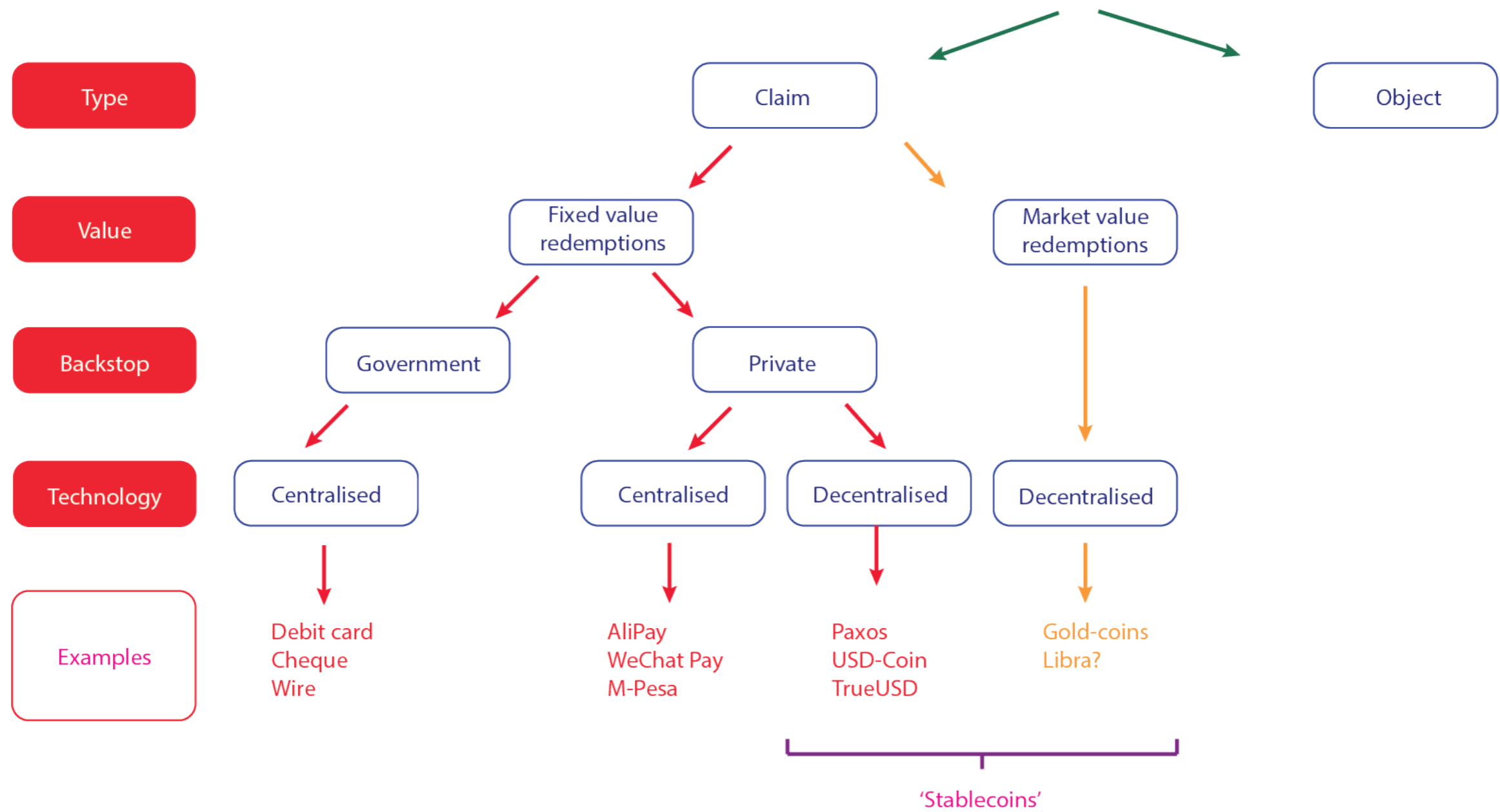
We illustrate this scheme in Figure 1 by contrasting bank deposits and stablecoins. Further details and discussions of other forms of money are in Adrian and Mancini-Griffoli (2019).

Bank deposits are the most popular means of payment in many countries. These are claims on banks, as opposed to objects with intrinsic value. Bank deposits have fixed value to the extent they can be redeemed into currency – or cash – at face value. Ten euros deposited in a bank can be redeemed against a ten-euro note with reasonable certainty in many countries. That is an incredibly useful feature, allowing payments in bank deposits to be made without concern for exchange rate risk.

Trust in the redemption guarantee rests on government backstops: deposit insurance, lender of last resort and emergency liquidity facilities, as well as careful supervision and oversight of banks. And finally, the settlement technology is usually centralised, as banks and central banks collaborate to maintain a shared ledger of account balances.

New means of payment such as stablecoins differ in important ways. Most stablecoins continue to be claims on the issuing institution. Many also offer redemption guarantees at face value – a coin bought for ten euros can be exchanged back for a ten-euro note (a sort of money-back guarantee).

Figure 1. Simplified money tree to classify different forms of money



However, trust in this pledge does not rest on government backstops. It must be generated privately by fully backing coin issuance with safe and liquid assets. Finally, the settlement technology is usually decentralised, based on the blockchain model.

Some stablecoins do not offer redemptions at fixed prices, but at market prices instead. We say their value is variable relative to the domestic unit of account. This is the case of commodity tokens, such as gold coins, and of coins that are exchanged or redeemed for the going value of the assets backing them. One example is mutual fund shares written to digital tokens that can be readily exchanged. Libra may fit this model.

### **Stablecoin adoption**

Adoption of new forms of money will depend on their attractiveness as a store of value and means of payment. Cash fares well on the first count, and bank deposits on both. So why hold stablecoins? Why are stablecoins taking off? Why did USD Coin recently launch in 85 countries<sup>1</sup>, Facebook invest heavily in Libra, and centralised variants of the stablecoin business model become so widespread? Consider that 90% of Kenyans over the age of 14 use M-Pesa and the value of Alipay and WeChat Pay transactions in China surpasses that of Visa and Mastercard worldwide combined.

The question is all the more intriguing as stablecoins are not an especially stable store of value. As discussed, they are a claim on a private institution whose viability could prevent it from honouring its pledge to redeem coins at face value. Stablecoin providers must generate trust through the prudent and transparent management of safe and liquid assets, as well as sound legal structures. In a way, this class of stablecoins is akin to constant net asset value funds which can break the buck – ie. pay out less than their face value – as we found out during the global financial crisis.

However, the strength of stablecoins is their attractiveness as a means of payment. Low costs, global reach, and speed are all huge potential benefits. Also, stablecoins could allow seamless payments of blockchain-based assets and can be embedded into digital applications by an active developer community given their open architecture, as opposed to the proprietary legacy systems of banks.

And, in many countries, stablecoins may be issued by firms benefitting from greater public trust than banks. Several of these advantages exist even when compared to cutting-edge payment solutions offered by banks called fast-payments<sup>2</sup>.

But the real enticement comes from the networks that promise to make transacting as easy as using social media. Economists beware: payments are not the mere act of extinguishing a debt. They are a fundamentally social experience tying people together. Stablecoins are better integrated into our digital lives and designed by firms that live and breathe user-centric design.

And they may be issued by large technology firms that already benefit from enormous global user bases over which new payment services could spread like wildfire. Network effects – the gains to a new user growing exponentially with the number of users – can be staggering. Take WhatsApp, for instance, which grew to nearly 2 billion users in ten years without any advertisement, based only on word of mouth!

### **Risks of stablecoins**

Risks are multiple, though that is not an excuse for policymakers to throw in the towel. On the contrary, they must create an environment in which the benefits of technology can be reaped while minimising risks, as discussed in Lipton (2019). Policymakers will need to be innovative themselves and to collaborate – across countries, but

also across sectors. Central bankers, regulators, ministries of finance, antitrust authorities, currency issuers, and technology experts will need to speak a common language for a common purpose.

The first risk is to the disintermediation of banks, which could lose deposits to stablecoin providers. However, banks will try to compete by offering their own innovative solutions and higher interest on deposits. And stablecoin providers could recycle their funds back into the banking system or decide to engage themselves in maturity transformation by turning themselves into banks.

Second, we could face new monopolies. Tech giants could use their networks to shut out competitors and monetise information. At the heart of this power is proprietary access to data on customer transactions. We need new standards for data protection, control, and ownership.

Third, there is a threat to weaker currencies. In countries with high inflation and weak institutions, people might give up local currencies for stablecoins in foreign currency. This would be a new form of 'dollarisation' and might undermine monetary policy, financial development, and economic growth. To avoid this, countries must improve their monetary and fiscal policies. The question is whether they can or should restrict foreign currency stablecoins in the interim.

Fourth, stablecoins could foster illicit activities. Providers must show how they will prevent the use of their networks for activities like money laundering and terrorist financing. This means complying with international standards. New technologies offer opportunities to improve monitoring. So, supervisors will need to adapt to the more fragmented value chain of stablecoins, including wallet providers, crypto exchanges, validation nodes, and investment vehicles.



The fifth risk is loss of 'seigniorage'. Central banks have long captured, on behalf of taxpayers, the profits stemming from the difference between a currency's face value and its cost of manufacture. Issuers could siphon off profits if their stablecoins do not carry interest but the hard currency backing them is invested at a return. One way to address this issue is to promote competition so issuers would eventually pay interest on coins.

Sixth, we must ensure consumer protection and financial stability. Customer funds need to be safe and protected from runs like the one that took down Lehman Brothers investment bank. In part, this calls for legal clarity on what kind of financial instruments stablecoins represent.

One approach would be to regulate stablecoins like money market funds that guarantee fixed nominal returns, requiring providers to maintain sufficient liquidity and capital. We could call this the 'shadow banking' approach, which attempts to extend prudential regulation beyond the classic banking perimeter.

### **Synthetic central bank digital currency (sCBDC)**

Another option is the 'narrow banking' approach. In this case, the central bank could require stablecoin providers to back coins with central bank reserves. The approach is not unheard of.

The People's Bank of China requires giant payment providers AliPay and WeChat Pay to abide by these standards, and central banks around the world are considering giving fintech companies access to their reserves – though only after satisfying a number of requirements related to financial integrity, interoperability, security, and data protection, among others.

Clearly, doing so would enhance the attractiveness of stablecoins as a store of value. Competition with banks would only grow stronger. The social price tag is up for debate.

But there are also clearer-cut advantages of offering stablecoin providers access to central bank reserves:

- stability, given the backing in perfectly safe and liquid assets;
- regulatory clarity as narrow banks would fit neatly into existing regulatory frameworks;
- interoperability among stablecoins (as client funds would be exchanged between reserve accounts) and thus greater competition;
- support for domestic payment solutions rivalling foreign currency stablecoins offered by monopolies that are hard to regulate; and
- better monetary policy transmission, thanks to lower pressure on currency substitution, and more immediate transmission of interest rates if reserves held by stablecoin providers were remunerated.

A final consideration jumps out: if stablecoin providers held client assets in reserves at the central bank, clients would essentially be able to hold, and transact in, central bank liabilities. That, after all, is the essence of CBDC<sup>3</sup>.

Bingo! We have thus manufactured what we call synthetic CBDC (sCBDC). We remain, however, fully aware that the stablecoins are the liability of private-sector firms despite the public determining the size of central bank liabilities.

sCBDC offers significant advantages over its full-fledged cousin. The latter, discussed widely in the literature and envisioned by central banks, requires getting involved in many of the steps of the payments value chain. This can be costly and risky for central banks.

Steps include interfacing with users and managing brand reputation; complying with integrity standards; offering clients an interface to hold and trade the payment instrument; picking, managing, and evolving technology; offering a settlement system; and managing data and monitoring transactions.

In the sCBDC model – which is a public–private partnership – central banks would go back to focusing on their core function: providing trust and efficiency by means of state-of-the-art settlement systems. The private sector – stablecoin providers – would be left to satisfy the remaining steps under appropriate supervision and oversight, and focus on their own competitive advantage – innovating and interacting with customers.

Whether central banks adopt CBDC at all is another matter and will result from carefully weighing pros and cons. But to the extent central banks wish to offer a digital alternative to cash, they should consider sCBDC as a potentially attractive option.

That is only one of the incarnations of stablecoins. Others will no doubt materialise and colour the future of payments and the financial industry. If anything, existing players will be induced to offer new and more attractive services in the payments – and especially cross-border payments – space. From desktop publishing, the digital revolution has finally reached the shores of consumer finance too. ■

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*Editor's note: the views expressed are those of the author(s) and do not necessarily represent the views of the IMF and its Executive Board*

### *Endnotes*

- 1. See Coindesk (2019), "[Coinbase rolls out trading in USDC stablecoin to 85 countries](#)", 14 May.*
- 2. Fast payments allow near-instantaneous and final settlement of transactions in central bank money. A prominent example is the euro area's Target Instant Payment Settlement (TIPS) service launched in November 2018.*
- 3. Importantly, appropriate legal structures would be needed to protect client assets from the bankruptcy of stablecoin providers. See Mancini-Griffoli et al. (2018) for a detailed discussion of CBDC.*

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# The benefits of a global digital currency

There have been negative reactions to the Libra cryptocurrency. Antonio Fatás and Beatrice Weder di Mauro argue that whilst a digital currency provided by central banks may be preferable, a private version would offer similar benefits

**E**conomists have reacted negatively to the prospect of Facebook's Libra cryptocurrency. This column, part of the [VoxEU debate](#) on the future of digital money, outlines how if we focus exclusively on the efficiencies a currency like Libra brings to payment, there are arguments in its favour. A global digital currency provided by central banks may be preferable, but a private version would offer many of the same benefits.

The launch of the Libra cryptocurrency has produced immediate and strong reactions from economists, regulators and even the G7, the majority of them negative. Many worry that Facebook will violate privacy provisions and use the generated data commercially. Others fret that a dominant global private currency that is outside the control of central banks could undermine monetary policy, pose risks for financial stability, and facilitate crime.

We share these concerns. We are not convinced that the Libra project will succeed – or even that it should succeed. But, as a contribution to the debate, we decided to give the idea of a global private digital currency (in other words, a Libra-type project) a chance and have tried to make the best case we could think of, focusing on the most immediate use case: as an alternative means of payment.

The Libra white paper<sup>1</sup> addresses some areas where improvement is overdue, such as financial inclusion and reduction in transaction costs for cross-border remittances. Also, if adopted more widely, a global currency might also mitigate some of the weaknesses in the international monetary system, for example the dominance of the US dollar and the difficulties in external adjustment that this causes. This was highlighted in a recent speech at Jackson Hole by Mark Carney, governor of the Bank of England (Carney 2019)<sup>2</sup>.

But the volatility of exchange rates means there is a cost in having two units of account. We focus on this trade-off, in particular from the perspective of payment. How large should the savings in transaction costs be to compensate

for the additional volatility associated to holding the currency? We use some of the details of the Libra white paper to illustrate our arguments, but our comments apply to any similar project.

### **Libra, currency boards, and fixed exchange rates**

In response to the high volatility of Bitcoin and other cryptocurrencies, developers have created 'stable coins', currencies whose value is tied to a traditional currency. Libra belongs in this category. Economists are familiar with fixed exchange rates, so this is not new. The stability of Libra is guaranteed by a redemption mechanism supported by assets that back the value of the currency in circulation. This mechanism, used by other stable coins, is equivalent to a currency board.

*While a global currency may be desirable, this currency does not have to be Libra. There are many other concerns not discussed here, such as privacy, data control, operational risk, regulatory consequences, or dominance*

Libra is global, so it is pegged to a basket of currencies. There are precedents in this for fixed exchange rates, although it is not common for currency boards<sup>3</sup>. Of course, fixing the value of Libra to a basket of currencies implies that its value will fluctuate relative to any single currency.

### **Reducing the costs of payments**

The most immediate use case for a Libra-type project would be for retail payments, in particular cross-border payments. They remain cumbersome, slow, and ridiculously costly. As an example, the World Bank estimates that the average cost of the \$600 billion of annual global remittances is 6.84%<sup>4</sup>. Improvements in technology and processes mean the average cost of remittances is getting smaller, but at disappointing speed<sup>5</sup>.

Transaction costs for local payments are smaller, although slow and costly means of payment are still common (for example, in some countries cheques are widespread, or there are high merchant fees for accepting credit cards). Hayashi and Keeton (2012) estimated the social costs of payment technologies in a sample of advanced economies to be between 1% and 3%<sup>6</sup>. Clearly there are potential efficiency gains here.

But do we need a new cryptocurrency to deal with all these cross-border and local payments inefficiencies, when existing providers could make use of similar technologies to become more efficient? Payment systems that rely on digitally supported instant-payment technologies are available. They are clearly superior to cash, cheques or credit cards. But their adoption is hampered by legacy systems, lack of incentives to adopt, and lack of competition. According to the World Bank initiative on remittances: *“the single most important factor leading to high remittance prices is a lack of transparency in the market.”*

Technology adoption also depends on factors like perceived convenience, trust and – importantly – the network effects that determine the availability of these technologies. We are not convinced that Libra solves all these issues,



but it may have technology solutions that remove some of the barriers to adoption. If we ignore this potential, we will underestimate how disruptive Libra and similar currencies can be. Adrian and Mancini-Griffoli (2019) have made a similar point.

A global currency can also help individuals diversify risk if the correlation of its returns with other risks is low, or even negative. This is plausible: when the economy is doing poorly, it is common for exchange rates to depreciate. In this case, holding a foreign currency would offer an opportunity to reduce the exposure to this risk, something that many people may not easily be able to do at the moment.

We could also imagine that a successful global currency might be adopted much more widely for pricing. A liquid global currency, used for pricing financial assets, would provide diversification against capital flow volatility and balance-sheet risks. If it was used as a unit of account and for invoicing international trade, it could create more stable trade receipts and payments.

Most of these benefits apply equally to the IMF SDR, currently used as exchange rate anchor in a few countries and is also used for some commercial transactions (IMF 2018) but, clearly, the SDR is currently not a liquid global currency to rival the dollar.

### **Costs and benefits of a global currency for retail payments**

To estimate how these potential efficiency gains compare to the risks of holding a foreign currency, we made a back-of-the-envelope calculation. We have taken the US as the domestic economy, and assumed that Libra will shadow the IMF SDR<sup>7</sup>. Between 1985 and 2019, the volatility of the SDR/USD exchange has been between 4% and 6%<sup>8</sup>, at the low end in recent years.

The question is, how large must the benefits of lower transaction costs be to compensate for the increased risk of holding the currency? A simple mean-variance model of an optimal portfolio provides a straightforward trade-off for an investor between returns and volatility as a function of risk aversion<sup>9</sup>.

The calculation has a complication: the 'return' when using Libra is proportional to the volume of payments (for example, if we think of savings in credit card fees), but the risk depends on the average holdings of Libra during the year. The relationship between these two amounts depends on how Libra would be used, that is, on the velocity of money. So we take the most pessimistic case and assume velocity of money to be equal to one: the average holding of money in any period is equal to the volume of transactions.

Table 1 summarises the results when volatility is in the historical range of 4% to 6%, and risk aversion varies between 1 and 10.

**Table 1. Required savings to compensate for risk of holding Libra**

	1	3	5	10
4%	0.16%	0.48%	0.80%	1.60%
5%	0.25%	0.75%	1.25%	2.50%
6%	0.36%	1.08%	1.80%	3.60%

*Source: Authors' calculations, based on historical data for IMF SDR.*

The (volatility) costs of holding Libra require savings between 0.16% and 3.60%. Some of these numbers might seem large, but they are small compared to the costs of remittances, credit card merchant fees, or the social costs of current payments. Recall also that the recent volatility of the SDR has been closer to 4% (as in the first row of Table 1) and, if we choose a relatively high-risk aversion (level 5), the efficiency gains would need to be only 0.80%<sup>10</sup>.

Note we are looking at the worst-case scenario in the holding period. There is no need to maintain such a high balance of Libra to make all these transactions. The shorter the Libra holding period – the higher the velocity of money, in other words – the lower the risk. In the extreme, the holding period could be a millisecond before the transaction, and then the exchange rate risk would be zero. In this case Libra would be a vehicle currency, used for conversion purposes only. This would be technologically feasible.

### **Conclusion**

Taking the Libra proposition at face value, we made the best economic case we could by focusing on it as a means of payment, domestically and internationally. We wanted to understand whether the potential benefits of a means of payment could compensate for the risks of holding a volatile asset.

Our estimates suggest that the overall risk of holding a global currency may not be large for plausible exchange rate volatility and risk aversion. On the other hand, the potential gain in lowering transaction costs in retail cross-border payments and even local payments are large.

While a global currency may be desirable, this currency does not have to be Libra. There are many other concerns not discussed here, such as privacy, data control, operational risk, regulatory consequences, or dominance.

In his speech at the 2019 Jackson Hole conference (Carney 2019), Carney discussed the benefits of a global currency that would be provided by a network of central banks, which he called a Synthetic Hegemonic Currency. But, without a coordinated effort by policymakers and regulators to create this currency, a private solution such as Libra might end up partially fulfilling this need. ■

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#### Endnotes

1. See <https://libra.org/en-US/white-paper/>
2. See also International Monetary Fund (2018) for a discussion of the weaknesses of the international monetary system that a basket currency like the SDR could mitigate.
3. Fixing the exchange rate against a basket of currencies makes the redemption mechanism more complicated. It might require a constant rebalancing of the asset side to ensure that the composition of currencies matches the composition of the basket. Otherwise, fluctuations in the exchange rates between those currencies could send the coverage rate below 100%.
4. <https://remittanceprices.worldbank.org/en>
5. The technology infrastructure behind Libra resembles that of blockchain while, at the same time, it promises to address some of its weaknesses, for example scalability. If properly implemented, moving balances from one Libra wallet to another across countries should be a smooth and costless transaction.
6. Social costs are broader than transaction fees. For instance, for a cash payment they include the resources spent by the buyer to retrieve the cash as well as by the seller to redeposit it.

7. As we write this post there are no details on the currencies that will be used in the basket, but the white paper refers to currencies from “stable and reputable central banks”. The SDR is the best known international global reserve currency that works as a claim on the currencies of five IMF members (US, euro area, China, Japan, UK).
8. This is the standard deviation of annualised daily changes over a five-year window from Cecchetti and Schoenholtz (2019).
9. This model can be seen as the solution to the optimisation of an investor with a constant absolute risk aversion (CARA) utility function.
10. As a quick reality check, if we were using the S&P 500 as the risky asset, its volatility would be around 15%. With risk aversion of 5, it would imply a required risk premium of 6%, not far from the historical equity risk premium.

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# Productivity and competitiveness in the euro area: a view from France

Agnès Bénassy-Quéré et al explain why current account imbalances in the euro area are both a sign of deficient adjustment mechanisms and a cause of concern

In September 2016, the European Council invited all euro area members to set up a National Productivity Board to focus on productivity and competitiveness. This column summarises the main findings of the first report of the Conseil National de Productivité, which analyses the causes of the French productivity slowdown that are common to other OECD countries and those that are specific to France.

It also proposes a definition of competitiveness that should be useful for euro area macroeconomic policy debates and explains why current account imbalances in the euro area are both a sign of deficient adjustment mechanisms and a cause of concern.

In September 2016, the European Council invited all EU member states sharing the euro to set up a National Productivity Board (NPB) whose objective is to offer a diagnosis and analysis that *“spans a comprehensive notion of productivity and competitiveness”* according to the Council Recommendation (European Council 2016). The French NPB whose members are independent economists just published its first report (French National Productivity Board 2019) which attempts to establish a diagnosis focused on France, but which also highlights the particular dimension that competitiveness takes in a monetary union.

The birth of NPBs is an interesting story in itself as it summarises some of the deep economic disagreements on the issues facing the euro area. A note of the French Council of Economic Analysis (Benassy-Quéré and Ragot 2015) recommended to *“establish an independent council for Competitiveness and Social Dialogue at member state level”* which became Competitiveness Authorities in the *Five Presidents’ Report* (Juncker et al. 2015) and finally morphed into National Productivity Boards in the Council recommendation.

This was a typically Franco-German compromise reflecting two opposite narratives: productivity (to push for structural reforms) was in the title, but competitiveness (to push for policies to reduce macroeconomic imbalances

in the euro area) was explicitly in the text of the Council recommendation. Constructive ambiguity was also at work in a typical European manner, as the two terms were not clearly defined and differentiated and so were left to the interpretation of the boards.

The French NPB took it from there and decided to take a stand on how we should define, measure and interpret the productivity and competitiveness concepts which we think are related but different. We also emphasise that productivity and competitiveness are not redundant and that policymakers should not confuse the two.

*... while economists are broadly at ease defining and ... measuring productivity, there is less consensus on competitiveness at the country level and whether it takes a special dimension in the euro area*



For instance, with similar productivity profiles, France and Germany have very different performances with regards to their competitiveness as measured by their current account (Figure 1).

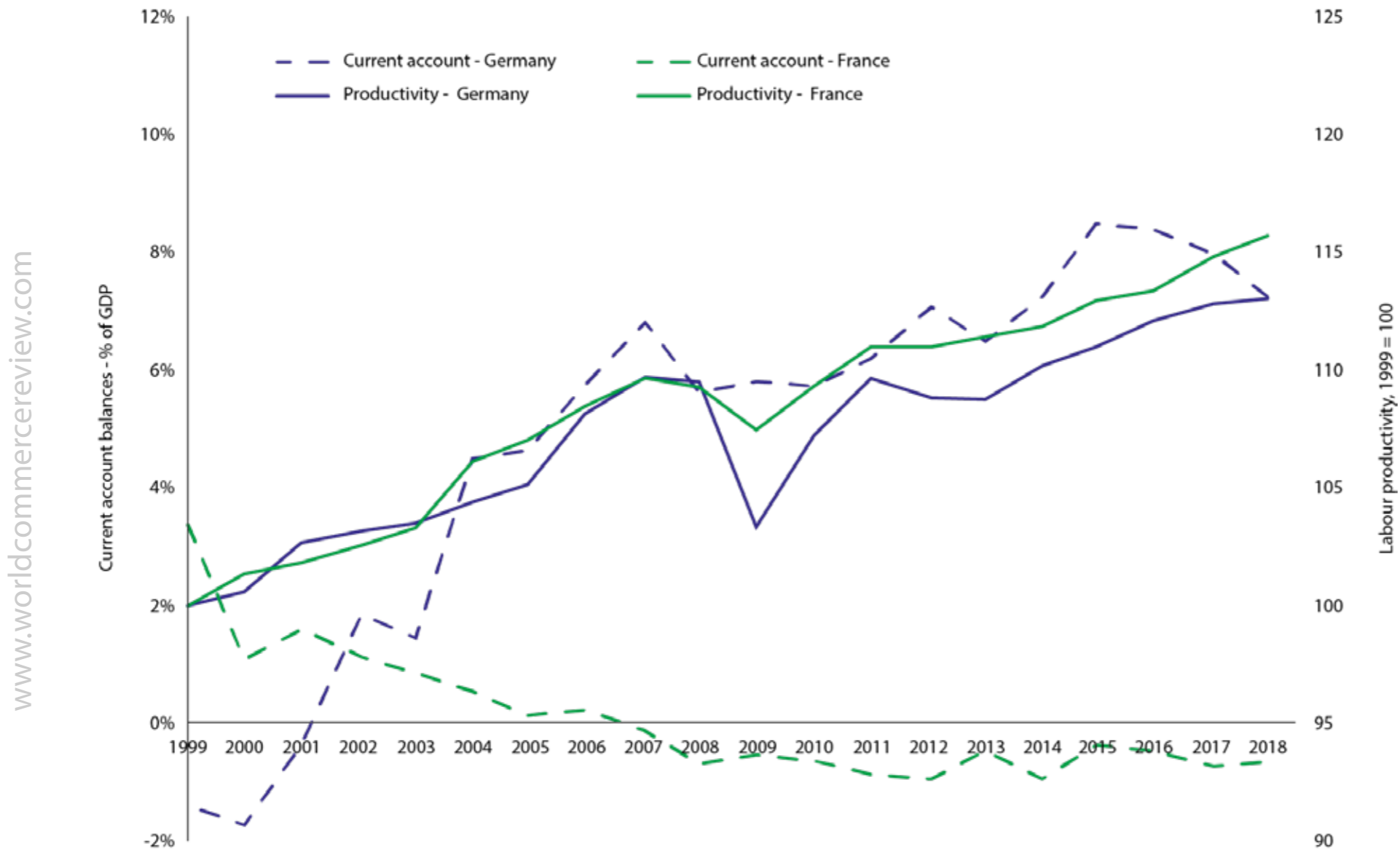
It is worth noting that while economists are broadly at ease defining and even – although with some well-known challenges – measuring productivity, there is less consensus on competitiveness at the country level and whether it takes a special dimension in the euro area.

In the French National Productivity Board's first report, competitiveness is summed up in the level of the current account relative to a norm. This norm is defined for each country by factoring in some structural factors such as demography and the net external investment position (Cubeddu *et al.* 2019).

Analysing its different detailed components (merchandise trade balance, services including sub-items like tourism or intellectual property incomes, net investment revenues, etc.) and the factors behind them, such as market share evolutions, allows for a more granular and disaggregated understanding of a country's main competitiveness components, strengths, and weaknesses. In this way, we hope to capture the causes of competitiveness gaps and identify policy recommendations to resort them.

The French NPB endorses the viewpoint of the Macroeconomic Imbalances Procedure: monitoring of competitiveness is a key issue in the euro area because the accumulation of external imbalances can, in the absence of exchange rate adjustments, lead to a balance of payments crisis and eventually to redenomination risk as experienced during the euro crisis. Conversely, excessive current account surpluses can reflect internal structural imbalances, complicating adjustment policy mechanisms.

**Figure 1. Labour productivity and current accounts in Germany and France**



Source: Eurostat.

Note: Productivity is real labour productivity per employed worker, 100 in 1999. Currents accounts come directly from the balance of payments.

## **The productivity slowdown is mainly the result of common international trends**

France's productivity, although it remains at a high level – similar to that of Germany – has slowed down since the late 1990s as in the rest of the OECD (Andrews *et al.* 2016, 2017). Our assessment is that the slowdown in productivity in France is mainly due to factors that are common to all developed countries. The main factors we emphasise are:

- The shift in the structure of production towards sectors with lower productivity levels, namely services as compared to industry. However, since the 2000s, it has rather been the productivity slowdown *within sectors* that has contributed to the overall slowdown.
- The weakening contribution to growth of information and communication technologies (ICTs) since the early 2000s. This is primarily due to the slowdown of technological progress within the ICT sector itself, but it may also reflect the slow implementation of the productivity enhancing organisational change complementary to these new technologies and the worsening of the reallocation of activity towards firms that are best able to use them.
- The increase in productivity dispersion between firms especially in less knowledge intensive services. Productivity growth has been weaker within industries displaying the largest divergences in productivity. This may reflect a poor allocation of resources between firms. A weakening of technological diffusion, which could be due to a growing difficulty in harnessing technological progress, may be part of the explanation for this increasing divergence.

## **A specific weakness in France: skills of the workforce**

The French productivity slowdown may also be linked to factors that are specific to France and that should be a

source of policy concern. First, we emphasise the fact that skills of the French workforce have been falling below the OECD average (OECD 2016).

This is particularly problematic given the growing skills requirements related to technological change. The French education system is characterised by a greater skills gap between people from different social backgrounds relative to other countries. Adult skills are lower than the average of the countries participating in the OECD surveys.

In addition, those skills appear to decline over the working life, in particular due to a lack of lifelong learning opportunities which is particularly prevalent among the most vulnerable employees. France also lags behind other countries in terms of soft skills (Algan *et al.* 2018).

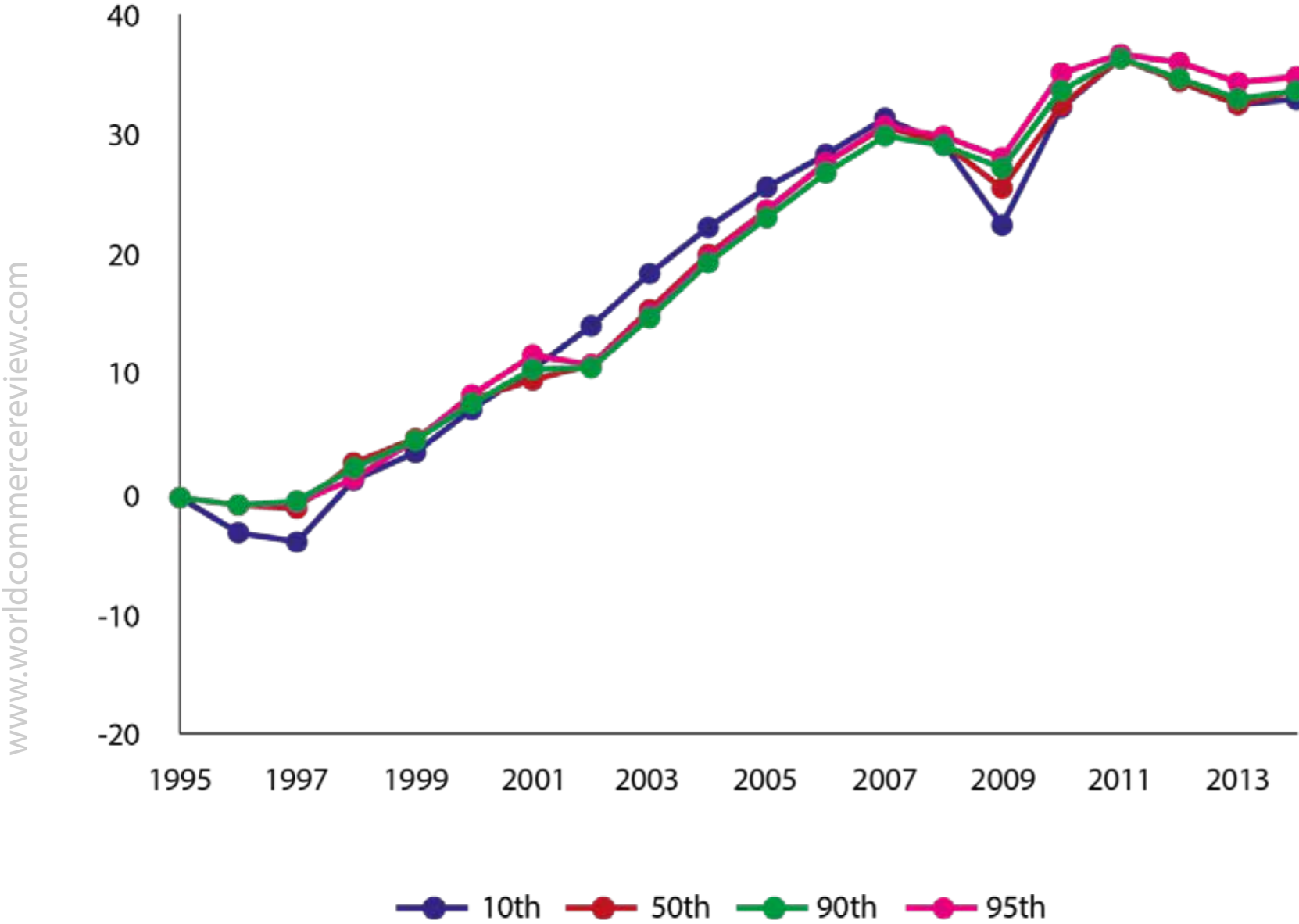
Second, the French production system may have some characteristics that are likely to hinder productivity especially in low-skilled services. In France, the gap between firms at the technological frontier and the rest is more pronounced for less knowledge intensive services (Figure 2).

This suggests (but more research is required) that France may suffer from a deficient allocation of resources in these sectors that hinders its productivity growth and/or that 'best practice' spreads more slowly in these sectors.

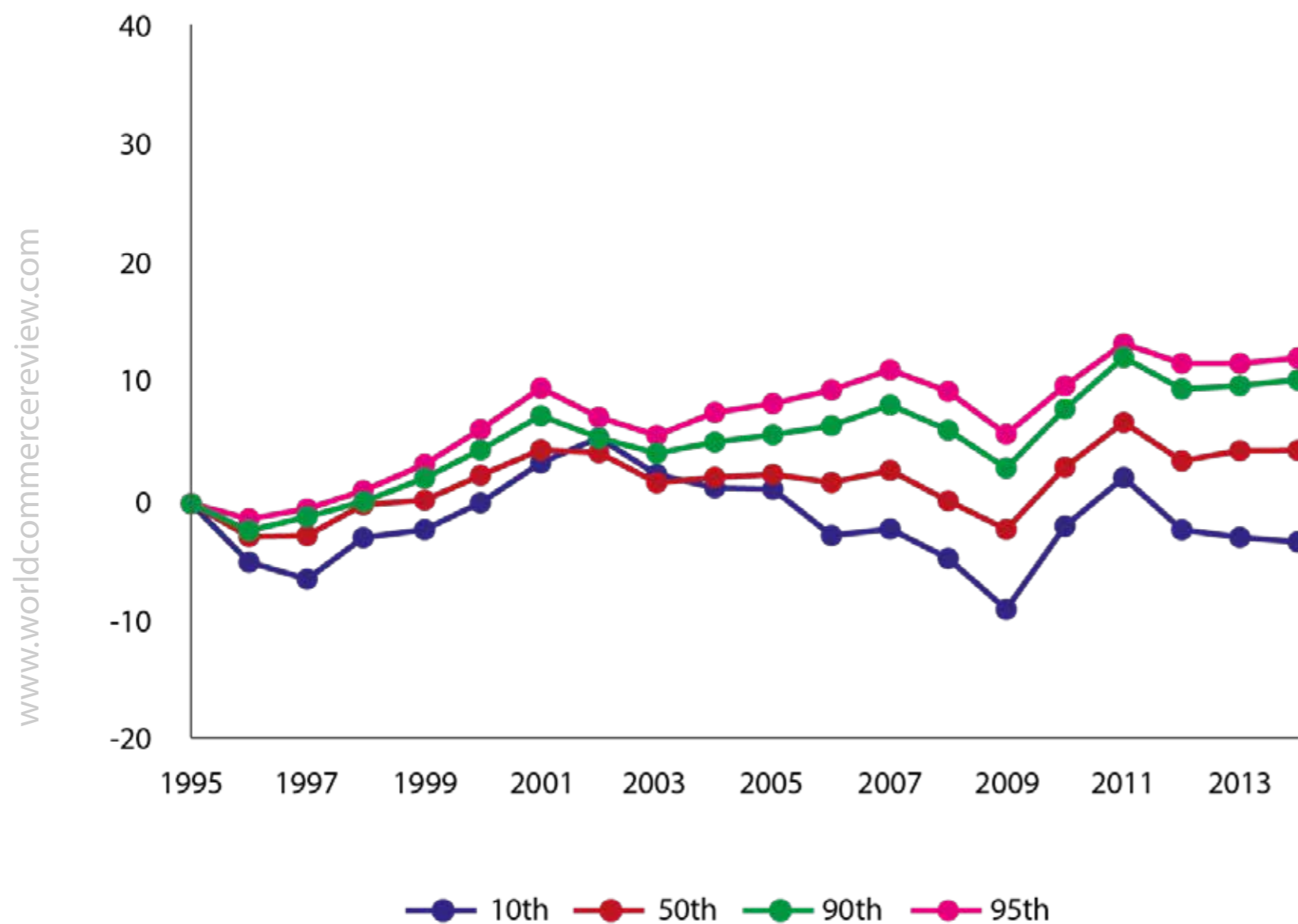
Finally, low-skilled workers have a particularly low level of employment and policies put in place to increase employment may therefore temporarily reduce the productivity growth rate.

Bourlès *et al.* (2012) estimate that were France to align its employment rate to the level of Germany (an increase of 8 percentage points), the level of labour productivity would fall by around 4 percentage points. This is not negligible, but this suggests that the high labour productivity level in France cannot be fully explained by this selection effect.

Figure 2. Labour productivity in France for different percentiles of the distribution - manufacturing



**Figure 2. Labour productivity in France for different percentiles of the distribution - less knowledge intensive services**



Source: MultiProd, OECD (see Berlingieri et al., 2017)

Note: Estimated year dummies of a panel-data regression of the relevant quantile of log labour productivity within industries in France, taking the first year as baseline

## **The modest French current account deficit hides a deficit in attractiveness as a manufacturing location**

In the report, we assess competitiveness on the basis of the current account relative to a norm which we take from the IMF to be around +1% for France. The French current account balance worsened in the early 2000s along with export markets shares and then stabilised.

In 2018, the deficit was modest at -0.3% of GDP, but France is the only euro area country with a current account deficit and it may deteriorate if the euro were to appreciate. This number hides a large trade deficit – which reflects a negative trade balance in goods – partly offset by a surplus in net income from foreign investment. France distinguishes itself within the euro area by the prominence of its multinationals, which has increased further after the crisis (Emlinger *et al.* 2019).

The combination of a surplus in the income balance and a trade deficit in goods suggests that France remains an attractive location for activities related to innovation and design, while its attractiveness as a location for manufacturing has worsened. In this sense, its modest current account deficit hides a larger deficit in attractiveness as a manufacturing location for tradable goods.

Our assessment is that while cost competitiveness has improved since 2010 it remains fragile in particular due to high wage growth in (non-tradable) service sectors that can affect downstream manufacturing. Non-price competitiveness also remains (especially relative to Germany) a challenge for the French industry.

In addition, one unique characteristic of the French tax system, namely high taxes on production, especially on turnover that are transmitted and amplified throughout the production chain, acts as a tax on exports (Martin and Trannoy 2019).

More generally, France has also been late in implementing structural reforms – in particular on the labour market but also on education and public spending – relatively to some other European countries that were hit harder by the crisis.

### **Current account imbalances in the euro area point to deficient adjustment mechanisms**

Competitiveness differentials are not only national issues but more largely a euro area issue. There are two apparently very different ways to analyse movements in current account balances: as the result of changes in the difference between 1) exports and imports, and 2) savings and investment.

Some observers think in terms of the former, some in terms of the second and both talk past each other. Both approaches however have to hold because they are the two sides of the same coin, and forcing oneself to tell the story both ways is essential to identify the initial source of the problem: shifts to saving, shifts to investment, increases in productivity relative to wages, overheating, and so on. This is also essential for policy implications.

In France, the current account deficit was initiated by an increased public deficit and higher corporate investment before the crisis; while the post-crisis stabilisation reflects a reduction in the public deficit in tandem with private disinvestment.

In Germany, the initial impulse was the low wage growth of the 2000s that led to an increase in exports and a large current surplus. This could have led to overheating were it not for fiscal consolidation and the resulting decrease in domestic demand. The increase in public saving came at the same time as increased corporate saving due to higher profits. This led to an excess of overall saving over investment. These trends were not fundamentally reversed after the crisis.



At the same time, peripheral countries were on an opposite trend. They experienced a boom in demand from the private or public sectors due to entry in the euro and the subsequent fall in interest rates and excess credit (Martin and Philippon 2017), which fuelled growth in unit labour costs, deteriorated their competitiveness and their current account balance.

This contrasted situation produced a balanced current account at the level of the euro area with important imbalances between countries within the area (see Figure 3). The crisis and the sudden stop in the financing of deficit countries forced a sharp adjustment which mostly took the form of tighter fiscal policy and lower demand rather than depreciation.

The current account reversal was therefore attained through lower investment, wage adjustments and higher public savings. For its part, Germany maintained a tight fiscal policy without sufficiently adjusting wages, prices, and its current account surplus. This adjustment asymmetry has led to excessively low demand within the area, an increase in its surplus and deflationary pressures.

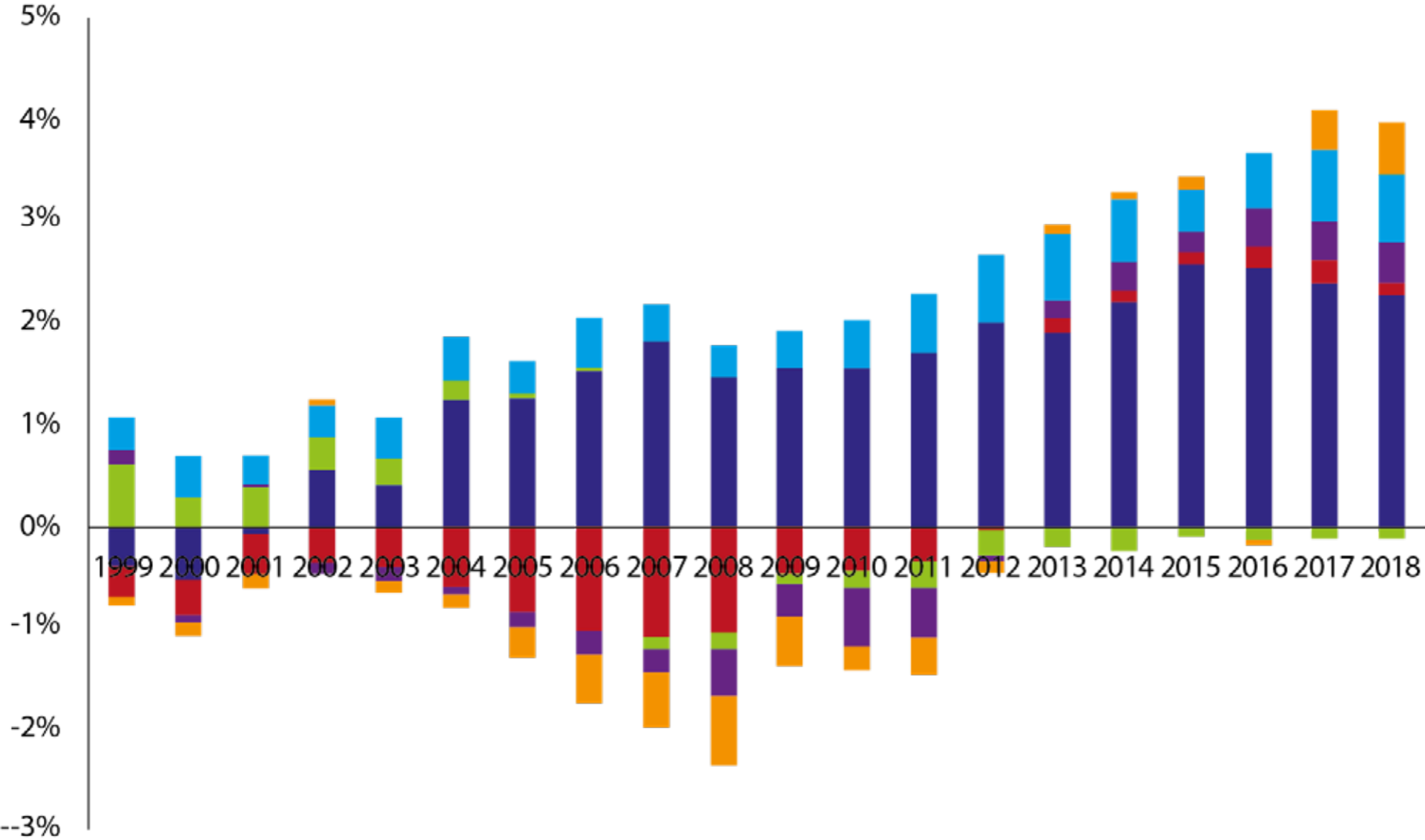
This then contributed to a heavy use of expansionary monetary policy by the ECB, which contributes to an undervalued level of the euro and in turn reinforces the area's current account surpluses vis-à-vis the rest of the world.

In its latest [external balance assessment](#), the IMF considers the 3.5% euro area current account balance in 2017 to be above its 'norm', which is estimated at 1.5% of GDP. This current account surplus hides larger imbalances, particularly surpluses of Germany and Netherlands of 7.3% and 12% of GDP, respectively (in 2018), which are a problematic issue particularly in a monetary union (Blanchard *et al.* 2011).

**Figure 3. Balance of current transactions with the rest of the world, relative to euro area GDP**

Germany Spain France Italy Netherlands Others

www.worldcommercereview.com



Source: Ameco

Given that adjustments of imbalances within the euro area can no longer be achieved through nominal exchange rates, they must be achieved either through decreases in prices and wages in countries in deficit, or through increases in prices and wages in surplus countries. The aggregate imbalance of the euro area is due to the fact that the adjustment has almost entirely happened through the first mechanism.

Existing studies suggest that a gap of 2 percentage points in inflation rates between Germany and the rest of the euro area would be required in order to rebalance current accounts over a 10-year horizon (Gaulier *et al.* 2018). This is sizable and requires higher inflation in surplus countries, which in practice amounts to a real appreciation in these economies. This also means that the inflation target cannot and should not apply to all countries but to the average only.

That prices and wages should grow faster in surplus countries of a monetary union constitutes the normal adjustment mechanism in market economies and this should be supported by economic policies. This could be achieved through a more expansionary fiscal policy for countries with surpluses and fiscal space in a persistent low interest rate environment and/or through increases in minimum wages.

This would contribute to a rebalancing of savings and investment, as well as relative prices within the euro area. Germany and Netherlands rely too much, even from their own welfare point of view, on foreign demand rather than domestic demand. An appreciation following a more expansionary fiscal policy would be welfare improving for these countries.

For countries with less fiscal space, higher inflation in surplus countries would allow for a real depreciation without deflation. This would allow for more reliance on foreign demand, less reliance on domestic demand, higher output, and would also be welfare improving.

Relying more on fiscal policy with more inflation in surplus countries would also help the ECB, which remains overburdened, towards monetary normalisation. This however should not exonerate countries – France in the first place – to put in place reforms to improve productivity and competitiveness.

More broadly, the dramatic adjustments that occurred after the crisis due to the mismanaged imbalances have shown the need for a thoughtful consideration of the required mechanisms to put in place in order to reduce those imbalances.

Because, by accounting, a national current account deficit can only exist if partner countries are running a current account surplus, and that the accumulation of current account imbalances puts the eurozone at risk, we argue that the issue of competitiveness is a matter that should be discussed and addressed not only at the national level but also at the eurozone level. ■

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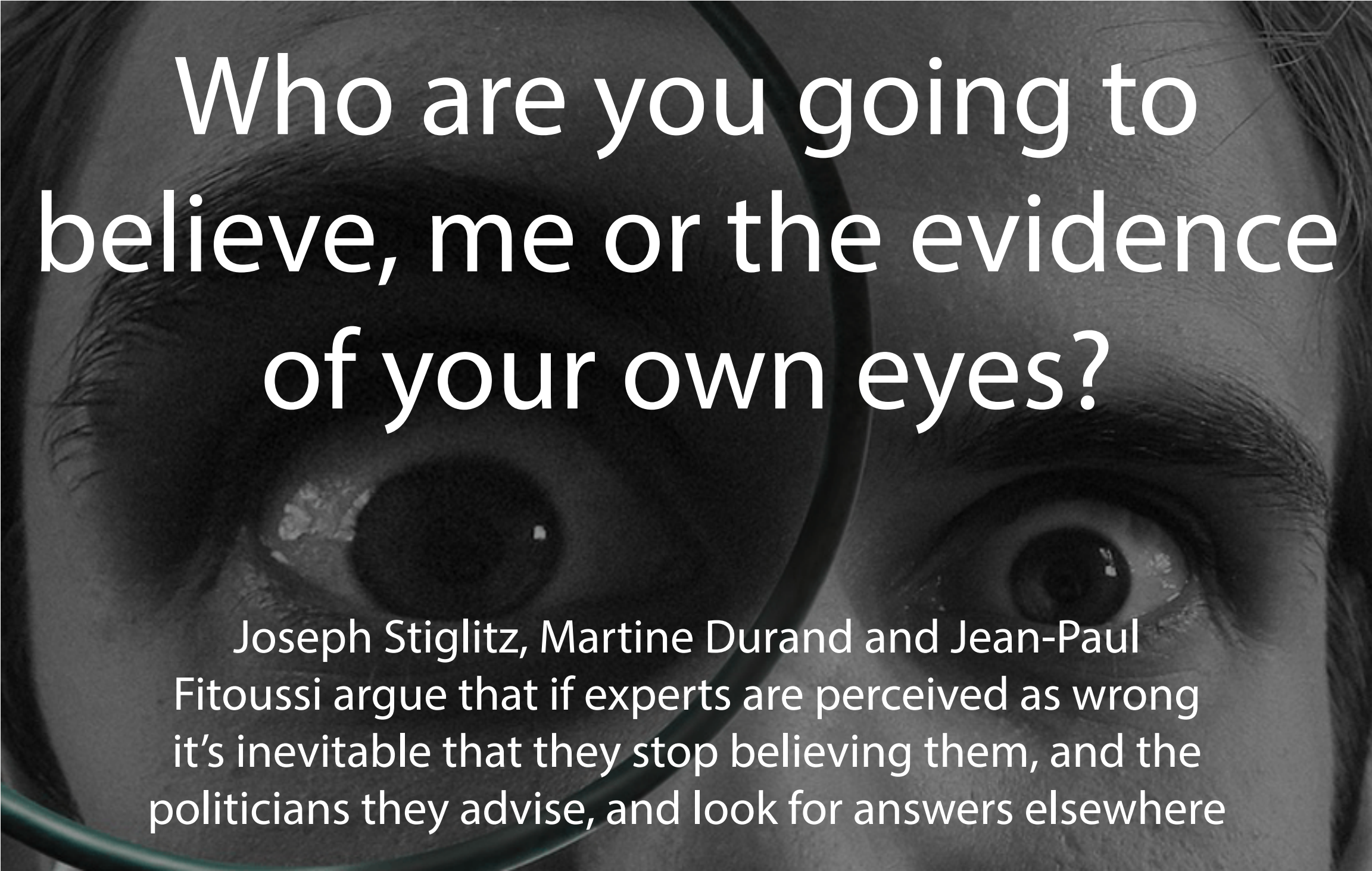
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Who are you going to  
believe, me or the evidence  
of your own eyes?

Joseph Stiglitz, Martine Durand and Jean-Paul Fitoussi argue that if experts are perceived as wrong it's inevitable that they stop believing them, and the politicians they advise, and look for answers elsewhere

**T**his column introduces the work of the High-Level Expert Group on the Measurement of Economic Performance and Social Progress, which argues that we need to develop datasets and tools to examine the factors that determine what matters for people and the places in which they live. Having the right set of indicators, and anchoring them in policy, will help close the gap between experts and ordinary people that are at the root of today's political crisis.

There's no point telling somebody who grows more desperate as each bill falls due that the overall economic situation is improving or to take a broader, longer-term view. If what the expert says has little or no relation to what people feel or can see all around them, it's inevitable that they stop believing the experts and the politicians they advise, and look for answers elsewhere.

President Sarkozy of France recognised this, and in 2008 convened the Commission on the Measurement of Economic Performance and Social Progress, the so-called Stiglitz-Sen-Fitoussi Commission.

The traditional approach to measuring an economy and well-being relies heavily on GDP. But GDP's inventor, [Simon Kuznets](#) warned against this. He stressed that GDP is a measure of output, not of well-being. *"It measures everything in short, except that which makes life worthwhile"* as [Robert F Kennedy](#) famously remarked. Kuznets and Kennedy also pointed out that GDP has nothing to say about the consequences of environmental degradation.

The OECD-hosted High Level Group on the Measurement of Economic Performance and Social Progress (HLEG) was created to pursue the work of the Stiglitz-Sen-Fitoussi Commission, whose final [report](#) was published in 2009 (Stiglitz *et al.* 2009). In a double volume of findings published at the end of last year – [Beyond GDP: Measuring What Counts for Economic and Social Performance](#) and [For Good Measure: Advancing Research on Well-being Metrics Beyond](#)



*GDP* (Stiglitz *et al.* 2018a, 2018b) – the HLEG argues that we need to develop datasets and tools to examine the factors that determine what matters for people and the places in which they live.

The production of goods and services in the market economy – something which GDP does try to capture – is of course a major influence, but even in the limited domain of the market, GDP doesn't reflect much that is important.

*If we want people to trust us, we have to show them evidence that is at least as good as the evidence of their own eyes. And we need to act on this evidence, designing policies that improve their lives. In this way we can close the gap between experts and ordinary people that are at the root of today's political crisis*

The most used economic indicators concentrate on averages, and give little or no information on well-being at a more detailed level, for instance how income is distributed among households. Once conclusion of the HLEG is then that we need more granular data that capture all components of income and wealth and how they are related to each other.

We also need to complete and render more timely the datasets we do have, both by integrating administrative and other types of data (such as from surveys) that already exist, and redesigning national accounts to incorporate distributional aspects.

It is often easier to measure outcomes than the factors that contributed to producing those outcomes. The Group devoted considerable efforts to circumstances outside the control of individuals, such as ethnicity or gender, that can have a significant impact on inequality and opportunities.

The HLEG also looked at factors, such as trust, that can be both a cause and consequence of both well-being and market income. The evidence shows that subjective well-being is influenced by trust, while countries with higher levels of trust tend to have higher income.

An important determinant of well-being is security, and as in many of the domains considered by the HLEG, there are important interactions between objective measures (such as the risk that an individual falls into poverty) and subjective metrics.

Economic insecurity today is only one of the risks individuals face. Other risks are those affecting people's future well-being. The Group considered how to better measure the resources needed to ensure economic, environmental

and social sustainability and the extent to which we are approaching (if not trespassing) critical 'tipping points' and planetary boundaries. The HLEG discussed the new metrics and tools that would be required to analyse the complex interactions between the economy, the environment and social conditions.

Misleading statistics result in misguided policies. If governments think the economy is well on the road to recovery because that's what GDP suggests, they might not take the strong policy measures needed to resuscitate the economy that they would take with metrics that inform on whether most of the population still feels in recession.

If they do not have metrics on the extent of people's economic insecurity, they may not take measures to bolster the safety net and social protection; they might even set about stripping away some social programmes.

One reason the Great Recession morphed into a social and political crisis is that relying on GDP not only gave a false picture of the overall state of well-being, it contributed to the decline of trust in governments and experts, as people saw that their own situation was not improving despite the claim by the experts, based on certain official figures, that a recovery was underway.

If we had had better metrics, including better measures of increases in people's economic insecurity, we might have realised that the downturn was deeper than the GDP statistics indicated. And if that had been the case, perhaps governments would have responded more strongly to mitigate the negative impacts of the crisis.

The HLEG sets statisticians a challenge: find the right balance between a comprehensive set of metrics that embraces a full account of what is occurring and a simpler and less complete set of metrics that are more comprehensible.

In other words, a set of indicators that is broad enough to reflect what matters in people's lives, but narrow enough to be readily understood by policymakers and the public. But having the right set of indicators is just the beginning. They need to be anchored in policy.

If we want people to trust us, we have to show them evidence that is at least as good as the evidence of their own eyes. And we need to act on this evidence, designing policies that improve their lives. In this way we can close the gap between experts and ordinary people that are at the root of today's political crisis. ■

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# The structure of global trade finance

Banking and liquidity problems can have far-reaching consequences on global trade. Olivier Accominotti and Stefano Ugolini take a very long-run view and reconstruct the evolution of trade finance

**T**he 2008 crisis has revealed how banking and liquidity problems can have far-reaching consequences on global trade. This column reconstructs the evolution of global trade finance from the Middle Ages until today. Just like in medieval times, today's global trade is predominantly financed through banks so that banking problems automatically transmit to international trade.

In contrast, from the 16<sup>th</sup> to the 20<sup>th</sup> century, trade finance was mostly market-based. The decline of market-based trade finance was triggered by major geopolitical shocks.

The Global Crisis of 2007/8 was followed by a sudden and unprecedented contraction of world trade – an episode known as the 'Great Trade Collapse' (Baldwin 2009). One of the explanations commonly advanced for this phenomenon is the reduced supply of trade finance following the global liquidity crunch (Ahn *et al.* 2011, Auboin and Engemann 2012, Del Prete and Federico 2014, Paravisini *et al.* 2015).

Since 2008, economists and analysts have highlighted how a well-functioning trade finance market is essential to the global trading system. Renewed attention has been paid to the instruments used for financing trade as well as to the structure and regulation of the global trade finance market (Asmundsson *et al.* 2011, BIS 2014, Niepman and Schmidt-Eisenlohr 2016a, 2016b, 2017).

Trade finance is the oldest domain of international finance. From the very beginnings of the history of international commerce, merchants and firms have been in need of working capital in order to finance their commercial transactions and have looked for methods to reduce the risks involved in long-distance trade.

However, relatively little is known about how trade finance evolved over the very long run. In a recent study, we review the main developments in international trade finance from the Middle Ages to today and compare

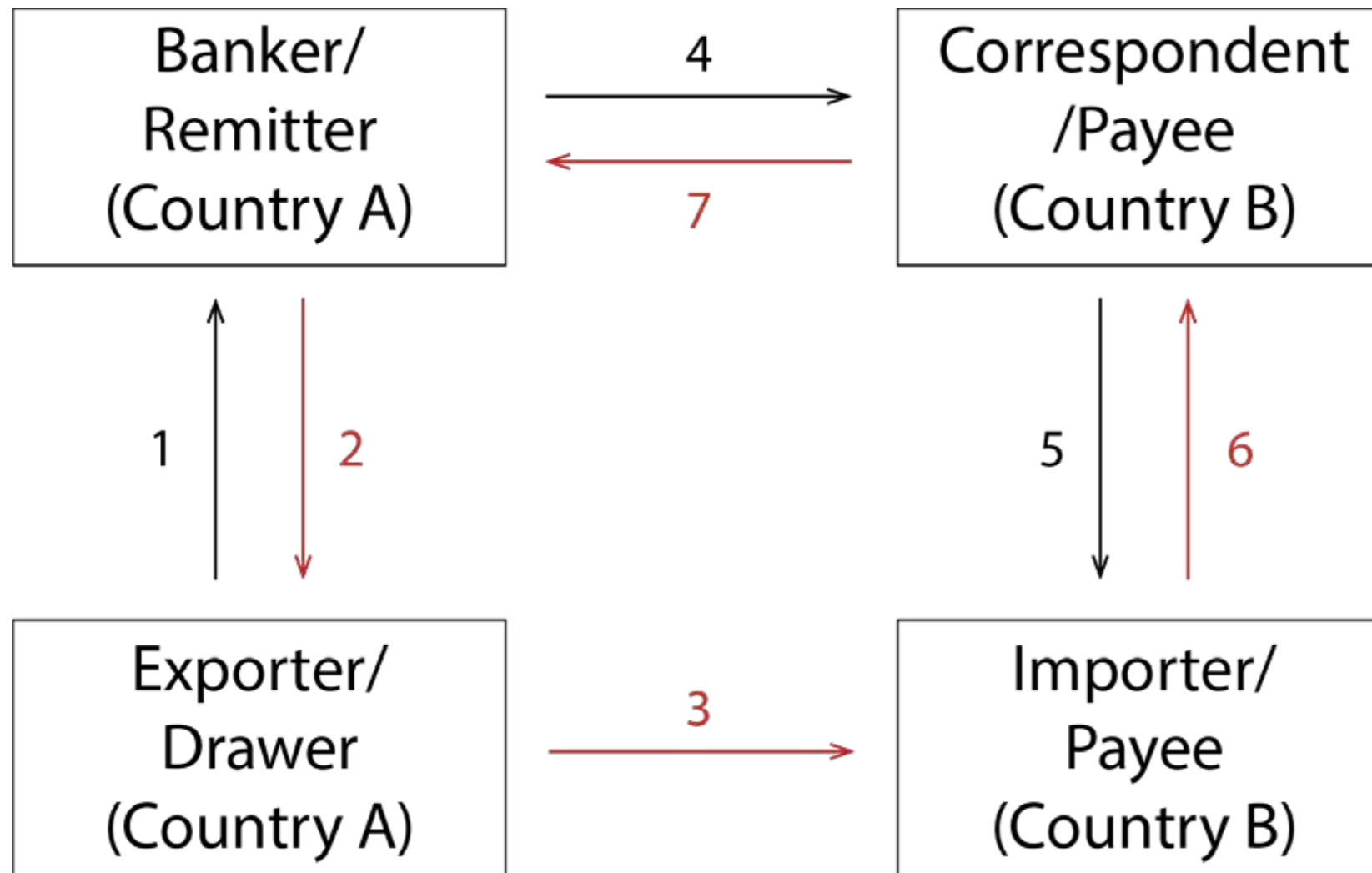
its structure and governance across time (Accominotti and Ugolini 2019). Our goal is to understand whether alternative structures existed in the past that might provide regulators with insights on how to design more resilient trade finance.

### **The emergence of trade finance**

Historically, the most widespread instrument for financing merchandise trade was the bill of exchange. A bill of exchange is a private written order addressed by one party (the drawer) to another (the drawee), asking to pay a given sum at a given date to a third person (the beneficiary). Bills of exchange are instruments of both international payment and credit.

*The long-run evolution in the structure of international trade finance has implications for its governance. [...] the more decentralised structure that prevails nowadays makes international control over the trade finance market less feasible*

**Figure 1. The medieval bill of exchange**



*Note: This example is based on a transaction described by De Roover (1953, pp. 45-47). A Florentine exporter (the drawer) established in Bruges (country A) issues a bill of exchange and sells it to her Bruges-based banker (the remitter, also originally from Florence). The bill orders the importer (the payer, also a Florentine) in Barcelona (country B) to pay a given sum to a specified correspondent in Barcelona (the payee) of the Bruges-based banker at a certain date in the future. 1. Issues bill of exchange; 2. Purchases bill of exchange/provides cash; 3. Ships goods; 4. Sends the bill; 5. Presents the bill at maturity; 6. Pays the bill at maturity/provides cash; 7. Credits remitter at maturity.*



Until the early modern period, in Western Europe trade finance products consisted of idiosyncratic instruments issued by local merchants and bankers. In the 13<sup>th</sup> century, Italian mercantile companies with correspondents in major European trading centres (Florence, Venice, Genoa, Bruges, etc.) were the main providers of trade finance. It is in this context that the medieval bill of exchange emerged.

The original bill of exchange was not a standardised financial instrument, but rather a certificate of a private credit contract passed between two local agents and to be presented to a foreign correspondent (De Roover 1953). An example of a transaction financed through a medieval bill of exchange is provided in Figure 1.

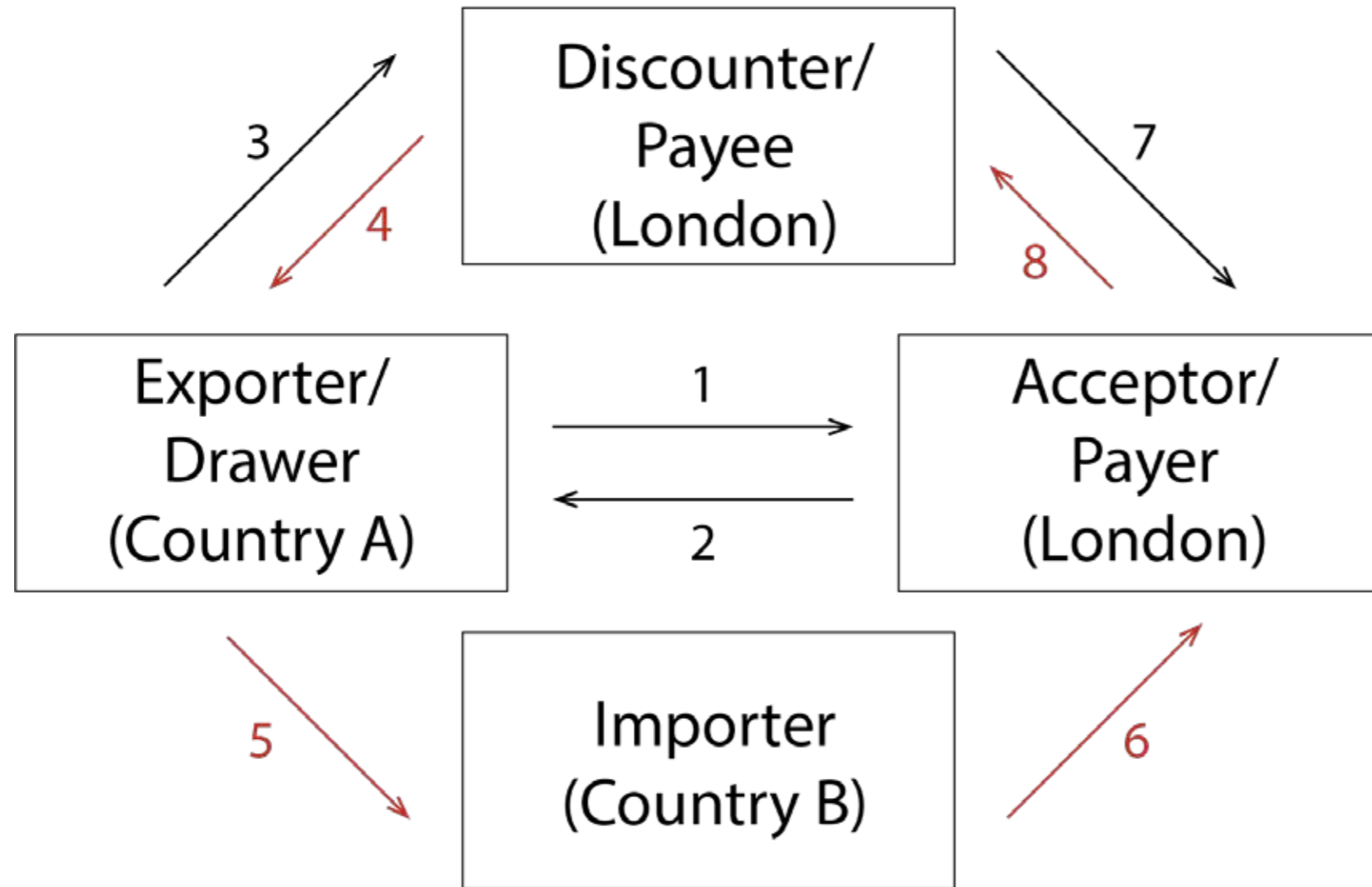
The nature of the bill of exchange then changed considerably in the early modern period when new legal provisions in Antwerp and Amsterdam instituted the right to 'negotiate' bills – the ability to transfer the original creditor's claim on the debtor to a third party. The bill of exchange transformed into an exchange-traded financial instrument. Nevertheless, in that period the circulation of bills of exchange still remained limited within a relatively small group of merchants.

### **Trade finance during the first globalisation**

From the 18<sup>th</sup> to the 20<sup>th</sup> century, the global trade finance market became increasingly concentrated around one leading financial centre – London. A large discount market for bills of exchange emerged in London at that time, which progressively evolved into the world's money market.

During the first globalisation, international trade was mostly financed through sterling bills issued through specialised agents in London but purchased by all kinds of domestic and foreign investors. Bills of exchange payable on London were used to finance commercial transactions taking place across the whole world. Figure 2

**Figure 2. The bill on a London acceptor (or acceptance)**



*Note: An exporter in country A has sold goods to an importer in country B and needs to finance production/shipment. The importer instructs the exporter to draw a sterling bill on a London acceptor with whom she has a relationship. The acceptor puts its signature on the bill ("accepts" the bill) in exchange for a fee, thereby committing to repay the holder at maturity (guaranteeing payment). The exporter discounts the bill to an investor in London at the market interest rate. At maturity, the bill holder asks for payment (in sterling) to the acceptor, who, in the meantime, has obtained payment from the importer. 1. Draws a bill; 2. Accepts the bill; 3. Sells the accepted bill; 4. Discounts the bill/provides cash; 5. Ships goods; 6. Makes payment ('provision') before maturity; 7. Presents the bill at maturity; 8. Pays the bill at maturity/provides cash.*

gives an example of how a bill on London could be used to finance a commercial transaction between two foreign countries.

Access to the global trade finance market was regulated through a set of informal governance rules enforced by a few private and public agents in London. In particular, financial institutions known as 'acceptance houses' specialised in guaranteeing the debts of foreign firms willing to borrow on the London bill market. These intermediaries screened and monitored a large number of borrowers around the world who needed their signature in order to access London credit facilities. They acted as gatekeepers to the London market.

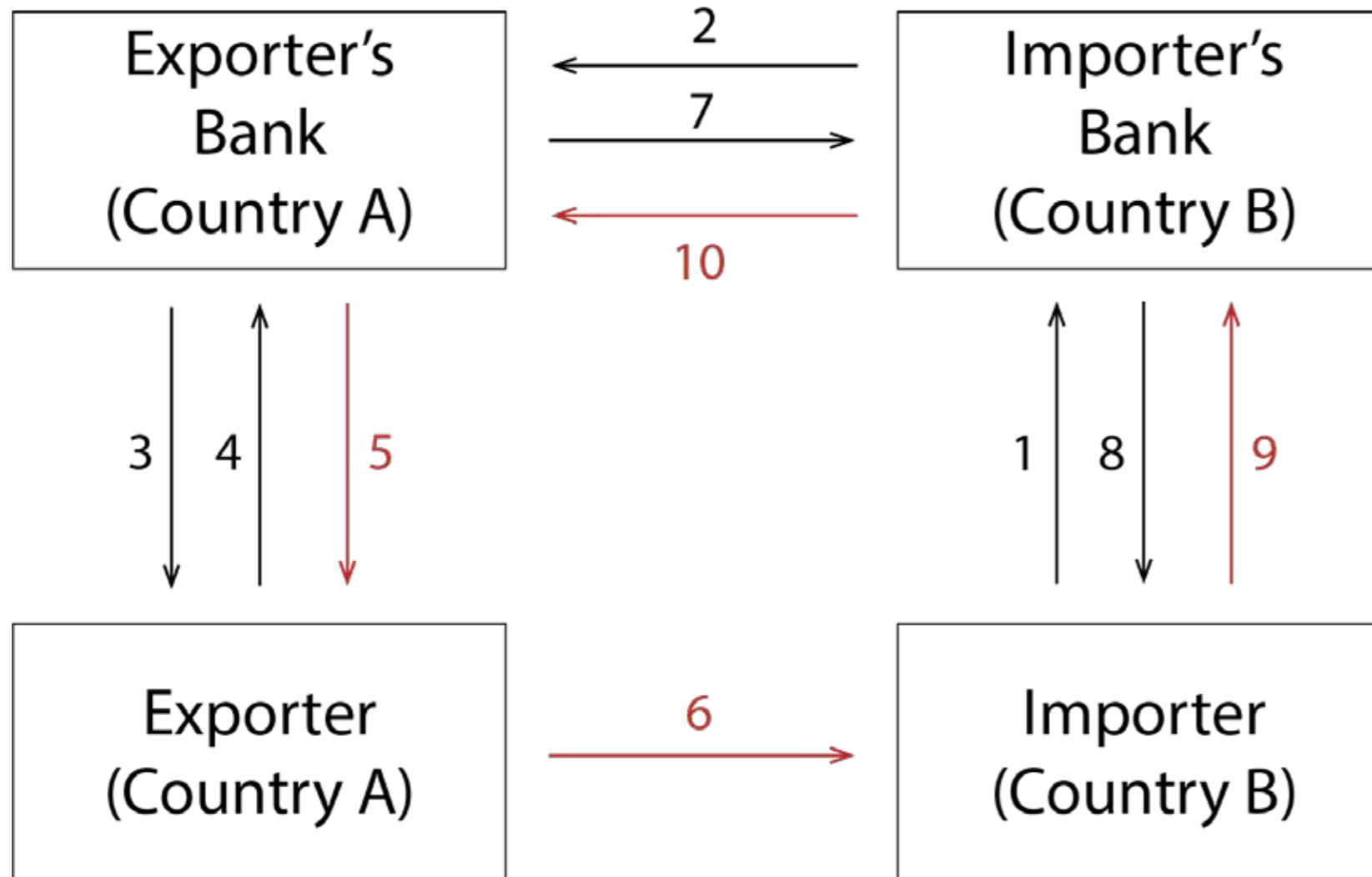
The Bank of England's purchases of bills for its monetary operations and its commitment to rediscount eligible bills under any market condition also contributed to their high liquidity. By setting eligibility rules for bills, the Bank contributed to regulating the production of trade finance products (Flandreau and Ugolini 2014, Jobst and Ugolini 2015).

London's dominant position therefore gave UK public authorities and private agents considerable power to regulate trade finance globally. This centralised market structure was an important component of the broader system of British imperial dominance that prevailed on the eve of the First World War.

### **The disintegration of trade finance during the de-globalisation**

The importance of London in global trade finance then progressively declined during WWI and interwar years. WWI created major disruptions in the functioning of the London bill market and, when international trade recovered in the 1920s, London now had to face the competition of New York as an international trade finance centre (Eichengreen and Flandreau 2012). At the beginning of the 1930s, New York and London were financing equal shares of global trade.

**Figure 3. The confirmed letter of credit**



*Note: An exporter in country A sells goods to an importer in country B. The importer asks her local bank to issue a letter of credit in her favour guaranteeing the exporter that payment will be made upon presentation of documents. Payment is also guaranteed by the exporter's bank (the letter of credit is confirmed). The letter of credit is accepted by the issuing bank and the exporter discounts it to her local bank (obtains a credit). 1. Applies for letter of credit; 2. Sends letter of credit; 3. Confirms letter of credit; 4. Sells letter of credit; 5. Discounts letter of credit/provides cash; 6. Ships goods; 7. Sends documents; 8. Presents documents at maturity; 9. Pays at maturity/provides cash; 10. Credits at maturity. Based on description of the instrument in Amiti and Weinstein (2011), BIS (2014), Niepman and Schmidt-Eisenlohr (2016, 2017).*

The Great Depression and the global financial crisis of 1931 precipitated the demise of international trade finance. Between 1929 and 1933, world exports contracted at an unprecedented pace. The 1931 crisis also severely affected London and New York intermediaries involved in the issuance of trade finance products (Accominotti 2012, 2019). In the mid-1930s, many countries imposed quantitative restrictions on trade flows, which reduced the scope for extending cross-border credits.

### **The reconstruction of trade finance during the second globalisation**

Until the collapse of the Bretton Woods system in 1971-1973, international payments remained subject to tight government regulations. The progressive removal of capital controls in the 1970s and 1980s resulted in the revival of international trade and in increased demand for credit from firms.

The most common trade finance instruments used nowadays are the letter of credit (see Figure 3) and documentary collections (Amiti and Weinstein 2011, BIS 2014, Niepman and Schmidt-Eisenlohr 2016a, 2016b, 2017).

The structure of global trade finance today differs from that of the first globalisation along two dimensions. First, in contrast to the 19<sup>th</sup> century when a large share of global trade flows were financed through London, trade finance nowadays is mostly intermediated on a local basis – ie. by national banks or branches of global banks located in the exporter's and importer's country (BIS 2014).

One implication of this decentralised market structure is that firms located in countries where the banking system is underdeveloped might suffer from a lack of intermediation, a phenomenon known as the 'trade finance gap' (Asmundson *et al.* 2011).

Second, the decreased use of trade finance products for money market transactions has substantially narrowed the range of investors involved in the provision of trade finance. In the 19<sup>th</sup> century, investors in sterling bills were numerous and extremely diverse as such bills were regarded as highly liquid and safe monetary instruments.

By contrast, trade finance products nowadays mostly remain on the balance sheet of the banks that have issued them. While attempts have been made to securitise trade finance credits, demand for such products has remained limited due to a lack of information about them (BIS 2014: 27-30).

### **Conclusion**

The long-run evolution in the structure of international trade finance has implications for its governance. In the 19<sup>th</sup> century, the global trade finance market was highly centralised and regulation was exercised by the leading political and economic power of the time – the UK. London's monopoly over the trade finance market was criticised by potential competitors as it granted UK financial institutions a significant rent.

By contrast, the more decentralised structure that prevails nowadays makes international control over the trade finance market less feasible. While this market structure clearly has advantages, it also makes exporting and importing firms more dependent on local credit conditions and pushes back the governance of the trade finance market into a sort of anarchy. ■

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# Hybrid and cybersecurity threats



Maria Demertzis and Guntram Wolff find that EU finance ministers should advance a broader political discussion on the integration of the EU security architecture applicable to the financial system

## Introduction

'Fantasia' is a member state of the European Union and the euro area. Fantasia's finance minister is woken at midnight by her chief of staff alerting her to social media reports showing documents that implicate her in illegal pre-election financing. While she knows this is not true, she spends much of the rest of the night mobilising experts to prove that the documents posted on the internet are false. But citizens, who in any case dislike the minister for her austerity policies, are suspicious of the ministry's early morning press statement. Trust in the government is falling.

Early next morning, on her way to the first meeting of the day, the minister is informed that the biggest bank in the country has faced a run. It started with messages on Facebook, Twitter and Instagram reporting that the bank's cash dispensers do not work, and showing citizens queuing outside various branches unable to withdraw money from their accounts.

The bank's CEO issues immediately a public statement that there is an unfounded social media smearing campaign against his bank and follows the appropriate emergency protocol: informing the board, the domestic supervisor and the supervisor in Frankfurt, and putting crisis-management teams in place.

However, despite the CEO's best efforts, citizens stricken by panic rush to withdraw their savings. The bank, the minister is informed, is now out of cash and requires liquidity as soon as possible.

An electricity blackout in the capital increases confusion while in the meantime the internet in the entire country slows down – there seems to be a connectivity problem. Citizens in Fantasia's neighbouring country begin to worry – after all, the bank has major subsidiaries in their country too and the public sector has no information on what is happening in Fantasia.

Fantasia's neighbour government calls the EU's Hybrid Fusion Cell in the European External Action Service (EEAS), which collects and analyses evidence from such cases. However, the EEAS has received little information from Fantasia.

Meanwhile, Fantasia's finance minister issues a statement that domestic deposits are protected by a guarantee and tries to assure citizens that the government will honour all claims and protect citizens against malicious attacks. What happens next?

*Cyber risks are typically managed as part of a financial institution's traditional operational risk management framework, but this is insufficient*

Such events occurring simultaneously as described in this scenario would constitute a hybrid attack. Because of the nature of the attack involving diverse, simultaneous incidents, players in the corporate and political worlds find it difficult to see the whole picture.

Situation analysis and awareness of the degree of interconnectedness are key to better understanding. Political judgement, necessary to contain the fallout from such attacks in real time, needs to be able to rely on well-established procedures based on thorough analytical evidence and knowledge.

The example simulates a reality for which preparations need to be made, especially in the light of recent individual attacks. Estonia in 2007 experienced something that comes perhaps closest to our Fantasia example<sup>1</sup>.

In 2014, Bulgarian banks experienced a run, triggered by an 'attack' when an unsigned news bulletin spread via social media<sup>2</sup>. Electricity blackouts can affect entire countries (as recently seen in Argentina, Uruguay and Paraguay)<sup>3</sup> and can be caused by cyber attacks, as happened with the December 2015 Kiev power outage<sup>4</sup>. Social media attacks against politicians are a well-studied subject (He, 2012; de Boer *et al*, 2012).

Meanwhile, a slowdown of the internet can be caused by physical or cyber attacks against the internet infrastructure, including against deep-sea cables, on which a lot of the internet traffic depends (Sunak, 2017).

The European Union considers hybrid *“activities by State and non-state actors”* to *“pose a serious and acute threat to the EU and its member states”* (European Commission/High Representative, 2018). According to European Commission/High Representative (2018), *“efforts to destabilise countries by undermining public trust in government institutions and by challenging the core values of societies have become more common. Our societies face a serious*

*challenge from those who seek to damage the EU and its member states, from cyber attacks disrupting the economy and public services, through targeted disinformation campaigns to hostile military actions.”*

The EU understands hybrid threads and campaigns to be *“multidimensional, combining coercive and subversive measures, using both conventional and unconventional tools and tactics (diplomatic, military, economic, and technological) to destabilise the adversary. They are designed to be difficult to detect or attribute, and can be used by both state and non-state actors”* (European Commission/High Representative, 2018).

Cyber attacks, meanwhile, can be part of a hybrid attack but not every cyber attack is a hybrid threat. Companies, institutions and governments can be victims of such attacks. Financial companies face significant risks of cyber attacks unrelated to any hybrid tactics, which might be motivated purely by criminal reasons. Conversely, hybrid attacks, even if not targeted at the financial system, can have huge repercussions for the financial system, for example as malware spreads.

### **Cyber attacks are an increasing, and increasingly costly, risk**

The frequency and cost of cyber attacks have increased. Sixty-one percent of companies reported one or more cyber event in 2018, up from 45 percent the previous year and the cost of those attacks is rising (Hiscox, 2019)<sup>5</sup>. The *2019 SonicWall Cyber Threat Report* finds over the course of 2018 an escalation in the volume of cyber attacks and new, targeted threat tactics used by cyber criminals (SonicWall, 2019). The Verizon 2019 data breach investigations report found that financial motives were the main reason for data breach attacks, but espionage was behind 25 percent of attacks (Verizon, 2019).

Data breaches arising from attacks often remain undetected for a considerable period of time. There is also evidence that small and medium-sized companies are often targets of attacks. The German industry association

BITKOM estimated that in 2016-17, German companies incurred damage of €43 billion from data espionage and sabotage. Seven out of 10 manufacturing companies have been subject to attacks according to BITKOM<sup>6</sup>.

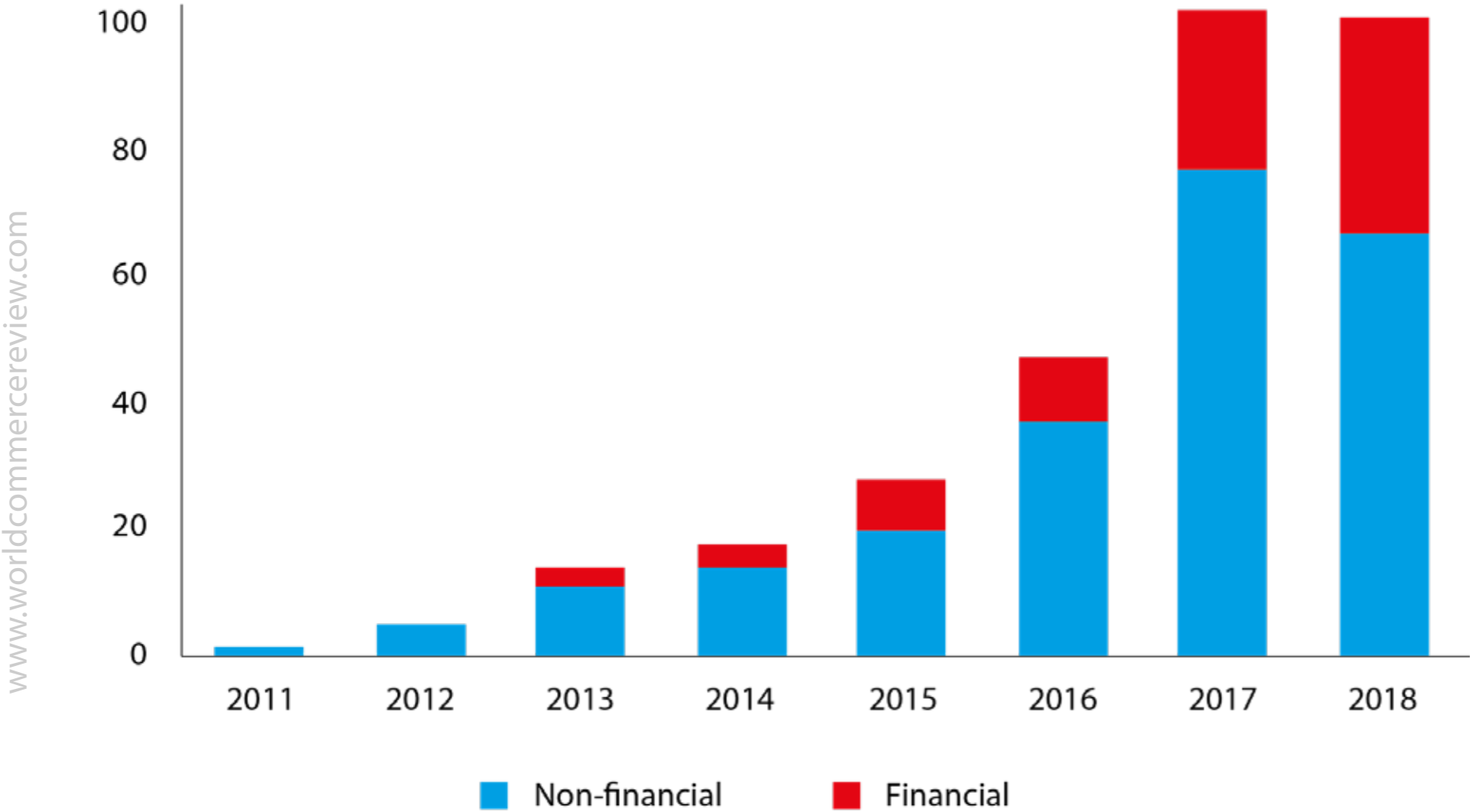
By contrast, the UK government Department for Digital, Culture, Media and Sport (DCMS, 2019) showed that 32 percent of businesses had identified a cyber security attack in the last 12 months, down from 43 percent the previous year. DCMS (2019) ascribed this reduction partly to new cybersecurity measures taken by companies in response to the introduction of tough new data privacy laws under the UK Data Protection Act and the EU General Data Protection Regulation.

Figure 1 documents the number of cyber incidents experienced by listed companies each year in Europe as reported in the press. While media reports capture only a fraction of the actual incidents, there is a clear upward trend in incidents affecting financial companies. In an empirical exercise, we show that the effects of cyber attacks on a company's value can be significant (see the Annex).

Cyber attacks are not restricted to listed companies but are also relevant for public and other institutions. Figure 2 lists the various EU28 institutions reported in the press as having been subject to notable cyber attacks in the past 12 months. Again, while press reports cover only a fraction of actual attacks, it is evident that the issue concerns a broad range of entities across sectors and topics. Given the highly interconnected nature of our economic systems, an attack on a public sector entity might well have repercussions for the financial system.

For example, five million Bulgarians had their personal data stolen in an attack on the Bulgarian tax authority in mid-2019<sup>7</sup>. This data could potentially represent risks to financial firms if, for example, stolen identities are used by criminals. The scope and complexity of modern economic systems imply that the downside risks of cyber attacks can be extremely disruptive and costly.

**Figure 1. Number of 'cyber-attack events' affecting listed companies domiciled in the EU28, financial and non-financial sector, as reported by the media**



Source: Bruegel.

Note: We classify articles in Factiva as cyber attack news if they contain the words 'Cyber attack', while simultaneously falling into any of the Factiva classifications 'Malware', 'Data breaches' or 'Cybercrime/Hacking' (Factiva articles in 31 languages). Factiva also identifies by name the company being discussed in these articles. One or more cyber attack articles written about a listed company in any given month counts as one 'cyber-attack event'. A 'cyber attack event' might not necessarily correspond to an actual cyber attack but, for example, to new measures companies take to fight cyber attacks, among other issues.

The literature on the impact of terrorism on the financial system can help discern some of the implications of physical-infrastructure disruptions related to hybrid attacks. Large-scale terror attacks can disrupt physical infrastructure, as can hybrid attacks in which, for example, deep-sea cables are targeted.

It is therefore useful to look at the empirical literature assessing the impact of events such as the 11 September 2001 attacks in the United States on the companies concerned and on the stability of the financial system, in order to better understand the effects of physical disruptions to infrastructure.

Theoretically, three impacts can be distinguished: the short-term market impact arising from the destruction of value; the medium-term confidence effects and the longer-term effects on productivity.

The empirical literature typically finds that even a large and successful terror attack such as 9/11 does not fundamentally endanger the stability of the global financial system or the global economy more broadly. While specific sectors such as the airline and defence industry might see lasting changes to their valuations<sup>8</sup>, the market as a whole recovered relatively quickly<sup>9</sup>.

Longer-term major fiscal and human costs resulted from the US response to 9/11 in the form of wars (Frey *et al*, 2007). But for the financial system alone, the rapid recovery observed was due to significant redundancy systems, such as back-up systems in different cities, at the company level and at the systemic/institutional level, and to decisive policy action in the form of additional central bank liquidity and effective communication<sup>10</sup>.

### **An evolving landscape for managing cybersecurity and hybrid threats to the financial system**

The EU has responded to hybrid threats with an extensive set of policies. There is no single definition of hybrid



**Figure 2. Notable cyber attacks in the EU28 in the year to July 2019 as reported in the press**

www.worldcommercereview.com



Source: Bruegel based on Factiva and CSIS data.  
 Note: Cyber attacks were identified through a Factiva search for cyber-attack news published between August 2018 and July 2019 (as explained in the note to Figure 1). We identified additional attacks through the 'Significant Cyber Incidents' list provided by the Center for Strategic & International Studies (CSIS), which focuses on "cyber attacks on government agencies, defence and high tech companies, or economic crimes with losses of more than a million dollars."<sup>11</sup>

threats but most definitions include conventional and non-conventional aggression by state and/or non-state actors.

The European Union Institute for Security Studies provides a good summary of hybrid threats and the respective policy responses (Fiott and Parkes, 2019). They find substantial shortcomings such as inadequate information sharing and intelligence exchange (including with EU institutions), and risk assessments that are based on the lowest common denominator among member states, which could lead to underestimation of risks.

They also highlight that collaboration with the private sector is suboptimal and that EU institutions find it difficult to overcome compartmentalisation when devising strategies and responses to hybrid threats.

They argue that the real challenge for the EU is to recognise and respond to a 'staccato' of events based on credible intelligence coupled with good political judgement. Official communications on hybrid threats make little specific reference to the financial system's vulnerability to hybrid threats.

The financial system, however, is considered an essential service by the Network and Information Security Directive (NIS Directive, 2016/1148/EU), under which EU countries must supervise the cybersecurity of such critical market operators (energy, transport, water, health, and finance sector) in their territories.

Cyber risks are typically managed as part of a financial institution's traditional operational risk management framework. This framework is insufficient. ECB (2018) sets out four key reasons why it falls short of what is needed. A distinguishing characteristic of cyber attacks is often the persistent nature of a campaign conducted by a motivated attacker. As a result, cyber attacks are often difficult to identify and to fully eradicate and they can have a substantial impact.

Second, and moreover, cyber risks posed by an interconnected entity are not necessarily related to the degree of the entity's relevance to a financial institution's business. In other words, unlike in traditional financial contagion, a small business partner might pose as big a risk to a given firm as a major partner.

Third, cyber attacks can render some risk-management and business-continuity arrangements ineffective.

Fourth, cyber attacks can be stealthy and propagate rapidly. We would add a fifth point: cyber attacks can be systemic if they exploit shared vulnerabilities. These could, for example, result from a scarcity of cybersecurity providers to major financial institutions, leading to similar cyber-protection systems and vulnerabilities in several institutions.

To increase resilience against hybrid and cyber attacks against the financial system, the EU has taken a three-part approach: (i) regulations and standards, (ii) testing and preparedness, (iii) governance.

Attempts to promote cybersecurity, including for financial market infrastructures (FMIs), have led to a number of initiatives at all levels: globally, at EU level and at national level. At the global level, the G7 Cyber Expert Group first took steps in 2013 to develop a set of high-level (but non-binding) fundamental principles for assessing the level of cybersecurity. The EU adopted a cybersecurity strategy in the same year. The EU finalised the NIS Directive in 2016, an initiative taken to tackle the cybersecurity challenges in a coordinated attempt.

When it comes to the financial sector in particular, the European Banking Authority, the Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions have taken a number of initiatives to mitigate ICT risks and provide for information security.

The European Central Bank's governing council adopted cyber-resilience oversight expectations (CROE) for the Eurosystem in 2018 (ECB, 2018)<sup>12</sup>. CROE is structured in a way that outlines expectations on governance, identification and detection of cyber risks, protection, testing and putting in place procedures for response and recovery.

It has three key purposes: 1) provide FMIs with detailed steps on how to operationalise the guidance given; 2) provide a framework to those who oversee FMIs for evaluating the level of cybersecurity; and 3) provide a basis for a communication between FMIs and their supervisors.

Concrete measures aim at promoting coordination and standardisation in two areas: identifying weak parts of the system – testing, and ensuring business continuing following a breach – quick recovery.

European financial regulators are increasing their efforts to promote good testing practices. The ECB sets expectations in CROE in terms of what constitutes a good testing framework<sup>13</sup>. At the same time the European Supervisory Authorities issued advice on how to provide a coherent framework across the EU, including on which parts of existing regulations will need to be adjusted (ESAs, 2019).

The EU has now produced a testing framework called TIBER-EU that was developed jointly by the ECB and the European System of Central Banks, and is based on the results of earlier similar testing frameworks including the UK's CBEST and the Dutch TIBER-NL. Such tests are typically voluntary and focus mostly on penetration vulnerabilities. Increasingly, there are tests that focus on the recovery capabilities of entities. TIBER-EU therefore is there to provide a framework for improving resilience rather than for holding entities to account.

CROE expectations all set a target to recover essential services within a two-hour period, following a cyber attack. All available guidance emphasises the need for availability and continuity of critical services. This involves setting targets in terms of both the minimum level of services that should remain available, and the time frame for recovery.

While the aim is to restore critical services within a two-hour period, full recovery should be expected by the end of the day of the disruption, in particular for functions that are systemically relevant.

The ECB, in line with international institutions such as the Bank for International Settlements, has formulated clear expectations on how governance at the level of the individual financial institution should be structured.

For example, ECB (2018) discussed in detail that board and management should have an awareness culture and also clear procedures involving large parts of the organisation to be able to deal with a cyber attack in real time.

We do not have systematic evidence on how well these expectations have been implemented in individual institutions but surveys suggest that the awareness and preparedness of individual institutions has increased<sup>14</sup>.

A more worrying aspect is the governance set-up to manage cyber and hybrid threats at a more systemic level. A key concern we have identified, in our interviews in particular, relates to the institutional interplay between private firms and European and national authorities. In the EU, security questions are dealt with by and large by national authorities, while the single market is a true EU endeavour.

This asymmetry of governance is becoming problematic as the global security environment becomes less benign. At the same time, the EU relies on the US for a military guarantee and vital elements of the security infrastructure.

As trust in the US declines and security weaknesses become apparent (Leonard *et al*, 2019), this asymmetry becomes an obstacle to effective cyber security.

The supervisory infrastructure of the EU's financial system has obviously evolved substantially in the last decade, with a much greater degree of centralisation and coordination, in particular because of the Single Supervisory Mechanism at the ECB and the European Supervisory Authorities (ESA).

There has not been, however, a corresponding increase in institutional collaboration, let alone centralisation of the security infrastructure<sup>15</sup>. The intelligence sharing between national security institutions and EU institutions or national institutions of other countries is sub-optimal according to analysts (Fiott and Parkes, 2019) and the EEAS calls on member states to increase intelligence sharing between national services and the EEAS-based service in charge of assembling and analysing hybrid threats (the Hybrid Fusion Cell)<sup>16</sup>.

### **Reinforcing the EU's financial resilience to hybrid and cyber risks**

The risks to the EU's financial system of hybrid and cyber risks are real but difficult to assess. The fact that so far there has not been a major incident with significant systemic repercussions does not mean that there will not be in the future.

Risks to the financial system from hybrid threats are multifaceted and do not originate necessarily in the financial system itself. Critical financial and other infrastructures need to be part of a strategy against hybrid threats. It is therefore important that the EU strengthens its resilience.

It is difficult to assess how adequately prepared the EU is to address these risks. In the course of our interviews with senior policymakers and private-sector representatives, we explored how they assess the state of play when

it comes to regulation, testing and governance at the level of the institution and at a more systemic level. While necessarily subjective, we have distilled our discussions and reading of public documents into five broad messages:

1. There have been significant advances to protect individual institutions. Considerably less has been done to address the issue from a system-wide perspective. In general, senior officials are well aware of regulatory, testing and governance measures recommended for, or required of, individual institutions.

The private financial sector, for its part, is alert to cybersecurity issues. Many institutions have put in place strong technical and procedural measures to protect their business, but we cannot be sure about the level of preparedness across all companies<sup>17</sup>.

It is our understanding that neither policy officials nor the private sector have advanced significantly on the broader systemic dimension. Interlocutors were much less clear when it came to the system as a whole – the perspective that is most relevant when thinking about actual hybrid attacks on a key infrastructure or systemic institutions.

Table 1 maps the vulnerabilities based on our interviews and reading of the publicly available material across the three main areas: regulation, testing and governance in terms of individual institutions and the financial system as a whole.

2. Starting with individual institutions, two issues deserve more deliberation. First, the joint advice from the European Supervisory Authorities (ESAs, 2019) is to streamline existing regulations and guidelines on cybersecurity. It is not always easy for countries with different legal systems to build a single or coordinated regulatory framework for cyber risks<sup>18</sup>.

**Table 1. A heat-map of the EU financial system’s preparedness in the face of hybrid and cyber risks**

	Regulation	Testing	Governance
Individual FMI	<p>What does regulation on cybersecurity say?</p> <p>Need to review the liquidity buffers?</p> <p>Need to review the capital requirements?</p>	<p>Are individual MFIs doing enough testing of their vulnerabilities?</p>	<p>Board-level priority, recommendations but how good is implementation?</p>
Financial system	<p>Systemic regulation? Macro-prudential discussion</p>	<p>G7 exercise, but no EU exercise. Euro- area exercise?</p>	<p>Integrated market but not integrated security structures.</p> <p>ECB and other EU financial supervisors lack counterpart on security side.</p> <p>Capacity to organise rapid macro-policy response.</p>

Source: Authors’ assessment based on interviews and reading of publicly available literature.



Currently, much is done through non-binding guidelines. The CROE example for payment systems points to the lack of regulatory alignment between the ECB and national authorities. We also found little evidence that existing rules on liquidity and capital regulatory requirements treat cyber risks differently to other operational risks that might require the built-up of separate buffers.

Second, when it comes to testing and governance, our impression is that large financial companies are very actively engaged. But it is less clear if smaller financial institutions and public institutions are similarly prepared. Unlike typical financial shocks that transmit via large institutions, cyber shocks might transmit as effectively via small institutions.

3. At the level of the system as a whole, significant issues deserve more deliberation. We received few indications that systemic regulatory questions have been considered. The macroprudential implications of cyber risks is also a topic that has not received much attention, despite an acknowledgement that cyber risks, let alone hybrid risks, cannot be treated as normal operational risks.

4. Cybersecurity is ultimately a matter for (and part of) national security in all countries, irrespective of the sector. National security authorities are informed and ultimately in charge, and security cooperation remains limited in the EU

This will have an impact on the way that cybersecurity is dealt with in the financial sector, despite banking union and, in the future, Capital Markets Union. This level of complexity is a lot more difficult to deal with as the EU remains still a union of 28 sovereign states.

5. The mismatch between strong financial integration and limited security integration could be a cause of systemic weakness. Strong financial integration means that many key financial services are provided by a limited number of

companies that might be concentrated in only a few member states.

While the supervision of such systemic institutions is centralised at European level (or there is a high level of supervisory coordination depending on the sector), the institutions' counterparts for security questions are national.

This mismatch could lead to systemic weaknesses if national authorities fail to internalise the financial effects that cyber attacks on local financial firms can have beyond national borders. Similarly, a cyber attack on the electricity or water supply system of an EU state could harm financial firms' activities, domestically and abroad.

### **The way forward?**

The five messages we have outlined indicate that policy discussion on cyber risks should address the following issues:

1. Information sharing can be improved within and between jurisdictions. The Basel Committee (BIS, 2018) reports that most jurisdictions have put in place cyber security information-sharing mechanisms (either mandatory or voluntary) involving banks, regulators and security agencies. Following an attack, financial institutions are required to report to the authorities.

BIS (2018) also found that banks communicate adequately between themselves, with the regulator and with national security agencies in the event of an attack. By contrast, there is typically much less communication going from the regulator back to banks, or between regulators across borders.

Some EU banks have indicated to us that they receive very little communication from authorities on cyber risks, in contrast to the detailed information banks are required to provide. Collaboration between the private sector and public authorities is important when it comes to information exchange and responding to ongoing attacks, as also emphasised by the NIS Directive.

2. When it comes to testing, the EU and the euro area in particular should consider holding regular preparedness exercises for the financial system.

The G7 under the French presidency undertook in summer 2019 a cyber attack exercise, but to our knowledge no such exercises for the financial system have been carried out at the EU or euro area level.

Clear assignment of responsibilities and rapid cross-border collaboration between national and European authorities and the private sector are critical to understanding how to reduce the damage and recover quickly.

While the European Union Cybersecurity Agency (ENISA) carries out exercises in other sectors<sup>19</sup>, an EU-wide exercise focusing on the financial system seems warranted.

3. The tension between national sovereignty on security matters and shared responsibility for financial-system stability creates multiple challenges.

For example, responses to cyber incidents involve law-enforcement agencies, which do not necessarily follow a sufficiently integrated approach to account for the wider implications to the EU financial system.

Even more difficult is the question of political judgement and response to hybrid threats. Who analyses such

risks and threats in real time from a truly EU-wide perspective? ENISA and the EEAS Hybrid Fusion Cell are useful institutional bases for a more systemic and EU wide response<sup>20</sup>.

But both ENISA and the Hybrid Fusion Cell are institutionally rather small with limited mandates and capacity to analyse and react in real time. EU institutions themselves can become victims of cyber and hybrid attacks.

While the institutions have obviously put in place significant measures to protect themselves, the question is whether sufficient public sector security infrastructure can be provided to them, including at the political level. How quickly would the EU be capable of defining a political response to a successful cyber attack on, say, the ECB?

Some progress in strengthening the mandate and competence of EU-level security agencies was made recently but this cannot be the endpoint given the high degree of interconnectedness. It is a big endeavour to improve and upgrade the coordination of national security agencies and EU capacity at the level of shared institutions. However, we believe it is imperative in such a highly integrated financial system<sup>21</sup>.

4. The issue of ownership of critical infrastructure, for example ownership of a stock exchange, a systemically important bank or even mobile networks, is left to EU member states. But if subject to cyber attacks, their ramifications could be felt across the EU financial system. To the extent that ownership has implications for management decisions and board procedures, foreign ownership of an important financial infrastructure could have implications for financial resilience against cyber attacks.

On 14 February 2019, the European Parliament adopted an EU framework for screening foreign direct investment

(Regulation (EU) 2019/452). This law<sup>22</sup> introduces a mechanism for cooperation and information-sharing among member states but stops short of giving veto powers to the Commission.

The objective of the framework is greater coordination on national security-related screening of foreign investment. It will help increase awareness and increase peer pressure across the EU. But it does not establish an independent EU authority for investment screening and also falls short of a single EU framework for assessing security risks.

We consider the new framework to be a step in the right direction but ultimately not commensurate with the challenge created by an integrated single market and still essentially national screenings of investments for national security reasons.

The point here is not to say that foreign ownership is the problem; rather that a national sovereign decision can have significant implications for the entire EU financial system.

5. A more integrated and better-functioning insurance market for cyber risks can help manage the costs but also help understand the risks themselves. The insurance market against cyber risks is relatively small and suffers disproportionately from the problems any insurance market suffers from (information asymmetry, adverse selection).

In the EU, the issue is compounded by the lack of a central security authority and information sharing. Yet, creating the right conditions for an insurance market to develop can help in two ways. First, the ability to insure against cyber risks will help cushion the cost for any individual entity that comes under attack.

Second, allowing for a market, and therefore for a pricing system, to develop will help understand the extent

and gravity of these risks. Helping therefore to define a methodology that is common across the EU could be an important contribution to the creation of an EU-wide insurance market. Also, creating uniform information and disclosure requirements will be a helpful step forward.

6. The response to a major systemic cyber or hybrid incident might also require a swift and decisive macro policy response. As we noted in section 2, the initial policy reaction to the 9/11 terror attacks involved significant liquidity provisioning by the Fed. Evidence suggests that this immediate and sizable response reduced the impact on the American economy<sup>23</sup>. The EU should be aware of this and be ready to act in a timely manner.

As cyber and hybrid risks increase, the EU's system of fragmentation on issues of security, but centralisation on financial and other economic issues, will be tested. This asymmetry was not an obstacle in a world in which security threats were more contained (or of a different nature) and the EU trusted the United States to be its security guarantor.

We believe that Europe will be increasingly asked to provide for its own security, and as a unit. At the very least, it will require a greater level of collaboration among national authorities. ■

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### *Endnotes*

1. See for example <https://www.bbc.com/news/39655415>.

2. See <https://www.bloomberg.com/opinion/articles/2014-07-01/bulgaria-s-a-soft-target-for-bank-runs>, <https://www.ft.com/content/40692919-312a-39e0-acd4-bce8c899ac66> and <https://bruegel.org/2014/07/fact-of-the-week-a-spam-newsletter-caused-a-bank-run-in-bulgaria/>.
3. See <https://www.dw.com/en/argentina-uruguay-paraguay-suffer-massive-power-blackout/a-49225070> and <https://www.dw.com/en/how-argentinans-nationwide-blackout-happened/a-49232203>.
4. See <https://www.reuters.com/article/us-ukraine-cyber-attack-energy/ukraines-power-outage-was-a-cyber-attack-ukrenergo-idUSKBN1521BA>.
5. The reported average loss increased 61 percent from 2018 to 2019, reaching \$369,000 (Hiscox, 2019). The report surveyed 5,400 firms in the US, UK, Belgium, France, Germany, Spain and the Netherlands. Approximately three out of four businesses failed a cyber-readiness test. However, Hiscox (2019) notes many cyber incidents involve viruses/worms, which might not constitute an 'attack' on a specific company.
6. <https://www.bitkom.org/Presse/Presseinformation/Attacken-auf-deutsche-Industrie-verursachen-43-Milliarden-Euro-Schaden.html>.
7. See for example <https://www.nytimes.com/2019/07/17/world/europe/bulgaria-hack-cyberattack.html?searchResultPosition=3>.
8. See Drakos (2004), Brounen and Derwall (2010) and Apergis and Apergis (2016).
9. See Chen and Siems (2003), Nikkinen and Vahamaa (2010), Maillet and Michel (2005) and Burch and Emery (2003).
10. See Chen and Siems (2003), Johnston and Nedelescu (2006) and Ferguson (2003).
11. Available at <https://www.csis.org/programs/technology-policy-program/significant-cyber-incidents>.
12. This followed on from various initiatives. The European Banking Authority (EBA) published a set of guidelines on ICT risk assessment in 2017, supplementing its own general Supervisory Review and Evaluation Process guidelines, which are used when the supervisor evaluates whether a bank meets capital requirements and manages risks. These guidelines refer to measures to mitigate ICT risks, information security and recommend that measures be put in place. The Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions published guidance

on cyber resilience for all FMIs in 2016, complementing its own Principles for Financial Market Infrastructures.

13. The ECB also emphasises the need for dynamism in approaching cybersecurity (Kopp et al, 2017). This requires promoting situational awareness and a process of continuous learning as cyber-related threats change and evolve.

14. Surveys from ACCA (2019), Kaspersky (2018) and TD Ameritrade Institutional (2019) show that cybersecurity is increasingly being prioritised by companies. Cybersecurity service providers are also expanding in revenue and achieving record product sales, while large technology companies, including BlackBerry, Symantec, IBM, BAE Systems and CISCO, are redirecting their investments towards cybersecurity.

15. The European Centre of Excellence for countering Hybrid Threats in Helsinki is an intergovernmental think tank, also supported by NATO and the EU. Other institutions with primarily analytical capacities exist, such as the European Union Institute for Security Studies.

16. See [https://eeas.europa.eu/sites/eeas/files/joint\\_communication\\_increasing\\_resilience\\_and\\_bolstering\\_capabilities\\_to\\_address\\_hybrid\\_threats.pdf](https://eeas.europa.eu/sites/eeas/files/joint_communication_increasing_resilience_and_bolstering_capabilities_to_address_hybrid_threats.pdf).

17. There are conflicting messages here. When we spoke to large individual financial firms, they were confident that they take adequate cyber security measures. However, a survey run by IMD International (Switzerland, World Competitiveness Center, [www.imd.org/wcc](http://www.imd.org/wcc)) showed that business leaders in many countries increasingly believe that cyber security is not adequately addressed. Also there are strong theoretical arguments why individual institutions might underinvest in cyber security, as they have an incentive to capitalise on other firms' actions (Gordon et al, 2015).

18. BIS (2018) surveyed the range of practices in different jurisdictions in terms of managing cyber risks. They found that most regulators have taken action to promote the creation of frameworks that enhance the cyber resilience of those they regulate. They did that by either issuing principles-based guidance or prescriptive regulation. The Basel Committee commented on the lack of homogeneity in approach, style and regulatory requirements across the globe. And while most regulatory authorities expect entities to have a cyber security strategy, they do not actually require it. As the financial sector is becoming increasingly digital there is a need for greater alignment of national regulatory and supervisors.

19. See [www.cyber-europe.eu](http://www.cyber-europe.eu).



20. See for example EPRS (2019).

21. An alternative would be to reduce financial integration with a view to reducing the scope of spillover from cyber and hybrid threats onto the financial system (see Stiglitz, 2010, for a theoretical exposition of the argument for limiting integration). However, this option would be inconsistent with a highly integrated financial system at the core of a monetary union and an integrated single market.

22. See <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R0452>.

23. See IMF (2001), Johnston and Nedelescu (2006), Maillet and Michel (2005) and Chen and Siems (2003).

24. For information on the rationale behind the factors, refer to Fama and French (1992). For information on the factors see Kenneth R French at [https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data\\_Library/f-f\\_factors.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html).

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## **ANNEX: THE IMPACT OF A GIVEN CYBER ATTACK ON COMPANIES' RETURNS: ECONOMETRIC EVIDENCE**

*The release of information on a cyber attack on a company – an unexpected event – might have an impact on its stock price, as financial markets update their expectations. If such events bring additional unexpected costs for the company (both direct and indirect), stock prices will move downwards. Cyber attacks are expected to have a one-off direct cost for companies when they take place, due mostly to interrupted business activity and costs to restart activity, and also an indirect one-off cost because of reputational damage and subsequent reduction in expected demand and brand value.*

*Any new information on cyber attacks can impact a company's returns upon its release, months or even years after the attack originally took place. New cost estimates, for instance, or news on legal proceedings, such as legal expenses or fines, are also expected to impact a company's stock price when made public.*

### *Econometric approach*

*We fit to a company's monthly returns the standard asset pricing models defined in the financial econometrics literature*

*(Fama and French (1992) 3-Factor model). To estimate the impact of cyber attacks on a company's returns, we extend the models by adding a variable representing the severity of a cyber attack event.*

*The models in question are the standard CAPM:*

*A.1*

$$(Y_{it} - RF_t) = \alpha_i + \beta_i(Mkt_t - RF_t) + \gamma C_{it}$$

*And the Fama and French 3-Factor model:*

*A.2*

$$(Y_{it} - RF_t) = \alpha_i + \beta_i(Mkt_t - RF_t) + \beta_{SMB}SMB_t + \beta_{HML}HML + \gamma C_{it}$$

*Where:*

*$Y_{it}$  is the market return of company at time  $t$ , ie. with representing the stock price of company at time  $t$ ;*

*$RF_t$  is the risk-free rate at time  $t$ , the monthly-equivalent of the 10-year US Treasury Bond rate;*

*$Mkt_t$  is the market return at time  $t$ , the market return of the S&P500 Index;*

*$SMB_t$  is the Fama-French monthly Small Minus Big Factor, meant to control for the excess returns of small (low market cap) stock portfolios compared to big stock (large market cap) portfolios;*

*$HML_t$  is the Fama-French monthly High Minus Low Factor, meant to control for the excess returns of large book-to-value stock portfolios compared to low book-to-value portfolios<sup>24</sup>;*

*$C_{it}$  is the variable of interest, representing the severity of a cyber attack event on company  $i$  at time  $t$ .*

*The variable of interest is the number of times a company has been mentioned in the media, in a given month, in cyber attack news (see note to Figure 1 for definition of cyber attack news). Our assumption here is that more substantial*

*attacks are more likely to be commented on by more media outlets and more frequently. The number of mentions in the media also directly correlates with dissemination of information to the public and thus brings higher reputation costs. Variable is therefore a proxy for the severity of the cyber attack.*

*The companies in questions are all those which over the 2011-2019 period were mentioned in the media as targets of cyber attacks.*

*We got the following key results:*

- 1. A press mention of a company in the context of a cyber attack is not enough for a statistically significant decrease in its returns. Only if a company is mentioned more than 15 times in a month in the context of a cyber attack do we find a negative effect on monthly returns.*
- 2. We estimate that 100 mentions of a cyber attack event on a company in the media in a given month is associated with a decrease of 2.6 to 3.2 percentage points on the company's monthly returns.*
- 3. We do not find any evidence that financial companies are more affected than non-financial companies, nor banks specifically.*