Financial Stability Paper No. 13 – December 2011

Reform of the International Monetary and Financial System

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The financial crisis has imposed large costs on the global economy and revealed deficiencies in policy frameworks around the world. While the ongoing reforms to financial regulation aim to make the financial system more resilient, they cannot eliminate all the risks associated with large global capital flows. This paper argues that broader reforms to the International Monetary and Financial System (IMFS) are also required.

The paper sets out three objectives for a well-functioning IMFS: i) internal balance, ii) allocative efficiency and iii) financial stability. The IMFS has functioned under a number of different regimes over the past 150 years and each has placed different weights on these three objectives. Overall, the evidence is that today's system has performed poorly against each of its three objectives, at least compared with the Bretton Woods System, with the key failure being the system's inability to maintain financial stability and minimise the incidence of disruptive sudden changes in global capital flows.

There is little consensus in the academic literature, or among policymakers, on what are the underlying problems in the global economy which allow excessive imbalances to build in today's IMFS and/or which impede the IMFS from adjusting smoothly to counteract these imbalances. This paper attempts to provide a framework for thinking about these underlying problems, and thus a means for discriminating among the reform solutions.

Finally, the paper proposes a number of reforms to today's IMFS. Measures that countries could implement themselves to reduce the underlying frictions include greater flexibility in nominal exchange rates; reforms to make national balance sheets more resilient; and measures to improve financial market participants' understanding of the risks on countries' balance sheets. Policy initiatives that require some degree of international co-operation to be effective include improvements to global financial safety nets; international initiatives to close data gaps; co-ordination on financial regulatory reform; and possibly revisiting the application of WTO rules. But the paper also notes that it may be impossible to remove the frictions entirely, and so there may be a need for a more fundamental overhaul of the IMFS in which a rules-based system would prevail, to force countries to internalise the externalities that result from their policies.

1 Introduction

The financial crisis has imposed large costs on the global economy. And it has revealed deficiencies in policy frameworks around the world. Policymakers are learning from the mistakes made and reforms are already in train. These include a range of international financial regulatory initiatives that will have fundamental implications for the way the global financial system operates.

Given that the proximate cause of the crisis was excessive risk-taking within the financial sector, it is appropriate that improving financial regulation and supervision are among the top reform priorities. But this paper argues that in today's highly interconnected global economy, a broader reform agenda is needed. In particular, reforms to the international monetary and financial system (IMFS) are also required.

The IMFS is the set of arrangements and institutions that facilitate international trade and the allocation of investment capital across nations. A well-functioning system should promote economic growth by channelling resources in an efficient manner across countries, over time, and in different states of the world. It should do this by creating the right conditions for international financial markets to operate in a smooth and sustainable fashion, discouraging the build-up of balance of payments problems, and facilitating access to finance in the face of disruptive shocks.

These functions suggest that the ideal system should satisfy the following objectives:(1)

- *Internal balance* — the IMFS should enable countries to use macroeconomic policies to achieve non-inflationary growth.

- *Allocative efficiency* — the IMFS should facilitate the efficient allocation of capital by allowing flows to respond to relative price signals.

- *Financial stability* — the IMFS should help to minimise the risks to financial stability.

While there are some complementarities between these objectives, there may also be conflicts. For instance, the pursuit of allocative efficiency is likely to be associated with increased financial integration, which has a complicated relationship with financial stability. While high levels of financial interconnectedness can facilitate greater risk-sharing and therefore lower the *probability* of financial crises, it can exacerbate the *impact* of any crises that do occur by providing numerous channels through which risk can spread (Gai and Kapadia (2010)). Similarly, although internal balance can eliminate the harmful effects of inflation volatility on financial stability, low inflation environments may also be associated with potentially destabilising increases in leverage, credit and asset prices (Borio and Lowe (2002)). And when countries attempt to mitigate risks to financial stability by managing their exchange rates closely, the problem becomes analogous to the Mundell-Fleming 'Impossible Trinity' (Mundell (1963) and Fleming (1962)). Under these circumstances, countries must choose between maintaining control over monetary policy (*internal balance*) and allowing capital to flow freely (*allocative efficiency*).

In a world where there were no underlying imperfections, or *frictions*, market forces should lead to an IMFS where all three objectives are achieved simultaneously. There would be no need for any 'rules of the game' — market forces would automatically result in the optimal outcome for the global economy. But in reality, of course, there are frictions in today's IMFS. And those frictions can result in externalities, which mean that one country's actions distort the choices open to others. The result is an IMFS that is unable to achieve its three objectives and a global outcome that is sub-optimal.

Over the past century or so, the IMFS has been through a number of incarnations, which have placed different weights on these objectives. That may, in turn, reflect changing views on the relative importance of the underlying imperfections in the IMFS and the externalities that exist. The various IMFS regimes have involved different combinations of international and national frameworks. Members of the Gold Standard, for example, fixed their currencies to gold, allowed capital to flow freely across borders and tended not to use monetary policy actively. So they gave up on the *internal balance* objective to achieve *allocative efficiency* and *financial stability*. The Bretton Woods System (BWS) featured fixed but adjustable nominal exchange rates, constrained monetary policy independence and capital controls — effectively sacrificing the *allocative efficiency* objective to allow greater control over *internal balance* and *financial stability*.

In contrast, in today's system there are almost no binding international rules; rather there exists a hybrid arrangement in which countries are free to choose whether to fix or float their exchange rate and whether to impose capital controls or not. While today's IMFS affords countries the freedom to pursue policies to suit their domestic objectives, this flexibility has also created problems. The main externalities in today's IMFS are most visible in the interaction between the advanced and emerging market economies (EMEs) (King (2011)). Trade has promoted development in China and other EMEs, and has benefited the rest of the world as the costs of a range of traded goods and services have been driven down. But the rise in trade has been accompanied by large changes in the global pattern of spending, which is currently reflected in sizable current account imbalances.

(1) These are loosely based on Krugman's (1998a) categorisation of the three objectives as 'adjustment', 'liquidity' and 'confidence'.

To put the performance of the current system into context, Section 2 of this paper provides an historical overview of the IMFS, focusing in particular on the Gold Standard and the BWS. Section 3 examines today's system in more detail and makes some qualified assessments of its performance relative to previous regimes against the three key objectives. Without placing undue emphasis on causation, the comparison of today's system with historical regimes suggests that better global outcomes are indeed possible.

Section 4 of the paper goes on to highlight our assessment of the key frictions in the global economy that explain the sub-optimal performance of today's IMFS. There is little consensus in the academic literature, or among policymakers, on what the *underlying* problems are in today's IMFS. In fact, relatively little has been written on this topic. Rather, the focus of the literature is on reform solutions, where proposals range from encouraging countries to allow greater flexibility in their exchange rates (Bernanke (2010a)), to ideas for a new rules-based IMFS with sanctions to ensure compliance (Eichengreen (2010)). But without a framework for thinking about what the underlying problems are, it is difficult to discriminate among the reform solutions. This paper attempts to provide such a framework, setting out what the frictions are in the global economy that today's IMFS has to resolve.

In our assessment, the main frictions are: *nominal rigidities* (stickiness in prices and wages) which have been exacerbated by fixed exchange rates in some EMEs and contributed to unsustainable patterns of spending; *missing markets*, which encourage countries to manage their exchange rates and/or accumulate excessive reserves; *imperfect information*, which may amplify movements in exchange rates and capital flows, and contribute to greater than warranted capital flows to 'riskier' parts of the financial system; and *international institutional arrangements*, which may encourage countries to undervalue their exchange rates in the pursuit of export-led growth. These frictions, some of which are very apparent in the ongoing euro-area crisis, have encouraged the build-up of large current account imbalances in today's IMFS and/or meant that adjustment to those imbalances, when it happens, is more costly. In view of this, the potential gains that could be realised from a better-functioning IMFS are considerable.

This framework of identifying the frictions in the IMFS is a useful disciplining device for assessing which reforms will be most effective. Section 5.1 takes each of the frictions identified and proposes remedial measures that could be implemented by individual countries, independently of international policy initiatives. Such measures include: greater flexibility in prices, wages and nominal exchange rates, reducing the problem of *nominal rigidities*; reforms to make national balance sheets more resilient and thus discourage excess reserve accumulation, through completing some *missing markets*; and measures to improve financial market participants' understanding of the risks on countries' balance sheets and thus reduce the problem of *imperfect information*.

However, in some instances it will not be possible for individual countries to correct the underlying failures completely, at least not acting on their own. In these cases, international policy initiatives will also be required to mitigate these frictions, or if this is not feasible, to internalise the externalities that result. Section 5.2 discusses policy initiatives which will require some degree of international co-operation to be effective, but which stop short of requiring countries to co-ordinate their policies on an ongoing basis. These include: improvements to global financial safety nets to reduce the impact of *missing markets* frictions; international initiatives to close data gaps and co-ordination on financial regulatory reform to reduce the impact of *imperfect information*; and possibly revisiting the application of WTO rules to help limit *international institutional frictions*.

Section 5.3 outlines reform options which would require a more active form of policy co-ordination. This could be through voluntary agreements, where the G20 Framework for Strong, Sustainable and Balanced Growth is an important attempt to develop such a mechanism. However, its effectiveness remains to be seen. In view of this, Section 5.3 also considers the possible need for a more fundamental overhaul of the IMFS, such as a move toward an explicit rules-based system. This would be a mechanism to *force* countries to internalise externalities related to current account imbalances, enforced by taxes on current or capital flows.

While there are a number of reform solutions proposed in this paper, there are no recommendations to reduce the dominance of the dollar. As well as requiring substantial policy co-operation in the near term and a considerable amount of time for the system to readjust, it is not clear which of the underlying imperfections such a reform would be targeting. And it has not been proven that a multiple reserve currency system would be more stable than one that is concentrated around a single currency. Section 6 offers some conclusions.

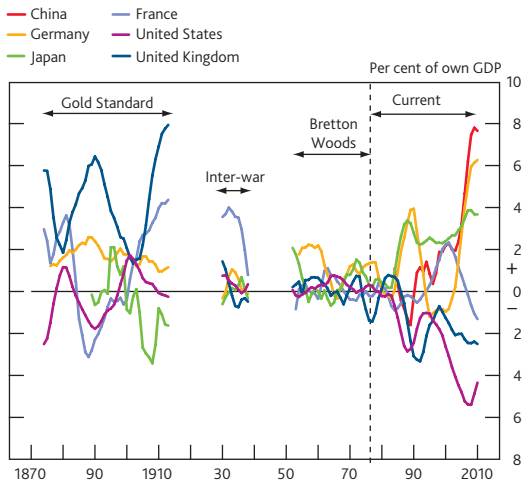
2 A brief history of the IMFS

The IMFS has functioned under a number of different regimes over the past 150 years. Each of these regimes has placed different weights on achieving the *internal balance, allocative efficiency* and *financial stability* objectives, and with varying degrees of success. That may reflect the changing importance of the underlying imperfections in the system and/or differences in countries' willingness to internalise the externalities from their policy actions. Both of these are difficult to know with any certainty. But either way, it is helpful to have some understanding of the features of past IMFS regimes as background to discussions on today's IMFS.

Under the Gold Standard, the money supply was linked to the availability of gold. Countries with current account surpluses accumulated gold, while deficit countries saw their gold stocks diminish. This, in turn, contributed to upward pressure on domestic spending and prices in surplus countries and downward pressure on them in deficit countries, thereby leading to a change in relative outlays and prices that should, eventually, have reduced imbalances. The credibility of countries' commitments to pursue this passive monetary policy approach was underpinned by the fact that central banks were under little pressure to help minimise unemployment or to pursue other potentially conflicting domestic objectives at the time (Eichengreen (1996)). There was no formal mechanism to force countries to adjust their domestic policies under the Gold Standard. Instead, they did so out of convention.

Net capital flows tended to be large under the Gold Standard (**Chart 1**). However, passive domestic monetary policy responses meant that they were not accompanied by large cross-country policy inconsistencies and so did not pose the same threat to global financial stability as those of today. **Table A** below, which presents a range of summary statistics on the performance of different IMFS regimes, shows for example that the incidence rate of banking and currency crises in the Gold Standard was much lower than in today's system. Of course these summary statistics should be treated with caution, as the variables included will also have been influenced by a wide range of third factors — such as globalisation, financial liberalisation and regulation.(1)

Chart 1 Current account balances(a)



Sources: Global Financial Data, IMF *World Economic Outlook* (September 2011), Taylor (2002) and Bank calculations.

(a) Five-year moving average.

The direction of net capital flows during the Gold Standard seemed broadly consistent with the efficient allocation of capital across countries. In particular, these imbalances were associated with 'downhill' flows of capital from the older, advanced economies in Europe to more productive opportunities in the younger, fast-growing economies in Asia and the Americas (Kenwood and Lougheed (1999)). Further, private sectors played the dominant role in these capital flows, which is consistent with the notion that economic fundamentals were at work.

Overall, the Gold Standard appeared to perform reasonably well against its *financial stability* and *allocative efficiency* objectives, while the *internal balance* objective was of secondary importance. But the effective sacrifice of this latter objective was the undoing of the Gold Standard, as growing recognition of the need to pursue domestic policy objectives (most notably, to respond to rising unemployment) and achieve internal balance eventually undermined the credibility of the restored Gold Standard in the interwar period. Against the backdrop of increasing concern about domestic objectives, political disputes over war reparations meant that central bank co-operation was not forthcoming when Germany faced a banking crisis in 1931, eventually triggering the collapse of the system (Eichengreen (1992)).

The BWS was established in the late 1940s in an attempt to allow countries greater domestic policy autonomy while still insulating them from excessive exchange rate volatility. Policymakers appeared to assign greater importance to achieving *internal balance* and *financial stability*, and less to obtaining *allocative efficiency*. Capital controls were sanctioned explicitly to prevent speculative activity from forcing premature and destabilising realignments. As a result, net capital flows were at their lowest during the BWS period. The US dollar was pegged to gold and all other currencies maintained their parities to the US dollar, although pegs were 'adjustable' in the case of fundamental disequilibria.

The International Monetary Fund (IMF) was created as an integral part of the BWS, with responsibility for supervising a pool of reserves that could be used to finance temporary imbalances and adjudicating changes to exchange rate parities. The IMF's Articles of Agreement also incorporated a 'scarce currency clause' which, although never invoked, allows members to impose tariffs and export restrictions on countries running persistent current account surpluses.

(1) And, of course, different countries participated in the different systems, further complicating comparisons. In particular, today's system has many more members than the BWS. Period averages can also mask differences.

Table A Selected metrics for measuring the performance of the IMFS over time[a]

PANEL A:

		World GDP (per capita)[b]		World inflation[c]	
		Growth	**Volatility**	**Average**	**Volatility**
		Annual average			Standard deviation
		Per cent	Coefficient of variation	Per cent	Percentage points
Pre-Gold Standard	(1820-1869)	0.5	—	—	—
Gold Standard	**(1870-1913)[d]**	**1.3**	**1.2**	**0.6**	**3.0**
Interwar Period	**(1925-1939)[d]**	**1.2**	**3.3**	**0.0**	**4.6**
Bretton Woods	**(1948-1972)[e]**	**2.8**	**0.3**	**3.3**	**2.1**
memo:	*1948-1958 [e]*	*2.7*	*0.4*	*3.1*	*2.9*
	1959-1972	*3.0*	*0.3*	*3.5*	*1.3*
Current	**(1973-2008)**	**1.8**	**0.7**	**4.8**	**3.5**
memo:	*1973-1989*	*1.4*	*0.8*	*7.5*	*3.4*
	1990-2008	*2.2*	*0.6*	*2.3*	*0.9*

PANEL B:

		Downturns		Current account balances
		Years of negative world GDP growth	**Years of negative country GDP growth[f]**	**Surpluses and deficits**
		Share of period	Share of period, median country	
		Per cent	Per cent	Per cent of world GDP[g]
Pre-Gold Standard	(1820-1869)	—	—	—
Gold Standard	**(1870-1913)[d]**	**7**	**19**	**2.4**
Interwar Period	**(1925-1939)[d]**	**21**	**27**	**1.2**
Bretton Woods	**(1948-1972)[e]**	**0**	**4**	**0.8**
memo:	*1948-1958 [e]*	*0*	*0*	*0.8*
	1959-1972	*0*	*0*	*0.8*
Current	**(1973-2008)**	**0**	**13**	**2.2**
memo:	*1973-1989*	*0*	*18*	*1.6*
	1990-2008	*0*	*11*	*2.8*

PANEL C:

		Incidence of crises		
		Banking crises[h]	Currency crises[i]	External default[j]
		Number per year	Number per year	Number per year
Pre-Gold Standard	(1820-1869)	0.6	—	0.7
Gold Standard	**(1870-1913)[k]**	**1.3**	**0.6**	**0.9**
Interwar Period	**(1925-1939)**	**2.1**	**1.7**	**1.5**
Bretton Woods	**(1948-1972)**	**0.1**	**1.7**	**0.7**
memo:	*1948-1958*	*0.0*	*1.4*	*0.3*
	1959-1972	*0.1*	*1.9*	*1.1*
Current	**(1973-2009)**	**2.6**	**3.7**	**1.3**
memo:	*1973-1989*	*2.2*	*5.4*	*1.8*
	1990-2009	*3.0*	*2.4*	*0.8*

Sources: Bordo *et al* (2001), Global Financial Data, Hutchison and Noy (2006), IMF *World Economic Outlook* (October 2010), Maddison (2006) with updated data from www.ggdc.net/MADDISON/oriindex.htm, Mecagni *et al* (2009), Reinhart (2010), Taylor (2002) and Bank calculations.

(a) The chosen start and end dates for the different IMFS regimes reflect historical data availability.
(b) Denominated in constant international dollars, as defined by Maddison (2006).
(c) Nominal GDP-weighted average of 12 countries.
(d) Where world-level data are unavailable, a subset of reporting countries is used.
(e) World GDP data begin in 1950.
(f) Sample of current G20 countries (including EU countries), where data available.
(g) Sum of absolute values of surpluses and deficits. Based on available data for a sample of G20 and EU countries.
(h) Based on a sample of 56 countries, using data based on methodology developed by Bordo *et al* (2001).
(i) Based on a sample of 56 countries, using data based on methodology developed by Bordo *et al* (2001) and supplemented by Reinhart (2010), Mecagni *et al* (2009) and Hutchison and Noy (2006).
(j) Based on a sample of 45 countries. External defaults as defined by Reinhart (2010).
(k) Currency crises data begin in 1880.

As **Table A** shows, the BWS performed well against a number of metrics. The period stands out as coinciding with remarkable financial stability and sustained high growth at the global level. Moreover, the solid growth outcomes were not simply the result of post-war reconstruction efforts — growth in real per capita GDP was slightly stronger in the 1960s than it was in the 1950s.

Importantly though, **Table A** provides no information about causality. In particular, it is difficult to be definitive about whether the BWS was successful in *delivering* growth and stability, or whether it was successful *because* it operated during a period of growth and stability (Bordo (1993)). The fact that the BWS existed only for a relatively short period of time (24 years based on a generous definition,(1) compared to at least 37 years for today's IMFS) suggests that the latter interpretation is certainly plausible.

Indeed, despite its apparent strong performance, the BWS ultimately collapsed because of fundamental flaws in its design. In particular, tight controls on private capital flows meant that global liquidity was determined by the supply of gold and the size of US balance of payments deficits. This feature of the system meant that US external liabilities were required to increase to match rising global demand for reserves, which eventually undermined the credibility of the dollar's peg to gold. Relatedly, US policymakers' inability to contain inflationary pressures in the late 1960s also contributed to the collapse of the BWS. Inappropriately loose monetary policy settings were exported to other countries via their exchange rate pegs, and as sterilisation became increasingly difficult, prompted them to float their currencies in 1971 and then again in 1973 (Bordo (1993)).

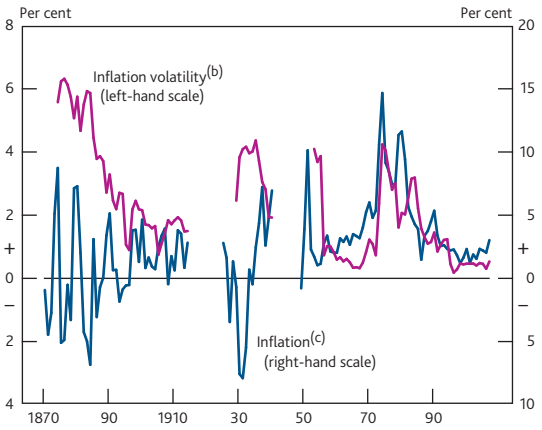
3 The performance of today's IMFS

Since the breakdown of the BWS, international monetary arrangements have evolved into a decentralised system, in which countries have chosen to make independent choices about their monetary, exchange rate and financial stability policies. Capital has become increasingly mobile between countries.

Against a range of metrics, today's system has performed poorly, at least relative to the BWS. **Table A** shows that the current system has coexisted, on average, with: slower, more volatile, global growth; more frequent economic downturns; higher inflation and inflation volatility; larger current account imbalances; and more frequent banking crises, currency crises and external defaults.

To some extent these period-average metrics obscure significant improvements over the current period. Inflation fell sharply over the 1990s (**Chart 2**), most likely reflecting greater recognition of the economic costs of high and volatile inflation in the 1970s and early 1980s.

Chart 2 World inflation(a)



Sources: Global Financial Data, IMF *World Economic Outlook* (September 2011) and Bank calculations.

(a) Calculated using CPI data for Australia, Belgium, Denmark, France, Germany, Italy, Japan, Norway, Sweden, Thailand, United Kingdom and United States. The period of German hyperinflation is excluded.
(b) Volatility measured as the five-year rolling standard deviation of the weighted inflation measure.
(c) Countries' CPI inflation rates weighted by their GDP in 1980.

Given the freedom that countries have in today's IMFS, they have chosen to adopt independent domestic monetary policy regimes, often with explicit inflation-targeting mandates. Nevertheless, with the (important) exception of inflation, the outcomes achieved during the BWS period were still better than those attained since 1990.

Examining the performance of today's IMFS in more detail, it is apparent that greater capital mobility has been one of the defining features of the current regime. In theory, financial globalisation should allow agents to: smooth the path of their consumption in the face of positive and negative shocks to their income; smooth consumption over the life cycle or between generations; and allocate capital to its most productive use. To take an extreme example, in the complete absence of *frictions*, net capital flows would simply reflect the efficient allocation of capital across countries and over time. These 'efficient' net capital flows would raise global welfare by allowing capital to flow from low-productivity to high-productivity countries and/or from countries with a higher preference for future consumption to countries with a relatively strong preference for current consumption.(2)

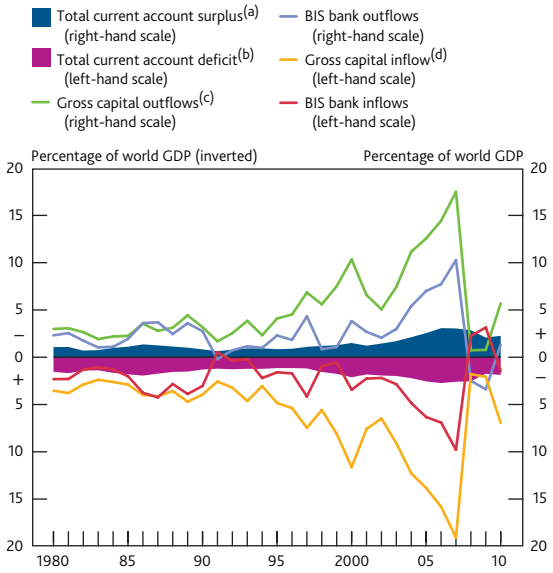
These capital flows would be entirely consistent with, and indeed facilitate, the IMFS simultaneously achieving its *internal balance, allocative efficiency* and *financial stability* objectives. In theory then at least, there is potential for

(1) Based on a stricter definition, the BWS only operated as truly intended for a nine-year period between 1959 (when advanced Western European countries made their currencies fully convertible) and 1968 (when the Gold Pool was eliminated).
(2) Differences in countries' stage of development are an important determinant of productivity differences, while demographic profiles and natural resource endowments are widely accepted as important influences on saving propensities. For further discussion on the drivers of capital flows, see Speller *et al* (2011).

financial globalisation to deliver large benefits (Dell'Arricia *et al* (2008)).

However, the evidence on the extent to which financial globalisation has translated into actual benefits is more mixed. Net capital flows have increased substantially in today's system relative to the Bretton Woods era. This has, however, been dwarfed by the rise in gross flows associated with the process of financial globalisation (**Chart 3**).

Chart 3 Gross and net capital flows

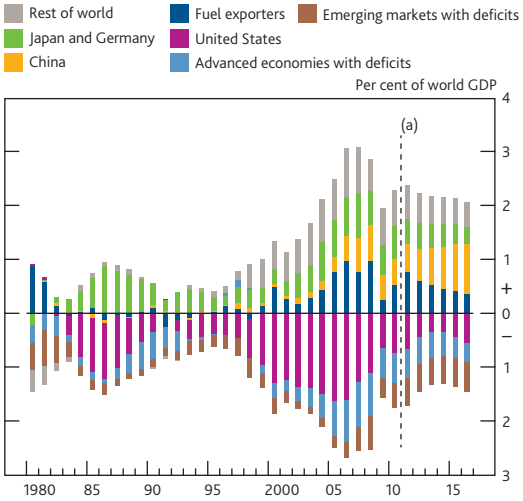


Sources: Bank for International Settlements, IMF *World Economic Outlook* (September 2011) and Bank calculations.

(a) Sum of global current account surpluses.
(b) Sum of global current account deficits.
(c) Sum of global net purchases of foreign assets by residents.
(d) Sum of global net purchases of domestic assets by foreigners.

Today's IMFS has permitted large imbalances to build between countries, particularly over the past fifteen years or so. After having averaged just under 1% of world GDP between 1980 and 1997, net capital flows (measured as either the sum of all countries' current account deficits or the sum of all countries' current account surpluses) roughly tripled to a peak of almost 3% of world GDP in 2006–07 (**Chart 4**). Although imbalances reversed sharply in 2009, they remain high by historical standards and are forecast by the IMF to continue at around 2% of world GDP over the next five years at least.

Chart 4 Global current account balances



Sources: IMF *World Economic Outlook* (September 2011) and Bank calculations.

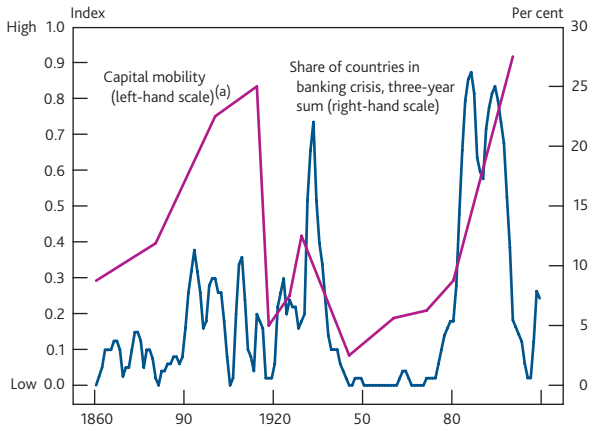
(a) Forecasts begin after 2010.

These growing flow imbalances have also been accompanied by growing stock imbalances. Between 1998 and 2008, the US net external liability position quadrupled in size, rising to $3.3 trillion (or 23% of GDP). Over the same period, the net external asset positions of Japan and Germany rose by $1.3 trillion and $0.9 trillion respectively. Chinese data are only available from 2004, but show that net external assets increased by $1.2 trillion, to $1.5 trillion (33% of GDP) in 2008, mirroring the increase in the US net external liability position over this period.

In today's system, 'uphill' flows of capital from EMEs to advanced economies are prevalent, suggesting that factors other than productivity have been at work (Lucas (1990)). One explanation is that differences in local property rights are behind this pattern. Some others are described in Section 4.

The historical record is chequered with episodes of highly disruptive surges and reversals of international capital flows to and from EMEs, and the recent crisis has demonstrated that advanced economies are by no means immune. **Table A** shows that the incidence of banking and currency crises has been higher in the current IMFS than in any previous regime, with the incidence of sovereign default second only to the interwar period. Since the 1980s in particular, the reappearance of episodes of global financial instability has coincided with a rapid increase in international capital mobility (**Chart 5**).

Chart 5 Capital mobility and the incidence of banking crises



Sources: Obstfeld and Taylor (2003), Reinhart and Rogoff (2008) and Bank calculations.

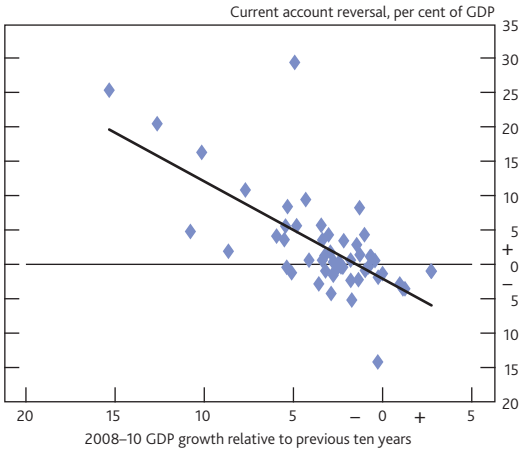
(a) A judgemental index on the extent of capital mobility constructed by Obstfeld and Taylor (2003).

A number of other papers also link the re-emergence of financial instability to the accumulation of global imbalances in today's IMFS. For instance, Barrell *et al* (2010) find that an increase in a country's current account deficit raises the probability of a banking crisis (in a sample of 14 OECD economies over a period of 26 years). Similarly, Reinhart and Reinhart (2008) find that the increase in the probability of a banking crisis, conditional on a capital inflow bonanza,(1) is 5.2% (although the figure for just advanced economies is much lower).

There is also some suggestive evidence that countries that have experienced the largest current account reversals in the recent episode have also seen the most pronounced slowdowns in output growth (**Chart 6**). Clearly the causality here could run in either, or both, directions. Historically, however, substantial pickups in unemployment have typically been preceded by large current account deficits and coincided with major current account reversals, suggesting that external financing problems often play an important role in crisis episodes (**Chart 7**).

It is clear that there have been many instances in which financial globalisation has imposed — or at least contributed to — large costs. Financial crises provide the most visible evidence of just how large these costs can be. And while it is too early to estimate the full impact of the most recent global crisis, clearly it has been severe and long-lasting.

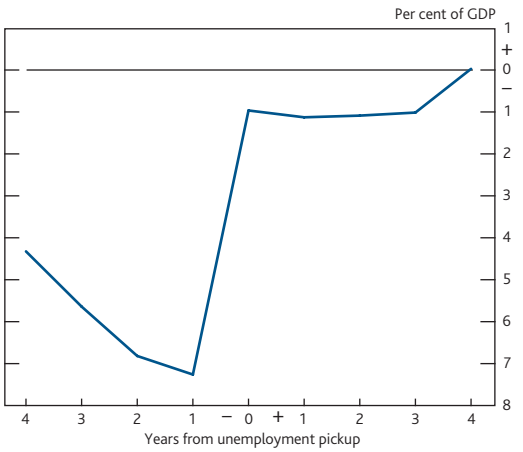
Chart 6 Current account reversals and output growth, 2007–10(a)



Sources: IMF *World Economic Outlook* (April 2011) and Bank calculations.

(a) Current account reversal is defined as the change in the current account balance from 2007 to 2010. Only advanced economies and EMEs are included.

Chart 7 Current account behaviour around large unemployment pickups(a)



Sources: IMF *International Financial Statistics*, IMF *World Economic Outlook* (April 2011), World Bank *World Development Indicators* and Bank calculations.

(a) A large unemployment pickup is defined as a rise in the unemployment rate of over 3 percentage points in one year. As the three datasets are not completely consistent, we only include episodes in which unemployment rises by over 3 percentage points in all three datasets. The series shows the average path of the current account before, during and after these episodes. The sample includes 22 such episodes.

The evidence from previous crises also points to very large effects. Cerra and Saxena (2008) find that currency crises and, even more so, banking crises have large, significant and persistent negative effects on output growth. In their sample of 190 countries between 1960 and 2001, currency and banking crises result in average losses of 4% and 7½% of GDP respectively over a ten-year horizon. Jordà, Schularick and Taylor (2010) suggest that for a smaller sample of advanced economies, recessions in the post-war period that have coincided with financial crises have been around twice as costly as recessions that have not. For EMEs, Hutchison and Noy (2005) find that between 1975 and 1997, currency crises

(1) A bonanza is defined as a current account deficit within the top 20% recorded by the country concerned (which gives a dispersion of figures — e.g. 1.8% of GDP for India and 6.6% of GDP for Malaysia).

reduced output by between 5% and 8% over a two to four-year period, while the output losses from banking crises were larger, at 8% to 10%. De Paoli *et al* (2009) also find that crises have very large and persistent effects, particularly when they combine a banking, currency and sovereign debt crisis.

Overall, the evidence suggests that today's system has performed relatively poorly against each of its three objectives. While inflation has fallen in both advanced and emerging economies (a positive from the perspective of the internal balance objective), per capita GDP growth has at the same time been slower and more volatile than in the BWS. The pattern of capital flowing 'uphill' suggests also that today's IMFS is not meeting its objective of allocative efficiency. But the key failure — as evidenced by the extraordinary severity of the 2007–09 global financial crisis — has been the system's inability to achieve financial stability and minimise the incidence of disruptive sudden changes in global capital flows. In light of these observations, the next section seeks to identify the underlying frictions in the current system, with a view to understanding why it has failed to achieve its three objectives.

4 What are the underlying imperfections that today's IMFS needs to resolve?

In order to design a policy response, it is useful to understand the frictions that have resulted in imbalances building, and/or which mean that adjustment to those imbalances is not smooth. An ideal IMFS would reduce the costs of these frictions, while still allowing the gains from inter and intra-temporal trade. In our assessment, the key frictions can be grouped into four categories: (i) missing markets; (ii) international institutional frictions (in particular, the role played by WTO rules in encouraging some countries to undervalue their exchange rates); (iii) imperfect information (particularly in financial markets); and (iv) nominal rigidities.

These frictions are in many cases closely interlinked, and in practice it is difficult to identify them separately. Generally speaking, the first two frictions (missing markets and international institutional frictions) have encouraged the build-up of risky imbalances, in particular by 'pushing' capital away from its most productive use. The third friction (imperfect information) has also contributed to the build-up of global imbalances, including by 'pulling' capital towards less productive uses. But the missing markets and imperfect information frictions have, in conjunction with the fourth friction (nominal rigidities), also played a large role in increasing the costs of the eventual adjustment to these imbalances.

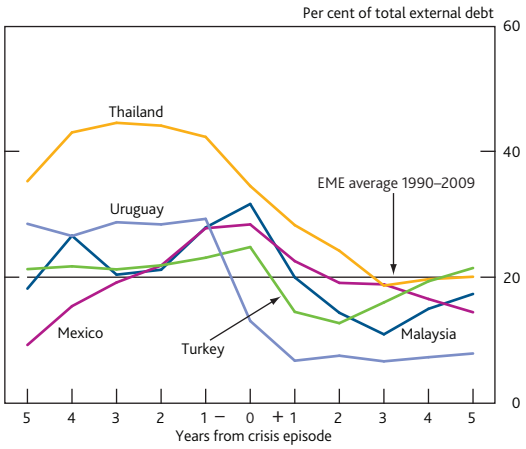
4.1 Missing markets

In the context of the IMFS, missing markets frictions stem largely from the interaction between financial market underdevelopment in EMEs and the process of financial globalisation. There are a number of missing markets in EMEs including the absence of deep and liquid local currency bond markets, the lack of hedging instruments and inadequate insurance markets, among others. Missing markets act primarily to push capital uphill from EMEs to advanced economies by incentivising reserve accumulation as a form of (self) insurance.

In general, there are three types of risks to which national balance sheets are vulnerable, each of which are heightened by missing financial markets: (i) maturity mismatch risk, which arises when assets are long term and liabilities are short term; (ii) currency mismatch risk, which arises in particular when assets are denominated in local currency and liabilities are denominated in foreign currency; and (iii) capital structure mismatch risk, which results from excessive reliance on debt financing, rather than equity.

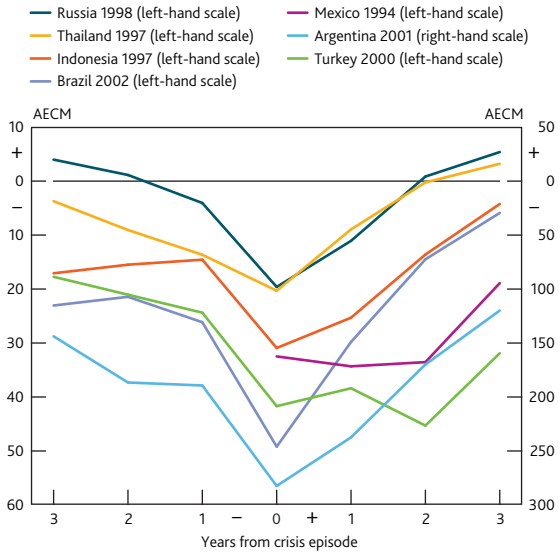
Maturity mismatch risk was significant in many recent EME crisis episodes. **Chart 8** shows that many of the recent EME crises were preceded by relatively high reliance on short-term external debt. In some cases, pressures came through short-term government debt (Mexico, Russia, Turkey and Argentina) while in others they arose from, or were augmented by, the short-term liabilities of the banking system (Korea, Thailand, Russia, Turkey, Brazil, Uruguay and Argentina) (Allen *et al* (2002)).

Chart 8 Short-term external debt shares — selected crisis episodes



Sources: World Bank and IMF *Quarterly External Debt Statistics* and Bank calculations.

Chart 9 National currency mismatch — selected crisis episodes(a)



Sources: Goldstein and Turner (2004) and Goldstein and Xie (2009).

(a) Goldstein and Turner Average Effective Currency Mismatch (AECM) measure. Negative values indicate a net short foreign currency position.

Currency mismatch risk is generally more pronounced in EMEs than in advanced economies, and has also featured in a number of previous crisis episodes. As **Chart 9** shows, borrowing in foreign currency was commonplace in several EMEs which subsequently suffered crises. Foreign currency borrowing was high because emerging market agents, public and private, have historically been less able to borrow in local currency from non-residents or even, in many cases, from residents — the 'original sin' problem, first coined by Eichengreen and Hausmann (1999).(1) Bordo, Meissner and Stuckler (2010) analyse data from 1880–1913 and 1973–2003 and find that higher ratios of foreign currency debt to total debt are associated with increased risks of currency and debt crises.

The underdevelopment of local currency bond markets is likely in large part to explain why some countries have currency and maturity mismatches on their balance sheets. If underdeveloped financial markets act to inhibit agents' ability to issue long-term local currency denominated bonds, currency and maturity mismatches can be particularly acute. Even though much progress has been made in this area — for example, Burger *et al* (2010) estimate that in Latin America in 2008, over 70% of outstanding bonds were denominated in local currency — there are specific areas where further progress can be made (see Section 5).

Capital structure mismatch risk — or an overreliance on debt finance — can be the result of weak corporate governance regimes and/or tax and regulatory distortions, or reflect a wider failure of property rights. These factors can inhibit the development of markets for equity, or equity-like, instruments. High debt to equity ratios were a feature of a number past EME crises (and of Japan in the early 1990s) and also, of course, were a feature of advanced country banking systems in the current crisis. Countries facing this risk may have a greater incentive to insure themselves against exogenous shocks, as debt service payments remain unchanged in bad times, even though borrowers will have reduced capacity to pay. In contrast, countries with lower debt-equity ratios will fare relatively better in the face of negative shocks, as payments from equity are state contingent, falling in bad times.

Each of these national balance sheet mismatches acts to increase countries' vulnerability to sudden capital flow reversals and balance of payments crises, creating strong incentives to seek insurance against these risks. But if there are missing markets, countries may be unable to access external sources of insurance, and may instead seek to self-insure by accumulating reserves. There are three key types of missing insurance markets which are important for explaining the accumulation of reserves and, consequently, global imbalances: (a) missing domestic insurance markets; (b) missing exchange rate insurance markets; and (c) missing country insurance markets. The self-insurance motive for reserve accumulation is argued by some to be significant. For example, Obstfeld, Shambaugh and Taylor (2008) estimate that between one half and two thirds of reserves accumulated between 2000 and 2009 were for precautionary purposes. Other commentators, however, most notably Dooley, Folkerts-Landau and Garber (2003), suggest that precautionary motives have played less of a role in countries' desire to accumulate reserves, rather seeing reserves accumulation as the by-product of countries promoting exports.

If households, firms and governments have incomplete access to domestic insurance markets, they will have an incentive to self-insure by accumulating foreign assets (Mendoza *et al* (2009)). Faced with an insufficient supply of 'safe' financial assets at home, the process of financial globalisation has allowed EME investors to accumulate 'safe' assets from advanced economies' financial markets (Caballero *et al* (2006)). This process has contributed to the build-up of current account surpluses in EMEs, and made it relatively easy for some of the major advanced economies (with highly developed financial markets) to finance their current account deficits. On the whole, EME purchasers of advanced economy assets have been EME public sectors rather than private sectors, consistent with the governments in these countries playing an intermediary role.

As highlighted in King (2011), incomplete markets for insurance against exchange rate volatility — for example, underdeveloped exchange rate derivatives markets — may

(1) Eichengreen and Hausmann (1999) define 'original sin' as 'a situation in which the domestic currency cannot be used to borrow abroad, or to borrow long-term, even domestically'.

encourage countries to choose to maintain fixed or managed exchange rate regimes. The incentives to limit short-term 'excessive' volatility are likely to be particularly strong for countries that run large currency mismatches (Goldstein and Turner (2004)). There is some evidence that a fixed exchange rate can lower the probability of banking crises in developing countries (Domaç and Martinez Peria (2003)), although this study also finds that once a crisis occurs, the costs are greater for countries with fixed exchange rate regimes.

While there is some evidence to support a link between exchange rate volatility and financial stability, the link to broader macroeconomic outcomes is less clear-cut (Rose (2010)). But regardless of whether the benefits of fixed exchange rate regimes are real or perceived, the fact remains that in practice, more than 90% of emerging and developing economies have opted to fix, or at least 'manage' their exchange rates.(1) And if these fixed exchange rate regimes impede desirable medium-term adjustments in real exchange rates, they can generate adverse spillovers for the global economy by perpetuating patterns of spending which are ultimately unsustainable and increase the output costs of eventual corrections. In this respect, the frictions associated with missing markets are closely related to nominal rigidities (discussed below).

Incomplete markets for country insurance may also encourage EMEs to accumulate foreign exchange reserves. If a country is unable to use financial markets to insure itself against national balance sheet vulnerabilities, the financial safety nets provided by international financial institutions or regional financing arrangements could offer an alternative. But if these financial safety nets are inadequate — or at least perceived to be — countries may consider that they have little choice but to self-insure by accumulating foreign reserves.

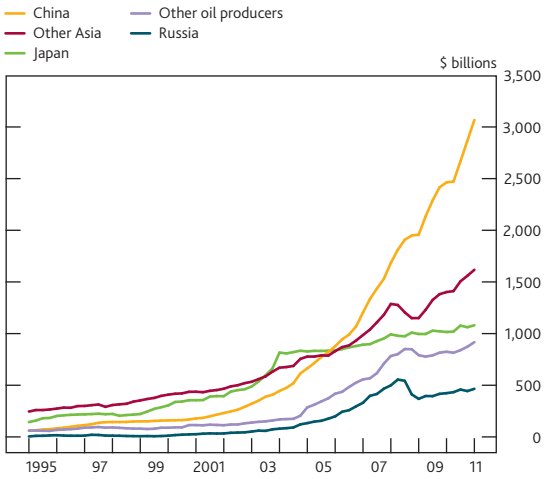
The Asian crisis in the late 1990s may have been a trigger for EMEs to accumulate reserves for precautionary reasons: foreign exchange reserve accumulation by non-oil exporting EME surplus countries rose by over half a percent of world GDP between 1998 and 2006 — matching the rise in their current account balances.

4.2 International institutional frictions

But missing markets are not the only explanation for reserve accumulation by EMEs. For individual countries, export-led growth can be an attractive development strategy over the short to medium term, because it allows output to expand rapidly, even if domestic demand is weak (Dew *et al* (2011)). Since existing WTO rules restrict the use of direct export or production subsidies, some countries have chosen instead to undervalue their exchange rates as an alternative policy tool. As a result, these international institutional frictions also act to push capital uphill, further contributing to the build-up of risky imbalances.

In order to maintain control over the exchange rate, the Chinese authorities have responded to upward pressure on the renminbi by accumulating reserves (which now exceed US$3 trillion (**Chart 10**)), while maintaining tight capital controls. Other countries have also pursued export-led growth models at various points in time (for example, Japan in the 1960s, South Korea in the 1980s). However, the recent Chinese experience stands out for the scale of imbalances built up as a result.

Chart 10 Reserve holdings



Sources: IMF *International Financial Statistics* and Bank calculations.

Export-led growth may be beneficial from the perspective of individual countries — at least in the short term.(2) Although reserve accumulation does impose some costs on the domestic economy (while difficult to estimate, costs of sterilised intervention could be of the order of 1%–2% of GDP per annum for most major reserve holders),(3) these costs may be small relative to the costs imposed on the global economy through its contribution to global imbalances. Moreover, because wealth and political power become concentrated in export-producing sectors, efforts to remove these distortions may be resisted by companies with vested interests. In this situation, countries may find it difficult to move away from this growth model even if it is in their own long-term interests to do so.

4.3 Imperfect information

While missing market and international institutional frictions have acted primarily as 'push' factors in the accumulation of global imbalances, imperfect information frictions have acted as important complementary 'pull' factors — most notably

(1) Based on the IMF's De Facto Classification of Exchange Rate Regimes and Monetary Policy Frameworks as at end-April 2010.
(2) In the long term, export-led growth is ultimately unsustainable, as countries cannot increase their share of world exports indefinitely. Moreover, maintaining an undervalued exchange rate may also lead to inflationary pressure, or alternatively if the authorities choose to combat this through sterilised intervention, it may contribute to banking sector fragility (domestic financial institutions may be unable to absorb sufficient quantities of expensive domestic bonds).
(3) See for example, International Monetary Fund (2010a) and Mohanty and Turner (2006).

through their contribution to excessive leverage in advanced economies. Imperfect information frictions include asymmetric information, legal uncertainties and differences in accounting practices among others, many of which are likely to be more problematic in the international environment than the domestic one. In addition to contributing to the initial build-up of imbalances (for example, through their impact on tail risk taking), imperfect information frictions have also acted to increase the costs of the unwinding of imbalances, for example through encouraging herding behaviour and contagion. Herding and contagion can amplify changes in exchange rates and capital flows, exacerbating the impact of a shock and meaning that the impact on output is much larger than it might otherwise be.

Imperfect information can result in moral hazard problems in banking sectors with implicit guarantees. Under these conditions, banks — and in particular, banks that are perceived to be "too important to fail" — will have an incentive to take on more risk than is socially optimal, ignoring the downside risks to depositors, and ultimately, to taxpayers. These risk-taking incentives will be present even if there are no frictions related to missing markets.

Imperfect information is crucial in this context, as it prevents investors and regulators from accurately observing the extent to which banks are taking on excessive risk (De Nicolò *et al* (2010)). It may also impede banks' own ability to assess the nature of the risks they are taking on — particularly if financial instrument structures are complex (Bank of England (2011)). In this setting, capital inflows can lead to strong credit growth which, in turn, contributes to over-inflated asset prices, over-borrowing and over-investment (e.g. McKinnon and Pill (1996) and Krugman (1998b)).

But imperfect information does not just encourage banks to take on more risk. Allen and Gale (2000) show how the same basic mechanism can work without a guarantee-induced moral hazard problem. As long as debt holders cannot observe risk-taking perfectly and there is limited liability, equity holders can still shift risk onto the debt holders. This leads equity holders to reallocate their portfolios towards risky assets and under-price risk.

Borrowers' ability to take advantage of imperfect information frictions will be amplified if various 'push' factors are resulting in large net capital inflows. For instance, banks are likely to find it easier to become "too important to fail" if they play an important role in intermediating foreign funds to domestic borrowers. Although there is some debate about the relative importance of foreigners' desire to save (the so-called 'saving glut' view) and loose US monetary policy settings in creating easy financing conditions for US financial institutions over recent years, Box 1 outlines the case for favouring the former. Kaminska *et al* (2011) find, for example, that foreign purchases of US Treasuries in the year to July 2004 may have lowered the ten-year rate by around 100 basis points.

In addition to contributing to the build-up of risky imbalances, imperfect information frictions also increase the likelihood that the eventual adjustment process will be disorderly. After an initial shock, there are two key channels through which imperfect information can have an impact. First, it can lead to herding behaviour, which can amplify movements in exchange rates and capital flows, including for countries which are not directly impacted by the shock. And second, it can lead to larger increases in credit spreads than would otherwise be the case, and consequently larger feedback effects on the real economy.

If investors face imperfect information, it may be rational to simply mimic the actions of other investors, as for example, in Keynes' (1936) beauty contest. This 'herding' behaviour may be rational from the individual investor's perspective if the pay-offs from acting 'alike' are increasing in the number of investors who adopt the same action — as in, for example, Diamond-Dybvig (1983) style bank runs.

In an international context — where imperfect information problems between lenders in one country and borrowers in another country are likely to be particularly acute — the herding phenomenon can cause exchange rates and capital flows to display excessive volatility, exacerbating the impact of any initial shock. Indeed, for countries with some pre-existing weaknesses in their economic fundamentals, herding behaviour can lead to full-blown self-fulfilling crises (Obstfeld (1996)). There is some evidence to suggest that imperfect information has played an important role in precipitating previous emerging market crises. For example, Frankel and Schmukler (2000) find evidence that imperfect information played an important role in crises in Mexico, Thailand, Indonesia, the Philippines and Malaysia.

Imperfect information can also contribute to disorderly adjustments by perpetuating adverse feedback loops between the real economy and the financial sector. Fisher's (1933) debt-deflation theory provides a useful framework for illustrating this effect in a generic context. In this model, an unanticipated deflation shock results in a transfer of wealth from debtors to creditors and erodes the value of collateral. As asset prices fall, debtors face a rising real debt burden, and the number of defaults increases. Lenders faced with imperfect information will respond by increasing their risk premia, and/or rationing credit (as in Stiglitz and Weiss (1981)) with consequent feedback effects for the real economy and financial stability.

So imperfect information frictions can act to make the eventual deleveraging process in countries with unsustainable current account deficits more costly than it would be otherwise.

And, given cross-country trade and financial linkages, the adverse consequences for output and financial stability could spill over to other economies. Moreover, as discussed below, the global consequences of disorderly deleveraging in deficit countries will be particularly large if these informational frictions also interact with nominal rigidities.

4.4 Nominal rigidities

In an ideal world, smooth adjustments to global imbalances would be achieved through relative price adjustments — prices, wages and exchange rates. In particular, deleveraging in deficit countries would be accompanied by falls in the price of their home output relative to the price of surplus country output. This would boost deficit country exports and surplus country demand. But if nominal rigidities are pervasive, the relative price adjustment process may be too small and/or too slow. In addition to compromising the ability of individual countries to achieve internal balance, nominal rigidities could also lead to deficient demand at the *global* level.

Downward price and wage rigidities can act to increase the output costs associated with negative demand shocks (in the context of global imbalances, it is helpful to think of a negative demand shock as an unanticipated rise in desired saving in current account surplus countries). There is evidence, for example, that wage stickiness was an important factor during the Great Depression. Bordo, Erceg and Evans (2000) attribute 50%–70% of the decline in US real GNP in the years to 1933 to the combination of sticky wages and unanticipated monetary shocks. For a broader sample of countries, Eichengreen and Sachs (1985) and later Bernanke and Carey (1996) also suggest that wage rigidities were important during the Great Depression, supported by evidence of a strong inverse relationship between output and real wages across countries and over time.

While the importance of nominal wage rigidities may be expected to have declined somewhat over time, there is still some evidence in more recent episodes. For example, Kuroda and Yamamoto (2003) find that nominal wage rigidities raised Japanese unemployment by almost 2 percentage points over 1993–98.

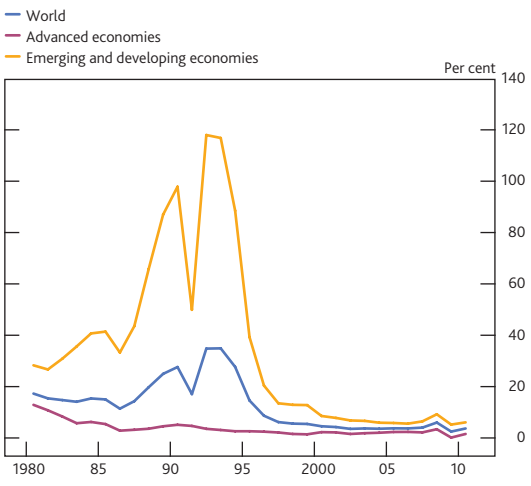
In theory, downward nominal price and wage rigidities can be offset by an easing in domestic monetary policy. But if monetary policy becomes constrained by the zero lower bound for nominal interest rates, this offset may only be partial. Recent studies for the United States find that the zero lower bound constraint prevented short-term interest rates from falling by around 400 basis points (Williams (2009), Chung *et al* (2011)), but that the Federal Reserve's asset purchase programme provided only partial compensation, amounting to the equivalent of a 300 basis point cut in short-term rates (Chung *et al* (2011)). The recent experience in the United States suggests that monetary policy alone may not be able to maintain sufficient global demand in all conditions.(1) In particular, its effectiveness may fall if global demand for saving were to rise further or global demand for investment were to decline even more.

With conventional monetary policy constrained by the zero lower bound in the United States at present, the need for relative price adjustment in surplus countries — more specifically real exchange rate appreciation — is even more crucial to minimise the costs of global rebalancing. But the extent to which this can occur is hampered by the prevalence of fixed or managed nominal exchange rate regimes in EMEs, which creates yet another nominal rigidity. Around one fifth of the world (in terms of global GDP in PPP terms) has some form of fixed or pegged exchange rate arrangement with the dollar (IMF (2010b)).

With fixed nominal exchange rates, monetary policy settings in the United States are more likely to spill over to EMEs, placing the burden of real exchange rate adjustment squarely on inflation. Even though inflation rates in EMEs have fallen markedly since the early 1990s (**Chart 11**), inflationary pressures picked up in 2010–11, coinciding with the easing in US monetary policy settings. In East Asian EMEs for example, consumer price inflation rose by an average of around 5 percentage points between the summer of 2009 and the summer of 2011.(2) But in China, which maintains a relatively tight peg to the US dollar, inflation has increased over 8 percentage points over the same period. This increase in inflation is helping to deliver the required real exchange rate appreciation but the pace at which it is happening is not rapid enough.

Spillovers from US monetary policy to EMEs via managed exchange rates may also be costly in tightening phases. Eichengreen and Rose (1998) estimate a probit regression on 39 emerging market banking crises between 1975 and 1992 and find that a 1 percentage point increase in the world real interest rate increases the probability of a banking crisis in an EME by 3%. In their data, movements in the world interest rate are primarily driven by the US interest rate. With a standard deviation of 2 percentage points over their sample, this channel is quantitatively important.

Chart 11 Inflation



Source: IMF *World Economic Outlook* (September 2011).

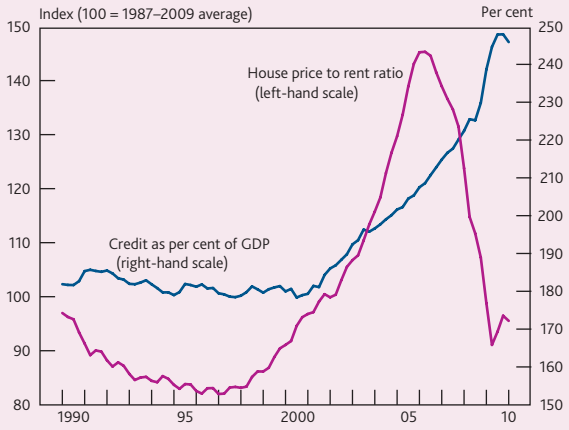
(1) Bernanke (2010a), for example, has stated that '[m]onetary policy is working in support of both economic recovery and price stability, but there are limits to what can be achieved by the central bank alone.'
(2) Sample of countries includes China, Indonesia, Malaysia, the Philippines and Thailand.

Box 1
'Saving glut' versus monetary policy errors

There are three pieces of evidence which cast doubt on the claim that US monetary policy errors explain the US credit and house price boom leading up to the crisis.

First, low long-term interest rates, and the rapid expansion in US credit and house prices, were decade-long phenomena (**Chart A**) which partly pre-dated the period of very low Fed Funds rates.

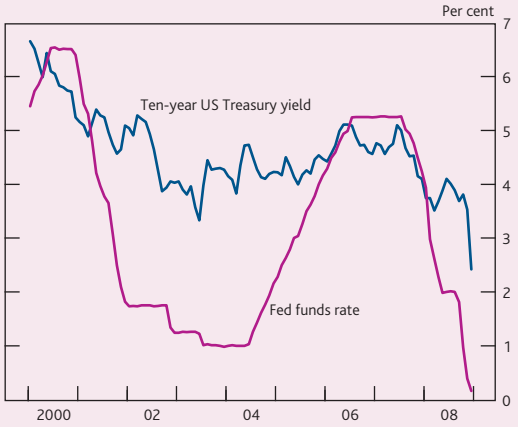
Chart A US credit and house prices



Sources: Federal Reserve, Thomson Reuters Datastream, US Bureau of Economic Analysis and Bank calculations.

Second, even as the Federal Reserve tightened monetary policy in 2004, long-term interest rates remained low (**Chart B**) and lending growth remained firm, suggesting some other factors were at play.

Chart B US federal funds rate and long-term interest rate



Source: Federal Reserve.

Third, there is no cross-country evidence of any relationship between countries' monetary stance (measured by the residuals from a Taylor rule) and real house price inflation (**Chart C**), Bernanke (2010b). If overly loose monetary policy had been the main driver, one would expect a strongly negative relationship between the Taylor rule residuals and house price inflation.

Chart C Monetary policy and real house price appreciation, 2002–06[a]

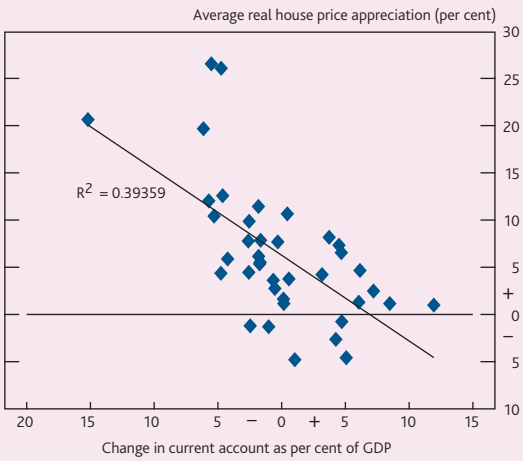
Sources: OECD *Economic Outlook* accessed via Thomson Reuters Datastream, Cesa-Bianchi (2011) and Bank calculations.

(a) Advanced economies only.
(b) A negative residual indicates that monetary policy was looser than a Taylor rule suggests it should have been.

By contrast the saving glut hypothesis is more consistent with the data. Around the same time as the sharp pickup in surplus country saving, long-term interest rates started to fall and the US current account deficit worsened. The boom in mortgage lending and house prices also intensified.

And there is some cross-country evidence that suggests a link between current account deficits and house price appreciation (**Chart D**). Sá and Wieladek (2010) have also examined the link between capital flows and house prices. They find that US house prices would have been 13% lower by the end of 2007 if the current account to GDP ratio had remained at its 1998 level. By contrast, tighter monetary policy would have had much smaller effects. That said, the direction of causation in their work is not clear.

Chart D Real house price appreciation and current account balances, 2000–06



Sources: Cesa-Bianchi (2011), IMF *World Economic Outlook* (September 2011) and Bank calculations.

4.5 Why might these frictions have become more costly over time?

Three of the frictions described above — missing markets, imperfect information and nominal rigidities — exist in economies that have closed capital accounts. Why might they have become more costly since Bretton Woods ended? There are two possible reasons. First, the frictions themselves might be more pervasive in an economy that has an open capital account. Second, factors which mitigate the costs of these frictions in a domestic setting might be less effective when capital is internationally mobile.

There are a number of factors which suggest that imperfect information problems may be more severe in a financially open economy. Most obviously, information asymmetries may be greater across country borders than within countries. Perhaps related to this, Giannetti and Laevan (2011) show that home bias(1) can pick up in financially stressed periods. This might explain why external funding is less stable than domestic funding. In addition, regulatory policies that mitigate the costs of imperfect information may be less effective in an open economy. This is likely to be the case if regulation is conducted on institutions rather than transactions and foreign lenders are less tightly regulated.

It is less clear that nominal rigidities or missing market failures are any more severe when capital accounts are open. But fiscal policy might be better placed to reduce the costs of both in a financially closed economy. If, for instance, there is a rise in desired saving, the government in a closed economy should find it easier to borrow and offset any downward pressure on employment which might otherwise occur if wages are sticky. Similarly, automatic stabilisers should be able to replicate insurance markets (by increasing transfers to those who suffer an adverse shock) more easily in an economy that is closed to capital flows.

5 How should the IMFS be reformed?

The large costs associated with the IMFS failing to meet its three objectives of *internal balance, allocative efficiency* and *financial stability* illustrate the need to consider ways to reform the IMFS. The preceding discussion suggests that the first-best policy solution would consist of a set of reforms that deal directly with the frictions that exist in today's IMFS. Section 5.1 discusses some ideas for how this might be done, focusing in particular on reforms that individual countries can implement *independently*.

However, in many instances it will not be possible for individual countries to mitigate the underlying failures, at least not acting on their own. In these cases, international policy initiatives will be required to mitigate these frictions. If this is still not feasible — for example, if it is too costly to do so — then it will be necessary to accept that the underlying imperfections will persist, and instead countries need to try to internalise the externalities that result. Section 5.2 discusses policy initiatives which will require some degree of international co-operation to be effective, but which stop short of requiring countries to co-ordinate their policies on an ongoing basis. Section 5.3 outlines reform options which would require a more active form of policy co-ordination, either through voluntary agreements, or a more rules-based approach.

5.1 Reforms that can be implemented without international policy co-ordination

Section 4 highlighted a number of underlying imperfections that either allow excessive imbalances to build in today's IMFS and/or impede the smooth adjustment of the system to those excessive imbalances. By their very nature, *international institutional frictions* cannot be affected by countries acting in isolation. But there may be actions that countries can take individually to help mitigate the other three sets of frictions.

5.1.1 Missing markets

As highlighted in Section 4, frictions related to missing markets act to push capital uphill from EMEs to advanced economies by incentivising reserve accumulation as a form of (self) insurance. One set of reform proposals aims to find ways to reduce countries' desire to accumulate excessive precautionary reserves through completing missing financial markets. There are two potential strands to this that countries can pursue independently: (i) develop domestic financial markets; and (ii) create exchange rate insurance markets so that investors are better able to hedge against exchange rate fluctuations. While the second of these is self-explanatory, the most pertinent aspects of the first are discussed below.

One reason why countries accumulate reserves is because their balance sheets are vulnerable to shocks. Those vulnerabilities stem from the currency, maturity and capital structure mismatches that exist on those balance sheets, which in turn reflect the absence of deep and liquid local financial markets (Section 4). Even though there has been much progress, there are specific areas where further progress can be made.

The development of local currency bond markets is emphasised in this year's G20 agenda. The main benefits of this agenda should be to reduce the *currency and maturity mismatches* on countries' balance sheets. In line with reports by the Committee on the Global Financial System (2007) and the World Bank (2011), the following areas should be prioritised:

(1) Home bias refers to the tendency for financial portfolios to be overweight in domestic assets relative to what theory might suggest.

- *Liquidity* needs to be improved. Domestic financial institutions need to be developed, as the domestic investor base is often too narrow. In particular, repo and derivative markets remain undeveloped, preventing investors from lending securities they do not wish to trade.

- The *maturity* of debt instruments needs to be extended, which in turn will extend the overall yield curve. This will require commitments from domestic policymakers to issue debt across a range of maturities.

- *Private sector issuance* needs to expand as issuance is often concentrated in a few highly-rated firms.

- *Risk concentration* needs diluting — in several countries, domestic banks hold the bulk of bonds outstanding. In some cases these holdings are dominated by short-term sterilisation bonds related to reserve accumulation.

Capital structure mismatches reflect in part the fact that firms in many countries can offset interest payments against corporation tax, but the same tax advantage does not apply to dividend payments. This distortion reduces the relative cost of debt financing and is likely to be an important factor in explaining high private sector leverage (IMF (2009)). Indeed, it was one of the key motivations for leveraged buyouts which were popular in the run-up to the financial crisis. Removing the subsidy for debt financing could reduce excessive leverage and help the IMFS to achieve its financial stability objective.

Some economists have gone further and proposed that the tax system should favour equity over debt. For instance, Bianchi and Mendoza (2010) and Jeanne and Korinek (2010) advocate a countercyclical tax on debt to prevent over-borrowing. And Rogoff (2011) emphasises that the IMFS would be more robust with a higher share of liabilities as equities.

Sovereigns cannot issue equity of course. But they too can take steps to improve the structure of their own liabilities, to allow them to share better the risks of their income streams with their creditors. By making their debt contingent on measures correlated with their future income, such as nominal GDP, sovereigns can mimic some of the attractive features of equity. GDP-linked bonds promise to pay a return that varies with the behaviour of GDP: investors share some of the risk with the issuer, receiving a lower payout in bad times, and *vice versa*. These markets are, in general, missing. Such proposals have been advocated by Shiller (1993), among others.

These reforms would help to smooth the adjustment of the IMFS once imbalances have emerged. And to the extent that they reduce capital structure mismatches, they could encourage countries to accumulate fewer precautionary reserves, thus also helping to reduce the build-up of those imbalances.

The benefits of this proposal stem from the stabilising effect on debt to GDP ratios. Simple counterfactual simulations suggest that if sovereigns were to issue nominal GDP-linked debt rather than conventional debt, the volatility of the debt to GDP ratio would be lower and they would be significantly less exposed to tail risk. Countries that are particularly sensitive to sudden changes in their debt to GDP ratios (either because they are more vulnerable to technology shocks or because their debt to GDP ratios are high) may therefore find GDP-linked bonds particularly attractive.

The stability benefit may come at the cost of higher debt interest payments, on average, if investors require compensation for being exposed to systematic risk, in particular that payouts will be lower when investors need the money most. For instance, Kamstra and Shiller (2009) have suggested that this risk premium might be as high as 1.5%. But there are a number of reasons why this might be an over-estimate. These include: the potential for GDP-linked bonds to facilitate international risk-sharing; the access they provide to a broader range of income-earning potential in the domestic economy; their ability to reduce the risk of sovereign default; and the likely demand for such instruments from investors such as pension funds with wage-indexed liabilities (as returns from GDP-linked bonds will be highest when pension funds need it most).

Given the apparent risk-sharing benefits of these missing markets, why have they rarely been developed? These general ideas — to generate new markets for instruments that allow countries to structure their external assets and liabilities to provide a greater degree of explicit contractual risk-sharing — were emphasised in a G20 Working Group report on International Financial Crises (1998). But without a co-ordinated international push for such instruments to be introduced, no real progress was made. One obstacle may be that the pricing of such instruments is more complex than traditional government bonds. For example, investors may fear that GDP-linked bonds dull governments' incentives to measure GDP accurately. GDP data are also revised. Of course, bonds indexed to consumer prices are also more complicated to price and there could be an incentive to mis-measure inflation, but in practice this has not been a problem for most issuers. There are also ways to overcome the problem of revisions (coupon payments can be linked to initial estimates, or revisions could be rolled into future coupon payments), though they are not perfect solutions.

But there are also other options: sovereigns could link repayments to variables outside their direct control for instance. Bonds with repayments linked to commodity prices have been used, though rarely. Another option, that has not been used, is repayments linked to trading partners' performance. Caballero and Panageas (2005) have also

proposed that EMEs should index debt to external variables correlated with the risks that they face, such as the VIX. And these reform ideas should not be limited to the sovereign: corporate and household debt instruments could also benefit from adopting some of these ideas. A less radical proposal would be to encourage more economies to issue debt that is indexed to the consumer price level (as currently already occurs in a number of advanced economies and EMEs). This could be beneficial for some governments, for example those in the euro area, to protect them from terms of trade shocks that lower the domestic price level.

5.1.2 Imperfect information

As discussed in Section 4, imperfect information among investors is often at the root of financial instability. In the presence of imperfect information, poorly-informed investors' optimum strategy may be to mimic the actions of others, which may amplify movements in exchange rates and capital flows. Individual countries can take a number of actions to reduce the impact of imperfect information, including by improving financial regulation; better disclosure rules; implementing countercyclical macroprudential policies; and improving their capacity to identify — and consequently, mitigate — vulnerabilities on their national balance sheets.

These reforms, however, will largely deal with the financial sector only. And there is a risk that much tougher domestic banking regulation will lead to higher non-bank, cross-border and foreign-branch lending (Aiyar *et al* (2011)). In these instances, there may be a case for prudential capital controls, such as taxes on foreign borrowing (Chamon *et al* (2009)). These could increase the effectiveness of financial sector regulation and level the playing field between domestic and foreign lenders. The 2011 coherent conclusions on capital controls agreed by the G20 are welcome, as a means to promote a common understanding of the appropriate use of capital controls. But capital controls may not be very effective in countries with highly developed financial systems; they may also introduce unwanted distortions.

It is striking that there is very limited surveillance of the risks associated with the structure of a country's *national* balance sheet. In the event of a negative shock, investors can be very uncertain about the vulnerability of individual countries, increasing their susceptibility to sudden capital flow withdrawals induced by herding behaviour. This would suggest that a better understanding is required of what shock, or combination of shocks, might cause the nation as a whole to become credit constrained. Countries should seek to achieve this, in conjunction with the IMF and BIS (see Section 5.2).

5.1.3 Nominal rigidities

The problem of nominal rigidities — in particular downward stickiness in wages and prices — is present to varying degrees in all economies. This is most starkly illustrated by recent events in a number of vulnerable euro-area economies, where protests against wage cuts have been prevalent. It seems unlikely that such rigidities can be easily removed. Rather, policymakers have to accept their existence and set policy accordingly.

But the problem of nominal rigidities is exacerbated in today's IMFS by actions taken by some EMEs to impede required adjustments in their real exchange rates, in order to maintain their level of competitiveness as they pursue export-led growth strategies. Consequently, an obvious reform that is required in today's IMFS — and one which can be achieved through countries acting independently — is for countries to allow greater flexibility in their nominal exchange rates. If all countries allowed for this, the problem of nominal rigidities in today's IMFS would be much reduced.

5.2 Reforms requiring international policy initiatives

While the *missing markets, imperfect information* and *nominal rigidities* frictions can be mitigated — at least in part — by actions taken by individual countries, international policy initiatives could also help. This is particularly true for the *missing markets* and *imperfect information frictions*. Improved global financial safety nets (FSNs) may help to mitigate the effects of the *missing markets* frictions by reducing EMEs' incentives to accumulate precautionary reserves. Co-ordinated efforts to close data gaps and international co-operation on the financial regulatory reform agenda could further reduce the impact of *imperfect information*. And by definition, *international institutional frictions* will have to be tackled via international policy initiatives.

5.2.1 Missing markets

As highlighted in Section 4, one of the reasons why countries choose to self-insure is because there are limited alternatives to obtain insurance in the event of a negative shock.

Moreover, missing domestic markets could make them more vulnerable to such shocks. Some progress has been made over the past two years to improve the provision of global FSN arrangements, through reform of the IMF's Flexible Credit Line (FCL) and the introduction of the Precautionary Liquidity Line (PLL). However, because the qualification criteria for these instruments remain qualitative to a large extent, it is still uncertain which countries would benefit from access to FSNs. There is also some uncertainty about whether FSN resources will actually be available when needed. As a result, these instruments are not widely seen as alternatives to reserve accumulation. Moreover, to be genuine crisis prevention tools and act as an alternative to reserve accumulation, the IMF's resources would probably need to increase substantially. One promising avenue to pursue in terms of the FSN agenda would

be greater transparency in the eligibility criteria for existing FSNs. This implies making the criteria more quantitative and encouraging all IMF Article IV consultations to state whether a country is eligible for a particular FSN.

5.2.2 Imperfect information

To reduce *imperfect information* frictions the IMF, working with the BIS, could reinforce efforts by individual countries to improve surveillance of their own national balance sheet vulnerabilities by stepping up the provision of systematic cross-country analysis. As an important starting point, there are undoubtedly data gaps that need to be filled. Promisingly, much of this is being captured in the G20 Data Gaps workstreams. For instance, the G20 is pushing for an increase in the number of countries reporting data on external assets and liabilities. In addition, for those countries that do report, the G20 is asking for an increase in the frequency and granularity of those data, by sector and maturity, including the international investment position, cross-border asset and liabilities of resident banks reported to the BIS, and portfolio debt and equity positions reported in the IMF Coordinated Portfolio Investment Survey. Such analysis should help to reduce the underlying friction of imperfect information, and should be supported as a matter of priority.

International co-operation on the financial regulatory reform agenda would also be useful to help mitigate the *imperfect information* friction within the banking sector. An important discussion here will be on the reciprocity of capital requirements under Basel III. Under the new rules, national authorities will be expected to increase capital requirements (up to a 2.5% limit) on lending to a particular country when that country itself increases capital requirements on its banking system. This should prevent some international leakages. But it will be important to ensure that the Basel III rules are fully implemented. And in order to preserve financial stability, it will be essential that national authorities have the option to apply *larger* buffers to their banks' exposures than the buffer set by a fellow country. The latter point is currently under debate.

5.2.3 International institutional frictions

International policy initiatives — for example, revisiting the application of WTO rules — may also be appropriate for dealing with *international institutional frictions*. WTO rules have transformed the world trade environment. But, as highlighted in Section 4, they also restrict the use of direct export or production subsidies as a means of promoting export-led growth. So while China's growth strategy today is in many ways similar to the strategy pursued by economies such as Japan and Korea in the past, one difference is the size of the current account surplus that China has run. Indeed, during comparable phases of their growth strategies, other countries that have pursued export-led growth have had much smaller surpluses or even current account deficits (Dew *et al* (2011)). In these earlier periods, WTO restrictions on the use of industrial policy were less strict, so WTO-member countries were more able to subsidise directly industries that were manufacturing based. WTO rules today mean that this is no longer possible and so countries have chosen to undervalue their exchange rates as an alternative means of promoting manufacturing. This may be one explanation behind the different patterns of current account balances during the periods of export-led growth and the consequent externalities in the IMFS from a country pursuing such a strategy.

Rodrik (2009) has suggested that advanced economies could agree to allow EMEs to adopt more active industrial policies to support their development, as a *quid pro quo* for allowing real exchange rate appreciation, arguing that the former would cause less of a distortion. But this conclusion is clearly open to debate and the WTO was set up initially because such direct export subsidies were creating tensions in the IMFS. So it may be preferable to focus international co-ordination efforts in other areas given how thorny an issue this is.

5.3 Reforms requiring active international policy co-ordination

This paper has argued that in today's highly connected world, actions in one country can affect outcomes in others. In the absence of any frictions, such spillovers would be benign. But as highlighted in Section 4, in reality there are frictions that mean such spillovers are often costly. Section 5.1 discussed ways in which national policy changes could partly mitigate these frictions and Section 5.2 examined how international policy initiatives could also help with this objective. While every effort should be made to reduce the underlying imperfections in today's IMFS, it is unrealistic to expect them to be eliminated altogether. In some circumstances, it may well be impossible or too costly for individual countries to mitigate the frictions directly.

In these same circumstances, it makes sense to describe spillovers as externalities. Because the full costs of the friction are not suffered by the originator of the spillover, incentives are misaligned and inefficient outcomes result. It is therefore also necessary to consider mechanisms to deal with the externalities that are a consequence of the frictions — a process which will require more active international policy co-ordination.

5.3.1 The G20 Framework for Strong, Sustainable and Balanced Growth

The G20 Framework for Strong, Sustainable and Balanced Growth agreed by G20 heads of state in Pittsburgh in September 2009 is an important step towards such international policy co-ordination. It brings together all the systemically important economies and asks: are countries' policy frameworks consistent or is it possible to achieve a better outcome for all and, if so, what policy action is required? It makes clear that joint action is needed and it

offers the opportunity to achieve this, on an ongoing basis. As a result, the Framework has the potential to play a critical role in identifying, and mitigating, policy externalities that lead to instability in the IMFS. And given that the G20 is responsible for co-ordinating the process, it is clear who should be accountable if it fails.

The G20 Framework is needed when global outcomes are sub-optimal and when countries' policies are leading to significant cross-border externalities. The first stage of the process should therefore be to identify when these conditions exist. An example of such a world is when global desired saving is high relative to desired investment. If underlying imperfections exist, in particular imperfect information and nominal rigidities, then countries with current account deficits may find it hard to maintain sufficient demand without running the risk of financial instability (most obviously triggered by a fiscal crisis).

So in order to identify whether the global outcome is sub-optimal, a useful starting point could be indicators of the global balance of supply and demand for goods and services, and indicators of the global balance of desired saving and investment. Of course this type of exercise will always require some degree of judgement, not least because of its risk-based, forward-looking nature. This suggests some kind of collective (but not necessarily consensual) judgement should be made as to the need for global policy co-ordination in the first part of the G20 Framework process.

Should a sub-optimal global outcome be identified in this first stage, the process would move to a second stage. The aim of this second stage would be to identify which countries were contributing most to the identified global imbalances. At this stage, analysing the *sources* of these countries' imbalances (including an assessment of whether they are justifiable or due to inappropriate national policies or distortions) would be important to inform policymakers about the *nature* of the policy response required.

But even if these first two stages work well, the hardest part of the G20 Framework process will be agreeing and implementing a set of actions that mitigates cross-border externalities. This is because the Framework is a peer-pressure based process. To maximise the chances of reaching agreement on a co-ordinated set of policies that mitigate the externalities, it may be necessary to achieve a Pareto improvement — in which every country is better off (or at least not worse off). While this might be feasible for a small group of countries with similar views of how the world works, the bargaining process may simply prove to be too complex for such a large and diverse group as the G20. Nevertheless, the exercise is to be welcomed and certainly has other benefits such as regular information exchange.

5.3.2 A rules-based system for global economic management

If a peer pressure-based system proves unworkable, then a rules-based framework with hard incentives may be necessary. This would clearly be a major change in global arrangements. This section is intended to spark debate rather than to call for a particular proposal to be implemented.

A rules-based system might work along the same lines as those suggested above for the G20 Framework, except that hard incentives would replace peer pressure as the enforcement mechanism. Countries should again focus on whether the global pattern of demand is leading to cross-border externalities. Should countries collectively agree that it is, economic theory suggests that Pigouvian taxes could be used to deal with these externalities.

In particular, if global desired saving were high relative to desired investment, or global demand deemed to be deficient, a collective decision could be made to allow countries with current account deficits to tax net capital or current inflows. Under the rules of the scheme, countries with current account deficits would be allowed to tax current inflows from countries with whom they run bilateral current account deficits. In this framework, the burden of adjustment would be on *all* countries with current account surpluses, regardless of whether their respective imbalances were justifiable with respect to fundamental determinants.(1)

As demand shifted from surplus to deficit countries, countries with current account surpluses would have three choices. They could (a) adjust domestic policies to boost domestic demand; (b) do nothing; or (c) choose to try to counteract the tax by subsidising their exports to countries with whom they run bilateral current account surpluses, leading to a transfer to deficit countries. In all three cases, the sanctions would remain in place until global conditions were deemed to have returned to normal. And in all three cases, deficit countries should find it easier to maintain sufficient demand without running such a high risk of a painful external adjustment. This mechanism would effectively mimic the role of exchange rate realignment (rotating demand towards deficit countries and away from surplus countries (who are better placed to offset any fall in their output)), or would work by transferring resources to deficit countries which could then be spent.

(1) This would avoid the need to separate out 'good' and 'bad' imbalances according to their causes. In addition, imbalances would be penalised in proportion to their negative effects on other countries, consistent with the spirit of the optimal taxation literature. And the system would incentivise countries running 'good' imbalances to put pressure on those countries with 'bad' imbalances to adjust their policies. This idea is similar to that of Fahri *et al* (2011)'s suggestion of import taxes and export subsidies as a means to tax net inflows. The difficulty with their proposal is that it is almost impossible to contain large-scale fraud when subsidies are used. This alternative has the advantages that it would discourage *net* rather than gross trade and would require only national data to implement, as in Fahri *et al*, but would be less subject to fraud.

Ideally, these taxes would never need to be applied: countries would anticipate their application and adjust policies pre-emptively. But for this to work, the sanctions must be credible, so it must be in countries' interests to apply the taxes should global macroeconomic conditions require. One way of ensuring this is to devise sanctions which bring direct fiscal benefits to the countries applying them: the fiscal benefits of applying the sanctions should exceed the costs when the framework is respected. Application of the sanctions by any country would be voluntary. This aspect would likely limit the application of sanctions to countries with larger imbalances.

Clearly, the big risk with this kind of framework is that it leads to a generalised increase in trade protectionism. But it is expected that countries would realise the high costs for all countries that this would entail and therefore refrain from pursuing such a strategy. Furthermore, the risks of a trade war absent a reform proposal such as this should not be ignored.

This proposal is highly controversial, not least because it would also involve changing WTO rules to allow taxes on current flows (tariffs). This might argue for a system which only taxes capital flows. However, capital flows might be harder to measure and control in practice. And the idea that taxes on current flows are legitimate tools for macroeconomic management in certain circumstances is already embodied in the IMF Articles (in the scarce currency clause). In addition, the notion that the WTO should promote reductions in the structural level of tariffs, but that another body might judge circumstances when cyclical variations in tariffs are needed, has a natural parallel in the regulatory sphere, with the Basel framework setting minimum requirements and other bodies such as the Bank of England's Financial Policy Committee applying additional cyclical variations.

This section has sketched out a vision for a rules-based system aimed at limiting cross-border externalities associated with large net capital flows. There are undoubtedly many pitfalls with such a framework, not least that a better understanding of these cross-border externalities will be required. Inevitably, such a system would also rely heavily on judgement, which could also be problematic. But there should be a debate on a rules-based framework and what it might look like given the risks surrounding a lack of meaningful reform of the IMFS.

6 Conclusion

Since the breakdown of the BWS in the early 1970s, the IMFS has evolved into a decentralised system. Countries have been free to pursue independent monetary policies and to choose their exchange rate regimes, and capital account liberalisation has led to an unprecedented rise in global capital flows. While today's IMFS has afforded countries the freedom to pursue policies to suit their domestic objectives, this has not been reflected in significantly better outcomes for the global economy and financial system.

The severity of the 2007–09 financial crisis and the ongoing problems in the euro area suggest there is scope for improvement. Some progress is already being made through the financial regulatory reform agenda. But regulatory reform will not eliminate all of the risks associated with large global capital flows, so a broader set of reforms to the IMFS should also be considered.

In order to understand precisely which reforms are likely to be most effective, this paper has attempted to identify the underlying failures in today's IMFS. It argues that the ability of today's system to achieve simultaneously the three key IMFS objectives — *internal balance, allocative efficiency* and *financial stability* — has been compromised by the existence of underlying frictions. These frictions have interacted to encourage the build-up of excessive current account imbalances and to increase the welfare costs of the eventual adjustments to these imbalances.

This paper has identified four key categories of frictions: (i) *missing markets*, which can encourage EMEs to accumulate official reserves and manage their exchange rates; (ii) *international institutional frictions*, which may incentivise EMEs to undervalue their exchange rates in pursuit of an export-led growth strategy; (iii) *imperfect information*, which can amplify exchange rate and capital flow volatility, and encourage excessive leverage in countries that receive net capital inflows; and (iv) *nominal rigidities*, which can exacerbate the output costs of eventual corrections. Each of these frictions has resulted in externalities, which have in turn led to sub-optimal global outcomes.

The first-best policy response would be to pursue a suite of reforms which deal directly with — and ideally eliminate — these frictions. In some cases, there is scope for reforms to be implemented without the need for international policy co-ordination. But given the inherent cross-country nature of many of the problems in today's IMFS, this will not always be the case. International policy co-ordination may be required to deal collectively with the frictions, or, if this is not feasible, to proceed on the basis that the underlying imperfections will persist and instead seek to internalise the externalities that result. In any case, the objective of reform should be to improve the ability of today's IMFS to meet its three objectives: *internal balance; allocative efficiency*; and *financial stability*.

Reforms that can — and should — be pursued without the need for international policy co-ordination include: domestic financial market development (to address the *missing markets friction*); improved financial regulation, better macroprudential policy frameworks and the elimination of

data gaps (to mitigate the *imperfect information* friction); and greater flexibility in prices, wages and nominal exchange rates (to mitigate the impact of *nominal rigidities*).

While the *missing markets, imperfect information* and *nominal rigidities* frictions can be tackled — at least in part — by actions taken by individual countries, international policy initiatives will also be needed. This is particularly true for the *missing markets* and *imperfect information frictions*, where improved FSNs, co-ordinated efforts to close data gaps and international co-operation on the financial regulatory reform agenda should all be encouraged. While international policy initiatives would also be required to tackle *international institutional frictions*, the feasibility and/or desirability of doing so is unclear, and it may be preferable to focus international co-ordination efforts on other areas.

Although there is much progress that could be made from efforts to deal directly with the frictions, it is unrealistic to expect to eliminate these frictions altogether. It is therefore necessary to develop a mechanism to deal with the externalities that are a *consequence* of these frictions — a process which will require more active international policy co-ordination. International co-ordination through the G20 Framework for Strong, Sustainable and Balanced Growth is an important attempt to develop such a mechanism. The Framework is designed to identify and resolve policy inconsistencies among systemically important countries, and if it functions as intended, could result in significantly better global outcomes.

But the effectiveness of the G20 Framework remains to be seen. Even at this relatively early stage there are operational risks around the process, not least because of difficulties associated with reaching agreement on the problems facing the global economy. But moving beyond this first stage, the subsequent task of reaching agreement on the required policy responses — and, even more so, ensuring they are implemented — will be more challenging still. In the absence of a formal mechanism to force countries to internalise the externalities created by their policies, there is no guarantee that the process will deliver to its potential.

In light of these uncertainties, this paper has also considered whether a more fundamental overhaul of the IMFS — in particular, a move towards an explicit rules-based framework — could be beneficial. Although the idea of a system which seeks to tax externality-generating activities in the IMFS is certainly one of the more radical policy options, it nevertheless warrants serious consideration given the very large potential costs of inaction.

The objective of this paper has been to provide a framework for thinking about the *underlying* problems in today's IMFS. Much work remains to be done to identify these problems further, and to quantify their relative importance. That work will make the case for particular reforms even stronger.

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