

# GLOBAL MONETARY ORDER<sup>1</sup>

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## 1 INTRODUCTION

The title of this paper, given me by our conference organizers, is an oxymoron. Earlier generations of economists distinguished the international monetary system of the Bretton Woods years from the international monetary “nonsystem” of the subsequent period (Williamson 1977 was probably first to use the term). Building on their insight or their way with words, it is tempting to similarly distinguish global monetary order from global monetary disorder and to ponder which term better captures the current state of affairs.

I will argue that the current international monetary and financial architecture, to invoke another popular phrase, this one adopted by the organizers as the title for our conference, displays elements of both order and disorder.<sup>2</sup> Order is defined as an arrangement of items in relation to one another according to a particular sequence, pattern or method. Thus, we see elements of order in the exchange rate arrangements operated by different countries, which are not entirely without logic. We see elements of order in policies toward international capital flows, which include, in different countries, restrictions on transactions on capital account, adjustments in macroeconomic policies and the adoption of macroprudential measures. We see elements of order in the provision of international liquidity, denominated mainly in a handful of leading national currencies that are traded in deep and liquid markets and used internationally. Finally, we see elements of order in how oversight of exchange rates, capital flows and international liquidity is provided through the International Monetary Fund, but also through other groupings of countries.<sup>3</sup>

In some cases this order reflects conscious organization by governments; an example is the creation of the IMF in 1944 and official support for its continuing role in the international monetary and financial system. In other cases the global monetary order is more spontaneous than organized.<sup>4</sup> The pattern observed may not have been consciously assembled but is no less well defined (no less “patterned”) for the fact. An example is the current constellation of pegged and floating exchange rates, which was not planned – unlike the Bretton Woods System it is not the result of an international treaty obligation – but nonetheless has a number of well-defined characteristics.

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<sup>2</sup> The phrase “international financial architecture” was popularized by U.S. Treasury Secretary Robert Rubin in a speech at the Brookings Institution in 1998 prompted by the experience of the Asian financial crisis. First use is seemingly confirmed by Google’s Ngram Viewer, in which the phrase first registers positively that year. There is then a spike in frequency of references that peaks in 2001-2 before heading steadily downward. The meaning of the phrase is disputed. Rubin did not define it; neither did Michel Camdessus, then managing director of the IMF. The one thing of which Camdessus was unambiguously clear was that whatever the concept entailed he wanted the Fund to be in charge of it. Hence my own involvement as an IMF staffer and author of a series of “non-papers” characterizing key aspects of the architecture and suggesting desirable reforms, subsequently published as Eichengreen (1999).

<sup>3</sup> The four aspects of the global monetary order cited in this sentence consciously echo the aspects emphasized by Williamson in his 1977 book: Williamson referred to the exchange rate regime and exchange rate/balance of payments adjustment; the extent of “market convertibility” (the presence or absence of capital controls and related policies toward capital controls); the supply of reserve assets (international liquidity); and the institution charged with managing the system (the IMF).

<sup>4</sup> Spontaneous in the sense of Hayek (1973).

At the same time, the current architecture also displays elements of disorder, defined by Merriam-Webster ([www.merriam-webster.com](http://www.merriam-webster.com)) as “a confused or messy state.” The constellation of exchange rate arrangements is nothing if not messy. There is disagreement and confusion about whether these deliver an appropriate degree of economic, monetary and financial stability. The same can be said of the management of capital flows, the provision of international liquidity, and the global safety net cobbled together out of multilateral, regional and bilateral arrangements.

In the next section I explore further what is meant by the global monetary order. The subsequent four sections then examine further four aspects of that order highlighted in this introduction: exchange rates, capital flows, international liquidity, and the global safety net (including the contribution of the IMF). This terrain has been reconnoitered before, but I hope to highlight some surprising and underappreciated facets.

## 2 WHAT DO WE MEAN BY GLOBAL MONETARY ORDER?

Maybe the most obvious metric on which to gauge the performance of a monetary order is its success at delivering price stability. The first panel of Figure 1 shows global consumer price inflation since 1980. Progress in a more orderly direction, so measured, is impressive. In 1980, recall, the United States was still reeling from high pre-Volcker inflation and other countries were still feeling the inflationary repercussions of two oil shocks. But it is the early 1990s, interestingly, that most stands out for monetary disorder, so measured. 1993, the year with the highest rate of CPI inflation, saw quadruple-digit inflation in the Commonwealth of Independent states, triple-digit inflation in Latin America and the Caribbean, high-double-digit inflation in Emerging and Developing Europe, and mid-double-digit inflation in Sub-Saharan Africa.

Progress since has been impressive. A global inflation rate of 3 ½ per cent is not unsatisfactory by historical standards, nor relative to the professed targets of governments and central banks. It is still closer to those targets (typically 2-3 per cent) if one believes that conventional measures underestimate technical progress and improvements in living standards and therefore overestimate underlying inflation.

Behind these global averages lie less satisfactory national outcomes. Countries in Sub-Saharan Africa are still experiencing inflation well into the double digits, as are Latin American countries like Argentina, Venezuela and Brazil at the time of writing.<sup>5</sup> Numerous countries in Europe and East Asia are seeing the change in the CPI dangerously close to or in deflationary territory. Figure 1, which shows the unweighted coefficient of variation of CPI inflation rates across IMF members, is a reminder that the cross-country variation in inflation rates has not come down along with average inflation.<sup>6</sup>

Figure 2 shows the distribution of monetary policy frameworks for 191 IMF members.<sup>7</sup> The picture is a bit surprising relative to the conventional wisdom. Starting in 2008, perhaps as expected, there has been some decline in the share of countries formulating monetary policy with respect to a foreign currency or

<sup>5</sup> Space constraints do not allow us to pursue the issue of the accuracy of published inflation figures for Argentina, Venezuela and other countries; here I simply flag the existence of the problem.

<sup>6</sup> The GDP-weighted coefficient of variation paints basically the same picture, aside from a larger drop in cross-country dispersion in 2009, when many of the world's large countries experienced the same drop in inflation. Whether greater dispersion of inflation rates is a problem depends, of course, on the nature of the shock causing changes in price levels. One might say the same about deflation itself of course, although I have made my own contrary views clear elsewhere (Eichengreen, Park and Shin 2015).

<sup>7</sup> 188 members in 2008. These are de facto frameworks as identified by IMF staff, which may differ from officially-announced frameworks.

basket of currencies. However, that there has been no decline in the share of countries that practice monetary-aggregate targeting is surprising given the notice paid to the instability of the relationship between monetary aggregates and inflation.<sup>8</sup> There has been no increase in the share of countries engaged in inflation targeting, which is again surprising given the fashion for the latter and the fact that countries adopting inflation targets rarely if ever abandon them (evidence, in other words, that inflation targeting is an absorbing state).<sup>9</sup> The growing share of monetary frameworks has been almost entirely concentrated in “other” arrangements in which countries either do not specify their framework or else formulate policy with reference to an eclectic mix of indicators. Evidently, opaque and eclectic approaches continue to have a place in the global monetary order.<sup>10</sup>

Figure 3 similarly shows the shares of countries operating hard pegs, intermediate regimes and floating exchange rates (along with the residual category “other”) in 2008 and 2014 according to the IMF’s de facto exchange rate regime classification.<sup>11</sup> The share operating hard pegs has risen due entirely to countries with no separate legal tender (whether through unilateral adoption of the dollar and euro or accession to the euro area).<sup>12</sup> There has also been a rise in the share of countries operating intermediate regimes, due almost entirely to increases in crawling pegs; this is the largest single change over this six-year period. Correspondingly, there has been a decline in the share of countries operating floating rates.<sup>13</sup> That decline is evident in the share of countries whose currencies float subject to various degrees of intervention, but it is especially evident in the share whose currencies float freely. One possible conclusion is that the global monetary order will continue to feature a variety of different exchange rate arrangements since no single arrangement is right for all times and places.<sup>14</sup> Another conclusion is that, academic advocacy of floating notwithstanding, the prerequisites for successful maintenance of a freely floating exchange rate are daunting, since they include deep and liquid financial markets, supervision and regulation capable of limiting currency mismatches, a clear and credible policy framework that does not revolve around the exchange rate, and substantial economic size.<sup>15</sup> A global monetary order based on free floating, it follows, is no more realistic than a return to a Bretton Woods-style global system of hard pegs.

Figure 2 above showed some decline in the shares of countries formulating monetary policy with respect to the value of the currency relative to the dollar, the euro and explicit currency baskets. This of course does not rule out the possibility that countries are implicitly adjusting policy in response to movements in the dollar, the euro and other currencies, shadowing these currencies in ways that the IMF’s de-facto-

<sup>8</sup> This is true in Europe (as relevant for this conference) and elsewhere; see OECD (2007).

<sup>9</sup> Rose (2007), who makes this point about the absorbing-state nature of inflation targeting regimes, goes so far as to characterize the result as a “stable international monetary system.” The present perspective suggests that reality is more complex and that more time will have to pass before Rose’s conclusion is definitive.

<sup>10</sup> This picture is even more pronounced when countries are weighted by their shares in global GDP.

<sup>11</sup> Readers will know that there exist a number of alternative taxonomies of de facto exchange rate regimes that differ in coverage and merits. For discussion see Tavlas, Dellas and Stockman (2008) and also footnote 15 below.

<sup>12</sup> Whether euro area members are properly classified as maintaining hard pegs to their monetary-union partners due to the existence of no separate legal tender or as floating collectively is a judgment call (the answer presumably depends on the question asked); this points up the hazards of adopting the IMF classification.

<sup>13</sup> Bleasby, Tian and Yin (2016) analyze trends over a longer period. They similarly conclude that the trend in the direction of greater flexibility has slowed in recent years. They attribute the change mainly to the decline in the level and variability of inflation as documented in Figure 1 above, which has made it easier for countries wishing to do so to hold their exchange rates relatively stable.

<sup>14</sup> As argued by Frankel (1999).

<sup>15</sup> This list of prerequisites suggests that de facto floating should be more frequently observed in advanced than developing countries. My own preferred measure of the de facto exchange rate regime (following Urban 2009) is the standard deviation of the change in the exchange rate normalized by the kurtosis of the change in the exchange rate. Intuitively, the standard deviation measures day-to-day fluctuations, while the kurtosis captures the frequency and importance of large jumps or realignments. This measure (aggregated with GDP weights) suggests, as expected, that advanced countries have, on average, been moving toward greater flexibility in recent years and decades while developing countries have not. For purposes of these calculations the post-2008 Euro Area is treated as a single economy.

exchange-rate classifiers do not perceive. A popular approach to identifying such tendencies is by estimating Frankel-and-Wei (2008) regressions, where the value of the national currency relative to a stable and systematically-neutral numeraire (the SDR or the Swiss franc, for example) is regressed on the major bilateral exchange rates relative to that same numeraire, where the estimated coefficients are interpreted as implicit basket weights.

Table 1 reports such regressions for a sample of 40 emerging markets, using monthly average data from January 2013 through January 2016 from Datastream, including not just the dollar and the euro but also the Japanese yen and Chinese renminbi as possible influences and using the Swiss franc as numeraire. Some of these results are a bit surprising, reflecting the short sample period and correlation among different bilateral rates – all of which is to say that, as with all econometrics, they should be taken with a grain of salt. For what they are worth, the point estimates suggest that in 40 per cent of cases policy is made mainly with reference to the dollar exchange rate, while in another 40 per cent it is made mainly with reference to the euro, and in the remaining 20 per cent it is made mainly with reference to the renminbi. Plausibly, the dominance of the euro is most prevalent in Europe, while dollar dominance is most prevalent in Latin America and the renminbi is most likely to dominate in Asia. This is an indication that today's international monetary order has regional and well as global dimensions, although it is equally evident (in the results for Asia, for example) that the two geographical dimensions overlap.

To what extent have these changes in exchange rate management enabled countries to avoid serious bouts of instability – currency crises or crashes? Figure 4 shows a conventional measure of these episodes: instances where the exchange rate depreciates by at least 20 per cent between successive quarters and does not recover 5 per cent or more of that depreciation in the subsequent quarter. Incidence spikes during well-known episodes: with the Latin American crisis in 1982, the EMS crisis in 1992, the Tequila crisis in 1994, the Asian crisis in 1997 and the global financial crisis in 2008. It is tempting to argue that the figure is bell-shaped, that incidence rises with the post-Bretton Woods capital-account liberalization but then falls after the mid-1990s with policy adjustment and reform that better accommodates the post-Bretton Woods reality. But the shape of the curve is in the eye of the beholder.<sup>16</sup>

A classic question is whether exchange-rate changes are useful for correcting trade imbalances. In the older literature on the international monetary system or order, this is referred to as “the adjustment problem.” It is fair to say that there is skepticism about the adequacy of this mechanism. When exchange rates change, trade flows and balances do not always respond as expected. Estimates of the elasticity of exports and imports with respect to the real exchange rate vary, to put an understated gloss on the point. Cases like Japan, where the real exchange rate fell sharply in recent years but exports showed little response, underscore the prevailing sense of doubt.

That said, recent research as I read it comes down firmly on the side that changes in real exchange rates affect the growth of real total exports, exports of goods, exports of manufactures, and real net exports. That said, researchers report some evidence of a decline in these elasticities over time. Ahmed, Appendino and Ruta (2015), analyzing 46 countries over the period 1996-2012, find that the elasticity of exports with respect to the real exchange rate is positive and significant (positive in the sense that real depreciation raises real exports) but that the elasticity in question has been falling. They attribute the change to the importance of trade in intermediate goods resulting from the growth of global supply chains, the argument being real depreciation does not reduce the cost of the imported-input component of a country's exports.<sup>17</sup> They provide evidence that the elasticity of exports is less for countries where the

<sup>16</sup> I return to the problem of currency crashes and their correlates in Section 3 below.

<sup>17</sup> In addition, in a world of global supply chains, real depreciation will reduce the cost of a country's intermediate exports to foreign producers, enhancing the competitiveness of the latter in turn and further reducing the effect on real net exports.

import content of exports is higher. Leigh, Lian, Poplawski-Ribiero and Tsyrennikov (2015) and IMF (2016) reach similar conclusions while cautioning that evidence of changes over time is fragile.<sup>18</sup> I conclude that real exchange rate changes are still relevant to international adjustment, although there is some reason to think that large changes in real rates, which can have other uncomfortable consequences, may be required to deliver the requisite results.

Separate from whether exchange rates affect exports and the current account is the question of whether currencies tend to move in directions consistent with current account adjustment. The modern literature on the exchange rate as an asset price focuses on the capital rather than the current account. It highlights the enormous growth of capital flows and emphasizes their volatility. Capital flows are also more difficult to measure than trade flows. Conventional balance of payments statistics measure changes in foreign assets and liabilities on the basis of the residence of the issuer, thus failing to capture changes in foreign borrowing and lending by overseas subsidiaries of a country's financial and nonfinancial corporations. For some purposes, such as gauging risks to financial stability, borrowing and lending offshore by nationals (which does not result in measured capital flows) may be as consequential as cross-border lending and borrowing. Attempts have been made to adjust statistics on capital flows for this "hidden debt" for some assets, countries and years (see e.g. Turner 2014 and Nordvig and Fritz 2015).

Bearing this in mind, Figure 5 shows two measures of capital flows, capital inflows attributable to nonresidents and capital outflows attributable to residents, both scaled by GDP. Three aspects stand out. First, gross capital flows have grown by a factor of five over the period for both advanced economies and emerging markets.<sup>19</sup> Contrary to the impression left by some of the literature, the growth of gross flows is not a phenomenon specific to emerging markets.

Second, gross flows are large relative to net flows, and the gap has been widening. This is telling us that gross inflows and outflows are positively correlated in the medium term, something that is sometimes lost from sight in discussions of capital-flow bonanzas and reversals. It makes sense that gross inflows and outflows should be positively correlated in the medium term, of course, insofar as both inflows and outflows tend to be encouraged by the same financial liberalization measures and by financial development more generally.<sup>20</sup>

Third, net capital flows remain less volatile in advanced countries than emerging markets. This is not immediately apparent from Figure 5, but it is clear in the first panel of Table 2, regardless of whether one's preferred measure of volatility is the standard deviation or the coefficient of variation of net flows of the median country. (Data here on capital flows are taken from the IMF's Balance of Payments Statistics; data on GDP are from the World Bank's World Development Indicators and IMF's World Economic Outlook Data Base. The country sample is limited by data availability; the sample here includes slightly over 100 countries.) That said, there is some evidence of convergence of these alternative measures of volatility between advanced countries on the one hand and emerging and developing economies on the other. The traditional interpretation was that net flows to emerging markets were more volatile because emerging markets were more volatile.<sup>21</sup> This is therefore a hint as to what has changed (can you say "Great Recession?").

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<sup>18</sup> Trade related to global supply chains has increased only gradually over time, making the associated structural shift in elasticities difficult to pinpoint. Efforts to isolate this effect are complicated by the fact that trade barriers have been reduced, transport costs have declined (due to, *inter alia*, containerization) and trade in services (where intermediates matter less and elasticities are higher) has increased (Eichengreen and Gupta 2013).

<sup>19</sup> The period covered in the figure is longer for the advanced countries than emerging markets, reflecting data availability.

<sup>20</sup> Although there can be exceptions, as in the case of emerging markets since the global financial crisis (detailed below).

<sup>21</sup> Where net capital flows are used to smooth consumption in the face of output volatility in the conventional model.

Total gross flows (the second panel of Table 2) are larger in advanced countries, but their volatility as measured by the coefficient of variation of the median country again looks similar across the three country groupings. The volatility of gross flows, so measured, has been rising for the advanced countries but not obviously for emerging markets and developing countries, consistent with what we saw above.

Table 3, following Bluedorn, Dattagupta, Guajardo and Topalova (2013), shows the coefficient of variation of various categories of capital flows scaled by GDP, again for the median country. Ratios are detrended using country-specific linear trends. Data on capital flows are again from the IMF's Balance of Payments Statistics; data on GDP are again from the World Bank's World Development Indicators and IMF's World Economic Outlook Data Base. These statistics confirm what was apparent from Figure 5, namely that the volatility of net capital flows is increasingly similar across advanced countries and emerging markets. Detrended in this way, net capital flows to advanced countries are now (meaning since 1991) at least as volatile as net capital flows to emerging markets when gauged by the standard deviation, more volatile when gauged by the coefficient of variation. This convergence reflects mainly that volatility has been rising over time in the advanced countries, as noted above.

Table 3 also confirms that equity investment (portfolio equity plus foreign direct investment) is less volatile than debt (portfolio debt and bank-related flows).<sup>22</sup> Among the advanced economies, the volatility of all types of capital flows rose between the first and second halves of the period, 1970-1990 and 1991-2014; this is true whether one measures volatility of flows by the standard deviation or the coefficient of variation. For emerging markets and developing countries, the standard deviations of the various types of capital flows similarly rose between the first and second subperiods, although the corresponding coefficients of variation did not rise uniformly, given how average levels also rose sharply.

It is worth asking how the recent decline in capital flows, to emerging markets in particular, fits into this picture. Net capital flows to emerging markets turned negative in 2015 for the first time since 1980. The swing from peak in 2009 to trough in 2015 is comparable as a share of recipient-country GDP to that experienced in the first half of the 1980s and second half of the 1990s. This is consistent with the observation that the volatility of net flows remains a fact of life for emerging markets. But as Figure 5 makes clear, net capital flows between advanced economies have also fallen (Bussiere, Schmidt and Valla 2016), consistent with the observation that the volatility of flows, so measured, is no longer a phenomenon peculiar to emerging markets. On balance, equity investment, especially FDI, has held up better than debt flows in the current episode, consistent with our emphasis on the relative stability of the former. The one obvious difference from previous episodes is that where gross inflows and outflows tended to be positively correlated in past cycles, this time there is more evidence of negative co-movement, with gross outflows from emerging markets rising at the same time gross inflows decline. IMF (2016a) describes this as an unintended consequence of financial development and of the growing integration of emerging economies into global financial markets, which work to amplify the volatility of net capital flows.

Another important aspect of international capital flows, in addition to the distinction between debt and equity and between banks and bonds, is that between domestic- and foreign-currency-denominated debt. (For my sins I am obliged to discuss "original sin.") Foreign-currency-denominated debt complicates use of the exchange rate as an adjustment mechanism, since any favorable impact of depreciation on the trade balance will be accompanied by an unfavorable impact on the real burden of debt (Kliatskova and Mikkelsen 2015). It hamstrings efforts to extend emergency assistance to indebted nations insofar as the authorities possess limited foreign-currency-denominated resources. Thus, the fact that emerging

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<sup>22</sup> The bank category is actually "bank and other" and includes *inter alia* trade-credit-related flows. But bank-related flows dominate this category.

markets have made progress in marketing domestic-currency-denominated debt securities, to non-nationals in particular, is seen as important progress in developing a more stable and smoothly-functioning global monetary order (see *inter alia* Burger, Warnock and Warnock 2012 Moody's 2015, IMF 2016).

As recent events have made clear, this picture is incomplete. Du and Schreger (2015), in a review of 14 emerging markets, confirm that that the share of external public debt denominated in domestic currency rose across the board between 2004 and 2012.<sup>23</sup> The same was not true, however, of the external debt of corporations. Its currency composition showed little change, and the vast majority of external corporate debt (80 to 90 per cent of the total) is still denominated in foreign currency.<sup>24</sup>

I am not aware of a convincing explanation for why emerging-market corporates have loaded up on foreign currency borrowing since the financial crisis.<sup>25</sup> The reassuring interpretation, heard more often in the past than the present, is that the corporations in question are naturally hedged. Because they export, they have foreign-currency-denominated assets to match their liabilities. But the fact that countries in which corporates have large amounts of foreign-currency debt also have lower sovereign ratings cautions against this interpretation. Nor is there any obvious reason why natural hedges should have become more prevalent since the crisis.

It could be that emerging markets have made more progress strengthening government budgets than strengthening corporate governance, allowing corporate borrowers to systematically undervalue the risks of foreign currency borrowing (Caballero and Krishnamurthy 2003), and that risk-neutral foreign lenders allow them to do so. It could be that international investors underestimate the risk of default by corporations with foreign-currency debts when the borrower's currency depreciates (see e.g. Delikouras, Dittmar and Li 2012). It could be that nonfinancial corporations in emerging markets are arbitraging regulations constraining the activities of financial institutions, borrowing abroad where interest rates are low and investing in higher yielding domestic assets like bank deposits (Caballero, Panizza and Powell 2015). The closest thing to a synthesis is that emerging market corporates have been lured to borrow in foreign currency by unprecedently low interest rates in countries engaged in quantitative easing (Chui, Kuruc and Turner 2016); they are prepared to incur those foreign currency exposures, and foreign creditors are willing to extend them, because emerging-market countries have accumulated massive foreign currency reserves which they will use to pay off these debts in extremis.<sup>26</sup>

No discussion of the role of capital flows would be complete without corresponding discussion of capital-flow regulation, the liberalization of restrictions on capital movements obviously having played a role in their extraordinary growth, and residual regulation being a conspicuous feature of the global monetary and financial order. Figure 6 shows the Chinn-Ito (2006) index of capital account openness, constructed on the basis of the IMF's *de jure* "Exchange Arrangements and Exchange Restrictions" measures, since 1970, separately for advanced and developing countries. As is well known, the advanced countries moved further in the direction of open capital accounts over the period than emerging and developing

<sup>23</sup> Governments of European countries like Poland and Hungary, which borrowed increasingly in euros, were the exception. The authors combine data from BIS debt statistics, Bloomberg and Thomson. In principle, this should account for the problem of hidden offshore borrowing by foreign corporate subsidiaries cited above.

<sup>24</sup> Using IMF data Acharya et al. (2015) document the same pattern. IMF (2016) shows the share of nongovernmental emerging market debt in domestic currency rising from 2004 through 2009 but then falling through 2015, where the share of the median country is again between 10 and 20 per cent.

<sup>25</sup> This is in contrast to the literature seeking to understand why governments borrow in foreign currency, for example Calvo (1996), where foreign currency debt is a self-imposed constraint on monetary policy makers otherwise lacking in discipline.

<sup>26</sup> In addition, Jeanne (2005) suggests that foreign-currency liabilities may be optimal for corporations when monetary policy makers lack discipline and chief financial officers wish to hedge against the risk of a rise in local currency borrowing costs. However, Jeanne's mechanism is hard to square with a world in which governments possess the credibility needed to borrow in local currency.

economies, with the value of the Chinn-Ito index tripling in the advanced countries but rising more slowly and erratically in emerging and developing countries. The advanced countries underwent a sharp increase in financial openness in the first half of the 1990s, when European countries removed their last remaining capital controls as part of the Single Market program and preparations were made for the transition to the euro. In developing countries there was a more gradual upward trend in the extent of financial openness since 1990.<sup>27</sup> The advanced countries also moved closer to full openness; they seemed to be approaching full capital account liberalization until the global financial crisis, in the course of which controls were temporarily restored in *inter alia* Greece and Cyprus and in response to which these and other advanced countries adopted macroprudential policies limiting their *de facto* financial openness.

In turn no discussion of capital controls would be complete without corresponding discussion of the “impossible trinity” of financial openness, monetary independence and exchange rate stability. (Nor would any discussion of the global monetary and financial order be complete without corresponding discussion of the “trilemma.”) Figure 7 therefore adds to the measure of financial openness of Figure 6 Aizenman, Chinn and Ito’s measures of monetary independence and exchange rate stability, contrasting 1970-84, 1985-99 and 2000-2013, and again distinguishing advanced countries, emerging markets, and developing countries. Monetary independence is measured by the correlation of a country’s short-term money-market or deposit interest rate with that in a base or reference country, while exchange rate stability is a function of whether or not a currency is kept within a narrow band against its base or reference currency and, if not, by the standard deviation of the resulting bilateral rate. The further a vertex lies from the center of the equilateral triangle, the further a class of economies has moved toward financial openness, monetary independence or exchange rate stability.

The main takeaway is the contrast in evolving policy choices in the advanced countries on the one hand and emerging and developing economies on the other. The advanced countries on balance have opted for greater financial integration and exchange rate stability, sacrificing a degree of national monetary autonomy in the bargain. While movement toward greater financial openness at the expense of monetary autonomy is evident in both euro-area and non-euro-area advanced countries, movement in the direction of greater exchange rate stability is almost entirely a euro-related phenomenon, although there is also some movement in the direction of greater exchange rate stability, as measured here, for other countries such as Denmark and Switzerland.

Movement in emerging markets and developing countries is less apparent to the naked eye. To the extent that it is evident, it appears that emerging markets and to a lesser extent developing countries have coupled greater financial openness with greater exchange rate flexibility, thereby sacrificing less monetary autonomy relative to the status quo.<sup>28</sup> Whether one is convinced that this is evidence that developing countries and emerging markets possess significant monetary independence depends, of course, on one’s assessment of the adequacy of the correlation of short-term interest rates as a measure of monetary-policy autonomy.<sup>29</sup>

In sum, the global monetary order continues to be characterized by a variety of different exchange rate and monetary regimes, by increasingly large and volatile international capital flows, by currency

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<sup>27</sup> Although there are also some ups and downs around that trend, about which additional stories can be told.

<sup>28</sup> Sacrificing little in the way of monetary autonomy as measured here, it should be emphasized. Arteta, Klein and Schambraugh (2016), slicing the data in a different way, similarly conclude that exchange rate stability and financial openness are negatively correlated in emerging markets.

<sup>29</sup> Nor is this to assert that such monetary autonomy as they possess necessarily provides complete insulation against shocks; Rey (2015) makes the counter-case.

mismatches whose locus is changing but whose risks are not, and by adjustment mechanisms whose adequacy is subject to question.

### 3 EXCHANGE RATES

The trilemma also offers a way of thinking about the longer-term evolution of exchange rate arrangements. Under the gold standard currencies were held stable (relative to gold and, through gold-market arbitrage, to one another). Since capital accounts were open, central banks and governments had only limited monetary autonomy.<sup>30</sup> But the intellectual and political context made sacrificing monetary autonomy feasible. Intellectually, there was no articulated theory linking monetary policy (in practice the level of the discount rate) to the state of the economy or even appreciation of the central bank's lender-of-last-resort function. Politically, there was little resistance to prioritizing exchange rate stability and little pressure to target other monetary goals when the electoral franchise was limited to the wealthy, when trade unions and parliamentary labor parties were unimportant, and when information (both conceptual and statistical) on other potentially relevant aggregates like unemployment was missing (Eichengreen 1998).

In the interwar period, central banks and governments approached the trilemma the same way, but the preconditions forsaking monetary autonomy were no longer present. The franchise was extended after World War I, and parliamentary labor parties gained voice. Union density rose. New analytical frameworks linked money, prices and, by implication, central bank policy to the state of the economy (see e.g. Keynes 1923). Hence when economic or financial conditions deteriorated, it was not clear whether policy makers would be able to prioritize exchange rate stability as before. Markets were quick to test their commitment (Eichengreen and Jeanne 2000). Some countries responded by abandoning currency stability. Others responded by sacrificing financial openness.

This experience was not happy. The contradictions of a system prioritizing exchange rate stability and capital mobility while sacrificing monetary autonomy when the circumstances needed in order to do so were no longer present were widely blamed for the onset of the global depression. The currency wars and capital controls with which countries responded in the 1930s were indicted as beggar thy neighbor. The monetary policies made possible by the new exchange rate cum capital control regime lacked coherence and failed to promptly end the depression.

Bretton Woods was then an experiment with an alternative trilemma configuration: stable exchange rates, greater monetary autonomy, and limits on capital flows. In practice, however, monetary policy was acyclic. Capital controls provided only partial insulation (more partial as the period progressed). There was nothing resembling inflation targeting to guide monetary policy, so central banks continued to make policy with reference to currency pegs. Systematic monetary policy responding to the output gap and deviations of inflation from desired levels then developed in two stages, as McGetigan et al. (2013) show. First, there was an increase in the countercyclical nature of monetary policy in the 1970s, mainly in the advanced countries, following the abandonment of Bretton Woods' par values.<sup>31</sup> Then there was a further increase in countercyclical nature in the late 1980s and early-to-mid-1990s, first in advanced countries and then emerging markets, as inflation targeting and Taylor-like rules were adopted as frameworks for

<sup>30</sup> That is, central banks and governments enjoyed limited monetary autonomy in normal times. In exceptional circumstances they might suspend convertibility (reintroduced exchange rate flexibility) in order to regain the ability to act as lenders of last resort (Bordo 1996). This of course presupposed an appreciation of the lender-of-last-resort function (see below).

<sup>31</sup> The cyclical nature of policy is measured by the correlation between the cyclical component of real GDP and the cyclical component of the real short-term interest rate.

monetary policy. Different countries implemented these frameworks in different ways as a function of their willingness to trade off exchange rate stability and open capital accounts, where different countries positioned themselves differently on this spectrum (see Section 2 above).

Where they positioned themselves was shaped in part by the relationship between the exchange rate regime and susceptibility to crises – both the reality and perception. Much of the literature has focused on currency crises in emerging markets (e.g. Obstfeld and Rogoff 1995, Rogoff et al. 2004), concluding that hard pegs and free floats are less crisis prone than intermediate regimes. Ghosh, Ostry and Qureshi (2014) generalize the point: their tabulations for 52 emerging markets over the period 1980-2011 confirm that countries with intermediate regimes (managed floats, soft pegs, bands and crawls) suffer from more frequent currency crises than countries with hard pegs and freely floating rates. There is also a relatively high incidence of banking, debt crises and growth collapses in emerging markets with intermediate regimes, although that incidence is comparable for emerging markets operating hard pegs in the case of debt crises, and it is even greater for growth crises (as if countries with hard pegs obtain their currency stability at the cost of other forms of instability).

Table 4 updates their tabulations through 2015 and, in addition, extends the comparison from 52 emerging markets to the entire range of IMF members (appropriately, it can be argued, for a paper on the global monetary order). Crisis dates are constructed following standard practice in the literature and by Ghosh, Ostry and Qureshi, although for currency crises we focus on large quarter-over quarter changes in exchange rates, rather than large year-on-year changes, as the former work better for situating crises in the years suggested by the qualitative literature.<sup>32</sup>

For emerging markets, the updated data again suggest that intermediate regimes are especially susceptible to banking, currency and sovereign debt crises.<sup>33</sup> These patterns basically carry over to the tabulations for the larger set of (181) IMF members, although tabulations for this expanded set paint hard pegs in a less favorable light (the incidence of banking and sovereign debt crises in countries with such regimes is relatively high), presumably reflecting reliance on hard pegs in a number of relatively fragile less-developed frontier economies.

Thus, there is tension between the relatively high frequency of stability problems in countries operating intermediate regimes and their revealed preference for such arrangements (Figure 3 above). That said, there are caveats to the conclusion that the persistence of intermediate regimes is a problem for the global monetary order. First, the economic and financial stability, such as it is, of countries with floating rates may reflect not the exchange rate regime per se but other characteristics of countries that allow their currencies to float. Countries with floating rates have smaller foreign currency mismatches and less violent credit cycles, perhaps indicative of better developed and managed financial systems that make for economic and financial stability and limit fear of floating.<sup>34</sup> Similarly, countries with hard pegs often have

<sup>32</sup> Banking crises come from the Laeven and Valencia (2012) data base as updated by the author. Currency crises are defined as in Figure 4 above, they are instances when there is a decline in the exchange rate of at least 20 per cent over the previous quarter against the U.S. dollar that is at least 5 percentage points greater than in the previous quarter (as opposed to 30 per cent year over year and at least 10 percentage points more than in the previous year, as in Ghosh et al.). Sovereign debt crises are from Laeven and Valencia (2012) and Beers and Nadeau (2015), as updated by the authors. Growth crises are years in the bottom 5 per cent of all annual growth rates (current year relative to the average of three preceding years). Ghosh, Ostry and Qureshi (2014) extrapolated back to 1980 the IMF's de facto exchange rate classification for the post-2006 period and kindly shared their data, which were then extended through 2015 by the author.

<sup>33</sup> The quarter-on-quarter dating scheme suggests that the incidence of currency crises is not that different between intermediate regimes and independent floats. Laeven and Valencia (2014) use an alternative measure of currency crises; using their measure and updating their series points to a much greater incidence in countries with independent regimes than in countries with free floats.

<sup>34</sup> Again, see Ghosh, Ostry and Qureshi (2014). Alternatively, lower currency mismatches could be a result of freer floating, insofar as this introduces the possibility of two-way variability in the exchange rate and leads prudent borrowers and lenders to limit

stronger political links with their currency-union and currency-board partners and political systems capable of coping with greater output volatility.

Whether this is the same or different from the previous point is partly a matter of semantics. The problem for the global monetary order is that countries have not put in place that stronger supervision and regulation. They have not succeeded in deepening and developing their financial markets in order to be able to float more freely. They have not put in place the political links and systems needed to sustain hard pegs. It is these deeper problems that render their exchange rate arrangements and stability outcomes problematic. The problem, in this interpretation, is not with their exchange rate arrangements per se.

Second, not all intermediate regimes are alike. Some studies suggest that intermediate regimes where the authorities announce explicit limits on flexibility and then seek to enforce them (as in the cases of soft pegs, preannounced bands and preannounced crawls) are more crisis prone than managed floats where such limits, where they exist, are implicit and more flexible. Table 4 is not inconsistent with this view. Evidently, managed floats are more like free floats in terms of the private sector behavior they induce and the public sector responses they permit.<sup>35</sup>

Although most such studies take the exchange rate and its management as a country characteristic, it is important from the perspective of the global monetary order to be cognizant of cross-country spillovers. This observation is of long standing; the particular context in which it arises currently is that of currency wars. The point is specific to an environment in which, whether because of secular stagnation or the aftermath of a financial crisis, economies are in a liquidity trap. Interest rates are as low as they can go, and banks' demand for reserves is perfectly elastic.<sup>36</sup> The only way of making monetary policy effective (of reducing the real interest rate) is then by changing expectations of inflation, and the only way of changing expectations of inflation is by pushing down the exchange rate. The exchange rate, being the single most visible price in the economy, may be singularly important for shaping expectations. Manipulating it may be a prominent way for policy makers to signal their commitment to reflation. Higher import prices then help to deliver on this promise.<sup>37</sup>

Two implications follow. First, exchange rate changes in this environment are beggar thy neighbor. Currency depreciation by one country that changes expectations in desirable directions changes them in undesirable directions in other countries with the same liquidity-trap problem. Second, to the extent that countries respond in similar fashion, no one's exchange rate changes, no one's expectations are modified, and the economy is only further depressed by volatility and uncertainty in the period when offsetting actions are unilaterally taken. "Currency manipulation," so defined, is a negative-sum game. Despite having written more than 70 years ago, Nurkse (1944) would recognize the problem and the case it creates for multilateral exchange rate surveillance.

But one can also question whether this is an accurate diagnosis of the problem in the 1930s, the episode of which Nurkse wrote, much less of the problem today. Even with interest rates near zero, it is not clear that monetary policy worked in the 1930s only by pushing down the exchange rate. In a number of the cases of which Nurkse wrote, exchange rates did not depreciate significantly, but monetary policy nonetheless had sustained effects. The United Kingdom allowed sterling to fall against the dollar in 1931,

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<sup>35</sup> their foreign currency exposures. This interpretation would be consistent with the "un-caveated" version of the argument that floating rates make for greater financial stability, as in the preceding paragraph.

<sup>36</sup> That said, there is less than full agreement on the point.

<sup>37</sup> For present purposes it makes no difference whether as low as they can go means zero or some negative number.

<sup>37</sup> Caballero, Fahri and Gourinchas (2015) formalize the argument.

but the currency recovered fully to earlier levels in 1933 when the dollar was pushed down.<sup>38</sup> Yet the authorities continued to expand money and credit with visibly positive effects on price expectations (real interest rates fell as inflation rose while nominal interest rates remained at low levels) and on the economy (Crafts and Fearon 2013).

The explanation for this positive impact on expectations, absent sustained depreciation of the currency, lies in institutional arrangements and leadership. Effective control of policy was transferred from a cautious Bank of England to a more aggressive Chancellor of the Exchequer, Neville Chamberlain, who managed monetary conditions through the Exchange Equalisation Account (Howson 1980). Interest rates were pushed down and expectations were pushed up despite little if any subsequent change in the exchange rate. What was true for Britain was also true for a variety of other countries. There was no further depreciation of the dollar exchange rate after 1933, for example. But there was the transfer of control over policy from a temperamentally cautious Fed to a more aggressive Treasury under Henry Morgenthau, which regulated monetary conditions through its gold sterilization operations.<sup>39</sup>

In both cases, in other words, it is not clear that the liquidity trap was binding in the sense that monetary policy was incapable of operating through channels other than the exchange rate. Monetary-cum-exchange-rate policies, even in this environment, were not a zero-sum game. In this interpretation, the conditions in question do not create a *prima facie* case for multilateral exchange rate surveillance or international policy coordination; instead they create a case for forceful policy action at the national level (although one can still argue that there is a case for international coordination of those national actions to limit exchange rate volatility and uncertainty).

Today it is similarly said that with near-zero interest rates and an enlarged balance sheet the only way the Bank of Japan can create expectations of inflation and reduce the real interest rate is by depreciating the yen, but that since other central banks are in a similar quandary the policy is self-defeating. But one also hears arguments that forceful leadership and action can raise inflation expectations even in the absence of a sustained change in the exchange rate. Time will tell.

## CAPITAL FLOWS AND SUDDEN STOPS

Capital flows are inextricably linked to the sudden-stop problem. Much of the literature on the global monetary order – on capital-flow volatility, IMF facilities, the adequacy of the global financial safety net, and episodes of turbulence like the 2013 taper tantrum and the 2015 capital-flow reversal – is similarly linked to sudden stops. This section therefore establishes that sudden stops remain a feature of the global monetary order. It provides evidence on how their incidence and characteristics have been changing.<sup>40</sup>

For present purposes, sudden stops are when portfolio and other inflows by nonresidents decline below the average in the previous 20 quarters by at least one standard deviation, when that decline lasts for more than one quarter, and when flows are two standard deviations below their prior average in at least in one quarter. The episode then ends when capital flows recover to within one standard deviation of their

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<sup>38</sup> The value of sterling and the dollar was still lower against the Gold Bloc countries than it had been in 1931, but this change in currency values was similarly reversed over the next couple of years.

<sup>39</sup> Again, see Crafts and Fearon (2013). My own interpretation of these same points is in Eichengreen (2015). Authors like Eggertsson (2008) would also point to a role of fiscal policy in shaping expectations in the 1930s and suggest that can play a similar role today (viz. the discussion of Japan two paragraphs below).

<sup>40</sup> Or, more precisely, not been changing. Evidence in this section is drawn from Eichengreen and Gupta (2016), where Poonam Gupta deserves much of the credit for whatever insight it contains.

prior mean.<sup>41</sup> The sample is made up of all emerging markets for which quarterly data on gross capital flows are available for at least 24 consecutive quarters between 1991 and 2015. The result is an unbalanced panel of 34 countries. The sample period can then be divided in half, distinguishing 1991–2002 from 2003–2015, as a way of highlighting what if anything has changed relative to the conclusions of the early literature focusing on the first period.

These procedures and sample identify 46 sudden stops, as summarized in Table 5. For no country does the temporary interruption of capital flows to emerging markets in 2013 at the time of the “taper tantrum” qualify as a sudden stop according to these criteria. The decline in capital flows into emerging markets and/or capital-flow reversals in this period lasted only one quarter, as opposed to four quarters on average in our sudden-stop cases. The average swing from quarterly inflow to quarterly outflow was 1 ½ per cent of GDP, as opposed to more than 3 per cent of GDP in our sudden-stop episodes. Currency depreciation was less than a third as large as in the sudden-stop episodes.<sup>42</sup>

A striking facet of Table 5 is how little difference there is in between the first period, when the sudden-stop problem first came to the fore, and the second period, when a wide range of measures to address it were taken at the national and international levels. The raw probability of a sudden stop in a given country in a given quarter, 2 per cent, is the same in both periods. The length of sudden-stop episodes is the same in both periods. The decline in GDP in the sudden stop episode is again basically the same in the two periods. The significant differences are in the magnitude of the capital flows themselves. Total inflows are larger in the four quarters preceding the sudden stop in 2003–2014, as is the subsequent turnaround in flows.

A small handful of country characteristics and variables are robustly associated with the incidence of sudden stops. The main such variables are predictable but no less important for the fact. The likelihood of a sudden stop is positively associated with the magnitude of the capital inflow in the preceding period; it is positively associated with the rate of growth of domestic credit to the private sector while those inflows are underway (as highlighted by *inter alia* Mendoza and Terrones 2012). Factors such as the VIX, as a measure of global risk appetite, and the Federal Reserve discount rate, as a measure of the stance of global monetary policy, also matter. The role of global factors has increased relative to that of country-specific determinants between the two periods. In terms of which global factors matter, the U.S. policy role plays the largest role in the first period, the VIX in the second.

At one level, that there has not been more progress – that the frequency and impact of the sudden-stop problem has remained largely unchanged – is disheartening. At the same time, the fact that the capital flow turnaround is larger but the drop in output is not suggests that someone is doing something right. Indeed, there are noticeable differences in policy responses between periods. There was less of a tendency to sharply tighten both monetary and fiscal policies in response to outflows in the second subperiod. Between 2003 and 2015 monetary policy as measured by the level of the policy rate was reduced, on average, in response to sudden stops instead of being raised as in the first subperiod. On

<sup>41</sup> When two sudden stops occur in close proximity, they are treated as a single episode. In focusing on gross inflows by nonresidents, we follow Efremidze et al. (2015), who show that sharp reductions in gross flows from abroad tend to be most strongly associated with sudden stops as defined here (and are more informative for understanding the latter than, *inter alia*, net flows). Cavallo et al (2013) show that the sudden stops in flows from non-residents tend to be larger and have larger impacts on economies than those which are driven by outflows by residents.

<sup>42</sup> The decline in equity prices was less than a fifth as large.<sup>42</sup> In 2015, another prominent recent instance of capital flow reversals, quarterly data identify two interruptions to capital flows that qualify as sudden stops only in Chile and South Korea. News reports in early 2016 (Moore 2016) of emerging markets such as Brazil, Turkey, Saudi Arabia, Russia and Argentina issuing or planning to issue international bonds to nonresident investors is consistent with the idea that all we have seen so far is a temporary interruption (“temporary” by the criteria used to identify sudden stops).

average, fiscal policy was tightened in response to sudden stops in both subperiods, although the extent of fiscal consolidation was less in the second subperiod.

That fiscal contraction was less in the second subperiod is consistent with the idea that fiscal positions were stronger on average, making it less imperative to undertake further fiscal consolidation to reassure investors and accommodate the declining availability of finance. That central banks were able to loosen monetary conditions and tolerate some depreciation of the currency is consistent with the idea that countries had made progress in addressing the currency mismatch problem than had made depreciation so costly in the first subperiod. This willingness and ability to reduce policy interest rates and allow the currency to depreciate also plausibly reflected the fact that inflation rates were lower coming into the sudden stop episode (6.4 per cent in the second subperiod versus 10.7 per cent in the first, in the eight quarters prior to the sudden stop), making any consequent depreciation-induced inflation less of a problem.

Putting these parts together paints the following picture. Comparing the most recent decade with its predecessor, the problem is basically the same. The main difference is that the magnitude of the turnaround in capital flows in sudden-stop episodes, relative to recipient-country GDP, is even larger now than before, reflecting the continued expansion of international capital markets. At the same time, stronger monetary, fiscal and financial positions have allowed emerging markets to buffer the macroeconomic impact, or at least to avoid having to exacerbate it, through the adoption of countercyclical (or less procyclical) policy responses. These larger shocks and more stabilizing policy responses have cancelled out in the sense that the resulting drop in GDP is the same across subperiods. Whether this is progress is for others to judge.

## 5 INTERNATIONAL LIQUIDITY AND INTERNATIONAL CURRENCIES

International capital flows serve a variety of purposes. Among them is contributing to international liquidity. Writing in 1961 in an earlier era when private cross-border financial flows were tightly controlled, J. Marcus Fleming of Mundell-Fleming-model fame defined international liquidity as "such resources as are readily available to [a country's] monetary authorities for the purpose of financing deficits in its balance of payments and defending the stability of its exchange rate."<sup>43</sup> Today, when banks, firms and households in addition to governments engage in cross-border financial transactions, one might wish to add to Fleming's definition "liquid resources available to the private sector for meeting foreign obligations." 1961 being the heyday of the Bretton Woods System, Fleming's focus was official resources denominated in U.S. dollars and gold. Now that other economies have open capital accounts and deep and liquid financial markets, one might wish to add resources denominated in their currencies to those denominated in dollars.

International liquidity so defined is distinct from safe assets. Safe assets are securities that are accepted and held in settlement of financial transactions because they are perceived as low risk and can be bought and sold at low cost in significant quantities without moving prices (International Monetary Fund 2012).<sup>44</sup> They provide pricing benchmarks. They are widely accepted in payment. They are reliable stores of value. They serve as collateral in financial transactions and satisfy prudential requirements.

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<sup>43</sup> Fleming (1961), p.439. Fleming spoke of external liquidity rather than international liquidity, but no matter.

<sup>44</sup> Ability to buy and sell significant quantities without moving prices being the definition of liquidity. This definition of liquidity is a reminder that this dimension of safety is a function not only of the characteristics of the security but also of the market in which it is traded (Gourinchas and Jeanne 2012, p.6). In this context, the constituents of low risk include low credit risk, low inflation risk, low exchange risk and low idiosyncratic risk (low idiosyncratic risk in the sense that the instrument is insensitive to information about the characteristics of the issuer).

But some safe assets may only have these attributes domestically. Investment-grade bonds denominated in some currencies may only provide a reliable store of value for domestic residents or only satisfy prudential requirements in the issuing country, exchange risk and regulatory obstacles to cross-border use preventing them from providing these same services elsewhere. International safe assets (Fleming's "international liquidity") are those that provide these functions globally, or at least in a significant number of countries.

This is how international safe assets are related to international currency status. International currencies are national units that are recognized in a number of countries as providing means of payment, unit of account and store of value services. An international currency is a national unit in which international safe assets are denominated.

Moving from theory to practice, one quickly encounters the problem of where to draw the line between assets that are safe and widely accepted in transactions internationally and those that are not.<sup>45</sup> Specifically, there is the question of whether privately-issued high-quality obligations should be regarded as a constituent of international safe assets.<sup>46</sup> This question dates to the 1990s when observers quaintly worried that the U.S. Treasury might retire its outstanding debt. The issue then was whether high-quality corporate securities might become an accepted form of international reserves. But as Gourinchas and Jeanne (2012) emphasize, private or inside assets that are safe in normal times may be reassessed as risky in periods of volatility.<sup>47</sup> For purposes of asking whether the supply of such instruments is adequate for coping with volatility, it makes sense to focus on publicly-provided or outside assets.<sup>48</sup>

Figure 8 shows one measure of international liquidity, defined as the high-powered money stock of OECD countries, the "safe" (AAA and AA rated) central government bonds of OECD countries, the bonds of supranationals, and gold in official and private hands, all scaled by global GDP.<sup>49</sup> I exclude SDRs from this definition of international liquidity on the grounds that they are not also traded in private markets and used to settle private cross-border transactions, and because they are simply claims on the outside assets of the countries whose currencies comprise the SDR basket, causing double counting of those assets if SDR allocations are included.<sup>50</sup>

Figure 8 is striking, even alarming. After rising between the 1980s and 1990s, international liquidity so measured spiked temporarily in 2002-4 (when all components of the numerator rose) and in 2009 (when there were sharp increases in base money and the value of gold and investment-grade government bonds, along with a decline in global GDP). Since then, the ratio of international liquidity to global GDP has fallen sharply.<sup>51</sup> With interest rates near zero in many countries, the world may be awash with

<sup>45</sup> For more on this, see below.

<sup>46</sup> Privately-issued assets are sometimes referred to, interchangeably, as "private-label" assets or securities and, as betrayed by the use of both "assets" and "obligations" in the preceding sentence, they are referred to as "inside liquidity."

<sup>47</sup> Insofar as there is no emergency lender with the capacity to provide elastic supplies of liquidity in that currency standing behind them. Gorton (2016) develops this same idea in the national context.

<sup>48</sup> Some would argue that commercial bank deposits should be included to the extent that these are fully and credibly guaranteed by the public sector, whether through deposit insurance or implicit guarantees, but their addition would not materially affect the analysis that follows.

<sup>49</sup> This refers to current OECD countries, since the composition of the OECD varies over time.

<sup>50</sup> A detailed discussion of these issues is Obstfeld (2011). In practice, the outstanding stock of SDRs is too small for this adjustment to make much difference for present calculations. Interesting in this connection are reports that China is pondering preparations for a platform for SDR borrowing by Chinese and foreign entities on China's onshore capital market (Marsh 2016). Other components of the global safety net (bilateral and multilateral swaps, for example) are similarly excluded on the grounds that they are reallocations of and not increases in the level of international liquidity. This is not to say that the safety net is irrelevant; I return to its structure and adequacy below. Some might argue that one should also exclude domestic government bonds acquired by central banks in the course of their conventional and unconventional monetary policy operations. Doing so would only reinforce the conclusions of the next paragraph.

<sup>51</sup> Arithmetically, that decline reflects downgrades on government bonds and the recovery of global GDP growth. The importance of sovereign downgrades suggests that international liquidity may display multiple equilibria. Like bank credit in a Diamond-

liquidity, but it is not awash in the high-quality assets widely accepted in cross-border transactions that contribute to international liquidity.<sup>52</sup> In the 1930s a shortage of international liquidity brought an abrupt end to an earlier era of globalization. This is a reminder that our current globalization could be at risk if the trend in Figure 8 is allowed to continue.

The traditional framing of the international liquidity problem, which traces back to Triffin (1947), is that international currency status is a natural monopoly because of the strength of network increasing returns – that the incentive to utilize a specific currency in international transactions is strongly increasing in the number of other agents using that same currency in their own international transactions. International currency status is effectively the monopoly privilege of the leading economy. But that leading economy will not be able to supply safe and liquid assets (it will not be able to supply international liquidity) on the scale required by an expanding world economy on its own forever, insofar as the logic of economic convergence implies faster growth of the world economy – and therefore faster growth in the demand for international liquidity than in the monopolist's capacity to supply. This then provides motivation for the creation of supranational sources of international liquidity.<sup>53</sup>

A number of authors have argued on this basis for significant new SDR issuance on a one-time, continuing or countercyclical basis (see Ocampo 2010, Stiglitz 2011). SDRs would be sold to the central banks that issue international currencies in exchange for domestic high-powered money, thereby creating additional outside assets (addressing the problem that traditional SDR allocations simply involve a redistribution of existing claims on the liquid assets of the countries whose currencies comprise the SDR basket).<sup>54</sup> Private markets would be created on which SDRs could be traded and through which private transactions could be settled. Whatever the merits of this idea, operationalizing it would require truly revolutionary changes in the structure of private markets, in the responsibilities of the IMF and in the autonomy of central banks, which would be obliged to create additional high-powered money when the IMF came calling. Beyond that, there would have to be an order-of-magnitude change in the stock of SDRs if this mechanism is to offset a decline in the supply of international liquidity like that which has occurred since 2009. The calculations underlying Figure 8 suggest that the stock of SDRs would have to increase by a factor of 50 to offset the 2009–2015 decline, which is not something that the IMF's principal shareholders are obviously prepared to contemplate.

Fortunately, there is another solution to Triffin's dilemma, suggested by the so-called new view of international currency status.<sup>55</sup> The new view questions this natural-monopoly characterization. It posits that multiple international currencies can coexist – that network effects, even if present, are not so strong as to leave room for only one international currency. This suggests that the international liquidity problem can be solved through the development of more national sources of safe and liquid internationally-accepted assets, in the form of high-quality public assets issued by additional governments whose financial markets also exhibit the requisite scale, stability and depth.<sup>56</sup>

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Dybvig world, it may be subject to runs: if rating downgrades that deprive international traders and investors of the liquidity required for cross-border transactions depress growth in open economies and create further financial difficulties for their governments, additional downgrades may then follow, further depressing international liquidity in a vicious spiral.

<sup>52</sup> It is worth recalling that any measure of global liquidity is arbitrary insofar as there are gradations of liquidity (assets are not simply either "liquid" or "illiquid." Global liquidity as measured in Figure 8 fell sharply after 2008 partly because AAA and AA rated bonds were downgraded, as noted above. The reality is that these bonds don't suddenly become "illiquid," only less liquid. But this observation does not alter the striking and potentially alarming implications of the figure.

<sup>53</sup> Although how these fit into a framework emphasizing strongly increasing network returns is not entirely clear.

<sup>54</sup> Details of one such scheme are in Truman (2010).

<sup>55</sup> The terminology is from Frankel (2011). A formal statement of the new view is Eichengreen, Mehl and Chitu (2016).

<sup>56</sup> Readers of the preceding footnote, anticipating that I am an adherent to the new view, will understand why I included the base money and investment-grade bonds of all OECD countries and not just those of the United States in the measure of international liquidity in Figure 8.

Two types of evidence support the new view. First, changes in financial technology suggest that interchangeability costs giving rise to network increasing returns and therefore favoring a single dominant international currency are no longer as strong as in the past. This idea builds on a literature on technology standards that emphasizes open systems, in which users of a particular technology or system can interact with users of other technologies or systems at low cost.<sup>57</sup> In these models, network effects still exist, but the technical barriers separating competing systems or standards can be surmounted by so-called gateway technologies that enable suppliers or customers to overcome pre-existing technical incompatibilities and integrate rival systems into “an enlarged production system or extended network.”<sup>58</sup> In the presence of these gateway technologies, interchangeability costs are no longer prohibitive. The network increasing returns associated with use of a particular technological system or standard are no longer so dramatic. First-mover advantage and the dominance of an established standard may still be present but they are no longer so pronounced.

This 21<sup>st</sup> century picture of low costs of information, transactions and coordination is more plausible for the modern-day foreign exchange market than the traditional assumption of high switching costs and costly information leading to strongly increasing network returns. In an age of high-speed communications, it is straightforward for potential customers to get real-time quotes on the price of foreign exchange and to compare the prices of commodities denominated in different currencies. When over half of all foreign exchange transactions occur on electronic platforms, it is possible to purchase and sell multiple currencies at microscopic bid-ask spreads in a matter of milliseconds. This is true not just for high-speed traders utilizing EBS and Thomson-Reuters servers and for large financial institutions with interbank electronic platforms but, as well, for retail investors with access to Internet-based foreign-exchange gateway technologies like Oanda and World First.

Likewise, it is now possible for firms to obtain protection from future exchange rate changes that might otherwise arbitrarily affect their costs and revenues by purchasing and selling currency forwards, swaps and other foreign exchange derivatives, transactions that can be undertaken at low cost in high-tech 21<sup>st</sup> century financial markets. Thus, the need for a firm to price its exports in the same currency in which its imported inputs are priced, as a way of naturally hedging its supply-chain risk, is no longer as pressing. And as more countries open their capital accounts and develop their financial markets, more national markets acquire the depth and liquidity necessary to render the assets traded there attractive to international investors.

Second, historical evidence suggests that network increasing returns were not, in fact, so strong in the past as to render international currency status a virtual natural monopoly, the anomalous Bretton Woods period notwithstanding. And while the IMF’s data for the final decades of the 20<sup>th</sup> century confirm that the dollar accounted for the single largest share of identified foreign exchange reserves, that share was only on the order of 60 per cent. Other currencies, evidently, also played consequential international roles. Neither do the data in Lindert (1969) on the period before 1914 support the assertion that international currency status is a natural monopoly; they show that other currencies in addition to sterling – the German mark and the French franc in particular – also accounted for non-negligible shares of central bank reserves. Evidence for the 1920s and 1930s, when both sterling and the dollar served as consequential international currencies, points to the same conclusion (Eichengreen and Flandreau 2009).

None of this is to deny that the adequate provision of international liquidity is a problem. But it does suggest that that it can be solved through the emergence of other sources in addition to the United States and the dollar. Here the euro and the renminbi are the obvious candidates, insofar as the Euro Area and

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<sup>57</sup> Here the analogy between technology standards and monetary standards is intentional and direct.

<sup>58</sup> David and Bunn (1988), p.170.

China possess the requisite scale. Large economic size gives them the fiscal capacity to back a large outstanding stock of government bonds attractive to international users. Because of their size and openness, these economies engage in a large volume of transactions with the rest of the world, creating a natural habitat for their currencies in the international domain.

But there are also questions about whether their currencies are capable of contributing to international liquidity in the manner of the dollar. In the Euro Area, unlike the United States, fiscal capacity is not pooled but divided among the member states. In some cases it is already exhausted (optimists would say “temporarily exhausted”), as a result of which the bonds of the governments in question lack investment-grade status, are not readily accepted by foreign investors, and do not contribute to international liquidity according to our calculations. Bond market liquidity has been further limited (the stock of Euro Area government bonds available to international investors has been further reduced) by the security purchases the ECB has been compelled to undertake to fend off the threat of deflation. All this is simply to say that in order to contribute significantly to international liquidity going forward, Europe will have to draw a line under its crisis.

Notwithstanding the publicity surrounding Beijing’s renminbi internationalization drive, China’s currency remains far behind the dollar and for that matter the euro on every relevant dimension.<sup>59</sup> For a national currency to play a significant international role, its markets must possess not only size but also stability and liquidity. Stability is not exactly an attribute that Chinese financial markets possess in abundance, as the events of the last year have made clear. There are also questions about the liquidity of those markets, insofar as residual capital controls and other regulations limit access. Ultimately, liquidity is a function of rule of law and reliable contract enforcement, insofar as “liquid” means that investors can buy and sell as much as they want whenever they want at the prevailing market price, subject to minimal legal and regulatory uncertainty and interference.<sup>60</sup> This leads one to ask whether aspirations for the renminbi to contribute significantly to international liquidity are in fact compatible with China’s prevailing political system.<sup>61</sup>

## 6 THE GLOBAL SAFETY NET AND THE IMF

Firms in different countries manage the liquidity needs associated with their cross-border transactions as best they can. Governments for their part require international liquid resources to finance fluctuations in their own cross-border transactions, to intervene in the foreign exchange market, and in order to assist financial and nonfinancial firms with emergency liquidity needs they do not anticipate or with which they are unable to cope. This last set of resources is what has come to be known as the global safety net.

Figure 9 summarizes the size and composition of that safety net, scaled by global external liabilities calculated in the manner of Lane and Milesi-Ferretti (2007). Included here are IMF facilities, regional lending arrangements, bilateral swap agreements and foreign exchange reserves. Four aspects of the figure stand out. First, these resources, so measured, trace out a u-shaped pattern. They fall initially, due to the rapid expansion of external liabilities, and then rise as the growth of external liabilities slows following the onset of the global financial crisis and policy makers respond by augmenting swap lines, regional financial arrangements and IMF facilities. Second, there are signs that the rise in the size of the global safety net, so measured, has now plateaued. In both these respects there is a contrast with Figure

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<sup>59</sup> Relevant dimensions include share of allocated global foreign exchange reserves, share in international debt securities outstanding, share in global foreign exchange market turnover, and share in global trade settlements.

<sup>60</sup> For elaboration see footnote 44 above.

<sup>61</sup> I have asked these questions in Eichengreen (2013).

8, which shows international liquidity declining rather than rising following the crisis, with no indication of that decline tending to abate.<sup>62</sup>

Third, despite the expansion of bilateral, multilateral and regional financial resources, foreign reserves held at the national level still comprise by far the largest component of the global safety net. Fourth, despite significant growth in recent years, the magnitude of that safety net relative to external liabilities has not yet matched the levels of the early 1980s.

Moreover, it can be argued that the available safety net is in fact less than meets the eye.<sup>63</sup> The Bank of Korea famously entered the global financial crisis with more than \$260 billion of reserves but, once these began to decline, \$200 billion somehow came to be identified as a critical threshold, or floor, below which reserves could not be allowed to fall (Asian Development Bank 2011, Aizenman and Sun 2012). Economists have models (e.g. Krugman 1979) in which a crisis and a run on the central bank can occur even when reserves are significantly above zero, but these do not suggest that this critical threshold or floor is necessarily so high or that it is such a conveniently round number. The IMF (2011) has rules of thumb for reserve adequacy, which it takes as a function of exports (so as to capture the potential loss of reserves from a drop in external demand or a terms of trade shock), short- and long-term debt (as a measure of interest payments and rollover risk), and broad money (as a measure of the scope for capital flight), with weights that depend on the exchange rate regime and the openness of the capital account. These rules of thumb suggest that China, for example, should be holding somewhere between \$1.1 trillion and \$2.8 trillion of reserves, depending on one's preferred characterization of its exchange rate and capital account regimes, where actual reserves are in excess of \$3 trillion at the time of writing.

The problem is that investors, in their wisdom, appear to regard these thresholds (\$1.1 trillion or \$2.8 trillion) as a floor rather than a ceiling on adequate reserves. They act as if reserves should not be permitted to fall below this threshold under any circumstances, implying that they should not be used to finance shocks to the balance of payments, where ironically this is the express purpose for which reserves are held and the use relative to which their adequacy is gauged. This may be a fundamental misperception of the meaning of reserve adequacy, but to the extent that it is held in financial circles, governments and central banks may feel inhibited from actually using their otherwise adequate reserves.<sup>64</sup>

Then there is the problem of IMF stigma – that countries are reluctant to draw IMF resources even when these are lightly conditioned and subject to prequalification. To some extent this stigma is likely to reflect coordination issues. Drawing IMF resources might not be seen as sending a bad signal if multiple countries displayed a willingness to do so at the same time, but there is the inevitable “after you, Alphonse” problem. The Fund has sought to orchestrate a collective solution, encouraging groups of countries to sign up for its unconditional or lightly-conditioned facilities, but to no avail. This suggests that the syndrome also has other sources. For example, it could be that IMF stigma has historical roots, something that has been argued for other forms of stigma (Goffman 1964, Kurzban and Leary 2001). In the case of the Asian countries, for example, IMF stigma could be rooted in the historical experience of the 1997-8 financial crisis and in how that experience affected perceptions, norms and behavior and how

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<sup>62</sup> This is relative to global GDP, recall.

<sup>63</sup> That is, less than is depicted in Figure 9.

<sup>64</sup> Another interpretation of the adverse effects of allowing reserves to fall is in terms of asymmetric information – that allowing reserves to fall is seen as sending a signal of some deeper underlying problem. I return to this in the final section.

it continues to promote other desired objectives – group solidarity, for example, being a well-known byproduct of stigmatization – even today.<sup>65</sup>

There also appears to be reluctance to draw on bilateral swaps and regional financial arrangements. The Chiang Mai Initiative Multilateralization, for example, has not been drawn on the decade and a half since its creation, not even at the depths of the global financial crisis. There is similarly reason to question whether the BRICS' Contingent Reserve Facility will be activated in times of need.<sup>66</sup> This is typically explained on the grounds that governments, notwithstanding their formal commitments, hesitate to lend without attaching conditions, but countries find it politically problematic to accept conditions imposed by their neighbors. In addition it is suggested that individual governments are in a poor position to determine whether their neighbors are merely experiencing liquidity problems, in which case repayment is likely, or have deeper insolvency problems, in which case the creditors' funds will be at risk. This is an argument for creating a link between IMF programs and regional financial arrangements, as in the case of the CMIM, since conditionality and the liquidity/solvency determination can then be outsourced to the Fund, which is in a better position to make these determinations. This assumes, of course, a solution to the aforementioned problem of IMF stigma.

An exception to this general reluctance is the bilateral swaps of the Federal Reserve System, extension of which during the global crisis was widely seen as having a calming effect (Park 2011) and which were actually utilized (Destais 2014). Five of the Fed's 14 temporary swap arrangements were subsequently made standing arrangements – those to the 5 largest advanced-country counterparties.<sup>67</sup> Whether the Fed would have the political cover to significantly expand the list of recipients in a future crisis is a good question. Another good question is why the Fed's swaps are not subject to the same stigma as other facilities.<sup>68</sup> A conjecture is that they are extended by an apolitical entity, namely an independent central bank, and therefore do not come lumbered with political conditions and obligations, either explicit or implicit, whereas the IMF and CMIM are directly answerable to and perceived as carrying out the bidding of governments.

The patchwork nature of the existing swap network has led observers like Reserve Bank of India Governor Raghuram Rajan to suggest that this network should be multilateralized and channeled through the IMF. The Fund would provide swaps of dollars and euros obtained from the Fed, the ECB and other issuers of international currencies to countries with sound policies and temporary liquidity needs. A moment's reflection suggests that this is less a new proposal than a repackaging of existing ideas. IMF dollar and euro swaps for countries with sound policies and temporary liquidity needs are simply the Flexible Credit Line (FCL) and the Precautionary and Liquidity Line (PLL) in another guise. The idea that such swaps should be made available through the Fund to a greater extent than in the past is exactly analogous to proposals for further increases in IMF quotas, together with more active use of the Designation Rule under which the IMF can oblige member countries to provide it and its other members with their currencies in return for SDRs. As such, any such scheme is subject to familiar objections and obstacles. Countries remain reluctant to sign up for the FCL and PLL (only five have done so at the time of writing despite the Fund's repeated efforts to make the facilities more attractive). Issuers of

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<sup>65</sup> To be clear, it is those applying the stigma and not those on the receiving end who are thought to experience the group solidarity. Since the crisis, Asian countries have sought to advance regional solidarity through a variety of mechanisms, such as the Asian Bond Fund, Asian Bond Markets Initiative, and Chiang Mai Initiative Multilateralization (more on which below).

<sup>66</sup> Other observers like Truman (2010), generalizing from the European case, argue that regional financial assistance is too freely activated. My overall conclusion is the opposite.

<sup>67</sup> The distinction between "made standing arrangements" and "made permanent" is important, since standing arrangements can always be revoked.

<sup>68</sup> One can ask the same question about the ECB's swap lines with the Danish and Swedish central banks.

international currencies, like the United States, are reluctant to incur the financial risk (real or imagined) of swapping dollars for SDRs and to thus dilute their decision-making control (Talley 2014).

What is to be done? A first step would be to authorize the IMF to unilaterally prequalify groups of countries as eligible for the FCL and PLL, as has been suggested before (Moghadam et al. 2010, Eichengreen 2010). Credible prequalification might suppose an increase in IMF resources, given that credit lines will reassure only to the extent that the IMF has the wherewithal to disburse them, and an increase in the range of such facilities to avoid triggering a crisis when a country was “downgraded” from one to another. If prequalified countries continued to display a reluctance to tap these facilities, further reforms might be needed. Reinhart and Trebesch (2016) suggest limiting all future IMF lending to short-term liquidity support for countries with “correctible maladjustments” in their balance of payments. They argue that because the IMF also lends for other purposes – for example, it provides the equivalent of debtor-in-possession finance to “insolvent” governments forced to restructure their debts – a country that takes an IMF loan would be signaling to the rest of the world that it is insolvent, thereby preventing the Fund from acting as an emergency lender to countries that are illiquid. This international equivalent of the Bagehot Rule for domestic lenders of last resort – provide only temporary liquidity support to solvent borrowers against good collateral – is intuitively appealing. But others of us would observe that limiting IMF lending to short-term liquidity assistance, to the exclusion of other programs and facilities, would have costs as well as benefits.<sup>69</sup> We would suggest that the line between illiquidity and insolvency is not always that easy to draw, especially for sovereigns. Hopefully unilateral prequalification would be enough.

The reluctance of countries like the United States to provide additional dollar swaps could be addressed by allowing the IMF to offer the U.S. a guarantee against financial losses in the event that the SDR depreciated significantly against the dollar while the swap line was being utilized. This would not eliminate the risk, but it would shift it from the balance sheet of the Fed to the balance sheet of the Fund. Such an arrangement would therefore have to be accompanied by agreement among the members to recapitalize the Fund in the event of significant capital losses. The United States would not be protected from all losses, but its part would be reduced to its quota share (currently some 17 per cent). This is an acceptable price, it can be argued, for a global insurance policy. Whether the U.S. Congress would view it this way remains to be seen.

It is tempting to argue that further governance reform – rebalancing voting shares toward emerging markets – will help to create the necessary confidence that the IMF will execute these functions in an evenhanded way. But the preceding discussion suggests that focusing on voting shares and government control of the IMF’s day-to-day operations may not be the correct emphasis. If the reason why Fed swaps are seen by the recipients as more attractive and effective than IMF lending is that they are provided by an independent agency that does not attach political conditions, either explicitly or implicitly, to its assistance, then strengthening the control of national governments over the Fund’s day-to-day operations may be a mixed blessing. An alternative is to give the IMF’s managing directors more independence, like that possessed by the members of the Federal Open Market Committee who are responsible for authorizing the extension of Federal Reserve swap lines.<sup>70</sup> The role of governance reform would then be

<sup>69</sup> Denying all IMF assistance under all circumstances to countries with solvency problems is especially problematic in a world where institutions for efficient restructuring of sovereign debts is absent. There is of course a large literature on how to create or reform those institutions, but pursuing this issue would take me too far afield in what is already a long paper.

<sup>70</sup> Proposals to this effect have a long history, dating all the way back to the Keynes-authored UK proposal for an International Clearing Union. Some readers of an earlier draft of this paper asked for a more detailed proposal about how a more independent management team might operate – for example, would the Managing Director and Deputy Managing Directors take decisions by majority vote, in the manner of a monetary policy committee, or would they do so by consensus, and at what frequency and under what circumstances would they be answerable to the Board of Governors of the institution? Filling in these details would require considerable additional space. Fortunately, the relevant details are already available, in De Gregorio,

to create a more representative executive board to which the managing directors would periodically report, and which would then be better positioned to hold those managing directors accountable for their decisions. This kind of arrangement would be more in line with Keynes' original vision of the role of the IMF in the global monetary order.

## AN INCREMENTAL APPROACH TO REFORM

Critics of the global monetary order fall into two camps: radical reformers and incrementalists. Radical reformers envisage *inter alia* the wholesale reimposition of controls on international capital flows, a new Bretton Woods Agreement requiring cooperation among central banks to stabilize exchange rates worldwide, replacement of the dollar as the leading international currency by a transnational unit, and the creation of an international bankruptcy tribunal or court for sovereigns. Incrementalists dismiss these ambitious initiatives as infeasible or undesirable and advocate instead "tinkering around the edges" so as to strengthen the existing order and enhance its operation. Being an incrementalist by nature, I will leave radical reform to others and conclude with a few modest proposals for strengthening the existing order.

First, the volatility of capital flows and the continuing problem of sudden stops is best addressed through policy incentives, applied in the context of the existing framework, to shift the composition of flows from short term to long term and from debt to equity. This means reforms of tax codes at the national level that make the bias toward debt less pronounced (eliminating the tax deductibility of debt service payments for banks and corporates in the United States, for example). It means changes in prudential regulation (further changes in capital and related charges for lenders designed to make short-term debt finance more costly and therefore less attractive compared to equity investment, including FDI). The evidence is overwhelming that short-term debt flows are especially volatile and associated with sudden-stop problems and that these flows are encouraged by tax and regulatory distortions. Once upon a time, these problems could be dismissed as specific to emerging markets. Recent trends and experience suggest that they need to be addressed by emerging markets and advanced countries alike.

A particularly difficult capital-flow-related issue, which has a heavy if not exclusively emerging-market flavor, is that of foreign-currency denominated corporate debt. Strengthening corporate governance requirements is the most straightforward way of discouraging corporations from incurring dangerous levels of foreign-currency debt but is easier said than done (Ananchotikul and Eichengreen 2009). Putting in place a proper insolvency code and efficient judicial procedures would help by strengthening market discipline: if financial reorganization is a viable alternative, then the government will not be forced to use its foreign reserves to bail out insolvent corporates for want of an alternative, and lenders will provide foreign-currency finance less freely. Using supervision and regulation to avoid a "Korea in 1997 scenario" where foreign-currency debt is channeled through domestic banks will further reduce the pressure for the authorities to bail out insolvent corporates and thereby further limit moral hazard for lenders. Finally, developing deeper and more liquid domestic corporate bond markets would provide firms seeking low-cost finance an attractive alternative to risky foreign currency funding (Eichengreen and Luengnaruemitchai 2006). But corporate bond markets are almost always and everywhere slow to develop, displaying as they do formidable information requirements and presupposing effective corporate disclosure, efficient rating-agency infrastructure and predictable legal regimes. More generally, that these were all well-known lessons of the Asian financial crisis, yet that they remain incompletely acted on even today, suggests that implementing these solutions will not be easy.

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Eichengreen, Ito and Wyplosz (2001). A longer paper would also discuss other aspects of IMF reform, and the associated political economy. Fortunately this one has been written as well (Eichengreen and Woods 2016).

Second, while we are likely to continue to observe a variety of different exchange rate regimes and different opinions regarding their efficacy, my reading of the evidence is that intermediate regimes remain disproportionately crisis prone. Countries should be encouraged, it follows, to move toward either freer floats or harder fixes. For the floaters, this requires putting in place the “deeper” prerequisites for the viability of a more flexible exchange rate regime alluded to in Section 3 above. In particular, as my discussant has observed, a floating exchange rate is not a monetary rule; it is the absence of a monetary rule (Calvo 2001). Countries moving to freer floats therefore need to articulate an alternative that does not involve targeting the exchange rate. Formal inflation targeting is an attractive alternative, although there is still only limited movement in this direction, as noted above. A corollary benefit is that inflation targeting also tends to deliver stable, better behaved exchange rates between pairs of inflation-targeting countries (Eichengreen and Taylor 2004). In terms of delivering a “stable system of exchange rates” (to paraphrase the IMF’s 1977 decision on surveillance), I would suggest that this is the best we can do.

But to work smoothly and provide a relatively stable system of exchange rates and other benefits, inflation targeting must be accompanied by an effective communications strategy, as China’s experience since August 2015 reminds us. It also must be implemented in a flexible manner that addresses financial concerns (where these are not adequately addressed by other agencies of government and their instruments), as we have been reminded by the global financial crisis.

Third, steps should be taken at national and global levels to address international liquidity needs. For the foreseeable future, the principal source of international liquidity on the margin will continue to be the liabilities of national governments, and specifically those national governments claims on which are liquid and widely accepted. In practice this means mainly the bonds of the U.S. government, Euro Area governments, and potentially China. For the U.S. to remain a source of safe assets, it will be important to shun proposals for radical tax reform that threaten to blow a hole in the budget, of a sort that regularly arise during the presidential campaign silly season. For the Euro Area to enhance its status as a source of safe assets, European governments that lack investment-grade ratings will have to rebuild their creditworthiness, or else members will have to agree on a scheme whereby they – and specifically members with strong credit – jointly guarantee their collective liabilities (can you say Eurobonds?). Either way, Europe will have to draw a line under its crisis. But both solutions will take time, which is another reason to anticipate that progress on the international liquidity problem will be incremental, rather than discrete. Effective internationalization of the renminbi, in the sense of enhancing the liquidity, access to and acceptance of renminbi-denominated assets internationally, will similarly take time. Recent events suggest that it will take even more time than previously supposed.

SDRs cannot supplement the overall stock of international liquidity in the short run, since conventional SDR allocations are simply claims on the aforementioned stock of government bonds. On the other hand, allocating SDRs directly to the central banks of the countries whose currencies are constituents of the SDR basket, in return for high-powered money, would make a difference for international liquidity provision. Here too there is an argument for proceeding incrementally. Members could agree to authorize the IMF to allocate SDRs to central banks in exchange for national currencies up to a modest ceiling, for temporary periods, under special circumstances, while guaranteeing the participating central banks against balance-sheet losses. This would modestly enhance the IMF’s lending capacity and augment the supply of international liquidity under those special circumstances, where both lending and liquidity were most urgently needed.

Proceeding on even a small scale would set a useful precedent. Establishing that this practice did inflict financial losses on participating central banks or undermine their monetary control might then set the stage for expanding the mechanism in the future.

An alternative or complement would be to permit the IMF to borrow on capital markets to fund its liquidity-provision operations.<sup>71</sup> The bonds of other multilaterals such as the World Bank are included in international liquidity as measured in Figure 8 because these are sold to private investors and have investment-grade status courtesy of the collective backing of members. Again, authorization to borrow on the markets could start modestly and then be ramped up gradually. Either way – either if the IMF guaranteed SDR allocations to central banks or if it issued bonds – there would have to be agreement by the members to recapitalize the institution in the event of losses if it is to stand behind its obligations. Again, the incremental approach suggests overcoming political resistance by experimenting with this mechanism on a modest scale.

Yet another approach to addressing global liquidity needs, at least in theory, is to pool the bonds of super-AAA governments with the sub-investment-grade bonds of other countries to create a “mezzanine tranche” of international liquidity (in effect extracting surplus liquidity from high grade bonds and assigning it to the holders of lower-grade securities). One wonders why, if international liquidity needs are pressing, private markets have not leapt into this breach. One answer is that such private sector securitizations would not be attractive for the same reason that private-sector liabilities are not attractive as a component of international liquidity, namely information sensitivity and counterparty risk (as discussed in Section 6 above). This, then, is an argument for an international financial institution like the IMF to undertake the role, presumably starting on a small scale, by issuing its own asset-backed securities.

If there is no silver bullet that will solve the problem of capital-flow volatility, eliminate the sudden-stop problem, or radically augment the supply of international liquidity, then it becomes even more urgent to fill the holes in the global safety net in order to ensure that the limited supply of international liquidity is made available to individual countries as appropriate. This means sending the message that reserves are there to be used, and that IMF reserve-adequacy calculations are intended to identify the ceiling for reserves, not the floor. To the extent that countries are reluctant to utilize their reserves for fear of sending an adverse signal, it means strengthening IMF surveillance so as to ameliorate the underlying asymmetric-information problem. It means addressing IMF stigma through collective, unilateral prequalification for IMF credit lines and continued procedural reform of the institution. It means expanding the currently limited network of permanent central bank swap agreements. The result will not be perfect. But the perfect should not be allowed to be the enemy of the good.

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<sup>71</sup> The IMF already has a framework in place for issuing bonds (Prasad 2009), but only to governments, not on private markets.

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TABLE 1. EXCHANGE RATE REGRESSIONS, JANUARY 2013 – JANUARY 2016

	Renminbi (RMB)	US Dollar (USD)	Euro (EUR)	Japanese Yen (JPY)	Adj. R	Dominant Reference
<b>Albania</b>	-0.014	0.058	0.956***	0.003	0.953	Euro
<b>Argentina</b>	0.537	0.346	0.162	-0.033	0.217	Renminbi
<b>Bolivia</b>	-0.023*	1.023***	0.002	0	0.995	US Dollar
<b>Bosnia</b>	-0.001	0.002	0.999***	0	1	Euro
<b>Brazil</b>	0.567**	0.125	0.294***	0.03	0.325	Renminbi
<b>Bulgaria</b>	-0.008	0.019	0.995***	-0.008*	0.991	Euro
<b>Chile</b>	0.392***	0.410***	0.207***	-0.014	0.625	US Dollar
<b>Colombia</b>	0.758***	0.061	0.157**	-0.113*	0.419	Renminbi
<b>Croatia</b>	0.033	-0.038	1.010***	0.002	0.966	Euro
<b>Czech Republic</b>	-0.065	0.026	1.012***	0.003	0.845	Euro
<b>Egypt</b>	0.025	0.956***	-0.01	0.001	0.943	US Dollar
<b>Hong Kong</b>	0.023**	0.976***	0.003**	-0.001	0.999	US Dollar
<b>Hungary</b>	0.091	-0.067	1.012***	-0.015	0.675	Euro
<b>India</b>	0.468***	0.482***	0.062*	-0.036	0.696	US Dollar
<b>Indonesia</b>	0.650***	0.343**	0.005	-0.035	0.732	Renminbi
<b>Israel</b>	0.223***	0.374***	0.418***	0.005	0.744	Euro
<b>Jamaica</b>	0.078**	0.906***	0.01	0.006	0.901	US Dollar
<b>Jordan</b>	0.019	0.992***	-0.004	-0.012**	0.988	US Dollar
<b>Latvia</b>	-0.036	0.05	0.990***	0	0.982	Euro
<b>Lebanon</b>	0.021	0.976***	-0.001	-0.002	0.986	US Dollar
<b>Malaysia</b>	0.953***	-0.06	0.070*	-0.018	0.658	Renminbi
<b>Mexico</b>	0.643***	0.117	0.284***	-0.039	0.574	Renminbi
<b>Pakistan</b>	0.02	1.006***	-0.009	-0.029	0.92	US Dollar
<b>Paraguay</b>	0.022	0.956***	0.03	-0.002	0.759	US Dollar
<b>Peru</b>	0.312***	0.637***	0.057***	0.01	0.886	US Dollar
<b>Philippines</b>	0.403***	0.571***	0.018	0.001	0.877	US Dollar
<b>Poland</b>	0.082	-0.051	1.013***	0.001	0.755	Euro
<b>Romania</b>	0.100*	-0.077	1.035***	-0.032	0.879	Euro
<b>Russia</b>	0.956***	0.066	-0.023	-0.133	0.19	Renminbi
<b>Singapore</b>	0.494***	0.121	0.205***	0.135***	0.845	Renminbi
<b>South Africa</b>	0.651***	-0.151	0.390***	0.099	0.38	Renminbi
<b>South Korea</b>	0.906***	-0.06	0.076**	0.060*	0.698	Renminbi
<b>Sri Lanka</b>	0.037	0.974***	-0.005	-0.02	0.964	Renminbi
<b>Taiwan</b>	0.530***	0.448***	-0.005	0.002	0.923	Renminbi
<b>Thailand</b>	0.14	0.157	0.171	0.008	0.137	Euro
<b>Tunisia</b>	-0.012	0.318***	0.660***	0.029**	0.906	Euro
<b>Turkey</b>	0.048	0.388	0.301**	-0.033	0.266	US Dollar
<b>Ukraine</b>	0.328	0.425	0.263	-0.037	0.066	US Dollar
<b>Uruguay</b>	-0.152	1.153***	0.062	-0.052	0.679	US Dollar

Global monetary order

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Vietnam	-0.059	0.960***	-0.006	-0.007	0.98	US Dollar
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\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Source: See text.

## Global monetary order

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TABLE 2. CAPITAL FLOWS: SUMMARY STATISTICS

	All Economies			Advanced Economies			Emerging Economies			Developing Economies			
	Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.	
<b>Net Capital Flows (CIF - COD)</b>													
All Sample	1.54	5.30	1.09	0.23	3.19	0.61	1.36	5.34	1.40	2.86	6.70	1.05	
1970s	1.88	2.92	0.57	1.21	1.61	0.62	3.19	3.32	0.47	3.40	5.78	0.72	
1980s	1.55	3.91	1.01	1.12	1.70	0.60	1.47	4.13	0.97	2.85	5.40	1.68	
1990s	1.23	3.70	0.75	0.49	1.84	0.55	1.43	3.97	0.93	0.06	5.41	0.53	
2000s	0.75	3.85	0.41	-1.09	3.10	-0.33	0.74	3.55	0.44	3.36	5.77	0.64	
2010s	1.27	2.35	0.23	-0.46	2.72	0.02	1.18	2.15	0.22	5.75	2.98	0.32	
<b>Total Gross Capital Flows (CIF + COD)</b>													
All Sample	11.60		10.61	1.00	16.39	15.38	0.96	8.74	8.82	1.04	12.27	11.11	0.94
1970s		7.65	3.45	0.41	6.51	2.28	0.32	7.86	3.52	0.41	11.26	4.29	0.79
1980s		5.77	5.33	0.60	8.83	4.17	0.49	3.67	4.67	0.67	6.32	7.67	0.70
1990s		8.65	6.53	0.68	15.21	9.18	0.67	7.25	5.64	0.69	10.36	6.53	0.61
2000s	15.48		9.95	0.74	33.22	16.25	0.59	12.84	8.55	0.76	14.48	10.32	0.74
2010s	11.40		6.25	0.51	11.83	11.86	0.62	10.69	5.30	0.50	12.30	5.75	0.49
<b>Capital Inflows by Foreign Agents (CIF)</b>													
All Sample	6.34		6.34	1.00	8.15	8.42	0.99	4.52	5.63	1.10	7.34	7.52	0.91
1970s	5.06		2.48	0.43	4.13	1.89	0.44	5.20	2.47	0.41	6.30	3.22	0.81
1980s	3.86		3.43	0.63	5.26	2.85	0.53	2.68	3.37	0.67	5.35	5.71	0.99
1990s	4.99		4.44	0.67	7.41	5.00	0.64	4.25	4.25	0.73	5.04	4.47	0.62
2000s	7.41		5.71	0.74	16.12	8.16	0.67	5.13	4.69	0.76	7.81	5.94	0.74
2010s	5.94		3.10	0.45	6.05	6.37	0.83	4.69	2.71	0.43	8.78	3.10	0.43
<b>Capital Outflows by Domestic Agents (COD)</b>													
All Sample	4.48		5.67	1.18	8.41	7.69	1.00	3.92	4.27	1.27	4.30	5.78	1.44
1970s	2.62		2.13	0.77	2.56	1.55	0.68	2.52	2.19	0.79	3.60	3.29	0.71
1980s	1.57		2.59	1.09	3.79	2.38	0.64	1.00	2.35	1.27	1.14	4.10	1.24
1990s	3.82		3.47	0.95	7.42	4.54	0.65	2.92	2.84	1.09	3.88	3.58	0.95
2000s	7.52		5.36	0.82	17.30	7.46	0.55	5.51	4.22	0.77	4.96	5.73	1.14
2010s	4.32		3.53	0.58	6.01	5.97	0.53	4.48	3.34	0.55	3.79	3.41	0.87
No. of Countries	103		22		57						24		

Note: This table shows the summary statistics of capital flows by both foreign and domestic agents (CIF and COD), net capital inflows (CIF - COD), and total gross capital flows (CIF + COD). Capital flows are scaled by trend GDP. The median value of country averages and of country standard deviations of capital flows are reported. The figure reports the results for all of the countries in the sample, as well as separately for high-income, upper-middle-income, and lower-middle-income countries. The sample period is from 1970 to 2014.

Source: see text.

## Global monetary order

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**TABLE 3. NET CAPITAL INFLOWS BY CATEGORY: SUMMARY STATISTICS**

		All Economies			Advanced Economies			Emerging Economies			Developing Economies		
		Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.	Median Average	Median Std. Dev.	Median Coeff. Var.
<b>Private Capital Flows</b>													
All Sample		0.19	4.34	1.54	0.33	4.34	3.81	0.17	4.20	1.37	-0.70	4.86	-0.93
1970-1990		-0.01	3.02	-0.38	0.90	1.38	1.61	(0.15)	3.31	-1.14	-1.66	5.87	-1.54
1991-2014		0.15	4.01	0.80	0.12	5.24	1.98	0.30	3.31	1.60	-0.52	3.99	-1.18
<b>Government Capital Flows</b>													
All Sample		-0.41		4.18	-2.22	-0.17	3.55	-1.86	(0.91)	4.17	-2.35	0.07	5.16 1.77
1970-1990		0.18		3.44	0.77	-0.33	1.59	-2.02	0.43	3.75	0.84	1.65	6.17 0.77
1991-2014		-0.92		3.96	-1.83	-0.27	4.36	-2.28	(1.53)	3.66	-1.61	-0.53	4.56 -3.55
<b>FDI</b>													
All Sample		1.78		2.26	0.88	-0.47	1.71	-2.00	1.98	1.88 0.93	3.49	3.34	0.96
1970-1990		0.57		0.72	0.74	0.00	0.64	-0.09	0.58	0.69 0.69	1.03	1.29	1.33
1991-2014		2.01		2.29	0.73	-0.80	2.05	-1.79	2.13	2.00 0.80	4.48	3.34	0.74
<b>Portfolio Equity</b>													
All Sample		-0.00		0.89	-0.49	-0.31	1.55	-2.63	(0.00)	0.68	0.22	0.00	0.55 1.66
1970-1990		0.01		0.22	0.92	0.06	0.31	0.98	0.00	0.09	1.07	-0.00	0.19 -1.89
1991-2014		-0.00		0.94	-0.92	-0.45	2.02	-1.91	(0.00)	0.73	-0.48	0.01	0.63 1.33
<b>Portfolio Debt</b>													
All Sample		0.22		1.77	1.71	0.59	3.53	1.67	0.23	1.68	1.76	-0.02	1.09 0.24
1970-1990		0.15		0.74	0.93	0.49	1.05	0.95	0.06	0.55	0.77	0.04	0.22 0.18
1991-2014		0.17		1.84	1.52	0.69	4.21	1.21	0.20	1.73	1.56	-0.02	1.17 0.59
No. of Countries		103		22		57		24					

Note: This table shows the summary statistics of net capital inflows by categories. Capital flows are scaled by trend GDP calculated using the Hodrick-Prescott filter. The median value of country averages and of country standard deviations of capital flows are reported. The figure reports the results for all of the countries in the sample, as well as separately for high-income, upper-middle-income, and lower-middle-income countries. The sample period is from 1970 to 2014. Private capital flows calculated as all other income, less other income related to general government and monetary authorities, less changes in reserves. Government capital flows calculated as other income related to general government and monetary authorities, less changes in reserves. Data on capital flows are taken primarily from the IMF's Balance of Payments Statistics; data on GDP are from the World Bank's World Development Indicators and IMF's World Economic Outlook Data Base.

Source: see text.

TABLE 4. CRISIS FREQUENCY 1980-2015 (IN PERCENT)

	<b>Banking</b>	<b>Currency</b>	<b>Sovereign</b>	<b>Growth</b>
<b>51 Emerging Markets</b>				
Hard pegs	3.10	0.78	1.55	6.98
Intermediate	4.10	6.03	2.24	3.79
Peg to single currency	2.98	7.28	3.31	5.30
Basket peg	5.15	3.09	1.03	7.22
Horizontal band	7.04	7.04	2.82	2.82
Crawling peg/band	6.89	7.49	2.69	3.59
Managed float	2.24	4.69	1.43	2.45
Independent float	1.12	5.59	0.56	3.91
<b>181 IMF Members</b>				
Hard pegs	2.57	1.21	1.37	5.15
Intermediate	2.32	4.90	1.26	3.33
Peg to single currency	1.08	4.98	1.08	4.26
Basket peg	2.21	4.43	1.85	4.61
Horizontal band	2.76	2.76	1.03	1.03
Crawling peg/band	5.64	6.55	1.52	3.20
Managed float	1.85	4.64	1.10	2.28
Independent float	2.12	3.92	0.33	3.43

Source: See text.

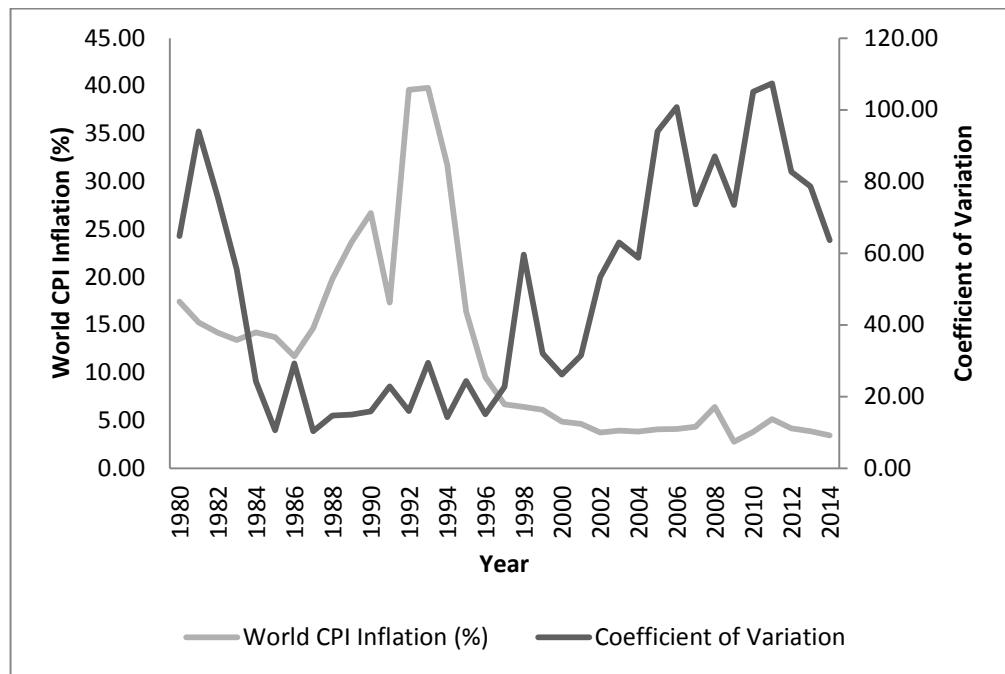
TABLE 5. SUDDEN STOPS, 1990-2002 VS. 2003-2015

	1991-2002	2003-2015
<b>Number of sudden stops</b>	16	30
<b>As percent of available observations (stops/total observations)</b>	1.8 % (16/903)	2.1 % (30/1354)
<b>Quarters for which the sudden stops last</b>	4.0	3.6
<b>Capital flows during sudden stops (% of GDP), first quarter</b>	-1.6	-1.3
<b>Capital flows during sudden stops (% of GDP), average for first four quarters</b>	-1.8	-1.7
<b>Capital flows in the four quarters preceding sudden stops (% of GDP)</b>	1.3	2.0*
<b>Capital flow turnaround: Avg. capital flows during four quarters of sudden stops - Avg. capital flows in the four preceding quarters</b>	-3.1	-3.5*
<b>Capital flow turnaround: Avg. capital flows during all quarters of sudden stops - Avg. capital flows in the four preceding quarters</b>	-2.3	3.2**
<b>Decline in GDP during sudden stop: 4 quarters year on year</b>	3.8	2.3

\* , \*\*, and \*\*\* indicate that the value is significantly different than that in the preceding column at the 10, 5 or 1 percent level.

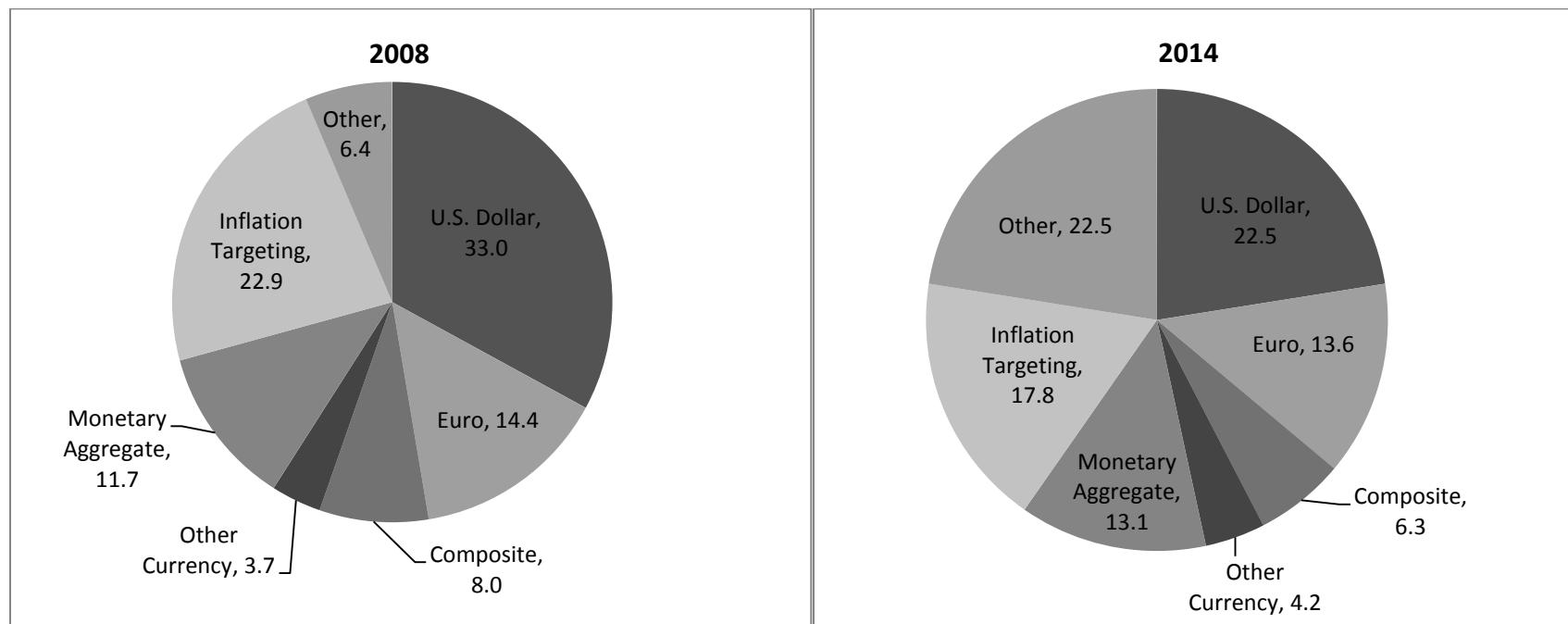
Source: Derived from Eichengreen and Gupta (2016).

FIGURE 1. WORLD INFLATION, ANNUAL AVERAGE AND COEFFICIENT OF VARIATION



Source: IMF WEO Database.

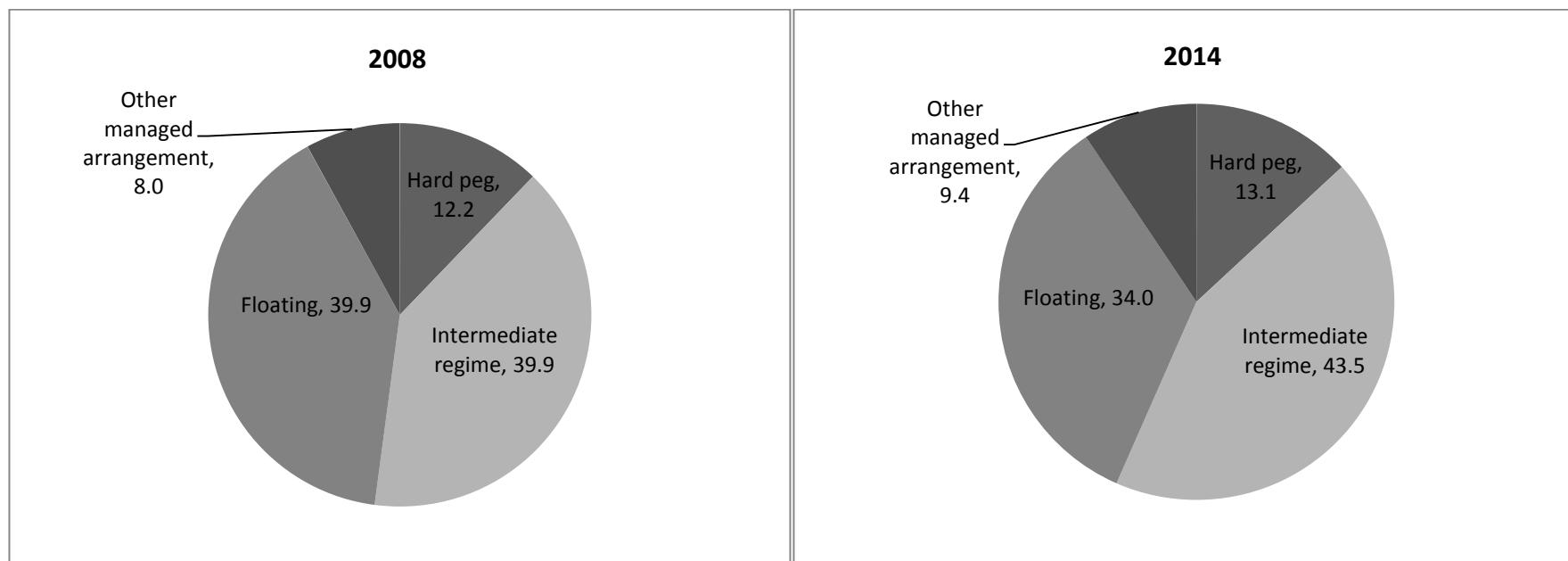
FIGURE 2. MONETARY POLICY FRAMEWORKS AND EXCHANGE RATE ANCHORS, 2008-2014 (PERCENT OF IMF MEMBERS AS OF APRIL 30)



Note: Figures cover 188 member countries and 3 territories: Aruba and Curaçao and Saint Maarten (all in the Kingdom of the Netherlands) and Hong Kong SAR (China). “Other” includes countries that have no explicitly stated nominal anchor but instead monitor various indicators in conducting monetary policy. Also used in a few cases when no relevant information on the country is available.

Source: IMF AREAER database.

FIGURE 3. EXCHANGE RATE ARRANGEMENTS, 2008–14 (PERCENT OF IMF MEMBERS AS OF APRIL 30)



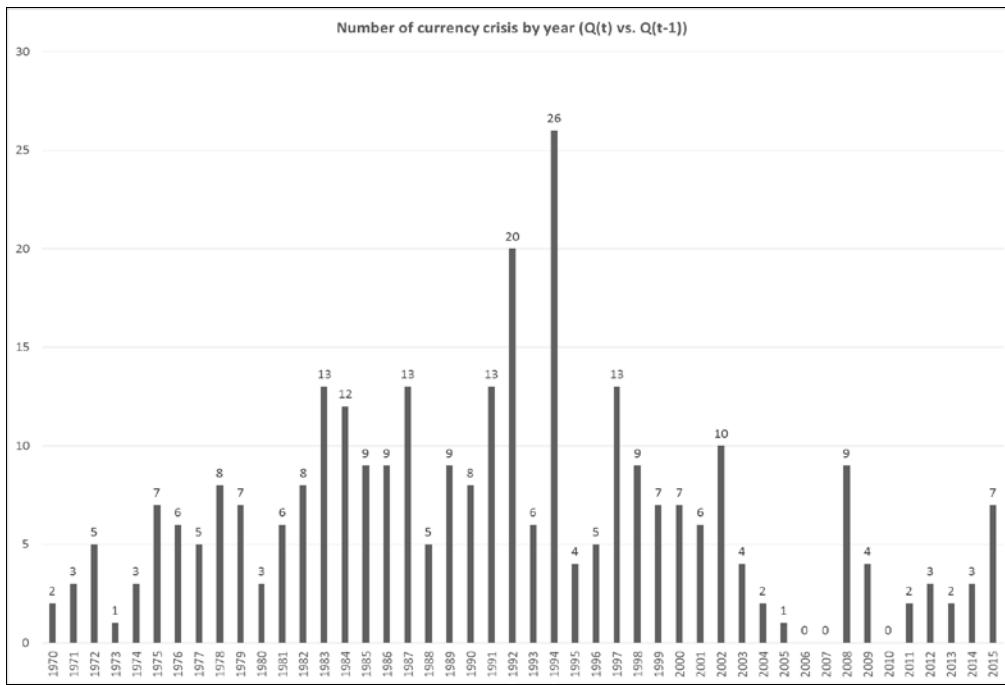
Note: Figures cover 188 member countries and 3 territories: Aruba and Curaçao and Saint Maarten (all in the Kingdom of the Netherlands) and HongKong SAR (China). 2008 data as retroactively classified February 2, 2009; does not include Kosovo, Tuvalu, and South Sudan, which became IMF members on June 29, 2009, June 24, 2010, and April 18, 2012, respectively.

Source: AREAER database

## Global monetary order

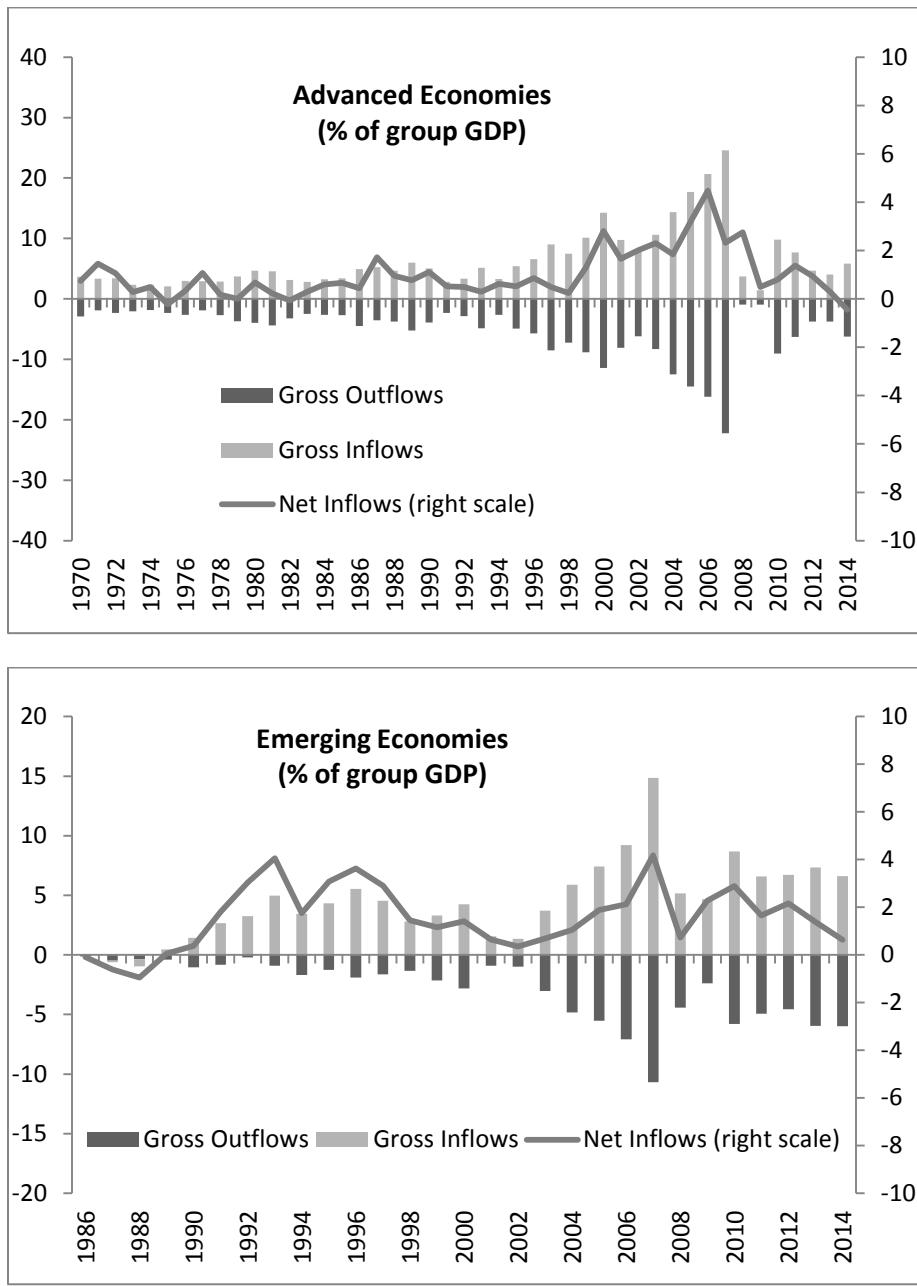
Eichengreen

FIGURE 4. NUMBER OF CURRENCY CRISES BY YEAR



Source: See text.

FIGURE 5. THE EVOLUTION OF TOTAL GROSS AND NET CAPITAL FLOWS: ADVANCED AND EMERGING ECONOMIES

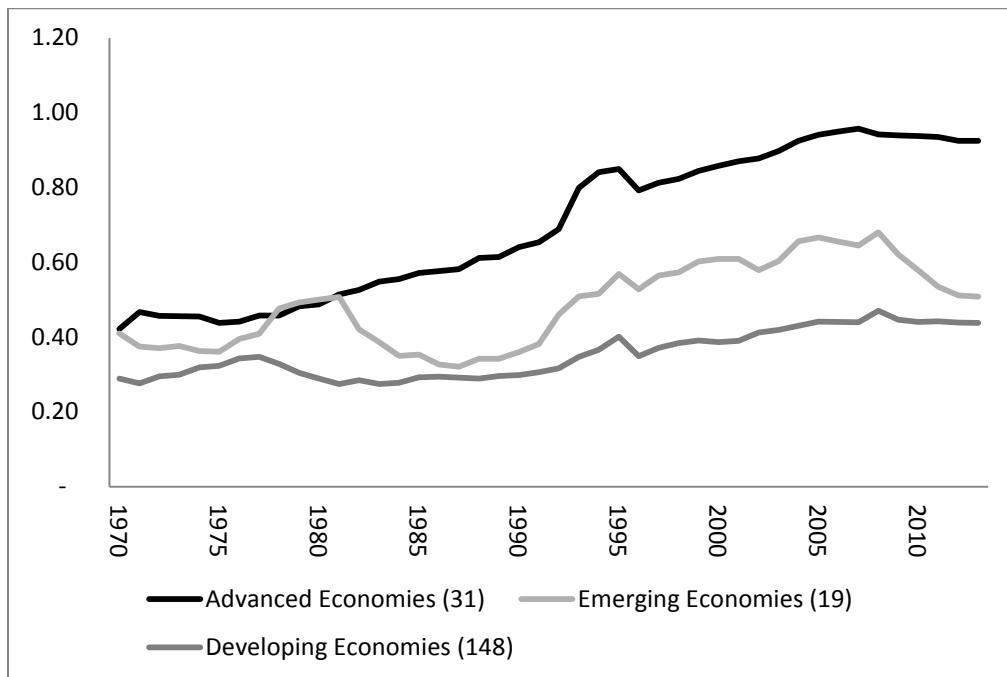


Source: IMF Balance of Payments Statistics

Global monetary order

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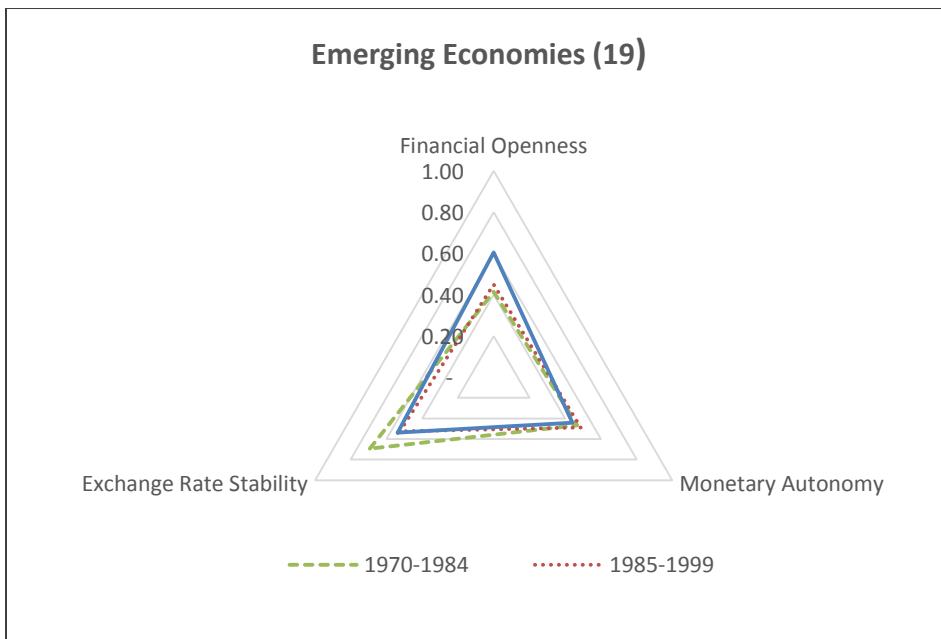
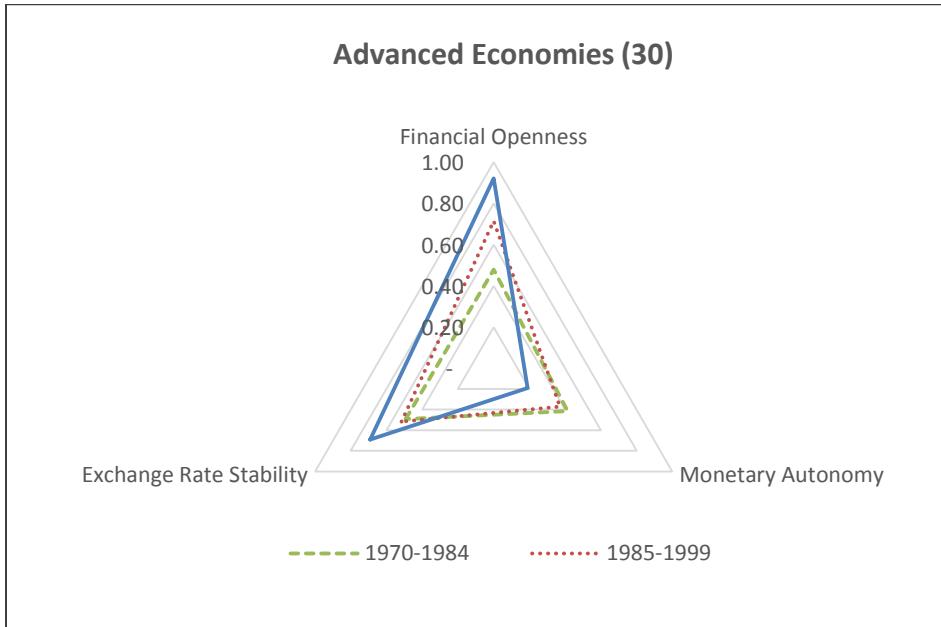
FIGURE 6. FINANCIAL OPENNESS INDEX SINCE 1970



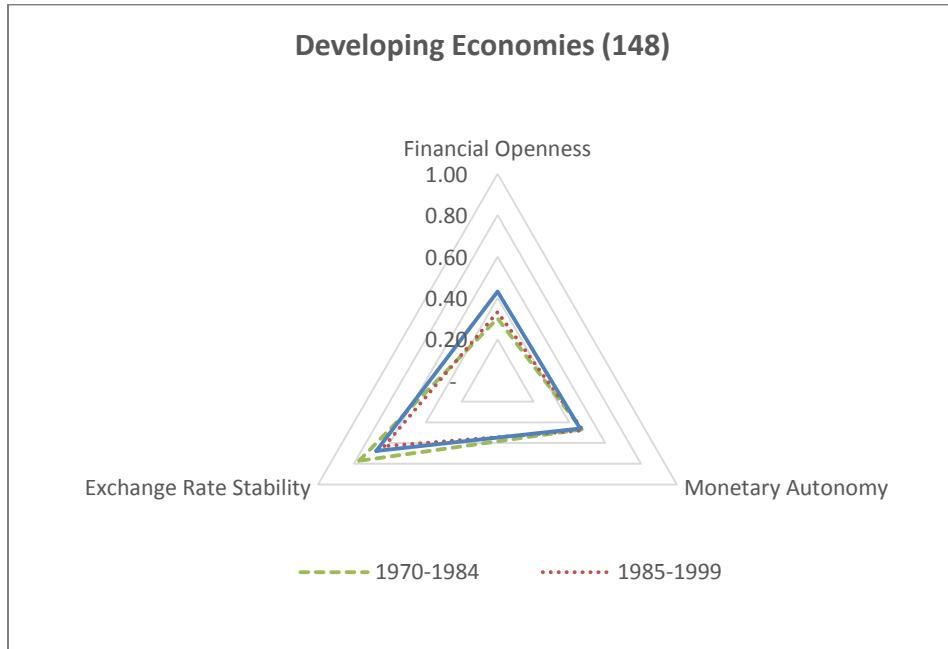
Note: Advanced economies based on IMF's categorization, excluding Hong Kong, Republic of Korea, Singapore, and Taiwan. Emerging economies based on emerging or frontier country classification during the period of 1980-1997 by the International Financial Corporation plus Hong Kong and Singapore.

Source: Chinn-Ito Data Base

FIGURE 7. TRILEMMA: ADVANCED, EMERGING, AND DEVELOPING ECONOMIES



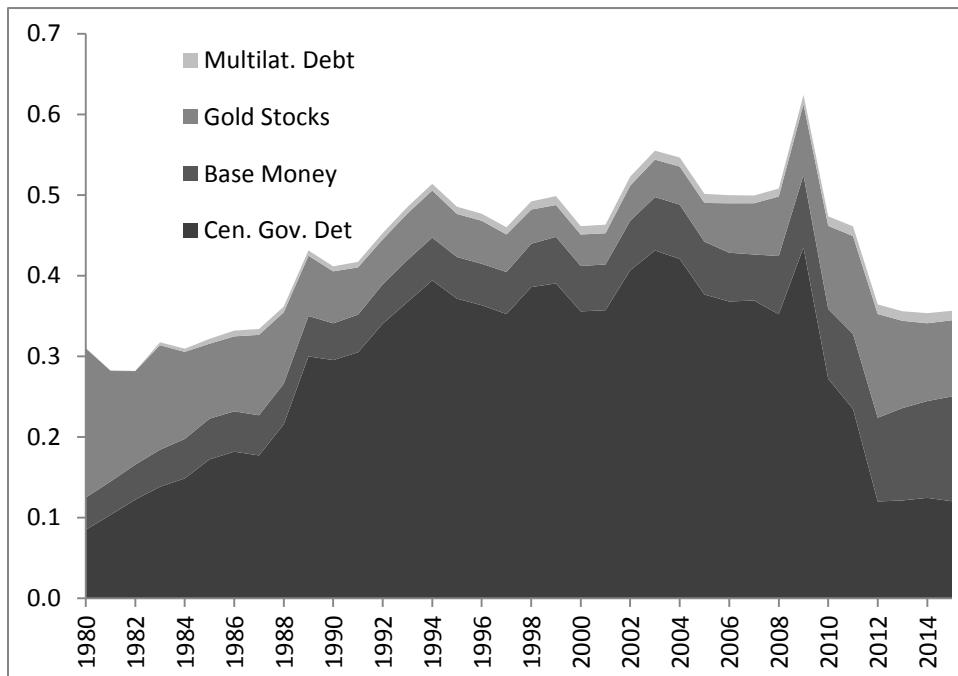
(CONTINUED) FIGURE 7. TRILEMMA: ADVANCED, EMERGING, AND DEVELOPING ECONOMIES



Note: Data set does not include the United States. Advanced economies based on IMF's categorization, excluding Hong Kong, Republic of Korea, Singapore, and Taiwan. Emerging economies based on emerging or frontier country classification during the period 1980-1997 by the International Financial Corporation, plus Hong Kong and Singapore. Developing economies are other countries excluding the above.

Source: Based on Aizenman, Chinn and Ito (2008) as updated. For details on figure construction, see text.

FIGURE 8. INTERNATIONAL LIQUIDITY AS A SHARE OF GLOBAL GDP, 1980-2015



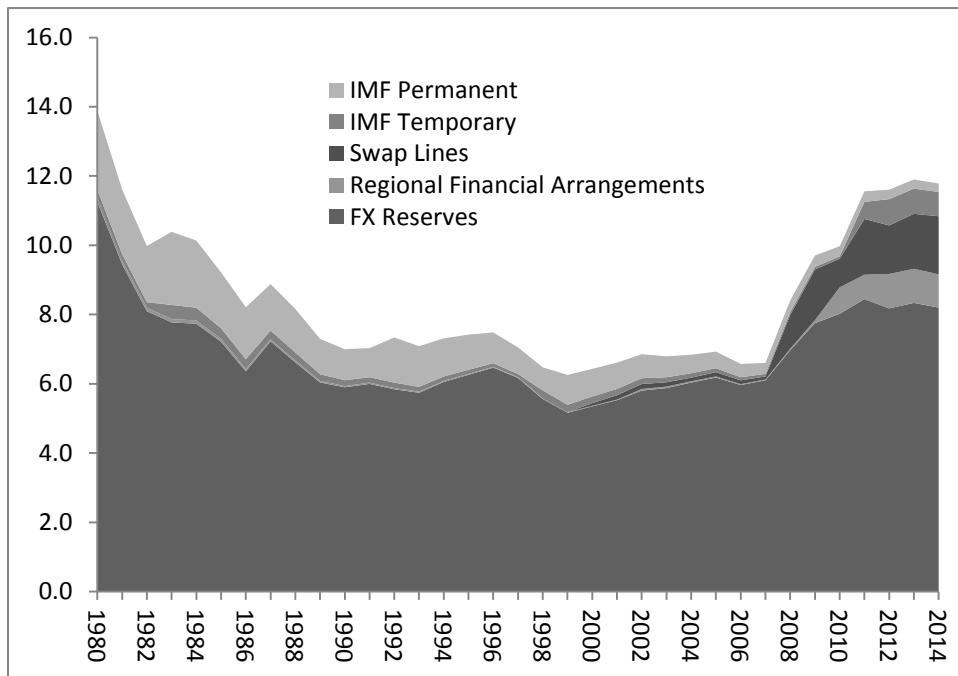
Note: Sum of global gold stocks (private holdings, central bank holdings, government holdings, and IMF holdings), AAA and AA central government securities of OECD countries, debt securities of supranational organizations, and high-powered money supplies of OECD countries. Note that data series are stacked in same order as legends for ease of reference.

Source: See text.

Global monetary order

Eichengreen

FIGURE 9. GLOBAL FINANCIAL SAFETY NET AS PERCENTAGE OF EXTERNAL LIABILITIES, 1980–2014



Note: Ratification of the IMF's 14th General Review of Quotas will see IMF permanent resources double and temporary resources fall by a similar amount. Note that series are stacked in same order as legends for ease of reference.

Sources: IMF *International Financial Statistics*, IMF *World Economic Outlook*, RFAs, updated and extended version of data set constructed by Lane and Milesi-Ferretti (2007).