SM/10/86

April 13, 2010

To: Members of the Executive Board

From: The Secretary

Subject: **Reserve Accumulation and International Monetary Stability**

The attached paper on reserve accumulation and international monetary stability will be discussed in a Board seminar that is tentatively scheduled for **Friday, May 7, 2010**. Issues for discussion appear on pages 28−29.

The staff proposes the publication of this paper after the Executive Board seminar, together with a PIN summarizing the discussion.

Questions may be referred to Ms. Mateos y Lago (ext. 37219), Mr. Goyal (ext. 36875), and Ms. Duttagupta (ext. 38583) in SPR.

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INTERNATIONAL MONETARY FUND

Reserve Accumulation and International Monetary Stability

Prepared by the Strategy, Policy and Review Department

In collaboration with the Finance, Legal, Monetary and Capital Markets, Research and Statistics Departments, and consultation with the Area Departments

Approved by Reza Moghadam

April 13, 2010

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I. INTRODUCTION[1]

1. ***The issue***. The last comprehensive discussion of reform of the international monetary system (IMS)—the set of official arrangements that regulate key dimensions of balance of payments—international reserves, exchange rates, current payments, and capital flows—was held nearly four decades ago. In light of repeated and costly international financial crises since then, it is timely to review the structure of the IMS to assess how it can be strengthened and made more resilient. At issue is the confluence of, on one side, an unprecedented build-up in global current account imbalances and volatile cross border capital flows, accompanied by a sharp build-up of international reserves, and on the other side, the concentration of those reserves in a few reserve currencies facing new challenges in maintaining fiscal and financial stability. As pre-crisis trends appear set to resume, this tension calls for examining their broader implications for the stability and efficiency of the current system. While the paper views the problems of the IMS through this prism in the tension between high reserve demand and narrow reserve supply, it also inevitably touches on all the components of the IMS—exchange rate arrangements, capital flows, and the global adjustment process. It should also be seen in the broader context of the Fund's recent work on IMS stability, which started with a paper focused on exchange rate arrangements last summer (IMF, 2009a) and will continue in coming months with another on capital flows.

2. ***The perspective***. Problems are not inevitable consequences of the system. The current IMS has proven resilient, and may yet continue to be so. However, the system could face substantial challenges. After all, previous systems too looked resilient until they fell apart because they no longer conformed to the domestic policy objectives of key members (see Supplement 1, section I). In particular, the trends in reserve accumulation are symptomatic of imperfections that merit deeper investigation and may need to be addressed over time by policy measures if the system is to support balanced and sustained growth. The externalities and other market failures associated with the current IMS can only be overcome by policy collaboration aimed at attenuating the demand for and promoting the supply of reserve assets. The paper puts forward ideas to address these issues.

3. ***Scope for change***. Since the mid-1970s, when key pillars of the pre-existing order broke down, the IMS has left much to national discretion, and dialing back on this point is probably not realistic. That said, this paper suggests that much could be achieved by way of

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[1] This paper was prepared by a team comprising R. Duttagupta, R. Goyal, P. Khandelwal, I. Mateos y Lago, A. Piris, and N. Raman (all SPR). Substantive contributions were provided by: M. Chamon, C. Crowe, A. Ghosh, J. Ostry, and R. Ranciere (all RES); S. Arslanalp, U. Das, K. Habermeier, E. Kazarian, A. Kokenyne, M. Papaioannou, J. Park, and J. Pihlman (all MCM); C. Beaumont, H. Hatanpaa, T. Krueger, and M. Rossi (all FIN); and R. Leckow, N. Rendak, G. Rosenberg, and R. Weeks-Brown (all LEG). A. Galicia-Escotto, R. Heath, R. Kozlow, and J. Joisce (all STA) also contributed. Inputs from R. Cooper and comments from B. Eichengreen, D. Rodrik, and K. Rogoff are gratefully acknowledged. They bear no responsibility for any flaws in the paper.

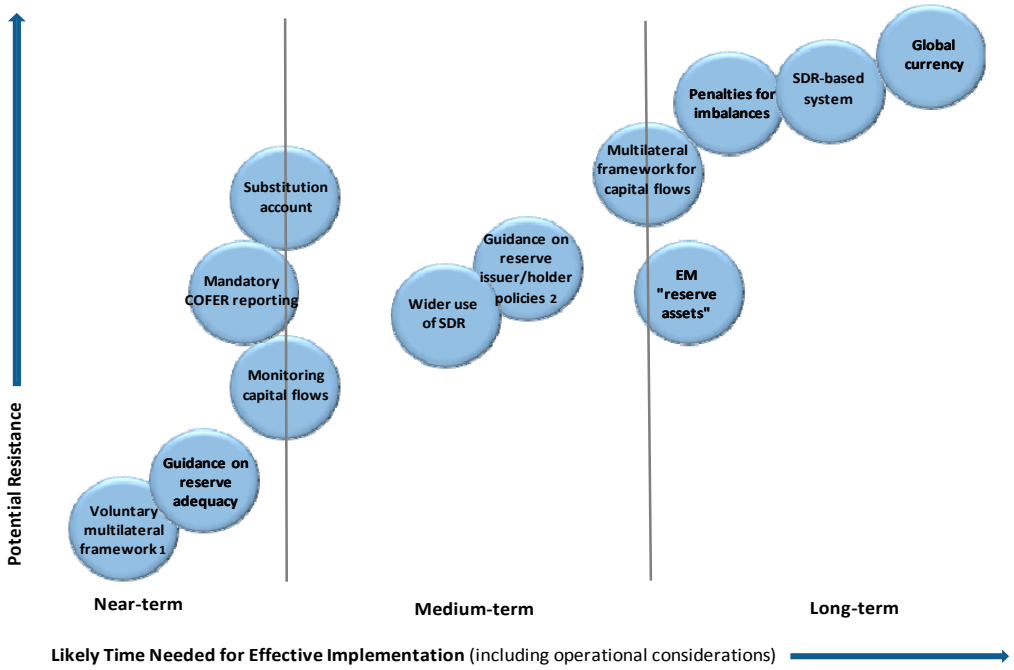
voluntary collaboration. In particular, members do, under the Articles of Agreement, have an obligation to collaborate with the Fund and with each other on their international reserves policies, with the objectives of promoting better surveillance of international liquidity and making the special drawing right (SDR) the principal reserve asset in the IMS (Articles VIII, section 7, and XXII).[2] While the latter objective is one for the long term, it is worth exploring what concrete steps could be taken over the years ahead to improve the functioning of the IMS, bearing in mind their benefits and costs.

4. ***Objective***. The reform ideas presented in this paper are not policy proposals but bring together for discussion relevant strands of thought by academics, informed observers and policy makers, against the background of an analysis of the functioning of the IMS. The purpose of this paper is to gauge members' perceptions of the seriousness of imperfections in the current system and of the costs and benefits of various solutions, and hence the scope for action. It is understood that some of the ideas discussed are unlikely to materialize in the foreseeable future absent a dramatic shift in appetite for international cooperation. Further, while the focus is on IMS-level measures rather than country-specific policies, it is clear that improving the system would be of little use if members with economies large enough to impact its functioning do not themselves pursue policies conducive to stability.

5. ***Outline.*** Section II explores the reasons for the recent rapid reserve accumulation and discusses the implications of this phenomenon for international monetary stability. Sections III and IV consider possible remedies, aiming respectively to attenuate the demand for international reserves—e.g., beyond efforts to provide alternatives to self-insurance, by collaborating on reserve adequacy, better monitoring and managing capital flows, and understandings between surplus and reserve issuing countries towards reducing foreign exchange intervention and guaranteeing the reserve asset's store of value properties─and to diversify their supply, including with recourse to globally issued reserve assets (such as SDRs). Figure 1 previews the range of ideas discussed. Section V offers some conclusions, seeks guidance from Directors, and maps a possible way forward.

[2] As noted in previous Board papers on the Fund's mandate (see IMF, 2010b), a number of important questions would need to be resolved before this provision could be used to promote collaboration among Fund members in this area, and not all the ideas floated in this paper could be implemented on its basis. It is beyond the scope of this paper to determine to what extent the ideas mooted in this paper could be implemented under the present international legal framework either within or outside the Fund.

Figure 1. Ideas to Mitigate Demand and Diversify Supply of Reserves for IMS Stability



[1] Members voluntarily commit to policy adjustments for IMS stability, including through quid pro quo agreements if needed.
[2] E.g., Fund supported reserve diversification standards for reserve holders; guidance to reserve issuers to limit currency volatility and broaden use of alternative instruments.

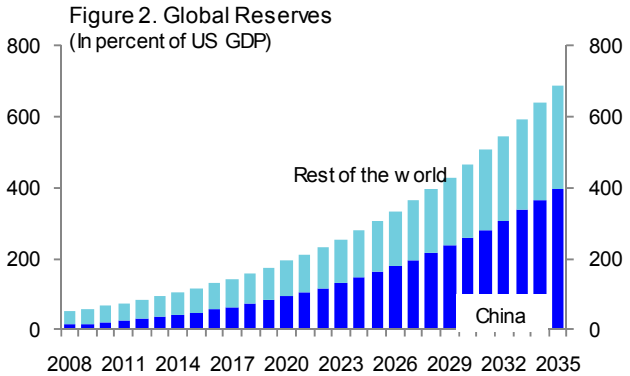
II. Reserve Accumulation: Causes and Effects

6. ***Rapid reserves growth***. In recent years, international reserve accumulation has accelerated rapidly, reaching 13 percent of global GDP in 2009—a threefold increase over ten years. It also remained concentrated in U.S. dollars. For most emerging markets, reserve coverage has risen to high levels relative to traditional norms (Box II.1), reaching almost 10 months of imports and 475 percent of short-term external debt in 2008.[3] Recent data suggests the pace of reserve accumulation is recovering after the hiatus of the crisis, in part reflecting the recovery of GDP, trade and financial flows. But this pace might accelerate as trade and financial openness increase further and if some countries draw from the crisis the lesson that they need even more reserves. Indeed, there is some evidence that higher reserves

[3] This paper does not consider whether these reserve levels are appropriate or not for individual countries, but rather the aggregate effects of reserves growth. SPN/09/08 discussed the potential need for EMs to hold higher reserves than traditional metrics suggested considering the impacts of financial crises in advanced economies.

helped reduce the impact of the crisis on growth in emerging markets, albeit with declining benefits as reserve coverage increases.[4]

7. ***Prospects***. Absent changes in reserve policies, extrapolations suggest demand for reserves would reach levels insupportable by reserve issuers in the medium-to-long term (Box II.1, Figure 2). While some changes in policies can be foreseen (e.g. increasing use of sovereign wealth funds less invested in traditional reserve assets), and this extrapolation does not attempt to account for valuation or exchange rate policy changes that will occur in some form, only over a longer-term horizon would this picture be expected to change, as emerging markets continue establishing strong policy track records and develop deeper and more stable sources of financing.



Sources: IFS, WEO, UN "World Population Prospects: the 2008 Revision", staff calculations.

A. Symptom of Imperfections in the System

8. ***Systemic imperfections***. Potential vulnerabilities and market failures in the international monetary and financial system have been important drivers of reserve accumulation, beyond the traditional motives for holding reserves (such as smoothing out the impact on consumption of shocks or ensuring inter-generational equity—e.g., for oil producers). These imperfections include uncertainty about the availability of international liquidity in a financial crisis; large and volatile capital flows; absence of automatic adjustment of global imbalances; and absence of good substitutes to the U.S. dollar as a reserve asset, which also reflects the fact that currency tends to be a natural monopoly. These issues are elaborated below.

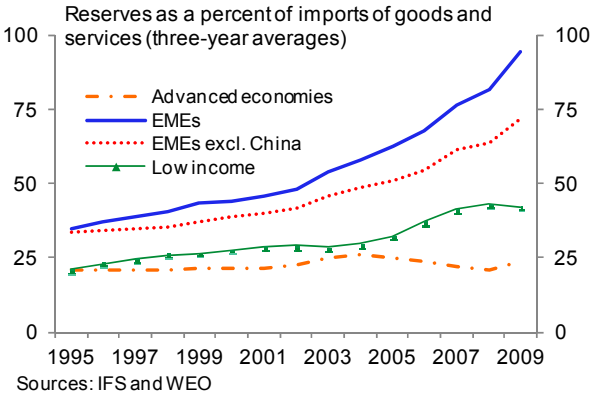
Precautionary savings

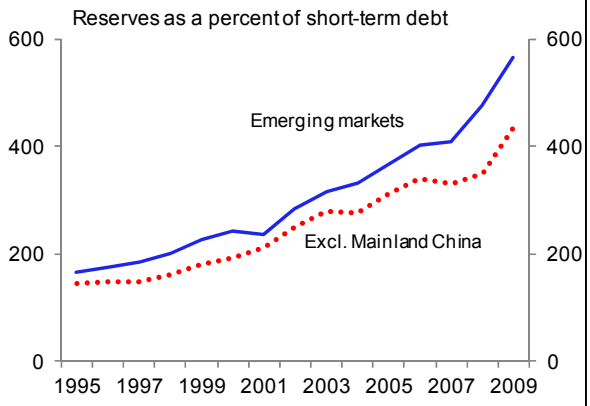
9. ***Volatile capital flows***. A feature of globalization has been huge growth in private international financial flows. The volume of global net private capital flows going to emerging markets increased sharply—from $90 billion in 2002 to $600 billion in 2007. This growth, which has generally been seen as welfare enhancing, is expected to continue. However, many emerging markets have very small financial intermediation capacity compared to the large inflows they can attract. Moreover, emerging markets have been

[4] See IMF (2010d).

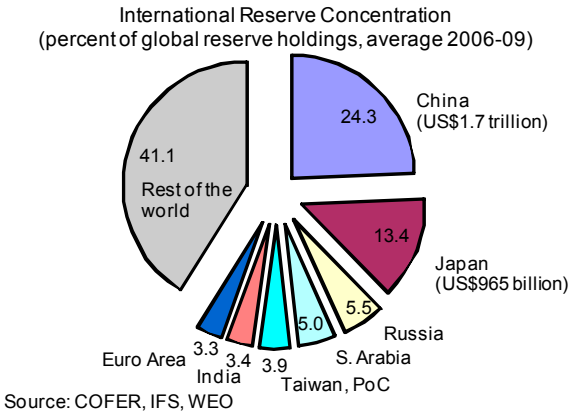
Box II.1. Reserve Accumulation from 2000-2010 and Beyond

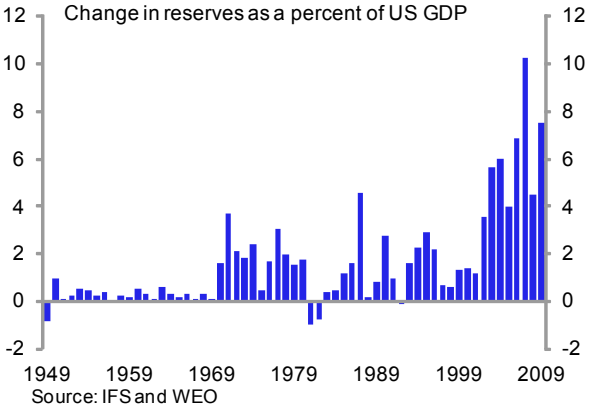
Reserve accumulation has accelerated dramatically in the past decade, particularly since the 2003-4. At the end of 2009, reserves had risen to 13 percent of global GDP, doubling from their 2000 level, and over 50 percent of total imports of goods and services. Emerging market holdings rose to 32 percent of their GDP (26 percent excluding China). Twenty-seven of the top 40 reserve holders, accounting for over 90 percent of total reserve holdings, recorded double-digit average growth in reserves over 1999-2008. Holdings have also become increasingly concentrated, with over half the total held by only five countries. These numbers exclude substantial foreign assets of the official sector not recorded as reserves, including in sovereign wealth funds (SWFs), and yet invested in liquid, dollar denominated financial instruments, that have grown even more in recent years.[1]





A key feature of official reserves is their concentration in U.S. dollars, which has varied between 60 and 75 percent over long periods, and may be higher considering that the composition of over a third of reserve holdings is not reported. Total reserve accumulation exceeded 10 percent of U.S. GDP in 2007: even assuming only two-thirds of this was in dollar assets, such levels are unprecedented, at least since World War II.



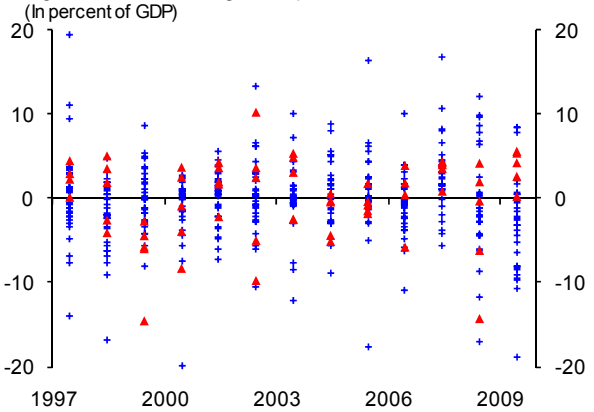


On present trends, global reserves would become extremely large over the long-term relative to existing supply. Assuming that reserve accumulation declines as emerging markets "mature" (so that global reserves growth falls steadily to 8.5 percent per year by 2035, from an average of 15.4 percent in 1999-2008), as a proportion of U.S. GDP, reserves are still rising at the end of the period (indeed, accelerating), reaching 690 percent. Reserves growth of oil exporters is assumed to converge within five years, on the assumption that oil prices and their savings-investment balances have reached equilibrium by then. Of course, emerging markets may adjust their reserves policies more quickly than implied in this extrapolation, and other mitigating factors could include a fall in the proportion of reserve assets held in dollars, an increased role for SWFs investing a much smaller proportion of their assets in Treasury paper, and a wider variety of alternatives to Treasury paper becoming attractive reserve assets. Nonetheless, shorter extrapolations (approaching 120 and 200 percent of U.S. GDP in 2015 and 2020, respectively) also suggest demand will be hard to meet. (Supplement 1, section II provides details on this estimation.)

1/ Setser and Pandey (2009), and Prasad (2010) discuss problems with the data (and provide estimates of total holdings of U.S. assets by China).

frequently subject to "floods" and "sudden stops" (Figure 3—on average for this sample, countries recorded a capital flow in excess of 3 percentage points of GDP in 7 of 18 years), reflecting shifts in advanced countries' monetary policy, amplified by market imperfections, uneven liberalization, and, sometimes, changes in fundamentals. Booming capital inflows can fuel asset bubbles, poor resource allocation, and balance sheet risks when lending is in foreign currencies. They also generate currency appreciation pressures that complicate macroeconomic management. Many policy makers have sought to buffer their economies from such inflows through intervention, among other policies, resulting in reserve accumulation. Conversely, the potential for rapid outflows—and the associated liquidity shocks—have created a strong need for insurance.

Figure 3. Annual change in capital flows, selected EMEs 1/
(In percent of GDP)



Source: WEO.
1/ 36 emerging market countries. Capital flow defined as negative of current account plus change in reserves. Red triangles indicate oil exporters. In 7 cases (not show n), absolute value of capital flow was greater than 20 percent of GDP.

10. ***Ratchet effects***. In addition to self-insurance, and to the extent international investors consider high reserves indicative of lower risk for them, individual countries may feel compelled to acquire reserves not only sufficient to cover their own needs in a "sudden stop" event (e.g. all of their short-term external debt), but also enough to compare favorably with other emerging markets in competition for international capital or facing similar risks.[5] A ratchet effect may be observable as countries effectively set new benchmarks for each other. Similarly, if a given fall in reserves provokes further capital outflows because it is seen as increasing the chance of outright crisis, a substantially larger initial stock than suggested by commonly used measures may be required.[6] Such effects are hard to quantify but would imply that self-insurance policies would require ever greater cost and effort to maintain similar protections.

Absence of Automatic Adjustment

11. ***Persistent imbalances***. Some current account deficits or surpluses have long-running structural reasons, such as differences in demography, productivity, or resource endowments (in particular oil) which underlie differences in savings-investment balances. These should not be considered disequilibria, as they do not call for policy adjustment. In other cases,

[5] Cheung and Qian (2009) develop a model and find empirical evidence of interdependence in holdings of reserves for ten East Asian economies.

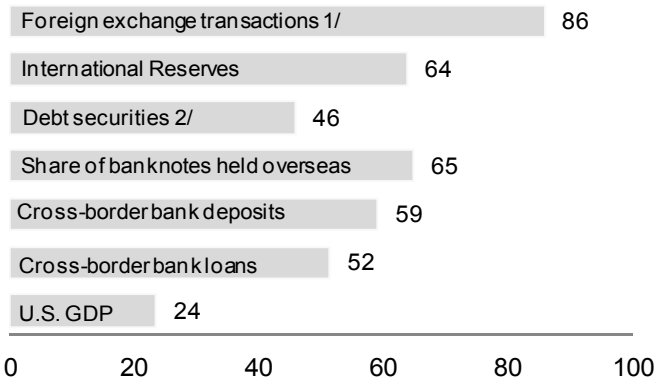
[6] Aizenman and Sun (2009) find a "fear of losing reserves" among emerging markets during the crisis, with countries sensitive to financial factors even less willing to reduce reserves.

forces equalizing prices and wages internationally will over time work to reduce individual country surpluses (and indeed deficits). However, policy choices—such as maintaining an undervalued exchange rate, with reserve accumulation as a by-product—can persistently put off adjustment for surplus countries (albeit with costs). As long as reserve issuing countries are willing to incur debt to purchase imports, an export-led growth strategy leading to persistent current account surpluses will be a feasible policy choice. As economies relying on undervalued exchange rates and demand from reserve issuers grow relatively large, the difficulties for the reserve issuers in achieving adjustment through domestic means alone increases.

Alternatives to the U.S. dollar

12. ***What else is there?*** The share of the U.S. dollar in global reserve assets far exceeds the share of the U.S. in the global economy. In large part, this reflects the dollar's central role as "international cash"—acting across the world as a unit of account and medium of exchange for cross-border trade and financial transactions, debt securities, commodity pricing, an anchor for monetary regimes, and as a store of value for savers (Figure 4). More diversified reserve holdings would require the availability of other asset classes that reproduce the desirable characteristics of the dollar in terms of liquidity, safety and yield (see Supplement 1, section III for a summary of desirable attributes for a reserve asset). Chief among the dollar's advantages is asset market liquidity, with U.S. Treasury market volumes far outstripping those of other reserve currencies such as the yen and euro. Large official holdings and transactions in U.S. assets reinforce their liquidity, which is a key desirable feature of reserves. Even apparently close substitutes for which there has been official demand in recent years (notably Federal housing agency paper) have lost attraction as a reserve asset in the crisis. More widely, the depth of U.S. capital markets, offering a large variety of products and high volumes of trading, can reduce diversification and portfolio management costs (Reisen, 2009).

Figure 4: The Dollar in the World
(percent of world totals)



Sources: ECB (2009), BIS (2007), Goldberg (2010), COFER.
1/ Share from 200 (each transaction involves two currencies).
2/ Foreign currency debt sold outside the issuer's home country (which corresponds to the ECB's "narrow measure").

B. Negative Impact

13. ***Costs and risks***. The risks associated with the recent reserve accumulation trends are potentially serious. Large reserve accumulation has significant opportunity costs for the accumulating countries, and in aggregate may have a systemic deflationary impact. If large, it may over time also lead to undermine the quality of the store of value represented by reserve

assets (through debt sustainability concerns) and, by depressing interest rates, foster excessive risk-taking and volatile capital flows. Meanwhile, accumulation concentrated in a few currencies exposes the entire system to shocks arising in the reserve issuing economies. The remainder of this section elaborates.

Costs

14. ***Domestic costs***. Reserve accumulating countries face opportunity costs in terms of foregone consumption and investment. These costs are difficult to measure, but are likely to be high in many EMDCs with high returns to capital and many unsatisfied social needs. Part of the cost is captured by the quasi-fiscal deficit incurred when reserve accumulation is financed, or sterilized, with debt offering higher yields—about 1.3 percent of EMDC's GDP in 2009 (considering the 2000-2007 average EMBI spreads of 300 basis points over U.S. Treasuries and a term premium of 100 basis points (5-year versus 3-month Treasury yields). It has been argued that this measure overstates the case, as country risk premia may fall as reserves increase (Levy Yeyati, 2008), and differences in default risk are not accounted for, as reserves are kept even in case of default. If only the term premium is included (as in Jeanne and Ranciere, 2006), the cost in 2009 falls to about 0.3 percent of EMDC GDP. Rodrik (2006), however, argues these estimates *understate* the case, as private external borrowing that leads to (or motivates) reserve accumulation occurs at a premium to the sovereign spread. An additional accounting cost will be incurred to the extent that a reserve accumulator's currency appreciates against the reserve currencies (which is likely as many EMDCs' productivity levels converge with the advanced economies). This valuation change, however, does not represent an economic cost unless realized through reserves sales.

15. ***Global demand gap***. If the counterpart of reserve accumulation is that many countries pursue current account surpluses, an aggregate deflationary impact may emerge to the extent that the rest of the world is no longer willing to incur balance of payments deficits. Protectionism and competitive devaluations could emerge as virulent consequences of countries' pursuit of external surpluses in a world of limited demand. The evidence suggests that to date reserve accumulation has reflected a mix of current account surpluses and capital inflows (Supplement 1, section II), and to the extent the main reserve issuer has acted as consumer of last resort, such deflationary bias has not materialized. However, it is a clear risk going forward, as demonstrated by the increase in the U.S. savings rate following the crisis.

Reserves and IMS Stability

16. ***Potential sources of instability***. Bearing in mind the concentration of reserve holdings in the government debt of few countries, two possible threats to IMS stability arise from reserve accumulation that is large relative to the size of the reserve issuers. They can be thought of as affecting the 'quality' and 'quantity' of international liquidity.

- *Qualitative effects*. If significant official sector demand for government debt for reserve purposes lowers yields below the pure market equilibrium (i.e., what would

result from demand for these assets in line with private sector asset allocation rather than criteria governing reserves management), risk-return calculations on marginal public projects will be more attractive, creating incentives for higher deficits and debt. Sustained government deficits may eventually bring public debt sustainability into question, undermining the *store of value* characteristic of reserve assets (by which is meant a stable value of a representative international basket of goods and services).[7] These concerns could escalate to the point of creating conditions for a rapid switch out of a specific reserve asset, with large and disruptive exchange rate and wealth effects, disruption to the smooth functioning of international payments and possibly implications for financial stability (see Box II.2).

- *Quantitative effects*. Lower benchmark yields may also lead financial intermediaries to underprice all risk. Excessive credit creation may ensue, resulting in misallocated capital and poor investment decisions.[8] To the extent that arbitrage conditions apply, this phenomenon would apply globally. Furthermore, there may be a link between availability of cheap credit and volatility of capital flows, notably through encouraging carry trade investments funding speculative positions in high yielding currencies with debt in low interest rate reserve currencies. While tighter monetary policy could counter these effects, if not implemented for whatever reason, the systemic effects just described will likely follow.

17. ***Core country policy matters***. Reserves concentration in the government debt of one country introduces idiosyncratic risks to the IMS stemming from conditions and policy in that country. Policies designed to meet domestic concerns typically do not consider effects on the wider world (e.g., a loose monetary policy may be warranted for domestic stability purposes, and yet induce unwanted demand at the global level). Moreover, the system is left vulnerable to policy mistakes, or private sector excesses, in the core economies. A more inflation-prone reserve currency relative to others would affect exchange and interest rate volatility even if nominal interest rates rise to compensate. Fears about long-term fiscal sustainability would be reflected in higher real interest rates everywhere, as the Treasury

[7] The "Triffin dilemma" (first posited in 1959 in two papers published by the Banca Nazionale del Lavoro) is sometimes invoked to suggest that accommodating demand for reserves would lead to dollar debt creation that could reach magnitudes that challenge sustainability. However, Triffin was principally concerned with the dollar's convertibility into gold, supplies of which were growing only slowly. With the dollar no longer tied to gold, demand for reserve assets can in principle be met entirely through the capital account (simultaneous creation of claims and obligations with non-residents), with a balanced current account. That does not mean an unsustainable current account, or debt burden, *could not* arise.

[8] Gambacorta (2009) finds an increase in risk-taking by banks in low-interest rate environments. Caballero and Krishnamurthy (2009) and Brender and Pisani (2010) argue that foreign demand for riskless assets increases financial fragility in the U.S. and globally. While these effects may be more subdued immediately following the crisis, they would likely reassert themselves over the longer run.

Box II.2. The Dollar as a Store of Value: A Summary of Views

There has been a long-running debate speculating on whether the dollar could collapse. Some commentators have focused on the sustainability of large U.S. current account deficits (e.g. Krugman, 2007, Obstfeld and Rogoff, 2004), and, particularly in the aftermath of the crisis, fiscal sustainability or the possibility of inflation (e.g., Ellis, 2009, Buiter, 2009). These concerns are in addition to long-standing worries on the challenge to long-term fiscal sustainability posed by the rising costs of healthcare and entitlements. Reinhart and Rogoff (2010) note that historically public debt levels above 90 percent of GDP have had an adverse impact on growth, and levels exceeding this threshold in the U.S. are now possible. Chinn and Frankel (2008) argue that a large or sustained trend depreciation would negatively impact the willingness of central banks to hold dollar reserves, imperiling the currency's role as a stable store of value, thereby precipitating the loss of its status as the premier reserve asset.

Reserve holders' intentions are unclear. As shown in Box II.1, just a handful of authorities account for more than half of global reserves, and the bulk of this is in dollar assets. This concentration could present big holders with a "Catch 22"— trying to switch out of dollar assets if they become concerned about the currency's value could precipitate a disorderly adjustment. Chinn and Frankel (2008) argue the creation of the euro make such a switch possible. Central banks would, however, face large accounting losses if a run on the dollar materializes, which may deter them from action that could provoke one. Ultimately, incentives for the private sector holders may present more risks. With little transparency about official reserve strategies, fears of a change in policy away from the dollar—whether well-grounded or not—could lead to a run as individual agents and institutions try and exit before official sales materialize.

Others point to the dollar's strengths. This is not the first time fears have been voiced over the dollar's future, but instability has to date always been short-lived. As the U.S. holds foreign currency denominated real and financial assets, but has liabilities in dollars, moderate dollar depreciation helps to make net external debt more sustainable. Truman (2009, 2010) points out that a large proportion of reserve accumulation has been in currencies other than the dollar, over many years, and this has not led to protracted dollar weakness. Cohen (2009) and Reisen (2009), among others, question whether good alternatives to the dollar exist.

yield curve acts as a benchmark financial asset pricing. Both issues would have effects beyond the domestic economy of the reserve issuer, and ultimately raise questions about the reserve asset's quality as a store of value. International investment flows and the appetite to incur risk, even where economically warranted, would ultimately be reduced. Finally, financial regulation, supervision and practice in reserve issuing countries will be one of the chief determinants of how international financial flows are intermediated (and thus of the safety of international financial system).

18. ***Some evidence***. These processes have arguably been working in recent years. For example, Warnock and Warnock (2006) suggest in rough terms that Treasury purchases of 1 percent of U.S. GDP could lower yields on the 10-year benchmark by about 20 basis

points.[9] Federal Reserve data show official purchases (central banks and SWFs) averaging 2 percent of U.S. GDP per year since 2003, suggesting a substantial impact. Taking a much broader view, Reinhart and Rogoff (2009) document repeated patterns of capital inflows, with growth in leverage and risk taking ending in crisis across a broad sweep of history and encompassing advanced, emerging and less developed economies. They argue the same pattern was present in the U.S. in the run-up to the subprime crisis (Chapter 13).

C. An Alternative View?

19. ***Resilience***. Despite shocks and sometimes acute differences in view on U.S. policy, the current system has been resilient over decades, and some voices have questioned whether there is a problem with the current IMS at all. Arguments stress that there is no necessary connection between U.S. deficits and reserve accumulation, and that relatively favorable demographic trends in the U.S. and the likely persistence of high savings in emerging markets (reflecting low financial development and poor social safety nets) suggest substantial U.S. external deficits are reasonable and consistent with sustainable growth (e.g., Truman, 2009, 2010, and Cooper, 2008). Other writers argue the U.S. plays an intermediation role—earning more on foreign investments than it pays on debts to non-residents—raising the capacity to carry large external debts (e.g., Caballero, 2006, or Hausmann and Sturzenegger, 2006). The extent to which demand for reserves affects yields has also been questioned, on grounds that real factors determine aggregate global savings, and arbitrage conditions will ensure private demand for reserve assets falls if yields are depressed by official purchases.

20. ***And yet…*** These arguments do not directly consider questions about the quality of reserve assets stemming from *fiscal* sustainability concerns, assuming demand for reserve assets continues to be met with Treasury debt. Theoretically demand for reserves could be met with other instruments. However, it is difficult to see what these might be that would not entail a significant debasement risk, particularly in light of the role of highly rated mortgage-backed securities in the crisis. Regarding the impact of reserve asset purchases on Treasury yields, the growing size of these purchases in relation to issuance, and market inefficiencies or regulatory restrictions limiting some private actors' (e.g., pension funds) portfolio reallocations, suggest a significant effect is possible and the empirical evidence is supportive overall. In the end, these views do not preclude that current arrangements *could* prove conducive to destabilizing policy choices (a point recognized by the authors cited), or that better arrangements could be made.

21. ***Exchange rate volatility***. Other views raise different concerns, notably long-run real exchange rate volatility between major currencies, driven by financial flows. It has been

[9] Other authors find different magnitudes (on either side). McKinsey Global Institute (2009) has a useful summary table and references, showing impacts ranging from 30 to 200 basis points for 2006, with net foreign purchases of about 3 percent of GDP.

argued the real sector costs (in terms of creating uncertainty about costs and returns for investors) will eventually impose costs sufficient to induce or impose a change in the IMS. However, while concerns about the real sector effects of long-run exchange rate volatility stretch back to end of the Bretton-Woods system, the steady rise in trade and cross-border investment over the decades suggests this may not after all have significantly held up growth (although it has been argued that FDI, by moving production to target markets, is a possibly second best response designed to mitigate the effects of exchange rate volatility on costs and profits). While this paper does not focus on this issue, some of the proposals in the following sections would help address this concern.

22. ***Bottom line***. Problems are not inevitable. The current IMS has proven resilient, and may yet continue to be so. But this is a strength as well as a weakness: while substantial challenges are not difficult to imagine—in particular, as global demand for reserve assets grows in relation to the U.S. economy, a more acute trade-off between domestic priorities and international monetary stability is conceivable—there is no clear market-driven process that would bring about a more robust system. Thus, it is worth exploring whether different arrangements could underpin a more robust system for the long-term. The Fund—whose purposes include to promote collaboration on international monetary problems—can play a role in making the system more stable over the next decades, as elaborated in subsequent sections.

III. Mitigating the Demand for Reserves

23. ***Road map***. This section considers three separate routes to attenuating global reserve accumulation: agreeing on an "adequate" level of reserves for precautionary purposes; trying to tackle directly the key factor underlying precautionary demand, i.e., volatility in capital flows; and options to reduce accumulation of non-precautionary reserves. Another very important axis of action—the provision of alternatives to self-insurance, is being considered separately in the context of the review of the Fund's financing role (see IMF, 2010d). A common axis among these ideas is to try and remedy the externalities and other market failures discussed above that underlie recent strong reserve accumulation.

A. Precautionary Reserves Adequacy

24. ***Existing levels***. Despite the clear motivation behind precautionary reserves, distinguishing it from non-precautionary demand is not an easy task: indeed there are only two basic sources of self insurance, importing capital and running current account surpluses, and the latter may be the preferred source given the unreliability of capital inflows (see Ocampo, 2010 and Supplement 1, section II). Accordingly, the share of global reserves that is precautionary is a matter of debate. By some estimates, they account for between half and two-thirds of the total (e.g., Obstfeld et al., 2008, based on a model considering financial openness, access to foreign capital markets, potentially convertible domestic financial liabilities and exchange rate policies).

25. ***Appropriate levels***. In order to underpin a concerted reduction in accumulation of precautionary reserves, the Fund could provide guidance on desirable ranges of precautionary reserve levels given country circumstances, and countries could agree to align their reserve accumulation policies to these guidelines over time. This would help overcome the ratchet effect problems discussed above. In this regard, a forthcoming staff report ("Assessing reserve adequacy") is intended to take stock of current developments in reserves, the recent crisis experiences, and relevant policy and academic work (for instance, Becker and others, 2007), in order to provide practical guidance on frameworks to assess reserve adequacy for precautionary reasons.

B. Reducing Underlying Volatility

26. ***Capital flow volatility***. While efforts to moderate demand for reserves would only address a symptom, managing capital flow volatility would help get at a key motive for reserve accumulation. Indeed, recent empirical evidence suggests that the dramatic pace of financial globalization has likely increased volatility in developing countries with low financial sector development (see Dell'Ariccia and others, 2008). There are no easy solutions in this context, but two elements that could help are closer monitoring of capital flows to identify potential instabilities; and adoption of a multilateral framework for the consideration of measures aimed at dampening capital flow volatility. The scope of any Fund role in these areas could vary significantly, from purely advisory to jurisdiction over capital controls (the latter requiring an amendment of the Articles). A full discussion of these issues is beyond the scope of the current paper, and will be further considered in coming months.

27. ***Monitoring***. Better monitoring would entail national authorities collecting and providing to the Fund data on cross border exposures by country and institution, and the Fund consolidating this data with information on balance-sheet exposures of large complex global financial institutions for a comprehensive mapping of global linkages and risk concentrations. With such information, authorities could assess what part of the inflows are potentially unstable and would need reserve backing (e.g., FDI inflows would generally not), and whether capital controls and/or prudential limits could be used to reduce country- and bank-specific risk concentrations rather than accumulate more reserves. Better mapping of cross-border capital flows could also reveal whether episodes of volatility were driven by liquidity conditions in the source countries (or at the global level), or by specific policies in the destination countries, and hence help assess the efficacy of alternative options to manage the volatility (see further below).

28. ***Data efforts***. For effective monitoring, high frequency (at least monthly) data on *gross* capital flows would be needed—with information on "from whom to whom" (although some 70 countries provide the IMF with data on portfolio investments, these account for bilateral positions rather than flows and at annual frequency only; similarly BIS data on bilateral bank exposures cover positions only). Potentially large resource costs of compiling such data could be addressed by expanding coverage in a gradual manner and prioritizing for

those dozen or so countries that together account for the bulk of the global capital flows, on a voluntary basis. A key role for the Fund could be to set out a common framework for the reporting of such data (in the same way that the national accounting framework was designed on the heels of the Great Depression). Given the public good nature of the effort, some of the costs could be mutualized (e.g., with Fund-provided technical assistance where relevant). Similarly, members could voluntarily agree to provide balance sheet data of large financial institutions that are key conduits of global financial flows (see IMF 2010a and 2010b for details). In this regard, recent coordinated efforts by the Fund and FSB in response to the G20's call to address data gaps are a step in the right direction (see IMF, 2009b, 2010c, and 2010e).

29. ***A multilateral framework for managing capital flows***. Currently, there is no comprehensive international framework that covers all types of capital flows or that has global membership. A multilateral framework would recognize the benefits of capital account liberalization under appropriate circumstances, while acknowledging a role for certain measures, such as capital controls, to dampen excessive movement when necessary. The emphasis should be on making sure that measures on cross-border flows motivated by domestic economy considerations actually help reduce global volatility and do not have adverse effects on others (e.g., adoption of comprehensive capital controls by a systemic country could increase the volume and volatility of capital flows for others). A multilateral framework could serve the following specific purposes: (i) establishing basic dos and don'ts—e.g., ensuring that capital controls are not used in place of needed policy reforms for the stability of the IMS (e.g., measures to allow global rebalancing of current account imbalances); (ii) providing a process for identification, at the global level, of when the use of capital controls may be appropriate for all exposed countries, e.g., when a sharp increase in capital flow volatility was triggered by an easing of global monetary conditions rather than by policy issues in destination countries; (iii) providing a toolkit of options (drawing on cross-country experience) that may be used to reduce capital flow volatility.[10] In addition, countries may be encouraged to take concerted actions to limit volatility of capital flows—e.g., by allowing the adoption of procyclical capital charges based on global economic cycles rather than domestic cycles, or by eliciting a voluntary commitment from large financial institutions with deep macro-financial linkages in the countries they invest in (e.g., subsidiaries of retail banks) to maintain business in the recipients' economies during a global liquidity squeeze. Achieving consistency between a new multilateral framework and existing arrangements would need to be considered, and may be difficult.[11]

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[10] See Ostry and others (2010) for a discussion of the role of capital controls at a country-level.

[11] This includes, for instance, consistency with countries' commitments under the GATS, the OECD Code of Liberalization of Capital Movements, the UE law, and bilateral trade and investment protection agreements.

C. Reducing Non-Precautionary Accumulation of Reserves

30. ***Backdrop***. The accumulation of non-precautionary reserves is not an objective in itself but rather the consequence of other policy choices (e.g., export-led growth strategy) or structural differences in country characteristics unrelated to policy (e.g., large public savings to ensure intergenerational equity given an eventual depletion of an oil endowment). The latter kind of reserve accumulation—i.e., due to structural reasons—should not be addressed by policy adjustments. By contrast, accumulation of non-precautionary reserves via protracted one sided intervention does impose a negative externality on the IMS, and solutions are needed to induce countries to internalize this cost. Reaching consensus on the type of solutions (voluntary or binding) would be challenging, given that the stability of the IMS would likely be of second order importance to countries' own near-term interests. At a minimum, this would require a common understanding of what is needed for the stability of the IMS and how factors motivating non-precautionary reserves can undermine this stability. Two types of approaches could be envisaged.

31. ***A concerted approach***. One possible approach would entail a multilateral framework of understandings amongst members to implement the needed policy adjustments for the effective operation of the IMS. For instance, under such understandings, the more systemic countries might adopt over a pre-specified horizon flexible exchange rate regimes with limited or no foreign exchange intervention, or move away from pegs to national currencies (which tend to thwart adjustment of the relevant countries), while reserve issuers would adopt a macro-economic policy framework (e.g., medium-term fiscal rules), to sustain credibility in their currencies and the IMS. A more ambitious quid pro quo could also be envisaged—e.g., alongside the understandings on exchange rate regime changes, steps could be taken to strengthen the global reserve system, e.g., by developing a systemic role for the SDR (see section IV). A question would be whether members could credibly be held accountable ex post for the implementation of these understandings. Thus, a gradual process may be preferable to a big bang one.

32. ***Penalties***. As an alternative or complement to the above approach, some observers have suggested penalties (e.g., Eichengreen, 2009a). Such penalties would need to be based on clear, objective criteria to internalize a part of the negative externalities posed by excessive reserves or, for reserve issuers, deficits. Examples include a reserve requirement on "excess" reserves, far above acceptable measures of reserve adequacy, or an automatic tax on persistent current account imbalances—surpluses or deficits (for reserve issuers)—beyond a certain threshold. The tax base could be defined in terms of global GDP to capture the systemic impact. Proceeds could go towards a global stability pool to finance liquidity needs during unanticipated global crises. An amendment of the Articles would be required for such a system to be established under the Fund. To mobilize member support, the measures would, at the least, need to be pre-announced with a sufficient transition time for implementation of measures to ameliorate underlying imbalances. Even so, reaching agreement on such a measure would likely be considerably more challenging than agreeing

on ad hoc adjustments in the context of a multilateral consultation, and therefore the step may be redundant. Indeed, while a global imbalance tax (initially envisioned by Keynes) was considered by the Committee of Twenty (tasked with rebuilding the IMS after the collapse of the original Bretton Woods agreement) in 1974, it did not gain adequate support, reflecting in good part the preference for floating exchange rates among major economies following the oil shock, while the periphery countries with fixed pegs were too small to pose a problem for systemic stability (see IMF, 1974, and Lowenfeld, 2003). Other caveats: while a case by case approach would seem appropriate in assessing reserve adequacy taking into account a country's own fundamentals and characteristics, if there is room for judgment in applying penalties, they may still not be used as suggested by existing multilateral examples; on the other hand, automatic penalties seem too far removed from the cooperative culture of the Fund, and unlikely to attract much support in the foreseeable future.

33. ***Feasibility***. Notwithstanding the potential efficacy of the above reform options, some ideas could take more than a lifetime to generate the extraordinary levels of political support needed penalties on imbalances. Others are unlikely to materialize absent a sort of "grand bargain" on IMS reform also involving deep changes to the supply of reserve assets.

IV. Diversifying the Supply of Reserve Assets

34. ***Why and how to diversify*****?** Given the limits to action on the demand side, it is worth considering also solutions on the supply side to help meet what demand for reserves exists in a way more conducive to IMS stability than at present. A more diversified allocation across available and new reserve assets would reduce the system's (and individual countries') exposure to risks stemming from economic outturns and policies in a single country, and may provide more stable stores of value by increasing reserve issuers' incentives to pursue sound policies and avoid losing the associated benefits. While global reserves are already diversified to some degree (see Section II and Ghosh and others, 2010) and further diversification is likely to continue gradually over time, the pace and eventual degree may not be enough overall to bring about the desirable balance in the supply, especially if reserve accumulation continues apace. This reflects the presence of a natural monopoly in the use of money, which could only be overcome by *active* coordination of all actors involved. A key question therefore is whether diversification should be encouraged among suitable existing currencies, and if so how, or if the solution should be sought more with global reserve assets, acting as a complement or even substitute to existing ones. In either case, an important issue to bear in mind would be the need for careful communication of the policy intent of the international community—namely, long term strengthening of the system, to avoid precipitating a crisis by undermining confidence in the current one.

A. Scope and Feasibility of a Multi-Polar System

35. ***Issues***. A multi-polar system would be one with several currencies operating as broad substitutes, perhaps alongside a broader set of secondary reserve currencies. As the world becomes more multi-polar in terms of GDP, the drive for a multi-currency system that mimics global economic weights is likely to increase—e.g., a dominant dollar zone, euro zone, or a formal or informal Asian currency zone. That said, the process could still be quite long, and there is in fact no guarantee that the world will become significantly more multi-polar through greater diversification among pre-existing reserve currencies (e.g., comparing the demographic growth prospects of the U.S., Euro-area and Japan suggests the U.S. may be the economy with the greatest momentum over the longer run, see Cooper, 2008). At the same time, it is possible that the advent of new reserve currencies generates momentum for a more diversified system. Supplement 1, section III discusses potential candidates and the extent to which they have the characteristics of major reserve currencies. Such a reserve system would be superior to the current one in that it would help discipline policies of all reserve issuers (given enhanced substitutability of their assets). However as discussed below, there are also a number of downsides to consider, so that in net terms it is unclear whether a more diversified reserve system would be an improvement.

36. ***Lower network externalities***. While network effects favor a single vehicle currency, the costs involved in transacting in a few additional major currencies may be limited. For example, the direct costs of converting dollars into euros consists of a razor thin bid-ask spread, which is negligible for international trade transactions as well as for most financial transactions. To the extent comparable reserve currencies will have comparably deep foreign exchange and financial markets supporting them, hedging costs should remain low. Another relevant transaction cost would be the need to manage exchange rate risk in multiple currencies for a business whose international trade is invoiced in a number of currencies, which could induce further polarization of the IMS into reserve currency zones (e.g., in line with countries' geographical concentration in trade patterns).

37. ***Volatility***. Volatility between major reserve currencies could pose substantial costs for trade and investment decisions (see McKinsey Global Institute, 2009, Ghosh and others, 2010). To the extent reserve currencies eventually become truly comparable with equally deep and liquid financial markets, opportunities for hedging risks would increase, but short-term volatility may also increase. It has also been argued that a multi-currency system might exhibit greater, if not continued high, long-run volatility. This is not a foregone conclusion: to the extent that central banks manage their international reserves portfolio to maintain constant shares of the different reserve currencies, they could play a stabilizing role such that volatility would be lower in the end in the steady state. In any case, managing the diversification process in a smooth and transparent way would be important to avoid large swings unwarranted by economic conditions. In any event, the volatility issue will likely remain in any IMS—new or current—in the absence of greater policy coordination between

reserve issuers to manage their exchange rates within acceptable ranges, or even adopt a common currency (see Box IV.1), both of which would represent profound change.

Box IV.1. Systemic Exchange Rate Arrangements

An imperfection of the current system is the significant degree of exchange rate volatility at both high and low frequencies, which can impose significant economic costs. The conventional wisdom is that while no one size fits all, monetary policy independence (and exchange rate flexibility), including among major economies that do not form an optimal currency area, can confer important benefits as an instrument for adjusting to shocks and helping meet domestic policy objectives.

Previous debates on IMS reform have focused on establishing rules in the current regime of flexible rates among major currencies. Proponents of such rules have argued that their benefits and the discipline they impose exceed the costs of foregone monetary discretion. Exchange rate volatility in a world of integrated trade and capital flows far exceeds what would be justified by real fundamentals. Since, therefore, the volatility of monetary/financial shocks exceeds that of real shocks, a form of fixed exchange rates is optimal. Among the proponents, Williamson (1987) proposed a target zone for the real effective exchange rates of the main industrial countries, while McKinnon (1988) called for a monetary standard among the major economies, with fixed exchange rates around narrow bands. Cooper (2006) has gone a step further, building on stage one of exchange rate convergence among the major economies to launch a common currency for highly diversified, industrialized economies, while Mundell (2009) has called for a global currency.

Under such arrangements, the Fund could serve as a coordinating platform between key reserve issuers (e.g., through its multilateral surveillance framework) in the latter's efforts to limit gyrations of their exchange rates from their fundamental values. Concretely, one approach would be to give guidance to reserve issuers on reasonable equilibrium ranges of reserve currencies (e.g., implicit target zones), and maintain continuous dialogue to keep the system in those ranges. Such a role would require an equal willingness of all reserve issuers to sacrifice monetary independence in the interest of lower volatility of the IMS, which makes it an ambitious proposal even in the long run.

38. ***The Fund's role***. Should the membership deem it desirable to encourage the orderly emergence of a diversified system, the Fund could consider the following roles:

- Encouraging reserve holders to adjust the currency composition of reserves only gradually and discourage any "active" currency management that could potentially cause large swings between reserve currencies.

- Requiring all reserve holding members to report their reserve composition to the Fund (possibly confidentially) including information on reserve holder's benchmark for the currency composition of reserves.[12] Using this information, the Fund could advise reserve

[12] Currently, reporting of currency composition is voluntary for IMF members. The Fund's Currency Composition of Official Foreign Exchange Reserves (COFER) database, which publishes aggregate information on the composition of total reserves, covers only about two-thirds of total global reserves.

holders on the pace of reserve diversification (if and when the latter express interest in adjusting the currency composition of their reserves) to maintain stability in the adjustment process, including during the transition phase to a balanced reserve system. For instance Truman and Wong (2006) propose an international reserve diversification standard comprising two basic elements: (i) routine disclosure of the currency composition of official foreign exchange holdings; and (ii) a commitment by reserve holders to adjust gradually the actual currency composition of its reserves to any new benchmark for those holdings.

- Engaging with potential major reserve issuers to help remove obstacles to broader use of their currencies, if the authorities so desire (Supplement 1, section III).

- Considering mechanisms to facilitate the use of emerging market assets to draw liquidity with greater certainty to attenuate their demand for hard-currency reserves (see Box IV.2).

B. Supranational Reserve Assets

39. ***Supranational alternatives***. As a complement to a multi-polar system, or even—more ambitiously—its logical end point, a greater role could be considered for the SDR. An even more ambitious option would be to develop a globally-issued currency distinct from the SDR that circulates in lieu of some national ones, or in parallel with them. Both approaches would allow the international monetary system to be less tied to the circumstances of any individual economy, and might even be considered as "Plan B" to increased fragility in the current or a more multi-polar system. To the extent that currency is a natural monopoly, they could also serve as "focal points" to which scale economies might propel the system.

Special Drawing Rights

40. ***SDR-based system***. The SDR is an international reserve asset, created by the IMF in 1969 to supplement official reserves of member countries. For countries with a balance of payments need, it represents an unconditional right to obtain foreign exchange or other reserve assets from other IMF members. The value of the SDR is based on a basket of four key international currencies (U.S. dollar, euro, yen, and pound). But it is not itself a currency, and its use in foreign exchange interventions and most payments requires conversion to one of the freely usable currencies of IMF members. A system centered on the SDR would maintain the SDR's essential character as a reserve asset and unit of account without an actual currency role, while a broad market in SDR-denominated instruments in both the public and private sectors would be developed.

Box IV.2. EM Assets as Substitutes for Reserves?

EMs' demand for hard-currency reserves and their carrying cost would be lower if they could use their own sovereign debt to draw liquidity through a pool or against a lender of last resort window:[1/]

- *Pooling arrangement*. Under this arrangement, sovereign debt issued by EMs would be pooled (and diversified across regions to minimize idiosyncratic risks) and securitized into a composite asset, which could then be held by members of the pool as reserve assets. The liquidity of the pool would be guaranteed by the IMF (administered through a trust fund that could be jointly funded by member contributions and own SDA resources), including during a crisis when liquidity from other sources dry up. Such a pool would be similar in some ways to current regional pooling arrangements like the Asia Bond Funds 1 and 2 but would have to be of a sufficiently large size and well-diversified, with reasonable assurance of liquidity (from the Fund) based on pre-determined criteria, to be a meaningful alternative to traditional reserves for members of the pool. Other important issues would also need to be considered—for instance, ensuring that claims on the pool qualify as claims on non-residents (e.g., establishing limits on the amount of assets issued to the pool by a given country relative to the size of the pool to avoid the situation where a country may de facto have a claim on itself), determining limits on the holdings of the pooled asset (e.g., should members be subject to a ceiling based on their quotas to ensure a fair access for all eligible members), determining the pricing of the pooled asset and implications for exchange rates of members, openness of the market (e.g., to manage capital flow volatility should the market be initially opened to the official sector only), addressing moral hazard risks given that any deterioration of policies of any underlying issuer would be reflected in the spread for the entire asset class (e.g., should there be a minimum set of criteria for a country to meet to qualify and maintain membership in the pool) and safeguard issues for the Fund (e.g., should the IMF be given formal preferred creditor status in the event of default).
- *Repo window*. The Fund could lend to solvent countries against collateral in the form of high quality EM assets (similar to above), on a temporary basis and at a penalty rate. Again, a number of issues with respect to consistency with the Articles of Agreement would need to be resolved—GRA lending against collateral is currently not allowed by the Articles if this fully substitutes for policy conditionality. Introducing clear qualification requirements would make the instrument consistent with the Articles (besides providing certainty about availability of liquidity through the window), while maintaining the de facto preferred creditor status of the Fund. While using a particular asset as collateral under a repo would not make it qualify as a reserve asset, it could nevertheless reduce demand for traditional reserves to the extent countries become more certain about their access to liquidity through this arrangement.

1/ See also IMF (2010d) for other ideas to alleviate emerging countries' demand for reserves.

41. ***Advantages***. The benefits of an SDR-based system are many in comparison to a uni- or multi-polar one:

- *Stability*. With a value defined in terms of a basket of major currencies, the SDR diversifies the currency and interest rate risks of its constituent currencies. Thus, it has more stable store of value and unit of account attributes. These properties would be important should exchange rate volatility remain high, or even increase, in a multi-polar currency system with no dominant currency, as some have suggested.

- *Scale*. In the presence of scale economies, the SDR basket provides a focal point around which a majority of international financial transactions could occur.

- *Financial integration*. By shifting relative demand towards use of SDR-denominated instruments from national currency-denominated ones, these scale economies could result in similar interest rates for countries with the same credit risk ratings that issue securities denominated in SDRs. Thus, the benefits of scale would be spread uniformly across similar issuers. At the same time, increased substitutability among the relevant assets should help strengthen market discipline.

- *Monetary conditions*. Another advantage would be to align *global* "monetary conditions"—the reference rates off of which risky assets are priced—more with global developments than with conditions in any single economy, particularly if the SDR basket is broadened.

- *Adjustment*. If countries with current account surpluses that currently peg to a national currency were to peg instead to the SDR basket (the dominant asset in place of the U.S. dollar), some automaticity would be introduced in the global adjustment process as the currencies of deficit countries could depreciate relative to others in the basket.

42. ***Hurdles***. Notwithstanding these positive attributes, the SDR's global monetary role has thus far been limited—only SDR 21.4 billion were allocated until mid-2009, and the SDR 182.6 billion allocations implemented thereafter only brought the total stock of SDRs to about 4 percent of total reserves—and its usage essentially restricted to the official sector (see Supplement 1, section IV). Additional hurdles to the development of an SDR-based system include potential resistance from reserve issuers who have no direct use for SDRs; restrictive allocation rules and complicated usage rules laid out in the Articles of Agreement and Executive Board decisions; the lack of deep and liquid markets; the need to convert SDRs into a freely usable currency for most payments transactions; and a perception that greater volumes of SDRs could be used to thwart adjustment.

43. ***Collaboration***. These hurdles are very significant but could probably be overcome if all or a significant subset of Fund member countries cooperated to that effect. Promoted by

the official sector, the attractiveness to the private sector of using SDR-denominated instruments could increase, in turn perpetuating a virtuous dynamic whereby both the public and private enhance their use of the SDR basket. Key areas for collaboration are discussed below (Supplement 1, section IV provides further elaboration).

44. ***SDR allocation***. As a first step, increasing the role of the SDR in the IMS would require a significant increase in the stock of SDRs, that is to say substantial amounts of new SDRs being allocated. Existing rules make this difficult however, and may need amendment. The following ideas seek to reconcile greater allocation with maintenance of adequate safeguards:

- Large and regular allocations, perhaps on the order of $200 billion annually (about half of the estimated annual increase in precautionary reserves, see Supplement 1, section IV) for some years: during periods of strong demand or increased inflation risk, there could be either cancellation or no allocations, although even if there were continued allocations, sterilization by central banks of allocations spent could neutralize their impact on inflation. Such allocations would not require a change in the Articles if they meet the required considerations governing allocations. Alternatively, large and regular SDR allocations could be held in escrow with the SDR Department, for use in the event of exogenous shocks—introducing greater automaticity and predictability in decision-making and the use of SDRs. This would require an amendment of the Articles.

- Modest allocations (say, $25 billion annually or up to 10 percent of quota as suggested by Clark and Polak 2004), though this would slow the move to an SDR-based system.

- Targeted periodic allocations to a subset of members that are accumulating reserves for precautionary purposes, perhaps as part of a quid pro quo on reducing national currency-based reserve accumulation. This would require an amendment to the Articles.

- Given the unconditional nature of SDRs, ensuring that countries in fragile debt dynamics do not overspend may be necessary, e.g., via a reconstitution requirement.

- The 85 percent majority of the total voting power of the Board of Governors sets a high threshold for both allocations and cancellation and, therefore, makes both more difficult to achieve. Moving to a lower threshold, say 70 percent, while maintaining economic rationale for allocations, would make these decisions easier, and would symmetrically make cancellation easier.

- To support the liquidity of these SDRs, the markets underpinning the voluntary exchange of SDRs would need to be deepened. A reconstitution requirement could support this objective as well.

45. ***SDR-denominated instruments***. Besides increasing the amount of SDRs allocated by the IMF, the official sector could issue SDR-denominated instruments such as bonds, which could be traded within the official sector or in some cases issued to the private sector:

- *Substitution account*. The creation of a substitution account could facilitate an increase in the stock of SDR-denominated instruments in one step. Operated by the IMF, the account would be an off-market mechanism for IMF members to exchange foreign currency reserve assets for SDR-denominated claims. A burden-sharing mechanism would be needed to cover the foreign exchange risk, which would likely be politically challenging (see Box IV.3).
- *IFI borrowing*. Building on recent interest for IMF SDR-denominated note purchase agreements, more such borrowing agreements could be considered (albeit requiring an amendment of the Articles if such borrowing were to be done on a large scale, de-linked from the Fund's liquidity needs, as quotas are the primary form of financing for the Fund and borrowing only supplements quota resources). Other international financial institutions (IFIs) could also consider issuing SDR-denominated debt on a regular basis.
- *Government borrowing*. While reserve issuers may not want to issue large amounts of debt in SDRs on account of the concomitant foreign currency risk, governments that issue debt in multiple foreign currencies may also be "natural" issuers of SDR-denominated bonds. Such issuances could help consolidate instruments into a single market with easier-to-manage yield curves (compared to managing multiple curves across markets). The largest such governments may find such issuances especially beneficial, as they may be unable to hedge all currency risks in derivatives market. However, to the extent that demand for SDR-denominated assets remains less than for the component currencies, a liquidity premium would prevail. That said, the extra costs that may be initially incurred by issuers could be seen as a subsidy to a nascent market worth paying for the sake of strengthening the global financial architecture.

46. ***Invoicing, pegging, and settlement***. Promoting invoicing of international trade and finance in SDRs could further enhance its role as a reserve asset. Invoicing commodities, such as oil, could be a useful and visible starting point. Since prices in SDRs are more stable than in the constituent currencies and commodities are used as hedges against dollar depreciation, invoicing in such markets may take root sooner than in other markets. Developing clearance systems in SDR-denominated instruments would also facilitate private use, although settlement may eventually need to be in one of the constituent currencies. Mechanisms would be needed to overcome market participants' inertia in using existing reserve currencies for invoicing and settlement. One such mechanism could be pegging to the SDR. Should countries that choose to peg their exchange rates do so increasingly against the SDR—a logical response to greater denomination of trade in SDRs—demand for SDR-denominated instruments would increase further.

Box IV.3. Substitution Account

Background. A substitution account to exchange foreign currency reserve assets for SDR-denominated claims on the account had been discussed actively in the late 1970s when concerns about the dollar's value emerged. But it was not activated reflecting both disagreements on cost sharing of the exchange rate risk and a sanguine view of the dollar's prospects against the backdrop of the second oil shock, which ex post was justified.

Potential benefits. If a large share of currently held reserves were to be exchanged, it would lead to a manifold increase in SDR-denominated claims. If assets are exchanged in the same proportion as the SDR basket, there would be no accompanying exchange risk, and the account would simply be a mechanism to increase the amount of SDR-denominated claims—to meet the objective of developing an SDR-based system, rather than diversifying portfolios. Being an off-market mechanism, however, it could also be used to facilitate diversification, without necessarily triggering a disorderly dollar decline that might otherwise accompany market sales of U.S. dollars by major central banks. Clear communication would be essential to limit adverse signals. One view is that mitigating this risk can facilitate a stable transition to a new system and reduce the premia in U.S. long-term interest rates that reflect such risk.

Risks. An alternative view is that, to the extent an exchange guarantee is provided for those who voluntarily accumulated dollar reserves (see below), perverse incentives may be provided to accumulate even further reserves. A guarantee would therefore need to be accompanied by appropriate incentives to stem the further accumulation of reserves, as a *quid pro quo* (see previous).

Exchange guarantee. To cover the exchange risk, an explicit burden sharing arrangement would be needed. The 1970s proposal envisaged the substitution account as a Fund-administered account under Article V, Section 2(b), for which the Fund may not bear financial exposure under the Articles, and for which members could only have voluntary exposure. Such an account could be established, for example, as an arrangement under which its participants would voluntarily agree to cover the cost based on a pre-specified mechanism, such as quotas. Alternative approaches involving potentially far-ranging amendment of the Articles could also be envisaged, however. For example, losses could be distributed in proportion of quotas across the participants in the account (which would be set up as a trust fund), reflecting the fact that the benefits in terms of systemic stability accrue to all participants and, in fact, the entire membership. Quotas need not be the only mechanism, and any voluntary agreement among the participants for cost sharing would suffice, although to be effective the largest reserve holders and other systemic countries would need to participate. Another approach would be to charge the account's users, i.e., those who exchange reserves for SDR-denominated claims, an annual premium to cover part of the loss (based on the premium on a USD/SDR forward contract and exchange rate volatility), with the rest of the participants covering the residual risk.

Cost. The extent of the loss could be limited, especially if the account is successful in mitigating the risk of a disorderly dollar decline. The risk would be further reduced if, as a *quid pro quo*, it provides time for policy adjustments and rebalancing in the U.S. and elsewhere. Illustrative calculations by Kenen (2010) point to the limited budgetary implications globally of a hypothetical substitution account established in the early 1980s—zero cost in the actual, historical baseline and an upper bound of 0.3 percent of U.S. GDP annually during 1995-2008 under adverse scenarios.

47. ***SDR basket***. Both the composition and the rules underlying the choice of the SDR basket matter for private sector use of SDR-denominated instruments. To enhance the private sector's use of the SDR basket, the rules for the review of the basket—currently every five years by decision of the Executive Board—would need to be made transparent, simple, and automatic, so that changes are predictable. Once the uncertainty induced by judgmental or political factors is removed, the basket would be more akin to widely-used market indices, such as the S&P 500, which provide real-time quotes for use in transactions and hedging notwithstanding periodic changes to the index. The components of the basket would need to continue to reflect their relative importance in the world's trading and financial system, while maintaining stability and continuity (see Box IV.4). Inclusion of a non-convertible currency would open possibilities for gaining exposure to these currencies, which could spur demand for SDR-denominated instruments, albeit with downsides for those wanting to hold only convertible currencies. But the broader implications and costs of such a move would need to be carefully considered—the quinquennial review of the basket is scheduled later this year.

Box IV.4. Composition of the SDR Basket

Periodic reviews. The Executive Board reviews the composition of the SDR basket every five years, although an earlier review could be contemplated in the event of major unforeseen developments in the international monetary system.

Criteria. The SDR basket comprises the four currencies issued by IMF members or monetary unions whose exports of goods and services during the previous five-years had the largest value and which have been determined by the Board to be freely usable. At its 2000 review, the Board adopted a currency-based approach (in lieu of a member-based one, after the introduction of the euro), added to the selection criteria the Board's determination of currencies as "freely usable" (i.e., as provided in Article XXX (f) " a member's currency that the Fund determines (i) is, in fact, widely used to make payments for international transactions, and (ii) is widely traded in the principal exchange markets"), and defined currency weights by combining the value of exports of goods and services of members or currency unions excluding intra-currency union trade and official reserves in the respective currencies held by other IMF members. The Board adopted the same criteria at the 2005 review.

Current basket. The components and weights of the current basket are the U.S. dollar (44 percent), euro (34 percent), Japanese yen (11 percent), and pound sterling (11 percent).

A sui generis Global Currency

48. ***From SDR to bancor***. A limitation of the SDR as discussed previously is that it is not a *currency*. Both the SDR and SDR-denominated instruments need to be converted eventually to a national currency for most payments or interventions in foreign exchange markets, which adds to cumbersome use in transactions. And though an SDR-based system would move away from a dominant national currency, the SDR's value remains heavily linked to the conditions and performance of the major component countries. A more

ambitious reform option would be to build on the previous ideas and develop, over time, a global currency. Called, for example, bancor in honor of Keynes, such a currency could be used as a medium of exchange—an "outside money" in contrast to the SDR which remains an "inside money".

49. ***Common versus parallel currency***. One option is for bancor to be adopted by fiat as a common currency (like the euro was), an approach that would result immediately in widespread use and eliminate exchange rate volatility among adopters (comparable, for instance, to Cooper 1984, 2006 and the Economist, 1988). A somewhat less ambitious (and more realistic) option would be for bancor to circulate alongside national currencies, though it would need to be adopted by fiat by at least some (not necessarily systemic) countries in order for an exchange market to develop.

50. ***Caveats and pre-conditions***. Absent significant monetary instability or an injunction for use of bancor for the making of an important set of payments (e.g. payment of taxes), surmounting the barriers to wide acceptance would be a key and perhaps prohibitive challenge. Moreover, an independent monetary policy constitutes an important instrument for adjustment when economies do not form an optimal currency area with others. Adoption of a common currency could limit the scope for adjustment to shocks, and developing alternative adjustment mechanisms would be a pre-condition for adoption (e.g. greater flexibility of labor markets) as would mechanisms for fiscal discipline and cooperation. Since a system with a few currencies competing alongside one another has built in safety valves (in terms of checks on inflation, for instance; see Rogoff, 2001), it would be essential to construct governance arrangements that ensure accountability of the bancor-issuing institution while assuring its independence. These arrangements would also need to be sufficiently flexible and robust to accommodate differences among adopting members. These considerations and costs—important as they are—would need to be weighed against the benefits of using a currency like bancor.

51. ***Why bancor?*** A global currency, bancor, issued by a global central bank (see Supplement 1, section V) would be designed as a stable store of value that is not tied exclusively to the conditions of any particular economy. As trade and finance continue to grow rapidly and global integration increases, the importance of this broader perspective is expected to continue growing.

- *Nominal anchor*. As a stable store of value, bancor could serve as a global nominal anchor. The variability of traded goods prices that is currently related to exchange rate volatility would be reduced. By not being tied as tightly as the SDR to the conditions of a particular economy or a group of economies, bancor could provide greater monetary stability, especially since key central banks retain monetary control under an SDR-based system and their respective economies and currencies would be expected to face episodic stresses and volatility (such as higher inflation or deflation).

- *Risk-free asset*. Once liquid markets for bancor-denominated instruments exist and bancor-denominated transactions are at a par with or exceed transactions in other currencies (i.e., in a bancor-based system), bancor-denominated debt of the sovereign with the highest credit rating could serve as the global risk-free asset, off of which all risky assets are priced. The risk-free asset would be less tied to the credit ratings and inflation outlook of the largest economies, and would therefore be subject to less volatility and dependence on their specific circumstances than the SDR-based system.

- *Lender of last resort*. The global central bank could serve as a lender of last resort, providing needed systemic liquidity in the event of adverse shocks and more automatically than at present. Such liquidity was provided in the most recent crisis mainly by the U.S. Federal Reserve, which however may not always provide such liquidity.

- *Adjustment*. If bancor were to circulate as a common currency, then current account imbalances among the adopting economies would reflect structural rather than monetary considerations. Instead, if bancor were to circulate as a parallel currency but in a dominant role in place of the U.S. dollar, then as in the SDR-based system described above, current account imbalances that reflect today's situation—namely, surplus countries pegging to bancor (the dominant currency in place of the U.S. dollar) with deficit countries floating against it—would adjust more symmetrically, and perhaps more automatically, than the current or SDR-based systems since the deficit currencies would be expected to depreciate against bancor.

V. Conclusion and Issues for Discussion

52. **Where to?** The global crisis of 2008/09, for all its costs, has not jeopardized international monetary stability, and the IMS is not on the verge of collapse. That said, the current system has serious imperfections that feed and facilitate policies—of reserves accumulation and reserves creation—that are ultimately unsustainable and, until they are reversed, expose the system to risks and shocks that a reformed system could minimize. Ultimately, whether the IMS is stable or not will depend on the policies of the main economies in it. But the foregoing paper identifies a number of reform avenues that, other things equal, would contribute to making the IMS more stable, in and of themselves and by reducing the demand for international reserves and diversifying their composition. Many of these reforms would require relatively new and complex forms of international collaboration, and must therefore be seen as a long haul effort. And it may well be that further exploration of alternatives lead to the conclusion that the current system, imperfect as it is, is the constrained optimum. But this should not be presumed. At this stage, Directors' views are sought primarily on the following key questions:

- Are there long-term threats to international monetary stability in recent patterns of reserve accumulation (both their level and their composition), and would collaboration on these issues be worth undertaking?

- Among the areas for collaboration identified in the paper (reserve adequacy, capital flows volatility, global adjustment mechanism, diversifying national reserve assets, global reserve assets), which are likely to be the most productive?

- In the areas they deem as higher priority, what are Directors' reactions to the specific ideas outlined in the paper?

Directors' answers to these questions will help shape the future work agenda on this topic, bearing in mind the IMFC's request for a report on these and other mandate-related questions by its Fall 2010 meeting.

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