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Towards A New Global Reserve System

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I. Introduction

The economic crisis has resulted in renewed attention to the creation of a new global reserve system. Some of the reasons should be obvious.[1] At least since the beginning of the century, the dollar has no longer seemed a good store of value; its value has been volatile and apparently subject to secular decline.[2] But the crisis has further undermined confidence in the U.S. economy and its management, and thus the dollar as a reserve currency (Bergsten 2009; Eichengreen 2009; United Nations 2010).[3] The way the country responded to the crisis—the enormous increase in debt and the ballooning of the Federal Reserve's balance sheet, from $800 billion to more than $2 trillion—provided further worries to those holding large reserves, typified by statements of China's Premier Wen Jiabao. There were concerns about inflation (though those anxieties could be addressed by shifting holdings to TIPS, inflation-indexed bonds) and declining exchange rates. Moreover, to many, especially outside the United States, it seems peculiar that a twenty-first century global economy should be dependent on the currency of a single country.

So long as America was the single superpower and its economy was dominant, few wanted to challenge its seeming resistance to the creation of a global reserve system. But with the crisis, this suddenly changed. The UN Commission of Experts on Reform of the International Monetary and Financial System[4] highlighted the ways in which the dollar reserve system contributed to global financial instability and a weak global economy.[5] Those in developing

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[1] A point noted in Chapter 9 of Stiglitz (2006).

[2] On a broad, trade-weighted index, the value of the dollar declined almost 10% from January 2000 to January 2010 (http://www.federalreserve.gov/releases/h10/summary/indexb_m.txt) and the volatility of the dollar exceeds that of the euro (Chinn and Frankel 2008).

[3] As usual, one has to be careful to distinguish between a shift in the demand curve and a change in the equilibrium demand. The demand curve is also affected by perspectives of risks associated with other currencies. Thus, while the dollar may be perceived as riskier than it was, so too might the euro (as a result of, say, the Greek crisis). The result is that relative holdings of dollars in reserves may have changed less than one would have expected, focusing only on the decline in the confidence in the dollar. While data on reserve holdings are incomplete, for emerging and developing countries, dollar holdings as a percentage of the allocated reserves (reserves whose currency composition has been identified) fell more than 21%, and as a percentage of total foreign exchange holdings by more than 46% between 2000 and 2009 (IMF Statistics Department 2010). But perceptions of increased risk associated with holdings of government paper may also have played an important role in the growth of sovereign wealth funds; countries are moving substantial amounts of their "precautionary savings" into other assets. (See the discussion below.)

[4] United Nations 2009.

[5] These effects have been discussed extensively elsewhere, including in the other papers in this symposium (see, in particular, Ocampo (2007/08; 2010a, b), Ocampo and Williamson (2010) and Williamson (2010) and the papers cited there; in Robert Triffin, 1960; and in Greenwald and Stiglitz, 2010 and Stiglitz, 2006). The most obvious of these concerns is that setting aside reserves

countries and emerging markets are especially sensitive to the inequities of the current system, where the United States is able to borrow at low interest rates from these countries.[6]

These concerns—a global reserve system that seems inequitable and that contributes to a weak and volatile global economy—have culminated in a demand for the creation of a new global reserve system. Based on the report of the UN Commission, in June 2009 the United Nations Conference on the World Financial and Economic Crisis and its Impact on Development called for the beginning of discussions; several countries—China[7], France, Russia—have been vocal about the desirability of a new system, though the United States has not enthusiastically endorsed such a discussion.[8]

One final factor has provided impetus to the discussions: the newly issued reserves could provide a convenient way of helping finance expenditures for climate change adaptation and mitigation for developing countries. The developed countries made a commitment to provide such support in the Rio Convention in 1992, and it is generally thought that as much as $100 to $200 billion a year are required. Yet, especially after the crisis, as national debts have soared in most of the developed countries, finding the money appears increasingly difficult. Newly created reserves can help fund "global public goods," including expenditures related to climate change and development.[9]

This paper does not make a political forecast concerning whether or when a new global reserve system will be created. What it tries to do is to analyze the impact of alternative reserve systems within a global general equilibrium model, focusing in particular on the sources of demand for reserves. It argues that the real choice facing the international community is whether to create, systematically, a new global reserve system, or to "muddle through," moving from the dollar-based system to a two- or three-currency reserve system, which

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(income that countries are not spending) depresses global aggregate demand. (See, for example, John M. Keynes 1942-43.)

[6] See Rodrik (2006) and Stiglitz (2006). R. N. Cooper (2010), citing a study by the McKinsey Global Institute, estimates the net benefits to the United States in the order of $40 to $70 billion. Even if these benefits do not constitute an "exorbitant privilege," the United States almost surely has access to funds at a slightly lower interest rate than it otherwise would. Later, we suggest that the *net* benefits to the United States may be negative, taking into account the macroeconomic consequences.

[7] Zhou Xiaochuan, Governor of the People's Bank of China, gave a widely acclaimed speech on the subject, "Reform the International Monetary System," March 23, 2009 (available at http://www.pbc.gov.cn/english/detail.asp?col=6500&id=178), shortly after the UN Commission, in its preliminary report to the UN, highlighted the need for a new global reserve system.

[8] Indeed, at the June 2009 UN Summit, the United States expressed explicit reservations about such discussions, at least within the context of the UN.

[9] See Soros (2002) and IMF Survey (2010).

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could be even more unstable and volatile. We believe there is much to be gained—even for the United States—from a move to a new global reserve system.

It should be obvious why it is imperative to look at reserves and the associated current and capital account deficits and surpluses from a global general equilibrium perspective. The American-centric view has seen the country's trade deficit through the lens of the "twin" deficit—America's large fiscal deficit results in (or "causes") a large trade deficit. But equilibrium patterns of trade (and the accompanying exchange rates) are the result of demands and supplies of all countries. A closer look at the data over time and across countries shows (a) there is no close association between trade and fiscal deficits; and (b) trade deficits are as likely to "cause" (in the sense of Granger) fiscal deficits as the other way around. Countries with large trade deficits may increase fiscal deficits to maintain aggregate demand and full employment (Greenwald and Stiglitz 2010).

II. The Historical Role of Reserves

Reserves were required under the Bretton Woods system to enable countries to intervene in foreign exchange markets to maintain fixed exchange rates in the face of fluctuating demands for their currencies. Much of the reserves were held in dollars. As levels of trade and cross-border investment grew, the demand for reserves rose with the consequent scale of foreign currency transactions. The supply of dollar reserves to meet this demand had to come from U.S. deficits on either current or capital account. This created two fundamental problems.

First, since the United States under this system owned the global printing press, there was no natural limit to U.S. balance of payments deficits. This was, obviously, profoundly disquieting. It simultaneously tended to undermine confidence in the dollar. This is the well-known Triffin dilemma.[10]

In the immediate aftermath of World War II, this problem was masked by a set of fortuitous circumstances. The economic destruction in Europe and Asia caused by the war meant that the United States, with its economy unscathed, was an essential source of both the goods required for reconstruction and the funds necessary to finance it. A U.S. trade surplus, coupled with domestic U.S. price stability, generated confidence in the value of the dollar. At the same time, because returns to capital in the devastated economies of Europe and Asia were far higher than those in the United States, there was a naturally large U.S. capital account deficit, and the amounts in excess of the current account surplus provided

[10] At the time, under the fixed exchange rate system with gold convertibility, the worry was the ability of the United States to meet its commitment if holders of dollars demanded the gold. Today, the worry is different: that the value of dollars (in terms of goods or other currencies) will decline.

a supply of U.S. currency to support global growth in reserves. U.S. government deficits on the international account, associated with the Marshall Plan, troop commitments overseas and the Korean War, were, to the extent that they were not used to purchase imports (say from the United States), a source of global reserves.

Yet, even under these conditions, it is important to remember that the early Bretton Woods system was not fully self-sustaining. It was supported by extensive capital outflow controls in Europe and Asia. The United States was able to make high-yielding equity investments in these countries, which were financed to a large extent by low-yielding investments in the U.S. government securities that foreign countries held as reserves. Not surprisingly, this generated some local resentment.[11] More significantly, the post-war recovery of Asian and European economies reduced and eventually eliminated the U.S. trade surplus (although, due to high U.S. equity earnings abroad, the U.S. current account surplus did not vanish until considerably later). In concert with the rise in U.S. domestic inflation in the late 1960s and early 1970s, concern over the future value of the dollar began to increase. The Triffin dilemma began to catch up with the Bretton Woods system by the late 1960s.

The problem can be seen another way: assume the U.S. had been able to maintain a trade surplus. To supply the world's need for reserves would have required the United States to simultaneously borrow and lend (or invest)—acting as a bank. But the liabilities are government liabilities, the assets are private assets: the implication was that as reserves increased, even if the national balance sheet looked good, the credibility of the reserve currency was put into jeopardy.

The system was ultimately undone by the lack of sustainability of the fixed exchange rates and gold parities that were established in 1944.[12] Meanwhile the United States had begun to have a trade deficit. In a sense, this was inevitable, once there was no longer a compelling reason for a net flow of (private) funds from the United States to Europe to finance reconstruction.

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[11] See Servan-Schreiber (1968). This resentment is not unlike that of many developing countries today, which see themselves as simultaneously lending to the United States at a low interest rate and borrowing at a high interest rate.

[12] The reasons for this are well known: Long-term changes in the terms of trade related to differential productivity growth rates across countries could not be offset by either inflation in the high export growth countries (e.g. Germany, Switzerland and Japan, which were strongly inflation averse) or by deflations in the countries whose trade parities were deteriorating. Significant deflation in a modern industrial economy is a process of such length and difficulty that few, if any, governments are prepared to commit to it. Reserves provided by U.S. international deficits were inadequate to finance extended periods of exchange rate imbalance. More importantly, exchange rates at 1944 parities were permanently, not temporarily, out of balance. If these rates prevailed today, the euro (based on the post-war Mark and Franc exchange rates) would be about $.25 and the yen would be over 300 to the dollar. U.S. international deficits at those rates would be completely unmanageable. In the end, the United States abandoned fixed exchange rates in 1971 and the rest of the world followed.

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Thus, the global financial system of today differs markedly from that prior to 1970 (the world about which Triffin was writing) in two ways. The United States has moved into a current account deficit, and the world has a flexible exchange rate system. The U.S. deficits were, in a sense, a natural concomitant of the demand for increased reserves.

III. The Impact of Flexible Exchange Rates

The need for national reserve holdings did not vanish with the movement to flexible exchange, nor did the post-1971 decline of the dollar eliminate the dollar's role as a global reserve currency. Foreign exchange market instability may have actually increased the demand for reserves to dampen destabilizing short-term fluctuations in rates.[13] In the absence of capital controls, which were greatly reduced post-1971, speculative capital flow may lead to short, sharp changes in exchange rates as traders try to take advantage of anticipated future changes in rates.[14]

At the same time, the Triffin dilemma may be made worse. The United States, as a reserve-currency country, still enjoys the freedom from international deficit discipline that it enjoyed under the original Bretton Woods fixed-rate regime. But now the cost to others of dollar deficits and/or inflationary U.S. domestic policies is greatly enhanced. With fixed exchange rates, the United States could not reduce the value of its reserve indebtedness by devaluing the dollar. With flexible rates, unrestrained U.S. deficits, which undermine confidence in the future value of the dollar, lead to anticipatory declines in its value. As these declines occur, they further reduce confidence in the dollar as a medium of international exchange. The result can be a major erosion in the value of U.S. overseas liabilities. Thus, present-day concerns with U.S. international deficits and the future value of the dollar (especially relative to Asian currencies) are not just an aspect of the current crisis; they are inherent in a reserve system dominated by a single currency.

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[13] European countries eventually stopped accumulating reserves (though between March 2009 and April 2010 Eurosystem foreign exchange reserves increased by some 5%; see http://www.imf.org/external/np/sta/ir/IRProcessWeb/data/EUA/eng/hsteua.csv). Countries that believe that they have ready access to (hard currency) credit, should they need it, have little need to hold reserves, which can have high opportunity costs. Total holdings of reserves have, of course, increased enormously, largely in developing countries, for reasons that we explain later in the paper.

[14] What happened was in marked contrast to what "market fundamentalists" had predicted would happen. They believed that markets would stabilize exchange rates. The fact that the advocates of moving to flexible exchange rates underestimated the costs does not mean, of course, that the move was wrong: it was clearly impossible to make a fixed exchange rate system work.

The shift to flexible exchange rates exacerbated a second aspect of the dollar-dominated global reserve system. With fixed exchange rates, chronic surplus countries are limited to those benefiting from favorable productivity and resource (e.g. oil price) trends that improve their terms of trade. With flexible exchange rates any country that is willing to see the value of its currency fall can create a potential surplus by manipulating its exchange rate downward. Broadly speaking it achieves this either by selling its own currency, of which it has an unlimited supply, in foreign exchange markets or by lowering domestic interest rates in order to drive financial capital abroad. In the latter case, sales of local currency by departing investors drives down the exchange rate.[15]

IV. Global Reserves and the New International Equilibrium/Disequilibrium

Governments and private agents determine the demand and supply of funds in different currencies, and this gives rise to a set of exchange rates and trade imbalances. Concern has been raised about four aspects of the current international monetary and financial system: (a) it is associated with large, unsustainable, imbalances; (b) it exhibits high volatility (e.g. in exchange rates, interest rates, and access to capital); (c) responses to the volatility lead to increased demand for reserves, which contributes to an insufficiency of global aggregate demand; and (d) there are grave inequities as poor countries lend to rich countries at low interest rates and borrow back funds at high interest rates. A central part of these problems is the global reserve system. At the same time, it must be recognized that the global reserve system is not the only problem with the global financial system. Still, a well-designed reform of the reserve system could ameliorate all four problems. Indeed, the four factors interact through the reserve system: a high level of volatility leads to increased demand for reserves, which in turn leads to weaker global aggregate demand.

To analyze the global general equilibrium, we have to understand not only America's supply of reserves, but also the rest of the world's demand—and this in turn is related to why countries might want to run trade surpluses.

There are several potential motives for doing this. Protection of local industry, (e.g. in Germany) can be achieved without restrictive trade measures, simply by undervaluing an economy's currency, which both reduces imports and stimulates exports. Countries with limited powers of fiscal and monetary intervention (e.g. China) may conduct their macroeconomic policy by stimulating demand for domestic output through lower exchange rates or, less frequently, by reducing demand through upward currency revaluation. The export-led growth

[15] In some cases, this may give rise to inflationary pressures, so that there may be little or no real devaluation. But, so far, China has shown that it can contain these inflationary pressures while maintaining what appears to many to be an undervalued exchange rate.

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model has been championed around the world, and one of the ways of promoting exports is a low exchange rate. The demand for a large margin of safety of imports over exports (because, as in Japan, imports of food and raw material are regarded as essential to national well-being) can be achieved, along with a high level of reserve holdings, through currency manipulation. Natural resource-exporting countries, aware of the high volatility of their export prices, need stabilization funds to help them weather the periods of low prices. Finally, countries that have historically run deficits, financed through dollar-denominated overseas borrowing, may experience the kind of painful adjustment that affected East Asia in the late 1990s. A collapse in the value of the currency, leading to a sharp rise in the local currency burden of foreign debt, may lead to widespread bankruptcies and painful economic contraction. In the wake of such an experience, these countries may insure against a recurrence by deliberately undervaluing their currencies so they never again have to deal with chronic deficits.

The problem created by these structural surpluses is that, summed over all, the global surplus (deficit) must be zero. Thus, chronic surpluses must be offset by chronic deficits. If surplus countries insist on maintaining their current account positions, a reduction in the deficit by one country must show up as an increase somewhere else. This can be part of the process of contagion: a country facing a crisis reduces its trade deficit, but the response entails an increase in deficits elsewhere, possibly to the point of creating a new crisis elsewhere. Ultimately, however, the offsetting deficit has come to reside with the reserve currency country, given its ability to borrow in its own currency. The United States has become the deficit country of last resort.

The current system has a deflationary bias for two reasons: the buildup of reserves through trade surpluses means that those countries are producing more than they are spending. And to supply reserves, the reserve currency country runs a trade deficit, which subtracts from its aggregate demand.[16] Unless the impact is offset, say by an investment boom or government spending, sluggish growth in that country will then tend to reduce the growth in exports by the surplus-seeking countries. A U.S. recession inevitably gets transmitted abroad where countries seek to offset the resulting balance of payments deterioration by further currency manipulation. The result is a chronically unstable global macroeconomic situation with a strong deflationary bias.[17]

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[16] We should emphasize that the reserve country may not set out to "supply reserves." The trade deficits (and reserve supply) are part of the global general equilibrium that arises in response to the demand for reserves by other countries.

[17] It is possible, of course, that the reserve country's ability to borrow at low interest rates could, at least in the short run, lead to an increase in its spending that more than offsets the savings on the part of the countries accumulating reserves, making net global effect inflationary. In the past, the

V. The Demand for Reserves

It is now widely accepted that the demand for reserves has contributed to weaknesses in global aggregate demand.[18] One response is the creation of a new global reserve system (possibly by the expansion of SDRs); another is to reform the global financial and economic system in ways that reduce the demand for the accumulation of reserves. This section addresses the second approach.

To understand how one might reduce the demand for reserves, one has to understand the factors that have contributed to the recent unprecedented rise in reserves—more than quadrupling over the last decade, from under $2 trillion in 1999 to more than $8 trillion in 2009, with emerging and developing economies responsible for almost three-quarters of that increase. There are at least three contributing demand factors[19]: (a) the high level of global macroeconomic volatility and the inadequacy of alternative mechanisms for risk mitigation have led to a high demand for precautionary savings (reserves); (b) the export-led model of growth, which has been touted as the most successful model for development, and recent trade agreements that have circumscribed the ability to use other instruments to promote exports; and (c) the high level of natural resource price volatility, especially that of oil.

We will explain why several of these factors have changed in the past fifteen years in ways which have led to a marked increased demand for reserves.

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willingness of many developing countries to spend beyond their means—risking future crises—probably played an important role in offsetting the deflationary bias of the system. Today, however, the deflationary net effect of the current reserve system is of particular concern because (i) reserve accumulations are far larger than they were before, say, 1997; (ii) developing countries have increasingly subscribed to tenets of fiscal and monetary prudence; and (iii) the ability of the United States—which had become the consumer of last resort—to fill in the gap is limited, given its household and government indebtedness and monetary policy constraints.

[18] Critics of this view point to the fact that growth in the past decade—during which there has been rapid build-up of reserves—has been higher than the previous decade. The deflationary bias of reserve build-up can, at times, be offset by government policy. Some would argue that this was the case during much of the past decade, through an unsustainable monetary policy that supported real estate bubbles in many countries. Currently, monetary policy cannot be used to offset this deflationary bias, and there is a worry that the scope for fiscal policy is also limited.

[19] Any global general equilibrium can be understood only as a balance of demand and supply. We have described some of what might be viewed as the reasons developing countries have run surpluses. But their willingness to run surpluses is affected, of course, by the other side of the equation, what might be viewed as the "supply of deficits," which in turn affects global prices (e.g. returns on investments abroad). Deregulation and financial sector deception led to a bubble and the *appearance* of high rates of return on large amounts of what turned out to be spurious investments. Justin Lin has emphasized this side of the global general equilibrium.

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(a) The high level of global macroeconomic volatility and the inadequacy of alternative mechanisms for risk mitigation.

Since the era of liberalization and deregulation began some three decades ago and since the world moved to a system of floating exchange rates (and managed floats), the world has been afflicted by repeated economic and financial crises.[20] The recession of 2008 is only the most recent and the most severe. But those countries (such as China) that had large reserves with which to finance a strong Keynesian stimulus have fared far better than those without adequate reserves. Having reserves doesn't necessary protect one fully; but had Russia not had adequate reserves, it would have faced a far more severe crisis.

But even apart from these calamities, an ample supply of reserves upon which countries can draw enables them to stabilize exchange rates. A more stable exchange rate reduces a major risk facing businesses (extending years after investments are made, so that firms can't mitigate the risk through futures markets), with positive benefits to investment.[21]

Such volatility imposes particularly high costs on developing countries because financial markets have done an inadequate job in shifting risk (e.g. the risk of interest rate and exchange rate fluctuations) from developing countries to the developed countries, which should be better able to absorb such risks. Standard economic theory suggests that, with efficient capital markets, risk-averse developing countries would have borrowed in their own currency. While recent theories have explained why private borrowers may borrow excessive amounts in foreign currencies, [22] there is no fully adequate explanation of these capital market imperfections and "failures."[23]

Given these inadequacies in modern financial markets, countries have set aside trillions of dollars in reserves *at great cost.* The cost of reserves is largely the opportunity cost: funds effectively lent to the U.S. government (now at close to a zero interest rate) could have been invested at home at much higher returns.

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[20] Of course, except for the relatively short period after the Great Depression, when strong regulations were put into place, market economies have been afflicted with crises since the beginning of capitalism. See Reinhart and Rogoff (2009).

[21] The modern theory of the firm has provided a variety of explanations for why firms should be expected to behave in a risk-averse manner. (Much of the development of derivatives is *justified* by the fact that such markets help risk-averse firms manage the risks that they face.) Empirical research has not always been able to identify the effect on investment. However, see Darby et al. (1999), Servén (2003), and Aghion et al. (2009).

[22] Capital markets are not efficient because developing-country borrowers do not internalize the risks they create by borrowing in foreign currencies. (See Korinek 2009).

[23] One argument sometimes provided is that there is a moral hazard associated with inflation. This does not provide an adequate explanation, since inflation-indexed bonds and/or bonds linked to the exchange rate of similarly situated countries could have been issued.

That governments are willing to forego those high returns testifies to the high social benefits of reserves.[24]

The accumulation of reserves does not, of course, mean that countries have to run current account surpluses. They can run a capital account surplus, accumulating what are sometimes called "borrowed" reserves. The problem is that such reserves are less reliable; foreigners who have put money into the country may demand it back quickly. [25]

(b) The export-led model of growth: Is there an alternative?

Governments around the world have been encouraged to promote exports as a way of promoting growth. The countries of East Asia have been well served by that model. One of the reasons that exports may be associated with rapid growth is that the growth of these sectors promotes learning—the transformation of the economy into a modern industrial and knowledge society.[26]

The promotion of exports does not necessarily lead to a trade surplus—and in fact did not do so to a large extent until the last decade. In a "three-commodity model," one can encourage both exports and imports, shifting production and consumption away from import substitutes and non-traded goods.

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[24] The fact that a country chooses to hold money in reserves rather than spend it means, of course, that *in total*, it believes the social return from doing so is larger than the alternative. The full (opportunity) costs depend on the circumstances of the country and how the money might have been spent. The cost calculus is somewhat more complicated in at least three ways: (a) many of the high-return investments involve domestic resources, and converting foreign exchange earnings would lead to an appreciation of the exchange rate and/or an overheated economy, with the adverse consequences noted in the text; (b) postponing investment may allow investments in technologies that are more appropriate to the country's evolving economic structure, and hence the "cost of delay" may be less than it otherwise would seem; and (c) there are long-term benefits of additional "learning" consequent from the extension of the low exchange rate, again reducing the cost of "delay." Critics of a slow adjustment often focus on the threat to inflation, but most of the East Asian countries have been able to contain these inflationary pressures through other instruments; however, in other parts of the world, that might not have been the case. The full marginal general equilibrium effect of a change in reserves may differ, too, depending on whether the country is running a trade surplus or deficit (whether the reserve accumulation is based on "borrowed" reserves). See the discussion below.

[25] In the East Asia crisis, one important measure of a country's vulnerability was the ratio of its dollar-denominated (or other foreign-denominated) short-term liabilities to its reserves. Hence, if a country increased its reserves through short-term borrowing, the likelihood of a crisis was unchanged—even though its reserves appeared larger. Only if the country increased its reserves by running a trade surplus or borrowing long-term would the likelihood of a crisis be reduced. A global general equilibrium approach (of the kind outlined in Greenwald and Stiglitz [2010]) identifies not only the overall level of the demand for reserves, but its composition and structure. This will be affected, too, by the ability and willingness of a country to prevent capital flight in the event of a crisis.

[26] See Greenwald and Stiglitz (2006).

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One can still have "trade balance" in an export-led growth model, and many countries did so, especially as the increased exports were offset by increased imports of capital goods.

One of the reasons for the change may, in fact, be the combination of neoclassical orthodoxy and WTO Uruguay Round strictures that made industrial policy more difficult (restricting not only protection levels, but also export and other subsidies) and seemingly less attractive. To encourage exports, then, countries had to rely more on exchange rate policy. But exchange rate policy simultaneously encourages exports and discourages imports—giving rise to trade surpluses.

The Uruguay Round agreement may have contributed to the problem in another way. The "Grand Bargain" was supposed to entail a significant reduction in agricultural subsidies, but the advanced industrial countries reneged on this part of the agreement.[27] U.S. subsidies after the Uruguay Round were actually increased substantially, and even when the WTO ruled that the U.S. cotton subsidies were WTO illegal, there was little change in policy. While in other areas, countries can impose countervailing duties, they are more constrained in doing so in agriculture.[28] The only way developing countries can offset the adverse distributional effect on their poorest citizens is to keep a low exchange rate. To put it another way, were they to allow their currency to appreciate, their poorest citizens would be hurt as a result of competition with America and Europe's highly subsidized farmers. Though they could respond by similarly subsidizing their farmers, to do so would take away funds badly needed for development. Thus, a low exchange rate serves both distributional and developmental objectives. But it also results in large build-ups of reserves.

There are alternative high-growth strategies, and China may in fact be switching to such a strategy through government investments in education and technology.[29]

Export-led growth is important in the initial stages of development as a way of promoting technology during a period in which the growth of demand may lag the growth of supply. But part of development strategy is the improvement in institutional arrangements that can facilitate the growth of domestic demand (e.g. public health and education, and improved financial institutions providing access to credit and insurance, which reduce the need for savings).[30] But China's high

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[27] See Charlton and Stiglitz (2005).

[28] The Uruguay Round created a category of subsidies that were non-actionable (the green box) that were *supposedly* non-distortionary. A closer look at these subsidies makes clear that most of them are distortionary, especially in a world of imperfect capital markets.

[29] It is a switch that is possibly also being encouraged by global trade policy: TRIPS has made it increasingly expensive to rely on foreign technology.

[30] China's gender imbalance may be another factor driving its high household saving rate. See Wei and Zhang (2009) and Du and Wei (2010).

savings rate is largely associated with a low share of household income in GDP, and changing the distribution of income (increasing the share of household income in national income) is always difficult and not typically accomplished quickly.

(c) The high level of natural resource price volatility, especially that of oil.

High growth in China combined with limited supplies of natural resources have, naturally, contributed to increasing prices of exhaustible natural resources like oil. The prices of these commodities have also been highly variable.[31] Sellers of these resources are aware of this variability and have been repeatedly advised on how to manage their economies in the presence of this high volatility, through the creation of stabilization funds—a form of precautionary savings that simultaneously helps avoid exchange rate appreciation (the Dutch disease problem). These accumulations of reserves were particularly important in the Middle East in the years before the current crisis.

Motives for holding (or increasing) reserves are often mixed and may change over time. China may have initially been driven by a "precautionary" motive, but current reserves exceed the levels that could be justified on that basis alone—current policy seems *more* related to its export-led growth model.

We have focused here mostly on those countries that have built up reserves through trade surpluses. But today, as we have noted, many countries have reserves that are at least partly a result of capital account surpluses. Such reserves are sometimes called "borrowed" reserves. There are several motives: (a) they may represent precautionary savings, especially against the risk of a reversal of the capital flows, especially if there are large amounts of foreign-denominated short-term debts; or (b) they may be an attempt to offset the adverse inflationary or exchange rate appreciation effects of capital inflows. In that sense, the motives are not unlike those described earlier—to stabilize the economy and promote exports *from what they would have been in the absence of the intervention.* It may not be easy or possible to identify, in any particular case, the mix of motives. For our purposes, though, the central point to emerge from this analysis is that a change in the reserve system may affect the demand for reserves, and this is true whether a country has a trade surplus or a trade deficit, whether or not the reserves are borrowed reserves or not, though the magnitude of the effects can clearly differ depending on the country's situation. The proposal we present below, in particular, should have the effect of reducing the "precautionary"

[31] See Hamilton (2009) on recent oil price volatility. There is a view that the financialization of commodity markets, documented by Büyüksahin, et al (2008) for oil, has contributed to this volatility. The economics literature, however, provides little support for this hypothesis; see, for example, Smith (2009) and Buÿuksaahin and Harris (2009).

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demand for reserves, and to the extent that that is true, it will lead to smaller trade surpluses (larger trade deficits) in those countries.[32]

VI. Equilibrium Reserve Levels

The first decade of the twenty-first century saw a remarkable build up of reserves. Previous subsections have outlined possible explanations. One may perhaps think of this build up of reserves as a movement from one equilibrium (defined, for instance, as a desired ratio of reserves to GDP or trade) to another. We have explained the factors that one might have expected to lead to an increase in the demand for reserves. The problem is that some of the factors leading to increased demand for reserves are ongoing, increasing the demand still further. For instance, the crisis and the way it was managed globally have shown the value of having a high level of reserves, encouraging those countries that did not previously have large reserves to accumulate them.

There are several factors that may, however, tame this demand. As reserves grow *globally*—especially reserves held in the currency of one country—perceptions of a risk of a loss of value also increase (another manifestation of the Triffin dilemma); in a sense, the expected costs of holding reserves increase at the same time diminishing returns to the benefits of holding reserves (at the margin) sets in. It is clear that today China is far more worried about its holdings of reserves than when those reserves were much smaller.

But there is a partial response on the part of the countries holding reserves that will undercut these forces that otherwise might have led to reduced trade surpluses: to hold reserves not in the currency of the United States (T-bills) and other hard currency areas but in non-financial assets or in less risky financial assets. Several countries, for instance, sell inflation-indexed bonds, which protect against the risks of inflation that one might think would increase as the indebtedness of the country increases. But such markets are relatively small and far less liquid than T-bill markets, so that they may be less effective in risk-mitigation.[33] Non-financial assets are, of course, more illiquid and still riskier. Yet, as government reserves increase, especially when the increase in reserves is due to the country pursuing an export-led growth strategy, governments are able to bear the additional risk, especially since such risks are accompanied by markedly higher returns when the funds are invested well. The major problem,

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[32] What matters, of course, is not just the change in the reserves, but the concomitant changes in behavior. Regardless of whether the country has a trade deficit or surplus, a marginal change in reserves could be (and typically would be) accompanied by a corresponding change in trade (with consequent effects on aggregate demand).

[33] Moreover, they do not fully protect against exchange rate risk, at least in the short run, when purchasing power parity doesn't hold.

however, is political: in spite of an official belief in free and open capital markets—and a demand that developing countries open up their capital markets to investors from advanced industrial countries—developed countries are likely to resist opening up their markets fully to sovereign wealth funds, or possibly even to firms in which governments have a large share. Curtailing investment opportunities reduces the returns to holding reserves, and again, in balancing out the costs and benefits of reserve accumulations, this may lead governments to limit the size of reserves.

Wealth Management and the Risk of a Two- or Three-Currency Reserve Regime

The large reserve holdings—combined with the volatility of global financial markets and enhanced understanding of the principles of risk management—have changed perspectives on reserve management.[34] It used to be a canon that reserves would be held in dollars. But, as we have noted, the dollar is no longer a good store of value: its value has been volatile and in secular decline. Countries have learned about the principle of diversification. Thus many (most) countries put a large fraction of their reserves in euros and other currencies. Though the recent volatility in the value of the euro has highlighted that no currency is "safe," it has not undermined the principle of diversification.

The problem is that as countries take an increasingly active role in managing their reserves, the global financial system may become increasingly volatile; a two- or three-currency reserve system may be more volatile than a single currency system. (For an excellent discussion of this, see Williamson [2010]). If countries holding large amounts of reserves come to believe that the dollar will be decreasing in value relative to the euro (because, say, of political and economic events in the United States or Europe), they may dump dollars and buy euros; because they are sufficiently big players in the global financial markets, their purchases and sales collectively may move the market—reinforcing the decline in the dollar.

Even in countries that might claim that they are not speculating, managers of reserves funds are held accountable. They have to make judgments about relative returns in different assets, not necessarily on a minute-by-minute basis, but over longer periods.

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[34] Our analysis of the demand for reserves has focused on factors other than the transactions demand, which has been stressed by others (Eichengreen 2010). In a world of convertible currencies, there is no need to hold wealth in the same currency that one might spend the money, though a full risk analysis needs to take into account "real" returns measured appropriately. Oil might be transacted in dollars, but holding a euro bond might still provide a better hedge against long-term oil prices.

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The largest holders of dollar reserves may, of course, act more cautiously, aware of the impact of the decline in the dollar's value on their remaining holdings. Moreover, those countries whose major motivation for holding reserves (at the margin) is exchange-rate management (for promoting export-led growth) may even be forced in these circumstances to increase their holdings of dollars, to avoid movements of the exchange rate. But to balance the increasing risk of a loss in value, they may move holdings to higher yielding assets. Given the fluidity of capital markets, such processes may contribute to global financial instability, as bubbles are fed in both the reserve currency and in the countries holding reserves.

Other Strategies for Risk Mitigation

While some reforms may slightly reduce the demand for reserves, we are not sanguine about any of the reforms currently under discussion having a significant enough impact to mitigate the need for a major reform of the global reserve system.

The importance of providing alternative mechanisms for risk mitigation has now been widely recognized.[35] The IMF has put itself forward as part of the solution. Countries can turn to it as a source of liquidity in a crisis, rather than accumulating reserves.

Such proposals, while well intentioned, are not likely to adequately address the problem. Countries have to be confident that they can have access to the funds when they need them, without onerous conditions being imposed. They need to have automatic drawing rights. While previously they could be confident that onerous conditions *would* be imposed, more recent IMF programs have been far better. But there are still some recent programs that have raised concerns. More fundamentally, while there have been notable reforms of governance at the IMF, the pace of change has been slow and the reforms have not been sufficiently deep to provide assurance that the current changes are *permanent* and not the happenstance of having a head of the organization who believes in Keynesian economics. Indeed, proposed changes in voting rights, even when they are fully implemented, are, by themselves, almost surely too small to make much of a difference on most issues.

In the absence of reforms that engender *long-term* confidence, countries will want funds that they can rely on—funds that are directly under their own control. There is likely to be little shifting away from reliance on reserves.

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[35] See, for example, Stiglitz (2006) and Wolf (2010).

Enhancing Global Stability

Given that reserves will likely be the major form of "insurance" for some time to come, the overall performance of the global economy would be enhanced if other factors contributing to the demand for insurance were diminished, i.e. if the international community took actions that reduced the scope for global volatility and for the transmission of global volatility into national economies.

Two sets of policies would contribute: better coordination of global economic policy (including those directed at redressing global imbalances) and better financial sector regulation.

Unfortunately, for all the talk of global macroeconomic coordination, there has been little progress. This crisis provides ample evidence. Each country determined the size of its stimulus largely on the basis of national considerations; for instance, Ireland could openly talk about being a free rider on a global economic recovery. While recognizing that policies that maximized *global multipliers* gave the most bang for the buck, each country instead focused on maximizing national multipliers.[36]

The crisis has brought home the role of financial and capital market deregulation and liberalization in causing the crisis and its rapid spread around the world.[37] If countries respond to the crisis by re-regulating (in the appropriate way), the global economy may become more stable, and the demand for reserves may accordingly decrease.[38]

VII. Towards a New Global Reserve System

The UN Commission laid out a variety of alternative forms that a new global reserve system might take and a variety of ways by which the transition from the

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[36] There is some evidence of coordination of monetary policies. Still, the United States, for instance, may have welcomed the exchange rate effect of its extraordinarily low interest rate policies, even if they had adverse effects on Europe. So too, Europe may benefit from the low exchange rate that followed the Greek crisis.

[37] Preferential treatment of capital gains may have also encouraged speculative activity. Tax policy can discourage such speculation and thus help to stabilize the economy, simultaneously reducing the need for reserves and thereby increasing global aggregate demand.

[38] One more factor may have contributed to the magnitude of volatility faced by countries: trade agreements (WTO as well as bilateral) have reduced the scope for countries to respond to the volatility of international prices. This is exemplified by the movement from quotas to tariffs and the strong opposition of the U.S. to Colombia's use of variable-rate tariffs for agriculture . Even to the extent of engaging in protectionist stimulus programs, exemplified by the "buy America" provisions in the U.S. stimulus. (While the US made its "buy America"provision WTO-compliant and exempted the least developing countries, this effectively led to discrimination against *non-LDC developing countries*). For a general discussion of why a shift from quotas to tariffs may increase risk, see Dasgupta and Stiglitz (1977).

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current system to the new one might be accomplished. We will not repeat their fairly comprehensive discussion here. What we will do is lay out the basic trade-offs and argue for a preferred approach.

Alternative Approaches

All entail annual emissions of the new global reserve currency.[39] The alternatives differ in their degree of "ambition," the rules by which the global reserve currency (bancor) are distributed, and their institutional structures. The least ambitious is a simple extension of the current system of special drawing rights (SDRs) within the IMF, which are issued only episodically. Under the new system, they would be issued regularly and in larger amounts. The most ambitious is one which (a) allows the amounts to be issued to vary with the state of the global economy, so that the issuance of the global reserve could be an active instrument of global macroeconomic stabilization policies; (b) allows the funds to be used for the pursuit of global public goods, like development and climate change; (c) builds in incentives for countries not to maintain high levels of surpluses, recognizing that persistent surpluses generate macroeconomic externalities on the global economy by contributing to an insufficiency of global aggregate demand; and (d) creates a new institutional structure to administer the new global reserve system.

The more ambitious systems are, we believe, more likely to address effectively the deficiencies in the current system, but even more modest versions can have significant salutary effects. The new system does not have to replace the old; the two can coexist, and it is possible that the transition can occur over time in a smooth way. The more ambitious versions may be harder to negotiate—though given the additional benefits that would be reaped, they might enjoy greater support.

Our Preferred System

We strongly believe that it would be desirable to move towards the more ambitious frameworks, which simultaneously address the central problems posed by the dollar reserve system (and discussed earlier in the paper) as well as other key problems in globalization. Keynes—not surprisingly, given his focus on underemployment equilibria—argued for a system that taxed surplus countries. This could be implemented by reducing allocation of new reserves to countries with persistent surpluses. These amounts could then be reallocated, e.g. for climate change or development.

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[39] There are even simpler proposals which entail little more than countries turning in (all or part) of their current reserves in return for a holding in the new global currency. An implicit issue in any such system is sharing the risk of changes in exchange rates.

There would be distinct advantages in having a rule-based system, for example with the issuance of reserves specified by agreed upon formulae. Though agreeing on the rules may prove difficult, this will obviate some of the worries about "government failure" (at the national or super-national level). It would make little difference whether such a rule-based system was administered by the IMF or a new agency.

But even the least ambitious alternative would help ameliorate the problems we have identified. By reducing, for instance, the demand for, say, dollar reserves (obviously less so than would be the case with the more ambitious alternatives), global aggregate demand would be strengthened. Reduced reliance on the United States as a reserve currency would reduce the current anomaly of poor countries lending to the richest country in the world at a low interest rate, and borrowing funds at a high interest rate.

Global stability might be enhanced (global macroeconomic volatility reduced) through several channels. There is a broad consensus that the demand for ever-increasing reserves contributes to global imbalances. At the very least, the persistence of these imbalances has contributed to global anxiety that there might be a disorderly unwinding of these imbalances. Some believe that the "savings glut" associated with the buildup of reserves contributes to bubbles; and a move toward a global reserve system of the kind described, by reducing the need for savings for the buildup of reserves, would ameliorate this problem.[40] The risk of a playing-out of the fears of the Triffin dilemma is reduced. Volatility in the supply of reserves from the United States (with the consequent disturbance to the global financial market equilibrium) as a result of changes in domestic politics or economics would be reduced. Finally, the annual emissions of reserves would provide some buffer to developing countries without large reserves, reducing the likelihood of a balance of payments crisis, and the risk of the contagion of that crisis elsewhere.[41]

In any case, we believe, for reasons already given, that such a system would be more stable, possibly substantially so, than the multiple reserve currency regime to which the world seems to be moving.

The United States is often cited as the major source of opposition to the creation of a global reserve system, since it might lose the ability to borrow at such favorable terms—a particular concern now, given the size of the deficits. We believe, however, that the global equilibrium that would emerge would be

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[40] See, for example, Wolf (2010). Stiglitz (2010) argues that the effects could have been offset by appropriate monetary and regulatory policy.

[41] More generally, the risk properties of a global economic system with our proposed reforms would differ markedly from the existing system. A full analysis of these properties takes into account the behavioural responses of governments and private actors (with each taking into account the induced changes in behaviour of the others).

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associated with smaller U.S. trade deficits (as a result of a weaker exchange rate, from the reduced demand for dollars), and therefore there would be less need for government to run a fiscal deficit to maintain the economy at full employment (especially important in coming years, when the ability of monetary policy to provide stimulus may be severely limited). The United States, too, would benefit—like all countries—from the stronger and more stable global economy.

VIII. Regional Arrangements

In spite of these advantages, it may be difficult politically to create a global reserve system—even one of the more modest versions—any time soon. Regional reserve arrangements, such as the Chiang Mai initiative, may, in these circumstances, be an important "half-way" house, especially if they can be designed in a way that gives confidence that the funds can be drawn upon when needed.[42] Since downturns within a region are more likely to be correlated than downturns across the globe, there is an argument for providing insurance at a global level. But this advantage seems to be more than offset by the greater difficulty of getting global agreements, at least of the kind that would provide confidence to countries that the funds would be there when they need them. The large spillovers across countries within a region—and the greater understanding of each others' economies and greater sense of solidarity[43]—make it more likely that money will be forthcoming. [44]

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[42] For example, provisions requiring IMF programs in order to draw upon the facility are counterproductive and will have to be eliminated. While changes in the IMF in recent months may have made these restrictions less burdensome, countries in the region should have enough confidence in their own judgments about the appropriateness of the economic policies of their neighbors not to require the concordance of the IMF. To be sure, it makes sense for those within the region to consult with others on their views and to be sensitive to any global externalities. But those in the region are likely to have a far better understanding of the economies in the region and to be far more sensitive to regional externalities.

[43] During the East Asia crisis, there was a widespread belief within Asia that the "Asian economic model" –with its large role for the government—was neither widely understood nor appreciated at the IMF or in the Finance Ministries and Treasuries of some of its major shareholders. There was a suspicion that many celebrated the crisis as confirming its deficiencies and the superiority of the American economic model. At the time of the East Asia crisis, there were proposals for the creation of an Asian Monetary Fund. The United States strongly opposed this initiative, which might have enabled the region to recover much more quickly, with a much shallower downturn. To many in the region, it appeared that the United States thought that such an institution would undermine the effectiveness of the IMF and American financial hegemony in the region. (Whether such an institution could have been created at the time without American opposition is open to debate, given opposition from within Asia; so too is whether these perceptions are accurate. What is clear, however, is that these perceptions do affect current policy stances.) See Stiglitz (2002) and Sakikabara (2001).

[44] Just as the U.S. was the prime mover in the Mexico bailout of 1994-1995.

If effective regional reserve funds (or other arrangements that would mitigate risk) can be established, then the aggregate size of the requisite "dollar" reserves can be smaller—and therefore the deflationary impact of annual increases in the size of the funds will be diminished.

The UN Commission report commends the regional arrangements (such as the Chiang Mai initiative), encourages their expansion, and sees this as a possible way forward in the creation of a new global reserve system. This can be done in two ways: either through open regional systems, in which countries not in the region eventually are allowed to join into the regional arrangements; or by joining together the various regional arrangements into a global system.

Regional cooperation can take many forms—just as global cooperation can. Just as we have argued for the virtues of a more ambitious global arrangement, so too we would argue for a more ambitious regional arrangement. A modest arrangement would entail a vastly expanded swap arrangement along the lines of current initiatives. But we would encourage the consideration of deeper arrangements, the creation of a regional *reserve* currency (an "ASIABANCOR"), with emissions of reserves being used to promote stability and growth.

Regions like Asia or South America are too diverse to satisfy the conditions for an optimal currency area; but the conditions for ensuring the success of a reserve currency are much less stringent. Such a reserve currency need not fully replace the use of other currencies in reserves.

A Portfolio Approach

As we have noted, regional reserve arrangements do not allow risk diversification to the same extent that a global reserve arrangement would. Yet, given the limited likelihood of a quick adoption of a global reserve system, we would encourage a portfolio approach—moving forward on several forms simultaneously: more ambitious regional arrangements concurrently with less ambitious arrangements at the international level, such as using SDR expansions for financing climate change policies.

IX. Concluding Comments

The world's financial system has been marked by a high level of instability in recent decades. The view of free-market fundamentalists that a movement to free and fully flexible exchange rates accompanied by financial and capital market liberalization would automatically be accompanied by the development of good markets for managing risk and a new era of true stability and high growth (as the episodic adjustments of exchange rates under the old regime came to an end) has

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been proven wrong. There have been far more financial crises—more than 120 in the last three decades; growth in most countries—other than those that did not buy fully into these doctrines—has actually been slower; and inequality has increased.[45] The international community has not managed these crises in ways that have instilled confidence, at least within developing countries.

Most of the crises occurred in developing countries, with the IMF and the G-7 bailing out Western banks that had made bad lending decisions—but with the burden of the bailout falling on the citizens of the developing countries. The effects of the crises were contained. So too, as the bubbles within the advanced industrial countries broke, government came to the rescue, with the Greenspan-Bernanke put. The inference made by many was that the system—free-market economics—worked wonders. But it was the wrong inference. What enabled the system to work, at least as well as it did, was that government was constantly coming to the rescue.[46]

This crisis has brought out into the open the deficiencies in current economic arrangements and the economic philosophies that underpin them. But these economic arrangements have served certain interests well; not surprisingly, reforms have been slow. Changing global economic arrangements is even more difficult.

The consequence is, as we have argued, heightened demands for reserves. The magnitude of these increases might be diminished with reforms in the ways that the international financial institutions work and in the "global financial and economic architecture"—rethinking, for instance, the principles of financial and capital market liberalization, both as they affect movements of capital and finance across borders and as they affect financial markets within a country; improving private financial markets so that they actually do a better job in managing risks, especially those facing developing countries; reforming the ways in which sovereign debt is restructured; and reforming the global trading system, which allows countries to manage their risks better and promote their development more effectively. Even with such reforms, there are likely to be substantial increases in reserve holdings in coming years—a form of precautionary savings that will weaken global aggregate demand. But without such reforms, the increases will be even larger, and the global economy even weaker. Of particular concern is the limited ability of monetary and fiscal policies to offset these adverse effects in the immediate future.

We have argued in this paper that a new global reserve system is therefore essential, if we are to restore the global economy to sustained prosperity and stability. But achieving this, too, will not be easy. In the interim, the countries of Asia and Latin America have an opportunity to strengthen existing regional

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[45] There may, of course, be many other factors contributing to these macroeconomic changes.
[46] See Stiglitz (2010) and Soros (2008).

arrangements. Doing so would not only contribute to the strength of their economies, but possibly also be a critical building block in the creation of a new global reserve system.

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