

The International Monetary System: Living with Asymmetry

Maurice Obstfeld
UC Berkeley, NBER, and CEPR

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The global economic crisis of 2007-09 generated calls to re-think the international monetary system, and indeed, the entire institutional framework within which international financial integration has advanced since the fall of the Bretton Woods regime four decades ago. Gaps in national and international structures of financial regulation were an obvious factor in causing the most severe global crisis since the Great Depression; another paper in this volume surveys that topic. Interactions between national macroeconomic policies also played a role, however, and have continued to generate rancor between countries as a geographically uneven recovery from the crisis has unfolded. The crisis and its aftermath exposed stresses in the world's monetary system that may lead to future trouble if the international community does not address them.¹

This paper analyzes current stresses in the two key areas that concerned the architects of the original Bretton Woods system: international liquidity and exchange rate management. Despite radical changes since World War II in the context for liquidity and exchange rate concerns, they remain central to discussions of international macroeconomic policy coordination. To take two prominent examples of specific (and related) coordination problems, liquidity issues are paramount in strategies of national self-insurance through foreign reserve accumulation, while recent attempts by emerging markets to limit real currency appreciation have relied heavily on nominal exchange rate management. A key message of the paper – an obvious point, but one that nonetheless is

¹ The crisis brought home vividly the strong two-way interaction between macroeconomic policies and financial-sector stability, demonstrating the folly of viewing macro and prudential policy as somehow orthogonal to each other. While my discussion thus will focus on macroeconomic policies, I will inevitably touch upon financial-stability considerations at several points.

a key starting place for predicting a range of tensions in any system of international monetary arrangements – is that a diverse set of potential asymmetries among sovereign member states provides fertile ground for a range of coordination failures.

Despite the progress of technology, financial innovation, globalization, and development, sharp international asymmetries remain and so coordination failures with recognizable analogs in earlier historical eras have emerged. Earlier efforts at international monetary reform attempted to reconcile individual nations' demands for domestic economic stability with a smooth international adjustment mechanism. Those attempts had limited success, and even the most ambitious and successful of them – the Bretton Woods system – crumbled after a quarter century under the weight of its internal contradictions. The recent global crisis has highlighted once again the twenty-first century incarnations of a range of time-honored systemic strains. Some of the problems have become more severe, or problematic in new ways. The resulting pressures on international economic relations define the current reform agenda.

The plan of this paper is as follows:

[Brief description of sections]

1. International Liquidity and Triffin Dilemmas

Like households and firms, governments need access to liquidity – readily salable assets (including cash, of course) that may be spent on goods or (particularly in crisis situations) on other assets. In a closed economy, the government (through its central bank) is always capable, in principle, of providing for all liquidity needs. In the open economy this is no longer the case. When the need is for a foreign currency, which governments cannot

print, gross holdings (reserves) and available foreign-currency credits constrain a government's powers, whether to provide liquidity to markets (as in a foreign exchange intervention) or to market participants (as in an emergency loan to a bank).

Throughout history, international reserves have been an important source of liquidity. What properties characterize an attractive international reserve asset? In the broadest terms, the asset should be widely acceptable as payment at a predictable value, even when liquidated without notice. But in what numeraire should value be measured? Merely asking the question reveals that “predictability of value” cannot be an absolute norm, unless the numeraire is a particular money – such as the international vehicle currency, which the American dollar overwhelmingly remains – or a particular commodity such as gold. In a world of significant departures from purchasing power parity, maintenance of *real* value (in terms of a comprehensive consumption basket) necessarily depends on the beholder. In a global economy, however, it may be more relevant to refer to “liquidities” than “liquidity.” If several currencies are widely used internationally as medium of exchange and/or unit of account, then it may well be desirable for a country to hold liquidity in all of those currencies, regardless of moderate changes in their relative values – a theme I explore further below.

Changes in value, moreover, can arise in different ways (again depending on the numeraire against which value is reckoned). Exchange rate and inflation risk are obvious possibilities, but so are default risk, sovereign or private, and political risk. Foreign-currency U.S. bonds issued by the Carter Administration inherited the minimal (at the time) default risk of conventional dollar-denominated Treasury obligations. On the other hand, liquid dollar liabilities of London eurobanks (typically counted in reserve measures

if owned by monetary authorities) carry counterparty risk (absent an official bailout) but not currency risk vis-à-vis the dollar. Again, safety is in the eye of the beholder.

Countries experiencing or contemplating political tensions with the U.S. – think Iran, Iraq, Russia, and now, Libya – might prefer the counterparty risk intrinsic to a lightly regulated offshore center to the risk a retaliatory freeze on assets held in the U.S.²

In the early post-World War II economy, with global capital markets dormant and much of the industrial world in ruins, the main forms of international liquidity were gross holdings of gold and U.S. dollars (and, to a lesser extent, sterling). Eichengreen (2011) paints a vivid picture of this period of virtually unrivaled dollar dominance as a reserve asset in the 1950s. That dominance persisted through the demise of the Bretton Woods system in the early 1970s (and indeed far beyond), but not without increasing tensions.

These tensions arose from one of a class of problems to which any reserve-asset system is potentially susceptible: what may be called a *Triffin dilemma*. A Triffin dilemma arises any time increasing demand for a reserve asset strains the ability of the issuer to supply sufficient amounts while still credibly guaranteeing or stabilizing the asset's value in terms of an acceptable numeraire.³

The Classic Triffin Dilemma: It's Mostly Fiscal

² The possibility of holding dollar reserves in banks outside the U.S. shows that it is not necessarily correct to assert that U.S. balance of payments deficits govern the growth rate of world dollar reserves. Of course, liquidation of such offshore reserves by the non-U.S. holder will ultimately have the same effect on the U.S. balance of payments as if the reserve assets liquidated were themselves held in the U.S.

³ The clearest recent identification of a Triffin dilemma in the contemporary context comes from Farhi, Gourinchas, and Rey (2011), although the general problem had been recognized before (for example, see Henning 1994, p. 317, in connection with the internationalization of the deutsche mark and yen).

Under the Bretton Woods arrangements, countries pegged their currencies to the U.S. dollar, while the U.S. Treasury continued a longstanding commitment (dating from January 31, 1934) to redeem dollars held by non-U.S. central banks and governments for gold “for legitimate monetary purposes” at a price of \$35 per ounce.⁴ While the Treasury guarantee of the dollar gold link reassured foreign official dollar holders that their reserves were “as good as gold,” led to at least two potential inconsistencies.

The first inconsistency was familiar from the classical gold standard. If world output growth outpaced world gold production, the relative price of gold would likely have to rise, implying secular deflation assuming a fixed market gold price of \$35 per ounce. Countries outside the U.S. could maintain their internal price levels by devaluing against the dollar, but the U.S. itself did not have this option. For a time in the 1950s and 1960s, various fortuitous developments held off the deflationary threat; for example, the development of new South African mining capacity, along with Russian gold sales (which ended in 1966). Eventually, though, the conundrum was resolved in March 1968 through the two-tier gold market, which allowed the nonofficial gold price to float. It was then that the U.S. currency, and currencies pegged to it, became fiat monies.⁵

The second inconsistency persisted even after the start of the two-tier market. The official tier (by design) left intact the U.S. obligation to redeem foreign dollar reserves for gold at the old official price. Once again, however, world output growth, and the

⁴ This commitment followed from the Gold Reserve Act of January 30, 1934 (Yeager 1976, p. 352). The Act also gave licensed users in industry and the arts the right to buy gold at the official price. (The Treasury added a ¼ percent transaction fee to the official price, and applied an identical discount to its gold purchases.)

⁵ This stratagem did not, by itself, resolve the (more serious) problem that the dollar itself could be devalued only through a concerted *revaluation* of foreign currencies (as occurred in August 1971, when the U.S. simultaneously suspended gold sales to foreign monetary authorities). One solution suggested for the Triffin problem before the gold window was closed was to raise the official dollar price. Apart from other drawbacks, a gold-price change would not automatically have devalued the dollar against other currencies.

concomitant growth in world dollar reserves, seemed likely to outpace world gold production. Were the U.S. Treasury to maintain a \$35 buying price for an ounce of gold, therefore, U.S. monetary gold stocks could not possibly increase. As famously observed by Triffin (1947, 1960), the United States eventually would not have enough gold to redeem all the official dollar reserves at par, even if it used up the entirety of its holdings. The reserve currency issuer would become vulnerable to a run by central banks.

Figure 1 illustrates the trends. In 1948, the United States held most of the world's gold reserves. Through 1960, U.S. gold stocks shrank but remained above the growing stock of dollar foreign reserves. And then the lines cross, seemingly making the U.S. vulnerable to a Triffinesque run. (That event was marked by speculation in the London gold market, causing the formation of the gold pool; see Eichengreen 2011.) The preceding trends continue as world monetary gold stocks fail to keep pace with growing global foreign exchange reserves. Figure 2 shows that in 1966 – the year that Russian gold sales ceased (Cooper 1969, p. 580) – world gold production leveled off. In retrospect, the abandonment of the single-tier gold market soon thereafter is not surprising. World dollar reserves began a steep upward ascent in 1970 as heavy speculation against the dollar set in. To defend the dollar parities of stronger currencies such as the deutsche mark and Swiss franc, the issuing central banks undertook massive dollar purchases. Global dollar reserves exploded -- without reducing U.S. reserves, absent gold redemptions.

On the surface Triffin's point seems obvious, but deeper reflection suggests that the classic form of the Triffin dilemma was really a fiscal problem. After all, why couldn't the U.S. government have purchased more gold on the market, if need be, to pay

off foreign central banks? And what strain on the U.S. fiscal position would have resulted?

At the end of 1970, the year before U.S. President Richard Nixon suspended official gold convertibility (August 1971), U.S. gold reserves stood at \$11 billion dollars, while world nongold reserves outside the U.S. stood at \$53 billion, leaving the U.S. with \$42 billion in potential official claims that it could not cover with its existing gold holdings. The sum of \$42 billion, however, amounted to 4.2 percent of that year's GDP, at a time when the gross U.S. federal debt stood at 28 percent of GDP – a large, but not impossible, fiscal cost (especially by today's standards).

The preceding calculation, however, assumes that the Treasury could have purchased the gold it needed in the world market at \$35 per ounce. But this is surely not the case. World gold production in 1970 (at the \$35 price) amounted to \$1.8 billion, whereas total world monetary gold stocks outside the U.S. were \$29 billion. The sum, roughly \$31 billion, falls far short of what the U.S. needed to cover its total \$53 billion obligation (an obligation that exploded in the succeeding years). Even if the U.S. Treasury had been able to purchase all the world's monetary gold and all current production without bidding up the world price – an impossibility – it still would have been \$11 billion short. It is clearly unlikely that the Treasury would have been able to buy all the necessary gold at any finite price. Any Treasury attempt to buy gold in private markets on any substantial scale would likely have resulted in a gold price so high as to make the resulting fiscal burden unbearable.

This potential fiscal insolvency was the key danger inherent in the Triffin problem. As Figure 1 shows, of course, the problem became even worse after 1970 as

speculative switches out of dollars into foreign currencies accelerated, and as even some central banks exchanged dollars for U.S. gold. The result was the Nixon-Connally policy package of August 1971, leading directly to the Smithsonian realignments in December 1971.

The Modern Triffin Dilemma

After the industrial countries moved to flexible exchange rates in 1973, world reserve growth, surprisingly at the time, continued. Global nongold reserves have expanded (in nominal dollar terms) in all but three of the years after 1971. Starting in 2002, and powered by the demand and growth of emerging economies, global reserves have grown at double digit rates in every year but one (2008, when the yearly growth rate was 9.7 percent). But between 1972 and 1980, global reserves likewise grew at double-digit rates in all but one year. Motivations for this continuing global demand for international liquidity have been widely discussed in the academic literature. As I take up in the next section, one can make a strong case that the evolution of world capital markets over recent decades has made the potential need for swift and perhaps massive key currency liquidity support – whether from reserves or some other source – much more pressing today than it was even in the days of generalized fixed exchange rates.

Nor has the basic Triffin paradox disappeared. The emergence of a modern species of Triffin dilemma has been diagnosed most clearly by Farhi, Gourinchas, and Rey (2011). It is a subtler problem than the Bretton Woods version, because there is no longer a reserve-center promise to redeem liabilities at a fixed price in terms of some

scarce numeraire. It is a Triffin problem nonetheless because the underlying asymmetric dynamics of global growth guarantee that eventually, the reserve system will become unsustainable. Moreover, the problem remains even in a multipolar world with several reserve currencies.

The problem is not simply that, under floating exchange rates, reserves are subject to depreciation risk: reserve holders have proved willing to tolerate exchange-rate fluctuations, provided there is not a predictable sustained trend of devaluation. Thus, for example, foreign accumulation of dollar reserve claims on the U.S. does not *inherently* require large U.S. current account deficits, which might predict significant future dollar devaluation. Dollar reserve growth may be primarily a result of capital outflows from the U.S., as was true during the mid-1960s (when the U.S. had a sizable trade surplus with trading partners and was still a net foreign creditor).

The modern-day Triffin problem resides instead in the *nature* of the securities central banks hold as reserves. A key feature of a reserve asset is that it is liquid and predictable in value. True, exchange rate fluctuations are not predictable – but for a country experiencing a localized crisis, any movement of the domestic currency against major foreign reserve currencies is likely to be downward. And the dollar, at least, has shown a safe-haven tendency to appreciate in global crises, which helps explain its attractiveness as a reserve asset (Gourinchas, Rey, and Govillot 2010).

Thus, central banks have gravitated toward the government liabilities of highly creditworthy countries – or other assets, such as U.S. agency securities, believed likely to come under the protection of a government guarantee. Such assets could include certain

liabilities of systemically important financial institutions in the creditworthy advanced countries.

So global reserve growth depends on issuance of gross government debt – requiring either that the government run ongoing deficits or issue debt to acquire assets likely to be inherently riskier than the corresponding liabilities. Just as in the classic Triffin dilemma, global reserve growth is largely driven by deficits – not national balance of payments deficit, but government deficits.

The additional dynamic element driving the modern-day dilemma is based on two asymmetries. First, the emerging and developing world is growing more quickly than the more credit-worthy industrial world. As Figure 3 shows, in 2009 the total GDP of the emerging and developing world (measured at PPP, and including newly-industrialized Asia) overtook that of the advanced economies, and the IMF predicts that the advanced economies will fall farther behind over time. The second asymmetry is that the advanced countries remain more creditworthy, and on average control their financial accounts more tightly, than the industrial world. The traditionally rich countries have been able to borrow more easily on world capital markets, and have therefore had less need for international reserves than countries that are vulnerable to sudden stops.⁶ Furthermore, they are less prone to foreign exchange intervention, with less capacity to sterilize. Together, these asymmetries imply that that the demand for rich-country government debt is likely to outstrip what can be supplied in the way of safe government debt without bringing the safety of that debt into question! Figure 4 gives a rough indication of the

⁶ Of course, recent sovereign debt crises in some of the richer countries show the strains on even advanced-country public finances as a result of the 2007-09 crisis.

trend to date. How will the demand for reserves be satisfied if the richer countries actually succeed in the fiscal consolidation to which they aspire?⁷

A number of developments could head off this unstable dynamic, but might not come into effect soon enough. First, countries' demand for reserves might level off, with some national wealth shunted into sovereign wealth funds willing to invest in riskier assets. To the extent that reserve demand is driven by the size of the financial system and the latter's growth rate is high, however, strong reserve growth is likely to continue. Second, growth could decelerate in the emerging and developing world or accelerate in the currently rich countries. That development seems unlikely in view of the fiscal and other burdens that currently afflict much of the industrial world. Finally, some major and swiftly growing emerging markets could graduate in terms of their creditworthiness, reducing their demand for reserves and, potentially, making them suppliers of reserve assets. China is the most likely candidate, but this very observation highlights the significant obstacles to such a development. Thus, the new incarnation of the Triffin dilemma is likely to bedevil the current system of international liquidity provision for some time, absent reforms.

The problem is still mostly fiscal. But then, so are the broader questions concerning the adequacy of international liquidity in a world without a true outside reserve asset such as gold. I now turn to those questions.

⁷ Figure 4 graphs general gross government debt growth in the U.S. and euro area against world nongold reserves. General government debt likely overstates the debt available for reserve growth, since central government debt is preferred. In addition, much euro zone central government debt would be viewed as riskier than, say, German debt – especially lately – and therefore not ideal for reserve holders.

II. Reforming the Liquidity System

The demise of generalized fixed exchange rates in 1973 allowed a solution to the open-economy macro trilemma based on flexible exchange rates, domestic monetary autonomy, and financial-account liberalization (Obstfeld and Taylor 2004). The process started in the 1970s in the industrial countries. With a lag, and with considerable individual heterogeneity, the emerging market economies have started to follow down this path. Domestic financial liberalization has gone hand in hand with the process of external opening, with strong channels of two-way causation driving the overall freeing of finance, domestic and international alike. Whether and how this process will continue in light of the recent global crisis is a major open question.

The main trend raising the level of financial fragility in the world economy, and therefore creating liquidity needs, has been the rapid expansion of gross international asset positions. That process has been driven by a range of factors, including expanded risk sharing, financial deepening, and, less benignly, regulatory and tax arbitrage. At a point in time, a country's *net* international position defines the gap that intertemporal solvency dictates between the present-values of expenditure and income. But it is the nature of a country's *gross* positions that determines its vulnerability to financial crisis – just as is the case for individual economic actors. Moreover, given the current magnitude of gross external asset and liability positions, asymmetric valuation changes can imply changes in net assets that overwhelm the smaller flow increments implied by the current account balance.

Figure 5 illustrates the trend in gross external assets for selected countries, plotting the ratio $(Assets + Liabilities)/GDP$ through 2007 (with data from the update of Lane and Milesi-Ferretti 2007). Particularly for relatively open industrial countries that are also financial centers, the multiplication of gross external positions has been extreme. In such cases, a current account deficit may be a consequence of financial excess, but it is not itself the prime locus of financial vulnerability. The main threat is that of a *balance-sheet crisis*. Thus, while Ireland had an external deficit in the run-up to the crisis, banks in surplus countries like Switzerland and Germany landed in trouble – dragging their governments along with them – because of toxic foreign assets on their balance sheets. Figure 6 shows that for emerging and developing countries, gross acquisitions of claims on advanced countries, whether as reserves or as nonreserve (mainly private-sector) claims, far exceed the net current account balance, a reflection of copious gross inflows from the industrial world. These flows are cumulating to economically significant shares of industrial country GDP: In 2007 alone, the annual flow amounted to 6 percent of industrial country GDP. The rapid GDP growth of the poorer countries is not matched by a commensurate importance in world financial markets, but the latter is certainly growing, and doing so relative to the shrinking relative scale of the advanced economies.⁸

Through their growing gross asset positions, emerging and developing countries, especially the EMEs, are increasingly important players in financial globalization, and their financial stability is becoming increasingly tied to that of the global financial system. Yet they remain more vulnerable to sudden stops in foreign lending than are most of the advanced countries – notwithstanding the sudden emergence of sovereign debt

⁸ The figure understates the trend, because the IMF definition of “advanced economies” includes Taiwan, Hong Kong, Korea, and Singapore. This labeling both reduces their measures of emerging and developing country financial flows, and inflates their measure of advanced country GDP.

problems in some. All the while, financial channels of contagious transmission have expanded along with gross positions. Any attempt to restructure the international liquidity system must contend with these facts.

The Need for Global Last Resort Lending

In the late 1970s, the United Kingdom, Italy, Spain, and Portugal all negotiated standby arrangements with the IMF. Between Portugal's last approach to the Fund in 1983 and Iceland's in 2008, no industrial country drew on Fund resources for balance of payments support – the Fund's client base came to be viewed as consisting exclusively of developing and emerging economies. By the 1990s and 2000s, the high-income countries were viewed as quite creditworthy, unlikely to need Fund resources or even to need to use large volumes of international reserves. At the same time, the central banks of high-income countries were viewed as well equipped to act as last-resort lenders if their domestic financial systems got into trouble.

Events after August 2007 have changed the picture, highlighting the more complex and in some respects more dangerous landscape that financial globalization has produced. Banks throughout the world, and especially in rich Europe, faced urgent needs for foreign-currency liquidity – liquidity that their home central banks could not create by the stroke of a pen. The result was the creation of a complex network of central bank swap lines, starting with the U.S. Federal Reserve's lines to the ECB and SNB in December 2007. Eventually that facility became unlimited in size. Furthermore,

following Iceland's collapse, the Greek and Irish governments suffered funding crises that have been managed so far only with financial support from the EU, ECB, and IMF. These advanced-country crises reflected, respectively, garden-variety fiscal improvidence (the Greek scenario) and government bailout of a collapsed banking system (the primary culprit for Ireland). But in both cases, globalized financial markets fueled easier access to large volumes of foreign credit.

What have we learned? There are at least two major lessons.

First, IMF facilities alone, even after being augmented in 2009, remain insufficient to deal with the prospective sovereign debt problems of rich countries. Furthermore, the speed and flexibility of IMF support has been inadequate to the needs of advanced countries, given their openness to high-speed global financial markets. The large gross asset liability positions of advanced countries – think of the external debts of Ireland, Iceland, or Switzerland, even though the last is a huge international creditor – have the potential to infect the government balance sheet, resulting in fiscal crisis. The assets of these countries' banking systems are in a number of cases substantial multiples of GDP. While the Irish crisis has been called a crisis of the euro zone – and adherence to a fixed exchange rate is indeed problematic for Ireland – the Irish crisis is even more a crisis of globalized finance. Even in cases where sovereign debt problems arise from pure government profligacy, as in Greece, globalized finance promotes a potentially wide exposure of financial institutions to the problem.

Second, a key implication of a globalized multiple-currency world is that traditional lenders of last resort (the central banks) are ill equipped to support the needs of their swollen financial sectors. For example, European banks in 2007 and 2008 were

big holders of U.S. mortgage-backed securities, these assets being funded by short-term dollar borrowing. Credit market disruptions sharply raised the cost of rolling over short-term dollar credits. At the same time, the costs of swapping euros for dollars to repay dollar credits rose far beyond what covered interest parity would imply. While the ECB, for example, could freely print euros and lend them to banks, its ability to supply dollars out of reserves was much more limited (although some national central banks did so). The ECB itself could have borrowed dollars and intervened in spot and forward exchange markets, at the risk of incurring incalculably large quasi-fiscal costs. In the circumstances, it was much more expedient to be able to borrow dollars directly from the Fed, which in any case needed to expand its balance sheet to meet a heightened global demand for dollar liquidity.⁹ Effectively, the Fed became an international last-resort lender in dollars – in the absence of which, European banks might have had to unload hard-to-sell assets, worsening fire-sale dynamics and weakening their own capital. Of course, the Fed also lent heavily, and directly, to the U.S. affiliates of foreign banks. At the same time, other central banks – including the ECB, SNB, BOJ, Sveriges Riksbank – eventually stepped up as global last-resort lenders in their own currencies.

The expansion of gross asset positions, given the inevitable gaps in global as well as domestic prudential oversight, suggests a need for global lenders – to governments as well as central banks and, though them, to the private financial sector – that is greater than ever before.

⁹ On the background for the swap network and its effects, see, for example, McGuire and von Peter (2009) and Goldberg, Kennedy, and Miu (2010).

Subsequent sub-heads for this section:

Emerging market reserves, precautionary rationale, problems with large-scale self-insurance, need for some intervention balances even if there are other supplementary financing sources available for crisis situations. Examples of unconventional EME reserve use during global crisis.

World central bank? Not any time soon.

Role of IMF? It has rightly expanded its resources and flexible lending programs, but not enough to handle balance sheet/capital-market crises, especially if these involve advanced countries. IMF has been a sovereign lender, not a lender to central banks or private financial institutions.

SDRs. Original rationale and rationale today. Can they displace the dollar as a reserve currency? What about dollar's vehicle currency role? To some extent SDRs function like a reserve pooling scheme, which might be a better way to go. The "basket" nature of the SDR is a distraction in all this, and would have to change over time to remain economically relevant. The SDR does not help promote symmetric international adjustment.

Credit lines/swaps. It is important to institutionalize these, building on the Dillon-Roosa swaps of the 1960s, the unconditional credit embodied in the SDR concept, and the GAB.

How large would credit lines need to be? Could there be a role for the IMF?

Surveillance to minimize the various sources of moral hazard. Role of the IMF in this.

Governance structure of Fund needs repair, for a number of reasons.

Liquidity vs. insolvency. Restructuring in cases of insolvency. Issue of fiscal backup for international last-resort lending, including lending by IMF; cf. Goodhart (1999).

Analogies with eurozone situation.

III. Global imbalances and asymmetric international adjustment pressures

IV. Living within the trilemma: Currency “wars” and capital controls

Emphasis in both sections: Role of relatively rapid recent and prospective growth of some EMEs in transforming their earlier problems into questions of first-order importance to the industrial countries.

References

Cooper (1969)

Eichengreen (2011)

Farhi, Gourinchas, Rey (2011)

Goldberg, Kennedy, and Miu (2010)

Goodhart (1999)

Gourinchas, Rey, and Govillot (2010)

Henning (1994)

Lane and Milesi-Ferretti (2007)

McGuire and von Peter (2009)

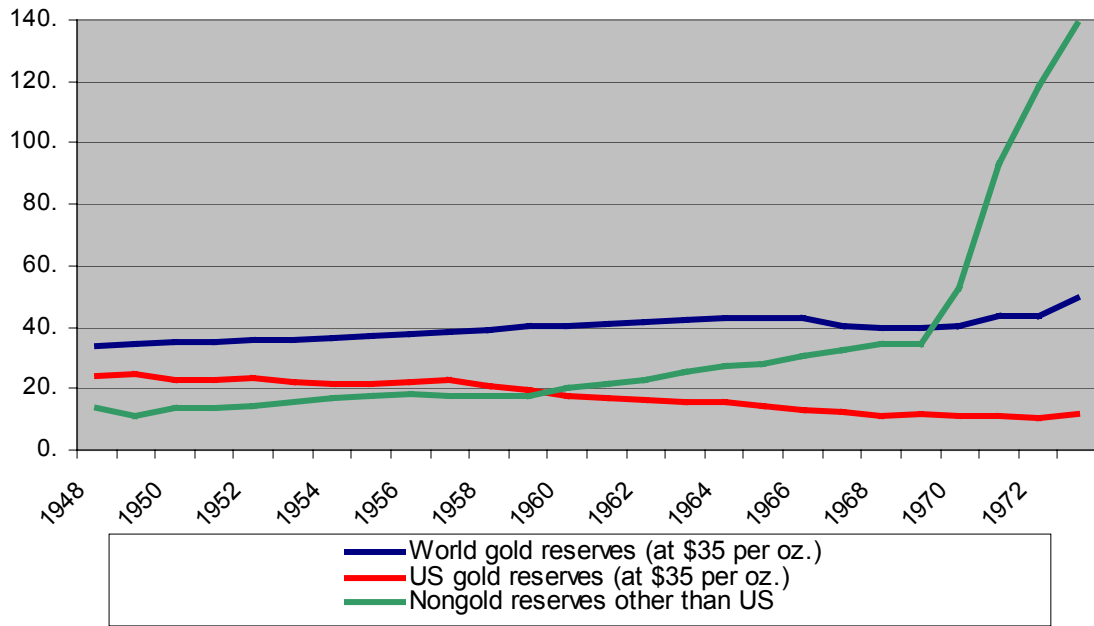
Obstfeld and Taylor (2004)

Triffin (1947)

Triffin (1960)

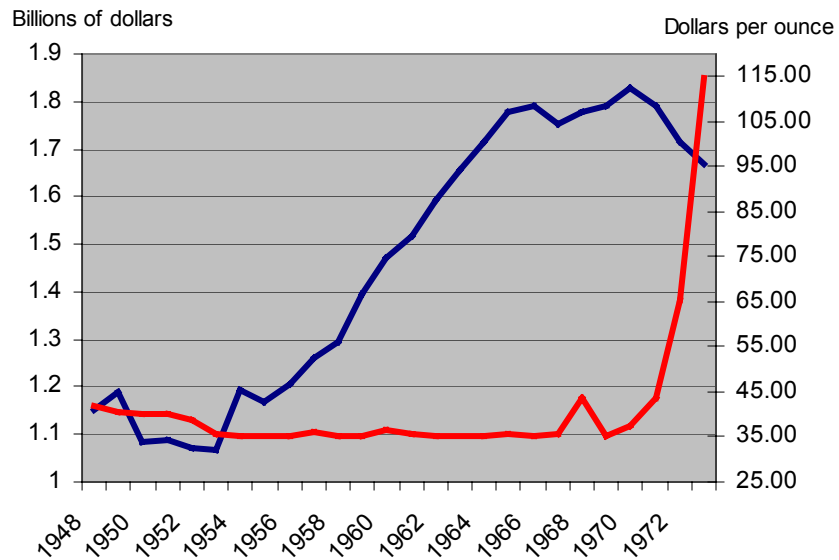
Yeager (1976)

Figure 1: Gold reserves and nongold reserves held by non-US governments (billions of USD)



Source: IFS

Figure 2: Value of world gold production and dollar gold price



Sources: U.S. Geological Survey and Global Financial Data

— Value of world gold production (at \$35 per oz., left axis) — Dollar gold price (right axis)

Figure 3: Output shares of advanced and emerging/developing economies (at PPP)

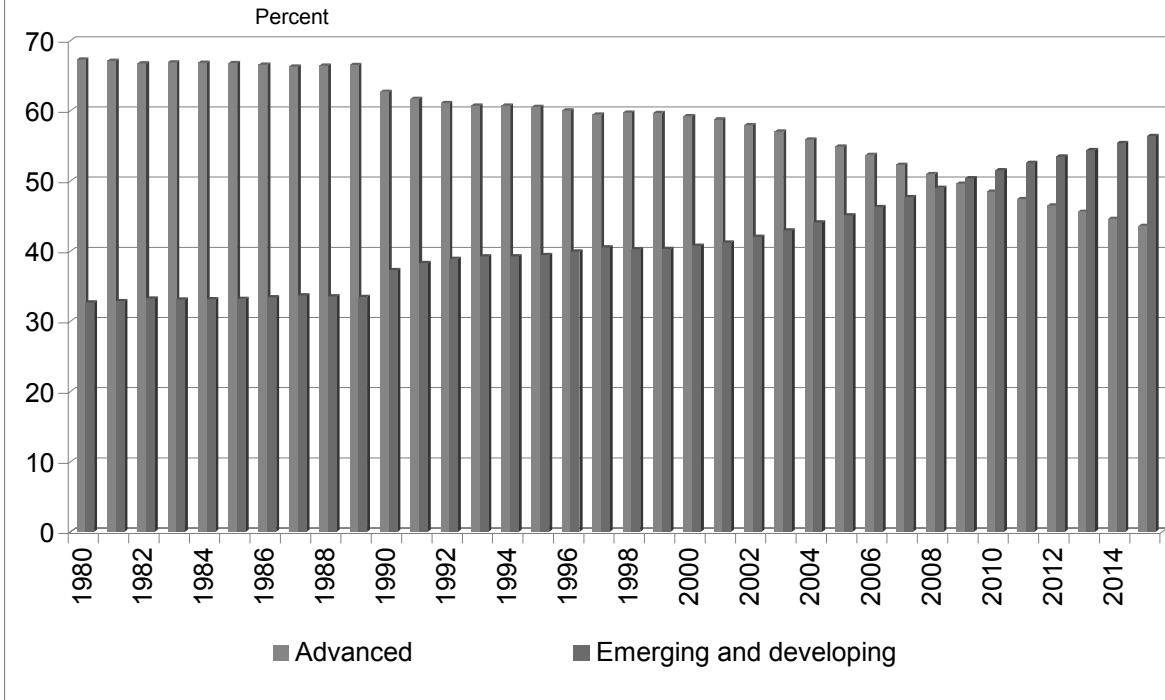


Figure 4: Global nongold reserves compared with gross general government debt

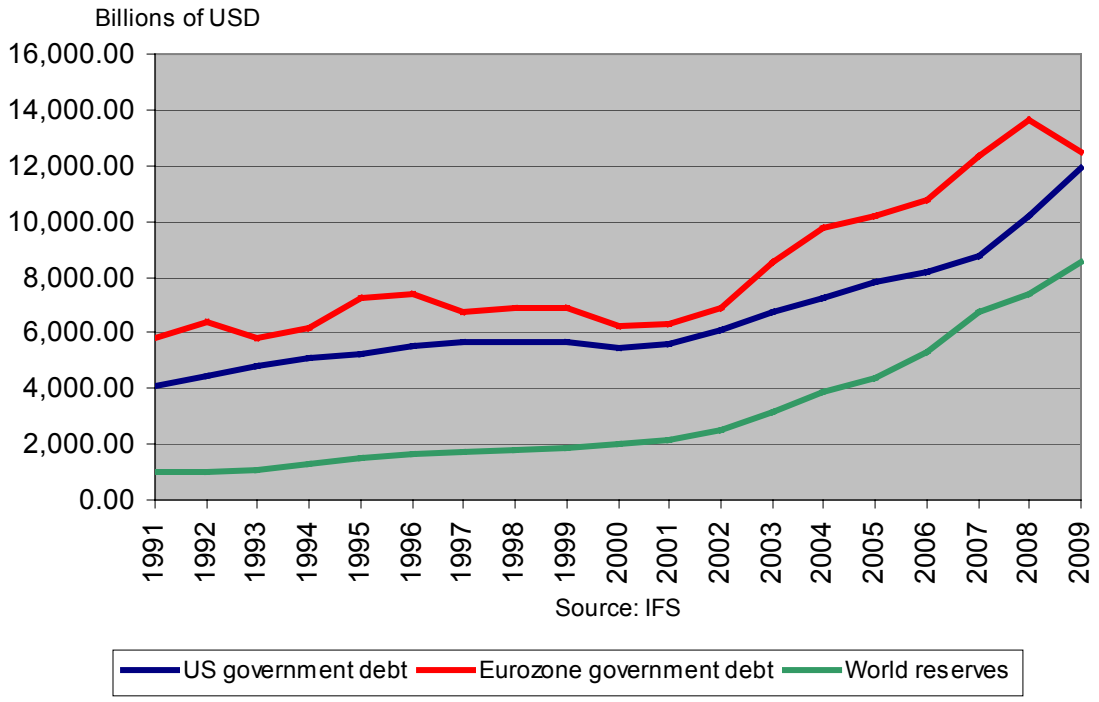


Figure 5: Gross external positions as a multiple of GDP, 1970-2007

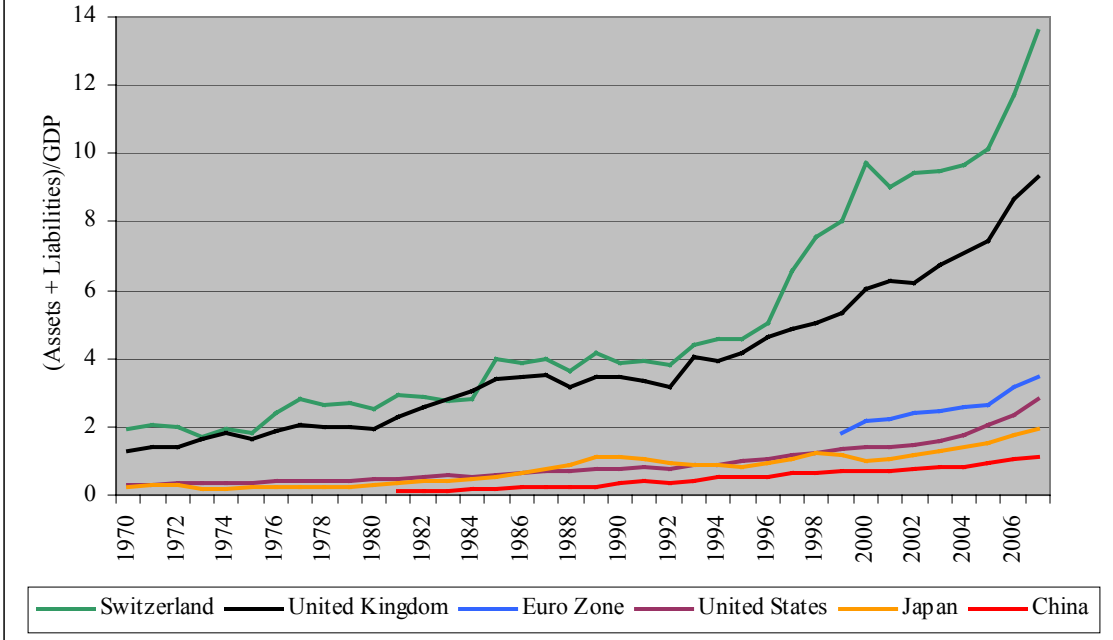
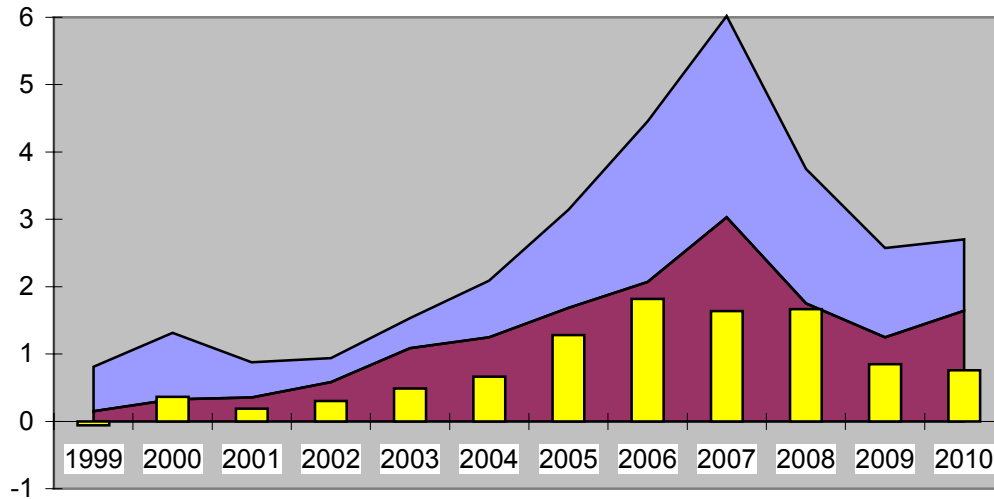


Figure 6: Gross asset accumulation and current accounts of emerging and developing countries

Percent of advanced country GDP



Source: WEO, GDP data and online table B18. Projections for 2010.

■ Reserve accumulation ■ Nonreserve gross foreign asset acquisitions ■ Current account balance