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Single Reserve Currency

An analysis of the benefits and challenges with implementing a single reserve currency

BUS 503E: Global Macroeconomic Perspectives

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Table of Contents

Introduction

A key component of foreign trade is the assets a central bank holds in reserve. These reserves allow a country to perform two primary functions: buffer financial shock and intervention in currency exchange rates (mercantilist motive). According to one IMF study, two-thirds of all reserves (about $4 trillion) are held as insurance against financial shock (Adornment, 2009). Any asset could serve this role but the need for high liquidity causes most reserves to be held in denominations of foreign currencies or frequently traded commodities like gold. For decades the US dollar (USD) has been the largest denomination held by countries around the world, either directly or through US government debt. The two fundamental reasons for this seigniorage is the large amount of global trade with the US but more importantly the perception that the US is the most financially stable currency among currencies large enough to serve as reserves.

The US is a significant contributor to the global financial crisis of 2008-2009 causing countries to question the seigniorage granted to the USD and many central banks have begun to diversify away from USD. For example, on November 3rd, 2009 India purchased 200 tons of gold worth $6.7 billion to add to their reserves out of fear of a further weakening USD (Adornment, 2009). India is not alone; other countries like China and Mexico are also buying gold to add to their reserves in place of the USD despite their close economic links to the US. In addition to gold and USD, countries also hold other currencies like euro, yen, British pound, and the IMF's Special Drawing Rights (SDR). While theoretically countries could rapidly sell their USD reserves, in reality if this occurred the USD value would crash leaving the US unable to import foreign products from the same countries that caused the crash. Instead, a gradual shift in the composition of reserves is a more likely outcome. Given the highly coupled global financial system, replacing the USD with another government's currency does not seem to solve the problem. Therefore, the question remains as to what reserve composition the world should aspire and the process by which this can be accomplished.

Given the recent financial crisis, the focus of this analysis of reserves is the objective of buffering financial shock. Traditional portfolio theory suggests that central banks should hold reserves in a variety of denominations to diversify and thereby reduce the unique risk with a single instrument. The challenge is that country economies are coupled so the benefits of this diversification are muted. Also, there are transactional costs associated with building and managing reserves across a number of different

financial instruments. Furthermore, because each central bank builds its reserves independently the amount of reserves held globally are higher than if central banks cooperatively held reserves to cover their collective risks. This paper explores an approximation of these collective reserves where central banks use a single reserve currency. Although individual central banks would still maintain individual reserves, a single reserve currency eliminates unique currency risk and reduces transaction costs. Our thesis is that by moving to a single reserve currency the global level of reserves can decrease thereby freeing capital for more productive investments.

This paper reviews the history and current state of world reserves with special focus on the role of the USD. The paper then explores in detail the history and mechanics of SDR and uses that financial instrument as a proxy for a single reserve currency. The European Monetary Union (EMU) is then analyzed as an example of countries collectively sharing a single reserve (held by the European Central Bank [ECB]) to build a predictive model of the extent to which reserve levels decrease after forming the ECB. This model is then applied to Mercosur as a proxy for other regional trade unions to determine the global benefit of a single reserve currency. The paper then outlines the process by which this transition could occur and concludes with a feasibility analysis including non-financial considerations.

Reserve Transactions

Reserve History

Countries have always needed a stockpile of assets to be used to pay foreign debt. Until World War I these reserves were predominantly in hard assets like gold or paper currency with a fixed exchange rate to gold. As the world industrialized and financial markets matured there was a growing need for financial liquidity, greater than what was capable with gold. Furthermore, gold was predominantly mined in Russia and South Africa, providing those countries an advantage that the rest of the world did not accept (Aiyar, 2009). The first step into the modern era was the creation of the IMF during the Bretton Woods UN Monetary Conference in 1944. Keynes argued the merits of creating an international currency based on 30 commodities but nations did not want to surrender their independent ability to print money and set policies (Aiyar, 2009). Instead, the members agreed to fix their exchange rate to the USD which was the only currency able to be converted to gold by central banks. Any changes in exchange rates would need approval of the IMF to prevent sharp devaluations.

This familiarized countries with the concept of holding currencies in reserve instead of gold although the liquidity problem remained. In 1967 the IMF created SDR referred to as "paper gold" and created allocations for member countries to use for further reserve liquidity. The liquidity problem was further addressed in 1971 when the USD was decoupled from gold standard and its value began to float as did that of other major currencies. The move to floating currencies brought unlimited potential for liquidity as money could always be printed but also the corresponding risk of inflation and political manipulation. In the decades of floating exchange rates countries have become accustom to currency fluctuations and thus reduced their need for reserves for massive intervention although there are still occasions where intervention occurs through managed floats. On the other hand, some countries with a fixed exchange rate continue to accumulate reserves instead of revaluing their currency.

The IMF found that a country's exchange rate regime is not a significant factor in the amount of reserves held by a country as shown in Figure 1 (Mateos, 2009). This is due to the desire for countries across the spectrum of exchange rate regimes to maintain some ability to intervene. More importantly it indicates that the larger benefit of reserves desired by a nation is financial stability. One study found that the optimal level of reserves is a balance between the costs of reserves being depleted
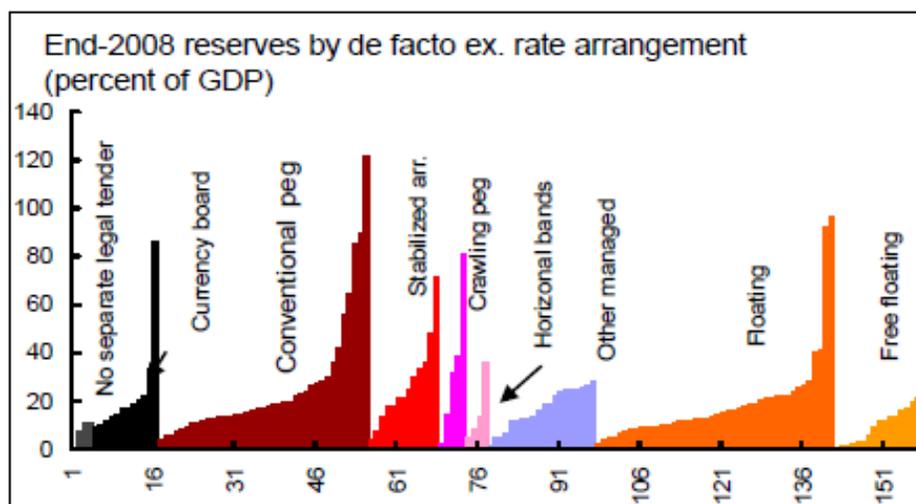

Figure 1 - Reserves as % of GDP grouped by exchange rate policy
Source : IMF Staff Position Note November 11, 2009 (SPN/09/26)

and the opportunity costs of holding reserves (Elhiraika, 2007). This means that the level of reserves increase with a country's risk aversion and output volatility. The majority of world reserves are concentrated in a few countries as shown in Figure 2. China holds 23% of world reserves and a handful of nations account for more than half of all reserves. The net result is that the amount of reserves has been growing exponentially in the past decade as shown in Figure 2. Furthermore, reserves as a percentage of GDP have been growing most in low income countries and emerging markets while advanced economies hold stable level of reserves at about 5% of GDP as shown in Figure 2.

Prior research has shown that there are 3 primary drivers of the amount of reserves held by countries (Chan, 2007). The first is the cost of macroeconomic adjustment to policies to restore the balance of payment with a corresponding cost to income. These costs are affected by the degree of exchange rate flexibility, openness of the economy, and the level of economic development within the country. Less flexibility (fixed exchange rates)

increase the cost of policy adjustments because there are fewer market mechanisms to absorb financial shock; therefore, they require larger amounts of reserves. Likewise, the more open an economy (floating exchange rates) the more likely it is to experience shock and thus the more reserves it would need. Developed countries typically can make macroeconomic adjustments quicker than emerging or poor countries. This speed enables developed countries to demand fewer reserves. Meanwhile, emerging or poor economies take longer to make policy adjustments in response to shock and thus need more reserves to buffer the economy while the changes are implemented.

Figure 2 – Reserves by country, global total, and economic development
Source: IMF Staff Position Note, November 11, 2009 (SPN/09/26)

The second driver for the amount of reserves is the opportunity cost of holding the reserves (Chan, 2007). A conservative estimated of the opportunity cost is the difference between the interest rate on the reserves and a risk-free rate such as LIBOR. Since most reserves are held in USD, the reserve interest rate can be approximated by the rate on US treasury bills. A more realistic estimate would assume that
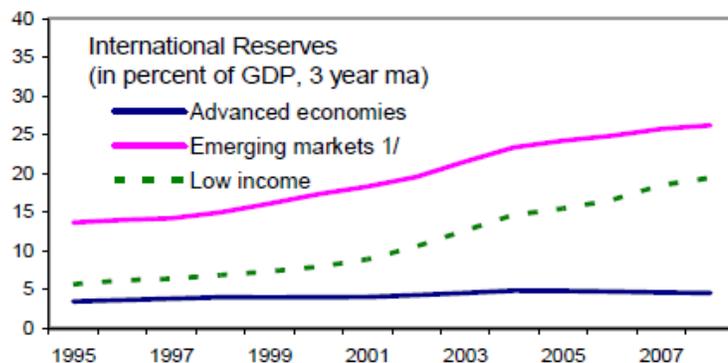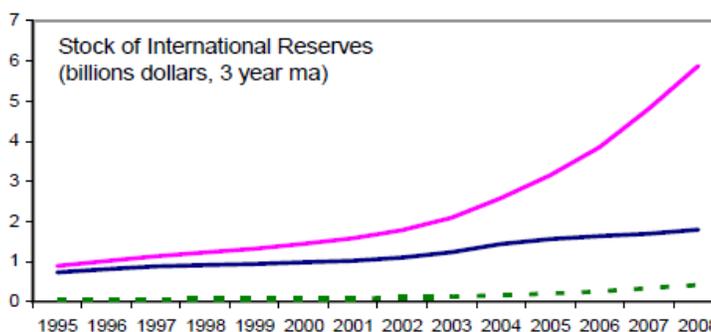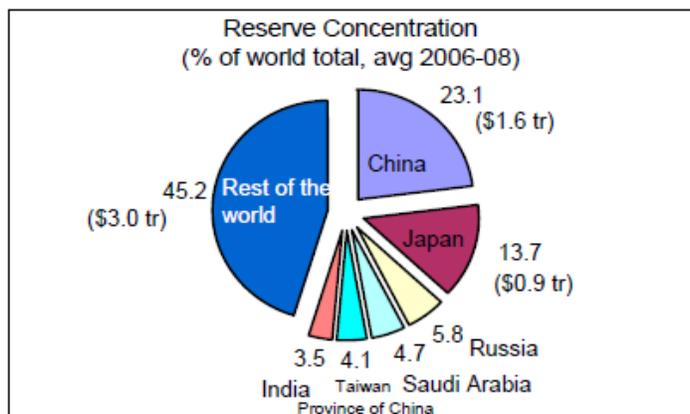
the assets would be invested more productively and thus should be compared to the average rate of return for business investments within the country.

The third driver for the level of reserves is the stability of the external sector (Chan, 2007). Wide variances in the level of international transactions would require more reserves than very stable trade due to the increased uncertainty. This driver leads to the concept of reserve adequacy which attempts to gauge if the current level of reserves is sufficient to absorb financial shock.
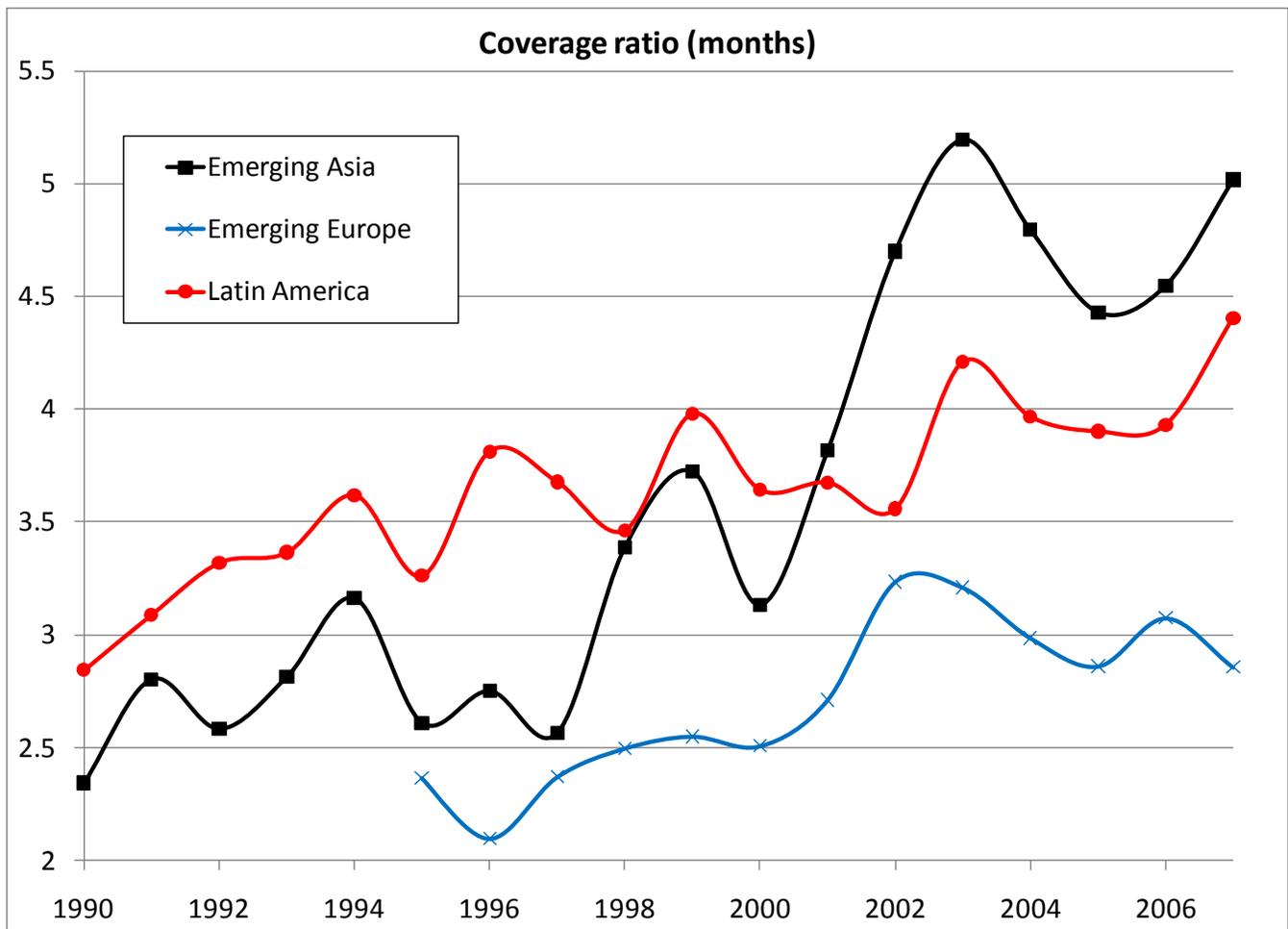
Figure 3 – Coverage ratios for selected regions
Sources: Bank for International Settlements; IMF, Coordinated Portfolio Investment Survey, and IMF staff calculations.

One measure of adequacy is the reserve to import ratio based on the premise that reserves levels should change relative to imports. Historically countries held this ratio above 40%. Interpreted another way, this ratio defines the length of time that reserves can cover imports. This coverage ratio is typically expressed in months as shown by the historical ratios by region in Figure 3. A similar measure

compares reserves to short term external debt to measure a country's ability to pay its debt if there was a stop in external currency transactions. A final measure of reserve adequacy is focused on the objective of maintaining confidence in the domestic currency using the ratio of reserves to the domestic money supply. The challenge with all of these ratios is that they are useful when comparing across countries but the extent and duration of financial shock is inherently unpredictable so there is no absolute measure of adequacy.

SDR (Special Drawing Rights)

SDRs were created by the IMF to create liquidity to address concerns that there would not be enough gold to handle the growing needs of international trade. Another benefit of SDR is access to cheap capital. While advanced economies have access to broad and cheap financing through their internal financial markets, developing and low income economies suffer from high costs of capital. Therefore, SDR currently plays two roles: a currency and a line of credit between IMF members (Aiyar, 2009).

The SDR is not a hard currency but rather a derivative as its value is determined based on the value of other assets. The IMF defines SDR as "a potential claim on the freely usable currencies of IMF members" (Factsheet, 2009). Initially it was a derivative of USD (and therefore gold) but in 1981 it changed to a basket of currencies reflecting the economic leaders at the time: US dollar, German mark, French franc, Japanese yen, and British pound (Aiyar, 2009). The basket changed again in 2000 to reflect the mark and franc consolidating into the euro which is the basket of currencies still in use today. The currency composition is adjusted every five years by the IMF and the current proportions set on January 1, 2006 are: 44% USD, 34% euro, 11% Japanese yen, 11% pound sterling (IMF, 2005). Note that this composition represents historically strong economies. Arguments have been made that it should instead start to incorporate the changing financial realities, especially with regard to East Asian countries like China. As a point of reference, the value of one SDR is approximately $1.60 USD as of late November, 2009 (SDR, 2009).

SDR are allocated to IMF members in the form of general or special allocations and there have been a total of four allocations in history: 1970 – 9.3 billion, 1979 – 12.1 billion, August 2009 – 161.2 billion, September 2009 – 21.5 billion (special allocation) (Factsheet, 2009). Note that there was a 30 year gap in issuing allocations between 1979 and 2009 and 90% of the total 204.1 billion SDRs in existence were issued in 2009. These results are due to the US holding a de facto veto on SDR allocations and

preventing allocations from occurring for decades. The only reason allocations were made in 2009 is in response to the global financial crisis and the desire by the US to flood financial markets with liquidity. While this may raise concerns about inflation, existing SDRs are small relative to global GDP (0.33%), trade (<1%), and existing reserves (3%). With rare exception, only IMF members have access to SDR and they are not available to private organizations or individuals.

SDRs are voluntarily traded between members with the IMF acting as the broker of the transaction. If a holder of SDRs cannot find a buyer, the IMF is authorized to designate a member who is obligated to exchange the SDR for currency. This option has never been executed but its existence enables the IMF to guarantee liquidity with SDR transactions. Members earn interest on SDR holdings that exceed their allocation at the SDR interest rate, which is a weighted average of money market interest rates of the SDR component currencies. As of late November 2009 this interest rate is 0.24%. Likewise, members holding fewer SDR than their allocation are charged interest at the SDR rate.

Reserve Composition

In addition to the analysis of the drivers for the level of reserves, it is important to evaluate the incentives for manner in which a country reaches those levels: the composition of reserves. Historically the USD has accounted for the large majority of world
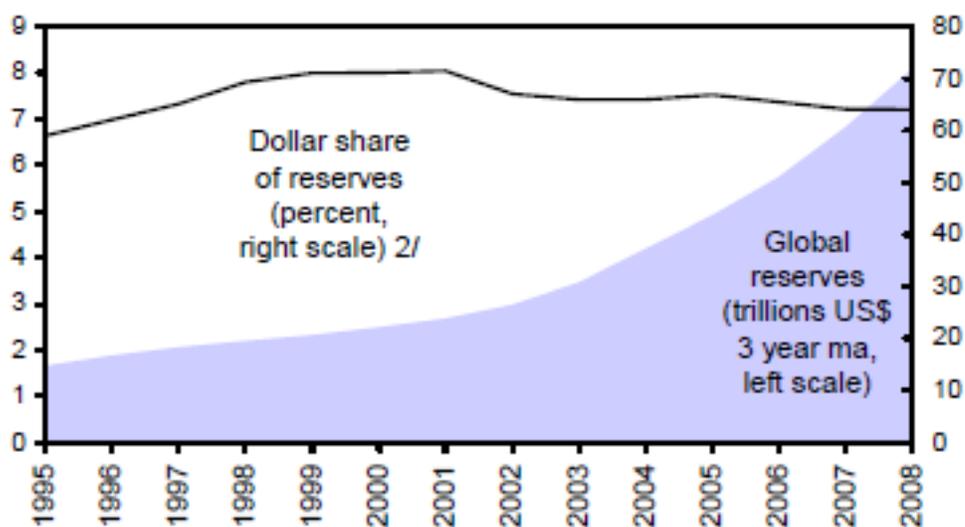
Figure 4 – Global reserves and USD share of reserves
Source: IMF Staff Position Note, November 11, 2009 (SPN/09/26)

reserves and in the late 1990s it even reached 70% of world reserves as shown in Figure 4. Its slight decline in 2002 is probably a combined effect of the recession in 2001 and the emergence of the euro as a viable alternative currency. Nevertheless, the USD continues to account for more than 60% of reserves even as the amount of reserves has grown exponentially in the last decade. The composition of reserves is a sovereign decision of central banks so governments must feel that it is in their best interest

to continue to invest heavily in the USD. However, the alternative this paper explores is holding

reserves in a single global currency and the SDR is used to represent that currency.

The SDR represents some key aspects required for a global currency; specifically, it is not issued by a

government but governments have agreed to accept it to settle debts. Some claim that the SDR should

not even be considered a currency because it is a derivative of other currencies and its governing body

has no ability to issue taxes to back the value of the currency (Williamson, 2009). These are weak

arguments because for years the USD was a derivative of gold but was still considered a currency.

Likewise, the taxation argument is irrelevant because at its core any currency is simply a symbol of trust

that carries a nominal value and would be accepted by either party to pay debts. While a tax base is one

method to build that trust, other mechanisms exist including formal agreements like the Articles of

Agreement of the IMF under which the SDR was created. If the SDR does become the global reserve

currency further actions would be needed to reinforce the trust underlying its more prominent role; this

trust can be created through further agreements. A final argument against a more prominent SDR is that

there are already enough well-managed currencies in the world that another one is not needed.

Unfortunately, the quality of government management of currencies is questionable in light of the recent

financial crisis. More importantly, the SDR is tied to all the world's economies unlike existing

currencies which are components of either a single country's economy or a pool of countries like the

euro. These technical arguments about the SDR are not convincing although there are more substantial

barriers to implementing this change that are discussed later. When comparing these alternatives, the

motivations for currency denomination can be viewed from multiple perspectives: non-reserve currency

countries, reserve currency countries, and China (Williamson, 2009).

Countries whose currency is not used for reserves have many considerations if they were to switch to

SDR. First, intervention in exchange rates would become more cumbersome as they would need to

convert SDR into commercial currency. The second factor rooted in portfolio theory is that the interest

rate yield on SDR is the same as the component currencies but the variance of the basket is lower

leading to more stability. Another benefit is the seigniorage provided by SDR is distributed across the

IMF member nations according to their allocations instead of concentrated with the countries currently

issuing reserve currencies. This benefit is manifested in the ability to borrow at lower rates than

normally possible in many countries. Another benefit to non-reserve nations is that it would be more

difficult for the US to wield such a large influence on trade balances, especially since during a crisis its

priority is protecting its domestic economy. Similarly the US would be subject to much stronger market pressures on exchange rates compelling it to maintain a better balance of trade (Coats, 2009). The final factor is the ability of current reserve currencies to continue to perform that function. As discussed earlier, the demand for reserves is expected to continue to increase yet the primary reserve issuer, the US, already runs a large and rapidly accumulating current account deficit. This is a manifestation of the Triffin dilemma which is an inherent conflict when the same instrument simultaneously attempts to satisfy both domestic and global monetary policy (Mateos, 2009). Foreign reserve demands would draw assets out of the country while domestic policy would attempt to pull assets into the country. The US has preferred to satisfy the global demands leading to accumulation of debt. Further increasing this deficit raises the risk of implicit default through inflation which would have a large effect on investor nations. While other currencies or gold could increase their role in reserves, they are also susceptible to limits in liquidity and influence from non-trade related factors. Also, using other government currencies would push them towards deficit as well, dissuading them from this approach. The SDR is a viable alternative that does not have these country-specific concerns about balance of payment or non-trade related factors. The net effect is that countries that do not issue reserve currencies have a net incentive to move to the SDR.

Countries that currently provide reserve currencies also have factors to consider when assessing a transition to SDR for reserves (Williamson, 2009). First, the seigniorage benefit of being the direct issuer of the currency would be lost but this would be replaced to a lessor extent by the seigniorage provided by the SDR allocation. This is because the countries with the largest allocation of SDR are the same as those currently providing reserve currencies to the world (US, Japan, Germany, France, and UK). Another problem with a transition to SDR is that it would increase the purchasing power of nations across the board including potential enemies of wealthy nations. Reserve issuing countries would rather explicitly choose the poor countries to support with direct aid to reward them for having positive political relationships with wealthy countries. In contrast to this cost there are a number of benefits offered by the SDR. The role of a reserve issuing country requires it to become a large short-term debtor to provide its currency to the world. This brings the associated risk of a run on the currency during financial crisis which can be mitigated by an accumulation of short term assets that by their nature have lower yields than other investments. This linkage means that domestic policy is now directed in part by foreign entities, a seemingly undesirable position. Another problem reserve currency countries experience is the instability of their currency caused by foreign banks trading the currency to

rebalance their reserve portfolio. This rebalancing adds noise to the exchange rate and demand for their currency instruments making it harder for the central bank to manage the currency. A growing risk to reserve issuing countries is that central banks lose confidence in the currency and decrease their holdings causing the currency to depreciate sharply, triggering a recession. If China were not so dependent upon the US to purchase Chinese goods, this rapid depreciation of the USD could have already occurred. A final cost of issuing a reserve currency is the political and financial leverage that foreign governments wield as they hold the debt, as demonstrated by the power China holds with the US. These costs provide a strong incentive for reserve issuing countries to support a move to SDR.

China holds a special place among nations when discussing reserves because it holds the most reserves in the world and its reserves are almost twice as big as the next largest reserves (Williamson, 2009). China is also growing rapidly so to maintain the same coverage ratio its reserves would need to continue to increase for the foreseeable future. China has strong incentives in the short, medium, and long term to move away from the USD and into the SDR. In the short term it is highly likely the USD will depreciate in value and China currently holds most of its reserves in that currency. If the world moved to SDR China would be able to transfer some of the cost of the depreciation to other parties. With the current IMF payment structure this deprecation would be absorbed by the US. A more realistic scenario is that a USD substitution account would be created within the IMF so any depreciation losses would be shared by all members of the IMF. Alternatively, the IMF could gradually adjust the composition of the SDR to decrease its percentage of SDR so China would lose a decreasing amount of value due to deflation. Regardless of the distribution method, each of these outcomes results in China losing less wealth as the USD depreciates, giving them an incentive to follow this strategy.

In the medium term China also benefits from a move to SDR by the seigniorage it gains from being part of the IMF (Williamson, 2009). Currently, the Chinese renminbi is not eligible to serve as a reserve currency because it is fixed to the dollar so foreign countries cannot use it to intervene in foreign exchange markets. Therefore, the SDR is a mechanism through which China can obtain some seigniorage without changing their currency exchange regime. In the long term China aspires to have its currency act as a world reserve so it has the ability to run a large current account deficit with impunity as the US does today. The SDR is a convenient mechanism through which China can move the world to gradually accept its currency as a reserve. The first move is to get governments and central banks to accept the SDR for central bank transactions to de-anchor them from the concept of requiring true

government currencies for reserves. Since SDRs are already used for reserves, albeit a very small amount, this transition is a matter of scaling the holdings of SDR as opposed to starting a new process. Once the SDR is accepted, gradual changes in its currency composition can occur without changing the name of the currency on central bank balance sheets. As China's economy continues to grow, it will have a strong argument to be added to the component currencies of the SDR. Once accepted, it can then gradually increase its proportion of the composition of SDR with little publicity. This could continue until they comprise a large enough portion to then argue that their currency should be held directly by central banks. While this process is highly speculative and would occur over decades, it does demonstrate a plausible incentive for China to support a move to use SDR for reserves.

The following is a summary of the broad benefits of the SDR relative a nation-specific currency (Coats, 2009). The SDR value is more stable relative to currencies in general. Its supply is determined by a collective decision of IMF member countries. SDRs are assigned to member nations at no cost and in proportion to their IMF allocation. Finally, the global supply can be increased without the need for a current account or trade deficit. These SDR benefits can be deployed with reserves to also realize benefits in reducing the total level of reserves and the transactional costs associated with multiple currencies. This paper builds a model to better quantify those benefits for both a region and the world as a whole to guide policy makers assessing the transition to a single reserve currency.

The EMU Model

EMU Background

The model begins by looking at the countries forming the European Monetary Union (EMU). In the late 1900s countries in Europe recognized their tight economic relationships as there was frequent trade across their borders. To reduce transaction costs and to build a trade environment corresponding to this close dependency the European Economic Community (EEC) was formed initially with the intent of creating a customs union and a common agricultural market (Mateos, 2009). At the time a common currency was not deemed necessary because the Bretton Woods system of fixed exchange rates was sufficiently maintaining exchange rate stability. In the late 1960s the Bretton Woods fixed exchange rates became strained due to US balance of payment policy and EEC members had diverging priorities for economic policy. In response, the member countries moved through various organizational

experiments from the 70s to 90s with the goal of creating more control over their collective economic policies leading to the creating of the EMU. One of the most prominent features of the EMU was the creation of a single currency that would replace the currencies of the individual countries.

A corollary of this is the formation of one central bank, the European Central Bank (ECB), to replace the central banks of the constituent countries for certain economic functions; this transfer of responsibility of the single monetary policy to the ECB occurred on January 1, 1999. Technically national central banks (NCB) still exist and maintain reserves but they do not influence the euro monetary or exchange rate policy as that is the function of the ECB. Indeed, the reserves held by the ECB are dwarfed by those held by the NCBs: in 2003 the ECB held €38.3 billion in reserve while the collective NCBs held €332 billion (Scheller, 2004). However, the NCBs operate under the direction of the ECB to ensure consistency of policy and the ECB maintains authority to call upon the reserves of NCBs as needed to execute policy decisions. Therefore, given this tight central control and the focus of this paper it is convenient to view the collective reserves as one group of assets under the control of the ECB.

Model Creation and Analysis

The EMU fits well into the context of this analysis because it is a supra-government organization with common reserves and a single currency. These pertinent features occurred in the last decade so the global economic and financial environment is similar to current and foreseeable environment, increasing the confidence in the analysis. Additionally, the ECB has had years to function enabling longer-term trends to emerge. Therefore, the EMU is used as an example of a move to a single reserve currency with 1999 as the milestone year when the countries began acting in union.

The first model is a simple comparison of the level of reserves relative to imports for four regional trade unions: EMU, ASEAN, Mercosur, and NAFTA. The time range is from 1991 to 2008 so there is approximately a decade of data from both before and after the EMU formation. Exhibit 1a shows reserves as a percentage of imports and demonstrates a number of points for consideration. The EMU maintained a ratio of about 20% until 1997 when it began a sustained decline reaching about 5% in 2008. NAFTA maintained its ratio throughout the time period and its percentage is approximately the same as that of the EMU. The ratios for these groups, which supply the predominant reserve currencies, are significantly lower than the other regions. The other regions actually increased their reserves over this time period although ASEAN maintains fewer reserves than Mercosur. It is possible that this is due

to ASEAN reflecting the minor role the yen performs in reserves while Mercosur represents no currency used for reserves. This would indicate that the larger extent a region's currency is used for reserves the fewer reserves it holds relative to imports.

Another way to conceptualize the ratio of reserves to imports is that it represents the reserve coverage ratio: the number of months that reserves could pay for imports with no other funding. Exhibit 1b shows the historical trends in terms of import coverage. Note that the EMU reduced from about 11 weeks of coverage to about 2 weeks, a significant reduction.

The same ratio of reserves to imports is analyzed as a year-on-year percentage change in Exhibit 1c. Both ASEAN and Mercosur demonstrate wild cyclical swings of reserves as a percent of imports, often in excess of 10%. NAFTA's ratio only changes about 1% each year and has longer periods between cycles. The EMU before 1999 has moderate changes each year with frequent cycles but after 1999 the magnitude of its changes become much less dramatic and its cycles become longer; in essence, it behaves more like NAFTA. This demonstrates that the changes inherent in the formation of the EMU increase stability in international trade and by extension its financial system.

After observing changes in EMU monetary policy with reserves after its formation, a regression model was created to determine how the reserves from 1999 to 2008 would be different if the EMU had not been created. These predictions are then compared to actual results to estimate the benefits the EMU experienced due to their consolidation into the ECB. Exhibit 2 shows the actual and predicted reserve to imports ratio as well as the monetary benefit of a consolidated monetary union. The predictive variables used in the model are GDP, imports, net capital account, and a correction factor for the year. As expected, once the ECB took effect in 1999 there is a financial benefit demonstrated by the actual reserve ratio being lower than the predicted ratio. This ratio also diverges over time, potentially explained by the world's growing confidence in the euro as a currency. The amount of assets "saved" from reserves due to the lower reserve ratio also grows rapidly and by 2003 exceeds $100 billion.

Based on these estimated savings from lower reserves, a new model was created with the same independent variables to predict the savings Mercosur could have also experienced from 2000 to 2008. Exhibit 3 shows the results of that model. If Mercosur had a structure similar to the ECB it could have held its reserve ratio at 10% instead of continuously exceeding 60% that it actually did during those years. Given the smaller economies of Mercosur relative to the EMU, the dollar savings appear more

modest, ranging from $50 billion to $200 billion. The savings for the EMU are around 20% of GDP each year while the savings for Mercosur are about 8% of GDP. This contrast probably results from the EMU relying heavily on imports while Mercosur imports less relative to their GDP. Nonetheless, an 8% GDP is still a material amount of savings for any nation.

The models presented in this paper demonstrate significant financial savings possible through a common reserve currency for both the EMU and Mercosur and similar benefits are expected if this strategy is deployed globally. The analysis shows consistently for NAFTA, EMU, and Mercosur that a 10% reserve coverage ratio is the long-term levels of reserves anticipated by having seigniorage with a reserve currency. In 2008 world imports amounted to $16.2 trillion according to the IMF. If the world implemented a single reserve currency and thus maintained reserves at 10% of imports, the world would only need $1.6 trillion in reserves instead of the approximately $7 trillion being held, freeing the remaining $5.4 trillion of capital for productive investment.

Application of Model

Transition Process

The model predicts savings from a move to a single reserve currency but as demonstrated by the formation of the EMU this requires a gradual transition, probably over decades. The EMU process is a good roadmap to follow for this transition although additional changes would be required within the IMF if the SDR would eventually be used throughout the world. The most likely process for global deployment would begin with regional reserve unions like the ECB that in a second phase would merge together under a single central bank using SDR. This mimics the process outlined by the Single Global Currency Association for its proposed process for a world currency (Chronology, 2009). While regions divided by geography are not required, it is likely that this is the manner in which larger reserve unions would form. There are already some existing free trade areas and customs unions that would probably form the basis of the reserve unions in addition to some new organizations. Potential groups that could develop into reserve unions are: EU, Mercosur, NAFTA, ASEAN, OATUU, and a Russian-centric trade union. The implementation would begin concurrently with monetary unions formalizing across the globe and creating regional supra-government currencies. Smaller economies within the unions may adopt the currency as their commercial currency to gain further benefits from reduced friction in trade

although this is not required. Nations would build years of experience and familiarity with a supra-government currency and realize the material financial benefits identified earlier. This would then inspire closer relationships between the regional unions until they begin to merge under a common currency. This process would continue until a critical mass of the world economy used a shared currency at which point the remaining countries would join. It is anticipated that emerging economies would lead the adoption process while the economies currently at the vanguard of world finance would resist and be among the last nations to convert. The numerous coordinated steps in this process contain many barriers in addition to limitations inherent in the model itself. Both of these problematic areas are discussed in detail below.

Model limitations

Although the model predicts savings from a single reserve currency there are noteworthy problems with it. The first problem is that only one historical event is used to build the model so the robustness of its predictive ability is questionable. Furthermore, the EMU example is built upon a long history of high levels of trade between member countries that is not true in other regions of the world. This heritage of trade surely helped foster a collective union implying that other regions may not recognize the same scale of benefits. Another problem is quantifying the present value of switching to a single reserve currency because the actual transition would realistically take decades with many uncertainties about the timeline of each phase of the transition. This longer time horizon would significantly reduce the present value of the benefits. These concerns are more technical in nature and are dwarfed by two fundamental challenges with this model. The first major problem with the model is that the reserves of the ECB did not actually move to a single currency. The model argues that the benefits realized by the EMU are due to a single reserve currency but in fact the ECB maintains a portfolio of foreign currencies like other central banks. While this does weaken the model when comparing trade with the EMU countries and the rest of the world, the model remains valid when analyzing the transaction costs among EMU countries. The composition of the ECB reserves could be viewed as a meta-currency which all EMU countries use for trade given the single monetary policy of the ECB. Therefore, the model captures the benefits of the single meta-currency for trade within the EMU but not with external countries. Viewed from this perspective this actually implies that the model underestimates the benefits of a single reserve currency if all trade partners used the same currency.

The second significant problem is that the EMU example includes the creation of a supra-government central bank (SGCB) and a currency that served not only as a reserve but also replaced the individual currencies used for consumer transactions within the countries. This raises the question about the proportion of the benefit caused by a single central bank and the proportion resulting from a single consumer currency. The model presented truly represents a combination of these two factors and it could be argued that either of these factors results in the largest benefits because they are the first order effects that lead to a secondary effect of a single reserve currency between EMU countries. The model does not attempt to separate the causality of these effects and in the case of the single central bank it is not desired; while it is possible to implement a SGCB and a single reserve currency independently, this paper argues that the catalyst for a single reserve currency is the formation of a single central bank and thus does not consider an isolated single reserve currency. Put another way, the argument for a single reserve currency implicitly includes the formation of a SGCB. On the other hand, the influence of a single consumer currency is not included in the model or required by the implementation strategy proposed but it certainly has an effect in reducing transaction costs. This means that the predictions made by the model are overstated unless a single consumer currency is also adopted. While no attempts are made to quantify this, the maximum benefits would surely be realized if a single currency was included in the global deployment is a single reserve currency. The implication is that first regional currencies would emerge followed by a single consumer currency. Given the magnitude of a shift to a single global currency (SGC) and the benefits it offers, a deeper study of that topic is included.

Single Global Currency (SGC)

The concept of a single global consumer currency may seem an unachievable goal given the more than 190 countries and 140 currencies in the world but there are dramatic benefits if the world could evolve into this economic environment. Despite this, economists as well regarded as John Maynard Keynes proposed a supra-national currency used to settle international trade. It is also worth noting that until the 1970s the world was arguable on a single currency, gold, as there were fixed exchange rates among the nominal currencies that all referenced back to gold. The primary benefit of a SGC is the elimination of transaction costs on international trade at all levels from governments to corporations and individuals. One estimate is that each year there is $400 billion spent on exchanging money (Bonpasse, M., personal communication, November 18, 2009). The present value of these perpetual costs is $2 trillion using a

very conservative discount rate of 20% while using a more realistic discount rate of 7% results in a present value of more than $5 trillion. This capital would become available for investments as opposed being lost in transactions costs. Currency users, particularly global companies, would also benefit from eliminating the uncertainty with exchange rates allowing them to reduce the overhead required to manage and hedge their foreign holdings.

Another benefit of SGC is the elimination of foreign currency reserves as there would no longer be foreign currencies (Bonpasse, M., personal communication, November 18, 2009). Foreign currency intervention is currently a large source of international conflict so those roots of conflict would be removed. Nations would still hold reserves in SGC but those would primarily be used to ensure local banks had sufficient liquidity to prevent runs on banks. The net effect on reserves would be a sharp decline in the amount of wealth held in reserve, again freeing capital for more productive investment. A SGC would also reduce the frequency and severity of financial crises because currency imbalances would no longer occur. The common currency would by its nature share inflationary effects throughout the world and obviate the need for a balance of payment which is based on currency differences that would no longer exist.

In addition to eliminating the two primary reasons for currency reserves, there are other benefits from a SGC. One benefit is a reduction in the level of secrecy required by central banks because their actions no longer influence exchange rates (Bonpasse, M., personal communication, November 18, 2009). Increased transparency inherently adds trust to the system and enables better collaboration with foreign policy makers and the private sector. Another benefit of a SGC is reduced disparity of wealth in the world because the differences across countries would be more noticeable and there would be fewer costs to transfer wealth across national borders. The benefits of a SGC are enjoyed by all parties in international trade (except currency traders) because at its core a SGC makes transactions more efficient. Despite these substantial benefits there is strong resistance to a SGC.

The most daunting hurdle is convincing leaders that moving to a SGC is an achievable objective that should be pursued. Most people are biased by the status quo and nationalistic heritage causing them to immediately think of the implementation challenges with moving to a SGC. This anchoring to the current system blinds decision makers to the formidable benefits a SGC offers. The next strongest opposition is from the current financial system leaders, particularly the US, who fear they will lose

currency seigniorage and political advantage by surrendering the ability to print their nation's currency and by extension set its monetary policy. This seems a short-sighted view given the probable evolution of the global economic environment as the world shifts from a western-centric financial structure to an Asian-centric reality. It seems that given this perspective of the future, the current leaders should prefer a supra-national governance structure and retain some power instead of losing all influence as the world gradually decides to abandon 20th century powers for emerging ones. The continued success of the euro during is relatively short existence is a daily reminder of the potential of a common currency and other regions of the world are beginning to take note. In particular there has been discussion of ASEAN adopting a single currency with the Chinese promoting the renminbi as that common currency (Distant, 2009).

Another fear held by all nations is that without the instrument of exchange rates they would lose the ability to attract businesses. Nations can ignore this concern as they would still be able to influence investment decisions through other mechanisms like labor laws, subsidies, and education investments. Furthermore, countries that currently do not receive investments out of fear of currency fluctuations would no longer be ostracized because that risk would be eliminated. Finally, a SGC carries with it a single interest rate and thus inflation rate so financing would become more normalized around the globe.

Some technical arguments against a SGC also prove to be weak. One point is that the wide spectrum of economic development represented by the nations of the world prevents the move to a single currency because nations at the extremes could not share a currency. The EMU, in addition to the countries that fixed their currency to the euro, demonstrate how economic disparity is able to work within a single currency. Another long-standing example is the United States in which there is still wide economic variance between states but the currency is still controlled at the federal level. Also, the currency is not intended to shrink that disparity but simply provide a common platform for efficient trade across national borders. Some argue that this would require an excessively large range of denominations of bills to account for the wide range of standards of living but these differences are actually reasonable orders of magnitude and would continue to converge as they have been since international trade flourished in the late 1900s. Furthermore, financial transactions are predominantly performed electronically and cash transactions will continue to decline over time so the physicality of the bills is of decreasing importance.

Arguments are also made about the ability to get the entire world onto one standard. The first consideration with this point is that only a majority of the world needs to convert until a tipping point is reached and the rest of the world follows suit (Bonpasse, M., personal communication, November 18, 2009). Indeed, it seems that it would only take a few of the largest economies to shift to a single currency until the rest of the world also adopted the currency. The next fear is that with so many parties involved there would be no equitable way to share representation with all countries. This is unfounded though because there are already examples of organizations with numerous members sharing power in a structured manner; noteworthy examples are the UN, the US Congress, and the current IMF structure to manage SDR. The structure would probably mimic that of the EMU or the US Federal Reserve system where there are multiple regional banks contributing to the overall policy of the SGCB.

This analysis shows that a SGC offers extensive benefits with primarily superficial obstacles so the true catalyst for change is a paradigm shift in global currency principles. This paper asserts the value of a SGC and the ideal of it being the end-state of world currencies even though it would obviate the need for the reserve currency strategy proposed. The move to a single reserve currency and SGCBs can act as a tool to shift perceptions about a SGC and it is anticipated that as nations move into structures like the EMU they would be convinced of the value of a supra-national currency for commercial use. Therefore, this paper completes its analysis of a single reserve currency by identifying barriers to that process.

Barriers to a Single Reserve Currency

The problems with using SDR for a single reserve currency can be grouped into those specific to SDR and those specific to a single reserve currency regardless of the currency used. The SDR specifically is problematic because its current management structure is not designed for a globally traded currency. Therefore, structural changes would be needed in the IMF to adequately serve this purpose. First, the amount of SDRs would need to expand enormously; for example, if SDR was used for all reserves currently held in the world the IMF would need to issue an additional 4 trillion SDR. If this amount of SDR was simply allocated as they are today the component currencies would be crippled due to the massive creation of a derivative of their currencies. Therefore, the allocation process itself would also need to change so that countries exchanged current reserves currencies for SDR. One method to handle this is to create a new type of SDR issuance for reserve replacement. The exchange rate used for this

replacement would also need to be orchestrated so it did not cause rapid changes in the component currency market exchange rates; otherwise, the issuance would cause the instability problem it was trying to solve. But simply using the current reserve levels to establish the amount of SDR to create seems unlikely to be the right amount because the fundamentals in global financing would change, probably requiring fewer SDR. This uncertainty supports a gradual transition process.

The IMF would also need to change the governance structure to allow for more frequent changes to the amount of SDR in circulation so the IMF could respond to new economic conditions in a timely manner. This includes two features that would no longer be coherent with the purpose of the SDR: reconstitution and designation (Mateos, 2009). Reconstitution is the requirement of countries to hold a certain percentage of their SDR allocations. Designation is the ability of the IMF to force members to trade SDR with other nations. Neither of these current SDR features would be applicable with a freely-exchanged currency and they would need to be revoked. Additionally, the IMF already does not possess much legitimacy in the world so it is unlikely countries would spontaneously offer it such broad control over global fiscal policy. While the IMF has been successful in improving policies in some developing countries it has never been able to influence large creditor nations. Furthermore, the IMF would become the agent providing financing for both traditional debt through reserves and unconditional aid which could cause moral hazard and require additional vigilance to keep these functions separate.

The SDR itself would also need to undergo a fundamental shift to no longer be a derivative of other currencies but rather an independently floating currency and the IMF would need a new mechanism to set interest rates in part to influence inflation. However, the move to a single currency contrasts with portfolio theory of mitigating risk through diversification. There is also no way to mandate countries to hold SDRs; as long as the component currencies exist, central banks are free to use whatever financial instruments they prefer for reserves. Policymakers could easily argue that they could hold assets in the same proportion of SDR and thus not need the actual SDR currency while at the same time having more flexibility to tune their assets to their desired level of risk. To summarize, massive restructuring of both the IMF and the SDR would be needed for SDR to become the single reserve currency. Even if these mechanics could be solved substantial problems still remain with implementing a single reserve currency.

Many of the problems with a SGC also exist with any single reserve currency, the most prominent being the political will of central banks currently issuing reserve currencies (US, ECB) to surrender most of the seigniorage they currently enjoy. As argued earlier, the motivation is the long term prospects of losing this benefit completely but avoiding this fate by accepting a single reserve currency. All nations also fear a loss of complete control over monetary policy including hedges against perceived market inequities. While in reality these are material costs of implementing change, they are offset by the substantial benefits of liquidity, stability, and equality offered by a single currency. A related complication is raw nationalistic pride but there are other more suitable ways to demonstrate this, particularly with the increasingly international nature of finance. The next formidable political challenge is the ability to equitably distribute power and SDRs across nations. Again, the solution is that there are numerous examples of large organizations satisfactorily distributing assets and control while including mechanisms for evolution with the global economic environment. In addition to these problems shared with SGC, there are additional challenges if a single reserve currency is implemented.

Most central bank reserve transactions are not with other central banks but rather the market. Therefore, a single reserve currency to which the market does not have access would actually add inefficiencies into the process (Coats, 2009). To avoid this, the market would need some access to SDR or a financial tool that mimics it so direct transactions could occur between private entities and central banks. While the EMU did this during its creation, it was a brief transitory step until the euro became commercially used and it is unclear whether a similar arrangement would survive in perpetuity without becoming a consumer currency. The best market mechanism is for the currency to also be used for commercial use. In essence, this means that a successful implementation of a single reserve currency could only occur as part of an overall plan to move to a SGC.

Conclusions

The objective of this paper is to demonstrate that material financial savings result from a single reserve currency in the world. Global savings of $5.4 trillion were predicted based on the model created around the EMU emergence at the turn of the century. However, the source of this benefit is more likely due to a single commercial currency and central bank instead of a single reserve currency. This analysis shows that a single reserve currency only makes sense in the context of a non-derivative SGC managed by a

supra-government organization with an independent interest rate. The IMF itself does not believe the SDR could elevate to a role as a either a SGC or expanded role in reserves and prefer it to just moderately increase its role in international trade. The empirical results of decades of vast expansion of world trade despite limited SDR indicate that its importance is minimal. Despite these arguments, the potential value of a SGC is derived more from stability rather than increased trade and there are numerous examples of instability caused by the current financial system. Indeed, the IMF studied the various options for currencies and reserves and a SGC (also referred to as Bancor) is better than the other methods on many dimensions as shown in Exhibit 4. Therefore, further research should be performed focused on the benefits, barriers, and implementation of a single global currency.

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Exhibit 1a: Historic Coverage Ratios - percentages

Reserves as a % of Imports

Source: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics
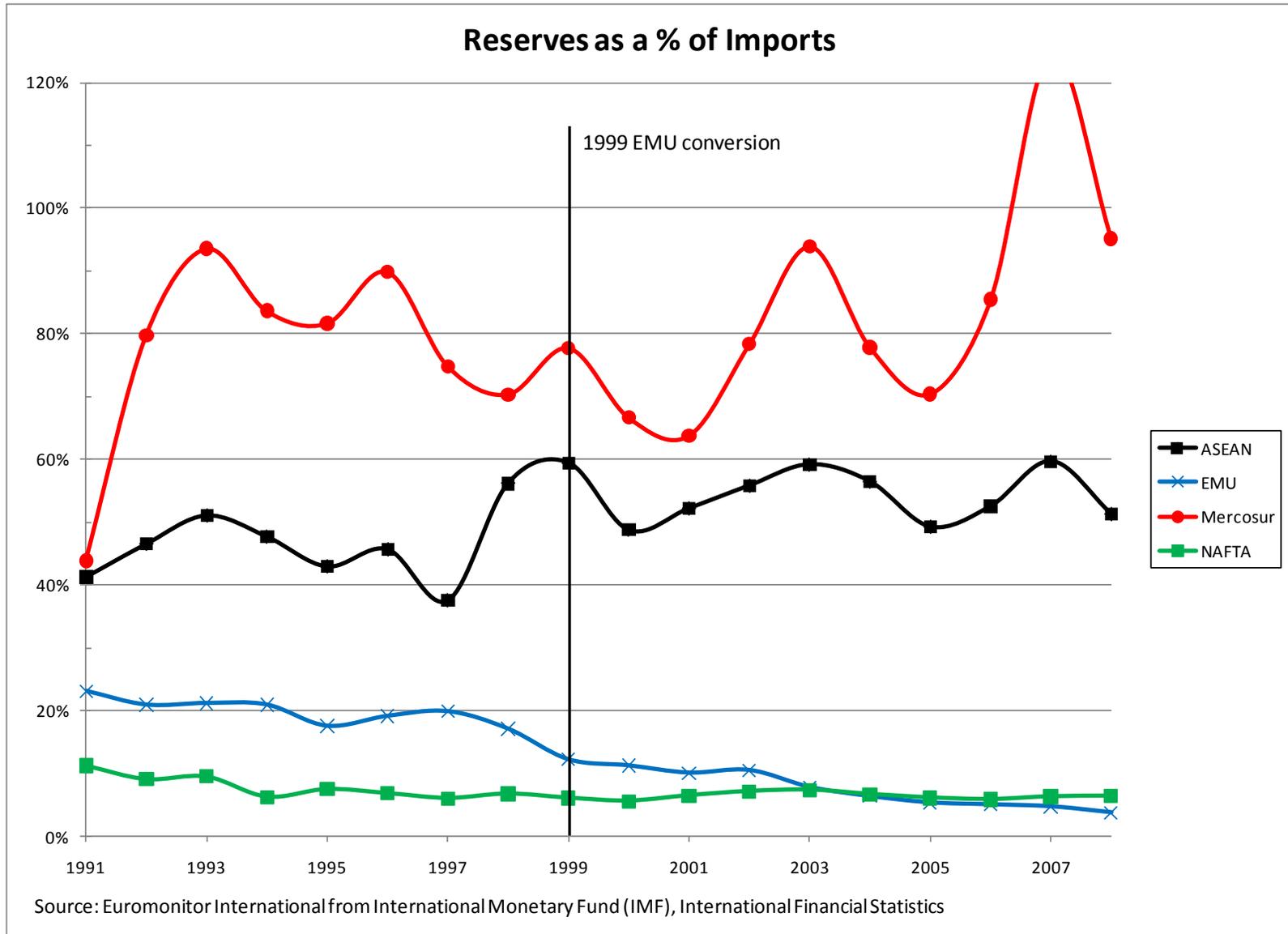
Exhibit 1b: Historic Coverage Ratios – months of coverage

Months of import coverage provided by reserves

1999 EMU conversion

Legend:
- ASEAN
- EMU
- Mercosur
- NAFTA

Source: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics
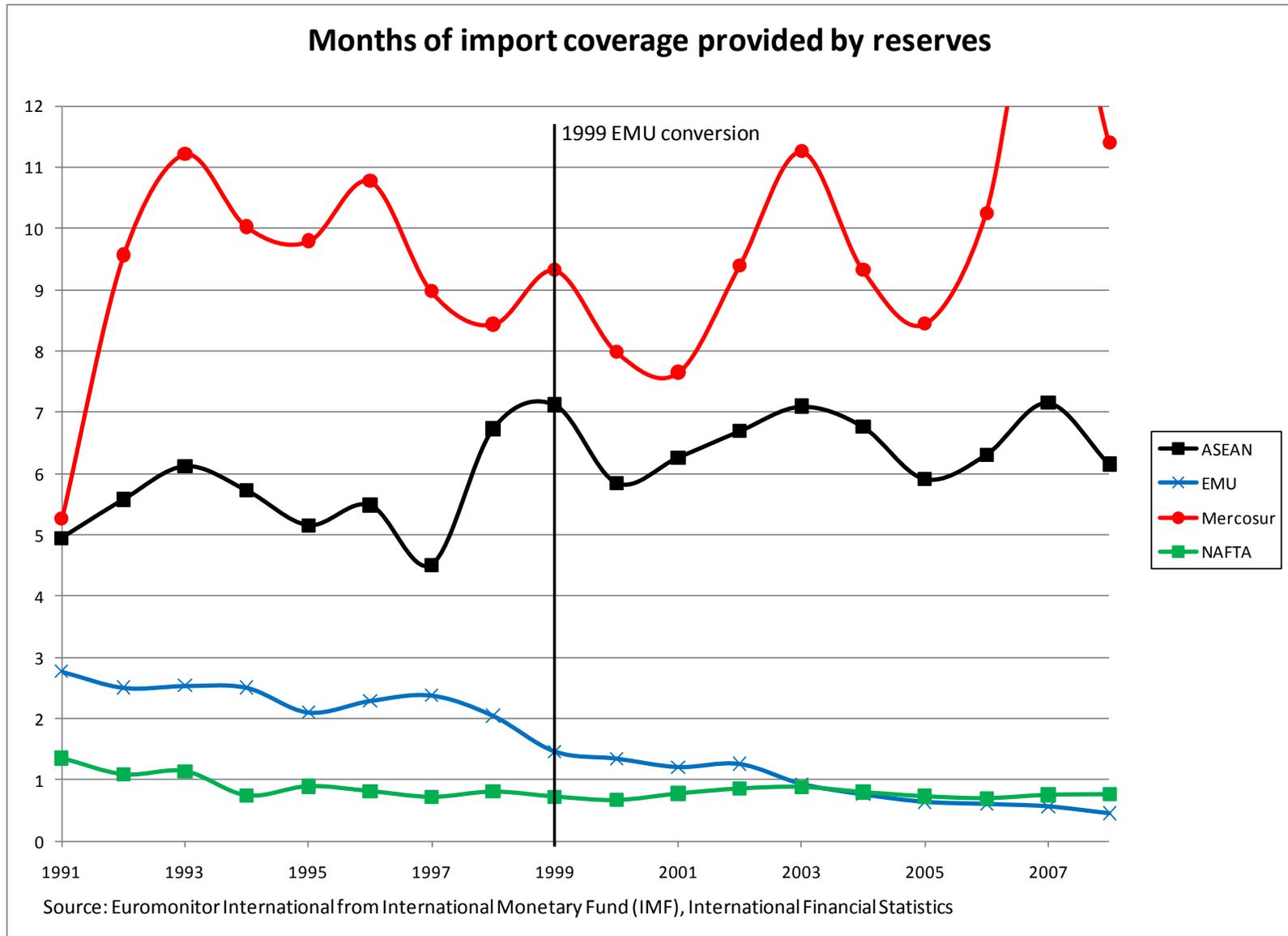
Exhibit 1c: Historic Coverage Ratios – year-on-year change

Year-on-year change in % of reserve to imports

Source: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics
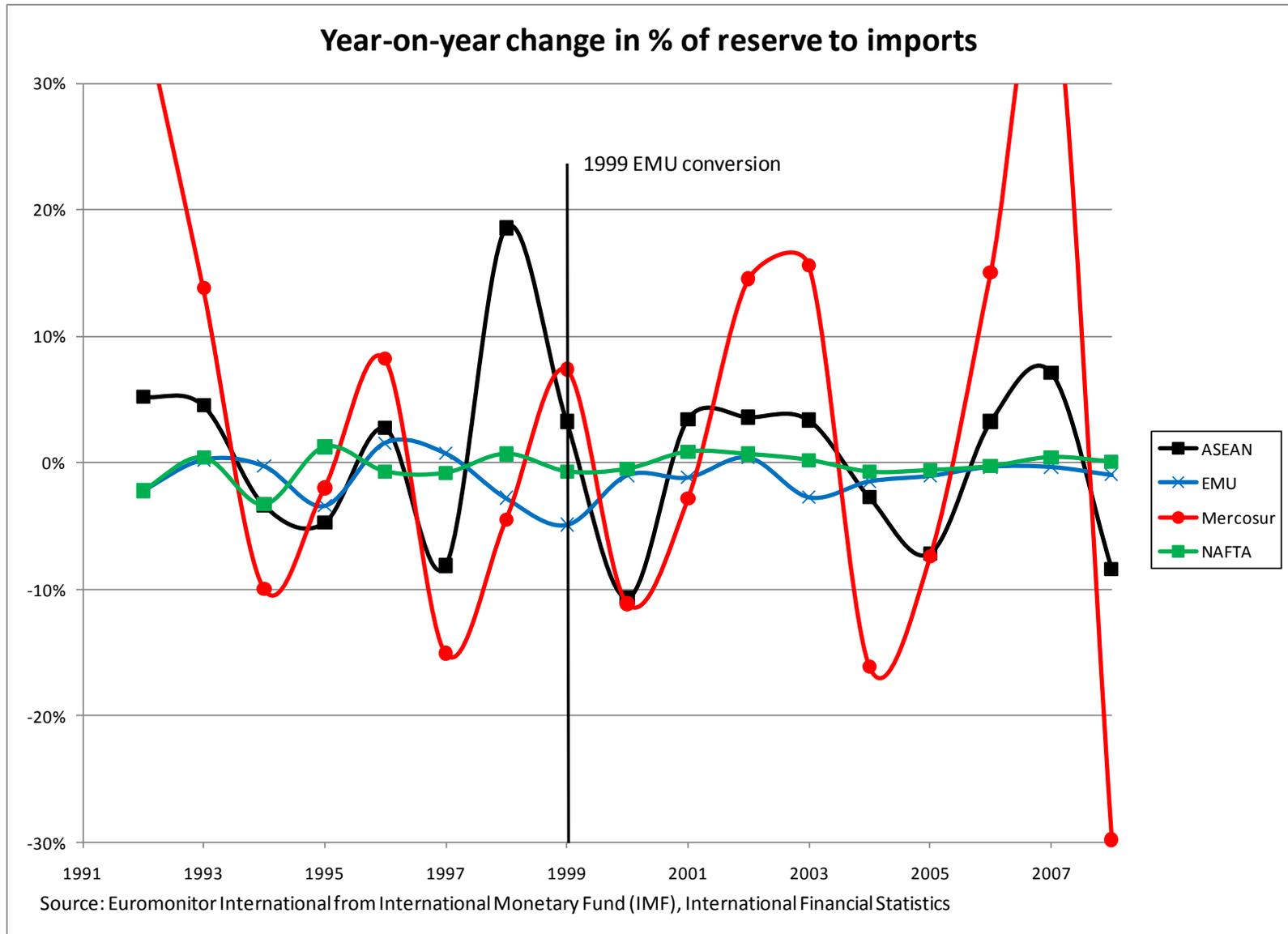
Exhibit 2: EMU Actual and Predicted Coverage Ratios

Left axis: Reserves/imports actual and predicted
Right axis: Savings by EMU in USD (billions)

1999 EMU conversion

Legend:
- Actual ratio
- Predicted ratio
- Savings (right axis)

Source: TBD
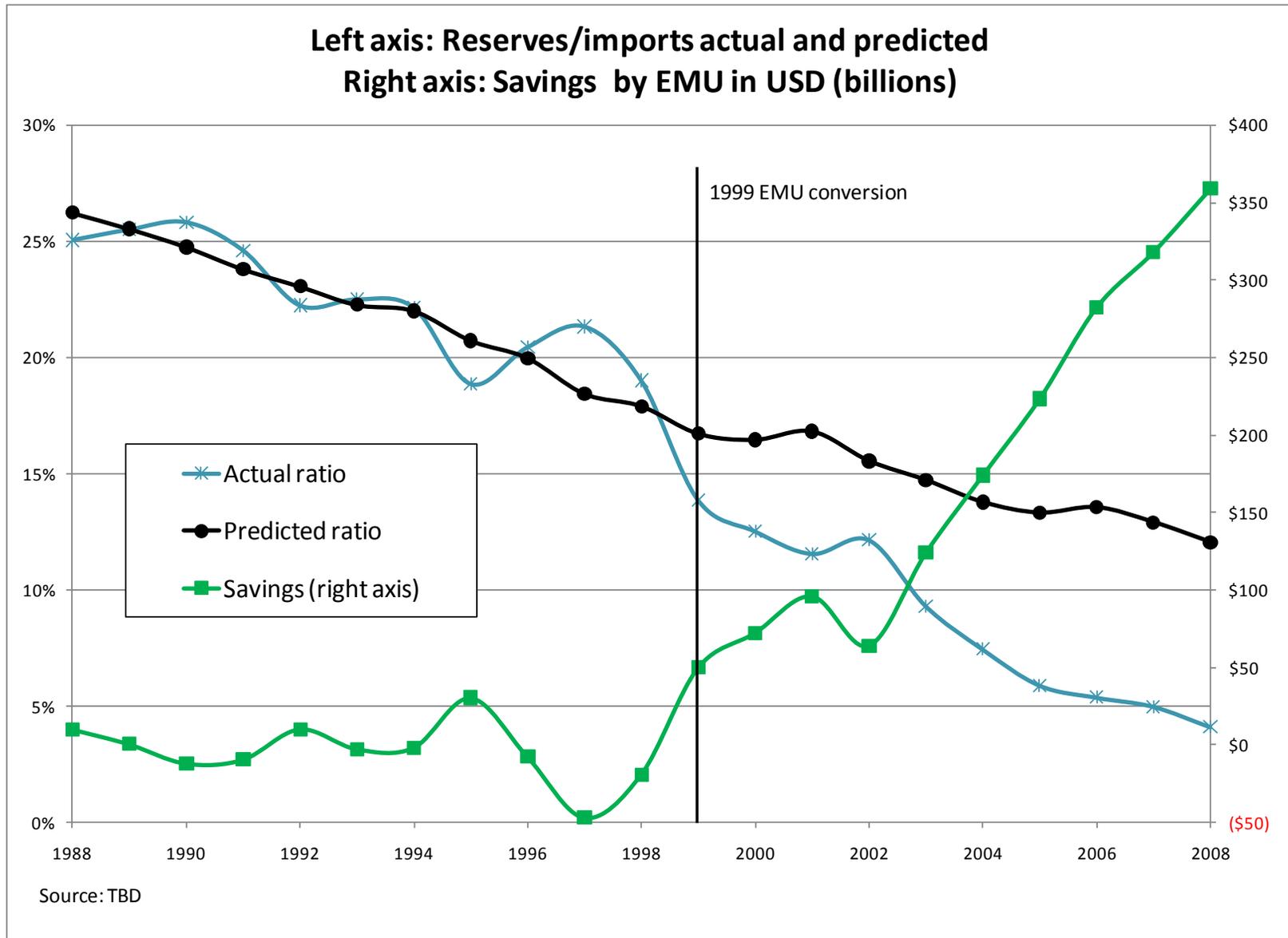
Exhibit 3: Mercosur Actual and Predicted Coverage Ratios

Left axis: Reserves/imports actual and predicted
Right axis: Predicted Savings by Mercosur in USD (billions)

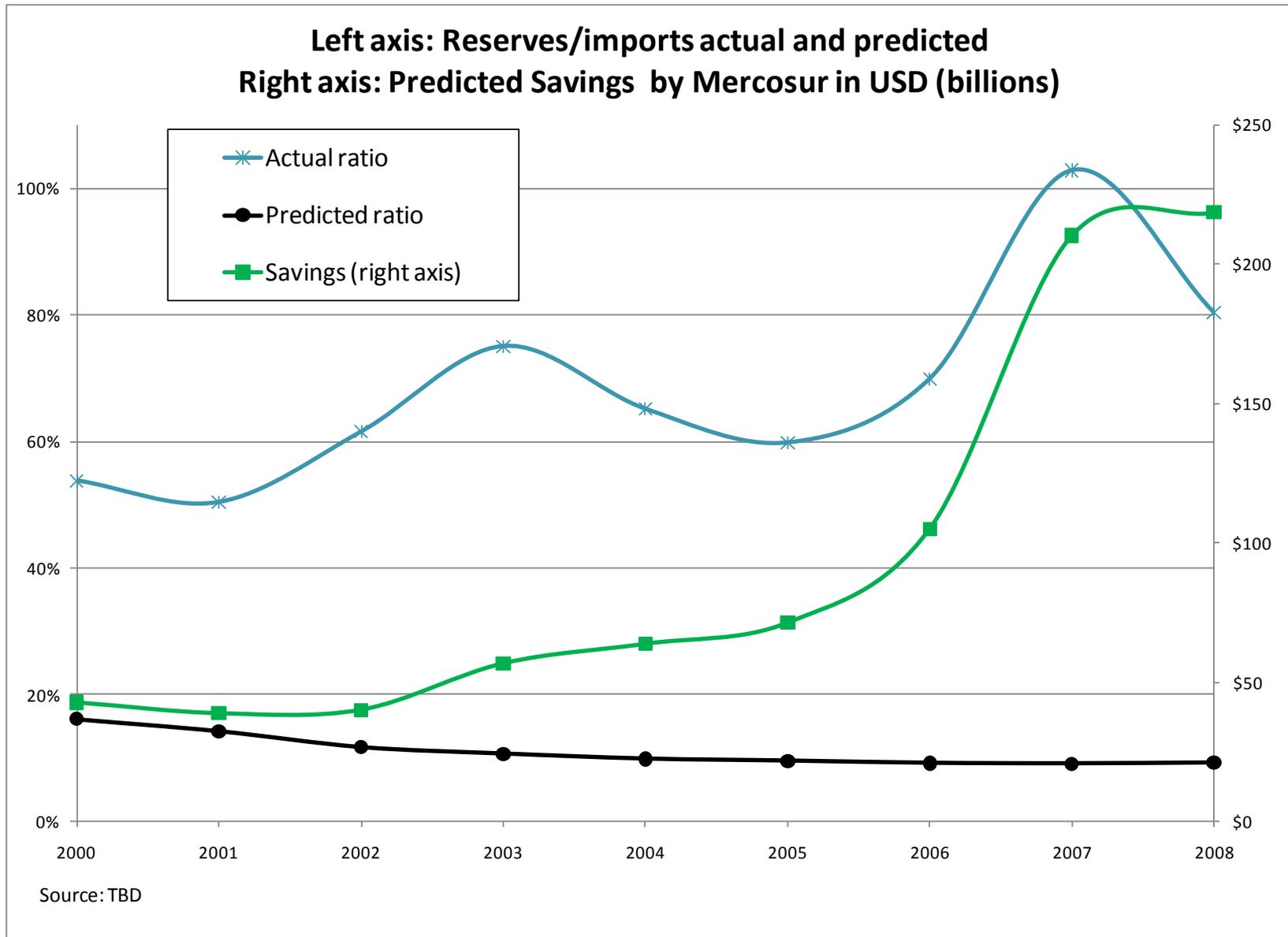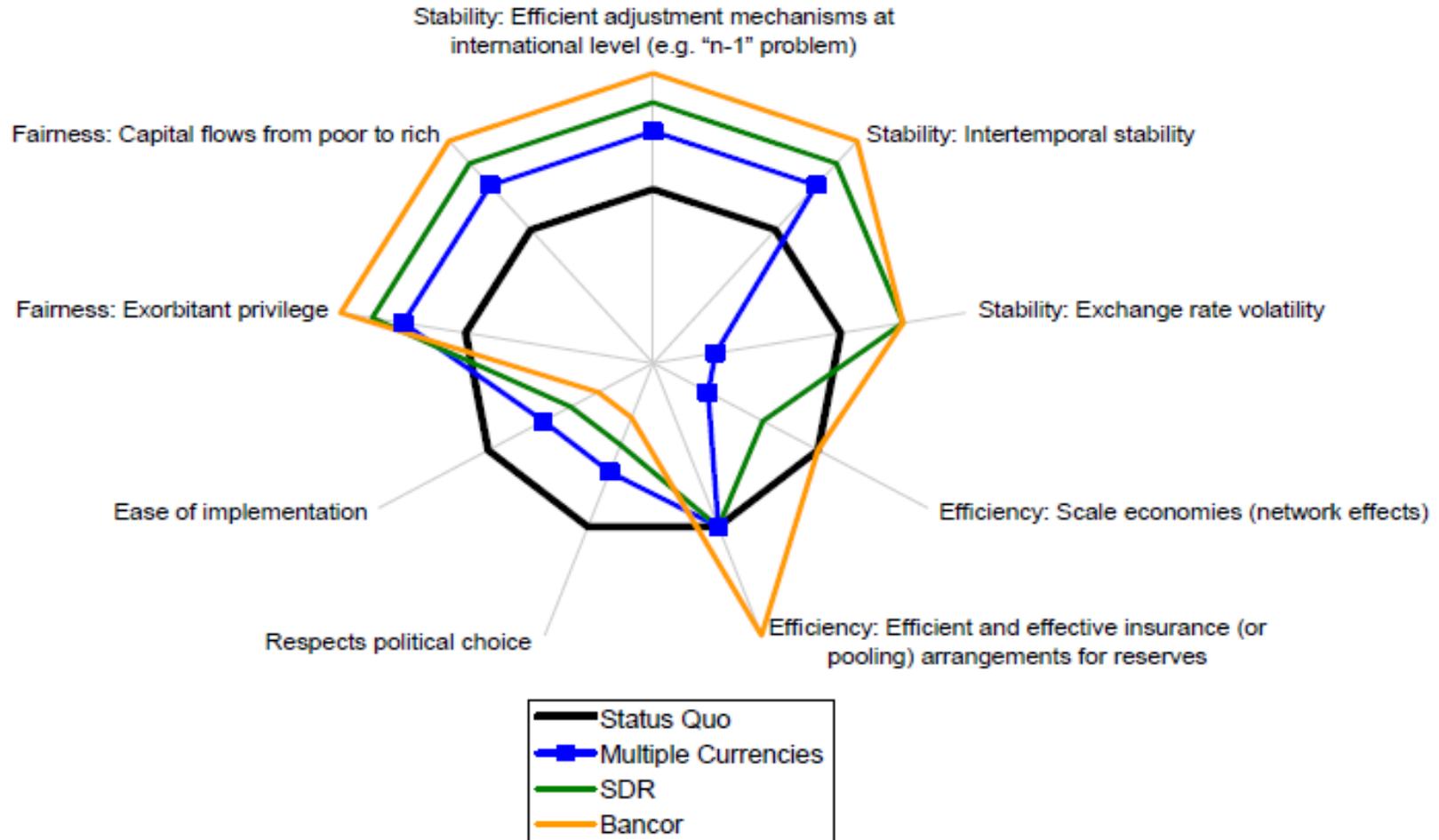Source: TBD

Exhibit 4: IMF Analysis of International Monetary and Reserve Systems

Note: Bancor refers to a single global currency other than the IMF's SDRs.

Source: Mateos y Lago, I., Duttagupta, R., & Goyal (2009). The Debate on the International Monetary System. *International Monetary Fund. Staff Position Note*, No. SPN/09/26, 23.

Exhibit 5: Data for Model Creation and Application

Regional Union data in millions of USD

Year	Reserves				Imports			
	ASEAN	EMU	Mercosur	NAFTA	ASEAN	EMU	Mercosur	NAFTA
1991	$74.3	$273.1	$15.0	$77.2	$180.1	$1,182.8	$34.2	$685.5
1992	$91.3	$258.2	$33.1	$67.8	$196.4	$1,236.0	$41.5	$748.2
1993	$114.9	$248.9	$45.2	$76.9	$225.2	$1,177.5	$48.3	$810.9
1994	$130.1	$279.2	$52.7	$57.5	$272.8	$1,336.3	$63.0	$927.4
1995	$148.6	$285.1	$65.5	$77.0	$346.0	$1,627.9	$80.2	$1,033.6
1996	$170.1	$315.6	$78.2	$75.5	$372.3	$1,653.6	$87.0	$1,113.4
1997	$142.6	$321.8	$75.2	$74.1	$379.7	$1,622.5	$100.5	$1,236.2
1998	$162.0	$293.8	$69.8	$87.4	$288.6	$1,722.6	$99.2	$1,303.2
1999	$183.9	$213.1	$64.3	$87.6	$309.6	$1,749.2	$82.7	$1,451.6
2000	$185.0	$206.4	$59.9	$95.4	$379.6	$1,841.4	$89.9	$1,714.8
2001	$181.6	$183.6	$53.7	$103.8	$348.0	$1,824.9	$84.2	$1,610.8
2002	$201.9	$197.4	$48.8	$116.4	$361.9	$1,884.4	$62.3	$1,632.6
2003	$235.6	$177.9	$64.9	$129.0	$398.3	$2,288.1	$69.1	$1,755.1
2004	$282.2	$174.0	$74.0	$135.7	$500.2	$2,750.4	$95.1	$2,040.5
2005	$295.7	$159.9	$80.2	$141.5	$600.1	$3,010.7	$113.9	$2,327.2
2006	$360.0	$173.2	$120.2	$149.6	$685.3	$3,456.1	$140.6	$2,572.7
2007	$461.3	$188.4	$230.1	$171.4	$773.2	$4,015.2	$184.2	$2,735.2
2008	$484.5	$169.1	$246.3	$185.1	$944.9	$4,519.8	$258.9	$2,912.0

Source: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics

Exhibit 5 Data Continued

EMU data in millions of USD

Year	GDP	Imports	Capital Account	Reserves	Actual Ratio	Predicted Ratio	Savings
1988	$426,769.0	$842,343.0	$490.0	$210,992.5	25%	26%	$9,959.9
1989	$435,310.0	$918,824.5	$685.3	$234,277.3	25%	26%	$389.8
1990	$548,404.0	$1,137,250.8	$2,296.8	$293,630.2	26%	25%	($12,080.9)
1991	$588,266.0	$1,182,820.1	$4,053.9	$291,179.1	25%	24%	($9,658.1)
1992	$649,828.0	$1,235,952.3	$4,638.2	$274,925.4	22%	23%	$10,030.4
1993	$594,739.0	$1,177,514.5	$4,723.1	$264,943.1	23%	22%	($2,783.9)
1994	$629,311.0	$1,336,320.2	$2,718.9	$296,021.0	22%	22%	($1,947.0)
1995	$726,934.0	$1,627,868.0	$7,554.4	$307,148.9	19%	21%	$30,252.6
1996	$735,570.0	$1,653,595.9	$7,921.5	$337,925.8	20%	20%	($7,638.2)
1997	$672,254.0	$1,622,462.3	$12,594.6	$346,128.2	21%	18%	($47,085.1)
1998	$690,117.0	$1,722,553.5	$11,961.9	$327,528.0	19%	18%	($19,213.7)
1999	$686,782.0	$1,749,191.0	$14,901.5	$242,552.1	14%	17%	$49,774.2
2000	$517,680.0	$1,841,431.0	$12,074.0	$230,616.0	13%	16%	$72,289.3
2001	$633,818.0	$1,824,857.0	$5,873.0	$210,866.0	12%	17%	$95,994.8
2002	$691,794.0	$1,884,417.0	$9,607.0	$228,910.0	12%	16%	$64,077.8
2003	$853,262.0	$2,288,083.0	$12,342.0	$212,939.0	9%	15%	$123,932.5
2004	$976,142.0	$2,750,430.0	$15,947.0	$204,827.0	7%	14%	$173,981.4
2005	$854,516.0	$3,010,651.0	$15,096.0	$177,422.0	6%	13%	$223,416.3
2006	$1,074,813.0	$3,456,111.0	$11,804.0	$185,786.0	5%	14%	$282,492.8
2007	$1,233,985.0	$4,015,244.0	$14,038.0	$200,045.0	5%	13%	$318,272.9
2008	$1,363,383.0	$4,519,828.0	$17,269.0	$185,531.0	4%	12%	$359,190.0

Source: World Development Indicators (WDI), WorldBank

The EMU regression equation for coverage ratio (reserves/imports) from 1988 to 1999 is:

Coverage ratio $= 14.42 - 0.00713 *$ year $+ 4.84\text{E-}9 *$ GDP $+ 6.57\text{E-}9 *$ imports $- 1.67\text{E-}6 *$ capital account

Exhibit 5 Data Continued

Mercosur data in millions of USD

Year	GDP	Imports	Capital Account	Reserves	Actual Ratio	Predicted Ratio	Savings
2000	$958,800.1	$113,031.1	$487.7	$60,822.6	54%	16%	$42,583.1
2001	$849,623.4	$106,916.5	$294.4	$53,926.7	50%	14%	$38,710.2
2002	$624,913.6	$80,162.1	$1,268.4	$49,349.7	62%	12%	$39,979.8
2003	$699,663.7	$88,004.3	$658.4	$66,052.1	75%	11%	$56,672.3
2004	$837,526.0	$115,184.1	$606.2	$75,022.6	65%	10%	$63,675.3
2005	$1,090,214.8	$141,738.1	$864.6	$84,795.2	60%	10%	$71,281.5
2006	$1,332,600.3	$172,867.8	$1,064.8	$120,847.1	70%	9%	$104,986.5
2007	$1,632,197.4	$224,365.8	$1,032.0	$230,690.7	103%	9%	$210,287.8
2008	$1,989,086.7	$307,200.3	$1,380.9	$246,895.8	80%	9%	$218,560.0

Source: World Development Indicators (WDI), WorldBank

The EMU regression equation for coverage ratio (reserves/imports) from 1999 to 2008 is:

Coverage ratio = $28.73 - 0.0143 * \text{year} + 4.54E\text{-}8 * \text{GDP} - 2.9E\text{-}9 * \text{imports} - 1.0E\text{-}6 * \text{capital account}$