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# *The Twentieth Adlith Brown Memorial Lecture*

## *Foreign Exchange Reserves: How much is Enough?*

*By*

*Dr. Marion V. Williams*

Delivered on November 2, 2005  
at the British Colonial Hilton Hotel  
Nassau, The Bahamas on the occasion of the  
XXXVII Annual Monetary Studies Conference of the  
Caribbean Centre for Monetary Studies



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## *About the Author*

**Dr. Marion Williams** is Governor of the Central Bank of Barbados, a position which she has held since 1999.

She has worked in the area of economics and finance for most of her working life. She holds a Ph.D. from the University of Surrey and a Masters Degree in Economics from the University of the West Indies. She is a Fellow of the Institute of Bankers (FCIB) of the U.K., and a Certified Management Accountant (CMA). Dr. Williams was the first President and a founding member of the Barbados Institute of Banking and Finance. She is the current Chairman of the Steering Committee of the Caribbean Technical Assistance Centre (CARTAC) and Chairman of the Executive Committee of the Caribbean Centre for Monetary Studies (CCMS). In 2006 Dr. Williams was the recipient of the Award of Honorary Fellow of the Caribbean Association of Banking and Financial Institutes (CABFI).

She has represented the Bank at several meetings and conferences, both regionally and internationally; has published articles in local, regional and international journals, and has served on many advisory boards and committees. She is the author of three books "*Liberalising a Regulated Banking System: The Caribbean Case*", published by Avebury, "*Managing Public Finances in a Small Developing Economy – The Case of Barbados*", published by Praeger, and "*Strategic Repositioning: A Caribbean Perspective on Economic Policy Making*", published by the Central Bank of Barbados.

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## *The Late Dr. Adlith Brown*

The Annual Adlith Brown Memorial Lecture honours the memory of Dr. Adlith Brown, Co-ordinator of the then Regional Programme of Monetary Studies from 1980 to 1984.

Although born in Jamaica, Dr. Brown could truly have been described as a Caribbean woman. Her sense of regionalism was nurtured on the Mona Campus of The University of the West Indies where she did her undergraduate work for the B.Sc. (Economics). She subsequently completed her Master's (with distinction) as well as her Doctorate from McGill University.

Adlith returned to teach at the University (St. Augustine Campus) in 1969 and in 1971 was transferred to the Mona Campus where she taught Monetary Economics in 1976 and was one of the main anchors of its research programmes. She co-ordinated, firstly, the Caribbean Public Enterprise Project and secondly, in 1980, the Regional Programme of Monetary Studies. In this period, she was also promoted to the position of Senior Research Fellow and in 1982 to the position of Acting Deputy Director - a position which she held until her death. These latter years demonstrated most her capacity for intellectual leadership and for creative management.

Adlith revelled in the realm of ideas. It is therefore understandable that she was fast developing a reputation for being an outstanding economic theorist as her writings attest. Indeed, she was an ideal person to co-ordinate the Regional Programme of Monetary Studies, given her passion for regionalism, her intellectual standing and her understanding of the process and problems of policy-making with which her colleagues in the Regional central banks had to cope.

Each year an eminent Caribbean scholar is invited to deliver the Memorial Lecture, during the Annual Monetary Studies Conference of the Caribbean Centre for Monetary Studies (CCMS), in tribute to the life and work of Adlith Brown.

**FOREIGN EXCHANGE RESERVES:  
HOW MUCH IS ENOUGH?**

*by*

*Dr. Marion V. Williams*  
*Governor*  
*Central Bank of Barbados*

Mr. Master of Ceremonies, Governor of the Central Bank of The Bahamas, Mrs. Wendy Craigg, former Governor of the Central Bank of Barbados, Sir Courtney Blackman, Deputy Governors, Central Bankers, distinguished guests.

I would first like to thank the Central Bank of The Bahamas and the Caribbean Centre for Monetary Studies for a well-organized Monetary Studies Conference and I wish also to extend my appreciation for the many courtesies extended to us.

It is indeed an honour to have been invited to deliver this year's Adlith Brown Memorial Lecture. The list of speakers who have done so before me is indeed distinguished and Adlith herself was a consummate economist who was dedicated to uplifting the level of scholarship on monetary and central banking matters in the Caribbean. I think this series attempts to do just

that. I cut my teeth in monetary matters at the Regional Programme for Monetary Studies, the precursor of CCMS, as a rapporteur at the first meeting held in Barbados under Mrs. Pat Robinson, who was the Research Director at the Central Bank of Trinidad. That was many years ago. I hope that today, I can add something to the body of knowledge on the subject, more particularly, on considerations surrounding the holding of an adequate level of foreign exchange reserves, as I address the topic “Foreign Exchange Reserves: How much is enough?” I will discuss why countries have varying views on what is adequate, why countries aim to have levels which are more than adequate, and what factors must be considered in arriving at internationally-accepted criteria without having a one-size-fits-all formula, how we can develop such formulae, and whether countries are likely to cease accumulating foreign exchange reserves.

In the Caribbean, almost any one who is an occasional reader of the newspaper knows that foreign exchange reserves are characterized primarily as a last resort stock of foreign currency for the financing of foreign currency outflows. Reserves help to maintain confidence in the currency, and allow central banks to intervene in the market in order to influence the exchange rate. They also permit central banks to limit the vulnerability of the country to external shocks, give confidence

to the public and reassure credit rating agencies and international financial institutions about the soundness of the economy.

Traditionally, the control and management of foreign exchange reserves have been the preserve of central banks. However, the accumulation of foreign exchange reserves depends not on the central bank directly, but on the structure and vibrancy of the economy, the split between the share in GDP of the traded and non-traded sectors, the level and rate of capital inflows and outflows, and on the attractiveness of returns offered in other currencies. Reserve accumulation can be built from strong performance of the economy and from current and capital account surpluses, or it can be supplemented by external borrowing.

All these factors taken together influence the level of foreign exchange reserves. Since the holding of reserves, which by definition is denominated in other countries' currencies, generally means that the home country is financing investment and development of other people's countries, then on the basis of pure arithmetic, countries should hold no more foreign exchange reserves than they think is necessary. However, most countries tend to do the reverse; they tend to accumulate as much foreign exchange as possible. Why do central banks then defy mathematical laws and consistently incur greater costs by holding increasingly higher levels of foreign exchange reserves.

Admittedly, if a country is earning foreign exchange at a rapid rate, it generally has little option but to hold its assets in foreign reserves, since the alternative of spending it on the imports of goods and services which are superfluous to its needs, can create inflationary pressures. However, countries which have difficulties in accumulating reserves, through normal transactions activities, will make vigorous attempts to increase their holdings.

### **Why We Need Foreign Exchange Reserves**

Traditionally, foreign exchange reserves were used to intervene in the foreign exchange markets. However, over the years the frequency of intervention by central banks in developed hard currency markets has waned. Few central banks in developed countries have actively intervened in the past decade, since for the most part, financial markets in developed countries are sufficiently deep to absorb and manage most shocks. Nonetheless, intervention still frequently occurs in emerging market economies, but intervention in developed countries, if and when it takes place, is often limited to ensuring orderly conditions for the movement in exchange rates. Indeed, increasingly, intervention is seen as having little lasting power to influence the real exchange rate and thus competitive conditions for the tradable sector. Intervention can be used, however, to supply liquidity to the foreign exchange markets or to influence the level of foreign exchange reserves.

## **When Foreign Exchange Reserves Are Not Needed**

A country with a hard currency, such as the US dollar, sterling or the euro, has little need to be concerned about the level of foreign exchange reserves. Their currencies are acceptable across the globe. However, very often, non-US dollar currencies are acceptable largely because the countries involved have substantial foreign exchange reserves. In recent years China has built up substantial reserves in US dollars, as have Japan and some other East Asian countries. Mervyn King in an article in the *Central Banking Quarterly Journal* of May 2005 observes that for most of the post-war period, the quantity of reserves held by Asian central banks was of the same order of magnitude as that of the central bank reserves held by the G7 countries. The example of South-East Asia in the mid-1990s showed that for developing and newly industrializing countries, even when foreign exchange levels are huge, they can be eroded rapidly if there is loss of confidence. Since then, in Asia and more recently in a number of Latin American countries, central banks have embarked on deliberate policies of reserve accumulation. By the middle of 2005, Japan and non-Japan Asia held reserves nearly 10 times larger than the combined reserves of the rest of G7 countries. Indeed the People's Bank of China's Monetary Policy Report for the second quarter of 2005 states that at the end of June official foreign exchange reserves had reached US\$711 billion, and

more importantly, had grown by US\$101 billion over the end of 2004. It is clear therefore that there has been acceleration in the pace of reserve accumulation by China.

Indeed, some Asian countries have kept their currencies undervalued in an effort to maintain external competitiveness, attract foreign direct investment and boost exports and growth. Dooley et al (2004) argue that the resulting accumulation of foreign reserves can be seen as collateral, which is being used for attracting foreign investment.

### **Increasing Levels of Reserves**

Without doubt, global reserves have increased rapidly over the past decade, principally as a means of combating financial market turbulence. Between 2001 and the end of 2004, global foreign exchange reserves grew by over US\$1600 billion, reflecting reserve accumulation by emerging market economies in Asia. In a survey on “How Countries Manage Reserve”, editors Pringle and Carver (2003), note that between 1975 and 2001, just after the move to generalized floating by major industrial countries, official holdings of reserve assets as measured by the IMF increased by more than ten times, (or about 10.2% per year). The same study reports that there are only a few years in which reserves did not rise and that these reflected years of acute crises in the system, sharp falls in the

market price of gold or changes in the outstanding holdings of IMF related assets.

### **Foreign Exchange Reserves and Hard Currency Areas Versus Soft Currency Areas**

In the case of hard currencies such as the US dollar, the value of the currency is less dependent on the volume of foreign exchange reserves and more on the strength of the economy. The value of these currencies rarely rises or falls on the basis of how much foreign exchange reserves the central bank has accumulated, but rather on corporate indicators, economic fundamentals and capital market movements.

Some central banks, through open market operations aimed at preventing their currency from appreciating, can at the same time build substantial reserves. For many years Japan engaged in a programme of buying US dollars in order to keep the yen/US dollar rate down so as to make its exports more competitive. This also led to a massive build up in foreign exchange reserves in the Bank of Japan. In these circumstances, the level of foreign exchange reserves is a secondary consideration. Canada did the same in the 1980s and its reserves rose steadily, reaching US\$18 billion in 1990 compared to an average of US\$2.5 billion between 1975 and 1986.

In small developing countries the reverse is the case. Intervention is usually intended to stop the rate from falling rather than to stop it from rising. Consequently open market operations usually take the form of selling foreign exchange, and the level of foreign exchange reserves to support interventions is a much more important factor.

### **Foreign Exchange Reserves: Oil Economies Versus Non-oil Economies**

Oil exporting countries are able to build reserves much more easily, while non-oil exporting countries have to continuously concern themselves with replenishment of foreign exchange reserves. This gives oil exporters much more flexibility in adopting a floating exchange rate regime, as they are able more easily to defend the rate. Indeed, in some oil exporting economies where there are large revenues from such exports, the central bank engages in passive intervention to prevent the foreign currency from reaching the market. Moreno (2005) notes that in Mexico, the Mexican oil company Pemex can only acquire pesos by depositing its dollars in the central bank.

### **Foreign Exchange Reserves: Politically Vulnerable Economies and Politically Correct Economies**

The political correctness of an economy influences what it considers to be an adequate level of foreign exchange reserves.

A centrally planned economy like China is not a politically correct economy. Nor, today, is Venezuela. Such countries see themselves as needing to avoid placing themselves in a position where they are forced to change their regimes. This comment is not in any way intended to be judgmental about any regime, but it is interesting to note that it was not until Indonesia came close to running out of foreign exchange reserves in the mid nineties that it was forced to change its regime from the family-run government system which had been in place for several decades. They had to privatise a number of family businesses, many of which were owned by the government in power. While this is not to condone their system, it is quite likely, that had they not come close to running out of foreign exchange reserves, they would have been able to continue with that system of government for many years.

There is evidence from the case of China that substantially high levels of foreign exchange reserves add political clout. Robert Pringle in reporting on the growth of China's reserves, notes that its economic dynamism and vast foreign reserves meant that its views needed to be listened to more respectfully than had been the case in the past. He notes that China's reserve accumulation has not only secured insurance against shocks but also the world's respectful attention. However, though accumulation of reserves adds confidence, over-accumulation in a single currency can in itself bring vulnerability.

It is argued that massive US payments deficits are beginning to undermine confidence in the dollar and for large dollar holders there may be a point beyond which there is over exposure to the dollar and therefore vulnerability can set in. This introduces issues of currency composition, portfolio management and duration, which need to be taken into account but are not intended to be the subject of this presentation, as that constitutes a different subject in itself.

### **Guaranteed Security and Foreign Exchange Reserves**

While reserves add to financial security, there is the political security which can result from where foreign exchange reserves are placed. In the BIS, for example, access to foreign reserves is guaranteed. According to its post-war Charter, foreign reserves placed with the BIS cannot be impounded or frozen, as happened in the case of Panama, several years ago. So, depending on one's political vulnerability, it is not only important to have large reserves, but it is also important to be mindful of where they are held.

### **Capital Account Liberalization and Reflows of Foreign Exchange Reserves**

The level of foreign exchange reserves is heavily influenced by the extent to which the capital account is liberalized. In

strong competitive economies where capital inflows are vibrant, the liberalization of the capital account can lead to continued inflows of foreign exchange. In less competitive economies, particularly where there is the expectation that the exchange rate cannot be maintained, liberalization of the capital account can lead to outflows of foreign exchange. Jamaica experienced this for several decades. Indeed, following the South-East Asian crisis of the mid nineties, Malaysia re-imposed exchange controls in order to pre-empt short term outflows, to staunch the outflow of capital and to rebuild reserves. From all reports this appears to have worked and though this is not a recommendation, it is one of the few cases where re-imposition of exchange controls has been successful.

In a BIS study on foreign exchange markets, it was observed that in EU accession countries a higher level of foreign exchange reserves helped mitigate an increase in external vulnerability stemming from liberalization of capital flows – in particular short term flows.

### **Rebuilding Reserves Under Liberalized Systems**

Though the adequacy of foreign exchange reserves is closely related to capital inflows and the extent of foreign borrowing, and though foreign borrowing can be an important method of rebuilding reserves, it cannot be a substitute for

autonomous inflows based on the proceeds of export of goods and services and foreign direct investment.

However, borrowing to supplement reserves is an appropriate method of ironing out difficulties, if those difficulties are just short term. If difficulties are chronic, then foreign borrowing will not be sustainable over the long term, even though the level of reserves, when borrowed, will help to add confidence to the public and to investors, in the short and sometimes even the medium term.

### **Sustainability of Reserve Levels**

While the level of foreign exchange reserves is influenced by the way in which reserves are managed, it is the underlying strength of the economy, and the ability to earn foreign exchange which are vital. In the Caribbean many countries consistently post current account deficits and rely on capital inflows to offset these deficits. However, where current account deficits become very large, dependence on capital inflows can be precarious as experienced in the nineties by Latin America. Perversely, because Caribbean capital markets are not yet very deep, capital flows tend to be less volatile, so for the time being, there is no evidence of excessive volatility in the capital markets of most of the English-speaking Caribbean, though there is greater volatility in Jamaica than in the rest of the Caribbean.

The prognosis therefore, would tend to indicate that as the Caribbean deepens its capital market – which it is making every effort to do – central banks in the region may need to hold higher levels of foreign exchange reserves in order to deal with the volatility which can result, unless they are willing to let the exchange rate depreciate.

### **Interest Rates and Reserve Levels**

While the level of foreign exchange reserves is influenced by economic fundamentals, interest rates can influence reserve stocks at the margin. Where interest rates are lower than metropolitan rates foreign exchange holders are likely to go in search of higher returns and may be slow in repatriating export proceeds and other funds earned overseas. Where interest rates are high relative to foreign rates, there is a greater likelihood that foreign exchange earners will keep funds at home. There is therefore pressure to keep interest rates competitive in order to discourage capital outflows, and low enough as not to adversely affect the cost of operations of business or precipitate outflows and hence a loss of foreign exchange reserves.

### **Cost Structures and Reserve Levels**

The country's cost structure, by influencing the competitiveness of its products, also influences the profitability of

businesses and the growth of its exports of goods and services. Countries with high cost structures will therefore have greater difficulty in building foreign exchange reserves through exports. Indeed, the United States has been adversely impacted in this way, particularly with respect to the export of vehicles and electronics goods and similar types of products.

In the final analysis, the competitiveness of the economy is the most important determinant of a country's ability to build reserves. While some capital may flow into the country on bases unrelated to competitiveness, it is the competitive ability to earn one's way in the world that leads to the most sustainable means of building foreign reserves.

### **Surplus Reserves**

Significant accumulation of reserves, as in the case of China and at one time Japan, can lead to calls for foreign exchange rate appreciation in some international quarters. This has been the argument made principally by the US and some European countries as to why China should revalue its exchange rate. This new dimension – too much foreign exchange reserves – is really, not so much about reserves as about the fact that the country has been able to out-compete so many other developed countries through the tremendous performance of its export sector.

However, there are the cases of Mexico and Chile where approaches to controlling foreign reserve accumulation have been adopted. These recent measures in Chile and Mexico to reduce foreign reserve holdings and to limit foreign exchange growth suggest that in some Latin American countries the cost of holding additional foreign reserves may be exceeding the benefits. Mexico, for example, has put in place a policy to limit the growth of foreign exchange reserves by selling foreign currency according to a pre-determined formula.

### **Impact on Other Economies of Holding Surplus Reserves**

The argument against countries holding too large a stock of reserves has another dimension. It is argued that struggling economies with high levels of foreign exchange reserves are really financing the development of other large economies by holding their government securities.

This argument has not been sufficiently persuasive as to stop reserve accumulation, simply because most developing countries generally do not find themselves in a position where they hold such excessive stocks of reserves. Even in Botswana, a diamond rich country, where reserves are equivalent to over 3 years of imports, it is debatable whether this is excessive given how rapidly fortunes can change.

The greatest risk to the holding country of holding excessive reserves is depreciation of the currency in which the reserves are held. Where large reserves are held then the impact of the risk of depreciation of the currency is greater. By buying other hard currencies one can hedge against depreciation, since the depreciation of one hard currency is often matched by appreciation of others. Without getting too deeply into currency diversification issues, this makes the point that countries can hold large stocks of reserves and yet reduce their exposures through currency diversification.

G7 countries are beginning to argue that the counterpart to the Asian Bloc's current account surpluses and acquisition of dollar reserves – which has been large current account deficits in the United States – could, in due course, cause investors to start to worry about the US' ability to repay. This, it is suggested, could then contribute to potential instability of the international financial system. However, the international system is already taking corrective measures. Data already show that the share of US dollars in the official holding of global foreign exchange reserves has declined from 71% in 1999 to 65.9% in 2004, mostly reflected in a shift to the euro.

## **Reserves and Their Impact on Government Spending**

It is sometimes argued that high levels of foreign exchange reserves allow the borrowing country to be less circumspect in assuming debt where they are a good credit risk, as financing is always available. There is a disadvantage here for prudent macroeconomic management. It is suggested that if foreign exchange reserves are highly visible and easily available, some governments may be encouraged to spend on public works and other similar activities. Aizenman and Marion (2004) even suggest that it is optimal to hold lower foreign reserves if the government is more inclined to spend them.

## **Non-Reciprocity in Investing and Borrowing**

It is however noteworthy, that while foreign assets are held mostly in government securities, borrowing is from the private sector. Invariably, developing countries have no direct access to borrowing from the governments in whose securities they invest and whose economies they therefore support. Increasingly however, as credit ratings become more widespread, central banks will be positioned to place their reserves in issues of highly rated developing country issues. This should lead to a situation where developing countries use their reserves to help each other without exposing their assets to too much risk. Unfortunately, current data indicate that while

there has been an increase in the holding of developing countries assets in global reserves, it has been through increased holdings by industrialized countries.

### **Opportunity Cost of Holding Reserves**

The matter of the opportunity cost of holding reserves is always a consideration, but becomes more of an issue where holdings reach significant levels. The opportunity cost of holding reserves is the foregone investment of resources which have been used to purchase reserves rather than towards building domestic investment capital. One could argue that the marginal productivity of domestic capital is the opportunity cost of holding reserves.

The optimal level of reserves has been indicated as the level where marginal productivity of reserves – including exchange rate stability, confidence factors, risk mitigation factors, insurance against capital flight and similar benefits, plus interest earned on reserves - equals the marginal productivity of real resources were they otherwise employed. Clearly, an attempt to quantify these costs and benefits is challenging. In reality therefore, most central banks do not calculate explicitly such costs and benefits, but instead use several indicators of foreign exchange adequacy, none of which by itself is sufficient.

Where domestic rates are kept high and US rates are low, the carrying cost of holding reserves increases. A consideration in any decision affecting reserve levels is therefore the marginal cost of holding reserves against the marginal benefits. Moreno (2005) suggests that if the impact on competitiveness is not a consideration, the marginal benefit of an additional dollar of reserves could be estimated as the expected reduction in the cost of a currency crisis based on early warning system estimates (i.e. the change in the probability of a crisis associated with an increase in reserves, times the cost of a crisis) while the marginal cost is the opportunity cost of holding reserves (e.g. the sovereign spread – which assumes reserves are financed by foreign borrowing) times the change in reserves. Research suggests (Moreno and Turner (2004), that higher foreign reserves can reduce sovereign spreads as well as improve credit ratings. Thus the cost of holding reserves can be narrowed as reserve holdings rise. Accordingly, the greater the quantum of reserves, the lower the cost of borrowing and the greater the benefit of holding reserves.

### **Currency Boards: Foreign Exchange Reserves to Broad Money and Base Money**

Some developing and newly industrialising economies opt for a currency board system where currency board principles require that changes in the monetary base can only be brought

about by corresponding changes in foreign exchange reserves. This is intended to place a known cap on outflows. Hong Kong, the OECS and some former USSR countries and Pacific islands are examples. It is argued that in this way all claims on local currency can be met by foreign exchange. In reality, there are several modifications to this and varying percentage coverage used in different jurisdictions. Generally, it is felt that a sizeable money stock in relation to reserves puts the monetary authority in a weak position to deal with possible capital flight. However, international crises in the past 10 years are not able to point to a high money base and low reserves as the cause of the crises, though low reserves do result from crises. In addition, where capital markets are open, currency boards no longer provide the insurance they once appeared to offer.

### **Reserve Levels and Access to Capital Markets**

Uncertainty about access to capital markets also influences the level of reserves which central banks hold. Access to capital markets can be cut off because a country's credit rating falls or because the market itself is short of liquidity. In addition, access may be so costly as to be prohibitive. In these circumstances, central banks can be pressed into drawing on international reserves. Though building foreign exchange reserves by way of foreign borrowing is not the optimum approach to foreign exchange accumulation, in some

circumstances countries may need to resort to the capital markets in order to boost reserves, in order to fund foreign currency payments and to boost confidence in the economy. In some developed countries, foreign borrowing is only undertaken to meet government's foreign currency liabilities and not for funding of private sector payments. Several central banks (among them the Bank of Canada) do not therefore provide foreign currency to the commercial banking system to fund private sector transaction balances.

### **Reserve Accumulation Needs in Fixed and Floating Rate Regimes**

In a fixed exchange rate regime ideally, commercial banks should finance transactions from their own foreign exchange resources before approaching the central bank. However, they can, and do, approach the central bank to purchase foreign exchange for transaction purposes. It is expected, however, that central banks will provide foreign exchange to fund only those private sector foreign payments which cannot be met from the system, but it is sometimes difficult to confirm that banks have tested the interbank market first. Consequently, unless central banks in fixed exchange rate regimes can get commercial banks to use their foreign exchange resources, (and we have been trying to do this in Barbados; Trinidad and Tobago and Jamaica operate that way all the time) fixed

exchange regimes will find it necessary to hold higher levels of foreign exchange than their counterparts in floating rate regimes where the exchange rate is not sacrosanct.

### **Foreign Exchange Reserves and Support for Exchange Rates**

Foreign exchange intervention aimed at preventing currency depreciation, requires high levels of foreign exchange reserves. In some floating rate economies regimes, authorities often worry that a steep depreciation of the currency could have political and credit risks and will intervene in order to support the rate or to slow its depreciation. Foreign exchange intervention is defined here as any operation that has the effect of altering the net foreign position of the public sector. Paul Moser Boehm (2005) in BIS papers on “Foreign Exchange Intervention in Emerging Markets” notes that there is a limit to intervention. If the exchange rate is depreciating as a result of weak fundamentals, intervention would not help to stabilize it for long unless the central bank raises interest rates, and even then stabilization is not assured. Likewise, trying to reverse depreciation by intervening in the foreign exchange markets can be ineffective in the face of chronically large budget deficits.

Where central banks take foreign currency directly from public or private entities outside the market, in some cases as

a result of surrender requirements, termed “passive interventions”, this can supplement reserves. These are direct dealings of the central bank with the private sector – where the private sector borrows or otherwise obtains foreign exchange and sells the foreign exchange directly to the central bank – and while used in some Latin American countries, it can sometimes be less than transparent.

Sterilized interventions are transactions that are offset by central bank transactions which nullify any impact on domestic money creation, while unsterilized interventions are included as part of a deliberate monetary policy.

Intervention is prompted by the view that if a country can keep its exchange rate relatively steady there is likely to be a greater likelihood of capital inflows. In order to support its exchange rate, a country must, however, have a healthy level of foreign exchange reserves so as to position itself to support the rate where it deems it necessary for the achievement of macroeconomic stability.

Indeed, in floating rate systems in developing countries, the quantum of foreign exchange reserves aimed for by the central bank depends to a large extent on the objectives of the bank. If the country wishes to keep its exchange rate stable, a higher quantum of reserves is required than if it is prepared to

allow the rate to depreciate. If it is prepared to allow it to depreciate at a controlled pace, it can suffice on somewhat less, but still substantial reserves; but if it is prepared to let the rate go altogether, less reserves are required.

In floating exchange rate regimes, particularly in hard currency areas, authorities seem more inclined to allow the rate to go where it will. This permits the central bank to hold on to its foreign exchange reserves. The decision not to intervene and so conserve reserves can also be influenced by the extent to which the central bank feels that its intervention can or cannot make a difference. Sometimes the cost in terms of likely foreign exchange loss is too high and the central bank may opt to hold on to its foreign exchange reserves and allow the rate to depreciate.

### **Foreign Currency Accounts and the Impact on Foreign Exchange Reserves**

Globally, there has been an increase in the holding of foreign currency accounts, principally in dollars, by resident account holders in non-dollar countries. While this may be advantageous to the holder, it removes large sums from the pool of foreign exchange reserves which can be made available to the general public, and creates foreign assets which are blocked by the banks who hold such accounts for particular customers,

whether or not the customer needs the funds for current use. This portion of funds, which would otherwise have been available to a greater number of users, reduces the pool of reserves and slows the pace of accumulation of official foreign exchange reserves. However, there is increasing pressure on central banks to allow the free holding of foreign currency accounts – this involuntary dollarization is represented as part of the liberalization process. This too, and it is increasingly the case, pushes central banks into holding more foreign exchange reserves, and also undermines the effectiveness of monetary policy. The ratio of foreign currency deposits to total deposits in the Caribbean ranges from a low of under 15% in Barbados and the OECS to close to 40% in Jamaica.

### **Sterilizing Foreign Exchange Inflows**

In some cases, the central bank may choose to sterilize the proceeds of foreign exchange flows by preventing the proceeds from entering the banking system for the financing of credit or for drawdowns to fund increased spending by government. This is sometimes necessary when government accesses large sums of foreign exchange. Sterilization thus slows or controls the rate at which funds are transformed into domestic spending.

## **Foreign Exchange Reserves and The Confidence Factor: What Builds It and What Undermines It.**

Where there is some weakness in underlying fundamentals, it is even more important that foreign exchange levels are healthy. Some will argue that foreign exchange reserves have their own dynamic, both in terms of encouraging inflows when stocks are high and encouraging outflows when stocks are low. However, once confidence is undermined, it is difficult to rebuild. Confidence-building efforts must not, however, be interpreted as an opportunity to be lax in fiscal policy. This can sometimes place central bankers in a dilemma, as it is often difficult to prompt governments to exercise restraint without having the public interpret words of caution as evidence of a lack of confidence in the economy. In Barbados, we have had to deal with this, and have found that pre-emptive policies can be wrongly interpreted as evidence of financial difficulties.

## **Seasonalities and Foreign Exchange Adequacy**

Invariably, every economy has periods when foreign exchange outflows are heavy and periods when foreign exchange inflows are thin. It is important to convey that seasonal movements are what they are – seasonal – so that the public will not change their opinions about economic performance because of large outflows during such seasonal

periods of high reserve use. What is important, is that seasonalities are planned for, so that the reserves remaining during such periods are still at healthy levels. The same applies to periods of execution of major projects. The outflows resulting from the foreign exchange costs of such projects should not leave the foreign exchange reserves at levels where these are considered inadequate. Even though the outflows are temporary, if the absolute level of foreign exchange reserves is allowed to fall below a certain threshold, confidence may still be undermined.

### **The Nature of Inflows**

The source of foreign exchange accumulation has also shifted over the past two decades. The pattern in the 1990s when aggregate current account balances for the emerging world as a whole were negative, was for capital inflows to be large and foreign exchange accumulation to be based on capital inflows. Over the period 2000-2004 the accumulation of foreign exchange reserves in emerging markets has instead been mostly through the generation of current account surpluses. Reserves built from current account surpluses tend to be less volatile than those built by either borrowing or short-term capital flows, as was the case in the 1990s.

Globalization has led to an increased demand for outward foreign direct investment, as investors go in search of competitive markets as well as markets which offer a vast consumer base. This is good business sense for the investor but can mean acceleration in capital outflows with little expectation of short-term reflow of profits and dividends. Barbados has tried to facilitate this through the development of a second tier of foreign exchange reserves. In the initial phase this represents foreign assets of long-term institutional investors with domestic long-term liabilities, particularly insurance and pensions, which have in due course to be repatriated to domestic beneficiaries, and helps to add a new layer to the normal level of reserves. I understand that Belize has also been considering this approach. (While I am at it, let me reiterate that Barbados' foreign exchange reserves are very healthy at BDS\$1.2 billion and the equivalent of 23 weeks of imports).

The Central Bank of Norway (Norge Bank) who manages the country's Petroleum fund, goes further and invests substantial proportions of its foreign exchange reserves in equities. This is a means of the country's participating in outward capital investment while retaining access to its foreign exchange reserves. It is not unlike the second tier reserves idea, except that the assets belong directly to government and are not simply pledged by the private sector.

As the stock of foreign exchange reserves rises across the globe, there is likely to be an increase in the purchase of equities by central banks, as they seek to take part in global investments while keeping access to reserves. Indeed, already, a number of central banks, particularly those which hold large surpluses, are modifying their portfolios in this way – and also improving income, I may add.

### **Foreign Exchange Reserves and Credit Ratings**

In a survey by the BIS on the impact of reserve accumulation on credit ratings and external vulnerability of central banks in emerging markets, all 16 central banks who responded believed that reserve accumulation has some positive impact on sovereign credit ratings. Only in Columbia did the credit ratings not improve during periods of reserve accumulation. Several central banks – in both fixed and floating rate regimes – commented that higher reserves gave them greater confidence and credibility in foreign exchange markets. They observed that this helped to improve the sustainability of their external positions and hence their credit ratings. Higher reserves implied greater capacity to redeem external debt and reduced the risk of speculative attacks on the currency. It also reduced international funding costs in a number of emerging economies. Most central banks also noted that rating agencies generally viewed the steady trend of reserve accumulation as

an indication of the underlying strength of the economy. While these survey results are opinions of central banks involved in taking these decisions, they generally corroborate the observed facts.

It is also generally agreed that an approach to evaluating the adequacy of reserves has implications for how reserves have to be managed. The design of investment strategies and the management of risks should ideally take into account the currency composition of reserves, duration and types of financial instruments. The view of the international financial institutions is that the currency composition of the reserves should broadly reflect the composition of potential flows rather than trade flows only. In addition, every effort should be made to avoid instruments that tend to be highly correlated with international contagion effects or other negative events. In the case of countries with more than sufficient reserves to cover country risks, then long-term investment, subject to holding adequate transaction balances, is the prudent option.

The Caribbean has watched with interest the fortunes of the euro. We have observed that it has become a stronger currency. That is well known. What is less known, is that it has allowed the euro area countries to economize on the use of foreign exchange, simply because all transactions with countries within the euro area are now domestic transactions

and this allows the euro region to pay less attention to the accumulation of foreign exchange holdings than its component parts did in the past. It now requires foreign exchange only to purchase goods and services or to make investments outside the euro region. At the end of 2004 France held 75% of the foreign exchange reserves held before entering the euro, Germany 62%, Greece 22%, Belgium 52%, Ireland 27%, Netherlands 45% and Spain 21.5%. Using a simple average, euro countries held on average, 40% of what they held in 1998. With the recent admission of new members, this allows them to even further economize on the use of foreign exchange. There are lessons for the Caribbean here with respect to a single regional currency and the way in which it can economize on the use of foreign exchange.

### **Factors Considered in Judging Reserve Adequacy**

Having discussed extensively the factors considered by central banks in deciding to accumulate reserves, let us attempt to draw up general rules about reserve adequacy.

The most common factor considered in judging reserve adequacy is the equivalent number of months of imports. It was felt that a measure based on imports, could determine how long a country could continue to import if all other inflows of foreign exchange dried up. For many years the guideline of

reserves equivalent to 12 weeks of imports was used as the accepted measure by the International Monetary Fund, but in recent years, particularly after the South East Asian, crisis this has been questioned.

The currently held view is that this measure is of limited value, since it focuses solely on the external current account, which was relevant in the years of limited capital flows to developing and emerging market countries. Indeed, these countries have more open capital accounts and are receiving greater amounts of capital flows. Therefore, in a world of highly mobile capital, reserve adequacy should be based on rules that focus on the vulnerabilities to the capital account. This view has been supported by feedback from outreach activities conducted by the IMF and World Bank in emerging market economies.

### **Reserve Levels and Debt**

Debt based indicators have been developed as a means of measuring reserve adequacy. One measure, the level of reserves to short term debt by remaining maturity, is deemed to be a useful indicator. The level of debt service repayment obligations as a ratio of export of goods and services is another which attempts to link earnings to payments. The ratio of debt service to gross domestic product is probably the most heavily

used. The latter does not take into account foreign exchange earnings. It is related more to the growth of the overall economy. However, high levels of growth of GDP do not guarantee foreign exchange growth. The structure of production must be geared towards export earnings in order for economic growth and foreign exchange accumulation to be in sync. Generally speaking, however, it is the foreign component of debt that is of most interest to capital market watchers and rating agencies, though international financial institutions like the IMF are also concerned about the overall debt burden and its sustainability.

Traditionally, government debt service obligations have been the major consideration, but with increasing globalization, central banks can indirectly be put under pressure to provide foreign exchange for the servicing of private sector foreign debts as well. In floating exchange rate systems this puts pressure on the exchange rate, and on foreign exchange reserves if the central bank intervenes to protect the rate. However, in fixed exchange rate systems it puts pressure on foreign exchange reserves directly. As a result of this internationalization, there is an increasing view among central banks that they should make every effort to increase their holdings of foreign exchange reserves, particularly in fixed exchange rate regimes. The greater the level of internationalization, the greater is the need for foreign exchange accumulation.

## **Reserve Levels and Capital Flows**

Given the inevitability of increasing internationalization, and the increasing range of financial instruments, the expected levels of capital outflows and inflows are particularly important in determining foreign exchange reserve adequacy. Allan Greenspan (1999) suggests a “liquidity at risk” rule which moves beyond simple balance sheet rules and works toward a standard that takes into account the foreseeable risks that countries face. One approach, he suggests would be to calculate a country’s liquidity position for relevant financial variables such as exchange rates, commodity prices, and credit spreads. It might be possible to express a standard in terms of the probabilities of different outcomes. He was of the view that such a “liquidity at risk” standard could handle a wide range of innovative financial instruments – contingent credit lines with collateral, options on commodity prices and put options on bonds etc, in an appropriate manner. This idea has never been developed into an implementable formula, although value-at-risk models have become more important in measuring overall portfolio risks.

## **The Guidotti Rule on Foreign Exchange Adequacy**

Pablo Guidotti, a former Deputy Finance Minister of Argentina, developed a simple rule for policy makers in

emerging market economies. It was that usable foreign exchange should exceed scheduled amortizations of foreign currency debts (assuming no roll overs during the following year). The Calvo rule is similar, that is, governments external debt repayments falling due in the next 12 months should not exceed its foreign exchange reserves. This was meant to lead to a measure that could serve as an indicator of how long a country could sustain external imbalances without resorting to foreign borrowing.

However, for small developing countries this rule is highly risky and is not likely to instil confidence in fixed exchange rate regimes. Foreign exchange reserves equivalent to debt repayments in the 12 months ahead would be woefully inadequate in small Caribbean countries with fixed exchange rates and possibly even in small countries with floating exchange rates. In such regimes, experience suggests that the pool of foreign exchange reserves needs to be much higher.

For the most part, holding foreign reserves in excess of short-term debt obligations could help to reduce the incidence of financial crisis. The level held in excess of short-term debt, however, depends on country-specific circumstances. Issues such as the prevailing macroeconomic conditions, particularly whether there is a large and persistent external current account deficit that needs to be financed by international capital inflows,

or an overvalued exchange rate that can lead to capital outflows, high levels of short-term public debt, and weak banking systems that can contribute to capital flight, are critical in this regard, and must be factored into the analysis. This underscores the need for a sound understanding of the interaction between reserve adequacy, vulnerability, and country-specific factors.

For instance, in Hungary, the targeting of reserve adequacy takes into account the amount of reserves needed to cover short-term debt as well as a mark-up (a kind of assurance) to reflect unfavourable macroeconomic fundamentals – i.e., the potential for an increasing external current account deficit or real exchange rate appreciation.

The IMF has proposed that, in addition to the benchmarking of foreign reserves to short-term debt, countries should undertake stress testing of the balance of payments. The results of these stress tests in different scenarios can serve as key inputs in the determination of reserve adequacy. For example, a ratio of one (reserves to short-term debt) is a simple stress test of the lack or otherwise of access to international markets for a single year, and represents a useful point of departure for more complex tests.

More complex tests should reflect different market access for each type of capital inflow, be it FDI, portfolio investment or trade credits, the risk of capital flight and the need to finance an external current account deficit. However, since in the field of finance and currency crises, the experience of the past has not been a good predictor of the future, the stress tests should incorporate the maximum historical variations as a basis for potential or future variations in each balance of payments flow. It must be stressed that the balance of payments flows must be measured accurately to derive a realistic estimate of reserve adequacy.

### **Absolute and Relative Increase in Foreign Exchange Reserves**

In commenting on the accumulation of foreign exchange reserves in recent years, Chairman of the Federal Reserve Board Alan Greenspan in an article “Current Policy Issues in Reserve Management” (1999), observed that while the stock of foreign reserves held by industrial countries has increased over time, those increases have not kept pace with the dramatic increases in foreign exchange trading or gross financial flows. Thus in a relative sense, the effective stock of foreign exchange reserves held by industrial countries has declined. This suggests that despite the high level of global foreign exchange reserves, reserve growth is likely to continue. This is based on the

argument that as transactions become more global and international, there will be a greater need for high levels of foreign exchange reserves. What is very clear is that there is likely to be acceleration in international transactions over the next decade. If however, former Chairman Greenspan is correct, that is, that the level of reserves relative to transactions is falling, then we are likely to see continued efforts to increase foreign exchange reserves in the years ahead.

This suggests that new measurement systems for foreign exchange adequacy will need to include not only some of the traditional factors, such as equivalent of months of imports and debt service ratios, and reserves relative to debt amortization, stress testing, and estimates of current and capital account balances but the size, nature and volatility of international transactions relative to reserves may need to be included. This suggests also that future formulae will not be as simple, either as the 3-months import rule or the Guidotti/Calvo Rule, but will become increasingly complex.

In thinking about this, I was reminded of the similarity of this process with the development of Basel II guidelines on Banking Supervision. Because of the need to measure every possible risk factor, those guidelines brought risk measurements to a new level of complexity and the measurement of bank soundness to such a level of intricacy, that the first draft was

600 pages, later refined to 300. I fear that the development of guidelines for the measurement of the adequacy of foreign exchange reserves could go a similar route and we could end up with Basel II complexity. Chairman Greenspan's comments on measuring value at risk in arriving at foreign exchange adequacy hint at this. I cannot help wondering how political risks will be measured and how countries like China and Venezuela, not to mention certain Middle Eastern countries will be able to quantify the political risks of guarantees of foreign exchange holdings into a measure of foreign reserve adequacy.

However, we do need to develop new measures of foreign exchange adequacy, with some urgency, before we can draw conclusions as to how much is enough. Until then – and this seems some way in the future – it is my prediction that, notwithstanding recent policies in Chile and Mexico – which are exceptions to the rule for developing countries and everyone is watching how their policies turn out – that without stronger guarantees and reliable formulae, central banks in developing countries will continue to accumulate foreign exchange reserves. In hard currency areas, however, like the US\$, £ Sterling and the euro, reserves are likely to stabilize. We have already seen what has happened since the introduction of the euro.

In the longer run – perhaps in another 25 years to 50 years – the world may move to only a few major currency areas, as

some pundits have predicted. In this scenario, foreign exchange reserve holdings could decline for if there are only a few currencies in the world, the need to hold foreign exchange is likely to be reduced. Perhaps then, central banks will say, enough is enough.

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