**Dissertation Title:**

# "The negative real and monetary implications of excessive accumulation of Foreign Exchange Reserves: comparison between Mozambique and Nigeria.

**- The rationality of the Central Banks in hoarding Foreign Reserves**

This Dissertation is submitted in partial fulfilment of the requirements for the degree of
Msc. Development Economics of the School of Oriental and African Studies (University
Of London)

**Name: Sofia Issufo Amarcy**
**Student number: 239486**
**Programme: Msc Development Economics**
**Supervisor: Myriam Blin**
**Date of Submission: 11/09/2009**
**Words: 8801**

## DECLARATION:

***I undertake that all the material presented for examination is my own work and has not been written for me, in whole or in part, by any other person(s). I also undertake that any quotation or paraphrase from the published or unpublished work of another person has been duly acknowledged in the work which I present for examination.***

Signature: _____

***I consent that copies of my dissertation may be held by the School, at the School's discretion, following final examination, for reference by other students or staff of SOAS as an example of good work or original research. I understand that such copies will be anonymised before they are made available to students.***

Signature: _____

## Acknowledgements

**The Author wishes to thank the members of IESE – Instituto de Estudos Sociais e Económicos, in particular, Dr. Carlos Nuno Castel-Branco and Dr. António da Silva Francisco for the scholarship to do my Master at SOAS.**

**The Author also wishes to thank all family and friends for the support during the Master Programme.**

**Acknowledgements also go to my supervisor, Myriam Blin, for all assistance during the preparation of the dissertation, and to Jan Toporowski and Costas Lapavitsas, for the additional comments on the thesis.**

## List of Acronyms

**CB** – Central Bank

**CBM** – Central Bank of Mozambique

**CBN** – Central bank of Nigeria

**FDI** – Foreign Direct Investment

**FER** – Foreign Exchange Reserves

**IMF** – International Monetary Fund

**IR** – International reserves

**PrI** – Private Investment

**RER** – real exchange rate

**UNICEF** - The United Nations Children's Fund

**WB** – World Bank

# Abstract

This dissertation analyses the negative implications of the excessive build-up of Foreign Exchange Reserves (FER) in African countries. It provides, along the main discussion, evidences from Mozambique and Nigeria, which helps to support the main theoretical framework.

The main argument is that African countries should pay particular attention to the exacerbate accumulation of FER for the purpose of self-insurance. This is due to the fact that such accumulation comes with significant fiscal costs and opportunity costs of not using these reserves to develop the productive sector and create productive dynamics. The costs underpinning in the excessive accumulation of FER not only are reflected in the productive sector, but also in terms of the losses in the competitiveness in the international markets in periods of shortage of capital inflows. It happens through the fluctuation of the exchange rate which would impact on the balance of payment deterioration.

The dissertation asserts that, contrary to the mainstream approach that excessive build-up of FER is accumulated for precautionary and mercantilist purposes, there are also personal goals of members of government and central bank involved in such accumulation. It also found that in low and medium income countries, aspects such as corruption and patron-client relations might influence negatively the management of FER.

# TABLE OF CONTENTS

## Graphs:



## Tables:



## Annexes:

# INTRODUCTION

Foreign Exchange Reserves, from now on called FER, are mainly constituted by deposits in foreign CBs and monetary authorities. These are assets belonging to the CBs and they are emitted in different currency reserves. The main objective of such reserves is to fulfil financial commitments such as issuing currency and to ensure the various bank reserves held in the CB government or financial institutions[1,2].

From 1995 to 2005, world FER increased in 180%, achieving a world historical record of US$ 4.3 trillions (Bastourre at al, 2008). In addition, countries of Asia account for 70% of the global FER (Gupta and Agarwal, 2004). Evidence suggests that developing countries in Africa are also increasing rapidly the level of FER, either for mercantilist or precautionary purposes. From 1996 to 2006, the level of FER in Sub-Saharan African countries has increased from US$ 21 billion to US$ 108 billion (Economist, 2007).

Some might argue that such increase in the level of FER was partially embedded in the context of macroeconomic stabilization in which countries in Africa needed to hold reserves in order to intervene in the markets and influence the exchange rate and stabilise the inflation rate (Elhiraika, 2007).

Nonetheless, there are controversies on whether this build up of reserves is convenient for the purposes of fulfillment of investment commitments and macroeconomic stabilization or is mainly a mechanism which developing countries found to increase the CB's reserves and use it as self-insurance.

---

[1] . Available online at www.**reserve**bank.co.za/internet/Publication.../NOTEa122005.pdf [accessed at 23rd of June 2009]

[2] . Although, if gold, special drawing rights (SDRs) and the IMF reserve positions are included in the foreign exchange, then the term is usually called International Reserves (IR).

Therefore, there is nowadays a huge debate on whether countries should better control the excessive build-up of foreign currency and about the macroeconomic implications behind such accumulation. The focus is mostly directed to developing countries, in particular African countries, which, among other factors, are characterized by underdeveloped financial markets and poor institutional organization.

This dissertation will analyze the undesirable effects of such build-up in the macroeconomic variables such as public and private sectors, inflation and exchange rate. Before going into the unwelcome effects, there will be some research about the main roots on such accumulation. African countries will be the main examples embedded in the whole thesis and particular emphasis will be on Mozambique and Nigeria.

Mozambique will be analyzed due to the fact that it is considered by the IMF as being "an aid success story" or "a success story in Sub-Saharan Africa". However, controversially, Mozambique is also considered by the WB and UNICEF as being one of the poorest and most underdeveloped countries in the world. The level of FER in Mozambique achieved US$ 1.508 million in December of 2007[3]. Although there is a huge disparity between the level of FER accumulated by Mozambique and Nigeria, there are implications for both, derived from such accumulation.

Nigeria will be also part of the analysis because it is considered the 33rd country in the world with the highest amount of FER[4] and the 1st country among the African

[3] . Central bank of Mozambique, [online], http://www.bancomoc.mz/index.php?menu=4132&lang=po&id=2252 [accessed on 09th of Sep. 2009]

[4] . With US$ 52.7 billion in December of 2008. According to the Central Bank of Nigeria (CBN)[4], the gross amount of FER in Nigeria achieved US$ 52.7 billion in December of 2008 [available at http://www.cenbank.org/IntOps/Reserve.asp.

countries[5] with highest level of FER. Furthermore, Nigeria is considered the 50th- largest export market for U.S goods and the 14th- largest exporter of goods to the U.S[6]. However, there are some controversies, which will be analyzed along the thesis, concerning to whether the country and the government are targeting or not the investment variables.

These figures might arise some questions concerning to the reasons which take these countries, with completely different characteristics, to accumulate these huge amount of FER. Why are these countries accumulating more than enough to cover all debt obligations for the period of one year?[7]

The concerns about the reasons behind the excessive build up of FER are pertinent because the scale and persistence of these recent reserves accumulation, mostly in countries of Asia and Africa, is an unprecedented phenomenon. Therefore, in face of such stockpile of low-yields assets by African countries, which need financial resources to improve their production capacities and mitigation of poverty, there are some questions which might arise: are these countries accumulating FER only to protect themselves from currency crisis? Or are they attempting to achieve a competitive advantage by manipulating the exchange rate? What are the costs embedded in these strategies?

---

[5] . After Nigeria, the IMF and the CIA[5] indicates South Africa with US$ 34.049 billions, Egypt with US$ 31.627 billions and Botswana with US$ 10.000 billions, as countries with highest level of FER. Information available on https://www.cia.gov/library/publications/the-world-factbook/rankorder/2188rank.html [accessed on 19th of Aug. 2009]

[6] . According to the U.S department of State, available at http://www.state.gov/r/pa/ei/bgn/2836.htm and accessed on 09th of Sep. 2009

[7] . The Greenspan-Guidotti rule postulates that reserves should be equal short-term external debt (one-year or less maturity). Furthermore, another measure of optimal reserves is determining that reserves should be between 5% and 20% of M2. Finally, for some risky country and the ones exposed to current account shocks, the convention declared that reserves should be equal to three or four months of imports (Oluba, 2008).

To make-up this discussion, this dissertation comprises three main objectives:

The *first objective* is to analyse the roots behind the exacerbated accumulation of FER, particularly in African countries.

The *second objective* is to evaluate the costs of maintaining high levels of FER and its implication on the domestic currency, on the macroeconomic variables and to the CB.

The *third objective* attempts to understand the rationality of the CBs in keeping accumulating these huge amounts of FER, knowing about all the costs underpinning.

Therefore, in order to fulfil all these objectives the dissertation will consist in four main chapters.

The *first chapter* will present the discussion about the main causes behind the motivations to accumulate FER. There will be various evidences, not only from the main countries to be analysed, in order to understand the overall environment. In this chapter, the data used will be relative to overall evolution of the FER from 1996 to 2006/7.

As regards to the causes of the build-up of FER, some argue that the capital account vulnerability, the necessity to control the exchange rate and the mercantilist purposes are the main reasons (Gupta and Agarwal, 2004; Romero, n.d).

However, there are others who blame certain governments and CBs to accumulate FER for the self-insurance purpose. They argue that the build-up of FER to reduce the exposition to the external shocks can harm the country due to the opportunity cost of not using these resources to the public investment (Elhiraika and Ndikumana, 2007; Mendoza, 2004). So, the causes of such build-up are divergent across countries and study cases.

The *second chapter* will examine the main costs and implications of accumulating excessive amount of FER. The main analyse will be on the implications for the domestic economies with high FER when there are fluctuations in the international markets. The opportunity costs[8]will also be analysed in terms of costs of idle capital which could be invested in alternative public projects with higher returns and benefits for the GDP.

The *third chapter* will focus on the efficiency of the sterilization[9] of the foreign currency as a mechanism of controlling the FER.

Elhiraika and Ndikumana (2007) argue that as the accumulation of FER leads to the expansion of the monetary base, there are some economic costs involved such as the cost of sterilizing the excess foreign currency and avoiding inflation and appreciation of currency.

In fact, there are two main costs from the process of sterilization, namely: (i) the fiscal costs which is the result of the difference between what the CB earns on international reserves and what it pays on the domestic debt issued to sterilize the reserves; (ii) the indirect systemic cost of preventing current account adjustment.

This chapter will also look at the CB balance sheet risks incurred when the sterilization takes place. These risks include the lost of revenue by the treasury when processes of recapitalization take place to counteract the appreciation of the exchange rate.

The *four chapter* analyses the rationality behind the accumulation of FER from the CB, particularly in Mozambique that receives significant amount of foreign aid.

[8] . The opportunity cost is the yield on reserves and the marginal productivity of an alternative investment.

[9] . Sterilization is mainly defined as any set of policies designed to alleviate the impact of reserve accumulation on domestic inflation, on the exchange rate and on the interest rates (Lavigne, 2008).

In conclusion, the main message to be taken from this discussion is basically that there are costs in accumulating excessive FER. These costs are more significant in developing countries with poor institutional and financial markets. It also concludes that corruption and patron-client system may be harmful to the management of FER because in most of African low and medium income countries, there are still strong linkages between CBs and government's objectives. As a consequence, these reserves might be redirected to personal ends instead of being used for macroeconomic stabilization and for the creation of growth dynamics. Therefore, the accumulation of these reserves might represent a curse instead of a blessing.

The *originality* of this dissertation is basically embedded in the discussion about the rationality of the CBs in keeping accumulating this huge amount of reserves. On the four chapter, after having giving all the insights concerning the topic "foreign exchange reserves", comes the remarks analysis on the main reasons which takes the CBs behaving in such way and how rational and pertinent is that behaviour.

# CHAPTER 1

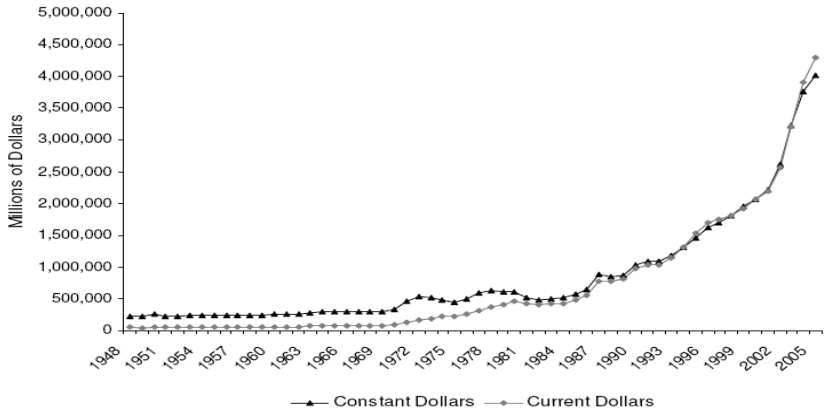
## 1. Overview on the overall level of Foreign Exchange Reserves (FER) and the motivations behind the huge stockpile of reserves

### *1.1. Evolution of the Foreign Exchange Reserves from 1995-2006/7.*

Foreign Exchange Reserves increased in whole world, from 1995 to 2005, in 180%, achieving a world record of US$ 4.3 trillions (Bastourre at al, 2008). In 2006 the amount increased to US$ 5.04 trillion. This can be visualized in the Graph I.

As asserted by Obstfeld at al. (2008), after the end of the Bretton Woods system of fixed exchange rates regime, the global International Reserves (IR), as a fraction of the world GDP grew from less than 2% in 1960 to 6% in 1999.

Graph I: World International Reserves from 1948-2005




Source: Authors' calculations based on International Financial Statistics (IMF). Reserves in constants dollars were obtained deflating by export price index of the United States.

*Source: Bastourre at al, 2008*

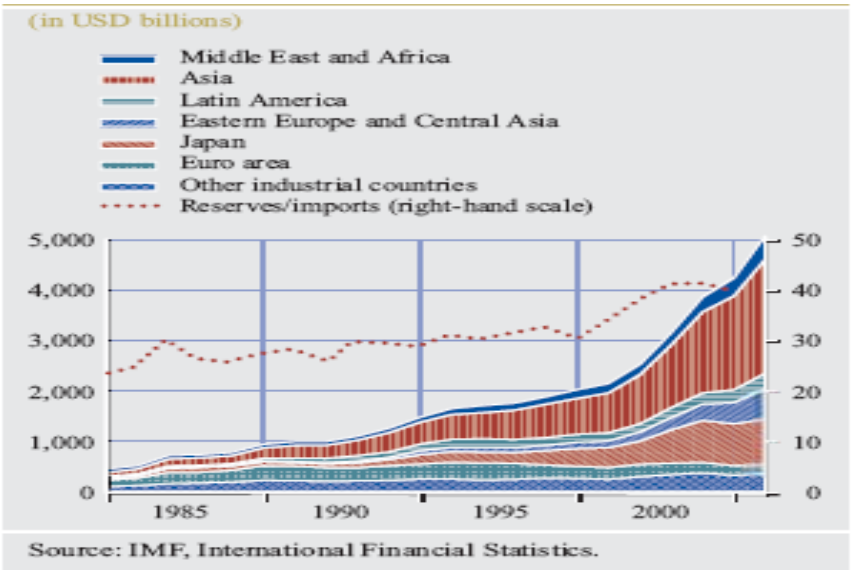
The main reason behind this increase was the fact that exchange policymakers were afraid of uncertainties on the new floating exchange rate system. Therefore, in order to intervene in the foreign exchange markets and guarantee the price stability, governments and CBs were advised to save some reserves in foreign currency. From 1990, almost all developed countries' fraction of reserves from GDP tended to stabilize at about 4% (Obstfeld at al., 2008).

However, from 1999, the levels of FER accumulation grew significantly and, industrial countries such as Russia as well as Asian, Latin American and emerging countries, have contributed considerably to this trend. By the end of 2006, the amount of FER reached US$ 3 trillions in developing countries, which represents 27% of the GDP of these economies (Cruz and Walters, 2008; Aizenman, 2007).

Data from the World Development Indicators point out that after the break on the accumulation of reserves, in 1994-95, due to Mexico's financial crisis, in 1995, the worldwide reserves revealed an increase of 19.4% (Cruz and Walters, 2008; Aizenman, 2007).

Graph II shows an acceleration of the foreign reserves in Asia, Middle East and Africa and so on. From this chart it is apparent that emerging economies accumulated much more FER than industrial countries, from the 1990s.

Graph II: Global Foreign Exchange Reserves




*Source: Wijnholds and Sondergaard, 2007*

In Africa, more than 60% of FER are held by Algeria, Libya and Nigeria. In these countries, such accumulation is mostly result of oil production and its exportation (Oshikoya, 2008).

According to Adewale[10] (2008), more than 99 percent of the foreign exchange earnings in **Nigeria** come from the revenues of the crude oil. While the CBN reports that in December 2008, the amount of FER in Nigeria could finance up to 13.8 months of imports[11], data from IMF (Table I) reports that Nigeria would be able to finance 4.5 months of imports from 2000-2008.

In **Mozambique**, in contrast, foreign exchange reserves come mostly from foreign aid[12]. From 2000-08 these reserves could finance 5 months of imports.

[10] . www.triumphnewspapers.com/nig25112008.html [accessed on 02nd of September 2009]
[11] .See Annex 1: Nigeria's Gross External Reserves Position (US$ billion) and Months of Import Equivalent
[12] . Central Bank of Mozambique.

In these two countries, the roots behind the accumulation of FER are different. In Mozambique, the implications of such accumulation, even in a lower dimension, might be more harmful than in Nigeria. This is due to the fact that foreign aid counts for more than 50 percent of its governmental budget. In this sense, economic development is highly dependent on foreign aid which is part of foreign reserves. As a consequence, if the national currency (Metical) faces an appreciation, it can lower the living standards. It means that foreign reserves can either create growth or chronic under-development, depending, among other factors, on the stability or not of the domestic currency.

Table I: Mozambique: Comparison with Sub-Saharan Africa, 2000-08

| | Mozambique | | SSA | | A ex. S.Afr & Nigeria | |
|---|---|---|---|---|---|---|
| | 2000-08 | 2008 | 2000-08 | 2008 | 2000-08 | 2008 |
| Real GDP, percent change | 7.5 | 6.8 | 5.9 | 5.4 | 6.0 | 7.0 |
| CPI period average, percent change | 12.9 | 10.3 | 10.5 | 11.6 | 12.9 | 11.7 |
| REER, percent change | 10.8 | 24.3 | -3.6 | -2.6 | 2.1 | 6.8 |
| Current account balance (before grants), percent of GDP | -19.4 | -20.4 | -1.2 | -1.3 | -4.7 | -2.8 |
| Broad money, percent of GDP | 29.0 | 33.7 | 41.9 | 48.2 | 26.3 | 31.8 |
| Gross international reserves, months of imports | 5.0 | 4.4 | 4.6 | 5.4 | 4.5 | 4.8 |
| Credit to the private sector, percent of broad money | 52.0 | 55.6 | 75.3 | 74.8 | 51.9 | 54.2 |

*Source*: *International Monetary Fund, July 2009, Country Report No. 09/227*

According to the IMF, there are essentially three main adequacy benchmarks which mainly determine what should be the parameters to evaluate the adequate level of reserves[13] (Greenand Torgerson, 2007):

Reserves equal to short-term external debt: assumes that countries with vulnerability to capital account crisis may hold reserves enough to cover all debt obligations with

[13] . Wijnholds, J. Onno De Beaufort and Arend Kapteyn, 2001, "Reserve Adequacy In Emerging Market Economies," IMF Working Paper No. 01/143

maturity of one year. This is known as Greenspan-Guidotti rule and basically is used to prevent countries from currency crisis.

Reserves equal to roughly 5-20 percent of M2: it is used to economies which need to fortify the confidence in the value of domestic currency to reduce the risk of diversion of capital. So, countries with less flexible exchange rate might need higher reserves relative to M2.

Reserves equal to three or four months of imports: it is appropriate to low-income countries where the exposure to current account shocks is higher. In these countries the access to capital markets is also very low or inexistent.

From the main literature and the empirical studies, both cross countries and panel data, there are divergences among different authors concerning to the causes of these build up of FER, during the last decade, 1995 to 2006/7.

In general, some analysts assume that the main cause underpinning the accumulation is the *precautionary intervention* from CBs against potential sudden crisis. On the other hand, there are the ones who claim that some economies insist in accumulating FER to be able to manipulate the exchange rate and therefore the main cause behind would be the *mercantilist motive*.

The next section explores the main causes and theories that support the different reasons for maintaining and increasing the level of Foreign Exchange Reserves.

### *1.2. Theories on the roots of Foreign Exchange Reserves*

In the international financial integration approach the main and the most conventional thought was that international integration should cause capital to flow from high-

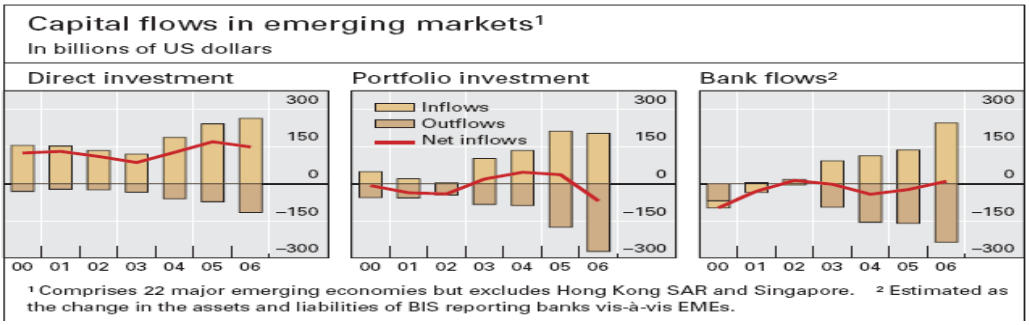
income countries characterized by high capital-labor ratios to low-income countries with lower capital-labor ratios (Prasad and Rajan, 2008). This process would improve the levels of investment through the increase in the level of domestic savings and the access to foreign capital.

According to this approach, it would also facilitate to boost growth in poor countries and to support the residents of rich countries in obtaining higher returns on their savings by investing abroad (Prasad and Rajan, 2008). The process of capital flows would be possible through the capital account liberalization.

Capital account[14] is part of the balance of payment and it provides evidences about all transactions between domestic and foreign residents which involves the ownership of an asset. It includes foreign direct investment, portfolio investment and other investment (BIS, 2007) which can be observed in the Graph III.

Therefore, in the mid-1990s, mainstream economists from almost all over the world were convinced that the capital account liberalization would be the causeway to promote free flows of capital to flow in and out of an economy and this would be the first step to achieve the economic development (Prasad and Rajan, 2008).

Graph III: Capital Flows in emerging markets




*Source: IMF; BIS, 2007*

[14] . The capital account is mainly the sum of the balance of trade plus the net factor income which can be interests and dividends plus the net transfer payments like foreign aid.

Nonetheless, the East Asian financial crisis of 1997-98 created massive capital outflows and giant currency volatility even in countries which seemed to be financially healthy like South Korea and, afterwards, the capital account liberalization issue became very controversial among economists (Prasad and Rajan, 2008).

Furthermore, there is little evidence that financial integration is positively correlated to GDP growth. Joshua, Pinto and Radziwill (2004) evaluated the impact of the growth in financial integration into the financial domestic capital stocks in developing countries and concluded that from the overall stock of capital in developing countries, approximately 90% is self-financed.

Thus, the evaluation concluded that there is no evidence to correlate growth level increases with the increasing in the financial share of foreign savings. Furthermore Prasad, Rajan and Subramanian (2007) argue that in the long run, during the last three decades, the non-industrial countries, which relied less on foreign finance have not grown slower than the countries which relied on the external capital (Prasad and Rajan, 2008). Therefore, there is the need to go into a deeper research about the causes behind this huge stockpile of assets.

In Africa, almost all movements are made through the balance[15] on goods and services which includes imports and exports. Balance on transfers is also important and it includes workers remittances (Elhiraika, 2007).

Mendoza (2004), Wijnholds and Sondergaard (2007), Gupta and Agawal (2004) and Oluba (2008) broke up the fundamentals of holding reserves in:

[15] . The balance on goods and services and the balance on transfers are part of the current account balance.

*(i)* *Macro and micro foundations* which basically consist in discrepancies among Monetarists and Keynesians. Among the monetarists[16,17] there are some who claim that accumulation of FER is a result of the excess demand for the domestic currency, and others[18] who support that the growth of the world trade is the flame behind the accumulation of FER (Mendoza, 2004).

On the other hand, for the Keynesian type demand side, an increase of the FER might improve the current account and therefore it will positively impact on the aggregate input. Nonetheless, this impact will only hold in the short-run due to the fact that in the short-run this accumulation is effective in changing the nominal exchange rates. In the long-run, although, the real exchange rates are completely adjusted to the equilibrium values in accordance to the balance of the current account in the long-run (Fukuda and Kon, 2008).

*(ii)* *Self-insurance*[19]. The main theory behind this fundament is the *precautionary theory* which might explain the maintaining of buffer stock of reserves or the necessity to keep reserve assets to deal with unforeseen events[20]. This reason can also be seen as a need for insurance against future crisis precipitated by financial crisis in the 1990s and early 2000s (Wijnholds and Sondergaard, 2007; Elhiraika, 2007; Fukuda and Kon, 2008).

Nonetheless, in developing countries there are still the ones who claim that foreign exchange bulwark is derived from the need to deal with "sudden stops" of capital

[16] . Who support the Macro foundations.
[17] . Stated by Johnson (1965) in Mendoza (2004)
[18] . Stated by Triffin (1947) in Mendoza (2004)
[19] . In the context of the self-insurance approach, there are the ones who argue that "rules of thumb" such as the stipulation of the worth reserves at least at three months of imports could be helpful to maintain the adequate level of reserves (Mendoza, 2004). Although, with the high mobility of capital and the openness of the current and capital account, particularly in developing countries, these "rules" seems to not be anymore sufficient to control the level of FER.
[20] . which is also called the "war chest" motive

flows. In fact, according to the IMF report, since the financial crisis of 2007, the projected real GDP growth to **Mozambique** reduced to 4.3 percent due to the decrease in the level of exports and capital flows. In addition, there is an expectation that the external overall balance will suffer a significant deterioration followed by a fall in the foreign reserves by more than US$ 200 million, which correspond to 4 months of imports instead of 5 months (IMF, 2009).

The same effects are projected to **Nigeria**, where it is expected to have a lower demand for oil, which is the major export commodity. As a consequence, there will be a falling in the foreign exchange receipt which will impact on the government revenue and therefore, at least theoretically, will impact on the level of public and private investment (IMF, 2009).

*(iii)* *Mercantilist motive* which basically is related to the expansion of the trade balance and the increase of the international transactions, which leads to an increase of the reserves (Gupta and Agarwal, 2004).

According to the Central Bank of **Nigeria**, the sources of their reserves are mainly the crude oil production and sales. The source states that the country produces approximately 2.000.000 barrels per day of crude oil (Oluba, 2008). However, even with an apparent good scenario, if FER are not used to promote continued and sustained capacity of human capital, the country will continued in a chronic dependence on foreign reserves. In addition, if such reserves are only used to contribute for the accumulation of idle capital and in the last instance to incentivise the extraction industry, chances of a deterioration of the current account are higher in cases of sudden stops of capital flows or decrease in the level of exportation.

*(iv)* *Tendency towards dollarization of international assets*. In Latin America, the dollarization occurred as a result of the macroeconomic instability caused by high fiscal deficits and inflation. Therefore there occurred the substitution from the local currencies. In Asian countries though, the dollarization was restricted to the former Indo-Chinese countries of Cambodia (Kuroda, 2005). The accumulation of IR in the dollarized economies is due to the recent systemic banking crisis which made these countries hoard liquid foreign assets to insure themselves, which, again, might be consider as a precautionary reason to hold international reserves. So, the reserves are centralized at the CB or at individual banks as reserve money or liquid assets.

Therefore, evidences suggest, there is a diversity of reasons that might influence the increase on the foreign exchange reserves.

However, there are analysts who argue that the holding of large foreign exchange reserves is not set on the development goals. Furthermore, Cruz and Walters (2008) claim that "*developing countries need the freedom of action*", therefore, these countries should resist to the full capital account liberalization.

Moreover, even if emerging and developing countries keep holding reserves, there are significant costs which must be take in consideration such as opportunity costs of hoarding reserves instead of using in alternative public projects, sterilization costs and balance sheet risks.

The next section will focus on the main costs of amassing foreign exchange reserves. Then, the third chapter will analyse a sterilization policy which is a tool to mitigate the negative impact of the excessive FER on the economy. The implications of this policy will then be analysed to help concluding the discussion on how effective is the process of build-up of FER.

# CHAPTER 2

## 2. Negative implications of excessive accumulation of FER in periods of international markets crisis and the opportunity costs underpinning in such accumulation

In spite of the fact that Foreign Exchange Reserves might be helpful in terms of manipulation of the exchange rate, stabilizing the foreign exchange rate and therefore contributing for a better economic environment or just by acting as precautionary or mercantilist policy, there are also costs in this huge build-up of FER.

One of the costs results from the fluctuations in the exchange market. For instance, economies which held reserves in US$ are now facing significant losses of wealth due to the weakness of the US$ in the exchange market. Therefore, in countries dependent on the FER, there might be the need to increase the amount of reserves in order to continue to manipulate the exchange rates. This creates a vicious cycle in which countries will try to accumulate as much as they can in terms of FER to counteract these losses in wealth.

Some authors[21], although, assume as main costs of excessive accumulation of FER the opportunity costs, the sterilization costs and the balance sheet costs.

In this dissertation, the current chapter will look, firstly, to the implications of excessive amount of FER in periods of volatility in the international markets and,

[21] . Greenand Torgerson, 2007; Elhiraika, 2007; Wijnholds and Sondergaard, 2007; Cruz and Walters, 2008.

secondly, the analysis will be on the opportunity costs[22] of not investing in the public and private projects which would result in higher returns.

The next chapter will look at monetary implications and so, to the sterilization costs associated with the excessive accumulation of FER and to the balance sheet risks. The role of sterilization is essentially to offset the impact of the increase in the money supply on the inflation. This offset is made through the issuance of domestic debt. So, if the interest rates for domestic borrowing exceeds the interest rate on reserves, there are direct fiscal costs implied which can be significant if the level of FER is high (Greenand Torgerson, 2007; Elhiraika, 2007; Wijnholds and Sondergaard, 2007).

Another problem associated with the high accumulation of FER is the balance sheet risks.

The main problem is that, if there is an appreciation of the domestic currency, the domestic value of these foreign reserves will decrease. Therefore it represents a loss for the CB's balance sheet because, unless the CB increases the foreign reserves, there will be loss of capital. There is in these cases, the chance to recapitalize from retained profits to fulfill the losses and so the balance sheet won't be penalized. However, these retained costs represent a loss of revenue for CB treasury (Greenand Torgerson, 2007)

Later on, in the next chapter, we will see the costs which CB undertake in order to control de monetary base, the inflation and the exchange rate.

Although, before going into these implications, it is pertinent to, briefly, bring about some measurement techniques of calculating the costs of holding reserves.

---

[22] . Opportunity costs are mainly associated with alternative use of FER, which might yield greater returns. For instance, if the excessive reserves (the excess from the indicated by adequacy benchmarks) are used for promote public investment projects, the returns could be higher and the contribution for the GDP could increase as much as one percent a year (as was argued by Geneva Reports on the World Economy 7, Centre for Economic Policy Research)

### *2.1. Mechanisms of measurement of the costs on holding reserves*

The literature concerning to the costs associated with accumulation of reserves is very ambiguous about the implications of holding FER. This is due to the fact that different papers bring about varied conclusions depending on the measures used to calculate the costs of holding reserves (Gupta, 2008).

Some authors[23] assert that because most of FER are held in USD, the costs should be calculated using the difference between returns on the assets (reserves in USD) and the country-specific interest rate. In doing so, the result would be the net gains of holding reserves.

According to Gupta (2008), there are some other authors[24] who advocate that the cost of holding reserves is given by the return of investment in physical capital. The authors assume that if the international assets were not used as reserves, it would be possible to use them to fund domestic investment in physical capital.

Nonetheless, in the current analysis, the calculation of the costs on holding reserves is made through the mechanisms on how that accumulation takes place in whole economy and how the FER are obtained (Wijnholds and Sondergaard, 2007). FER might be obtained through the process of running a current account surplus, or in other words, earning reserves or, by borrowing reserves[25].

[23] . Shinkai (1979) and Gupta (2008)
[24] . Neely (2000), Ben-Bassat and Gottlieb (1992b) and Baker and Walentin (2001)
[25] . In the macroeconomic perspective, the most important is evaluating the whole economy and not only the CB or the government perspective. Hence, the aim here is to examine the depth to which the country is generating capital by attracting Foreign Direct Investment (FDI), portfolio or banking inflows.

In Africa, countries which hold high reserves through the current account surplus are mostly oil-exporting countries and **Nigeria** is a suitable example. These countries are said to be accumulating FER through the commodity funds. Hence, the main objective is to maximize the overall rent from oil extraction. In oil-export countries the reserves as percentage of GDP far exceed the ratio[26] investment/GDP. However, the cost of holding reserves in countries with commodity funds is calculated by looking at the opportunity costs[27] of accumulating reserves instead of investing in the current period (Wijnholds and Sondergaard, 2007; Gupta, 2008).

On the contrary, **Mozambique** is one of the African countries in which FER are accumulated mainly through non-commodity funds due to the fact that the majority of FER consists in FDI and external aid. Because such reserves are not born from foreign exchange interventions, there are queries on whether these reserves can be managed within the standard framework of official reserve assets. Moreover, these queries also wonder on whether reserves originated from non-commodity funds should be or not analysed within the same rationality. In general, in countries where FER are accumulated through borrowing, then the cost of holding reserves is calculated through the "difference between the costs of borrowing in USD in the international capital markets and the return on investment of their reserves".

### *2.2. Impact of the excessive accumulation of FER on the international competition*

One of the risks of an exacerbated accumulation of FER is its negative impact on the countries with which the domestic country competes in terms of trade. As it is

[26] . Annex 1: Top 10 Africa: Reserve/GDP and Investment/GDP
[27] . The opportunity costs are normally equalized to the yields of the government bonds

asserted by Aizenman (2007), and commented by Noyer (2007), in an asymmetric world, the heterogeneity of countries, whether developing or emerging or even developed countries, is giant. As a consequence of such disparity, some countries might face very low costs of sterilization and others might face high costs. In developing countries and, particularly in African countries, the regional trade interdependence is more discernible and therefore such "hoarding war" might create some regional tensions which might end up in high welfare costs and the increase of the negative externalities associated with such tensions.

According to the IMF (2009), in 2008, **Mozambique** was negatively affected by the increase in the international prices, particularly in countries with which maintain trade relations. However, because of the significant inflows of capital, this negative impacted was offset and the overall result was an increase in the gross external reserves of about US$ 140 million. Nonetheless, inflows of capital might face fluctuations, particularly in periods of crisis where there might be some delay from the donors in fulfil all commitments with countries which depend on foreign aid. As a consequence, the current balance and in the case of Mozambique, the state budget might run out of enough capital to meet all public costs and it may destabilize the economy.

On the other hand, **Nigeria**, as an oil-exporter country, faced in 2008 a decline in the level of foreign reserves, as a result of the decline in the international oil prices, from US$ 147 per barrel in mid 2008 to US$ 73 per barrel in August 2009. According to the CBN, such decrease reduced the level of FER from US$ 58 billion in October 2008 to US$ 52 billion in December 2008. This shrink in the level of FER might

influence in the creditworthiness of Nigeria in the international markets and also might constraint its foreign currency liabilities and debt obligations.

Although these effects on international markets are not derived from conflicts between countries, the effect caused by changes in international markets can significantly upon, constrain the macroeconomic stability of the country concerned.

Therefore, some might argue that part of the whole FER should be channelled to developing infrastructures. According to the Chief Knowledge Officer of the Pan Africa Development, Odilim Enwegbara, the only countries which should keep high reserves should be the ones which already attained development. All others should channel such resources to develop the country. In fact if such resources were used to improve the infrastructure and promote the development of human capabilities, then the dependency with the regional partners would become mild.

### *2.3. Opportunity costs of exacerbated build-up of FER*

Opportunity costs of holding reserves are basically measured as "the difference between the highest possible marginal productivity forgone from an alternative investment in fixed assets and the yield on international reserves" (Aizenman and Marion, 2004:575).

There are many theoretical analyses which assume that opportunity costs of holding reserves are essential in determining the level of reserves. However, no empirical studies could measure the real opportunity costs effect of such accumulation of FER.

According to Aizenman and Marion (2004), despite the fact that the measure of opportunity costs is imprecise, they argue that political uncertainty influences might be the reason behind the level of reserves in countries with high level of FER. In most

of the low and medium income African countries, there is interdependence between objectives of the CB and the ones from the government. Therefore, the CB is not independent in these countries. The matter is further complicated due to the fact that the level of corruption in developing countries tends to be relatively high. Thus, corruption and patron-client system may be harmful to the management of FER

Despite the fact that it is difficult to measure the opportunity costs of holding reserves, there are some alternative uses of such reserves which could result in greater yield if compared with the returns of the same level of reserves if held by the CB.

Green and Torgerson (2007) pointed three main alternative ways of investing the foreign currency instead of hoarding in the CB. Attention should be paid for the fact that the reserves to be used in the alternative projects are the ones liquid from all the commitments to be fulfilled. In other words, FER are mainly used to intervene in the market, for execution of payments, for precautionary or insurance purposes, for deployment of "excess" balances and to be used as well as domestic liquidity operations. However, some countries hoard a huge amount of FER that even after fulfil all those commitments, the remained net amount is hoard in the CB with low yield returns. Therefore according to green and Torgerson, the remained net reserves could be used in three ways.

The *first* alternative use of reserves consist in spend such reserves on investment projects. These investments should be constrained to an agreement of non convertibility of the investment capital into domestic currency, to prevent unwelcome effects in the exchange rate. As a result, reserves could be used to purchase foreign medical supplies or equipment which would be used to increase the means of production in the sectors considered as sectors responsible for production of goods

and services. The final result estimated is the increase in the capital to labor ratios and a higher return from the public investment, comparing to what would be expected if such reserves were hold in the CB (Green and Torgerson, 2007).

The *second* alternative way of using reserves is by letting the private sector determine the best projects in which invest the reserves. The main assumption behind such alternative is that private sector is more able to apply these reserves in projects which end up in welfare enhancing. Nonetheless, there must be a special attention to the rate of return of these projects which is manipulated through the interest rate parity[28] relationship. In this latter case, the appreciation or depreciation of the domestic currency will encourage or discourage the domestic PrI (Elhiraika, 2007). Therefore the impact of FER on the domestic PrI will depend on the performance of the domestic currency.

Lastly, the *third* alternative mechanism is generated through the government action. If a government pays down its sovereign short-term external debt, assuming that the interest cost of a defined amount of short-term external debt exceeds the earnings on an equivalent amount of reserves. In doing so, the government is reducing the vulnerability of holding reserves with low yields (Green and Torgerson, 2007).

However, there is a constraint in using such alternative measures. The constraint is the fact that these forgone returns have to be measure to report some practicability; otherwise it would be just theoretical without any support. In one hand, it is difficult to measure these foregone returns if CB decides to hold FER and not investing. On

[28] . Interest rate parity is an arbitrage argument used to derive forward foreign exchange rates (Lehman Brothers, 2004). It has to do with the fundamental equation that leads the relationship between interest rates and currency exchange rates.

the other hand Green and Torgerson, (2007) and Summer's (2006) suggested an ad-hoc mechanism of evaluating those costs. The main idea is to assume a "6 percent return[29] for domestic infrastructure investment and paying down short term external debt or portfolio diversification" (Green and Torgerson, 2007:9). Then these 6 percent is multiplying by reserves held above adequacy standards and as a result, the annual opportunity cost becomes substantial for all the largest reserve holders, according to the authors[30].

[29] . Net of earnings on risk-free reserve assets in domestic terms.
[30] . The table containing these calculations is in the Annex 3.

# CHAPTER 3

## 3. Monetary costs behind the build-up of FER – The sterilization costs and the central bank balance sheet risks

Before going into the analysis of the effects of FER on the balance sheet of the CBs and on the management of the goals of the CB, I will give a short explanation[31] about the process through which FER might influence the monetary base and therefore the macroeconomic indicators such as the level of inflation and the exchange rate.

First of all, when a country receives foreign inflows, it means that the foreign currency have increased in such country. An increase in the level of foreign currency impacts on the monetary base and on the level of money supply which also increases. Therefore, there is a positive relationship between the levels of inflows, the money supply and consequently the level of inflation[32] which will tend to increase.

In addition, assuming the existence of an open economy, the CB has authority to buy or sell foreign exchange whenever the exchange rate appreciates or depreciates. If such given CB buys foreign exchange to counteract the appreciation of the exchange rate, the consequence will be the increase in the money supply[33].

Therefore, in order to mitigate the inflationary pressure and maintain the control of the exchange rate, the CB or the Reserve Bank[34] use a monetary tool which is the sterilization.

---

[31] . This explanation will help understand the role of the sterilization which is the main issue of this chapter.

[32] . Concerning inflation, it is pertinent to emphasise that inflation here is considered as being caused by an increase in cash and deposit currency or money supply in general, comparing to the trade needs.

[33] . In macroeconomic theory, it is known that, permanent increases in the money supply will lead to an increase in the price level in the same proportion and therefore to a depreciation of the domestic currency in the long run. In addition, the exchange rate will overshoot, in the short run.

[34] . The Reserve Bank is responsible for formulating and implementing the monetary policy.

### *3.1. Costs of sterilization of the Foreign Exchange Reserves*

Sterilization tool is used to cancel the effect of the foreign inflows on the real economy or, in other words, it is used to counteract the effect of changes in the money supply, keeping the monetary base unchanged (Jang-Yung Lee, 2007; Lavigne, 2008; Adebayo, 2007).

There are several ways in which the process of sterilization can take place. It can be through the encouragement of private investments overseas which will drag the excessive money out of the country or, by promoting more openness to foreigners to borrow in the domestic market which will have the same impact on the domestic monetary base (Jang-Yung Lee, 2007). However, the most usual form of sterilization is through the open market operation. It consists in managing the size of money supply through the process of selling and buying of credit instruments, foreign currencies or commodities. In the case of sterilization, the CB can either issue bonds such as treasury bills to keep the money supply unchanged.

However, sterilization comes with advantages and disadvantages. The benefits of the sterilization though, only hold in the short and sometimes in the early medium term.

The advantage of sterilization is that, interventions by the CB in offsetting the excess supply of money can work in the short term and it's able to affect the exchange rate as planned.

---

"*It is the duty of the Reserve Bank Board, within the limits of its powers, to ensure that the monetary and banking policy of the Bank is directed to the greatest advantage of the people of Australia and that the powers of the Bank under this Act and any other Act, other than the Payment Systems (Regulation) Act 1998, the Payment Systems and Netting Act 1998 and Part 7.3 of the Corporations Act 2001, are exercised in such a manner as, in the opinion of the Reserve Bank Board, will best contribute to: (a) the stability of the currency of Australia; (b) the maintenance of full employment in Australia; and (c) the economic prosperity and welfare of the people of Australia." (Quote) from Reserve Bank, Act 1959.* Section 10(2) of the Act, pg. 6 and 7, available on http://www.comlaw.gov.au/comlaw/Legislation/ActCompilation1.nsf/0/C25B42A4BA366496CA25757D0081DC63?OpenDocument

The positive impact can occur if the CB first hides from the foreign investors that sterilization is taking place and, second, keeps driving the FER intervention. This is called the *signalling channel.* The signalling channel basically asserts that intervention by the CB might work on the exchange rate through expectations. It means that in the presence of intervention, economic agents might change their exchange rate expectations expecting a change in the future monetary policy (Adebayo, 2007).

The result might be that those investors would think that in the future the foreign currency[35] will lower its value and this fact will adjust to their expectations about the exchange rate. Therefore, the result would be an increase in the expected exchange rate in response to the future depreciation of the foreign currency. As a consequence the GNP will increase and the dollar will, in fact, depreciate (Suranovic, 2007). However, this is a short term impact, because in the long term, the investors will know about the real monetary policy in the country in which they are investing.

However, there are constraints that most African countries come across when trying to achieve these results. The problems come from the fact that most of the low and medium income African countries are characterized by having operational problems in dealing with monetary policy due to the following reasons: *(i)* Existence of poor finance and particularly Assets Markets; *(ii)* CB is not independent from the government, Therefore the monetary policy is partially determined by political desires of the government which normally are correlated with non-monetary and private goals. As a result, developing countries actually have very poor records in management of the monetary policy (Oluba, 2008; Adebayo, 2007).

[35] . mostly the USD

In this sense, the main point to bring about here is that, FER might be good for the economy in the short-term[36]. However, when this build-up of FER goes beyond the optimal declared, it can create some distortions in some economies.

On the other hand, there are mainly two costs of the excessive holding of FER, the direct fiscal cost to the monetary authorities and the indirect systemic cost of preventing account adjustment (Green and Torgerson, 2007).

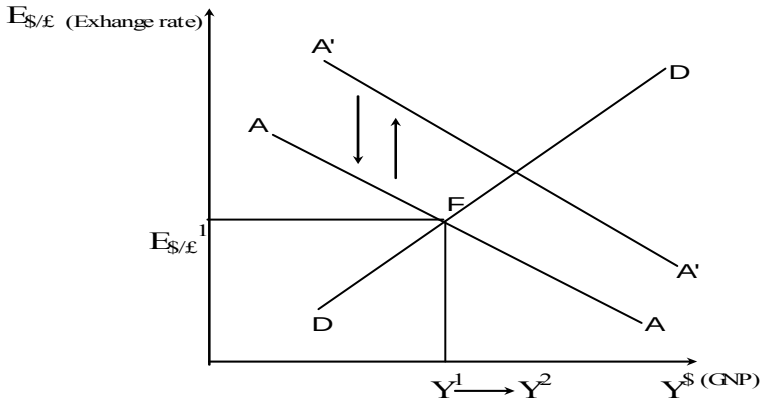
The fiscal cost is essentially the "*difference between what the central bank earns on international reserves and what it pays on the domestic debt issued to sterilize the reserves*" (Green and Torgerson, 2007:7)

The main point assumed by Green and Torgerson is that sterilization, by intervening in the foreign exchange, allows the CB to influence the RER. Although it might seem favourable to the trade sector, it might also be harmful in the sense that this "stabilization" can distort the price signal for resource allocation. The result of this distortion would lead to an overinvestment in tradable sectors at the expense of non-tradable ones (Green and Torgerson, 2007).

In order to better understand the effects of the sterilization in the stabilization of the exchange rate, we will consider the AA-DD graph below (adapted from Suranovic, 2007), where it is possible to observe the unwanted effects of sterilization, particularly in developing markets.

[36] . Because, as it was said before, it protects the economy, particularly developing economies, from sudden crises, it creates more openness to the international market, it helps to control the exchange rate and the macroeconomic stability.

Graph IV: AA-DD for sterilization effect on exchange rate and GNP (hypothetical case)




*Source: Adapted from Suranovic, 2007*

In the above graph, **F** is considered as the equilibrium and the initial point of the analysis. If the CB of this hypothetical country intervenes in the market by trading national currency for foreign currency[37], the direct effect of this trade on the exchange rate will not be in the graph above because there is no evidence of the increase of the money supply. If the money supply increases, the **AA** curve which represents the Assets Market curve will move upwards to **A'A'**. At this stage, the CB implements the offsetting open market operation through the selling of government bonds of an equal value of the FER. This operation will lower the money supply and the **A'A'** curve will shift to **AA** again. It is known by the monetary policy that, the FER intervention and the sterilization should occur at the same time or, if not in the same day, at least in the same week. It means that, as soon as the foreign currency increases, the sterilization should take place. Therefore the **AA** curve doesn't move to **A'A'**, and

[37] . Let's say that in this case the national currency is USD and the foreign currency is GBP.

as a consequence, because none of the curves move from the equilibrium, the GNP and the exchange rate will not change (Suranovic, 2007).

Although, in developing countries, where the government bonds market is not very well developed, the process of sterilization might take time to take place, and depending on the amount of foreign currency that needs to be offset, the exchange rate can appreciate and it will create a negative impact on national tradable goods and therefore the current account and the balance of payment might deteriorate.

In this sense, the main point to bring about here is that, FER might be good for the economy in the short-term[38]. However, when this build-up of FER goes beyond the optimal declared, it can create some distortions in some economies.

### *3.2. The Balance Sheet risks originated by the accumulation of high amounts of FER*

The costs of FER for the CB's balance sheet basically come from the loss in the FER's value in local terms when there is an appreciation on the exchange rate.

In order to understand the dynamics of the CB's balance sheet, Table II below shows the stylized version of a CB's balance sheet, in terms of net amounts.

Table II: A Stylized CB Balance Sheet

| Assets | Liabilities |
|---|---|
| • Net domestic assets (Government bonds)<br>• Net foreign assets (Reserves) | • Reserve money<br>— Currency<br>— Reserve deposits |

*Source: Lavigne, R. 2008*

[38] . Because, as it was said before, it protects the economy, particularly developing economies, from sudden crises, it creates more openness to the international market, it helps to control the exchange rate and the macroeconomic stability.

The Assets side contains net domestic assets and net foreign assets, which hereafter will be called NDA and NFA respectively. The Liabilities side is composed by reserve money (RM) or base money (Mb) and it is subdivided in reserve deposits and currency.

By looking at the stylised CB's balance sheet it is known that changes in the liability side or in the RM imply changes in the asset side, through NDA or in NFA. This equilibrium must hold in order to always maintain the balance sheet in equilibrium through the equilibrium of the following identity[39]:

$$\Delta \text{ Currency} + \Delta \text{ reserve deposits} = \Delta \text{ NDA} + \Delta \text{ NFA}$$

If any intervention in the foreign exchange markets takes place, the NFA will alter. In cases where the net worth is not significant, the result will be a balance sheet where Mb is equal to NDA plus NFA.

However, in cases in which foreign assets represents a large share of a CB's balance sheet there are implicit risks of losses for the CB. This is due to the fact that foreign exchange reserves tend to lose its value in domestic terms when there is appreciation of the exchange rate.

Here, the CB has two options. The first one is keep it undercapitalized, running with negative capital. However it implies a risk for the central in terms of "target price stability, intermediate government foreign borrowing, act as lender of last resort or to maintain a domestic payment system" (Green and Torgerson, 2007:9).

On the contrary, if the CB opts for the capital injection from the national treasury, it will generate fiscal costs to the government. Even if this recapitalization occurs through the saved profits, there is still revenue missed by the treasure (Green and

[39] . *Lavigne, R. 2008*

Torgerson, 2007). Therefore the last impact is a fiscal cost for the government and for the CB.

To sum up, excessive accumulation of FER incurs in sterilization and balance sheet costs. In order to mitigate these costs, especially in developing countries, two conditions have to be fulfilled. *First*, the asset markets have to be developed. *Secondly*, there has to be independence between the CB and the government goals. However, even if these conditions hold, there is still a fiscal cost associated with the losses in the foreign exchange currency derived from the appreciation of the exchange rate.

# CHAPTER 4

## 4. Rationality of Central Banks in hoarding exacerbated amount of idle capital

According to the traditional approach, the principal aim of international capital flows should be creation of fresh finance capital to developing economies where there is low capital. The result of such inflow should be the creation of new domestic investment and the promotion of development links. As it is asserted by Ocampo and Chiappe (2003), one of the best ways to support progress based on the international financial reform that promotes development and mitigation of poverty is to increase the technical knowledge concerning to the reforms on the international financial system and also by strengthening their bargaining position.

However, in countries like **Mozambique**, characterized by aid dependency, such bargaining power between agents is asserted to be unequal with different social, political and economic development interests between them (Castel-Branco, 2008).

Ocampo and Chiappe (2003) assert that there are two main tasks to be tackled in order to achieve the outlined goals, and deal with the divergences among different agents. The first one is by developing an agreement about the precise positions on the main areas outlined, such as "*provision of sufficient official liquidity and development finance, appropriate regulation of financial markets and capital flows, international standstills and orderly debt workouts, and participation of developing countries in key institutions*" (Ocampo and Chiappe, 2003: 50). After getting in the agreement, the next step would be the creation of a suitable strategy which would be used to achieve such outlined projects.

The second task would be the transformation of the international finance architecture, through changes in small sectors, although important for the development of sustainable production of tradable goods.

As it is argued by Castel-Branco, foreign aid should be used to mitigate the aid dependency, using aid for the "*construction of socially effective, efficient, diversified and sustainable productive capacities and to use the state to strategically guide and nurse this process"* (Castel-Branco, 2008:46). However, this implies changes in the policy and political organization with a different coordination among the recipient government, donors and according to the international trade and financial economics.

Nevertheless, there are some constraints in going through these changes. The main constraint is derived from the fact that in **Mozambique**, at least, there is the ownership and leadership problem, where all parties seek for mechanisms of influence decisions, based on their own terms. Therefore, the process of management of aid (which constitute the majority of the foreign exchange reserves in Mozambique) becomes more complex and inefficient, due to the existence of conflict of interests and influence in the society, which is aggravated by conflicts of power within the members of government.

Therefore, in order to be able to manipulate the market and the exchange rate, responsible for the maintenance of the trade balance, countries like Mozambique use capital inflows to manipulate the capital account, hoarding the foreign exchange reserves in the CB, instead of creating the market synergies. But, there are risks in hoarding such reserves. As it asserted by Rodrik (2006) "*holding high reserves is the price to be paid for not managing the capital account more actively*" (Rodrik 2006:4).

On the other hand, in countries like Nigeria, the monetary policy is partially determined by political desires of the government which normally are correlated with non-monetary and private goals. As a result, developing countries actually have very poor records in management of the monetary policy.

A specific case of this dependence between government and central bank can be found in Oluba's paper, where he argues that, external reserves accumulated through the exportation of crude oil are held by the government[40] of Nigeria (Oluba, 2008).

In addiction, In Nigeria, the effects of monetary tools, like the signalling channel might be ambiguous, as it is asserted by Adebayo (2007). The support for this assert comes from the fact that, in Nigeria it is not clear for an agent whether the foreign exchange purchase represents a signalling of a change in the monetary policy or it is just an accumulation of foreign reserves. This uncertainty might be the result of the weakness of the financial asset markets and the political risks associated with the investment, due to the fact that the private and public organizations are mostly linked to political agents (Adebayo, 2007).

To sum up, in low and medium income African countries, the management of FER is correlated with social, political and economic aspects. Issues concerning to ownership, corruption, division of power, interdependence between CB and government and patron-client might influence negatively the application of such reserves in the productive sector, inhibiting in this way, the development of the productive synergies which would be responsible to the mitigation of the poverty and would also reduce the aid dependency in the long term.

[40] . In fact, the Nigerian government is known to have some records with corruption issues which emphasizes the problem that these reserves might not be used by the economic agents who would invest in the productive sector.

# CONCLUSION

The dissertation has provided the evidences on the recent and noticeable increase in the level of Foreign Exchange Reserves in whole world, with particular attention to Mozambique and Nigeria.

The main objective of the dissertation was to discuss the costs associated with the excessive build-up of reserves, in particular in developing countries in Africa and the rationality behind such accumulation.

In the last three chapters, the main aim was to bring in the dissertation the main discussion on the causes and motivation of countries around the world and, in particular, in African countries, to hoard excessive amounts of FER. Precautionary and mercantilist purposes were pointed as the main roots of such accumulation.

There was also the conviction that African countries are not just building up such amount of reserves for mercantilist motive, but there are also some personal interests from the members of the government and the central bank. This means that central banks, among other factors, have in mind that by attracting foreign currency, it will be better able to control the exchange rate, letting it unwavering so the foreign investors might be expected to invest more in the country.

However, as it is known by the macroeconomic theory, foreign currency inflows alter the monetary base, and if the money supply increases, the expected value of the local currency will also increase. This will lead to higher inflation rates which will cause a decrease in the competitiveness of domestic exports. Therefore, the balance of payment might become deficient.

As a consequence, it is desirable that the monetary authorities employ the sterilization policy which is able to offset the negative impact of the foreign reserves on the monetary base and on the macroeconomic variables. It works mostly through the open market operations and consists in selling government bonds in order to equilibrate the balance sheet of the central bank. However, as the evidences suggested along the dissertation, the sterilization process becomes doubtful when Assets market in some economies is underdeveloped.

Then, the dissertation went through the main costs of this build-up, particularly for low and medium African economies, which are mainly characterized by poor financial and asset markets and underdeveloped institutional organizations. In this sense, monetary costs such as costs with sterilization and CB's balance sheet were analyzed. Negative impacts on the domestic economies due to periods of crisis in the international markets and opportunity costs of forgone investment in public sector were also analyzed.

One of the main costs discussed in this dissertation was the opportunity costs which basically assume that excessive reserves should be used to finance alternative public projects which would lead to higher returns and increases in the GDP level. There are also sterilization costs which are the cost of offsetting the excessive money supply. Lastly, there is the balance sheet risk which is associated with the risk of foreign currency lose its value through appreciation of the exchange rate. Therefore, the balance sheet can be in risk of run with negative capital in case of no capitalization. In cases where the recapitalization takes place, there are still costs of revenue forgone by

the treasure. As a consequence, excessive accumulation of FER might bear significant costs for the economy.

So, to sum-up, based on this research, African countries and in general, countries in developing stage should pay more attention to the future negative implication of such desperate accumulation of foreign reserves. International institutions, World Bank, International Monetary Fund, as responsible to cover the current account deficit in developing countries, should pay more attention to the mechanisms through which these foreign currencies are drained.

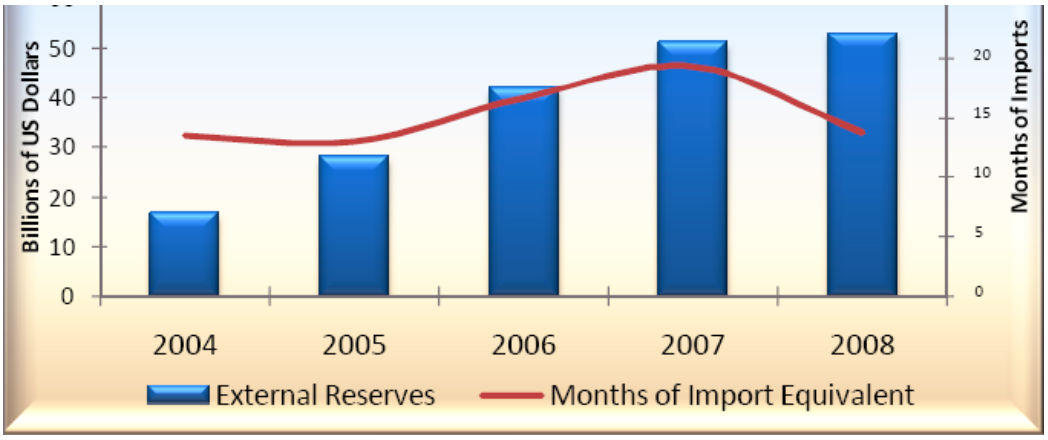
# REFERENCES


1. "African foreign-exchange reserves", Economist, June, 2007. [online], available: Economist, http://www.economist.com/finance/displaystory.cfm?story_id=9414591, accessed [06th of June 2009]
2. AIZENMAN, J. and LEE, J., 2006. "International Reserves: Precautionary versus Mercantilist views, Theory and Evidence", [online] available on http://www.aeaweb.org/annual_mtg_papers/2007/0106_1015_1303.pdf [accessed on 19th of June 2008]
3. Bank for International Settlements: "Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007 – Final results" [online] available at http://www.bis.org/publ/rpfxf07t.htm [accessed on 20th of June 2009]
4. BASTOURRE, D. at al., 2008. "What is driving reserve accumulation? A dynamic panel data approach" [online], pg.1, available: http://sccie.ucsc.edu/conference/2008/april/Bastourre-Carrera-Ibarlucia%20January%202008.pdf [accessed 06th of June 2009]
5. CASTEL-BRANCO, C.N., 2008. "Aid dependency and development: A question of ownership? A critical view". Working paper No1. [online] available at http://www.iese.ac.mz/?__target__=investigator&investigatorid=1 [accessed on 11th of September, 2009]
6. Central Bank of Nigeria, [online] available on http://www.cenbank.org/IntOps/ReserveMgmt.asp [accessed on 24th of July 2009]
7. CRUZ, M. and WALTERS, B., 2008, "Is the accumulation of international reserves good for development?", Cambridge Journal of Economics. Pg. 1-17
8. DIKE, V. (2008), "Corruption in Nigeria: A New Paradigm for Effective Control", [online]
9. http://www.africaeconomicanalysis.org/articles/gen/corruptiondikehtm.html [accessed on 28th of August 2009]
10. DURDU, C. B. at al. 2007. "Board of Governors of the Federal Reserve System". International Finance Discussion Papers, No 911, [online] available on http://ideas.repec.org/p/fip/fedgif/911.html [accessed on 24th of June 2009]
11. ELHIRAIKA, A at all, 2007, "Reserves Accumulation in African countries: Sources, Motivations and effects", [online] available at http://www.uneca.org/aec/documents/ [accessed on 23rd of April 2009]
12. FUKUDA, Shin-Ichi and KON, Y., 2008, " Macroeconomic Impacts of Foreign Exchange Reserves Accumulation: A theory and some international evidence", [online] available at www.nzae.org.nz/conferences/2008/100708/nr1215384178.pdf [ accessed on 02nd of September 2009]
13. GREEN, R., Torgerson, T., 2007. "Are high foreign exchange reserves in emerging markets a blessing or a burden?" [Online], Occasional Paper No. 6. Department of the Treasury office of internal affairs, available on www.treas.gov/offices/international-affairs/...paper.../**reserves**.pdf. [accessed on 07th of September 2009]
14. GRIFFITH-JONES, S. and OCAMPO, J.A., 2003, "What progress on International Financial Reform? Why so Limited?" [online] available at

www.egdi.gov.se/pdf/study/study2003_1.pdf [accessed on 11th of September, 2009]
15. GUPTA, A. and AGARWAL, R., 2008. "How should emerging economies manage their foreign exchange reserves?" [online], pg.1, available: http://129.3.20.41/eps/if/papers/0401/0401005.pdf [accessed on 6th of June 2009]
16. JANG-YUNG Lee, 2007. "Sterilizing Capital Inflows" [online], Economic Issues No.7, International Monetary Fund, available on http://www.imf.org/EXTERNAL/PUBS/FT/ISSUES7/INDEX.HTM [accessed on 6th of August 2009]
17. JOSHUA, A., Pinto, B., and RADZIWILL, A., 2004. "Sources for Financing Domestic Capital - Is Foreign Saving a Viable Option for Developing Countries?" [Online], Working Paper 10624. Cambridge, MA: National Bureau of Economic Research. available at http://www2.ucsc.edu/sccie/workingpaper/2004/0415.pdf [accessed on 15th of June 2009]
18. KAPUR, D. and PATEL, U.R. 2003, "Large Foreign Currency Reserves: Insurance for Domestic Weaknesses and External Uncertainties?" [online], Economic and Political Weekly, Vol. 38, No. 11, pp. 1047-1053 Published by: Economic and Political Weekly Stable, http://www.jstor.org/stable/4413342 [Accessed on 08th of June 2009]
19. KURODA, H. 2005. "De-Dollarization Strategies and Domestic Debt Markets in Emerging Economies" [online]. Inter-American Development Bank Annual Meeting Seminar, available on http://www.adb.org/Documents/Speeches/2005/ms2005042.asp [accessed on 24th of July 2009]
20. KRISHNA, V., 2002. "Auction Theory", [online], available at http://books.google.co.uk/books?id=F2FON7GVtcMC&dq=Auction+Theory:+By+Vijay+Krishna&printsec=frontcover&source=bl&ots=4GBrDwLmyg&sig=wqrEbiNrmMYccwk9LnU0UF8n5MU&hl=en&ei=2vGXSt26HJisjAfE3ezFBQ&sa=X&oi=book_result&ct=result&resnum=2#v=onepage&q=&f=false [accessed on 28th of August 2009]
21. LAPAVITSAS, C., 2007, "Using ODA to accumulate foreign reserves in Sub-Saharan Africa", International Poverty Centre, No. 37, One Pager.
22. LAVIGNE, R., 2008, "Sterilized Intervention in Emerging-Market Economies: Trends, costs and risks" [online], International department, bank of Canada, http://www.bankofcanada.ca/en/res/dp/2008/dp08-4.pdf [accessed on 8th of June 2009]
23. MOHANTY, M. S. and TURNER, P., 2006, "Foreign exchange reserve accumulation in emerging markets: what are the domestic implications?", [online] available at http://www.bis.org/publ/qtrpdf/r_qt0609f.pdf [accessed on 07th of June 2009]
24. NYBERG, L. and VIOTTI, S., 1974. "Optimal Reserves and Adjustment Policies" [online], The Swedish Journal of Economics, Vol. 76, No. 4, pp. 415-433, Published by: Blackwell Publishing on behalf of The Scandinavian Journal of Economics, http://www.jstor.org/stable/3439249 [Accessed: 08th of June 2009]
25. PAINCEIRA, J.P., 2008, "The role of developing-country reserve accumulation in the current financial crisis", Development View Point, No.18, Centre for Development Policy and Research, SOAS.
26. PRASAD, E. S. and RAJAN, R. G., 2008. "A Pragmatic Approach to Capital Account Liberalization" [online], Discussion Paper No. 3475, available at http://ftp.iza.org/dp3475.pdf [accessed on 15th of June 2009]

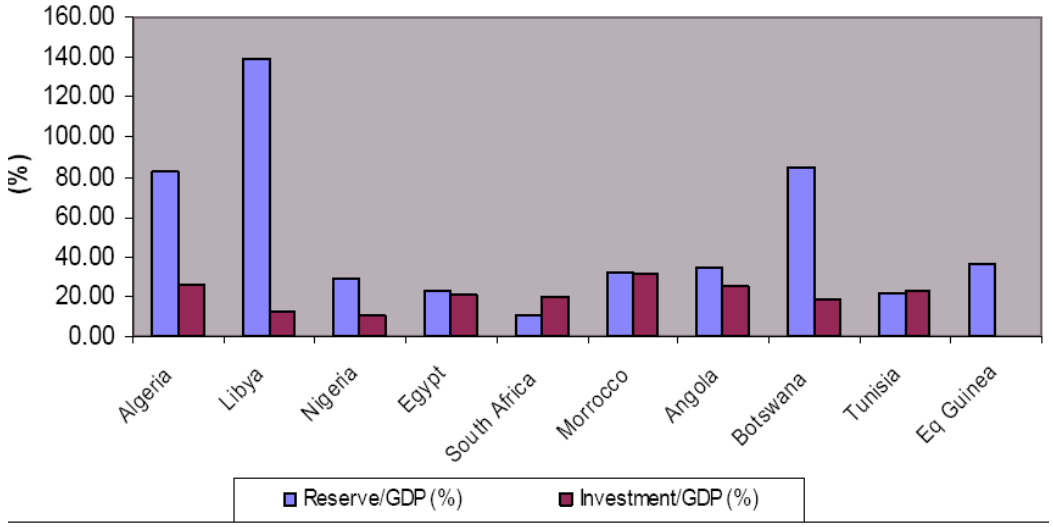
27. RODRIK, D., 2006, "the social cost of Foreign Exchange reserves, NBER, working paper Nr. 11952
28. ROMERO, A. R., n.d. "Comparative Study: Factors that affect foreign currency reserves in China and India", [online] http://www.iwu.edu/economics/PPE13/romero.pdf [accessed on 07th of June 2009]
29. SUMMERS, L.H., 2006. "Reflections on Global Account Imbalances and Emerging Markets Reserves Accumulation" [online], L.K. Jha Memorial Lecture, Reserve Bank of India, available at http://rbidocs.rbi.org.in/rdocs/Publications/DOCs/69527.doc [accessed on 07th of June 2009]
30. SURANOVIC, S. C., 2007. "International Finance Theory and Policy", [online] available at http://internationalecon.com/Finance/Fch70/Fch70.php [accessed on 13th of August 2009]
31. TERADA-HAGIWARA, A., 2004. "Reserve accumulation, sterilization, and policy dilemma", Asian Development Bank, SOAS library, A332.1095/925999
32. WYPLOSZ, C., (2007), "The fuss about foreign exchange reserves accumulation" [online], available on http://www.voxeu.org/index.php?q=node/182 [accessed on 29th of June 2009]

**Annex 1: Nigeria's Gross External Reserves Position (US$ billion) and Months of Import Equivalent**




*Source*: *CBN - Draft Annual Report for the Year Ended 31st December 2008 - part 2 (Activities of CBN) Published 7/7/2009*

**Annex 2: Top 10 Africa: Reserve/GDP and Investment/GDP**




*Source: Oshikoya, n.d. "Opportunities and challenges for managing Africa's reserves by African financial institutions*

## Annex 3: Calculated Annual Opportunity Cost of Excess Reserves (%GDP)

| | Reserve Adequacy Criteria | | |
|---|---|---|---|
| Country | 100% of Short-term Debt | 20% of M2 | 3 Months Import Coverage |
| China | 2.0% | 0.2% | 1.9% |
| Taiwan | 3.7% | 1.9% | 3.8% |
| South Korea | 1.0% | 0.1% | 1.1% |
| Russia | 1.1% | 1.1% | 1.2% |
| India | 0.8% | 0.7% | 0.8% |
| Mexico | 0.4% | 0.0% | 0.2% |
| Malaysia | 2.2% | 1.7% | 2.2% |

Note: Annual opportunity cost is the foregone return every year on reserves held above the adequacy criteria, assuming a 6% net return on alternatives.

Source: IMF and Economist Intelligence Unit

*Source: Green*, R., Torgerson, T., 2007.

## Annex 4: Mozambique Recent Economic Indicators

| *Recent economic indicators:* | 2004 | 2005 | 2006 | 2007 | 2008(a) | *2009(b)* |
|---|---|---|---|---|---|---|
| **GDP (US$bn) (current prices):** | 5.7 | 6.6 | 7.2 | 8.1 | 9.7 | *10.2* |
| **GDP PPP (US$bn) (c):** | 12.7 | 13.9 | 15.6 | 17.1 | 18.6 | *19.6* |
| **GDP per capita (US$):** | 297 | 336 | 362 | 397 | 465 | *483* |
| **GDP per capita PPP (US$) (c):** | 664 | 711 | 782 | 843 | 897 | *925* |
| **Real GDP growth (% change yoy):** | 7.9 | 8.4 | 8.7 | 7.0 | 6.2 | *4.3* |
| **Current account balance (US$m):** | -507 | -749 | -660 | -768 | -1,213 | *-1,197* |
| **Current account balance (% GDP):** | -8.9 | -11.4 | -9.2 | -9.5 | -12.6 | *-11.7* |
| **Goods & services exports (% GDP):** | 30.9 | 31.7 | 38.4 | 35.6 | na | *na* |
| **Inflation (% change yoy):** | 12.6 | 6.4 | 13.2 | 8.2 | 10.3 | *5.4* |

*Source: Market Information and Research Section, DFAT, using the latest data from the ABS, the IMF and various international available at* www.dfat.gov.au/geo/fs/moza.pdf