

AMERICAN UNIVERSITY OF BEIRUT

EXCHANGE RATE ARRANGEMENTS: THE LEBANESE
CONTEXT

by
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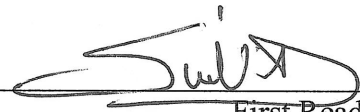
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AN ABSTRACT OF THE PROJECT OF

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Fifteen years of disturbances have left the pre-war booming Lebanese economy in a much-deteriorated state, and have had highly destructive repercussions. The country embarked on a massive reconstruction plan in the early 1990s, and since then, the Lebanese economy has been caught in a chronic viscous cycle of high indebtedness and recurrent budget deficits. In view of skyrocketing inflation rates, increasing fiscal pressures, high exchange rate volatility, and a severe trend of depreciation, and in order to reestablish confidence in the economy, the central bank has engaged in exchange rate-based stability policies, pegging the Lebanese Lira to the dollar at a rate of LBP 1507.5 per US Dollar, in 1999. With the aim of weighing the benefits of adopting a pegged exchange rate in Lebanon against the costs of defending it, this project starts with an extensive literature review of exchange rate arrangements, detailing their advantages and disadvantages. Emphasis is placed on fixed exchange rate regimes, and how particularly vulnerable they are to currency crises. Along the way, the aim of this study is to assess the sustainability of this established parity, given country-specific circumstances. In this context, we empirically test for the stability of the Lebanese money demand function, which turns out to be highly volatile and susceptible to shocks. The results reveal that the exchange rate peg policy efficiently helps in stabilizing prices, which perfectly matches the ultimate objective of the central bank. However, the strictly high Debt-to-GDP ratio, coupled with persistent fiscal and current account deficits, indicates that such a fixed rate regime cannot be sustained indefinitely, and Lebanon could be heading towards an exchange rate crisis.

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CHAPTER I

INTRODUCTION

Considerations defining the choice of an exchange rate regime can vary over time, with changing circumstances, and a constructive consensus to build on is that “no single exchange rate regime is best for all countries or at all times” (Frankel, 1999). Moreover, all exchange rate regimes offer benefits, but each also has its costs. A key concern in choosing the appropriate exchange rate regime is the vulnerability of the regime to speculative attacks and currency crises. Countries open to international capital flows with pegged rate regimes, especially emerging countries, are found to be particularly vulnerable to currency crises. The main reason is usually doubts about the credibility of the peg; as doubts accentuate about the ability of the central bank to commit to the parity, a run starts on foreign reserves. As this happens, it becomes very costly either to maintain the peg or to exit, because depreciation might overshoot.

This project evaluates the fixed exchange rate regime in Lebanon, and tries to assess the sustainability of this regime. Fifteen years of disturbances resulted in substantial losses and fundamental changes in the pre-war Lebanese booming economy, with changes including exploding inflation rates, high exchange rate volatility and a severe trend of depreciation. Subsequently, Banque du Liban (BDL) opted for exchange rate-based stability policies, in a move designed to restore confidence in the economy. The central bank has, indeed, succeeded at maintaining a firm commitment to the Lebanese Lira, which has been pegged to the dollar since 1999 at a rate of LBP 1507.5 per US Dollar.

The exchange rate anchor policy has been very useful in bringing down inflation rates quickly, and thereby stabilizing prices. However, the reconstruction program, initiated after the war, resulted in the accumulation of high budget deficits, which has simultaneously led to a buildup of considerable public debt, with a particularly high debt service that mainly stands behind the continuous fiscal deficit. Consequently, Lebanon's debt hit 140% of GDP, surpassing a 90% cliff after which most fiscal and currency crises have been observed, in the literature, to occur.

Therefore, fixing the exchange rate has contributed to the financial stability of the country and has allowed BDL to achieve its primary goal of price stability, but this procedure has also been costly. Lebanon has been running a continuous and persistent budget deficit for the past two decades, resulting in a huge debt stock that has been soaring at a very rapid pace. In this project, we weigh the benefits of adopting a pegged exchange rate against the costs of defending it. Along the way, we try to evaluate the sustainability of the current exchange rate arrangement, mainly in view of a persistent fiscal deficit, that is unsustainable debt, capital flow swings, and a persistent current account deficit. If these indicators are found to be fundamentally inconsistent with the maintenance of the peg, then expectations about currency depreciation are likely to emerge, and the country may be heading towards an impending fiscal and exchange rate crisis.

The rest of the project is divided as follows: chapter 2 is a thorough literature review of exchange rate regimes. It presents an in-depth classification of possible exchange rate arrangements, and evaluates their advantages and disadvantages. After we describe the mechanism of exchange rate pegging, and how costly this mechanism can be, especially in emerging market countries, we turn to the literature of competing

theories that try to explain the causes at the origin of currency crises, to understand how fixed exchange rate regimes can fail to work and eventually break down. Chapter 3 overviews the macroeconomic developments in Lebanon, the implications of the exchange rate stabilization program implemented by the central bank, and the evolution of the economy over the past two decades. In chapter 4, we empirically test for the stability of the Lebanese money demand function, to check if it is compatible with the established exchange rate policy, and then we assess the sustainability of the parity and consider whether an alternative plan is possible. Chapter 5 concludes, with some policy recommendations.

CHAPTER II

LITERATURE REVIEW

A. Overview

An exchange rate, as a price of one country's money in terms of another's, is among the most important prices in an open economy. It influences the flow of goods, services, and capital in a country, and exerts strong pressure on the balance of payments, inflation and other macroeconomic variables. Therefore, the choice and management of an exchange rate regime is a critical aspect of economic management to safeguard competitiveness, macroeconomic stability, and growth (Yagci, 2001).

The question that has long been at the center of debate in economics is about the appropriate choice of exchange rate regime that would “best” suit a country’s economic interests and circumstances. Choices of exchange rate policies have, in fact, followed a changing pattern over history. At the beginning of the twentieth century, the most common choice was to join the gold standard, since all advanced countries have done that. In 1944, the Bretton Woods agreement, by which countries fixed their currencies to the United States Dollar (USD), was signed. However, right after the breakdown of the agreement in 1971, the major currencies of the world began to float.

Thus, the choice of exchange rate policy has turned to be a debatable question of high importance. To understand the costs and benefits of any exchange rate system, we first need to define and classify these systems. Broadly speaking, in floating regimes, the real and nominal exchange rates are endogenous variables simply determined by supply and demand. In all other regimes (except for the currency union/ dollarization

where the central bank gives up on its currency, as we shall see), the government needs to have an idea of where the real rate should stand, in order to guarantee a competitive national economy.

Before we proceed into a more detailed and sophisticated classification of exchange rate regimes, we should keep in mind the policy dilemma that open economies face according to the Mundell-Fleming model, as this frames our discussion. This model, which studies the short-run relationship between an economy's nominal exchange rate, interest rate and output, argues that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement and an independent monetary policy. Under this well-known principle called the "Impossible Trinity" or also the "Open Economy Trilemma", only two of these three objectives can be achieved at a time and the central bank defines its priorities based on country-specific circumstances. For instance, if the central bank aims at achieving exchange rate stability in a country with free capital flow, it instantly gives out the option of monetary autonomy; monetary policy can no longer be directed towards domestic goals, but becomes simply an exclusive tool determined to keep the established exchange rate peg.

B. Classification of exchange rate regimes

The spectrum of exchange rate regimes does not only consist of simple fixed and floating. The choice is much more complicated and diversified, and a whole bunch of intermediate arrangements exist in between pure floats and hard pegs. In his study, Yagci (2001) dissects exchange rate policies and carefully suggests ten different possibilities of regimes, which he places under four broad categories: floating regimes,

intermediate regimes, soft peg regimes and hard peg regimes. Let us examine how Yagci defined each of these ten regimes.

- *Independent float* is an exchange rate determined in the market, by supply and demand. Under this regime, monetary authorities do not intervene in the foreign exchange market. Hence, monetary policy is independently and freely used to control the movement of the domestic economy.
- *Lightly managed float* is also an exchange rate determined by supply and demand. The central bank intervenes occasionally and monetary policy can be freely used to guide the domestic economy.
- *Managed float* is a regime under which the central bank intervenes actively in the foreign exchange market, but without any preannounced path for the exchange rate. Monetary policy is free to be used, to a certain extent, to guide the domestic economy.
- *Crawling broad band* is an exchange rate kept within a broad band around a central rate. The central bank intervenes to keep the rate between the bands. Monetary policy independence is a function of the band width.
- *Crawling narrow band* is an exchange rate kept within a narrow band around a central rate. The central bank intervenes to keep the rate between the bands. The degree of discretion of monetary policy is a function of the band width.
- *Crawling peg* is an exchange rate adjusted periodically by the central bank based on a number of indicators. It imposes constraints on monetary policy.
- *Pegged within Bands* is an exchange rate that fluctuates within a narrow band around a formal central fixed rate, which is fixed in terms of a single currency or a

basket of currencies. There degree of monetary policy discretion is limited and depends on the band width.

- *Fixed peg* is an exchange rate pegged, at a fixed rate, to a major single currency or a basket of currencies. Monetary policy is used to defend the peg, which implies that the level of discretion is limited. However, monetary authorities are not committed to the peg indefinitely.
- *Currency board* is a strict exchange rate regime committed to exchange domestic currency for a specified foreign currency, at a fixed rate. This means that domestic currency is only issued against foreign exchange, which implies that an independent monetary policy is almost impossible.
- *Currency union dollarization* is a regime under which, either another country's currency is used, or the country belongs to a currency union. Monetary autonomy is totally surrendered and thus an independent monetary policy is impossible.

The table below, extracted from the study done by Yagci(2001), but which has been adjusted, demonstrates in more detail all of these regimes, along with the convenient circumstances they best match with, their advantages and disadvantages. They are ranked on the basis of the exchange rate flexibility with at one extreme the independent float regime providing maximum monetary autonomy, and on the other extreme the currency dollarization regime under which monetary autonomy is totally surrendered.

Table 2.1: Exchange Rate Regimes

	Main Features	Country Circumstances	Main Advantages	Main Disadvantages
FLOATING REGIMES				
Independent Float	<ul style="list-style-type: none"> -Determined in the market freely by supply and demand -Monetary authorities do not intervene in the foreign exchange market -Monetary policy is independent of the exchange rate regime and can be used freely to steer the domestic economy 	<p>Appropriate for:</p> <ul style="list-style-type: none"> -Medium and large industrialized countries -Emerging market economies 	<ul style="list-style-type: none"> -Absorbs adverse shocks to the economy -Not prone to currency crisis 	<ul style="list-style-type: none"> -High short-term volatility (excessive fluctuations may be dampened in the case of lightly managed float)
Lightly Managed Float	<ul style="list-style-type: none"> -Determined by supply and demand -The central bank intervenes occasionally -Monetary policy is largely free to be used to steer the domestic economy 	<ul style="list-style-type: none"> relatively closed to international trade, but fully integrated in the global capital markets 	<ul style="list-style-type: none"> -No high international reserves required 	<ul style="list-style-type: none"> -Large medium-term swings -High possibility of misalignment -Discretion in monetary policy may create inflationary bias
INTERMEDIATE REGIMES				
Managed Float	<ul style="list-style-type: none"> -It may operate like an unannounced crawling broad band -The central bank intervenes actively in the foreign exchange market, but without specifying or precommitting to a preannounced path for the exchange rate -Monetary policy is relatively free to be used 	<p>Appropriate for:</p> <ul style="list-style-type: none"> -Emerging market economies -Developing countries with strong financial sectors and disciplined macroeconomic policy 	<ul style="list-style-type: none"> -Limited flexibility permits partial absorption of adverse shocks -Can maintain stability and competitiveness if the regime is credible -Low vulnerability to currency crisis if edges of the band are soft 	<ul style="list-style-type: none"> Lack of transparency: the criterion for intervention is not disclosed in the managed float and broad band regimes -Lack of transparency may lead to uncertainty and lack of credibility -High international reserves are required
Crawling Broad Band	<ul style="list-style-type: none"> -Maintained within a broad band, around a central rate that is adjusted periodically -The central bank intervenes to keep the rate between the bands -It imposes constraints on monetary policy: the degree of monetary independence is a function of the band width 			

Table 2.1. Exchange Rate Regimes (cont'd)

	Main Features	Country Circumstances	Main Advantages	Main Disadvantages
SOFT PEG REGIMES				
Crawling Narrow Band	<ul style="list-style-type: none"> -Maintained within a narrow band, around a central rate that is adjusted periodically -The central bank intervenes to keep the rate between the bands -There is limited discretion for monetary policy depending on the band width 	<p>Appropriate for:</p> <ul style="list-style-type: none"> -Developing countries with limited links to global financial markets, less diversified production and export structure, shallow financial markets, and lacking monetary discipline and credibility -Countries stabilizing from very high levels of inflation 	<ul style="list-style-type: none"> -Can maintain stability and competitiveness if the peg is credible -Lower interest rates -Provides a clear and easily monitorable nominal anchor -Allows high inflation countries to reduce inflation by moderating inflationary expectations 	<ul style="list-style-type: none"> -Prone to currency crisis if the country is open to international capital markets -Encourages foreign debt -High international reserves are required -Little shock absorptive capacity: shocks are largely absorbed by changes in the real sector
Crawling Peg	<ul style="list-style-type: none"> -Adjusted periodically according to a set of indicators -It imposes constraints on the monetary policy 			
Pegged within Bands	<ul style="list-style-type: none"> -Allowed to fluctuate within a narrow band, around a formal central fixed peg -The central rate is fixed in terms of a single currency or a basket of currencies -There is limited discretion for monetary policy depending on the band width 			
Fixed Peg	<ul style="list-style-type: none"> -Pegged at a fixed rate to a major single currency or a basket of currencies -The monetary authority is not committed to the peg indefinitely -Monetary policy stands ready to defend the peg: the degree of monetary policy discretion is limited 			

Table 2.1. Exchange Rate Regimes (cont'd)

	Main Features	Country Circumstances	Main Advantages	Main Disadvantages
HARD PEG REGIMES				
Currency Board	-Strict exchange rate regime supported by a monetary system, based on legislative commitment to exchange domestic currency for a specified foreign currency at a fixed rate -Domestic currency is issued only against foreign exchange -There is almost no scope for an independent monetary policy	Appropriate for countries with a history of monetary disorder, high inflation, and low credibility of policymakers, that need a strong anchor for monetary stabilization	-Provides maximum credibility for the economic policy regime -Can facilitate disinflation -Not prone to currency crisis -Low transaction costs, low and stable interest rates -Lack of monetary discretion, which eliminates inflationary bias	-Central bank loses its role as a lender of last resort: higher probability of liquidity crisis -Low seigniorage under currency board, and no seigniorage in case of dollarization -No shock absorptive capacity: shocks have to be fully absorbed by changes in economic activity -Exit from dollarization is very difficult
Currency Union Dollarization	-Another country's currency is used as the only legal tender, or the country belongs to a currency union in which the same legal tender is shared by all members of the union -Monetary autonomy is fully surrendered: there is no scope for an independent monetary policy	Appropriate for: -Countries that have already developed extensive trade and other economic ties (EMU) -Small countries already integrated in larger neighboring countries (dollarization)		

Source: Yagci (2001), with some adjustments.

Yet, we should note that a precise and delicate reading of the experience shows that these official classifications often fail to describe the real country practice. Hence, a gap exists between the official classification of exchange rate regime (*de jure*) reported by the country and the actual (*de facto*) regime adopted by that country. In other words, there is a clear difference between what countries say they do and what they eventually

do. The literature has repeatedly pointed out to these mismatches, revealing that the characterization of actual regimes is not a simple task. For instance, Calvo and Reinhart (2002) have suggested that many countries that are officially reported as floaters do in fact intervene in exchange rate markets, sometimes even heavily, in order to reduce exchange rate volatility. This gives rise to a phenomenon called “Fear of Floating”. In a similar manner, but on the other side of the spectrum, Levy-Yeyati and Sturzenegger (2001) have pointed out to the rise of what also came to be called “Fear of Pegging”, referring to countries that have a *de facto* peg but that try to avoid an official commitment to a fixed parity.

Indeed, many methodologies have been suggested to classify countries in terms of the policies they actually run, by observing, for instance, the variability in the exchange rate and reserves levels. But, this classification isn’t easy neither, and does not sound definitive.

C. Determinants of exchange rate regimes

As developed by Yagci (2001), all exchange rate regimes offer benefits, but also do have costs. One extremely important consensus to be remembered for the rest of this study is that “no single exchange rate regime is best for all countries or at all times” (Frankel, 1999). In the purpose of a thorough understanding of the main advantages and disadvantages of exchange rate regimes, and for closer evaluation, let us group those under two broad categories: fixed and flexible.

1. Advantages of fixed exchange rate regimes

a. Nominal anchor for monetary policy

Economists tend to put emphasis on this advantage, as they believe that there is a high probability of inflationary bias when monetary policy is fully discretionary. Frankel (2003) addresses the subject of exchange rate regimes and summarizes the debate wisely. In case of high inflation, a central bank can credibly commit by fixing the exchange rate, of course to a hard currency with strong monetary discipline, or can even give up on its currency altogether through a currency union. This drives people to expect low inflation since the peg prevents any monetary expansion and limits the degree of discretion, which eventually does result in a lower level of inflation in the country. Additionally, as advanced by Mishkin (1998), fixing the value an emerging country's currency to that of a stronger and sounder currency, anchors inflation expectations to the levels of inflation in the anchor country. Thus, the main argument in favor of fixed exchange rate regimes is their ability to induce discipline and credibility, especially when it comes to an emerging country, while keeping inflation under control. These regimes do stimulate price stability, which is one of the main goals of most central banks.

b. Stimulator of international trade and investment

As Frankel (2003) argues, fixing the exchange rate can eliminate exchange rate risks (high variability and fluctuations). Since the peg provides a more stable value of the currency, foreign investors are exposed to lower levels of risk. Consequently, this encourages investment in the country, increases capital inflows and promotes openness to trade and economic integration, hence stimulating growth in the economy.

2. Disadvantages of fixed exchange rate regimes

a. Vulnerability to currency crises

A main concern in the choice of exchange rate regime is the vulnerability of the regime to currency attack, as we shall stress later in our discussion. In short, countries open to international capital flows, with pegged regimes, were found to be particularly vulnerable to currency crises, from the 1990s experience. As Yagci (2001) highlights in his study, the main common factor of those crises was the variety of soft peg regimes that were adopted back then by the countries (The European Monetary System in 1992-3, Mexico in 1994, East Asia in 1997, Russia and Brazil in 1998 and Turkey in 2000). In essence, doubts about the credibility and sustainability of a peg are, most of the times, the key reason behind the vulnerability of the regime to a crisis. These doubts may emerge from policy mistakes, a variety of shocks, weaknesses in the financial sector, large foreign-denominated debt, or political instability in the country. The capital account has an important and essential role in forming the currency crisis. When doubts arise about the ability of the government to stick to the peg, capital inflows stop suddenly and international reserves start running out. When this happens, it becomes very costly either to defend the peg or even to exit. Indeed, Obstfeld and Rogoff (1995) believe that exchange rate pegging leaves the country open to attacks on its currency and explain, again, how important it is for the central bank to gain credibility: when confidence in policymakers is lost, and the central bank is no longer able to convince speculators that there will not be any devaluation of the currency, attacks do force the country to forgo its fixed rate regime.

b. Loss of the lender of last resort role of the central bank and seigniorage capability

Another main disadvantage of the exchange rate peg is that it limits the ability of the central bank to act as a lender of last resort. This means that its function of providing liquidity, when needed to prevent financial panics and bank runs from hitting the country, is strictly weakened. As monetary autonomy is surrendered because money supply can only be used to maintain the parity, the capability of the government to raise seigniorage revenue is restrained.

Chang and Velasco (1998) tackled the relationship between exchange rate regimes and financial stability. They studied financial fragility, exchange rate crises and monetary policy in an open economy under the Diamond-Dybvig model for fixed rates, flexible rates and a currency board system. They found that “flexible exchange rates, coupled with a policy by the central bank to serve as a lender of last resort, can both implement the first best allocation and eliminate bank runs”.

3. Advantages of flexible exchange rate regimes

a. Monetary policy autonomy

It is commonly argued that the key leading advantage of floating the exchange rate is the ability to pursue an independent monetary policy, which does not need to be manipulated to keep defending the peg, but can be freely used to rather guide and promote the domestic economy. In contrast, under a fixed exchange rate regime, monetary policy is rendered powerless. As Mishkin (1998) suggests, we know that with open capital markets, interest rates in a country with a fixed rate regime are closely tied to those of the anchor country, and money creation becomes very limited. Therefore, a country that chooses to peg its currency to that of an anchor country cannot use

monetary policy to respond to domestic shocks that are independent of those hitting the anchor country. This same idea is highlighted by Yagci (2001), who believes that the ability of a country to use a free and independent monetary policy, adapted to local conditions, rather than following an imported policy, is a highly important tool of adjustment, since cyclical conditions differ among countries.

b. Ability to absorb adverse shocks and provide financial stability

Another key advantage discussed by Yagci (2001) is that flexible regimes help divert or absorb the impact of adverse domestic and external shocks (e.g. increase in international interest rate, reversals of capital flows, deterioration of terms of trade, contraction in world demand, natural disasters, etc.). By doing so, these regimes protect the real economy from large losses, and thus provide the economy with greater financial stability. In fact, such shocks usually require an adjustment in the real exchange rate, and because prices move slowly in general, it is not only faster but also less costly and damaging to let the nominal exchange rate respond to a shock.

Moreover, Frankel (2003) explains in more detail how both fixed and flexible regimes react when a disturbance hits the country. If, for instance, the economy is hit by a fall in the demand for domestic goods, the government would naturally want to respond to this shock to prevent the country from going into a recession. In case of a fixed rate regime, monetary policy is mostly diverted to dealing with “balancing” the balance of payments. Because the domestic interest rate is highly related to the foreign interest rate, any attempt to expand the money supply is ineffective and the economy must simply live with the effects. In contrast, under a floating rate regime, the country can respond to a recession through an expansion of the money supply and a depreciation

of the currency, which stimulates demand for domestic goods and returns the economy to the desired levels of output and employment, much faster than under a pegged regime. This actually takes us back to the leading advantage of an independent monetary policy.

4. Disadvantages of flexible exchange rate regimes

a. Time-inconsistency

Discretionary monetary policy, which appears under flexible rate regimes, usually brings up the problem of time-inconsistency. Yagci (2001) explains that time-inconsistency problems arise because policymakers tend to use discretionary monetary policy to achieve short-run objectives like, for example, higher growth and employment, although this may result in poor long-run outcomes such as high inflation. Therefore, if the government misuses its discretionary policy and is not able to keep its promise of low inflation, it will face difficulties to gain the credibility of the public for future policy announcements. This creates a kind of trade-off between the credibility and flexibility of the regime: the degree of discipline and credibility decreases as the degree of flexibility increases.

b. Volatility

Although flexible rates permit the absorption of shocks and offer more financial stability, but they lead to high exchange rate volatility in the same time. This creates an environment of uncertainty, which can in turn discourage international trade and investment, and fuel inflation. As mentioned by Yagci (2001), this is particularly damaging for developing countries, where persistent real exchange rate volatility and

misalignment have been accompanied by unsustainable trade deficits and lower economic growth on the long-run. Moreover, he adds that, by nature, volatility is higher in developing countries, since these countries are characterized by small foreign exchange markets, and they most likely lack political stability and disciplined macroeconomic environment.

D. Mechanism of exchange rate pegging

As already stated, when a country opts for a fixed exchange rate regime, the central bank stands ready to defend the parity by controlling the money supply i.e. the monetary base. But, how exactly does it do that? In fact, in order to maintain the pegged value of the domestic currency in terms of the foreign currency, the central bank adjusts the money supply through buying and selling foreign exchange reserves. Let us briefly summarize the mechanism to understand how a fixed rate regime functions in contrast with a flexible regime.

First, suppose that we are in a small open economy, under a flexible exchange rate regime. If, for instance, the central bank engages in an expansionary monetary policy, people will actually be left with extra money than needed and will engage in the purchase of domestic bonds, hence pushing domestic interest rates down, below the world interest rate. Remember, we are in a small open economy and the domestic interest rate is determined by the Uncovered Interest Parity. Consequently, the decline in the domestic interest rate creates an incentive for people to shift away from domestic bonds and buy more foreign bonds at the now relatively higher rate. As the demand for foreign currency increases gradually, there is an ascending pressure on the domestic currency to depreciate. If the central bank does not intervene and allows the currency to

eventually depreciate, local currency gets cheaper relative to the foreign one, which increases exports and decreases imports. This, in turn, results in a higher GDP, which increases money demand, so that equilibrium is restored in the money market.

Note that, away from any monetary expansion, if people expect, whether for a rational reason or an irrational one based on pure speculative motives, that there is going to be a currency depreciation, this would eventually put pressure on the exchange rate to depreciate, hence making expectations “self-fulfilling”.

On the other hand, suppose that a small open economy, which operates under a fixed exchange rate regime, is hit by a negative shock, say to spending. As a result, GDP falls and money demand shifts down, hence putting pressure on the exchange rate to depreciate. To prevent the currency from depreciating, the central bank must now intervene and decrease money supply by selling foreign reserves to the public, to restore equilibrium in the money market. Therefore, the ability of the central bank to defend the pegged rate largely depends on its foreign exchange reserves.

E. Dangers of exchange rate pegging in emerging market countries

Up to this point, we have examined how a fixed exchange rate regime generally works and what are its major privileges and drawbacks. Let us now detect the “dangers” that this process can have on emerging market countries, in particular. In an interesting manner, Mishkin (1998) studies whether fixing the exchange rate is a good strategy for developing countries and explains how damaging and dangerous this strategy can actually be, especially for controlling inflation in these countries. He starts off by defining a financial crisis as a “non-linear disruption to financial markets in which asymmetric information problems (adverse selection and moral hazard) become much

worse, so that financial markets are unable to efficiently channel funds to economic agents who have the most productive investment opportunities. A financial crisis, thus, prevents the efficient functioning of financial markets, which leads to a sharp contraction in the economic activity”. Mishkin continues by stating three clear reasons for which an exchange rate peg in emerging market countries makes these countries more vulnerable to financial crises.

First, a devaluation of the domestic currency under a pegged exchange rate can cause a non-linear deterioration in the balance sheets of financial and nonfinancial firms, thereby causing a failure in the ability of financial markets to move funds to agents with productive investment opportunities. In fact, emerging economies differ fundamentally from developed ones in the institutional structure of their credit markets. Typically, developed countries have long-term debt contracts, mostly denominated in domestic currency, while in emerging market countries debt contracts are mainly of short duration, as these countries have little credibility in fighting inflation, and are often denominated in foreign currency. As such, when there is a depreciation or a devaluation of the domestic currency in emerging market countries, the debt burden of domestic firms goes up, but without a matching increase in the value of firms’ assets, since these are usually denominated in domestic currency. This results in a deterioration in firms’ balance sheets and a decrease in net worth, which increases moral hazard incentives. All of this provides lenders with less protection and a much higher risk. Hence, lending decreases, leading to less investment and resulting in a slower economic activity. Similarly, the depreciation of the domestic currency also drives the deterioration in the balance sheets of the banking sector, and in the extreme case to a banking crisis. Essentially, when firms and households default on their loans, banks’

balance sheets deteriorate and this typically results in the contraction of lending. Moreover, it should be noted, as Mishkin argues, that even if depreciation in an emerging economy, under a flexible exchange rate regime, does also promote financial fragility, it is less probable to induce a “full-fledged” financial crisis; when a currency attack occurs, the decrease in the value of the currency is generally larger and at a more rapid and unanticipated pace under a fixed rate regime than under a floating one.

Second, Mishkin believes that any successful attack against the currency of an emerging market country can lead to a sharp and rapid rise in inflation, which further weakens balance sheets, and consequently weakens the circulation of funds to productive agents in the economy. Because emerging market countries have in general bad experiences with high inflation, they display little and fragile “inflation-fighting credibility”. Hence, a decrease in the value of the domestic currency can dramatically increase actual and expected levels of inflation. As expected inflation rises, interest rates also do. With the presence of short-term debt contracts, firms will incur sharp increases in interest rate payments, which weakens firms’ cash flow position and further deteriorates their balance sheets, thus resulting again, in less lending and a slow economic activity.

Third, because the currency gains a more stable value after an exchange rate peg, foreign investors face less risk and capital inflow is encouraged. It is true that capital inflows can stimulate investment and growth, as we have seen previously, but they may as well trigger uncontrolled lending. With a weak bank supervision, as it is often the case in emerging market countries, the lending boom usually ends up with bad loans and results in a deterioration in banks’ balance sheets. Accordingly, banks have no other solution but to restrict their lending, and many banks are eventually forced into

solvency. Any attempt to defend the domestic currency from depreciating, by raising interest rates, hurts balance sheets even more, and might lead to a collapse of the banking system. Mishkin adds that, once investors realize that defending the currency is very difficult under a weak banking system, they are more incited to attack the currency because they are provided with greater expected profits by selling it. The final result is a very successful currency attack and foreign exchange crisis, which causes the collapse of the economy.

“The scenarios we have seen recently in emerging market countries such as Mexico, Thailand, South Korea, Malaysia and Indonesia illustrate how dangerous exchange-rate pegs can be. These countries experienced massive capital inflows which were intermediated by the banking sector, and the resulting lending booms led to large loan losses and a deterioration in bank balance which helped promote the subsequent foreign-exchange crises. The collapse of domestic currencies then led to a huge number of insolvencies and sharp rises in inflation and interest rates which caused further deteriorations in balance-sheets. The outcome has been severe depressions in all these countries, which has also engendered substantial social unrest. Their experience suggests that using an exchange-rate peg to control inflation is highly problematic.”
(Mishkin, 1998)

F. Models of currency crises

In this context, let us now turn to the literature of competing theories that try to explain the causes at the origin of currency crises. We are again concerned with fixed exchange rate regimes, and how they fail to work and eventually break down. We have been talking about the possibility of a currency crisis under a fixed rate regime but what is it exactly and how does it really work? A currency crisis, normally considered as part of a financial crisis, can be defined as a speculative attack on the foreign exchange value

of a currency. It usually originates from doubts about the capability of the central bank to defend the peg and ultimately results in a sharp exchange rate depreciation, despite a strong policy response from the central bank to defend the currency value. Indeed, fixed rate regimes collapse most often when the foreign currency reserves are exhausted. The crisis results from serious balance of payments deficits and this is why, it is also called a Balance of Payment Crisis. Models of currency crises are mainly categorized as first and second generation models.

1. First generation models

The classic first generation models go to Krugman (1979) and Flood and Graber (1984). According to these models, fixed exchange rate regimes collapse due to an unsustainable fiscal policy, and existing inconsistencies between the pegged rate commitment and persistent government budget deficits. Remember, we are operating under a fixed rate regime, which means that the government's capability to raise seigniorage revenue is very limited. Hence, in order to finance the imbalance, the central bank must either deplete its assets (like foreign reserves) or borrow. However, neither of these two options can be used indefinitely. With the absence of fiscal reforms, the government is left with no choice but to print money, although excess money creation leads to high inflation. The moment investors perceive the inconsistency of economic policies vis-à-vis keeping the pegged exchange rate, they anticipate the breakdown of the regime. Consequently, they massively flee the domestic currency and rush to convert their money into foreign currency, as the central bank still has reserves left to offer them. Such a speculative attack in the foreign exchange market devastates the reserves, which eventually fall to zero, and this inevitably leads to the abandonment

of the peg. Therefore, an important question to be answered is: what determines the timing of the collapse?

To illustrate, we assume that these models are set in a world of no uncertainty regarding the path of domestic credit and the volume of reserves the central bank is willing to use to defend the parity. This means that agents carry no risk and have perfect foresight. In other words, they know the exact timing of the attack, i.e. they know exactly when they should attack. Hence, expected depreciation of the exchange rate is practically zero for the time preceding the attack.

Money Market equation:

$$M/P = a_0 - a_1 i \quad (1)$$

Where $a_0 = c_0 + c_1 y$

Monetary Base equation:

$$M = D + R \quad (2)$$

Monetary base stands for money supply, where D is domestic credit (domestic bonds held by the central bank) and R is foreign exchange reserves held by the central bank.

Purchasing Power Parity:

$$P = P^* S \quad (3)$$

Where P is the domestic price level, P* the foreign price level, and S the exchange rate.

Uncovered Interest parity:

$$i = i^* + S'/S \quad (4)$$

Where i is the domestic interest rate, i* the world interest rate, and S' the change of exchange rate with respect to time.

Rate of Change of Domestic Credit:

$$D' = U \quad (5)$$

Where D', the rate of change of domestic credit, is assumed to be constant and positive.

Let us plug equations (3) and (4) in equation (1):

$$M / (P^*S) = a_0 - a_1 (i^* + S'/S)$$

Rearranging terms, we get:

$$M = \alpha.S - \beta.S' \tag{6}$$

$$\text{Where } \alpha = a_0.P^* - a_1i^*.P^*; \beta = a_1.P^*$$

Under a fixed exchange rate S (denoted by S_f): $S' = 0$ and $i = i^*$.

$$\text{Hence, } M = \alpha.S_f \tag{7}$$

Under a fixed exchange rate, money supply is fixed and from equation (2) we have:

$$R = M - D \text{ or } R = \alpha.S_f - D \tag{8}$$

If we take the derivative of equation (8) with respect to time (given that $\alpha.S_f$ is constant under a fixed exchange rate), we get:

$$R' = - D' \tag{9}$$

Therefore, under a fixed exchange rate, the rate of change of R should equal minus the rate of change of D, which means that as the domestic credit grows at a rate of U, reserves fall at the same rate. Put differently, for the central bank to buy government bonds, and hence inject money in the economy and increase the money supply, it should simultaneously sell its reserves in order to defend the peg and prevent the currency from depreciating. Clearly, the country will eventually run out of reserves and the fixed exchange rate will break down. Now, let us derive the shadow exchange rate \hat{S} , which is the exchange rate that prevails after a successful attack i.e. when reserves fall to zero $R=0$ and the exchange rate becomes floating.

We can solve for \hat{S} by solving the differential equation (6), using the method of Undetermined Coefficients.

$$\text{Let } S = \hat{S} = \lambda_1 + \lambda_2 M$$

Then, $S' = \hat{S}' = \lambda_2 M' = \lambda_2 D' = \lambda_2 U$, since after the crisis and under the floating exchange rate $R=0$. So, $M=D$, and therefore, $M'=D'=U$.

Now, we substitute S and S' in equation (6) and get:

$$M = \alpha. (\lambda_1 + \lambda_2 M) - \beta. (\lambda_2 U)$$

Restriction are such that:

$$\alpha \lambda_2 = 1 \rightarrow \lambda_2 = 1/\alpha$$

$$\alpha \lambda_1 - \beta \lambda_2 U = 0 \rightarrow \lambda_1 = \beta. (U/\alpha^2)$$

This yields to:

$$S = \hat{S} = \beta. (U/\alpha^2) + M/\alpha \tag{10}$$

$$S' = U/\alpha \tag{11}$$

$$\text{We can consider } D_t = D_0 + U.t \tag{12}$$

Since now $M = D$, then equation (10) becomes:

$$\hat{S} = \beta. (U/\alpha^2) + 1/\alpha. (D_0 + U.t) \tag{13}$$

Timing of the attack:

Once reserves fall to some critical value, there would be an instantaneous speculative attack, which totally depletes reserves, and consequently forces the abandonment of the fixed exchange rate. The attack will occur at the time when S_f is equal to \hat{S} , which we denote by Z . For now, let us continue solving the model, but we will shortly see why speculators need to attack at no other time than Z .

$$\text{At } Z, S_f = \beta. (U/\alpha^2) + 1/\alpha. (D_0 + U.Z) \tag{14}$$

Rearranging terms gives us:

$$Z = (\alpha S_f - D_0)/U - \beta/\alpha \tag{15}$$

Using equation (8): $R = \alpha.S_f - D$, equation (15) becomes:

$$Z = R_0/U - \beta/\alpha \tag{16}$$

From equation (16), we can safely conclude that the higher initial reserves are, the longer the crisis is delayed. On the other hand, the higher is the rate of domestic credit (domestic monetary expansion), the sooner is the collapse.

We have seen the time at which the fixed rate must break down, by introducing the idea of the shadow exchange rate. This rate is indeed crucial in assessing the profits available to speculators in a crisis, since it is the price at which speculators can sell the reserves they bought from the government. Therefore, the shadow exchange rate is the rate that balances the money market after an attack. In figure 1 below, extracted from a study done by Flood & Marion (1999), both the shadow exchange rate and the pre-attack fixed rate are plotted, and the two lines intersect at time Z represented by point A , where domestic credit $d = d^A$.

To see why speculators must attack only at time Z , first suppose that d is smaller than d^A . In this case, $\hat{S} < S_f$. If speculators choose to attack at this time and at such a level of d , then the currency will appreciate after the attack and speculators will experience a capital loss on their reserves. This simply means that there will be no attack at any time preceding time Z .

Second, consider the case where d is larger than d^A . Now, $\hat{S} > S_f$ and there is definitely a capital gain to be made. Thus, speculators will compete on this profit and will try to get a jump on each other and attack earlier. In this fashion, the attack is brought back in time to the point where $d = d^A$.

With this in mind, it is important to note that, at the time of the attack, the drop in the money supply (as reserves are exhausted) should exactly match the increase in the expected depreciation in order for the money market to clear, with no pressure on the exchange rate to depreciate or appreciate.

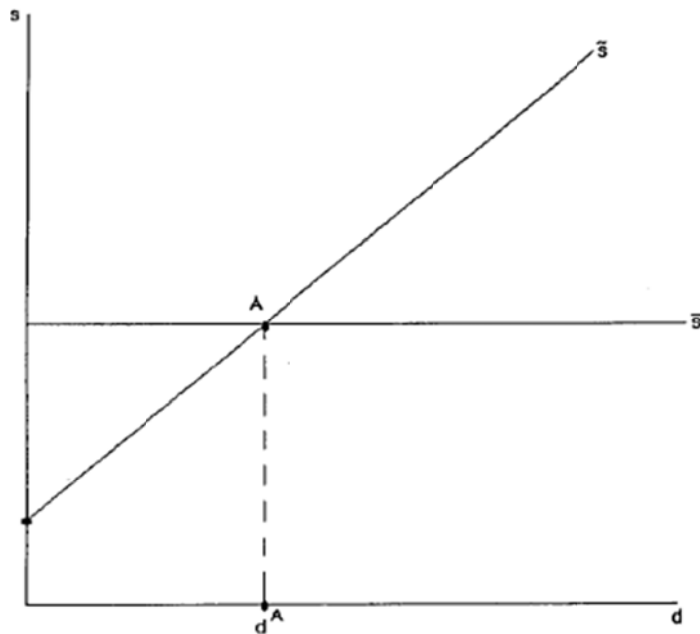


Figure 2.1. Attack time in a certainty model
Source: Flood & Marion (1999).

2. Second generation models

Under second generation models, which start with Obstfeld (1986), speculative attacks can occur because of self-fulfilling expectations. These models relax the assumption of a linear behavior, and focus instead on important nonlinearities in government behavior, which can lead to the existence of multiple equilibria. Because of speculators' doubts about the ability of the government to protect the exchange rate target, a speculative attack can take place and succeed, although government's current policy is not inconsistent with the fixed exchange rate commitment. Hence, speculation does not always reflect economic fundamentals but can be driven by the sentiments of the financial markets.

In the related literature, Flood & Marion (1999) use the following example, where they wisely introduce a policy nonlinearity into the standard first generation

models. The nonlinearity they consider is a conditional shift in the growth rate of domestic credit; domestic credit grows at a rate U_0 if there is no attack on the fixed exchange rate, and at a faster rate U_1 in case of attack. In contrast with figure 1, figure 2 has now two shadow exchange rate lines: one that represents the rate of credit expansion U_0 and another higher one, representing U_1 .

First, consider the case where the domestic credit is less than d^B . Without any attack, the shadow exchange rate is on the \hat{S}_{U_0} line. However, if speculators do attack, the shadow rate jumps to the higher \hat{S}_{U_1} line but, still lies below the fixed exchange rate. In both cases, the attack leads to capital losses. Hence, there is absolutely no incentive to attack and the fixed exchange rate can survive indefinitely.

Second, suppose that d is exactly equal to d^B . If there isn't any attack, the shadow rate lies on the lower \hat{S}_{U_0} line, at point C. But, if an attack occurs, the shadow rate jumps to point B, which is the point of intersection between \hat{S}_{U_1} and S_f . In this case, the attack is successful, but results in zero profits since the fixed rate is exactly equal to the shadow rate. Hence, equilibrium can take place equally at points B or C.

Third, if d ranges between d^B and d^A , multiple equilibria are possible, given that speculators are "small and uncoordinated". In fact, if agents believe that there is no possibility of an attack, the economy can stay on the \hat{S}_{U_0} line and, in consequence, the fixed exchange rate can be maintained indefinitely. But, if agents do believe that there will be a run on the currency, i.e. that the currency is going to collapse, and if a certain mechanism coordinates their expectations and actions given that they are only small credit-constrained traders, then an attack scenario emerges and multiple equilibria are probable.

Finally, if d lies in the range to the right of d^A , then the shadow exchange rate is either equal to or larger than the fixed rate. As such, the fixed exchange rate is definitely attacked.

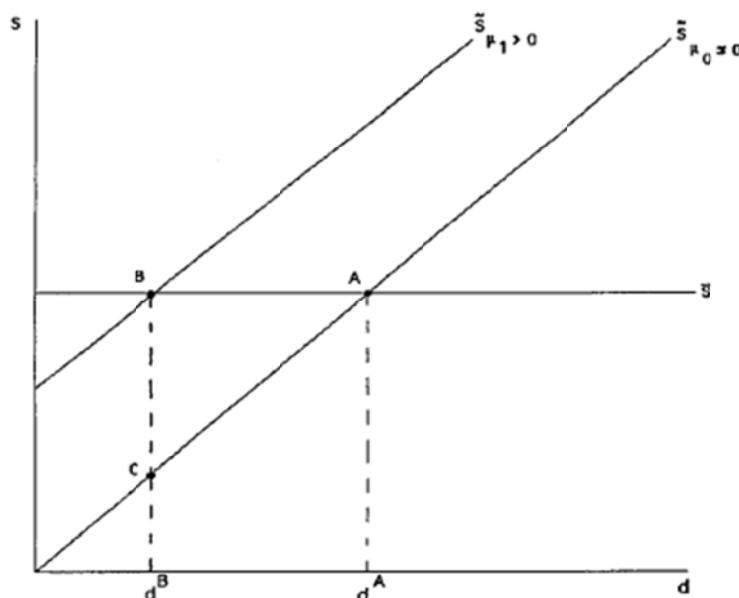


Figure 2.2. Attack times with attack-conditional policy shifts
Source: Flood & Marion (1999).

G. Major signs of currency crises

Now, that we have studied the process of currency crises, a valid question arises as to which channels are likely to increase doubts about the capability of the central bank to defend the peg. In other words, what are some of the alerting signs that induce an increase in economic agents' expectations about exchange rate depreciation in the real world of uncertainty, and hence, trigger a currency crisis?

1. High debt

One main channel, that extremely serves the purpose of this study, is the sustainability of government debt, which plays a major role in driving a speculative

attack. When a country is constantly running a fiscal deficit and is borrowing too much, its debt can become unsustainable, which means that the government wouldn't be able to meet its requirements and would eventually default on its debt. The moment debt is not sustainable, reforming fiscal policies become a must in avoiding fiscal, monetary and exchange rate crises. In fact, fiscal policy becomes unsustainable if the government is unable to generate appropriate revenues, and accordingly plans to finance future interest expenses via issuing additional debt. The moment investors perceive/expect the risk of default, they would lose confidence in the currency and wouldn't lend the government anymore. They would actually sell their domestic bonds and invest their money somewhere else, where they think is safer and more attractive. In turn, this puts pressure on the exchange rate to depreciate, and in the extreme case leads to a successful currency crisis.

The bottom line is: as Debt to GDP ratio persistently increases, expected depreciation increases as well, and in fact a 90% threshold of Debt to GDP ratio exists, after which most currency and economic crises have been observed to occur in the literature. In this sense, excessive accumulation of government public debt is very dangerous.

2. Balance of payment swings

Another essential channel relevant to our analysis is the balance of payment (BOP), which is a record of all the flow of payments between residents of one country and the rest of the world. The BOP is composed of three distinct accounts: the current account, the capital account, and the official international reserves. The net results in the

current and capital accounts must be financed by changes in reserves of foreign exchange, so that $BOP=0$.

Under a fixed exchange rate regime, in order to prevent exchange rate changes, the central bank uses its foreign reserves to ensure that the BOP is actually “balanced” i.e. in equilibrium: $CA + KA = \Delta RFX$.

Accordingly, when the BOP is in surplus ($BOP>0$) i.e. there is an excess demand for domestic currency, the central bank buys foreign reserves against domestic currency, thereby creating an increase/accumulation in the reserve of foreign exchange ($\Delta RFX > 0$).

On the other hand, a BOP deficit ($BOP<0$) should lead the central bank to reduce its reserve of foreign exchange to prevent an exchange rate depreciation.

But, what if there is an insufficient stock of foreign reserves and the BOP deficit is persistent? The answer is simple: the central bank wouldn't be able to defend the fixed exchange rate for too long, as reserves get exhausted, and the country may be forced to devalue its currency. Therefore, assuming that investors are rational, as they perceive recurrent BOP deficits, they would expect the central bank to desperately deplete its reserves sooner or later, so as to maintain the peg. In other words, they expect the currency to depreciate, which successfully leads to a speculative attack and a currency crisis.

CHAPTER III

THE LEBANESE ECONOMY

After we have presented different possibilities of exchange rate arrangements and weighted the advantages and disadvantages of a fixed rate regime versus those of a flexible regime, we turned our attention to the pegged rate regime: how it works, how particularly dangerous it can be, especially in emerging countries, and how it can fail to work, by driving a successful speculative attack. We can now put things in place and bring the discussion to the Lebanese context. In accordance with our previous analysis, Lebanon is a developing country that runs a fixed peg regime, since 1999. This choice has been made under an overly volatile exchange rate and high inflationary pressures, and has induced credibility to monetary authorities, while stimulating price and exchange rate stability. However, such a regime leaves the country open to attacks on its currency, especially given the massively growing accumulation of public debt by the government and the persistent current account deficit. In this chapter, we study the Lebanese situation, by examining the dynamics of the war, its effects on the economy and the impacts of the so-called reconstruction plan and exchange rate-based policies on the country. We conclude with an overview of the evolution of macroeconomic indicators in Lebanon.

A. The Lebanese context

Prior to 1975, the Lebanese economy was one of the most dynamic in the Middle East. Lebanon enjoyed a liberal open economy with a stable macroeconomic environment. Lebanon's economic stability, marked with large balance of payment

surpluses, small budget deficits, a floating and stable Lira, and low inflation, which perfectly matched with political stability, fostered prosperity and growth, and attracted foreign direct investment, turning the country into a tremendously attractive business center.

However, the Civil War (1975-1990), along with the Israeli invasion in 1982, put an end to this flourishing era and resulted in substantial losses and fundamental changes in the pre-war Lebanese booming economy. Among the numerous and devastating consequences of the war, as enumerated by Dibeh (2005), was lost output, estimated at USD 24 Billion in 1986. GDP per capita in 1990 was less than one third of the GDP per capita in 1974. Domestic prices were severely inflated, causing the real exchange rate to dramatically shoot up. The economy witnessed large capital stock destruction; physical assets destroyed are estimated at around USD 25 Billion. The country's loss of human resources was inevitable and war-related deaths are estimated at 131 000, while emigration at 500 000. The country suffered from a massive infrastructure deterioration, as well as a weakening of the state institutions, especially those with revenue generating capabilities and resource mobilization.

Hostilities ended in 1990. The first two postwar years were mainly dedicated to political reconstruction; the reestablishment of the political, military, security and administrative capabilities of the country were vital after fifteen years of destructive war. In 1992, a new government, headed by Rafic Hariri, took power and a new era of reconstruction began. Hariri's government set an ambitious economic reconstruction plan, called "Horizon 2000", which consisted of an investment expenditures program, along with corresponding macroeconomic targets up to the year 2007. The plan

envisaged spending around USD 18 Billion on public and social infrastructure over the 1995-2007 period, and promised a prosperous new era.

Yet, postwar growth was less than spectacular and the economy experienced what Dibeh (2005) calls a “Growth Trap”, in the early postwar reconstruction period. Indeed, confidence was boosted up in the economy and economic growth was sustained, but the boom was highly unstable due to high government deficits. An inefficient management of the plan and a poor fiscal policy led to uncontrolled public borrowing. The Horizon plan lasted for only four years and the “reconstruction boom phase” of the Hariri’s successive governments ended up in 1998, with the presidential election of Emile Lahoud. The new government, headed by Selim Hoss, had an anti-Hariri vision of the direction of the reconstruction path, especially in terms of public finances. It put in place an austerity and stabilization plan, in order to stop the public deficit and debt from growing further. However, this plan did not get implemented, as confidence in the economy was again significantly lost, and the economic crisis deepened. Hariri was brought back to power in 2000, but the Horizon reconstruction plan was clearly over by then.

B. War impacts and exchange rate-based stability policies

Fifteen years of war left the country with chronic economic difficulties. The financing of continuous government deficits, which resulted from the war, mainly led to an intense exchange rate depreciation and severely high inflation rates. Throughout the war, government’s revenue base was destroyed due to the inability of the government to collect taxes, but also its inability to gain external support, given the high political instability. Therefore, in order to finance government spending, the Lebanese

government was continually borrowing, while relying heavily on the domestic currency, thus increasing money supply, raising inflation, depreciating the Lira and increasing further the deficit. As such, the economy was trapped into a dangerous non-ending vicious circle. Rising inflationary expectations accentuated the shift from the Lira to the Dollar, increasing the deficit even more, and the story goes on. The rate of inflation was at its highest historical level of around 300% in 1987. From a relatively strong and healthy rate of LBP 2.3 to the Dollar before the civil war, the Lira started depreciating dramatically in the early eighties, to reach more than LBP 1700 to the Dollar in 1992. Moreover, by the end of 1992, and before any significant reconstruction initiative was undertaken, public debt had already totaled 40% of GDP. The economy was under significant threat and repeated runs on the domestic currency were exhausting the official reserves. Dollar-denominated deposits were far more tempting, the currency was freely converted, and the Lira was just collapsing.

Increasing fiscal pressures, skyrocketing inflation rates, high exchange rate volatility and a severe trend of depreciation, induced the central bank to target the exchange rate, adopting exchange rate and price stability as its main goal. This was viewed as necessary for reinstating confidence in the country and attracting foreign capital for the reconstruction program. Hence, Hariri's established government aimed at stabilizing the Lira and stopping inflation. In light of the reconstruction phase, confidence in the Lebanese economy was indeed progressively rebuilt; people were mostly confident in the "strong and international figure" of Rafic Hariri. Accordingly, the demand for domestic currency started to increase all over again and the Lira was appreciating. BDL has eventually succeeded at maintaining a firm commitment to the Lira, which had been stabilizing since the early nineties and pegged to the dollar since

September 1999, at a rate of LBP 1507.5 per USD. Figure 1 below illustrates how steeply the currency had depreciated, especially towards the end of the war and in the early postwar years. However, as of 1992, and as BDL shifted its monetary policy targets, the Lira experienced a gradual appreciation, before it got fixed in 1999.

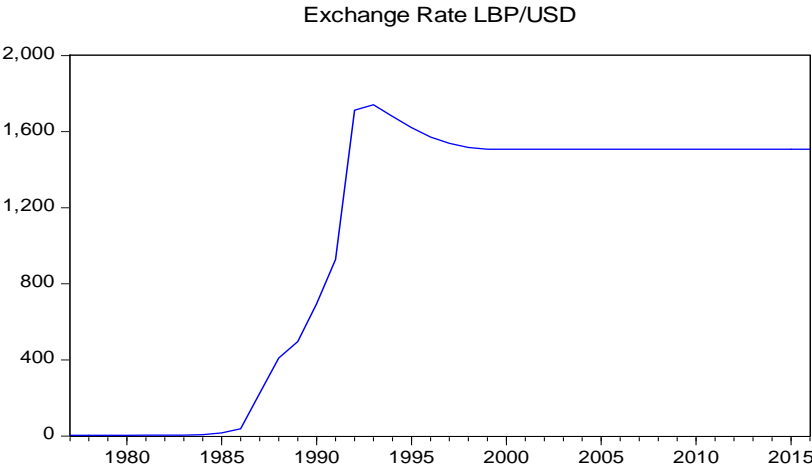


Figure 3.1. Exchange rate LBP/USD
Source: Euromonitor Databases.

The Lebanese economy was directly affected by the exchange rate anchor policy. First and foremost, this policy has successfully reached its target of reducing inflation. Figure 2 reflects the decrease in the postwar inflation rates, shortly after the implementation of the policy. Indeed, the rate of inflation was lowered to single digits in the mid-nineties and hit zero in 1999. In fact, credibility in the Horizon plan of the Hariri’s government is one of the major factors that helped lower and stabilize inflation, and ultimately helped fight against speculative attacks.

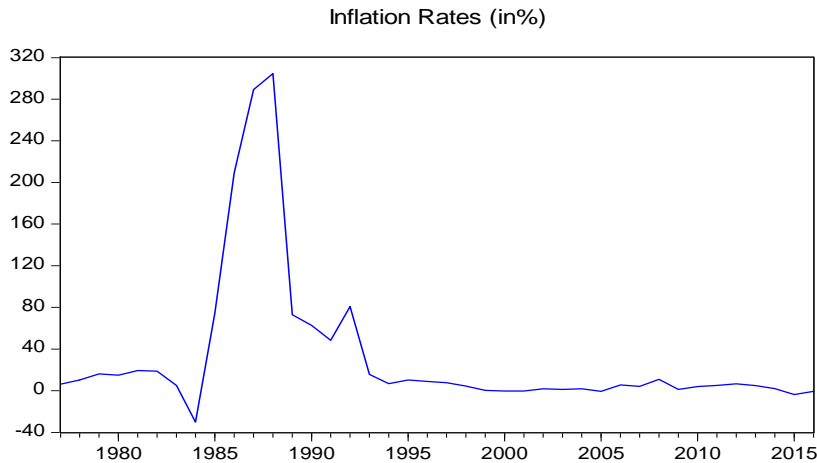


Figure 3.2. Inflation Rates (in %)
Source: Euromonitor Databases.

Moreover, the exchange rate stabilization program was supported by considerable rises in interest rates on LBP Treasury Bills (TBs) and LBP Bank deposits BDL, which helped BDL achieve its goal. High interest rates, which exceeded the 25% threshold, as shown in Figure 3, attracted large capital inflows that were much needed to finance the reconstruction program, and increased foreign exchange reserves, which amounted to USD 1.5 Billion in 1992 and reached USD 7.6 Billion by the end of 1999.

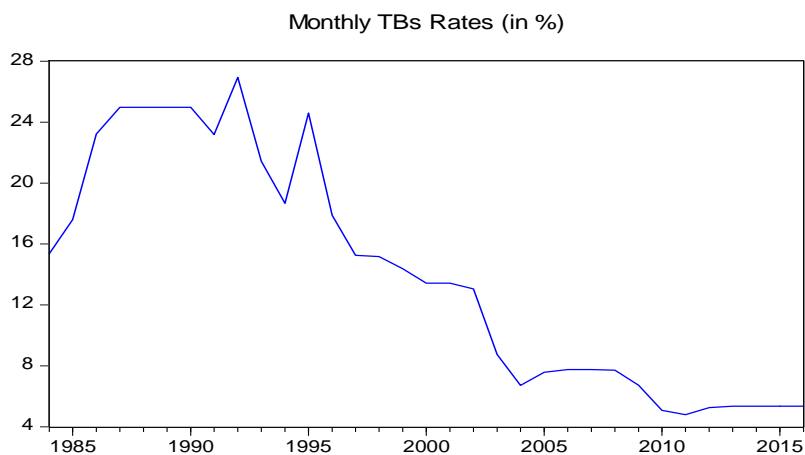


Figure 3.3. Monthly TBs Rates (in %)
Source: Euromonitor Databases.

C. Macroeconomic developments: evolution of the economy

To get a picture of where the Lebanese economy stands today, let us first observe total public debt, which has been growing exponentially over the postwar years to reach about USD 70 Billion in 2015 (Figure 4(a)), hence hitting an alarming 140% level of Debt to GDP ratio (Figure 1(b)) and making Lebanon among countries with the highest Debt to GDP ratios in the world. As discussed above, in order to rebuild its severely destroyed public and social infrastructure, the Lebanese government resorted to borrowing stiffly from the domestic and international financial markets, but at a very high cost, via the issuance of a sizable amount of high-yielding TBs, at double-digit rates. However, the greater share of public debt has been accumulated, by far, through domestic borrowing. Massive government expenditures, matched with serious corruption and a failure to conduct any fiscal adjustment, continue to date in widening the gap between government revenue and expenditure (Figure 4(c)). In fact, huge government expenditures and a heavy debt service on one side, and low government revenues on the other, have resulted in persevering budget deficits (Figure 4(d)), hence calling for more and more borrowings to finance the gaps. Therefore, the heavy debt service is mainly behind the continuous fiscal deficit and the increased debt amount. A permanent and continuing rise in the deficit would most likely make debt unsustainable and cause an even worse management of public debt.

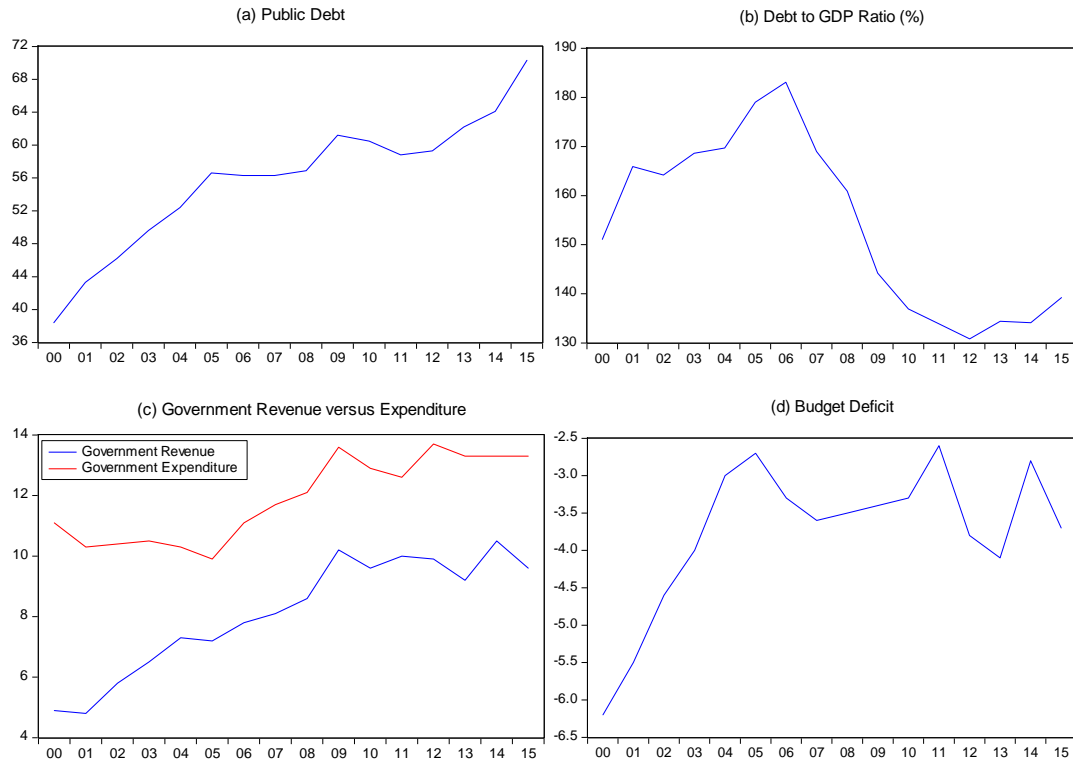


Figure 3.4. Macroeconomic indicators (USD Billion): (a) Public Debt; (b) Debt to GDP Ratio (%); (c) Government Revenue versus Expenditure; (d) Budget Deficit

Source: Euromonitor Databases.

On the external sector level, Lebanon has always been a heavy importer of goods and services, with imports reaching a relatively high amount USD 18.40 Billion in 2015. However, Lebanon’s exports have only been able to reach a maximum of USD 5 Billion over the period lasting from 2000 to 2015 (Figure 2(a)). This has led, subsequently, to large gaps between imports and exports, resulting in continual trade and current account deficits (Figure 2(b)).

However, as depicted by Figure 2(e), as of the year 2002, the Central Bank has been able to accumulate foreign reserves, thus creating significant surpluses on the capital account side (Figure 2(c)). These capital account surpluses, along with the Errors

and Omissions, have been able to offset the current account deficits, hence causing the overall BOP to register surpluses, as of the year 2008 (Figure 2(d)).

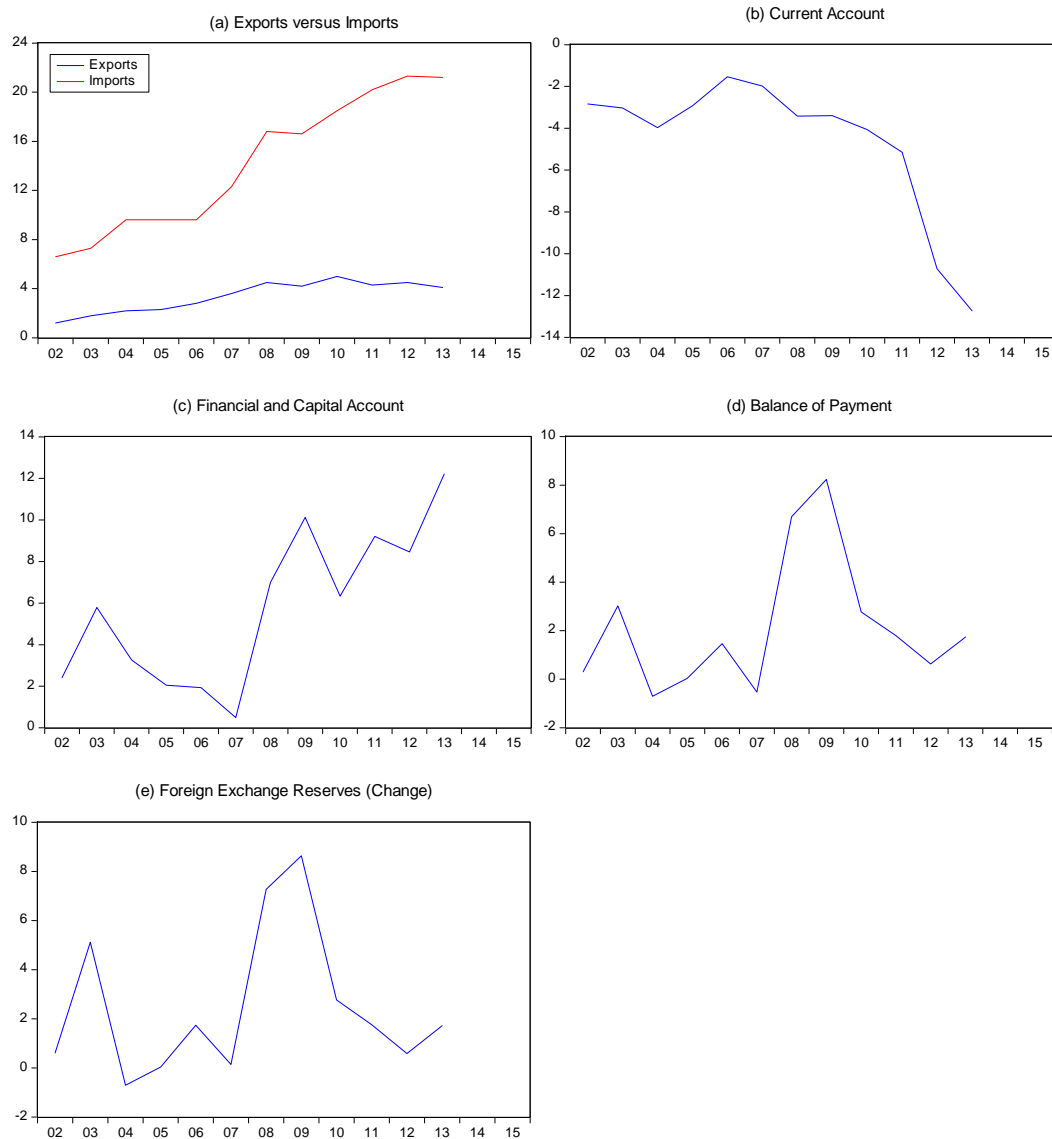


Figure 3.5. Balance of Payment Components (USD Billion): (a) Exports versus Imports; (b) Current Account; (c) Financial and Capital Account; (d) Balance of Payment; (e) Foreign Exchange Reserves

Source: Euromonitor Databases and IMF Consultation Reports.

CHAPTER IV

EMPIRICAL TESTING AND DISCUSSIONS

So far, we have focused on the evaluation of a fixed exchange rate regime and we have been able to translate our analysis into the Lebanese context, by describing the Lebanese economic situation and macroeconomic developments over the past two decades. Now, we wish to weigh the benefits of adopting a pegged exchange rate in Lebanon against the costs of defending it. Therefore, we first orient our attention to the money demand function to test whether it is stable or not for the case of Lebanon. The intuition is that, if money demand turns out to be volatile, then a fixed exchange rate policy has advantageous virtues in that it helps achieving a better degree of price stability. However, a pegged rate is also costly to maintain.

To begin with, let us have a comprehensive overview of monetary economics, with regard to central banks' strategic goals and tools, before we present our empirical hypothesis and discuss the results. In essence, monetary policies set by central banks can have various goals: economic growth, high employment, price stability or disinflation, etc. However, the tools that central banks use have an indirect impact on their desired goals. Precisely, once the central bank sets its goal, in view of the country's specific circumstances, it must choose the appropriate instrument to reach this goal.

For a clearer vision, we consider the typical example of the Keynesian IS-LM model, where the goal of the monetary policy is to minimize the variance of output, in order to achieve a certain level of growth in the economy. In the meantime, monetary

policy has two possible targets that are measurable and controllable with the instrument, and which have a predictable and direct effect on the goal.

- a. Interest rate target, i.e. to keep the real interest rate fixed by varying the money supply, which is the instrument.
- b. Money supply target, i.e. to keep the money supply fixed by varying the real interest rate, which is the instrument.

Nonetheless, since there is a great degree of uncertainty in the real world, unanticipated shocks such as unexpected changes in consumption expenditure, government spending, investment, money supply, net exports, and money demand, are likely to shift the IS and LM curves. Consequently, two possible scenarios may arise:

- a. Unstable real side: the IS degree of uncertainty is higher than the LM degree of uncertainty, such as:
 - IS equation: $Y_t = \alpha_1 + \alpha_2 C_t + \alpha_3 I_t + e_t$, where e is a random shock affecting the real side of the economy with mean $E(e) = 0$ and variance $V(e) = \sigma_e^2$
 - LM equation: $(M/P)_t = \beta_1 + \beta_2 Y_t + \beta_3 R_t$

In this case, it has been proven that fixing the money supply results in a lower variance of output, and therefore it is the best target.

- b. Unstable money side: the LM degree of uncertainty is higher than the IS degree of uncertainty, such as:
 - LM equation: $(M/P)_t = \beta_1 + \beta_2 Y_t + \beta_3 R_t + w_t$, where w is a random shock affecting the money side of the economy with mean $E(w) = 0$ and variance $V(w) = \sigma_w^2$
 - IS equation: $Y_t = \alpha_1 + \alpha_2 C_t + \alpha_3 I_t$

In this case, it is better to target the interest rate, since it results in zero variance of output.

Back to our country of interest, Lebanon, where the central bank's main goal, after fifteen years of destructive war, was to achieve price stability through gradual disinflation of the Lira, especially after a large exchange rate volatility and a severe trend of depreciation. Accordingly, BDL had decided to target the exchange rate and keep it fixed, at a rate of LBP 1507.5 per USD. Ever since, its objective has been to maintain low levels of inflation.

In our model, we are mainly concerned with the money side of the economy, as we wish to estimate the volatility of money demand in Lebanon. As shown in the above IS-LM framework, economic theory does predict a possible interrelationship between the instability of the money side of the economy and the monetary policy to be conducted by the central bank. Nevertheless, empirical evidence is essential in validating the theory.

The LM equation, representing the money side of the economy, is:

$(M/P)_t = \beta_1 + \beta_2 Y_t + \beta_3 R_t + w_t$, where:

$(M/P)_t$ is real money demand,

M is money supply,

P is GDP deflator,

Y_t is GDP,

R_t is interest rates on treasury bills,

w_t is a random variable affecting the money side of the economy with mean $E(w) = 0$

and variance $V(w) = \sigma_w^2$.

The functional form is assumed to be:

$$\ln (M/ P)_t = \beta_1 + \beta_2 \ln Y_t + \beta_3 R_t + w_t$$

The data spans over the period 1984 through 2016, and was retrieved from the Euromonitor International Databases and Banque du Liban statistics.

The table below depicts the outcome of the regression of real money demand on GDP and interest rates, through Ordinary Least Square (OLS) method, which we run on STATA.

Table 4.1. Empirical Results

	GDP	Interest	Constant
M/P	0.3146596*	0.002286*	.7877205
R2	0.35		
Obs	33.00		

*Denotes rejection of the hypothesis at 10% level

Most importantly, we are interested in the coefficient of determination R-squared, which indicates the proportion of the variance in the dependent variable that is predictable from the independent variables. In this regression, R-squared is equal to 35%, thus indicating that a significant percentage of the response variable's variation is not explained by the model, rather by the noise. This translates into a high degree of volatility on the money demand side of the Lebanese economy. Under these circumstances, where money demand is found to be highly susceptible to shocks, and as BDL's ultimate goal is price stability, fixing the exchange rate definitely helps in offsetting the effects of volatility on the money demand side. As such, price stability can be more efficiently reached.

Now, that we have identified why fixing the exchange rate contributes to the financial stability of Lebanon, let us gauge the sustainability of this already established exchange rate policy- fixed parity. In this context, our aim is to estimate how alerting symptoms of a possible currency crisis hitting the country are, i.e. how costly maintaining the parity can be. Therefore, we track down factors, such as persistent fiscal deficits, that is unsustainable debt, and large capital flow swings and/or persistent current account deficits, as these factors primarily affect economic agents' expectations of currency depreciation.

The accumulation of a fairly large amount of public debt, roughly USD 70 Billion constituting 140% of GDP, is sufficient to drive expectations about the unsustainability of the debt. As is explained by Neaime (2004), an unsustainable debt refers to the insolvency of a given country, which means that the country will not be able to serve its debt out of its own resources. In other words, we say that fiscal policy is unsustainable if the country is not capable of generating sufficient net revenues in the future to repay public debt and its service, and consequently plans on financing its future interest expenses through issuing additional debt. As such, economic agents would stop lending the government, which subsequently leads the government to go bankrupt and default on its debt. In the meantime, they would invest their money abroad, hence a capital outflow emerges, putting pressure on the exchange rate to depreciate. Therefore, we deduce that the current huge Lebanese Debt to GDP ratio, coupled with the permanent increase in the primary fiscal deficit might serve as a coordination method for agents to attack the currency and as previously discussed, a speculative attack under self-fulfilling expectations can lead to currency crisis in the country.

Additionally, given a persistently growing current account deficit, which has reached almost USD 13 Billion, as well as present capital flow swings, mainly significant oil prices fluctuations, which affect remittances flowing into Lebanon, the country might be heading towards a BOP crisis. This is because, the central bank is constantly committed to a “balanced” BOP in order to defend the peg, which, in turn, might drive the depletion of foreign reserves. Accordingly, we conclude that macroeconomic factors do not seem to tip the balance in favor of a fixed exchange rate regime.

Otherwise, what can possibly be a better alternative? What if the country decides to move to a more flexible exchange rate system? Although the central bank can adopt a floating exchange rate regime as a buffer against rapid flows and BOP swifts, the floating exchange rate mechanism can induce high volatility and spark inflation via sporadic expected inflation rates, especially if imports constitute a large bulk of the GDP, hence dragging the economy into a vicious cycle of chronic inflation, similar to the Argentinean case. In Lebanon, imports do constitute a relatively large volume of total consumption; imports were estimated at roughly USD 18 Billion in 2015. This fact, coupled with the effect of a large public debt and persistent current account deficit, can drive the currency to drastically depreciate i.e. overshoot. This is also the case of Egypt, where the central bank has recently allowed the currency to freely float, expecting the exchange rate to increase from around EGP 9 per USD to EGP 14-15 per USD, while it actually hit the ceiling of EGP 20 per USD. The bottom line: Lebanon is unfortunately stuck in the current exchange rate arrangement, mainly due to its extremely high debt to GDP level and permanent current account deficits.

CHAPTER V

CONCLUSION

Subsequent to fifteen years of devastating war, financial and exchange rate stability were viewed as necessary for controlling skyrocketing inflation rates and saving the Lebanese Lira, which was totally collapsing. In this context, the central bank chose the exchange rate as a nominal anchor and, ever since 1999, Lebanon has successfully maintained a fixed exchange rate regime and BDL has been able to achieve its goal of price stability and low inflation. However, maintaining this parity has also been costly, and adhering to the established peg may paradoxically lead to a currency crisis.

The Lebanese economy is one exposed to shocks largely destabilizing the demand for money, as identified by our empirical results, thus a fixed rate arrangement is indeed helpful in stabilizing prices. Nonetheless, it is of utmost importance to understand that the choice of exchange rate regime varies over time, with changing country, regional and international circumstances. For the case of Lebanon, which has a harmful history of high inflation, a fixed exchange rate might have been the best option for the country to guide expectations and reduce inflation rapidly. However, as inflation was brought under control, and as confidence was progressively rebuilt in the country, a more flexible exchange rate arrangement would have been necessary to minimize the vulnerability to currency crises, but also to let monetary policy freely promote the domestic economy. Nevertheless, even if today a flexible exchange rate were to be more effective in avoiding BOP swings, capital flow volatility and reserves depletion, it is too late to opt for this option, given that the huge accumulation of debt, coupled with

persistent current account deficits, would severely increase currency's expected depreciation, which would drastically harm the exchange rate, similarly to the Egyptian devaluation recent scenario. Moreover, high levels of dollarization in the Lebanese economy, makes it difficult to switch to a flexible rate regime; the choice of monetary policy is very critical because the central bank does not have full control over money supply.

It should be noted, as Yagci (2001) concluded, that monetary and macroeconomic policies have to be consistent with exchange rate goals, whatever they turn to be. Fiscal discipline is also vital, and failure to put in place fiscal adjustments at the right time might lead to a debt and currency crisis, under any exchange rate regime.

Furthermore, it should be clear that for any exchange rate regime to sustain a stable and competitive real exchange rate, it has to be supported by a policy environment that includes wise and consistent macroeconomic policies, a strong and transparent financial sector, as well as reliable institutions.

Therefore, to prevent a fiscal and exchange rate crisis, the government should urgently take action and subsequently restructure the components of the economy. Political economy considerations should be taken care of and the alarming corruption should come to an end. Otherwise, all fiscal and monetary indicators reveal that the country might be heading towards an inevitable fiscal and exchange rate crisis.

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