

**DE FACTO EXCHANGE RATE POLICIES IN THE MENA
REGION: TOWARD DEEPER COOPERATION**

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Abstract

The adoption of exchange rate policy coordination and cooperation within a regional framework becomes a necessity to avoid the self-fulfilling exchange rate crises, especially in the context of the MENA region, which is cursed with significant regional political instability.

In this paper we have focused our attention on the Agadir countries, namely Egypt, Jordan, Morocco and Tunisia. According to the results of our econometric test, the real exchange rate behavior in our sample countries has been influenced in different ways by the theoretical determinants (the government spending policy, the monetary policy, the trade openness, the capital liberalization, and the terms of trade).

We recommend that the Agadir countries should envisage the coordination of their equilibrium exchange rates through the creation of a common equilibrium central parity reflecting a weighted average of all their economic partners, bordered by a +/- 10 percent fluctuation band, taking into consideration the potential increasing role of the Euro in the Agadir countries' trade induced by the Euromed agreement.

Deeper cooperation would also require the creation of common liquidity fund, similar to the one in place in South East Asia (the Chiang Mai Agreement) in order to enhance the accumulation of substantial international currency reserves, which can allow the participating countries' central banks to provide immediate liquidity support for any member that experiences short run balance of payments deficits. This cooperation should take place not only among the four Agadir countries but rather within the framework of the PAFTA, and with the support of the EU.

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1. Introduction

To float or not to float: this is no longer the question for developing countries. The recent exchange rate crises in Latin America, East Asia, Eastern Europe and Turkey have proven that the fixed exchange rate is unsustainable in the growing financial globalization context. The other corner solution advocated by the IMF, the free float, makes economies subject to high fluctuations. Also, there are no central banks in the world that completely abstain from intervention in the currency markets. Therefore, the main question for most emerging market economies is what kind of managed float to have.

The recent researches on exchange rate policies illustrate that the developing countries may actually be following an exchange rate regime different from the arrangement that they declare (see for example Bubula and Otker-Robe, 2002, or Yayati and Sturzenegger, 1999). Our previous research (Kamar and Bakardzhieva, 2003) identified the *de facto* exchange rate regime of Egypt during the period 1974-1999 as an intermediary “managed bands” arrangement, despite the *de jure* “adjustable peg”, “crawling peg”, or even “free float” announcements.

Therefore, we examined the adequate environment that could allow for an intermediary exchange rate policy to be carried out successfully. We ended up with some policy recommendations that could be summarized as follows: The exchange rate of the local currency shall be managed towards a basket of foreign currencies, selected according to the balance of payment of major partners. The government should impose some limits, in the form of bands, in order to avoid exaggerated fluctuations. The central parity of the bands shall be determined by the real equilibrium basket exchange rate. The width of the bands should not be pre-announced in order to minimize the risks of speculation. Finally, the central bank should intervene in the exchange market constantly to orient the nominal exchange rate toward its *desired* value that serves best the country’s economic policies, allowing the bands to crawl.

Still, despite all these efforts, a currency crisis can start simply because of the self-fulfilling expectations of the international investors. Since the MENA region is cursed with significant regional political instability, we could expect international investors to be reluctant to invest in the region, and the exchange rates to be under capital volatility pressure, bearing the risk of speculative attacks. Therefore, a regional cooperation framework is required to enhance the accumulation of substantial international currency reserves, namely through the creation of a regional liquidity fund that can allow the participating countries’ central banks to provide immediate liquidity support for any member that experiences short run balance of payments deficits. This policy is actually applied in South-East Asia, and we will examine in this paper how this experience could be transposed to the MENA region.

In the first section, we are going to analyze the exchange rate policies in the MENA, based on the historical evolution, the *de jure* announcements, and the reported *de facto* exchange rate policy. We will focus our attention on the North African Countries, namely the members of the new Agadir agreement¹ - Morocco, Tunisia, Egypt and Jordan - since the Gulf countries have adopted a common fixed exchange rate policy in order to create a common currency by 2010.

In the second section, we expose our own approach to identify the *de facto* exchange rate policy and inform us about the determinants of real exchange rate behavior, during the period from 1960 to 1999, upon data availability. The methodology is largely inspired by the works

¹ The Agadir agreement was signed on February 25, 2004 between Morocco, Tunisia, Egypt and Jordan, aiming at the creation of a free-trade area between those four countries by 2005.

of Edwards (1989, 1991) and Elbadawi (1994, 1997), using the single equation two-steps cointegration procedure of Engle and Granger (1987).

In the third section, we expose a scheme for exchange rate policy cooperation among these countries, relying on the successful worldwide experiences, including their policy implications.

2. Exchange Rate Policy Evolution and Classification in The MENA Region

Since the beginning of the Bretton Woods system, the Arab countries witnessed a certain will in creating an exchange rate policy cooperation, when Twenty-two Arab countries planned to launch a united currency called “Arab Dinar” in 1945. Sixty years later, only the Gulf Cooperation Council (GCC) countries – Saudi Arabia, Kuwait Oman, Qatar, the UAE and Bahrain – are still pursuing their efforts to create a common currency by 2010.

As we can see from Figure 1, the GCC countries have always guaranteed an important stability of their exchange rates. The large oil-export revenues have allowed those countries to accumulate huge foreign exchange reserves of around US\$50bn in order to counter any currency fluctuation².

On December 31, 2002, Kuwait pegged its currency exclusively to the US dollar, rather than to the currency basket it was previously attached to for more than 25 years. The other five members of the GCC already tie their currencies to the US dollar. We could conclude that the *de facto* exchange rate policy (see Appendix n°1) in these countries, is the same as the *de jure* one (see Appendix n°2), namely a fixed exchange rate policy toward a single currency, the US dollar.

If the GCC economies are largely dependent on the world oil price fluctuations, the Arab Mediterranean Countries depend on their side very much on the workers’ remittances and the tourism revenues as a source of foreign capital inflows, which in turn makes them suffer from another type of instability due to the surge of international terrorist activities. Only Algeria has an economy close to the Gulf countries, with oil representing 95 percent of exports, 60 percent of government revenue, and 30 percent of GDP in 1997 (Sorsa, 1999). As we already noted, for the purpose of our research, we are going to focus on the countries member of the newly created Agadir Agreement, namely Morocco, Tunisia, Egypt and Jordan, in order to flesh-out the importance for these countries to go beyond the simple free trade in goods and to coordinate a common exchange rate policy.

2.1. Exchange rates’ historical background in the Agadir countries

Since the Second World War, the MENA region has witnessed high instability. War started in 1948 in Palestine, in 1956 in Egypt, in 1967 in Egypt, Palestine and Syria, in 1973 in Egypt and Israel, in 1981 in Lebanon, in 1984-1989 in Iran and Iraq, in 1990 in Kuwait, during the 90s until 2003 in Iraq, and always in Palestine till today.

Certainly, such a region could have been completely neglected by international investors, but it has been saved by its oil reserves. Yet, saying “saved” is probably exaggerated, since oil is a main source of instability and conflicts, as seen recently in Iraq.

The impact of the US occupation on Iraq is still not clear, but the situation will surely increase the MENA instability, and cast a shadow on the region. International investors might

² For example, the constitution of Kuwait stipulates that 10 percent of oil revenues are diverted into a fund established to counter balance swings in the volatile business cycle. That fund now stands at around US\$100bn. The Saudi Arabia Monetary Agency (SAMA) manages at least part of Saudi Arabia’s net foreign assets, estimated at over US\$180 billion.

be reticent to involve in the region until the situation clarifies. The international competition for attracting capitals and investments is rude, and other regions in the world could seem much more attractive to investors, mainly Central and Eastern Europe, and South East Asia.

Moreover, international terrorism is highly active in the region. Terrorist attacks have been recently perpetrated in Tunisia, Morocco, Saudi Arabia, Yemen, Kuwait, and during the 90s in Egypt (Kamar, 2003).

Egypt

With its strategic geopolitical role in the MENA region, Egypt has faced most of these conflicts and shocks. The recent Egyptian crisis is highly illustrative of the impact of global and regional conflicts on the regional economy.

Since the 60s, Egypt had a “fixed adjustable peg” to the US dollar, combined with foreign-exchange controls and multiple exchange rates, operating adjustments in 1979, 1989 and 1990. With the beginning of the economic reform program in 1991, the Egyptian government unified the exchange rate system and announced the adoption of a “managed floating” regime. In fact, the exchange rate was simply devalued in 1991-1992, and then maintained fixed until June 2000. Therefore, the IMF revised its classification in 1998 and ranked Egypt as having resumed its “conventional fixed peg” arrangement. (Figure 2)

Starting from 1997, the Egyptian exchange rate became subject to numerous external shocks (see Appendix n°3). The East Asian crisis in mid-1997 provoked capital outflows, a slowdown in the capital market investments and significant losses for the investors. The devaluation of the Asian currencies made their exports much more competitive, which led to a rise in the Egyptian imports from these countries, increasing the trade deficit by US \$1.6 billion in 1998. In the same time, capital flows were drained out of Egypt by the attractive world stock markets performances. The Luxor terrorist attack in 1997 led to a decrease of the tourism revenues for several years ahead, a slowdown in the tourism sector, and a consequent general economic growth slowdown. In 1998 world oil prices fell from US \$15.6 per barrel to US \$9.7 per barrel, which reinforced the deterioration of the current account balance, turning it from a surplus to a deficit of US \$2.4 billion. The revival of tensions in the Middle East peace process in the end of the 90s and the Second Palestinian Intifadah launched in October 2000 impacted negatively the economy of the entire region and the Egyptian economy in particular. Capital flight increased and the stock exchange performance reached its lowest level since 1993.

In January 2001, the government decided to restore market stability and confidence by announcing a new central exchange rate of EGP 3.85 per USD and introducing a “crawling peg” system. A three-stage devaluation was operated during that year and the Egyptian Pound lost 32 percent of its value, shifting to EGP 4.51 per USD. It was expected that the devaluation, together with some currency injections, would stabilize the market until the drop of the exchange revenues recovered. Unfortunately, the negative effects of the 1997-1998 exogenous shocks were only aggravated after the events of September 11, 2001, with further decline in tourism and Suez Canal receipts. The aftermath of the New York terrorist attack with the subsequent wars on Afghanistan and more recently on Iraq, darkened the image of Egypt as an attractive localization for international investments.

On January 28, 2003, the Egyptian Prime Minister announced a free float of the Egyptian pound. By mid-October the exchange rate had declined by 33 percent reaching EGP 6.15 per USD. The government reacted to this depreciation by imposing a three-month suspension of state imports, excluding basic foods items, and by fixing the price of 15 basic food items, with producers to be reimbursed by the state for any losses incurred.

According to the experts, the overall damage for the Egyptian economy of the US occupation on Iraq is likely to reach between 5 and 8 billion dollars, constituting a further pressure on its balances.

As seen, the global and regional conflicts have affected the economic policy of the Egyptian government, tacking it back to a situation close to the one existing before the reforms, or more than ten years of vain efforts.

Jordan

Jordan's dinar exhibited relative stability during 1975-85; it was supported by large capital inflows, mostly in foreign aid from Gulf Arab countries and remittances from large number of Jordanians working abroad (mainly in the Gulf countries again). This exchange rate policy has resulted in a RER appreciation of about 31 percent during 1970-79. Although the economic stabilization efforts in early 1980s partially reversed this trend, the RER of the dinar remained relatively more appreciated at the end of 1985 when compared to the 1970 level (Domac and Shabsigh, 1999). (Figure 3)

The period 1986-92 was characterized by increased instability in the foreign exchange markets and by shifts in exchange rate regime as the government attempted to stabilize the exchange rate. The ensuing recession during the second half of the 1980s and the balance of payment pressures, forced the partial floatation of the dinar. On October 15, 1989, the dinar was put on a managed float and devalued by about 12 percent. Recognizing the ineffectiveness of these measures to halt the fall of the dinar, the authorities devalued the dinar by about 13 percent in early 1989. The dual exchange system was terminated on February 17, 1990, and the exchange rates were unified at USD1.49 per one dinar. Significant restriction, however, remained on banks' dealings in foreign exchange. The dinar was formally pegged to the USD on October 23, 1995.

The exchange rate anchor has helped the country reduce inflation and accommodate nominal shocks to money demand but made it vulnerable to terms of trade shocks. This small open economy has remained competitive despite the significant appreciation of the dollar and the deterioration in its terms of trade in the past few years (Jbili and Kramarenko, 2003). This was due in part to the flexibility of its labor market, structural reforms, a free trade agreement with the US and an association agreement with the European Union, and the cushioning provided by in-kind oil grants from Iraq. Although private capital inflows are not large, commercial banks built up foreign assets during periods of instability to match residents' increased preference for holding foreign currency. Pressures on the dinar are addressed through a combination of central bank intervention in the foreign exchange market and interest rate adjustments. The accumulation of gross official reserves equivalent to 9 months of imports by the end of September 1992 has reduced Jordan's vulnerability to shocks, while a fiscal adjustment that decreased public debt ratios has improved credibility and created room for countercyclical fiscal policy.

Morocco

The Moroccan dirham experienced significant instability in early 1970 - reflecting the instability in the French franc to which the dirham was fixed. The link to the franc was cut on May 17, 1973 and the dirham was put on a managed float regime, with the objective of maintaining a relatively stable effective rate for the dirham in relation to a basket of major foreign currencies that takes into account the changes in Morocco's foreign trade pattern and the structure of currencies in external settlements. (Figure 4)

The exchange rate policy during 1980-85 aimed at achieving substantial, albeit gradual, real depreciation of the dirham. Together with the appreciation of the US dollar, this policy resulted in RER depreciation of about 84 percent (Domac and Shabsigh, 1999). The

worsening of Morocco's terms of trade and the associated deterioration of the balance of payments position that started in 1986 led to a significant real appreciation of the dirham. The relative tightening of policies succeeded in stabilizing the RER from 1987 to 1990 with the devaluation of the dirham by about 9.3 percent in 1990. In January 1993, full currency account convertibility was established, followed by the establishment of the interbank market in June 1996.

With capital account restrictions (mainly on outflows by residents) in place, Morocco's central bank has preserved some monetary policy autonomy. Owing to generally prudent monetary policy, consumer price index inflation rates have converged with those of developed countries. However, the dirham appreciated by about 21 percent in real effective terms during January 1991-March 2001, mainly because of the US dollar's large weight in the basket (Jbili and Kramarenko, 2003). This, together with Morocco's growing integration with the European Union, prompted the central bank to adjust the composition of the basket in April 2001 in favor of the euro, which resulted in a relatively small depreciation of the nominal effective rate. Despite the progress in macroeconomic stability, growth in Morocco has been relatively weak, reflecting the economy's dependence on agriculture and the slow pace of structural reforms. In the absence of productivity gains, the real appreciation of the dirham may have also slowed export growth.

Yet, in 2002 Morocco's tourism receipts plunged by almost 19 percent combined with a higher decrease in tourist spending. The downturn was attributed to the global slump in tourism industry in the aftermath of the 11 September 2001 attacks, and the ongoing regional uncertainties related to continuing hostilities in Israel and the Occupied territories. In May 2003, international terrorist organizations, probably related to Al Qaeda, perpetrated suicide attacks in Morocco's business hub Casablanca, which shattered the Kingdom's image as a safe tourist destination.

The terrorist attack had an immediate impact on the dirham value, which depreciated from 9.18 dirham per dollar on the May 2003 to 9.48 in the end of June (Reuters, Spot Exchange Rate). In the same time, the foreign trade regulatory Office des Changes reported in May 2003 a sharp increase in the trade deficit by 68 percent as a result of increased refined oil-product imports and a slowdown in exports. In this context, the disequilibrium in foreign capital flows could lead to possible turmoil on Morocco's the real exchange rate.

Tunisia

The Tunisian dinar experienced significant instability in early 1970, reflecting the instability of the French frank to which it was informally linked. In April of 1978, the dinar was linked to a new basket comprising the French franc, the German mark and the US dollar. The basket was expanded in 1981 to include the Italian lira and the Belgian franc, and later to include the Dutch florin and the Spanish peseta. These policies succeeded in reversing the RER appreciation, and the dinar depreciated in real terms by 73 percent from 1975 to 1984 (Domac and Shabsigh, 1999).

The ensuing recession and balance of payments problems of the mid-1980s exerted significant pressures on the dinar. In response, attempts were made in 1985 to stabilize the exchange rate by changing the weights of the currency basket. These corrections, however, were ineffective thereby forcing the authorities, on August 1986, to begin depreciating the dinar until early 1989. The nominal depreciation of the dinar during 1985-1988 was not sufficient, however, to maintain the RER level, resulting in a real appreciation by about 18 percent in the face of continued economic instability. The depreciation of the dinar, coupled with an ambitious economic reform program in the late 1980s and early 1990s, stabilized the foreign exchange markets, allowing the liberalization of the exchange rate for current account purposes in December 1992. However, foreign exchange transactions were kept exclusively

at the central bank until the establishment of the interbank spot exchange market in March 1994. (Figure 5)

Additional liberalization of the foreign exchange market during June - July 1997, increased the flexibility of the spot market (raising the foreign exchange exposure limit from 5 percent to 10 percent) and allowed banks to transact in the foreign exchange market, including the quoting of forward exchange rate up to 12 months for import purposes and 9 months for export purposes.

The de-facto targeting of the real exchange rate for the dinar has allowed Tunisia to enjoy low inflation since the mid-1990s, owing mainly to prudent fiscal and monetary policies, and real GDP growth averaged 5 percent during 1996-2001. Tunisia's exchange rate policy has been facilitated by the absence of major terms of trade shocks and by capital controls for nonresidents. Tourism has become increasingly important, and dependence on agriculture has declined (Jbili and Kramarenko, 2003).

Before the April 2002 terrorist attack in Djerba the sector had looked set to continue its impressive growth. However, in the wake of the attack, coupled with the slowdown in global industry and the increased perceptions of risk in the Middle East as a whole, the sector witnessed a 19.4 percent slide in European visitor numbers, down to 2.9 million in 2002 from 3.6 million in 2001. The slide in tourism receipts combined with a year of sluggish exports and severe drought decreased the growth rate to 1.9 percent in 2002 from the 4.9 percent projected in the year's budget, its lowest level in 15 years.

While the government anticipated a recovery in the tourism sector in 2003, continued global economic instability and a downturn in international travel following the US-led attack on Iraq continue to hurt Tunisian tourism receipts, which continued to fall in the first four months of 2003. Nevertheless, the government announced in February 2003 that Tunisia's stock of foreign-exchange reserves rose by 48 percent year-on-year to 3.492 billion Tunisian dinars, boosted by the rise in FDI in 2002, following the one-off sale of a mobile phone license to the Egyptian Orascom Telecom. This will contribute to releasing the pressure on the real exchange rate and on the debt repayments that remain at manageable levels. The gradual weakening of the Dinar has helped Tunisia ride out of the global downturn more effectively than other MENA economies. Yet, Tunisia's Central Bank should maintain its convertibility policy of the Dinar for the current transactions and not liberalize the capital account, at least until the Iraq war effect on the region clarifies. Capital account liberalization could lead to higher volatility, and an increased vulnerability to regional and international shocks.

Monetary policy should become more active in 2004, with the introduction of a broad money growth target, expected in the 8-8.5 percent range and compatible with an inflation objective of 2.5 percent. Base money growth will be the operating target. Bank liquidity management will, accordingly, need to be modified to calibrate the central bank's interventions in relation to monthly base money targets (IMF, 2003).

3. Determinant Variables of the *de facto* Exchange Rate Policy

In the recent years, several researchers have attempted to determine the *de facto* exchange rate policy. The works of authors like McKinnon (2000) and Calvo and Reinhart (2000) suggest that most emerging economies fear the perfectly free float and even if they announce

it officially to satisfy the IMF recommendations³, their real exchange rate policy is much closer to a heavily managed float.

We have summarized the results obtained by Bubula and Otker-Robe (2002) on the MENA countries in Appendix n°2. As we can notice, MENA countries witness wide disparities when choosing their exchange rate policies. Nevertheless, the methodologies applied to determine the *de facto* policy don't illustrate the determinants of the real exchange rate behavior or the interdependence between the exchange rate policy and the monetary and trade policies.

In our research, we use our own approach to identify both the *de facto* exchange rate policy and the link between the other governmental policies that influence the real exchange rate behavior, based on Edwards (1989, 1992) and Elbadawi (1994, 1997) using the single equation two-steps cointegration procedure of Engle and Granger (1987).

3.1. Theoretical approach: Mundell's trilemma

For the purposes of our study, we first need to identify the major macroeconomic variables that have significantly affected the long-run exchange rate equilibrium in each country. Using Robert Mundell's economic trilemma triangle, presented in detail in our previous research, we will interpret the *de facto* exchange rate regimes applied to our sample countries.

In our analysis we consider that the three corner points of the triangle (A, B and C) are extreme cases, and that in reality a country's policy mix is always somewhere *inside* the triangle, at least concerning emerging markets' economies in the actual globalized system⁴.

Economic theory and practice have proven that exchange rate stability is incompatible with an activist monetary policy directed toward output stabilization. As the quantity theory of money puts it, the price level is directly related to the stock of money or monetary base (Fisher, 1911). Knowing that the real exchange rate is a relationship between national and international prices, this implies that any variation in the monetary base that induces a price level change different from the international price level change will provoke a variation in the real exchange rate. Therefore, we consider the AB side of the Trilemma triangle as practically unsustainable in the long run.

The BC side of the triangle implies a complete sacrifice of the monetary policy that can no longer be used for any domestic economic purposes such as output or employment dynamization. Policy makers are in general rather reluctant to the idea of abandoning one of the major tools for economic adjustment to external and internal shocks, not to mention the threat for the domestic financial system in the absence of a lender of last resort.

The remaining AC side of the triangle implies a clean float of the exchange rate, which means high fluctuations of the nominal exchange rate – the equivalent to high volatility of relative prices. This volatility is costly either directly, or because it provokes output fluctuations and damages the financial system's health (Velasco, 2000). In order to mitigate this volatility the policymakers practice floating with varying degrees of management. Even the US, usually regarded as the cleanest of floaters, intervenes occasionally in the foreign exchange market.

Within this configuration, we introduce the intermediate exchange rate policy on the Trilemma Triangle, on the median axis (BF) between the fixed exchange rate policy and the floating regimes, inside the *spot* area on Appendix n°8, which groups our idea of a "managed

³ Since the mid-50s, the IMF considers the independent float as the optimum exchange rate regime, as noted by Mundell (1997).

⁴ For more in-depth explanation of the theoretical foundation of our methodology, please refer to Kamar and Bakardzhieva (2003).

band” with different degrees and types of management restrictions. The primary benefit of an intermediate regime is that it allows policy to be directed to limit misalignments, which is something that cannot be claimed by either of the corners. As defined in the economic literature, exchange rate overvaluations are damaging because they lower the competitive power of the tradable goods industry, whereas an undervalued currency can provoke stagflation (Williamson, 2000). Therefore, when examining particular country cases, we should better analyze in detail the exchange rate behavior and its determinants in order to establish the *de facto* exchange rate policy applied by the government and its position inside the Trilemma triangle.

We use the liquidity to GDP ratio (M3 to GDP) as a proxy of the monetary policy in defining point A. An increase in the liquidity ratio (LIQ) will lead to an increase in prices and an appreciation of RER (increase in the value of RER). We use the GCON variable to represent an important part of the demand for both tradable and non-tradable goods. If that consumption was biased in favor of the non-tradables, an increase in GCON will lead to increase in the prices of non-tradable goods and an appreciation of the RER (an increase in the value of RER). If the government consumption is dominated by tradables, the effect of an increase in GCON on the RER is likely to be in the direction of depreciation. We also consider that both variables LIQ and GCON represent point A in the Trilemma triangle.

Next, we need indicators to determine the capital flows, or point C in the Trilemma triangle. Capital mobility and capital controls are hard to measure, as pointed out by many authors (see for example Obstfeld, Shambaugh and Taylor, 2003, or Edwards, 1992).

First, we take the terms of trade (TOT), which represent the relative price of exports to the price of imports. It can be used as an additional indicator of capital flows fluctuations, since an increase in the international price of a country’s exports, oil prices for example, will lead to an increase in capital inflows. Theoretically, the terms of trade influence on the RER cannot be given an *a priori* sign, because it will depend on whether income or substitution effects dominate. If the income effect is stronger, this will lead to an appreciation of the RER, and if the substitution effect is more robust, this will mean RER depreciation (Elbadawi, 1997).

The growing degree of openness is consistent with decreasing capital controls, which in return creates higher possibilities for capital flows fluctuations and a movement towards point C in the Trilemma triangle. Therefore, to measure the degree of the country’s trade openness we use the variable OPEN (total trade as percentage of GDP). The increase of openness will lead to higher capital flows, both for import, export and investment concerns. Yet, the economic theory is rather ambiguous concerning the exact effect of a commercial liberalization, so there is not an *a priori* sign given to that variable (Edwards, 1992).

We also calculate and test alternatively a measure of capital flows, called CAPF, which represents the net trade to GDP ratio, and the net capital flows (NKF), calculated as the balance of goods and services minus the change in reserves as percentage of GDP. For the purpose of our study we will consider that central bank interventions through change in international reserves neutralize the impact of net capital flows fluctuations on the exchange rate behavior. Therefore, we use a proxy of reserve to GDP ratio (RESY) to capture the impact of the reserves on the exchange rate behavior. If our net capital inflow proxy is not significant, this will be due to central bank interventions and a situation closer in effect to point D (without meaning that the country has really imposed capital controls).

Notations and detailed description of the initial set of variables is available in Appendix n^o4.

3.2. *Econometric Analysis of Real Exchange Rate Behavior*

From a methodological point of view, we will follow the methodology of Ibrahim Elbadawi (1994, 1997). We start the analysis by the standard ADF unit root tests for each variable, which allow us to fulfill the appropriate condition for applying the cointegration technique of the Engle-Granger (1987) two-step cointegration methodology with a unique equation, including a long-term static OLS regression and an Error Correction Model for the short-term dynamics.

The theoretical formula defining our model is as follows:

$$RER = f(LIQ, GCON, TOT, OPEN, CAPF, RESY)$$

In the calculations of the indices (like RER and TOT) we have chosen 1974 as the base year since it represents the collapse of the Bretton Woods system and the beginning of the general exchange rates' fluctuation.

As expected, and in concordance with the methodology requirements, all our sample variables are I(1) in level and I(0) in the first difference (see Appendix n°5). The first step in the Engle-Granger cointegration method is applying Ordinary Least Squares (OLS) to a static regression relating the levels of the real exchange rate and the variable that determine its behavior.

$$\log RER_t = C + \beta_1 \log GCON_t + \beta_2 \log LIQ_t + \beta_3 \log TOT_t + \beta_4 \log OPEN_t + \beta_4 \log OPEN_t + \beta_5 \log CAPF_t + \beta_6 \log RESY_t + \beta_7 DUMY_t + RESIDUAL_t$$

We test subsequently two proxies of capital flows (CAPF and NKF). To finalize this first step of the cointegration test, we shall test the RESIDUAL from the regression of equation (3) for stationarity. If the residual term is stationary, then we could conclude that our variables are cointegrated. The unit root tests of the RESIDUAL term from the above equation, provided in the last row of Appendix n° 6, imply that the real exchange rate and the variables from our models are cointegrated.

The last step estimates a dynamic version of our model in order to verify the short-run effects of our variables on the RER. We confirm once again the validity of the cointegration relationship by the negative sign of the significant and less than one coefficient of the error-correction term. The results of the dynamic ECM are given in Appendix n°7.

Commentary on the results for Egypt

In the case of Egypt, the sample period is 1970-1999. All variables enter the system with statistically significant coefficients (borderline for GCON), except for the reserve ratio. The model specification requires the inclusion of a trend and a constant, as well as an impulse dummy to take into account the turmoil of 1991 with the First Gulf War and the start of the reform program. The model is statistically acceptable, as can be judged from the R², adjusted R² and Durbin-Watson statistics.

The ADF test applied to the residual series from this long-run regression proves the existence of a cointegration relation between our variables in the long run. The error-correction model illustrates that the lagged residual has a significant and negative sign, with a coefficient lower than 1, which indicates that the RER is auto-correcting toward its long-run equilibrium (which is the case for our four countries).

When interpreting the results, we shall admit that before the “open door” policy, implemented in 1974, Egypt was located near the point D, which was unsurprisingly the case of most countries before the collapse of the Bretton Woods system.

As we can see from the coefficient estimations, the monetary and spending policy of the Egyptian government has played a rather consistent role on the determination of the long-run

real exchange rate behavior over the analyzed period. Money supply increased steadily until the late 80s, leading to high rates of inflation and corresponding RER appreciation. During the reform period that started in 1991, the Egyptian government had an active monetary policy through Treasury Bonds issues, which led to foreign capital inflows and current account surplus. In the same time, the Central Bank of Egypt (CBE) intervened continuously by buying the excess of foreign currency in order to avoid nominal exchange rate appreciation, and a loss in the competitiveness of the exporting sector (Abu El Ayoun, 2003). This might be interpreted as a position that is still compatible within the A(D)B side of the triangle.

The capital flows had a significant negative impact on the RER, while in the same time, the opposite in direction and similar in significance effect was exerted by the terms of trade and the degree of trade openness of the Egyptian economy. Nevertheless, the significance of TOT and OPEN in the long run, illustrates that the CBE interventions did not completely compensate the fluctuations of capital flows (see annex Table A3 for results on net capital flows proxies). Therefore, referring back to the Mundell Triangle, we position the Egyptian economy *inside* the triangle and more precisely close to the center of the triangle (see Appendix n°8).

In the short run (ECM) the real exchange rate is only reacting to the shocks in the terms of trade and the degree of openness, while the other variables turn to be insignificant. The dummy variable is also very significant, reflecting the Egyptian economy reactivity to the regional shocks.

Commentary on the results for Jordan

In the case of Jordan, the sample period is 1976-1999. The only variables that enter the long-run system with statistically significant coefficients are LGCON (borderline) and LOPEN. The model specification requires only the inclusion of a constant. The model is statistically acceptable, as can be judged from the R^2 , adjusted R^2 and Durbin-Watson statistics (see Appendix n°6).

The Jordanian government consumption has the negative impact witnessed in all four countries within our sample, and the trade openness has the expected opposite sign. LTOT and CAPF turn out to be insignificant, which might be explained by the opposite sign and similar insignificance of the reserve ratio.

In the short run, the government consumption continues to exert a borderline significant negative impact on the real exchange rate. The terms of trade are statistically significant and have a negative impact on the short-run system, where as the openness is also highly significant, but positive. The capital flows have an extremely small coefficient, which renders it insignificant. The short-run system includes an impulse dummy variable, which represents the change of exchange rate policy and the devaluations of the Jordanian dinar in 1989.

In the framework of the Mundell Triangle, we position Jordan's economy *inside* the triangle, close to the center of the triangle and closer to point C than to point D on the CD axis (see Appendix n°8).

Commentary on the results for Morocco

In the case of Morocco, the sample period is 1960-1999. The variables that enter the system with statistically significant coefficients are GCON, TOT, OPEN and RESY. The model specification requires the inclusion of a trend and a constant, as well as an impulse dummy to take into account the sharp increase in the capital flows in 1974. The model is statistically acceptable, as can be judged from the R^2 , adjusted R^2 and Durbin-Watson statistics.

The government consumption has a negative effect, as in the case of Egypt. The terms of trade have also a negative impact on the long-run system, which is opposite to the case of Egypt, which might be explained by the fact that Egypt is an oil-exporting country, where as Morocco is an oil-importing country. The openness has a positive impact on the real exchange rate, while the reserves have a negative effect.

In the short run, the changes in government consumption have a negative impact, while the changes in the openness have a positive effect. The reserves are borderline negatively and to a small extent related to the real exchange rate in the short run. The other variables don't affect the system.

In order to place Morocco in the trilemma triangle, we consider all the results from the long-term and the short-term analysis, and situate it slightly to the right from the very center of the figure.

Commentary on the results for Tunisia

In the case of Tunisia, the sample period is 1975-1999. The variables that enter the system with statistically significant coefficients are TOT, OPEN, NKF, RESY and NER. The model specification requires the inclusion of a constant. The model is statistically acceptable, as can be judged from the R^2 , adjusted R^2 and Durbin-Watson statistics.

The first important difference in the Tunisian case as compared to the other three countries is the lack of statistical significance for the coefficients of LGCON and LLIQ, which implies that the Tunisian government has maintained a non-inflationary monetary and spending policy.

The other difference is that, as explained earlier, the Tunisian authorities adjusted the nominal exchange rate to maintain the real exchange rate close to its equilibrium. In effect, we have included the NER variable in the model and it turns out to be negatively and significantly related to the RER.

The openness has as well a negative impact on the behavior of the RER, with a coefficient almost equal to the sum of the terms of trade, the reserves and the net capital flows. Those remaining three variables have a positive impact on the long-run system, which helps maintaining the exchange rate close to its equilibrium.

In the short run, the changes in the monetary base, in the terms of trade and the net capital flows (with a very small coefficient for the later) have a significant positive impact on the RER. The changes in the country's openness and the nominal devaluations have a negative effect.

With those characteristics, the Tunisian exchange rate policy finds its place within the trilemma triangle, but outside the center, close to point C, allowing for certain exchange rate fluctuations.

The appendix figure n°8 summarizes the results for our four countries. We can see that they are all close to the area of the intermediary exchange rate policies. We cannot classify any of them neither as a hard fixed nor as a completely floating exchange rate policy.

Therefore, in the next section we are going to present policies that shall accompany the intermediary exchange rate regime in order to create a harmonized and coordinated framework for the exchange rate policy of all countries within the Agadir agreement.

4. Characteristics of Potential Cooperation among The Agadir Countries

Since the collapse of the golden standard, the international monetary system has undergone numerous turbulences and crises, which clearly indicate the need for its reform. Many authors

in the economic literature have analyzed its deficiencies and suggested different solutions for the improvements of its architecture. Alan Blinder (1999) set up an agenda of “eight steps to a new financial order”, aimed at a system with less frequent and much less severe crises. The most fundamental step, according to the author, is that fixed exchange rates, being hazardous to a country’s economic health, should be avoided, where as managed floats are just fine. Others, like US economist Fred Bergsten, hedge fund celebrity George Soros and Paul Volcker, former head of the US Federal Reserve Bank, suggest the desirability of international coordination through the implementation of flexible bands between the main currencies (Dieter 2000). This gives us one more argument in favor of the “monitoring bands” or “managed bands”, which allows for a higher degree of exchange rate policy coordination among regional partners than any of the corner solutions.

Therefore, we believe that the Agadir countries should start adopting the managed bands exchange rate policy, perhaps the most efficient policy for coordination and cooperation, since engaging in regional integration with no concern about financial and monetary cooperation might include potential threats to the members. This issue influenced Eichengreen (1998) to launch the idea of the creation of a single currency in the Mercosur trade block. In fact, the example of the interdependences between Argentina and Brazil is indeed particularly illustrative for our countries, which we illustrate through a *Game Theory* representation (Kamar and Bakardzhieva, 2003).

After the crash of the East-Asian currencies in 1997-1998, the Asian exports had become very competitive in the world markets. The trade of the Latin-American economies was hurt (theoretical position (-5, -5) or Nash equilibrium on the prisoners’ dilemma type of graph in the figure below). One way of remedying to that damage was the devaluation of the Brazilian *real* in 1999 (Brazil’s dominant strategy), which gave Brazil a maximum gain (of 20), against a loss (of -10) for Argentina. Then, the only solution left for Argentina was to abandon its currency board and devalue as well in order to reach the Dominant strategy equilibrium (10, 10) for each country. If the two countries had negotiated and installed a monetary regional cooperation agreement, the decision for devaluation could have been taken simultaneously (a direct jump from the non-cooperative Nash equilibrium towards the cooperative Dominant strategy equilibrium), smoothing out the turmoil witnessed by Argentina, for example. (Figure 6)

As we can notice from the MERCOSUR experience, the Agadir countries should take an engagement towards exchange rate cooperation initiatives in order to limit the exchange rate fluctuations risks and increase the potential of enlarging reserves.

The regional monetary cooperation examples from other developing countries, such as the East-Asian Chiang-May Initiative, or the GCC currency union project, show that the exchange rate coordination policies are deservedly gaining more and more importance in the regional integration negotiations in today’s globalized and liberalized world economy.

We shall cite here three regional monetary cooperation examples that can be relevant to our case study. The creation of the Euro Zone monetary union with the launch of the Euro is the most complete version of a monetary regionalization effort. Agadir countries have close and long-lasting links with the European Union block, reinforced recently by the ratification of the Euro-Med agreements. Unfortunately, for the time being, exchange rate and monetary cooperation is not even near the topics discussed within this framework. It is nevertheless important to suggest the possibility for the European Central Bank (ECB) to play the role of regional monetary policy supervisor and lender-of-last resort. We must acknowledge, that the rules that regulate the functions of the ECB probably do not allow such an implication, and that the European partners might be reluctant for political or stability reasons to let the ECB act as a safeguard for currencies other than the Euro. Nevertheless, one could envisage the

establishment of a specially designed financial and supervisory institution in the framework of the Euro-Med agreements with the active participation of the ECB as an advisory authority in the early steps of such cooperation. We believe that more research on this topic is clearly needed.

An illustrative example of a safety net through a regional financial agreement is already a reality for the East-Asian countries⁵, whose finance ministers signed on May 6, 2000, a multilateral financial cooperation agreement called the “Chiang Mai Initiative” (CMI). Its main goal is to enable the region to cope with the potentially disruptive currency fluctuations and international capital movements in the aftermath of the Asian crisis. The principal tools, on which the agreement relies, are the ASEAN Swap Arrangement, the Bilateral Swap Arrangements and the Repo Arrangements. This network of swap agreements is designed to provide immediate liquidity support for any member country that experiences short-run balance of payment deficits, in order to prevent a systemic failure and subsequent regional contagion (Park, 2002). The lack of a well-established surveillance system and the small amount of liquidity available through the CMI (around US \$20 Billion) are often cited as its main shortcomings. Nevertheless, the negotiations for additional bilateral swap contracts continue among member countries, and the idea for creating an Asian Monetary Fund, though vetoed by the IMF when proposed by Japan in 1997, is gaining more and more ground (Rana, 2002)

4.2. Application to the Agadir Countries

There are different levels of exchange rate and monetary regional cooperation. Dieter (2000) classifies four stages – regional liquidity fund, regional monetary system, economic and monetary union, and political union.

As far as the liquidity fund is concerned, the Agadir countries should put aside a part or all of their foreign reserves for a liquidity pool. Then a member central bank will be able to use its own reserves, but also those of the other central banks. This fund would be better implemented on a larger scale, as in the framework of the PAFTA agreement that includes all the member countries of the Arab League.

This will increase the amounts of the liquidity available for the members and will widen the cooperation among all Arab countries, with the GCC countries acting both like example and driving force behind this cooperation. The creation of an Arab public regional liquidity fund, as shown by the CMI example, will be an important attempt to provide a regional safety net if a crisis hits.

Another important aspect of such regional exchange rate policy cooperation among the Agadir countries is the coordination of policies. As could be noticed from the EU experience, such coordination should include not only the exchange rate policy, but also the monetary and fiscal policies, both directly influencing the real exchange rate behavior. The members should pursue a common inflation targeting policy with an independent monetary policy in order to avoid real exchange rate deviation from the equilibrium and the budget deficit and government debt should be precociously managed to limit any exaggeration.

Moreover, a common long-run real exchange rate equilibrium should be identified to serve as the central parity, based on the economic partners of the members as a group. A fluctuation band will allow each currency to fluctuate within a limit of +- 10%, while the crawl of the bands is to be decided through common agreement between the members.

⁵ The actual members of the Chiang-Mai Initiative are Japan, Korea, the Public’s Republic of China and the ten ASEAN countries: Thailand, the Philippines, Malaysia, Indonesia, Singapore, Brunei, Viet Nam, Myanmar, Cambodia, and Lao People’s Democratic Republic.

This mechanism requires the creation of a regional monitoring body that shall supervise the monetary and fiscal policies of the members, as well as their financial systems regulation. We believe, that the European Union and the ECB can play a capital role as a forum for spreading the idea and supervising the negotiations process. This will bring credibility to the process, which in return, if successfully implemented, will enhance each member country's ability to conduct sound and coherent economic policies.

We would also like to underline that establishing regional monetary cooperation needs not wait for, but should better act as a further stimulus for the development of deeper trade and political regional integration.

Conclusion

The *de facto* exchange rate policies in the MENA region are characterized by a high disparity, with the Gulf countries being completely fixed to the US dollar, while the Mediterranean countries are closer to the intermediary classification. Since the Gulf countries are already engaging in exchange rate policy coordination, we have focused our attention in this paper on the Agadir countries, namely Egypt, Jordan, Morocco and Tunisia.

According to the results of our econometric test, real exchange rate behavior in our sample countries has been influenced in different ways by the theoretical determinants. While the spending policy of Egypt, Jordan and Morocco has played a rather consistent role in the determination of their long-run real exchange rate behavior over the analyzed period, the monetary policy appeared to have a significant impact only in the case of Egypt. Therefore, the Egyptian government should start adopting a more independent monetary policy in order to be closer to the monetary policy adopted by the other countries.

Concerning trade openness, all countries' real exchange rates appear to be significantly influenced by trade in the long-run, while capital liberalization has less impact in the case of Egypt and even no impact on the real exchange rate in the other countries. This might be due to the fact that the Agadir countries have used the central banks' reserves in order to limit the impact of the capital flows in the short-run.

Finally, the terms of trade have had a long-run significant positive effect on the real exchange rate in Egypt and Tunisia, negative in Morocco and null in Jordan. The short-run shocks to the terms of trade seems to be significant in all countries (borderline in Morocco), with a highly positive effect in the case of Egypt (due to the high part of oil in its exports) and Tunisia, while the impact is negative in Jordan and Morocco.

Nevertheless, all four countries fall under the intermediary exchange rate policy classification, with Tunisia being the closest to float and Egypt the closest to fixed. In order to create a viable environment for the intermediary regime, we suggest that the four countries should coordinate their economic policies, following the experience of the EU stabilization pact. This will harmonize the real exchange rate behavior in these countries and eliminate the potential risks created by a non-cooperative behavior.

The Agadir countries should envisage the coordination of their equilibrium exchange rates through the creation of a common equilibrium central parity reflecting the weight of the totality of their economic partners, bordered by a +/- 10 percent fluctuation bands. This equilibrium exchange rate should take into consideration the potential increasing role of the Euro in the Agadir countries' trade induced by the Euromed agreement, as well as the new GCC countries' currency that will be effective in 2010.

Deeper cooperation would also require the creation of common liquidity fund, similar to the one in place in South East Asia, the so called the Chiang Mai Agreement, not only among the four Agadir countries, but rather within the framework of the PAFTA, and with the support

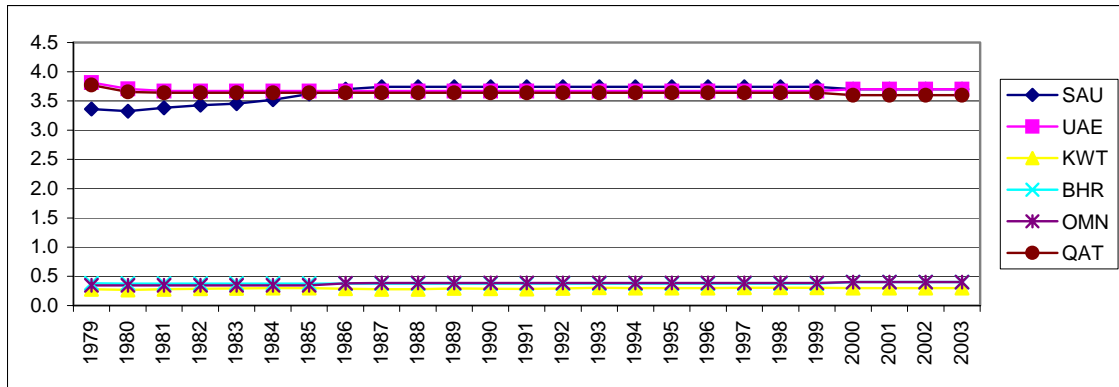
of the EU. The larger the fund, the higher the chances that it would counteract speculation effectively.

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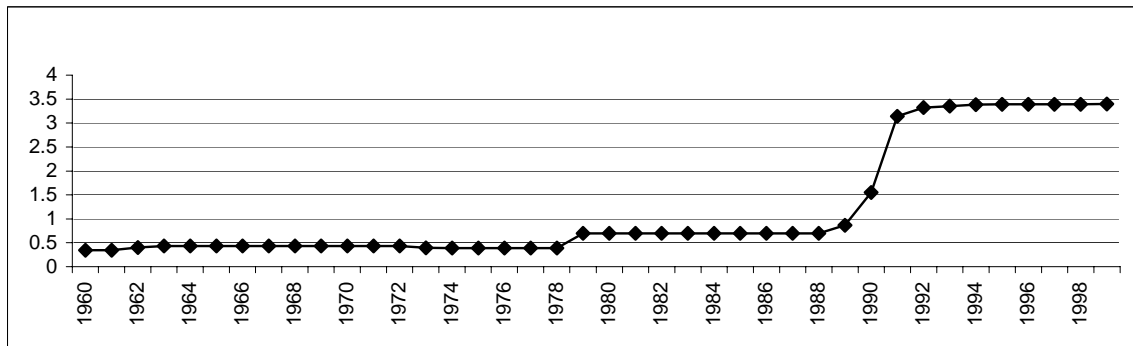
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Figure 1: GCC Nominal Exchange Rates



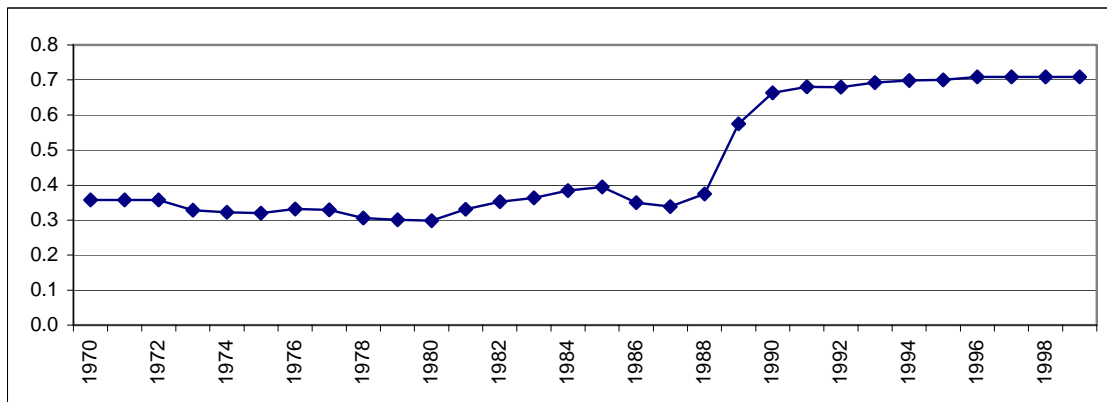
Source: World Bank Data Base and World Markets Research Centre, 2002-2003.

Figure 2: Egypt's Official Exchange Rate



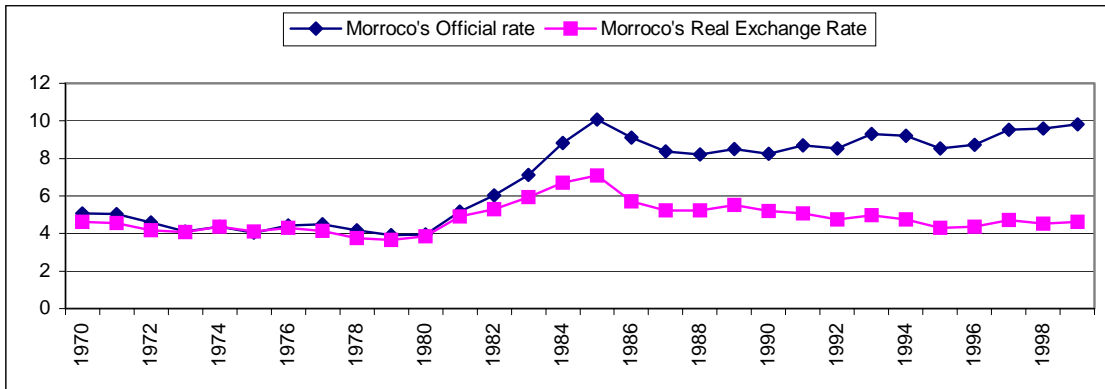
Source: World Bank Database, 2001

Figure 3: Jordan's Official Exchange Rate



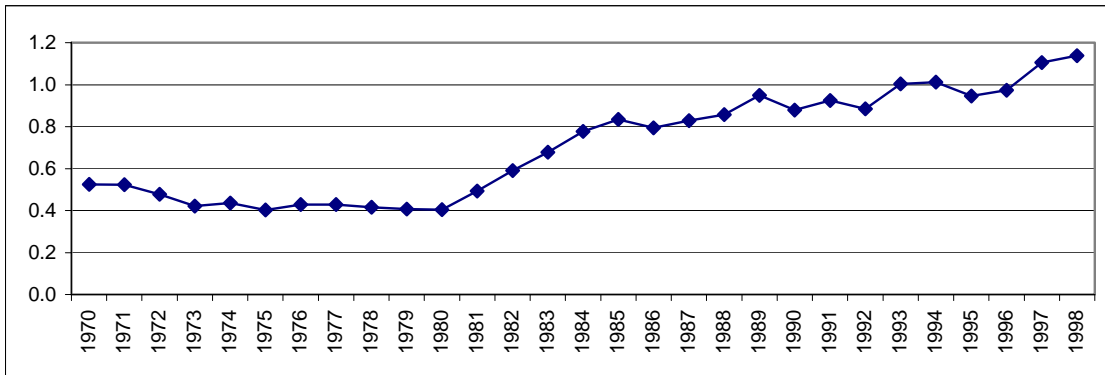
Source: World Bank Database, 2001

Figure 4: Morocco's Official and Real Exchange Rate



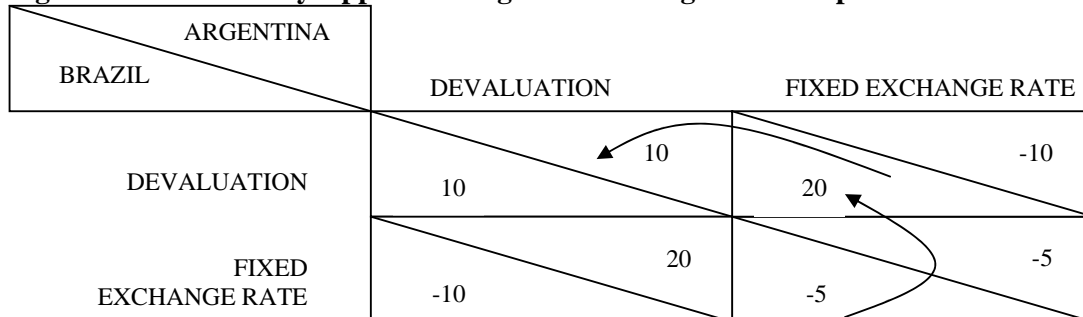
Source: Author's calculation based on the World Bank Database, 2001.

Figure 5: Tunisia's Official Exchange Rate



Source: World Bank Database, 2001

Figure 6: Game Theory Applied to Regional Exchange Rate Cooperation



Appendix 1: Exchange rate arrangements and monetary policy frameworks of MENA countries

Exchange Rate Regime	Monetary Policy Framework				
	Exchange Rate Anchor		Monetary Aggregate Target	Inflation Targeting Framework	Other
	Single currency	Against a composite			
Other conventional fixed peg arrangements	Bahrain Jordan Kuwait Lebanon Oman Qatar Saudi Arabia Syria UAE	Morocco			
Crawling pegs	Tunisia		Tunisia		
Managed floating with no pre-announced path for the exchange rate			Egypt		Algeria
Independently floating				Turkey	

Source: IMF Classification as of June 2003

Appendix 2: Database on De Facto Exchange Regime Classification

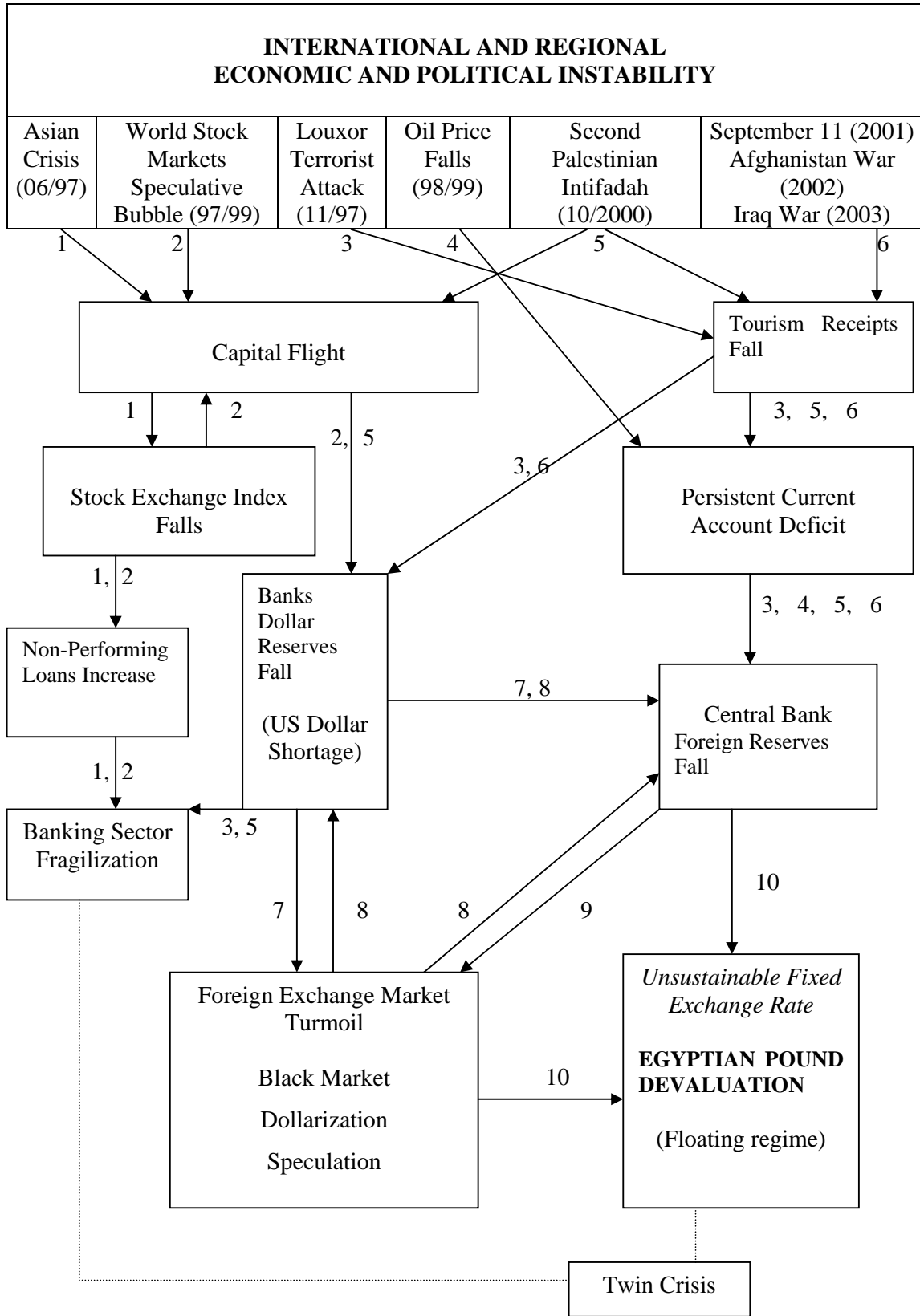
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Algeria	5	5	5	5	12	12	12	12	12	12	12	12
Egypt	4	6	6	6	6	6	6	4	4	12	12	6
Jordan	5	5	5	5	5	4	4	4	4	4	4	4
Lebanon	12	12	12	7	7	7	7	7	4	4	4	4
Libya	5	5	5	5	5	5	5	5	5	5	5	5
Morocco	5	5	5	5	5	5	5	5	5	5	5	5
Syria	4	4	4	4	4	4	4	4	4	4	4	4
Tunisia	9	9	9	9	9	9	9	9	9	9	12	12
Turkey	9	9	9	9	7	9	9	9	7	7	7	13
GCC countries												
Bahrain	4	4	4	4	4	4	4	4	4	4	4	4
Kuwait	5	5	5	5	5	5	5	5	5	5	5	5
Oman	4	4	4	4	4	4	4	4	4	4	4	4
Qatar	4	4	4	4	4	4	4	4	4	4	4	4
Saudi Arabia	4	4	4	4	4	4	4	4	4	4	4	4
UAE	4	4	4	4	4	4	4	4	4	4	4	4

Note:

- 1 = another currency as legal tender;
- 2 = currency union;
- 3 = currency board;
- 4 = conventional fixed peg of single currency;
- 5 = conventional fixed peg to basket;
- 6 = pegged within a horizontal band;
- 7 = forward-looking crawling peg;
- 8 = forward-looking crawling band;
- 9 = backward-looking crawling peg;
- 10 = backward-looking crawling band;
- 11 = tightly managed floating;
- 12 = other managed floating;
- 13 = independently floating.

Source: Bubula and Otker-Robe (2002)

Appendix 3: Political and Economic Instability and Exchange Rate Crisis



Source: Kamar and Bakardzhieva (2003)

Appendix 4: Our variables are defined and constructed as follows:

Variable	Definition
RER	Real Exchange Rate Index = The ratio of the foreign (US) wholesale price index, multiplied by the nominal exchange rate (NER), to the domestic consumer price index 1974 = 100 for the index.
GCON	Government Consumption = General Government Consumption / GDP
LIQ	Liquidity = M3 / GDP
TOT	Terms of Trade = The relative price of exports to the price of imports. 1974 = 100 for the index.
OPEN	Degree of Openness = (Imports + Exports) / GDP
CAPF	[- (Exports – Imports) / GDP]
NKF	Net Capital Flows = Balance of goods and services [- (Exports – Imports) / GDP] – Change in Gross international reserves (including gold, in current US Dollars) / GDP
LRESY	Total Reserves (Including Gold) / GDP
DUMEGY91	Devaluation and start of the Reform Program (= 1 in 1991, = 0 elsewhere)
DUMROC74	Sharp increase in Capital Flows in 1974 (= 1 in 1974, = 0 elsewhere)
DUMJORD89	Devaluation of the Jordanian dinar in 1989

Appendix 5: Results from the Unit Root Tests

Variable	Egypt	Jordan	Morocco	Tunisia
LRER	I(1), lag 1	I(1), lag 1, Intercept	I(1), lag 1, Intercept	I(1), lag 1
D(LRER)	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1
LGCON	I(1), lag 1, Trend & Intercept	I(1), lag 3, Trend & Intercept	I(1), lag 1	I(1), lag 1, Intercept
D(LGCON)	I(0)** , lag 1	I(0)* , lag 3	I(0)** , lag 1	I(0)** , lag 1
LLIQ	I(1), lag 1	I(1), lag 2	I(1), lag 1, Trend & Intercept	I(1), lag 1
D(LLIQ)	I(0)** , lag 1	I(0)* , lag 1	I(0)** , lag 2, Intercept	I(0)** , lag 1
LTOT	I(1), lag 1, Trend & Intercept	I(1), lag 2, Trend & Intercept	I(1), lag 4, Intercept	I(1), lag 1, Trend & Intercept
D(LTOT)	I(0)** , lag 1	I(0)* , lag 1	I(0)* , lag 1	I(0)** , lag 1
LOPEN	I(1) , lag 1	I(1) , lag 1, Intercept	I(1), lag 1, Trend & Intercept	I(1), lag 1
D(LOPEN)	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1
CAPF	I(1) , lag 1, Intercept	I(1), lag 1, Trend & Intercept	I(1), lag 1	I(1), lag 1, Intercept
D(CAPF)	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1
LNKF	I(1) , lag 1, Intercept	I(1), lag 1, Trend & Intercept	I(1), lag 1	I(1), lag 1, Intercept
D(LNKF)	I(0)** , lag 2	I(0)** , lag 2	I(0)** , lag 1	I(0)** , lag 1
LRESY	I(1), lag 2, Trend	I(1), lag 1	I(1), lag 1, Trend	I(1), lag 1, Intercept
D(LRESY)	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1	I(0)** , lag 1
NER				I(1), lag 1
D(NER)				I(0)** , lag 1

Notes:

** denotes significance at 1 percent level according to Augmented Dickey-Fuller stationarity statistic. * denotes significance at 5 percent level according to Augmented Dickey-Fuller stationarity statistic. # denotes significance at 10 percent level according to Augmented Dickey-Fuller stationarity statistic.

Lags were chosen according to the Akaike and Schwarz Information Criterion.

Appendix 6: OLS estimations of the long-run determinants of the real exchange rate behavior; the dependant variable is LRER

	Egypt	Jordan	Morocco	Tunisia
LGCON	-0.275020 (-1.779759)	-0.408556 (-1.929893)	-0.817016 (-4.722609)	-0.422419 (-1.251724)
LLIQ	-0.605235 (-3.574888)	0.210608 (1.458215)	0.115936 (1.328821)	0.058261 (0.150144)
LTOT	0.940230 (4.81029)	-0.285051 (-1.178883)	-0.403749 (-2.103394)	0.504209 (2.498520)
LOPEN	0.673499 (4.12542)	0.555991 (4.207007)	0.888118 (4.760088)	-0.760920 (-5.364660)
CAPF	-0.188723 (-2.99462)	-0.001754 (-1.645846)	0.007034 (1.079068)	
LNKF				0.013789 (3.746322)
LRESY	-0.040194 (-0.462454)	0.007465 (0.172512)	-0.116983 (-3.980753)	0.134128 (2.288220)
NER				-0.357082 (-3.645068)
C	-5.226257 (-5.145373)	2.545690 (1.807492)	1.870068 (2.074060)	6.239989 (4.427213)
@TREND	0.032590 (2.851078)			
DUMEGY91	0.320831 (-2.431830)			
DUMROC74			-0.231860 (-2.369800)	
R²	0.886566	0.791389	0.737383	0.956888
Adjusted R²	0.850473	0.717762	0.679963	0.938027
DW	1.827072	1.465056	1.546630	1.756517
ADF	-3.925617	-3.091624	-3.262384	-4.171617

Note: The ADF test refers to the residual series from each regression.

Appendix 7: OLS estimations of the short-run determinants of the Real exchange rate behavior; the dependant variable is D(LRER).

ECM	Egypt	Jordan	Morocco	Tunisia
RESID (-1)	-0.929042 (-3.634478)	-0.729659 (-4.479611)	-0.553454 (-3.287622)	-0.818051 (-3.905665)
D(LGCON)	-0.144120 (-0.783365)	-0.194358 (-1.948419)	-0.377359 (-2.433962)	-0.010399 (-0.043720)
D(LLIQ)	-0.303091 (-1.094420)	0.032314 (0.325965)	-0.064054 (-0.310133)	0.425827 (1.878468)
D(LTOT)	1.120942 (5.251564)	-0.421771 (-2.665111)	-0.239715 (-1.690647)	0.519020 (2.720267)
D(LOPEN)	0.349457 (1.968929)	0.376225 (5.926499)	0.506314 (3.898935)	-0.450045 (-2.919546)
D(CAPF)	-0.013940 (-0.188006)	-0.001468 (-2.700070)	0.004352 (1.067957)	
D(NKF)				0.006338 (2.322687)
D(LRESY)	-0.011514 (-0.124254)	-0.000897 (-0.034340)	-0.066891 (-1.922268)	-0.012084 (-0.232126)
D(NER)				-0.354651 (-2.402338)
C	-0.018668 (-0.795199)			
DUMEGY91	0.413419 (3.192959)			
DUMJORD89		0.146967 (2.988535)		
DUMROC74			-0.111887 (-1.409193)	
R²	0.827810	0.899248	0.558180	0.548764
Adjusted R²	0.778613	0.852231	0.458418	0.338187
DW	2.317507	1.581981	1.474192	1.240113

Appendix 8: *De facto* exchange rate classification of the Agadir countries based on real exchange rate determinants

