

Real Exchange Rate Misalignment and Economic Performance: The Case of Jordan*

By:

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Abstract

Both developing and emerging economies are sensitive to exchange rate policy used and its potential effect on economic growth. An overvaluation or undervaluation of the real exchange rate can have a direct impact on such a country's economic performance. This study attempts to estimate the Jordanian Dinar real exchange rate misalignment and its impact on economic growth of Jordan. Although there are several measures of real exchange rate misalignment, this study uses the simple purchasing power parity measure for its convenient and simplicity. Other measures may be introduced later in other studies. A simple and widely used empirical model is used to estimate the real exchange rate misalignment impact on economic performance. The study reveals that there were periods of overvaluation and alignment of the real exchange rate of the Jordanian Dinar. Overvaluation of the Jordanian dinar turned to significant magnitude over the last five years reaching to more than 13% by the end of first quarter of 2012. The results also indicate that the misalignment of the real exchange rate had a negative impact on economic performance. In particular, a one-percentage point increase in real exchange rate misalignment will induce a decrease in real GDP by JD96 million.

Keywords: real exchange rate, misalignment, competitiveness, PPP, growth, Jordan.

*This research is funded by WTO Chair program at the University of Jordan.

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1- Introduction

The question of real exchange rate misalignment with respect to its long-run equilibrium is a matter of concern in many countries. It is generally acknowledged that maintaining the real exchange rate at its equilibrium levels is an important condition for enhancing economic performance and macroeconomic stability. A real exchange rate not aligned with its equilibrium level is perceived as being misaligned and this could increase economic instability and distort investment decisions, which may result in a decline of welfare and efficiency for a country. This is especially true in the case of an overvalued real exchange rate as it affects international competitiveness position and therefore hurts exports, deteriorate current account and cause capital flight.

2- Jordan Exchange Rate Policy

The Jordanian Dinar was primarily linked to the Pound Sterling until the fall of sterling area in 1972. Starting February 22, 1975, the Dinar was linked to a basket of special drawing rights (SDRs); a policy that lasted until 1986. The 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 Arab Gulf countries).

This exchange rate policy has resulted in a real exchange rate (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 level¹.

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

¹ IMF. 1999.

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. The pressure on the exchange rate, however, continued in the following three months thereby prompting extensive government intervention in the foreign exchange market to ensure the compliance of foreign exchange dealers with the foreign exchange regulations. Recognizing the ineffectiveness of these measures to halt the fall of the Dinar, the authorities devalued the dinar by about 13 percent in early February 1989 (the exchange rate was fixed at USD 1.76 per one Dinar). The devaluation was accompanied by the closure of the exchange houses. The crises, however, continued to deepen, with the spread between the official market and parallel market exchange rates rising rapidly. In an attempt to stabilize the market, the JD was delinked from the USD, on May 30, 1989, and linked instead to a trade-weighted basket of currencies. On July 31, 1989, a two-tier exchange rate system was established, comprising official and free market exchange rates. The official exchange rate was applied to the public sector's imports of essential goods and transfers to Jordanians studying abroad. The dual exchange system was terminated on February 17, 1990, and the exchange rates were unified at USD 1.49 per one Dinar. These exchange rate adjustments resulted in a sharp depreciation of the RER of the dinar to about its 1970 level. Significant restrictions, however, remained on banks' dealings in foreign exchange. The dinar was formally pegged to the USD on October 23, 1995². This policy of exchange rate pegging has become debatable recently in light of the development of structural imbalances in government budget, current account and accumulated public debt.

3- The Choice of Exchange Rate Regime

The choice of exchange regime must take into account the increase in potentially volatile capital flows that could follow further trade and capital account liberalization and other reforms and deregulation that may induce large capital inflows. Indeed, it would become

² Bassem Kamar. Working Paper 0408.

increasingly difficult for the central bank in such circumstances to maintain conventional fixed pegs under more liberalized capital accounts. In addition, it must also consider other real exogenous shocks facing the economy, such as terms of trade and security issues³. The experience of other emerging market economies illustrates that more flexible exchange rate arrangements may be better suited to help these countries adjust to increased capital inflows and exogenous shocks. Conventional fixed pegs or narrow bands could have heavy economic costs, particularly if the weak fiscal positions is not addressed in a timely manner. The policy of fixed pegs works better if most of the external shocks faces the economy are of nominal rather than real nature. In such case, nominal shocks to money demand can be absorbed through purchases and sales of foreign exchange by the central bank in the foreign exchange market, which would directly affect the amount of high-powered money in circulation and maintain the fixity of the exchange rate. The sustainability of such exchange rate arrangement depends on the central bank ability to maintain enough quantity of international reserves to face normal and speculative demand on forging currencies at the announced fixed price⁴. In contrast, countries that are subject to real shocks would benefit from exchange rate flexibility. In the face of negative real shocks, a depreciation of the exchange rate would help reduce real wages and ensure expenditure switching from more expensive foreign goods to relatively cheaper domestically produced ones, thereby maintaining employment and output. A credible nominal anchor such as inflation target as well as the absence of fiscal dominance of monetary policy are key to a successful implementation of a floating exchange regime. Experience has shown that in the absence of a policy framework consistent with price stability, a floating exchange rate can be easily transformed into a “free falling exchange rate,” in particular under a liberalized capital account⁵. The recent experience of some Arab countries who adapted a system of managed floating like Egypt, Sudan and Tunisia supports this conclusion. However, the evidence appears to suggest that developing countries with flexible exchange rate regimes are better able to absorb economic shocks (for example, external demand shocks, negative terms-of-trade shocks and natural disasters), and deal more effectively with high current account deficits and

³ Abdelali Jbili and Vitali Kramarenko. 2003.

⁴ Awad Taleb. 1995.

⁵ Fahrettin Yagci. 2001.

exchange rate risk than are developing countries with fixed exchange rates. In contrast, when evaluating greater exchange rate flexibility during the recent global economic crisis, it is necessary to distinguish between the effects of two separate external economic shocks. The first shock - the sharp international food and fuel price upsurge - contributed to higher inflation and to a rise in the measured real effective exchange rate, while a later shock - the global economic recession - contributed mainly to a lower demand for exports sourced from developing countries (and in some cases lower remittances and tourism receipts as well)⁶.

3-1 Sustaining a Fixed Exchange Rate

Any country has three options under fixed exchange rate regime: (1) to join a currency union; (2) to unilaterally adopt a foreign currency (i.e. dollarization or euroisation); or (3) establish a currency board.

However, for a country to maintain a hard peg there are some requirements. First, policy consistency requires that the government maintain a sustainable levels of public debt and moderate fiscal deficits. Otherwise, a lax fiscal policy may force government to ultimately turn to domestic borrowing or attempt to inflate away domestic-currency debt, implying an exit from the currency peg⁷.

Second, a sound banking system facilitates the sustainability of a fixed exchange rate regime. Empirically, banking crises and currency crises are often correlated events⁸. The provision of liquidity to troubled banks and the fiscal costs of re-capitalizing a failed banking sector may ultimately require a shift to a floating exchange rate⁹. As such, it is imperative to ensure that banks are well regulated and alternative sources of funds are available in the event of liquidity or solvency problems. Again, a government with a low level of public debt and access to capital markets is better able to deal with a banking

⁶ M. Friedman (1953).

⁷ Corsetti and Mackowiak, 2001.

⁸ Reinhart, Carmen; Goldstein, Morris and Kaminsky, Graciela .2000.

⁹ Chang and Velasco. 1999.

crisis without resort to the printing press. A substantial role for foreign-owned institutions in the domestic banking sector is also desirable, since this improves monitoring and the parent firms are also a source of reserves and confidence in the event of trouble.

Third, a high level of external debt potentially poses a threat to a hard peg. Debt markets are exposed to the risk of speculative activity: if a country is expected to repudiate its external debt, interest rates rise to compensate for the default risk. In turn, this raises the cost of servicing the debt, making repudiation more likely¹⁰.

In turn, this may involve the abandonment of the peg, if the government prefers indirect method of negation to outright default (e.g. conversion of foreign-currency debt into domestic currency, with the government printing money to formally pay the domestic-currency debt in nominal terms). Clearly, in addition to maintaining fiscal prudence as discussed above, a stable political environment in which all major parties are fully committed to servicing external debt is helpful in avoiding speculative attacks in the debt markets.

In addition to the risk of speculative risk premiums, high levels of external debt also potentially threaten the viability of a currency peg. Significant outflows of investment income may require a real depreciation to generate the associated trade surpluses. In turn, real depreciation implies deflation under a peg, which has damaging economic consequences. Accordingly, it is desirable to ensure that capital imports are not excessively biased towards debt flows¹¹.

Finally, a hard peg is clearly more sustainable, the more closely the small open economy and the anchor zone resemble an optimum currency area. The greater are the gains and the smaller are the costs to a hard peg, the larger are trade volumes, the more diversified the export base and the more flexible are prices and wages. Moreover, studies in this area have shown that a peg is easier to maintain, the more external debt is financed in the

¹⁰ Guillermo A. Calvo. 1988.

¹¹ IMF. 2012.

currency of the anchor zone¹². Clearly, many of these criteria are to some extent endogenous to the exchange rate regime. The hope is that fixing the exchange rate will itself raise trade volumes, induce greater flexibility in prices and wages and encourage the integration of financial markets. These trends can be reinforced by active government policies and institutional reform in support of such structural adjustment.

Comparing across alternative forms of hard peg, the currency union is most attractive. Membership allows the small open economy to contribute to the formation of the monetary policy for the currency union and share in the seignior age revenues earned by the common central bank. Regarding the former, the small open economy may itself be too small in size to matter for aggregate economic variables in the currency union. However, if it is similar in economic structure to some other members of the union, this grouping may have sufficient weight to be factored into monetary policy decisions.

At the least, membership of a currency union may improve the political acceptability of the monetary stance, since the small open economy is formally involved in the decision-making process. Finally, this option provides the strongest commitment to a fixed exchange rate, since the country would experience intense pressure from other members of the union if it ever contemplated leaving the union.

In contrast, unilateral adoption of a foreign currency (i.e. dollarization or euroisation) offers relatively fewer benefits. Although the elimination of domestic currency is a strong signal, it is more reversible in the unilateral case relative to joining a currency union. Moreover, a unilateral approach may be expensive in terms of the loss of seignior-age revenue. Although it is conceivable that the anchor zone could agree to compensate the pegger for the transfer of seignior-age, this tends not to happen in practice since the anchor zone may not wish to formally endorse unilateral decisions to adopt its currency.

Finally, a unilateral pegger must passively adopt the monetary stance of the anchor zone.

¹² Philip R. Lane. 2001.

The third option in establishing a hard peg is a currency board which has the property of signaling a much stronger commitment than weaker pegged exchange rate systems¹³. Since the domestic currency remains in existence, this is a less irreversible peg than in the other hard peg cases. However, if the conditions for membership of a currency union are not yet established, a currency board may be more politically acceptable to the anchor zone than the unilateral elimination of the domestic currency. Furthermore, as a transitional stage, a currency board retains the flexibility to permit a choice concerning the irrevocable conversion rate upon entry into a currency union. A further advantage is that, compared with unilateral adoption of a foreign currency, a currency board provides more seigniorage revenues.

The remainder of the paper is organized as follows: Section 4 presents various measurements of exchange rate misalignment and the estimation of misalignment in the Jordan Dinar against the US Dollar. Section 5 provides the empirics of the relationship between exchange rate misalignment and economic activity, and finally the conclusions are presented in section 6.

4- Exchange Rate Misalignment

First the operational concept of real exchange rate (RER) must be defined:

$$RER = NER P^* / P_N \quad (1)$$

Where NER is the nominal exchange rate measured as the amount of domestic currency per unit of foreign currency, P^* is the foreign currency price of tradables, and P_N is the domestic price of non-tradables. Following many researchers the US price index P^{us} is used to represent the foreign currency price of tradables, and the domestic consumer price index (P^j) is used to represent domestic prices of non-tradables¹⁴. Hence the real exchange rate is calculated as follows:

$$RER = (NER) P_{us} / P_j \quad (2)$$

¹³ Spiegel and Valderrama. 2003.

¹⁴ See Balassa, B. (1990) and Cottani et al. (1990).

This measure of RER indicates to domestic countries competitiveness in international markets. A decline in RER represent a real exchange rate depreciation or domestic currency appreciation, which means a rise in domestic cost of producing tradable goods. On the other hand, an increase in RER means domestic currency depreciation or an improvement in domestic country's international competitiveness.

Real exchange rate misalignment (RERMIS) refers to deviations of RER from its long run sustainable values. A currency is said to be undervalued (overvalued) when it is more depreciated (appreciated) than its equilibrium level; misalignment may refer to either of these two situations. However, RERMIS is more commonly associated with currency overvaluation particularly in the case of developing countries. This is because currency appreciation can negatively affect economic performance. In particular, in addition to undermining international competitiveness as explained above, it misallocates resources by distorting prices of domestic goods relative to both each other and to international prices. This affect adversely domestic investment and efficiency reducing real output. In addition, RERMIS increases uncertainty in financial markets and may result in dangerous speculations against domestic currency. If overvaluation last long enough, it may results in the failure of domestic industries and banks and cause financial instability.

Real exchange rate misalignment measurement can be constructed as follow:

$$RERMIS_{it} = (ERER_{it}/RER_{it} - 1) \quad (3)$$

Where ERER refers to equilibrium RER, and the subscripts t and I refer to time and country, respectively.

Clearly the measurement of RERMIS will vary depending on the way ERER is calculated. Researches have used many methods to calculate RERMIS, we limit the analysis to three of them here:

Purchasing power parity (PPP) Method: according to Ballassa (1990), the RERMIS is calculated as the deviation of the actual RER from the value of base year in which the RER is believed to be in equilibrium. Many researchers including Cottani (1990) and Ghura and Gremmes (1993) suggested using the average of the three highest values of RER during the sample period. A major shortcoming of this method is that it fails to capture changes in equilibrium RER produced by changes in its fundamentals determinants.

Black market measure: another measure of RER is to use the black market exchange rate premium if existed. According to this measure RERMIS is calculated as:

$$\text{RERMIS}_{it} = (\text{BER}_{it}/\text{ER}_{it} - 1) \quad (4)$$

Where BER and ER refer to nominal black market exchange rate and the official rate, respectively. However, this measure captures more than misalignment in RER, in addition, it also captures distortion in foreign exchange rate market and the degree of exchange rate control or import rationing.

Equilibrium model method: in this case RERMIS is derived from equilibrium model for

$$\text{ERER} = f(\text{X}'\text{s}) + \epsilon \quad (5)$$

Where $f(\text{X}'\text{s})$ is a mathematical function in the set of explanatory variables X's to be determined according to certain economic theory; such as terms of trade, capital inflows, technology, and trade policies., and ϵ is the random error term.

4-1 Measurement of RERMIS

exchange rate determination:

There are no clear cut agreement among economists on the best method to measure misalignment of exchange rate. Data availability and the purpose of research affect the choice of measurement and econometric methodology utilized. For example since Jordan

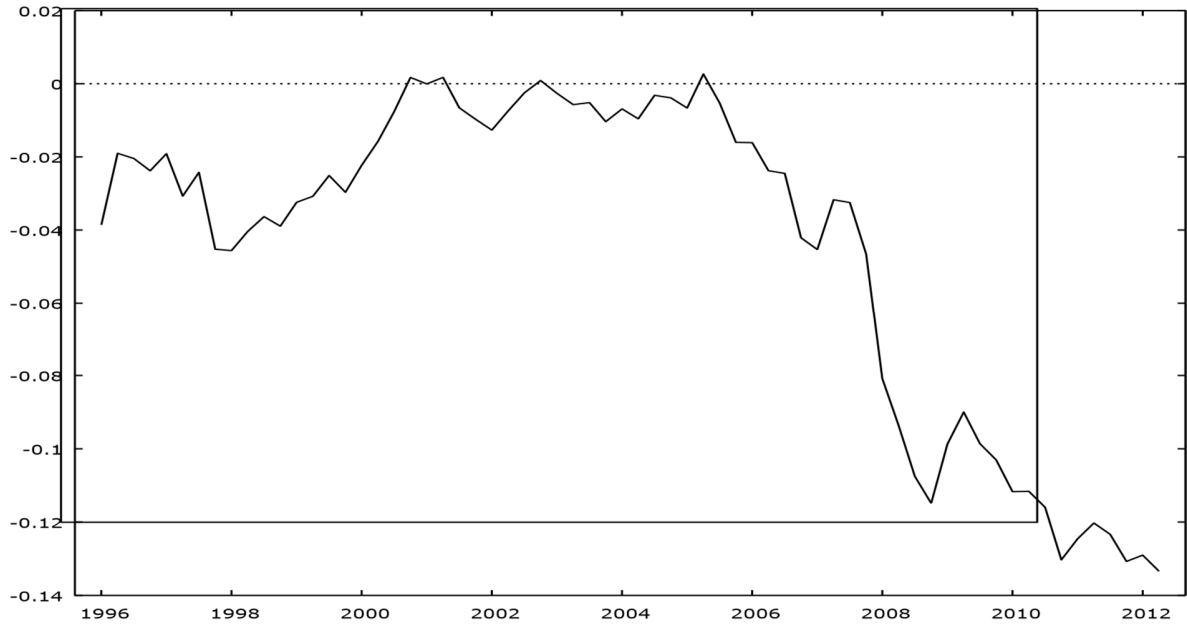
effectively moved into pegged exchange rate starting only 1996, annual time series data or even quarterly data, is not sufficient to pursue meaningful cointegration analysis to estimate the long run values of real exchange rates. However, some attempts were made for different research objective, for example, Saadi-Sedik and Petri¹⁵, estimated an equilibrium path for the Jordanian real exchange rate using the Johansen cointegration methodology over the period 1964 to 2005. They found that both grants and workers' remittances appreciated the equilibrium real exchange significantly. For the purpose of this study, a quarterly data covering the period of effective pegging 1996 to 2012 is used. The data were obtained from various sources including the International Financial Statistics of the International Monetary Fund (IMF) and Jordanian Central Bank (JCB). Real exchange rate misalignment is calculated according to equation (3) and method three above. The result of misalignment measurement is shown in Figure (1). The graph shows three periods of real exchange rare development:

- 1- 1996q1-2000q4: a period of modest misalignment where real exchange rate were below its equilibrium level but remained within 4% margin.
- 2- 2001q1-2005q4: a period of aligned exchange rate toward its long run level with slight fluctuations.
- 3- 2006q1-2012-q1: a period of strong misalignment where real exchange rate were below its equilibrium level by as high as 13% in 2012.

Figure (1) shows a worrying persistent trend of real exchange rate misalignment starting (currency overvaluation) 2006 up to the first quarter of 2012.

¹⁵ Saadi-Sedik Tahsin and Martin Petri. 2006. to Smooth or Not to Smooth—the Impact of Grants and Remittances on the Equilibrium Real Exchange Rate in Jordan. IMF Working Paper WP/06/257.

Figure 1: Misalignment in real exchange rate of the Jordanian Dinar against the US Dollar, 1996-2012.



5- Exchange Rate Misalignment and Economic Activity

Real exchange rate depreciation undermines the country competitiveness in international markets; it misallocates resources by distorting prices of domestic goods relative to both each other and to international prices. This affect adversely domestic investment and efficiency reducing real output. It can also increase financial uncertainty and may result in dangerous speculations against domestic currency. If overvaluation last long enough, it may results in the failure of domestic industries and banks and cause financial instability.

Based on literature review provided by many researchers on the impact of real exchange rate misalignment on economic performance, the following empirical model is used for

testing the effect of real exchange misalignment on level of economic activity¹⁶. The model is shown in equation (6)¹⁷:

$$Y = C0 + C1 P + C2 RERMIS + C3 INVY + c4 open + e \quad (6)$$

where: e is a white noise.

In Equation (6) the dependent variable is real GDP (y) with the explanatory variables represented by inflation (p), real exchange rate misalignment (RERMIS), trade openness (open) measured as total trade divided by GDP) and the ratio of investment to GDP (invy). Inflation is expected to affect negatively real GDP and the variable of interest real exchange rate misalignment, is expected to impact negatively on real GDP. Trade openness is expected to affect positively real GDP, similarly the ratio of investment to GDP is expected to affect GDP positively.

5-1 Data and Estimation

A quarterly data covering the period of pegged Dinar against the US Dollar 1996q1-2012q1 was used in the estimation of the model represented by equation (4). Due to lack of data on domestic investment, net export as ratio to GDP was used instead. Stationarity and cointegration tests were applied and indicated to the absence of both properties, the results of these tests are not reported here but can be provided upon request from the author. Therefore, the model was simply estimated by ordinary least squares OLS¹⁸.

¹⁶ For example Jordaan and Eita (2012) provided a very good literature references on this topic.

¹⁷ Trade openness variable is added to the model to account for the special role of trade openness in the Jordanian economy.

¹⁸ The Durbin-Watson statistics is much greater than the coefficient of multiple determination in this regression, which may rule out the problem of spurious regression. For more details see Guajarati, 2003.

	Coefficient	Std. Error	t-ratio
const	-162.639	169.76	-0.9581
p	-41.4165	8.914	-4.6462
invy	20.4883	7.59332	2.6982
open	2.90104	0.475534	6.1006
RERMIS	-96.0068	6.45698	-14.8687
Adjusted R-squared	0.829850	F(4, 60)	79.03478

OLS Estimation Results, 1996Q1-2012Q1. Real GDP.

The estimated model is statistically significant as evident from both adjusted R-squared and F-test. All coefficients carry the correct expected sign and statistically significant at better than 1% level. A one-percentage point increase in real exchange rate misalignment will induce a decrease of about JD96 million in GDP at constant prices. Similarly, a 1% increase in the inflation rate will decrease real output by about JD41 million. External investment and trade openness affect positively real output. The variable of our interest RERMIS turned out to be the most significant compared to other independent variables as it has the largest t-value in absolute term.

6- Conclusion

The result from the empirical estimations indicate to two periods of exchange rate misalignment: the first was 1996-2000, and the second and the strongest occurred during 2006-2012. The middle period that extends from 2001-2005 witnessed exchange rate alignment relative to its long run equilibrium level. The study provides tentative evidence of overall Jordanian Dinar overvaluation. Furthermore, econometric estimation supported the existence of negative impact of real exchange rate misalignment on real economic growth. As an overvalued real exchange rate is perceived as a greater concern as it is

expected to deter economic growth more than an undervalued real exchange rate, this could present an opportunity for further research. The impact of real exchange rate misalignment on economic growth could be analyzed using other measurements of exchange rate misalignment indicated in this study and compare with the result of this study.

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