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Review

The real exchange rate and growth in Malawi: Exploring the transmission route

Thomas Munthali[1], Kisu Simwaka[2]* and MacDonald Mwale[3]

[1]Economics Association of Malawi, Malawi.
[2]University of KwaZulu-Natal, Marianhill Rd, Pinetown 3610, South Africa 031 260 3414, South Africa.
[3]Reserve Bank of Malawi, Malawi.

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This study focuses on the impact of real exchange rate on savings rate and economic growth. It further explores the savings transmission mechanism through which such a link can take place in the country. The results show that real effective exchange rate (REER) volatility has adverse effects on economic performance. Contextually, an appreciated REER is significantly and positively correlated with economic growth, reflecting Malawi's net-importer position. On the other hand, REER volatility is significantly and negatively correlated with growth, reflecting investors' preference for a stable exchange rate. With regard to savings, the study finds that appreciation of the REER (or nominal exchange rate) would encourage savings. The study also finds that devaluation of the REER has an insignificant effect on economic growth in the long-run. The negative impact of real exchange rate volatility on economic growth suggests that eliminating real exchange rate volatility can have strong growth-enhancing effects. Government has a variety of instruments at their disposal to influence the level, and reduce the volatility of the real exchange rate. The options include currency intervention (building up foreign exchange reserves) and eliminating institutional and market failures.

Key words: Malawi, real exchange rate, economic growth, transmission route.

INTRODUCTION

The role of real exchange rates has traditionally found prominence in the literature on export-led growth. The orthodox view posits that temporary departures of the real exchange rate from its equilibrium level (misalignment) harm growth by distorting a key relative price in the economy (Domac and Shabsigh, 1999). Rodrick (2007) points out that just as overvaluation hurts growth, undervaluation facilitates it. While some evidence exists on the negative impact of depreciation on econo-mic growth like the Mexican case (Grier and Hernandez-Trillo, 2003), literature is replete with evidence of high-growth periods being associated with undervalued currencies. Evidence points to this relationship holding only for developing countries but disappearing when the sample is limited to developed economies. This suggests that more than macroeconomic stability is at stake – the relative price of tradable to non-tradables (the real exchange rate), though an endogenous variable, seems to be used as a policy variable playing a more fundamental role in the growth process for most developing economies (Bhalla, 2007; Gala, 2007). Japan, Hong Kong, Singapore, South Korea and Taiwan, and now China have had success in their strategy of treating the real exchange rate as a growth-relevant policy tool. China and some developing countries have adopted a competitive real exchange rate as an important stimulus to the overall rate of growth (Michael et al., 2003).

Avoiding overvaluation of the currency, therefore, has been one of the most robust imperatives that can be gleaned from the diverse experience with economic growth around the world, and it is strongly supported even by cross-country statistical evidence (Razin and Collins, 1997; Johnson, Ostry, Sub- ramanian, 2007). Others have focused not just on the level of the real exchange rate but also on its volatility (Grier and Hernandez-Trillo, 2003). Here it is argued that real exchange rate volatility discourages trade and investment, which are important for growth. They observe significant costs in terms of the growth of output during episodes of sharp increase in real exchange rate

*Corresponding E-mail: kisusimwaka@yahoo.co.uk.

Table 1. Savings, exports, and GDP growth.

	Decades				Fixed (pegged) rate regimes	Free (managed) rate regime
	1970-1979	1980-1989	1990-99	2000-2007	1970-1993	1994-2007
Savings growth	-0.3	0.5	2.4	-10.3	1.5	-2.8
GDP Growth	6.3	1.7	4.1	3.8	4.0	3.9
Exports	16.1	0.4	6.3	4.0	10.1	6.8

Data source: National Statistics Office (NSO), World Development Indicators (WDI).

volatility.

Literature seems to suggest that keeping the real exchange rate at competitive levels and avoiding excessive volatility are important for growth – though the statistical evidence is not overwhelming. But this fact, in and of itself, conveys an important message. A stable and competitive real exchange rate should be thought of as a facilitating condition for economic growth. Keeping it at competitive levels and avoiding excessive volatility facilitate efforts to capitalize on economic growth enhancing fundamentals: human capital, savings and investment, and the institutional capacity to assimilate and generate organizational and technological know-ledge, *inter alia*. The transmission mechanism in which devaluation or real exchange rate volatility can affect economic growth has however been a subject of theoretical debate with inconclusive empirical findings. Two views seem to be dominating literature though: the traditional re-allocation of resources, especially the increase in productivity due to technology and human capital transfers, from non-tradables to tradable sector due to the increase in tradable prices; and the fairly novel argument that emphasizes the high savings rate channel – where a real depreciated rate leads to high interest rates for maintaining internal balance (Montiel and Serven, 2007). These high interest rates in turn lead to high savings rates that impact positively on growth as they encourage capital accumulation.

RESEARCH QUESTIONS AND ANALYTICAL PATH

This study aims at assessing the linkage between real exchange rate levels (and volatility) to economic growth in Malawi. It further explores the savings transmission mechanism through which such a link can take place in the country. It addresses the following questions:

1. What is the impact of the real exchange rate (particularly devaluation) on economic growth?
2. Is the real exchange rate impact only direct or it is also transmitted through the domestic savings route?
3. What is the impact of real exchange rate volatility on economic growth?
4. Is the real exchange rate level and volatility impact on economic growth observable both in the short and long-term?
5. What are the other conditioning factors for the link between the real exchange rate and economic growth?
6. What is the link between real exchange rate and sectoral output growth? With special focus on the tradables and non-tradables in the agriculture and manufacturing sectors.

THE REAL EXCHANGE RATE, SAVINGS AND GROWTH IN MALAWI: A BRIEF DESCRIPTION

So far no study has linked the real exchange rate to economic growth in Malawi. Attempts at this have stopped at linking devaluation to export performance with economic growth only being implied. For example, Musila and Newark (2003) find a positive impact of devaluation on export performance and in turn imply for positive impact on economic growth.

In this section, drawing largely on graphical aids, we present a broad picture of the Malawian experience with regard to linkages between the real exchange rate and economic growth and the candidature of savings as a transmission route of this link. Table 1 shows that the period 1970 to 2007 has seen savings growing over the decade while growth rates have been small, volatile and in most cases negative. Most of the savings growth has been in the decades 1980 - 1999. Surprisingly, growth has been lowest in those years suggesting possibly that the high savings rates were arising from deliberate polices aimed at reviving the economy that had declined significantly in the late 1970s and early 1980s partly due to the recessionary effects of the world oil price shocks. On the other hand, exports have grown more in the decades when Gross Domestic Product (GDP) has also grown. The close link between GDP growth and exports could be suggesting positive correlation of these two economic variables.

With regard to the exchange rate regimes, a fixed rate seems to be associated with higher savings rates and higher growth rates and exports. This, particularly the high export growth, could be reflecting the undervaluation that largely characterized the period before floatation. One has to note, however, that there could be many

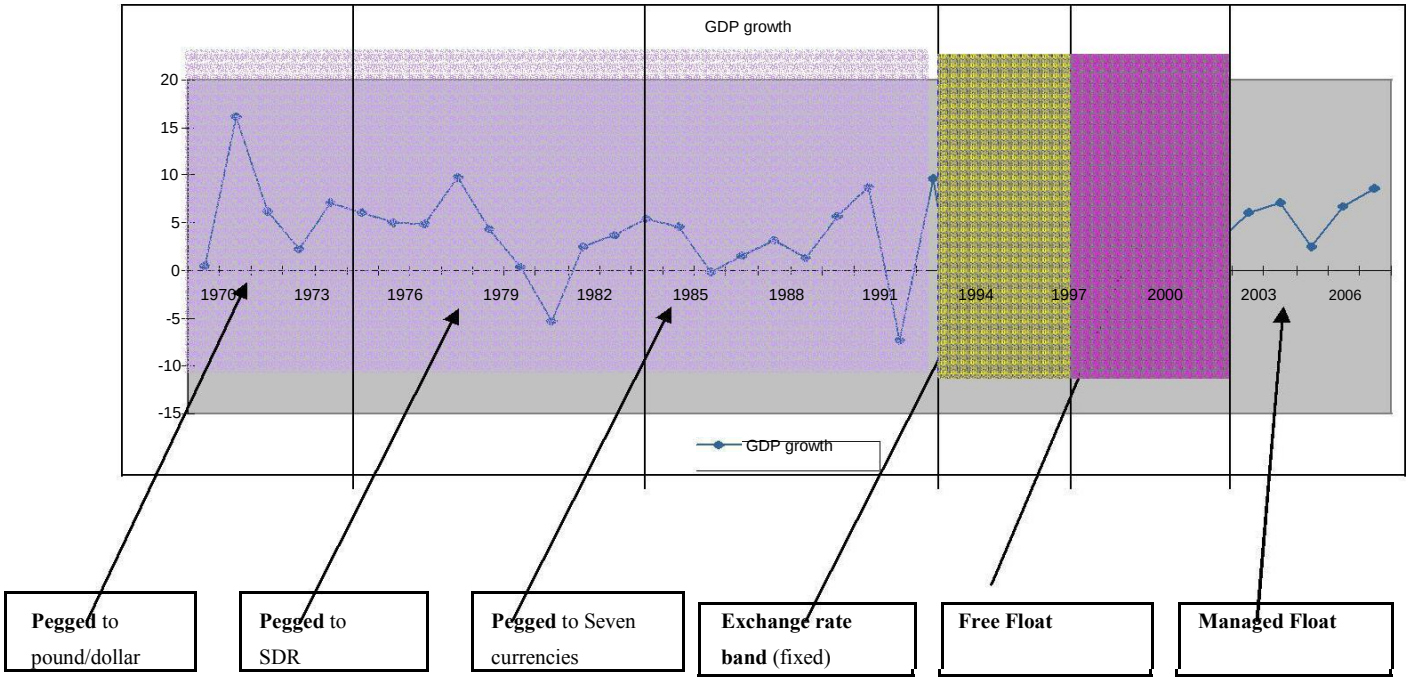

Figure 1. Linking the exchange rate regimes to economic growth.Data source: Reserve bank of Malawi.

other factors behind the high (low) levels in the variables under discussion under the fixed (floated) periods. Some relate to aid levels, external shocks, government policies, *inter alia*.

Notably, different exchange rate regimes have characterized the Malawi economy with the period before 1994 largely being under a fixed/pegged exchange rate regime (Figure 2). A free float, though not strict, operated in the period 1997 - 2003 but was abandoned for a managed float due to economic disequilibrium/instability arising from the low foreign exchange inflow resulting from drought and suspension of the IMF PRGF in 2000 and 2001 respectively. Interestingly, for most of the period up 1970 - 2003 when the nominal exchange rate was fixed or pegged to a basket of other currencies, the rate had been overvalued. On the other hand it had been overvalued for most of the period after 2003 in a period when free and managed floats have been in place. This could possibly be suggesting that while the periods before 2003 had a more competitive exchange rate, the latter parts of the current decade have had more increase in foreign exchange earnings likely from donor inflows and trade. In Figure 1, we look at the link between different exchange rate regimes that have characterized the Malawi economy over the years and economic performance.

Figure 1 shows, with the exception of a few shocks like the 1992 drought that an exchange rate pegged to a number of currencies and a managed float is associated with a growing economy. However, this link does not reflect causality. It should be noted also that the observed growth trend is also reflective of other developments in the economy along the years. For example, terms of trade fell in the late 1970s, the Mozambican war disrupted the transport system in the late 70s and early 1980s; droughts (1992) and political events (1993 – 1994 change to multiparty politics) and aid inflows (dry around 1992 -1993 and also late 1990s, but more aid from 2004) all played significant roles for growth. Notably, the period 1984 to 1992 had the most devaluation (7 in total) followed by increasing growth rates (which just got disrupted by the drought in 1992).

Worth noting also is the observation that a period of fixed exchange rates (1970 - 1997) had the most volatility in economic growth compared to the free and managed float period (1997 - 2007) with the manage float (effectively fixed) having the most positive association to growth. This could be reflecting the uncertainties that face investors in an economy that may be deemed to be overvalued with huge possibilities of unannounced devaluations as was the case with the 7 devaluations that took place in the period 1984 - 1992.

Secondly, we consider the link between the exchange rate misalignment[1] and economic growth. Figure 2a and b

[1] Real exchange rate misalignment refers to a situation in which a country's actual real exchange rate (RER) deviates from some notion of an implicit 'ideal" RER. Conceptually, a RER is misaligned when it deviates from the underlying RER that would have prevailed in the absence of price rigidities and short term factors. The exchange rate misalignment was found by modeling the REER on terms of trade index, openness of the economy, national output, behaviour of government expenditure on consumption of non-tradables and tradables.

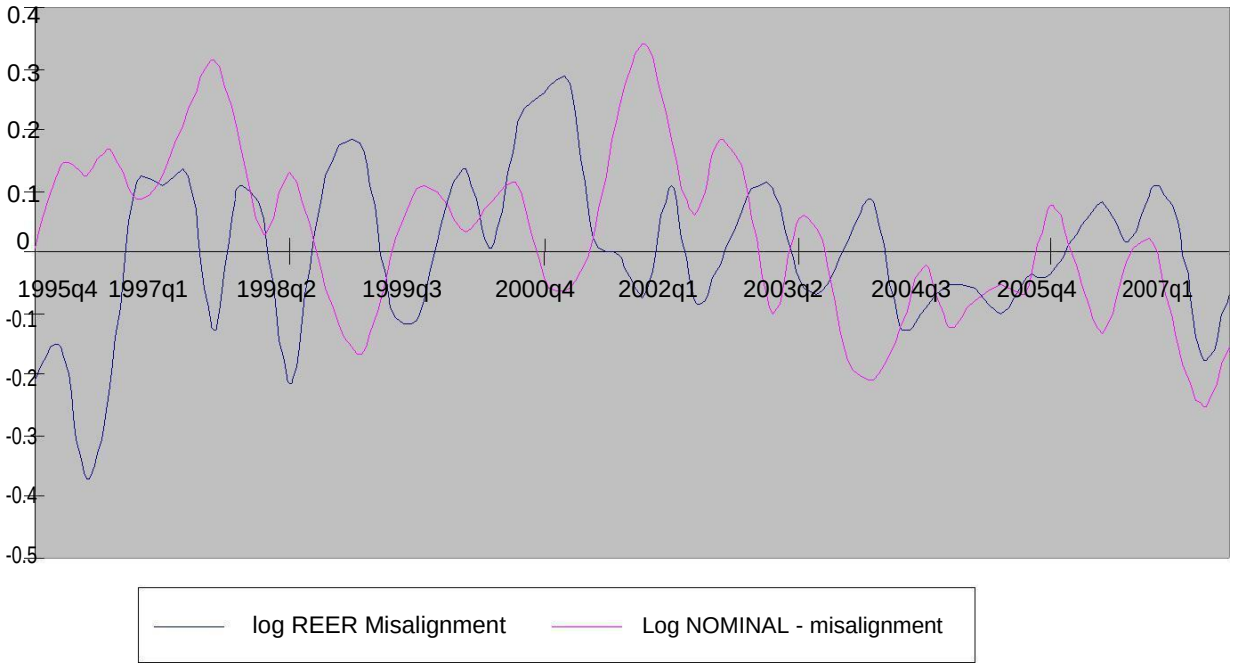

Figure 2a. The Nominal and REER misalignment: 1995 – 2007. Data source: Reserve bank of Malawi.

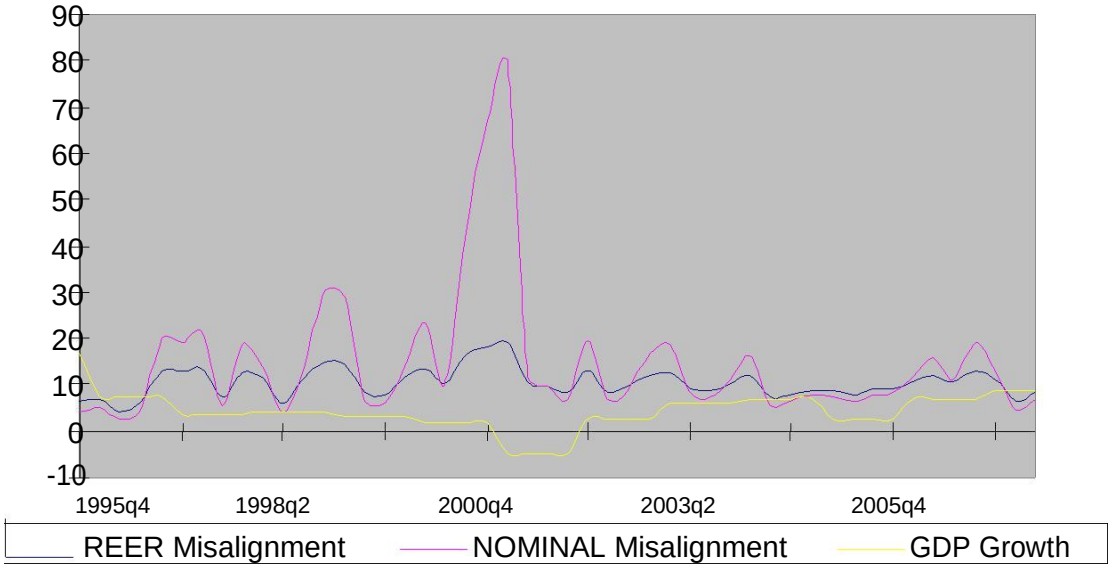

Figure 2b. Relating the exchange rate misalignment to economic growth: 1995 – 2007. Data Source: Reserve Bank of Malawi and NABOP.

depict the relationship. As can be seen from Table 2, for most of the period between 1994 when the exchange rate was floated under an exchange rate band, the nominal exchange rate had been mostly undervalued for most of the period (1994 - 2003). But for most of the 2004 - 2008 periods, the nominal exchange rate remained overvalued.

On the other hand, the real effective exchange rate (REER) has assumed the opposite behavior to that of the REER – appreciating as the nominal depreciated. This could be reflecting inflation differentials which seem to have been adversely affecting Malawi's competitiveness for most of the 1990s and period 2003 - 2006. From 2007

onwards, the REER regained its competitiveness (depreciating) as inflation levels kept on declining. Currently, as Figure 2a shows, the REER is undervalued while the nominal is overvalued.

In relation to economic growth, the misalignment in either the nominal exchange rate or the REER did not seem to have explicit relationship with it (Figure 2b). However, the huge nominal exchange rate misalignment in 2000 due to the weakening external value of the kwacha particularly starting the second quarter of the year seems to have been followed by a decline in national output in the subsequent year. Simwaka (2006) points to a number of factors as accounting for this development. On the international scene, one of the factors was the growth in the US economy which resulted into strengthening of the US dollar against all major currencies. Subsequently, the Malawi kwacha weakened in an attempt to maintain its competitiveness. On the domestic front, the collapse of tobacco prices at the auction floors had an adverse impact on the country's reserve position. This together with the hoarding of foreign currency by some exporters and non-receipt of pledged donor support led to scarcity of foreign exchange on the market thereby putting pressure on the kwacha. By end December, 2000, the external nominal value of the kwacha weakened by about 38 percent from the value observed at the end of 1999.

However, given that the REER reflects the ratio of the tradables to non-tradable prices; it is a more important variable to analyze with regard to a country's export competitiveness. Since the argument in the paper centres around the link between the exchange rate and growth, we briefly consider the two channels being posited: first a direct effect that runs through resource transfers from non-tradables to tradables. Second, link running from exchange rates to savings to economic growth. Figures 3a and b are telling in this regard.

Table 3 shows no link between the REER and export growth. While the REER seems to have been trending downwards over the years (implying competitive), there seems to have been no response in export growth. On the other hand trade competitiveness reflected in falling of the REER, has been associated with a decline in savings. This seems to imply that a devaluation of the exchange rate could lead to low national savings. One possible explanation could be that devaluation is associated with high inflation levels which may not be adequately corrected for by high interest rates to warrant increased savings. On the other hand, savings do not seem to be trending together with economic growth as can be seen in Figure 4. If any relationship exists between these two economic variables, the relationship is not explicitly detectable.

Summarily, through use of graphical lens, this section has helped to start unraveling the economic growth story with regard to influence of the exchange rates. So far, the graphs seem to suggest for no explicit relationship between the exchange rate and economic growth; a positive relationship between REER devaluation and savings; No relationship between the REER and export growth; a seemingly positive but unclear relationship between export growth and economic growth and inexplicit positive relationship between savings and economic growth.

However, the story so far cannot be substantiated in the absence of defining the causality in play as well as the general behavior of GDP growth, savings and exports under different conditioning factors. In the next section, we discuss causality between the series of interest (savings, exports, exchange rates and economic growth) in order to confirm the story we see in work.

ESTIMATING THE LINK BETWEEN THE REAL EXCHANGE RATE AND ECONOMIC GROWTH IN MALAWI

Following, Elbadawi et al. (2008), a modified economic growth behavioral model is specified. Given the evidence that real exchange rate, as well as its volatility, do affect trade and also evidence that trade affects growth, we control for trade when testing for the effects of the real exchange rate level and volatility on economic growth. Similarly, since REER can affect growth through the savings and other channels, we also control for savings and the other possible transmission candidates. Therefore, the impact of the real exchange rate on economic growth was parsimoniously specified as follows:

$$Y_t = \beta_0 + \beta_1 REER_{t-1} + \beta_2 \sum_{k=1}^{k} SAV_{t-1} + \beta_k x_{kii} \quad (1)$$

Where Y is the GDP per -capita growth standing for economic growth; REER is the real effective exchange rate; SAV is the gross national savings rate; x is a vector of control variables that enter parsimoniously and includes terms of trade (trade ratio), real exchange rate volatility, foreign aid; and is the disturbance term assumed to be an *i.i.d* Gaussian process with mean zero and variance . 0, 1, 2 are constant, coefficients showing the effects of real effective exchange rate and savings on per-capita GDP, respectively.

In the above model specification which links economic growth to the real effective exchange rate and savings rate (controlling for other factors), causality is assumed to run from the latter two to the former. In order to generate simultaneous results, the single-equation reduced-form behavioral model above can practically be expressed into a GARCH-M system of equations taking the following general form:

Table 2. Savings and the exchange rate.

Dependent: Savings growth	Period: 1970 - 2007 (except doe REER which runs from 1980)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	5.099 (1.23)	6.36 (1.33)	0.294 (0.08)	-198.7 (-2.08) **	-242.03 (2.19)**	-56.56 (0.85)	220.94 (1.39)
Savings growth (lagged)	-0.289 (1.72)	-0.330 (1.71)	-0.193 (1.16)	-.368 (1.86)	-0.37 (1.90)	-0.36 (2.27)**	-0.48 (2.36)
Exchange rate (nominal)	-0.239 (2.25)**	-		-	-	-	-0.141(0.48)
Exchange volatility (nominal)		9.35[A] (2.28)**		-	-	-	-
Exchange Misalign (nom.)[a]	-	-	50.716 (2.24)**	-	-	-	-
REER[a]	-	-	-	4.86[B] (2.07)**	-	-	4.50 (1.27)
REER volatility[a] -	-	-	-	-	54.52[B] (2.18)**	-	
GDP growth (lagged)[a]	-	-	-	-	-	5.97 (0.90)	5.39 (1.03)
Trade (lagged)[a]	-	-	-	-	-	45.23 (2.85)**	43.69 (2.22)**
Foreign aid (lagged)[a]	-	-	-	-	-	3.90 (0.63)	-8.19 (0.61)
Total observations	35	27	35	25	25	35	23
Adjusted R^2	0.12	0.16	0.12	0.15	0.16	0.26	0.27
Prob (F- BreuschGodfrey)	0.06	0.39	0.21	0.85	0.77	0.31	0.09
Prob (F-Statistic)	0.045**	0.05**	0.046**	0.05**	0.05**	0.02***	0.05**

(**), (***) represent 10, 5 and 1% significance levels respectively. Parentheses figures are t-statistics based on heteroskedastically consistent standard errors, [a] Expressed in Logs, [A] joint significance holds with ninth lag, [B] Joint significance holds with twice lag.

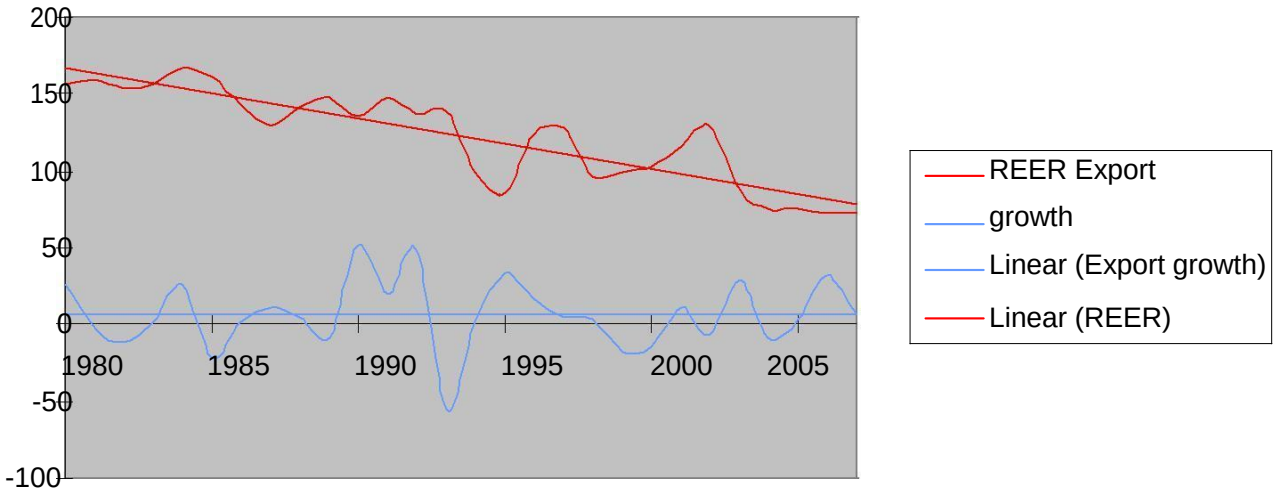

Figure 3a. Relating the REER to export growth.

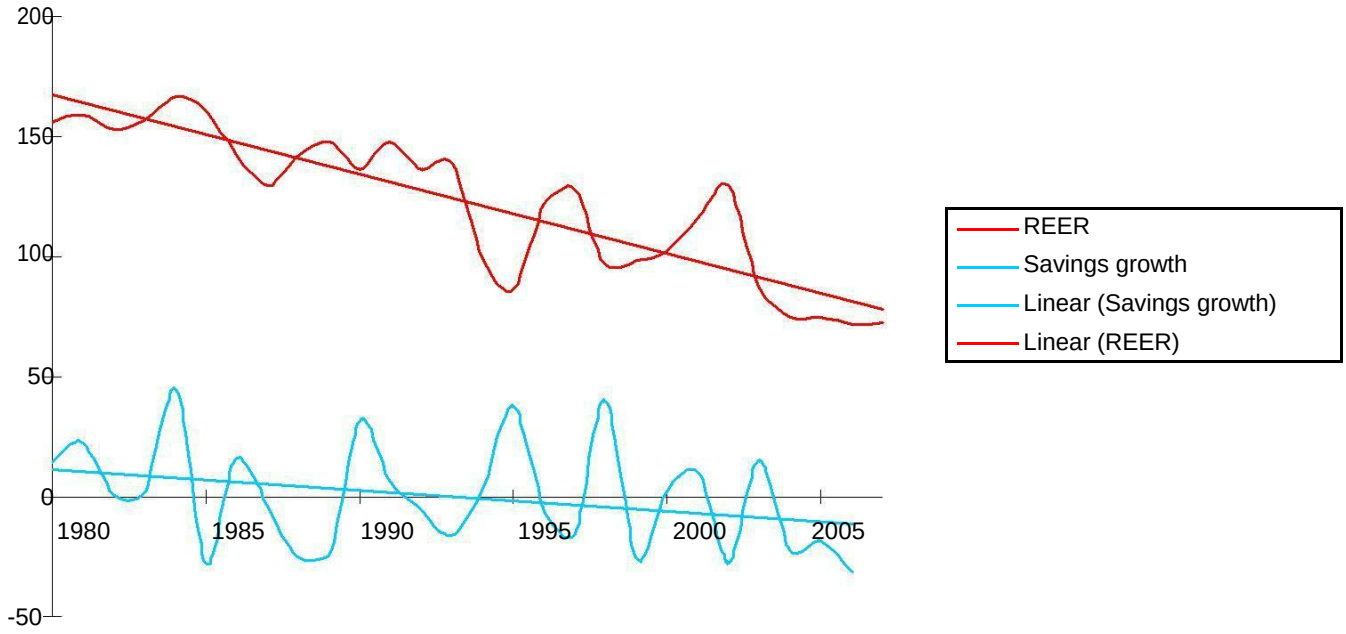

Figure 3b. Relating the REER to Savings growth, Data source: Reserve Bank of Malawi.

$$SAV_t = \alpha_0 + \alpha_i SAV_{t-1} + \beta_i \varepsilon_{t-i} + \beta_1 Y_t + \beta_2 Trad_{t-1} + \beta_3 REER_{t-1} + \beta_4 AID_{t-1} + \varepsilon_t \quad (2)$$

$$Y_t = \theta_0 + \Sigma\theta_0 Y_{t-i} + \Sigma\phi_i v_{t-i} + \Phi_1 REER_{t-1} + \Phi_2 SAV_{t-1} + \Phi_3 RSA_t + \Phi_4 Trad_{t-1} + \delta\sigma\varepsilon_t + v_t \quad (3)$$

$$COV_t = \rho(\sigma\varepsilon_t \sigma v_t) \quad (4)$$

Where Equation 2 is the national savings rate function with ARMA terms, national output growth, terms of trade, the lagged real exchange rate, and foreign aid; Equation 3 is the GDP per capita growth (Y) equation with ARMA terms, the lagged real exchange rate, national savings rate, the foreign income of the main trading partner, an annual lag of the terms of trade (trade ratio), and the conditional variance[2] of the real exchange rate (volatility).

Equation 4 is the constant correlation model of the covariance of the two error terms.

In this analysis, of main interest are the following parameters: β_3, the effect of the real exchange rate on national savings growth; Φ_1, the effect of the real exchange rate on economic growth controlling for savings, trade and other key growth determinants; δ, the effect of the real exchange rate volatility (uncertainty) on economic growth controlling for some of the savings, trade and other fundamental variables. A negative sign on the β_3 estimate would mean a devaluation having positive impacts on national savings rate. Also, a negative and significant estimate of Φ_1 would imply growth-enhancing effects of a devaluation. On the other hand, a negative and significant estimate of δ would imply an adverse effect of exchange rate uncertainty. These effects would be tested in Equations 1 and 2 controlling for savings and the other conditioning factors in order to test existence of a savings transmission route of exchange rates, apart from being a robustness check of the observed effects. An observed statistically significant diminished impact of the real exchange rate or its volatility on economic growth when savings is controlled for would imply that the latter could be a transmission channel for exchange rate policy effects on growth. Attempts were made to run the GARCH-M system of equations on real sectors, particularly

[2] The REER conditional variance (σ^2) reflects the exchange rate volatility (uncertainty). Following the leads of Erden and Holcombe (2006), Munthali (2008), this study uses a simple univariate model of GARCH(1,1) to obtain the real exchange rate uncertainty measure as follows:

$$x_t = \Phi_1 + \Phi_2 x_{t-1} + \upsilon_t; \quad t=1,\ldots,T;$$
$$\sigma_t^2 = \zeta_0 + \zeta_1 \upsilon_{t-1}^2 + \zeta_2 \sigma_{t-1}^2 \quad (5)$$

Where $\upsilon_t \sim N(0,\sigma_t)$ and σ_t shows the variance of υ_t onditioned on an information set up to period t. The fitted values of the conditional variance provide a proxy for uncertainty.

Table 3. Economic growth and the exchange rate.

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(**), (***) represent 10, 5 and 1% significance levels respectively. Parentheses figures are t-statistics based on heteroskedastically consistent standard errors. [a] Expressed in logarithms, [B] Joint significance holds with twice lag.

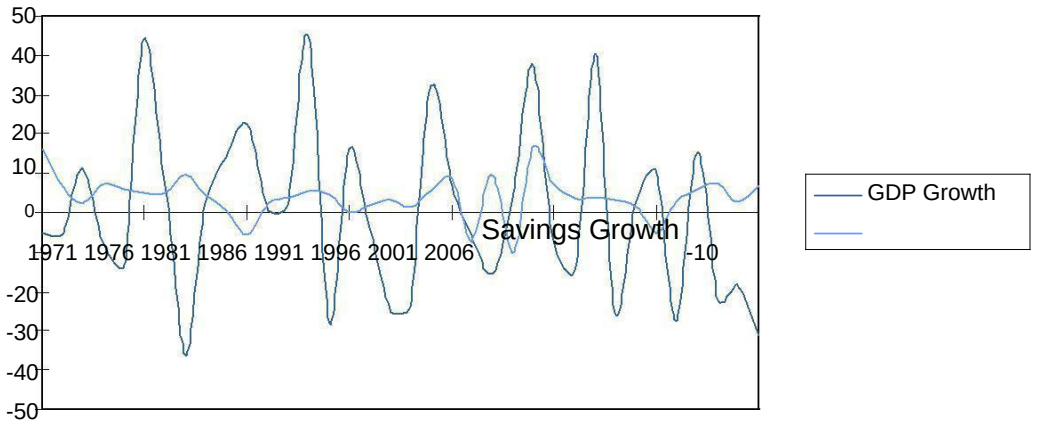

Figure 4. Linking savings to economic growth. Data source: WDI and NABOP Committee.

agriculture, manufacturing, and services to test for robustness of the findings at the aggregate level. Further, attempts were made to distinguish tradables from non-tradables in order to determine any taxing effects devaluation (appreciation) could have on the non-tradables (tradables).

DATA ISSUES

The following data series used in this study was explained in Table 6.

STUDY FINDINGS AND DISCUSSION

In the subsequent sub-sections, the authors report and discuss the results of running the regressions of Equations 2 and 3 in work.

Unit root and cointegration tests

The authors first inspect the series of interest for any trending behavior. With the exception of savings growth and REER misalignment, all other variables display some trending (Appendix 1a). We then proceed to formally test existence of unit roots in the series using the Augmented Dickey-Fuller and Philips Perron given their relatively high power over ordinary Dickey-Fuller-tests. The tests do confirm that REER misalignment and savings growth are stationary in levels while all the other variables are integrated of order one that is I (1) –Appendix 1b.

Further, following Johansen and Julius (1992), we test cointegration of the variables to see if there exists any long-run cointegrating vector amongst the variables of interest. Appendix 1c reports the cointegration tests. The variables are found to be cointegrated with 3 vectors observed. The cointegration still exists even when we take out GDP growth given its correlation effects to almost all the variables in the cointegration equation. This implies that one can model the long-run as well as the short run effects so long the integrated variables are first-differenced in the short-run error-correction scenario.

Estimating the savings function

We first estimate the savings function. Here we aim at assessing the effect of the nominal exchange rate (and its volatility), and the REER (including its volatility) on savings. We posit that devaluation will positively impact on savings. In turn high savings are hoped to influence economic growth as they offer more and cheap resources for capital accumulation. At this stage we make the assumption that savings impact on growth positively (even though this link has so far not come strongly in Descriptive and causality tests done so far). Table 2 reports the findings on savings. As seen in Table 2, the REER has very positive relationship with savings – a unit increase in the REER leads to an increase in savings growth of over 4% (Column 4 of Table 2). One would be looking at the mechanism here as being that of an appreciated currency encouraging savings due to the perceptions of the currency being over-valued and facing an unannounced depreciation. Individuals and firms would then save more than invest given the uncertainty of the currency direction. These effects are also obtained if the nominal US$ dollar exchange rate is used in the functions (column 1 of Table 2) . Further, nominal exchange rate misalignment leads to huge domestic savings growth.

The huge positive coefficient implies that a unit devaluation would lead to reduction of around 50% change in the savings rate – possibly implying running down of reserves towards investment in tradables.

On the other hand, the REER volatility is observed to be significantly positive implying possibly that volatility in the REER does encourage savings. Specifically, a unit increase in the REER leads to an increase in savings of over 4%. An appreciated currency could be encouraging savings due to the perceptions of the currency being over-valued and facing an eminent unannounced depreciation. This could be because firms and individuals would not be sure of investing until the REER becomes stable enough. Otherwise a non-stable currency could adversely affect investment plans as reflected in the 54% increase in savings arising from a unit standard deviation in the REER. The other conditioning variables largely assume the expected signs with trade having the most significant effect on savings.

Summarily, from Table 2, one would conclude that the REER level and its volatility, has very significant positive effects on growth such that devaluation (appreciation) would lead to reduction (increase) in savings. Similarly, an appreciation of the nominal exchange rate leads to increases in savings.

Estimating the economic growth function

Now that we know devaluation (appreciation) of the REER could lead to a reduction (increase) in savings, we turn to finding out what role the REER and savings have on economic growth. It could well be that increase or reduction of savings is an end in itself – that is, it does not translate into any effect on GDP in the economy. Table 3 links economic growth to the REER and savings. The results in Table 3, show a devaluation of the REER as having insignificant but positive effects on economic growth. In other words, GDP growth is largely inelastic to the REER changes. Interestingly, however, the table shows that a series of seven devaluations in the period 1984 to 1992 which cumulatively accounted for

devaluation of over 154%, had very significant effects on economic growth – specifically, each year of devaluation contributed around 47% to annual economic growth.

Relatedly, the US dollar nominal exchange rate which forms the core of the REER after the South African Rand shows that an appreciation (devaluation) of the dollar would have positive (negative) effects on economic growth. This finding, though contrary to theoretical expectation, is simply reflective of the trade structure of the Malawi economy – a net importer. Figure 3a and b showed imports as always being higher than exports and trending together. The trending together puts forward important suggestion: that Malawians exports could be dependent on imported inputs. A conjecture which is confirmed in Table 1 where granger causality tests show that imports cause exports and not the other way round.

Additionally, a REER and nominal exchange rate volatility are found to have negative effects on economic growth with the latter registering significant effects. Further, savings are found to have very insignificant, albeit positive, effects on economic growth in Malawi. One then questions the exchange rate's effects on economic growth through the savings route as suggested by literature. Again, the probability for rejecting a savings route in Malawi is reinforced when the economic growth function has savings controlled for and yet the effects of the exchange rate remain unchanged (both in magnitude of coefficient and its significance).

Conclusively, a single year devaluation of an overvalued REER would result in very insignificant effects on growth unless done over a series of consecutive years. Actually, a devaluation of the nominal exchange rate would lead to adverse effects on economic growth. Further, the savings channel through which exchange rate changes could affect economic growth seems to be rejected – in other ways, the capital accumulation route seems to be non-plausible. Instead trade is seen to have the most impact on economic growth. A unit drop in trade is seen to lead to increase in economic growth.

Estimating a trade function

Given the significance of trade in economic growth, one would wish to test if trade is the route through which exchange rates could be affecting economic growth in Malawi – allocation of resources from tradables to non-tradables (Total factor productivity route). Table 4 presents the findings linking the exchange rate to trade. Table 4 confirms the trade route in which exchange rates could be affecting economic growth. Both the nominal and REER appreciation (devaluation) are found to have positive (negative) effects on trade. This finding is contrary to theoretical expectations but suggesting that an appreciation of the exchange rate would lead to cheap imported inputs. However, this would imply that an appreciation facilitates easy access to more imported inputs (at lower value than previously) which in turn feed into exports. The result could be long-run increase in exports. Expectedly, therefore, the devaluation variable is found to have little impact on trade (Column 5 of Table 4).

More important to note, however, is the finding of a significant REER volatility variable (and to some extent that of the nominal exchange rate) (Columns 3 and 7 of Table 4). This could be signifying that volatility is very important for policy targeting in Malawi than mere levels. Again, a typical re-enforcement of the absence of the savings channel is observed - Controlling for savings in the export function does not affect the significance or magnitude of the REER coefficient (columns 1 and 2 of Table 4). Summarily, the analysis so far points to an appreciation (devaluation) of the exchange rate as having positive (negative) impact on savings, trade, and economic growth in the long-run. However, the transmission route for which exchange rates affects economic growth seems to be direct reflecting resource re-allocation towards the tradables rather than capital accumulation due to higher savings.

Short term effects of the REER on savings, exports and GDP growth

The next question is to consider whether the long-run effects so far observe remain robust in the short-term. Table 5 estimates an error-correction mechanism given that the authors already established integration of the variables in the work. In Table 5, The REER is seen to have significantly positive short-term effects on trade but no effects on economic growth and savings (Columns 1 - 3). However the consistently positive sign and economically significant REER coefficients points to an appreciation having positive effects on savings, trade, and economic growth. Generally, from an economic point of view, market participants desire predictability of real values, or relative prices. However, it is not historically obvious that a fixed nominal exchange rate produces a fixed or even easily predictable, real exchange rate. And it is precisely in the developing countries like Malawi where predictability is most valued, because the ability to hedge risk with financial derivatives is generally limited. Summarily, devaluation would likely favor agricultural exports but not necessarily services and manufactures. This seems to be suggesting that the latter two sectors favour a stable currency. On aggregate, however, devaluation is largely found to have insignificant effects on economic growth.

CONCLUSIONS

This paper aimed at assessing the effect of the exchange rate on economic growth in Malawi. In that regard, one objective was to find the transmission mechanism

Table 4. Trade and the exchange rate.

Dependent: Trade [a]	**Period: 1970-2007 (except doe REER which runs from 1980)**							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Constant	-2.20 (2.55)**	-2.19 (2.49)**	-2.59 (2.55)**	-0.68 (1.63)	-1.63 (0.72)**	0.004 (0.09)	0.002 (0.05)	1.38 (0.58)
Trade(lagged)[a]	0.58 (3.57)***	0.58 (3.49)***	0.54 (3.17)***	0.69 (4.15)***	-0.39 (2.28)**	-	-	0.46 (2.78)**
GDP growth (lagged)	-	-	-	-	0.99 (15.13)***	-	-	-0.34 (1.26)
Exch. (Nominal - lagged)	-	-	-	-	-	0.004 (2.97)**	-	-0.36 (1.46)
Exch. (Nominal) Volatility	-	-	-	-	-	-	-0.05 (1.82)	-
Savings growth (lagged)	-	-0.001 (0.28)	-0.001 (0.45)	-	-0.002(1.16)	-	-	-0.004 (1.75)
REER (lagged)[a]	0.44 (2.49)**	0.44 (2.44)**	-	-	-0.06 (0.18)	-	-	-
REER Volatility (lagged)[a]	-	-	-1.63 (2.50)**	-	-	-	-	-
REER Misalign[a]	-	-	-	0.62 (1.51)		-	-	-
Foreign income (lagged)[a]	-	-	-	-	0.22 (1.16)	-	-	0.11 (0.67)
Foreign aid (lagged)	-	-	-	-	-0.20 (1.14)	-	-	0.10 (0.52)
Devaluation	-	-	-	-	0.30 (1.79)	-	-	-
Total Observations	26	26	26	26	26	35	35	35
Adjusted R^2	0.49	0.47	0.47	0.41	0.44	0.41	0.29	0.34
Prob (F- BreuschGodfrey)	0.80	0.89	0.89	0.96	0.98	0.96	0.42	0.42
Prob (F-Statistic)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.01**

(**), (***) represent 10, 5 and 1% significance levels respectively. Parentheses figures are t-statistics based on heteroskedastically consistent standard errors, [a] Expressed in Logarithms.

Table 5. Short-term effects of the REER on savings, exports and GDP growth. Estimation **Period:** 1970-2007 (except for REER which runs from 1980).

Dependent	**Savings**	**Trade**	**GDP Growth**
Constant	0.21(0.04)	0.03 (0.44)	-0.02 (0.27)
Savings growth (lagged)	-0.31(2.24)**	-0.001(0.47)	0.001(1.26)
REER (lagged)[a]	26.33 (0.87)	1.19 (2.96)**	0.25 (0.81)
GDP growth (lagged)[a]	31.9 (0.16)	-0.40 (1.40)	0.94 (2.99)**
Trade (lagged)[a]	60.74 (3.15)***	0.94 (2.53)**	-0.30 (2.11)**
Devaluation (lagged)	-14.6 (1.22)	0.14 (1.59)	0.05 (0.60)
Total Observations	24	25	24
Adjusted R^2	0.72	0.42	0.44
Prob (F- BreuschGodfrey)	0.84	0.94	-
Prob (F-Statistic)	0.00**	0.01***	0.01**

(**), (***) represent 10, 5 and 1% significance levels respectively. Parentheses figures are t-statistics based on heteroskedastically consistent standard errors, [a] Expressed in Logs, [A] joint significance holds with ninth lag, [B] Equation with all variables in levels.

Table 6. Show the following data series used in this study.

Variable	Variable description	Data source
GDP growth	-	World Development Indicators (World Bank), Bank, Reserve Bank of Malawi (RBM)
REER	Real effective exchange rate	RBM
REER Misalignment	The exchange rate misalignment was found by modeling the REER on terms of trade index, openness of the economy, national output, behaviour of government expenditure on consumption of non-tradables and tradables	RBM
Nominal exchange rate misalignment	Nominal misalignment is found by modeling the nominal MK/US$ exchange rate on expected and actual differentials of inflation and also of interest rate.	RBM
Nominal Exchange rate volatility	Proxied by the conditional variance of the Nominal Exchange rate	Estimation
REER volatility	Proxied by the conditional variance of the REER	Estimation
Gross national savings rate	National Savings growth	World Bank Development Indicators, National Statistical Office (NSO)
Trade balance	Exports: imports ratio was used to avoid problems with logging trade deficits (that is negative values)	World Development Indicators
Agricultural value added	-	National Statistical Office (NSO)
Manufacture value added	-	NSO
Services value added	Proxying for non-tradables	
Foreign income	National income of the main regional trading partner that is, RSA	NSO
Foreign aid	ODA	World Development Indicators (WDI)
Gross capital formation	-	WDI
Financial depth	Proxied by ratio of bank credit to private sector to GDP	RBM/WDI

Table 6. Show the following data series used in this study.

Variable	Variable description	Data source
Devaluation	Dummy – assumes value 1 for each of the years a devaluation was effected in the period 194-1992	RBM
Float/managed float	Dummy - covers the period 1994-2007	RBM
Fixed/pegged	Dummy - covers period 1970-1994	RBM
GDP/capital growth	Lagged and differenced to control for endogeneity if entered as a right hand side variable.	WDI

through which exchange rates could affect economic growth. Generally, the estimation results cast doubt on the proposition that an undervalued REER would promote growth in Malawi. The observed effects in this study are in line with findings on the Mexican economy by Grier and Hernandez-Trillo (2003). Just like Malawi, Mexico is characterized by an extremely variable REER, little opportunity for hedging, and many exchange rate regimes. The negative impact of real exchange rate volatility on economic growth suggests that eliminating real exchange rate volatility can have strong growth-enhancing effects. It must be noted, however, that the real exchange rate is not a policy variable. It is a relative price, and is determined in the general equilibrium along with all other relative prices. Governments have a variety of instruments at their disposal to influence the level and reduce the volatility of the real exchange rate. The options include currency intervention (building up foreign exchange reserves) and eliminating institutional and market failures.

REFERENCES

Bhalla S (2007). Second Among Equals: The Middle Class Kingdoms of India and China. Peterson Inst. Int. Econ. Washington, DC.

Bernanke B (2005). The global saving glut and the US current account deficit. Paper presented at the Sandridge Lecture, Virginia Assoc. Econ, Richmond, Virginia (March).

Coiteux M, Olivier S (2000). The Saving Retention Coefficient in the Long-run and Short-run: Evidence from Panel Data. J. Money Finance, 19: 535-548.

Domac I, Shabsigh G (1999). Real exchange rate behaviour and economic growth: Evidence from Egypt, Jordan, Morocco, and Tunisia. IMF, Working Paper No. 99/40.

Elbadawi I, Kaltani L, Schmidt-Hebbel (2008). Foreign aid, the real exchange rate, and economic growth in the aftermath of civil wars. World Bank Econ. Rev., 22(1): 113-140.

Kamoto E (2006). The J -curve Effect on Trade Balance in Malawi and South Afr. MA thesis, University of Texas at Arlington.

Koop G (2005). Analysis Economics Data. 2nd Ed. John Wiley&Sons: West Sussex, England.

Grier K, Hernandez-Trillo F (2003). The real exchange rate process and its real effects: the case of Mexico and the USA. J. Appl. Econ. 7(1): 1-25.

Johansen S, Julius K (1992). Testing Structural Hypotheses in a Multivariate Analysis of the PPP and UIP for UK. J. Econom. 53: 211-244.

Johnson S, Ostry J, Subramaniam A (2007). The prospects for sustained growth in Africa. IMF Working Paper 07/52.

Li Y, Rowe F (2007). Aid Inflows and the real effective exchange rate in Tanzania. World Bank Policy Research Working Paper No. 4456

Micheal D, Folkerts-Landau D, Garber P (2003). An Essay on the Revived Bretton Woods System. NBER Working Paper no. 9971

Montiel P, Serven L (2007). Real Exchange rate, Saving and Growth: is there a link? The World Bank Policy Research Working Paper 4636.

Musila J, Newark J (2003). Does Currency Devaluation Improve the Trade Balance in the Long run? Evidence from Malawi,' African Development Bank.

Munthali T (2008). Interaction of the Public and Private sectors in Southern Africa: A Dynamic Panel Analysis. Int. Rev. Appl. Econ.

Prasad, Eswar, Raghuram G, Rajan, Arvind S (2006). Patterns of international capital flows and their implications for Economic Development. Proceedings, Federal Reserve Bank of Kansas City, p. 119-158.

Razin O, Collins S (1997). Real exchange misalignment and growth. NBER Working Papers, No. 6174.

Rodrick D (2007). The Real Exchange rate and economic growth: Theory and Evidence. Harvard University.

Rodrik D (2000). Saving Transitions. World Bank Econ. Rev., 14(1): 481-507.

Simwaka K (2007). The Effectiveness of Official Intervention in foreign exchange market in Malawi. MPRA Paper No. 1123.

Yeyati L, Sturzenegger F (2000). Exchange Rate Regimes and Economic Performance. Paper presented at the first IMF Research Conference (Washington, DC, 9-10 November). [on line] 47(special issue), pp. 62-95.