THE RELATIONSHIP BETWEEN DEVALUATION, EXPORTS AND IMPORTS: EVIDENCE FROM MALAWI

By

Pachalo Mgola Mwanza

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

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ABSTRACT

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The objective of the study was to explore the relationship between devaluation and exports and imports in Malawi. The study employed a linear dynamic model estimated by OLS method in E-Views software on annual data from 1980 to 2010. The study established that devaluation is associated with an increase in exports and a decline in imports in the country as theory suggests. However, these relationships are not statistically significant. The insignificant increase in exports is attributed to existing impediments such as cumbersome procedures when exporting. At the same time, the country imports intermediate commodities that cannot be easily substituted even if they become expensive. Thus, devaluationwill be a panacea for improving export revenuesif the impediments are reduced in the long run and imports will decline much if other policies such as import substitution supplement the devaluation strategy.

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CHAPTER 1: INTRODUCTION

1.1 Brief Background and Problem Statement

Malawi is among the least developed countries in the world. The average GDP per capita is less than US$500.Absolute poverty remains high with 40 percent of the population living on less than 1 dollar a day as of 2011. The country's expenditure is more than its income since 1980 as evidenced by the persistent current account deficits. Thus it depends on assistance from the IMF, the World Bank, and other multilateral and bilateral donors to finance the gap. The assistance is through grants as well as concessional and non-concessional loans. These financing options have not only made the country to over rely on foreign assistance but also made it to accumulate debts. These are viewed as risks to the future development of the country.[1]

Various policy makers, including IMF, highly recommend that an exchange rate policy that makes the Malawi currency, the Kwacha, lose value relative to other currencies (devaluation) will reduce the current account deficit since exports will increase while imports will decrease. This is based on the assumption that an increase in the price of importsincentivises the domestic economy to substitute the expensive imports for cheaper local commodities while a decline in price of exports incentivises the trading partners to increase demand of the relatively cheaper exports.[2] Nevertheless, Malawi has implemented this devaluation advice several times since 1980, but its benefits are yet to be observed.

In Malawi, over 80 percent of exportsconstitute tobacco, tea, coffee and cotton. Thus it is argued that these are primary products and theyhave a unique characteristic in that their demand does not increase much when their prices go down, hence devaluation does not

[1]Central Intelligence Agency (C.I.A),"Malawi,"*The World Fact-Book*. U.S.A: C.I.A, 2012.
The spending beyond generated income is reflected in the chronic current account deficits the country experiences since 1980.
[2] Government of Malawi, *Economic Policy Briefs*, Ministry of Economic Planning, 2012.

increase exports significantly.[3] Todaro and Smith also indicate that "demand for primary productsis not very responsive to price changes."[4] Still, the assumption of a small exporting country in International Trade Theory suggests that a country faces an inelastic demand even if the overall demand on the world market is inelastic. Thus impediments in exporting might be the ones hindering increase in exports other than the nature of the products being primary.

The country's major imports include petroleum products, fertilizer, other semi-manufactured products, and machinery and spare parts. Malawi has failed to substitute these imports despite the fact that their prices have been increasing in local money because they are necessary intermediate goods for the survival of the economy. Such being the case, there is low chance that devaluation will reduce imports significantly.[5]

However, devaluation tends to be inflationary whenit does not lead to significant decline in imports and significant increase in exports, as such, it introduces other economic challenges. James Chad (2012), for instance, argues that devaluation has instantaneous effect of increasing prices of imports;hence cost of production also increases. If imports cannot be reduced overtime, high domestic prices are set to prevail. In this situation, employees also ask for higher wages to maintain their living standards, which further increase the production costs. This "wage-price spiral" is then set into action.[6]Data shows that Malawi experiences

[3]Government of Malawi, *Economic Policy Briefs*, Ministry of Economic Planning, Various issues.

[4]Michael P. Todaro and Stephen C. Smith, *Economic Development*, 11th Ed., Boston: Addison-Wesley, 2012: 572-574.

[5]Government of Malawi, "Trade and Private Sector Development."*Annual Economic Report*, Ministry of Economic Planning, (various yearly issues).

[6]James M. Chad,"The J-Curve: Impact of Exchange Rate Changes on National Economies," Finance Train, 2012.https://www.cia.gov/library/publications/the-world-factbook/geos/mi.html.

Samson Kwalingana, Kisu Simwaka, Thomas Munthali and Austin Chiumia **,** " The short-run and long-run trade balance response to exchange rate changes in Malawi**."***Journal of Development and Agricultural Economics 4*, 2012. http://www.academicjournals.org/JDAE.

Eric B. Kamoto, "The J-Curve Effect on the Trade Balance in Malawi and Southern Africa," Univesity of Texas, 2006.http://wweb.uta.edu/economics/theses/Eric.Kamoto.pdf.

rapid inflation as soon as devaluation is implemented; therefore, this policy should be handled with care.

1.2 Purpose and Significance of Study

Against this background, the study explores the relationship between devaluation, exports and imports in Malawi. This evidence is vital in that it will guide policy makers realise whether this policy should be relied on or not as a major solution in boosting exports and reducing imports in order to increase domestic production. Studies done in Malawi, for instance, Kwalingana et al (2012)and Kamoto (2006) have concluded that devaluation increases both exports and imports in the long run; hence there is no improvement in the current account deficit. However,these papers have not disentangled the impact of devaluation on exports and imports; they just infer it from the movement of the ratio of exports to imports in response to devaluation in reduced form models. Therefore, to come up with proper policies, there is need to establish the behavior of imports and exports in response to devaluation in isolation since alternative policies directed at exports or imports only can be considered in this case. Thus the study would like to bridge this information gap.

1.3 Research Questions

With the above purpose in mind, the study addresses the following questions:

- To what extent does devaluation affect imports in Malawi? and
- To what extent does devaluation affect exports in Malawi?

1.4 Organization of the Study

The remaining part of the study is organised as follows: Chapter 2 is literature review which comprises of the theoretical relationship between devaluation, exports and imports and the empirical evidence from studies on these relationships. Chapter 3 deals with methodology of the study andChapter 4 is a discussion of the statistical results obtained based on the

methodology. Finally, chapter 5 is a summary of the main findings of the study and policy implications on the same.

CHAPTER 2: LITERATURE REVIEW

2.1 Devaluation, Exports and Imports in Theory

The difference between exports and imports is called a trade balance and it's the major component in current account. When exports are less than imports it is called a trade deficit but when they are more than imports it is called a trade surplus. Devaluation is normally advocated to reduce a trade deficit. Devaluation simply means a situation where a domestic currency starts to buy less of foreign currencies. This affects relative prices of goods and services between countries which then impacts on the demand of exports and imports. The relative price of goods and services is called the real exchange rate. This paper, however, defines real exchange rate in unconventional way due to data limitations, as such, it is being defined as $RER=EP/P^*$ where RER is real exchange rate, E is the nominal exchange rate, P is the domestic price level and P^* is the foreign price level. A decrease in E means foreign currency is becoming expensive in terms of domestic currency (also called nominal devaluation) hence RER goes down in this expression (real devaluation). Real devaluation will also occur when P goes down or P^* goes up. If real devaluation occurs, foreign goods and services become expensive relative to domestic goods and services, as such, the demand for imports goes down. A real devaluation also makes domestic goods and services to become relatively cheaper in foreign markets hence exports increases. This occurrence improves the trade balance and boosts domestic production--economic growth.[7]

There are several theoretical explanations on the response of the real exchange rate from nominal devaluation and its associated impact on trade balance and growth. The notable ones include the Asset Approach, the Monetary Approach, the Absorption Approach, and the Synthesis Approach. The Asset Approach argues that a nominal devaluation always results

[7]AnjuGupta-Kapoor and Uma Ramakrishnan. "Is There A J-Curve? A New Estimation for Japan."*International Economics Journal* 13.Number 4.1999. http://147.46.167.195/~kiea/IEJ/vol13_4/w5.pdf.

in real devaluation in the short run. Therefore, it implies that exports will increase and imports will decrease in the short run due to devaluation. This improves trade balance hence boosts domestic production in the short run. Complementary to the Asset Approach, is the Monetary Approach which argues that nominal devaluation does not have an impact on the real exchange rate in the long run. It is based on the Purchasing Power Parity (PPP) which says that due to arbitrage, a basket of given goods sells at the same price in different locations or countries in the long run when expressed in common currency. In other words, the theory postulates that that there is no change in relative prices due to nominal devaluation in the long run. This implies that there is no effect on exports and imports in the long run due to devaluation. As such, there is no effect on trade balance and domestic national production.

The Absorption Approach argues that a nominal devaluation may affect the real exchange rate both in short run and long run. It says that, if this is achieved, imports go down either through expenditure reduction as purchasing power of the domestic economy declines due to increase in foreign prices or through expenditure switching from expensive foreign goods and services to relatively cheaper domestic goods and services. But, aggregate output in this case may increase if there are unutilized domestic resources but may decline if the economy depends on imported intermediate goods. In other words, devaluations will increase exports and boost domestic production only if there are enough domestic resources for that purpose. Similar to this argument, is the Synthesis Approach which also says that in both short run and long run, nominal devaluation affects real exchange rate, but only if the initial condition of the RER is misaligned. Thus depending on whether the initial condition is an overvaluation or undervaluation, a nominal devaluation affects the relative prices in different magnitudes. For instance, during an overvaluation, a nominal devaluation may not completely erode this overvaluation hence exports will not increase and imports will not go

down. As such, increase or decrease in exports and imports is a matter of macroeconomic policy which depends on whether the economy is undervaluing or overvaluing its currency.[8]

Nevertheless, devaluation generates two types of impacts on exports and imports namely the price effect and the volume effect. According to Gupta-Kapoor and Ramakrishnan (1999), the price effect means that devaluation makes imports to be expensive soon after devaluation but make exports to be cheaper in the foreign markets soon after devaluation. This price effect dominates in the short run making imports value to be high and exports value to be low in the short run. However, economic agents respond to these price changes and make necessary adjustments in the long run such that the volume of trade changes: the volume of exports increases while the volume of imports decreases. This volume effect dominates making value of imports low and value of exports high in the long run.Starting from a trade deficit situation, thus devaluation increases the trade deficit in the short run since imports increase and exports decline due to price effect domination but it eventually improves as exports increase and imports decline due to volume effect domination. Plotting this phenomenon produces a J-Curve hence it is dubbed the "J-Curve effect."[9]

2.2 Empirical Evidence in Malawi and Elsewhere

Most studies on the impact of devaluation on exports and imports thus have aimed at established whether a J-Curve exist in respective countries, that is, increasing trade deficit in short run but improving it in the long run. Evidence is mixed in that in some countries the phenomenon holds but in other countries it does not. For instance, Kalyoncuand others (2009) examined "effectiveness of devaluation on the trade balance in Argentina, Brazil, Mexico and Peru." Theyfound that devaluation indeed worsened balance of trade in all the four

[8] Feenstra, Robert C., and Alan M. Taylor, *International Macroeconomics*, Worth Publishers, 2008.
Also information got from Isabel Muguamba, *The Impact of Exchange rate Devaluation on Imports and Exports in Mozambique*, University of East Anglia, 1998.

[9] AnjuGupta-Kapoor and Uma Ramakrishnan. "Is There A J-Curve? A New Estimation for Japan."*International Economics Journal* 13.Number 4.1999. http://147.46.167.195/~kiea/IEJ/vol13_4/w5.pdf.

economies in the short run, but in the long run, it improved only in Argentina and Peru. In other words, Mexico and Brazil failed to increase their exports or reduce their imports, contradicting the theory.[10]Kapoor and Ramakrishnan (1999)also investigated the "effects of devaluation on balance of trade in Japan." they discovered that devaluation increased trade deficit in the short run and it improved after wards implying that exports increased and imports declined, confirming the theory.[11]

Studies on impact of devaluation on exports and imports in Malawi have also been aimed at verifying if the J-Curve effect exists in the country. For instance, Kwalingana and others (2012), senior economists at Reserve Bank of Malawi, examined the short-run and long-run effects of real exchange rate changes on the trade balance in Malawi. They discovered that devaluation does not improve trade balance in the long run.[12]Kamoto (2006) also investigated the "effects of devaluation on the trade balance in Malawi and South Africa." He also discovered that devaluation does not improve trade balance in the long run[13]

These Malawian studies argue that trade balance is not improving because exports are not increasing significantly while imports are increasing instead of decreasing mainly because exports are primary products and imports are necessities. But these author did not empirically test the exports and imports function separately; they just inferred this behavior from the reduced form movement of the of the trade balance in response to devaluation.Therefore, the conclusions they draw from these studies do not provide all the necessary evidence required for better policy formulation.

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[10]HuseyinKalyoncu, IlhanOzturk, SeyfettinArtan and KahramanKalyoncu, "Devaluation and Trade Balance in Latin American Countries," *Zb. rad. Ekon.fak. Rij* 27, 2009: 115-128.

[11]AnjuGupta-Kapoor and Uma Ramakrishnan, "Is There A J-Curve? A New Estimation for Japan,"*International Economics Journal* 13, Number 4, 1999.

[12] Samson Kwalingana, Kisu Simwaka, Thomas Munthali and Austin Chiumia **,** " The short-run and long-run trade balance response to exchange rate changes in Malawi**."***Journal of Development and Agricultural Economics 4*, 2012. http://www.academicjournals.org/JDAE.

[13]Eric B. Kamoto, "The J-Curve Effect on the Trade Balance in Malawi and Southern Africa," Univesity of Texas, 2006.http://wweb.uta.edu/economics/theses/Eric.Kamoto.pdf.

Unique to these studies, is Musila and Newark (2003) who analyzed the "impact of nominal exchange rate devaluation on the trade balance for Malawi" and the results supported the "view that nominal devaluation can indeed be a quite powerful tool in minimizing the imbalances in Malawi's international trade." They established that "devaluation helps to improve export performance and to curtail the growth of imports in the long run, which lead to improvement in the trade balance position." This study, however, uses nominal effective exchange rate which in theory and practice is not a good predictor of imports and exports, hence the results might not be reliable for policy formulation as well.[14]

2.3 Study Hypothesis

To address the short falls of evidence for policy implications observed in the previous studies in Malawi on the impact of devaluation on export and imports, this study tests the following hypothesis:

- Devaluation is not associated with a significant increase in exports in Malawi.
- Devaluation is not associated with a significant decrease in imports in Malawi.

The study expects to fail to reject them all. This is because Malawi's major exports are primary products which are less sensitive to relative price changes and major imports are the necessities to the economy which cannot be easily substituted.

[14]Musila J.W. and J. Newark, "Does currency devaluation improve the trade balance in the long run? Evidence from Malawi" *African Development Review-Revue Africaine De Developpement,* Volume 15. Issue: 2-3: 2003.

CHAPTER 3: METHODOLOGY AND DATA

3.1 Theoretical Model

This paper aims at examining the relationship between devaluation, exports and imports in Malawi. According to literature, the major determinants of exports and imports are domestic income, foreign income, and relative prices. The import demand function can be theoretically stated as follows:[15]

$$M = f(Y, RER) \quad \text{..... (1)}$$

Where *M*isthe quantity of imports demanded.*Y*is the domestic national income and its increase, is associated with an increase in *M*. Therefore, Y and M are positively related. *RER* is the real exchange rate, which indicates the relative prices of domestic and foreign goods and services and is expressed as $RER=EP/P^*$ where *E* is the nominal exchange rate, *P* is the domestic price level and P^* is the foreign price level. A decrease in *E* means foreign currency is becoming expensive (devaluation) and *RER* goes down: *M* also goes down since foreign goods become relatively expensive. In other words, there is a positive relationship between real devaluation of domestic currency (*RER* decline) and imports (M). *RER* also goes down when *P* decreases or when P^* increases.

In the same manner, the export demand function can be theoretically stated as follows:

$$X = f(Y^f, RER) \quad \text{..... (2)}$$

Where *X*is the quantity of exports demanded in foreign countries Y^f is the foreign national income and *RER* is as defined above. An increase in the foreign national income increases *X*, the quantity of exports demanded. Thus *X* and Y^f are positively related. A decline of *RER* means that the prices of domestic goods are relatively cheaper in the foreign

[15]Feenstra, Robert C., and Alan M. Taylor, *International Macroeconomics*, Worth Publishers, 2008.

countries, therefore, the demand for exports (imports in foreign countries) increases. Thus *X* and *RER* are negatively related in this scenario.[16]

3.2 Econometric Model

Based on these theoretical concepts, most studies, such as Munguamba (1998), express the imports and exports demand functions as follows:[17]

$$LM = a + \beta_1 LMGDP + \beta_2 LREER + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$LX = a + \beta_1 LWGDP + \beta_2 LREER + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where *LX* is the natural log of exports quantity, *LM* is the natural log of imports quantity, *LMGDP*is the natural log of real domestic national income; *LWGDP*is the natural log of real foreign income (world GDP); and *LREER*is the natural logarithm of the real effective exchange rate (the weighted average of the real exchange rate RER). The variables are expressed in logarithmic form in order to avoid heteroskedasticity issues and also to interpret β_1 and β_2 as elasticities. Finally, ε is an error term while *a*is a constant term which captures the average effect on *LM* and *LX* that is not explained by the included explanatory variables.

In equation (3), the study expects to find positive sign for β_1. This is because theory assumes that an increase in domestic national income leads to an increase in imports. The sign of β_2 is also expected to be positive. This is because our data has been expressed in such a way that decline in *REER* means real devaluation and theory indicates that there is positive relationship between devaluation and imports. In equation (4), the sign of β_1 is expected to be positive because increase in foreign national income is supposed to increase export in theory.

[16] AnjuGupta-Kapoor and Uma Ramakrishnan. "Is There A J-Curve? A New Estimation for Japan."*International Economics Journal* 13.Number 4.1999. http://147.46.167.195/~kiea/IEJ/vol13_4/w5.pdf.

[17] Isabel Muguamba, *The Impact of Exchange rate Devaluation on Imports and Exports in Mozambique*, University of East Anglia, 1998.

The sign of β_2 is expected to be negative. This is because real devaluation is supposed to increase exports in theory.

3.4 Data Description

The study utilizes secondary annual data ranging from 1980 to 2010, which was collected from the World Bank and IMF databases. Real effective exchange rate ((REER) is an index and is calculated in such a way that a decline in the index means a real devaluation and an upward movement is real revaluation. The study uses export volume index (X) and import volume index (M) instead of the absolute volume numbers due to data unavailability. It also uses the real income of advanced countries as proxy for real world income (WDGP) due to same reason of data limitation. In addition, the study uses real domestic national output (MGDP) expressed in local currency than in US dollars because the latter is more volatile due to swings in exchange rate.

Table 1 provides correlation coefficients between the variables and it shows the direction and strength of the relationships of the above variables in their log transformations over the period 1980 to 2010.

TABLE 4: CORRELATION MATRIX

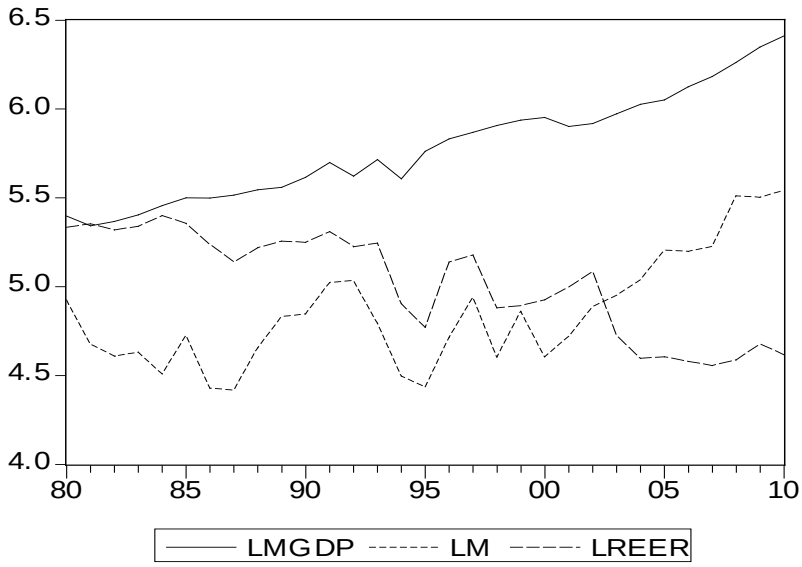
	LREER	**LX**	**LM**	**LMGDP**	**LWGDP**
LREER	1.000000	-0.875773	-0.594217	-0.880944	-0.891476
LX	-0.875773	1.000000	0.760582	0.961920	0.915229
LM	-0.594217	0.760582	1.000000	0.763275	0.707579
LMGDP	-0.880944	0.961920	0.763275	1.000000	0.932750
LWGDP	-0.891476	0.915229	0.707579	0.932750	1.000000

The matrix indicates that there is strong negative relationship between the log of real effective exchange rate index (LREER) and the log of export volume index (LX) and the log of import volume index (LM). This implies that as the Malawi currency devalues, both imports and exports increase. However, the relationship between LM and LREER is opposite

of theoretical expectation. LX is also strongly positively correlated to the log of advanced countries national output (LWGDP) implying that as world output increases exports increase as well. The log of domestic gross production (LMGDP) is also strongly positively correlated to LM implying that as national income of Malawi increases, imports also increase. These relationships are in line with theory.

Figure 1 below indicates the visual representation depicting the relationship between log of real effective exchange rate, log of domestic national income and imports. The figure shows that between 1980 and 2002, imports (LM) and real effective exchange rate (LREER) were moving together as theory suggests, with observable lags.

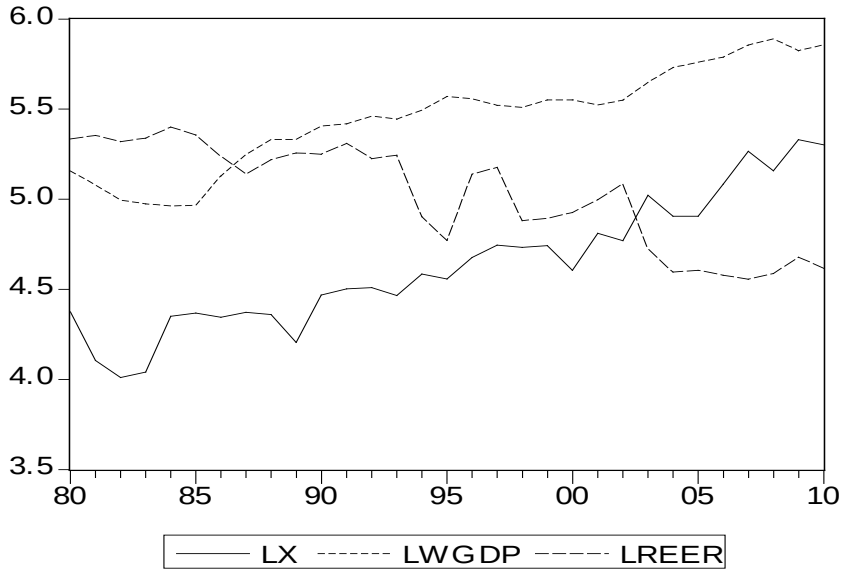
FIGURE 1: RELATIONSHIP BETWEEN LREER, LMGDP AND LM



This means that between 1980 and 2002, imports declined when Malawi currency devalued and increased when it revalued, however this changed after 2002 in that imports increased when the currency was devaluing. This can be attributed to the effect of the booming in the economy influencing imports more than the effect of real effective exchange rate. This is observed by the sharp increase in domestic national output (LMGDP) from 2002 onwards.

Figure 2 below depicts the relationship between log of real effective exchange rate, log of world output and log of exports. The figure shows that LX and LREER have been moving in opposite direction over the entire period. In other words, exports have been increasing while the real effective exchange rate has been declining (real devaluation). In addition, world output and exports have all been moving together in an upward direction. All this is in line with theory.

FIGURE 2: RELATIONSHIP BETWEEN LREER, LWGDP AND LX



CHAPTER 4: EMPIRICAL RESULTS

4.1 Impact of Devaluation on Exports

The study estimated two regressions on the relationship between devaluation and exports using Ordinary Least Squares technique in E-Views software. The results are presented as Case A and Case B. The difference is that case B includes a lagged term of the dependent variable as an explanatory variable mainly to resolve serial autocorrelation problem experienced in Case A. Table 2 below provides the regression results. The figures in parenthesis are t-statistics.

TABLE 5: EXPORT REGRESSION RESULTS

Dependent Variable is LX

Independent Variable	**Case A**	**Case B**
c	1.86	0.64
	(0.90)	(0.34)
LX(-1)		0.54
		(2.96)
LWGDP	0.84	0.43
	(4.13)	(1.86)
LREER	-0.36	-0.17
	(-1.84)	(-0.88)
R^2 adjusted	0.84	0.88
F-Statistic	82.62	71.60
Durbin-Watson	1.16	1.91
Observations	31	31

Starting with Case A, the sign of the coefficient of log of real effective exchange rate (LREER) is negative as expected. The size of the coefficient indicates that a 1 percent real devaluation is associated with a 0.36 percent increase in exports in the long run holding the influence of world income (WGDP) constant. However, the t-statistic at -1.84 indicates that this relationship is not statistically significant at 5 percent significance level. The sign of the coefficient for world income (LWGDP) is positive as expected. It shows that a 1 percent

increase in world income is associated with a 0.84 percent increase in exports in the long run holding the influence of real effective exchange rate (REER) constant. This relationship is significant at 5percent significance level as indicated by the t-statistic of 4.13.

The adjusted R^2 shows that the model explains about 84 percent of the variation in export volume. This indicates that the model is well fitted although this might be due to trend over time of the variables; as such, the regression might just be picking this strong correlation. Still, the F-statistic is also statistically significant from zero at 5 percent significance level indicating that the explanatory variables (LREER, LWGDP) together have a significant impact on the explained variable (LX). However, the Durbin-Watson statistic of 1.16 is less than 2, hence it indicates presence of positive serial correlation. This undermines the efficiency of the coefficients meaning that there is high probability of declaring a coefficient insignificant. Therefore, Case B regression included the lagged term of LX as an explanatory variable to correct this problem.

Case B regression (in table 2 above) means that exports this year are also influenced by exports of last year. The sign of the coefficient of LREER is negative as expected. This implies that a 1 percent real devaluation is associated with a 0.17 percent increase in exports in the short run. If this 1 percent real devaluation is sustained, it is associated with a 0.37 percent increase in exports in the long run.[18] However, this relationship is not significant as indicated by the t-statistic of -0.88 in the short run. The sign of the coefficient of LWGDP is positive as expected and it shows that a 1 percent increase in world income is associated with 0.48 percent increase in exports in the short run. In the long run, this increase in world income is associated with a 0.93 percent increase in exports. But still, the relationship is insignificant in the short run at 5 percent level of confidence since t-statistic is 1.86.

[18] To calculate long run effect, the coefficient of LREER and coefficient of LWGDP is divided by 1 minus the coefficient of LX(-1).

The adjusted R^2 showsthat the model explains about 88 percent of the variation in export volume. This indicates that the model is well fitted and the F-statistic is also statistically significant from zero at 5 percent significance level indicating that the explanatory variables (LREER, LWGDP) together have a significant impact on the explained variable (LX). The Durbin-Watson statistic at 1.91 (close to 2) indicates that the problem of positive serial correlation in the residuals has subdued.

4.2 Impact of Devaluation on Imports

The study also estimated two regressions on this relationship. The results are again presented as Case A and Case B. The difference is that case B included a lagged term of LM (imports) as an explanatory variable in order to resolve serial correlation problem experienced in Case A. Table 3 below provides the regression results. The figures in parenthesis are t-statistics.

TABLE 6: IMPORT REGRESSION RESULTS

Dependent Variable is LM

Independent Variable	**Case A**	**Case B**
c	-3.56	-4.31
	(-1.28)	(-2.03)
LM (-1)		0.55
		(3.97)
LMGDP	1.13	0.80
	(4.29)	(3.54)
LREER	0.38	0.38
	(1.40)	(1.83)
R adjusted	0.58	0.77
F-Statistic	21.89	32.75
Durbin-Watson	0.68	1.91
Observation	31	31

In Case A, the sign of the coefficient of log of import (LM) is positive as expected in theory. It shows that for a 1 percent real devaluation, there is a decline in imports by 0.38 percent in the long run holding effect of domestic national income (MGDP) constant.

However, the t-statistic at 1.4 indicates that this relationship is not significant at 5 percent level of significance. The sign of the coefficient of log of domestic national income (LMGDP) is positive as expected and it shows that a 1 percent increase in domestic national income is associated with a 1.13 percent increase in imports in the long run holding effect of real effective exchange rate (REER) constant. This relationship is significant at 5 percent significance level since the t-statistic is 4.29.

The adjusted R^2 shows that the model explains about 58 percent of the variation in import volume. This is low for time series data and it suggests that some important variables that also better explains changes in imports are missing. Still, the F-statistic is statistically significant from zero at 5 percent significance level indicating that the explanatory variables (LREER, LMGDP) together have a significant impact on the explained variable (LM). The Durbin-Watson statistic at 0.68 indicates that there is serial autocorrelation; as such the efficiency of the model coefficients is compromised, meaning that there is high probability of declaring a coefficient insignificant. As such, Case B regression included the lagged term of LM as an explanatory variable to correct this problem.

In Case B (in table 3 above), the sign of the coefficient of LREER is positive as expected and it shows that a 1 percent real devaluation is associated with a 0.38 percent increase in exports in the short run. This real devaluation is associated with a 0.84 percent increase in exports if sustained in the long run. However, the t-statistic at 1.83 indicates that this relationship is not significant at 5 percent confidence level in the short run. The sign of the coefficient of LMGDP is positive also as expected and it shows that a 1 percent increase in domestic national income is associated with an increase of 0.8 percent in imports in the short run. In the long run, the same 1 percent increase in domestic income is associated with a 1.78 percent increase in imports. The t-statistic of 3.54 indicates that this relationship is significant at 5 percent level of confidence in the short run.

The adjusted R^2 indicates that the model explains about 77 percent of the variation in import volume meaning that the model is well fitted. The F-statistic is statistically significant from zero at 5 percent significance level indicating that the explanatory variables (LREER, LMGDP) together have a significant impact on the explained variable (LM). The Durbin-Watson statistic at 1.91 indicates that the problem of serial autocorrelation has been resolved.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The main objective of the study was to explore the relationship between devaluation, exports and imports in Malawi. This was motivated by the fact that the Malawi government and development partners might be overemphasizing devaluation policy as the main solution for increasing exports and switching from imports to domestic goods and services in order to boost the gross domestic production. Therefore, the study tested two hypotheses which are; (i) devaluation is not associated with significant increase in exports in the country, (ii) devaluation is not associated with significant decrease in imports in the country.

The results show that devaluation is associated with an increase in exports and a decrease in imports as proponents suggest; however, the relationships are not statistically significant. The insignificant increase in exports can be attributed to exporting impediments which among others include the unrecognized status of the Malawi bureau of standards internationally to certify exports as well as cumbersome procedures during exportation. On the imports side, the economy depends on foreign intermediate goods for its domestic production, as such it cannot easily substitute them, and hence imports do not go down when devaluation is implemented. Still, the results show that increase in domestic national income is associated with significant increase in imports as suggested in theory.

5.2 Policy Recommendations

The following policy implications can be deduced for the results:

- On the one hand, the government can increase exports through devaluation of the local currency, but not significantly. Supplementary policies that aim at reducing impediments in the exports system can be very beneficial to the economy if the goal is

to increase exports. Thus devaluation should be regarded as a panacea to increasing exports in the country in the long run but subject to the reduction in the impediments.

- On the other hand, imports are not declining much even if they become expensive due to devaluation. This is because there is no immediate substitute of intermediate necessities such petroleum products and machinery. Nevertheless, the country should put in place policies that attract investment in the areas of the commodities that are being imported if the goal is to reduce imports. On the extreme case, the government can implement policies that influence people to avoid importing luxurious products that might also be contributing to the huge import bills.

APPENDICES

APPENDIX

Below are the detailed regression results from E-Views software.

Dependent Variable: LX
Method: Least Squares
Date: 11/15/12 Time: 13:07
Sample: 1980 2010
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.856686	2.054896	0.903543	0.3739
LWGDP	0.844836	0.204723	4.126722	0.0003
LREER	-0.364298	0.198319	-1.836930	0.0769

R-squared	0.855105	Mean dependent var	4.634809
Adjusted R-squared	0.844756	S.D. dependent var	0.362319
S.E. of regression	0.142758	Akaike info criterion	-0.963572
Sum squared resid	0.570632	Schwarz criterion	-0.824799
Log likelihood	17.93536	F-statistic	82.62193
Durbin-Watson stat	1.163041	Prob(F-statistic)	0.000000

Dependent Variable: LM
Method: Least Squares
Date: 11/15/12 Time: 13:12
Sample: 1980 2010
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.561589	2.792640	-1.275349	0.2127
LMGDP	1.125645	0.262197	4.293132	0.0002
LREER	0.379745	0.271298	1.399738	0.1726

R-squared	0.609886	Mean dependent var	4.856416
Adjusted R-squared	0.582021	S.D. dependent var	0.315503
S.E. of regression	0.203976	Akaike info criterion	-0.249858
Sum squared resid	1.164979	Schwarz criterion	-0.111085
Log likelihood	6.872805	F-statistic	21.88696
Durbin-Watson stat	0.679021	Prob(F-statistic)	0.000002

Dependent Variable: LX
Method: Least Squares
Date: 11/15/12 Time: 13:17
Sample(adjusted): 1981 2010
Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.644662	1.869900	0.344757	0.7331
LX(-1)	0.538540	0.181675	2.964301	0.0064
LWGDP	0.430209	0.230813	1.863882	0.0737
LREER	-0.166778	0.189525	-0.879981	0.3869

R-squared	0.892028	Mean dependent var	4.643474
Adjusted R-squared	0.879570	S.D. dependent var	0.365232
S.E. of regression	0.126747	Akaike info criterion	-1.169689
Sum squared resid	0.417682	Schwarz criterion	-0.982863
Log likelihood	21.54534	F-statistic	71.60136
Durbin-Watson stat	1.906108	Prob(F-statistic)	0.000000

Dependent Variable: LM
Method: Least Squares
Date: 11/15/12 Time: 13:15
Sample(adjusted): 1981 2010
Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.314242	2.130457	-2.025031	0.0532
LM(-1)	0.550982	0.138765	3.970618	0.0005
LMGDP	0.796877	0.224941	3.542609	0.0015
LREER	0.376246	0.206150	1.825110	0.0795

R-squared	0.790727	Mean dependent var	4.854159
Adjusted R-squared	0.766580	S.D. dependent var	0.320641
S.E. of regression	0.154913	Akaike info criterion	-0.768337
Sum squared resid	0.623951	Schwarz criterion	-0.581510
Log likelihood	15.52505	F-statistic	32.74652
Durbin-Watson stat	1.906661	Prob(F-statistic)	0.000000

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