

Does Exchange Rate Volatility Harm Exports? Evidence from Mauritius

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Abstract

Mauritius is a small island economy, dependent on trade and highly influenced by changes in world demand and currency fluctuations. This paper empirically investigates the impact of real effective exchange rate volatility on the Mauritian export performance from 1975 to 2007. Exchange rate volatility is derived from the moving average standard deviation method since no GARCH effect was obtained. The empirical results based on the ARDL analysis show that real exports are cointegrated with foreign economic activity, real effective exchange rate and volatility of real exchange rate. Our findings reveal that exchange rate volatility has a positive and significant short run effect on exports, whilst in the long run; volatility adversely affects the Mauritian exports. It thus becomes crucial to consider both the existence and the degree of exchange rate volatility for the implementation of appropriate trade policies to improve the country's export performance and trade balance.

Keywords: exchange rate volatility, exports, MASD, ARDL, cointegration

INTRODUCTION

Like many developing countries, Mauritius depends on the rest of the world and the level of interdependence has increased in last decade. Mauritius is a small island economy with a domestic market insufficiently large to support large scale production and inevitably depend on imports from other countries to supply a large part of domestic consumption and on exports to other countries to provide markets for much of its output. It is vulnerable to any adverse changes in other economies and changes over which it does not exercise any control. Mauritius has increasingly liberalized its trade frontiers leading to lower barriers to trade, for both goods and services. This has increased trade and intensified international competition.

In addition to greater trade and financial liberalisation, two specific changes have impacted significantly the Mauritian economy namely the phasing out of the preferential access obtained on the EU market for sugar exports and the dismantling of the Multi Fibre Agreement for our textile products. In addition, currency markets show different degrees of volatility, reflecting the particular economic circumstances that the country faces through time. Exchange rate volatility is another crucial element that needs to be considered for small countries that depend extensively on trade – the case of Mauritius. The problem of exchange rate volatility has given rise to a broad debate but there is no consensus on whether exchange rate volatility influences trade

volumes or on whether any such influence is negative or positive.

Exchange rate fluctuations has been a major concern for export enterprises as an appreciating rupee has a strong bearing on the competitiveness of their products and hence on their profit margin. The Central Bank has, whenever possible and required, intervened in the market to stabilise the rupee. The Bank introduced the Swap Scheme in January 2011 to hedge against currency fluctuations, and so far some US\$ 40 million have been swapped. However, enterprises cannot depend on a weak rupee to enhance their competitiveness as improving productivity, focusing on product development; moving up market and tapping niche markets remain essential conditions to confront competition. In particular, Mauritius has also attempted to diversify its export markets by focusing on the regional markets of SADC and COMESA and exploring emerging markets untapped until now.

Exports account for around 30 percent of our GDP. The export oriented enterprises have registered a robust growth of around 6 percent and a record export figure of Rs 40 billion which is attributed to strong macroeconomic policies pursued at home and exports represents a backbone for the Mauritian economy, since it has a high rate of profit and generates foreign exchange earnings. It also

generates employment opportunities and ability to achieve strong and sustainable growth for a country.

The objective of the paper is to examine the impact of exchange rate volatility on the Mauritian export flows to the rest of the world. The ARDL bounds testing procedures developed by Pesaran et al. (2001) is used on annual data for the period 1975 to 2007. The paper is structured as follows. Section 2, reviews the literature on exchange rate volatility and exports whilst section 3 analyses the growth and export performance of the Mauritian economy. Section 4 sets out the analytical framework specifying the model and variables used. The estimation technique is discussed in section 5 and section 6 analyses the findings. We finally conclude in section 7.

LITERATURE SURVEY

The effect of exchange rate variability on exports is still a debatable issue as it depends on the paradigm we adopt and various assumptions namely currency denomination of the contract, utility functions used, firms' or traders' attitudes towards risk, presence of imported inputs, market structure, and availability of hedging opportunities (Cote, 1994).

The neoclassical paradigm argues that prices and factor markets are perfectly flexible, and hence any shock arising from changes in the nominal exchange rate will be absorbed through changes in prices or hedging markets, leaving the real effective exchange rate and trade volumes unchanged (Friedman, 1953; Johnson, 1969). De Grauwe (1988) argues that a rise in nominal exchange rate fluctuations can either have a positive or a negative effect on the volume on trade as it depends on the substitution and income effects. The substitution effect leads risk-averse agents to decrease export activities as the expected marginal utility of export revenues decreases whilst the income effect causes risk-averse agents to increase exports to avoid severe fall in revenues. If the income effect offsets the substitution effect, there will be a positive link between exchange rate volatility and trade. Alternatively, then an increase in risk will have a negative impact on trade.

Most current microstructural theoretical models of exporter behaviour predict a negative relation between exchange rate risk, reflected in the conditional variance of the exchange rate, and export volumes (Barkoulas et al. 2002). The increased risk associated with volatility is likely to induce risk averse agents to direct their resources to less risky economic activities. Cote (1994), Hooper and Kohlhagen (1978) and Clark (1973) state that exchange rate volatility depresses trade. This occurs because markets may be imperfect particularly in less developed countries and also because hedging may not only be imperfect but also very costly as a basis for averting exchange risk. Hence in line with the

risk-aversion hypothesis, exports may be negatively correlated with exchange rate volatility (Doroodian, 1999; Krugman, 1989). Even where hedging is available, the effect of exchange rate volatility on the variability of profit can be diminished, but not fully eradicated (Clark, 1973). In addition, Arize et al (2000), Hooper and Kohlhagen (1978) argue that higher exchange rate volatility will depress trade volume through a rise in adjustment costs like irreversible investment due to higher uncertainty and risks.

On the other hand, exchange rate variability can affect trade volume positively (Franke, 1991 and Sercu and Vanhulle, 1992). Higher risk present greater opportunity for profits and, thus exchange rate volatility, to the extent that it increases risk, will increase trade. Exporting goods can be perceived as an option (Broll and Eckwert, 1999). The value of the option is positively related to the volatility of the underlying asset. Thus, an increase in exchange rate variability will improve export performance as firm will exercise the option to export and thus increase the volume of trade. International firms with large domestic shares of markets can also benefit from exchange rate fluctuations as they are able to move products between domestic and foreign markets and the higher expected profits opportunities that arise from exchange rate volatility make trading more attractive. The ambiguity of theoretical predictions has made the debate to become an empirical one. The direction and the magnitude of the effects of exchange rate volatility on export turn out to be an empirical issue.

However, the empirical studies still provide mixed results. Qian and Virangis (1994) examine the impact of exchange rate volatility on trade in six countries, using ARCH to approximate volatility and monthly data from 1973 to 1990. Their results show a negative link between exchange rate volatility and export volumes for Australia, Canada, and Japan, while for United Kingdom, Sweden, and Netherlands there is positive relationship. The magnitude of the impact of exchange rate volatility differ considerably ranging from a decline in exports of 7.4 percent for Canada to an increase of 5 percent for Sweden, as a result of a 10 percent increase in volatility. Fountas and Bredin (1998) show that exchange rate volatility has only a short run negative effect on real exports for Ireland to UK from 1979 to 1993. Using the ARDL bounds testing method to cointegration and monthly date from 1993 to 2001, De Vitta and Abbott (2004) observe that short term volatility in exchange rate does not affect UK exports to the EU both at the aggregate and sectoral levels. However, there are significant and negative effects of long term volatility on UK exports to EU. The negative link is attributed to the difficulty to hedge against long run fluctuations. Further, Ekanayake et al. (2010) find

that exchange rate volatility has a negative effect on export demand in six products exported by U.S. to its major trading partners and significant positive effects in four products, from January 1990 to December 2007.

In addition, Aguirre et al (2003) show that exchange rate volatility has a significantly negative effect on Brazilian manufactured exports in the period 1986 to 2002. The study of Alam (2011) based on the ARDL analysis shows that real exports are cointegrated with foreign economic activity, real effective exchange rate and volatility of real effective exchange rate. Real effective exchange rate is found to have a significant negative coefficient, while the volatility of real effective exchange rate, adversely affects the Pakistan's aggregate exports from 1979 to 2005. Further, there is no dynamic short run causality from exchange rate volatility to demand for exports. Hosseini and Moghaddasi (2010) use the ARDL bound testing procedures and observe that depending on the measure of volatility used¹, there is no significant relationship between Iranian exports flows and exchange rate volatility from 1970 to 2006. However, there is positive significant effect on agriculture, minerals, transport means and oils and fats exports.

The empirical studies on developing countries are rather scant. Arize et al (2000) examine the impact of exchange rate on the export flows of 13 less developed countries over the quarterly period 1973-1996. Exchange rate volatility is measured by the moving-sample standard deviation. Their results reveal that for each country, exchange rate volatility elasticity is significantly both in the long run and the short run. The long run negative volatility elasticities range from 0.10 in Taiwan to 0.85 in Mexico. For Mauritius, the negative coefficient is 0.59. The short run coefficients for exchange rate volatility range from 0.68 to 15.37 on average. For Mauritius, the short run negative effect of exchange rate volatility on exports is 0.27. Cameron et al. (2005) further provide evidence for negative effects of monthly exchange rate variability on Uganda's coffee exports from 1998 to 2001. Todani and Munyama (2005) use different measures of exchange rate volatility and show that there is no statistically significant relationship between South African exports flows and exchange rate volatility from 1984 to 2004 or when a significant relationship exists, it is positive. These results are however not robust as there is a huge degree of sensitivity with respect to the different measures used. Musonda (2008) shows negative short run and long run impacts of exchange rate volatility on non-traditional exports performance in Zambia. Sekantsi (2008) through the ARDL

approach provides evidence that real exchange rate volatility exerts a significant and negative impact on South Africa's exports to the U.S. from 1995 to 2007.

Situational Analysis of the Mauritian Economy

Despite the inherent constraints of a small island economy, Mauritius has achieved remarkable economic success over the years. The economy was entirely dependent on sugar exports and showed little scope for sustained economic progress and improvement in living standards (Meade, 1961). But, Mauritius has since evolved into an upper middle income economy. The economy grew at an average rate of 5.7 percent between 1990 and 2000. However, Mauritius was faced with the challenge of adjusting to the phasing out of trade preferences in textiles and sugar. Economic growth slowed down to 4.7 percent per annum on average from 2000 to 2005.

GDP growth has been stable from 2006 to 2008 but with a sudden drop of 2 percent, from 5.1 percent in 2008 to 3.1 percent in 2009. This is largely attributed to the impact of the global financial crisis on the different sectors of the economy. The economy grew by 4.2 percent in 2010 higher than the 3.1 percent recorded in 2009, gradually recovering from the effects of the global crisis (Tandrayen, 2011).

Mauritius depends considerably on external trade and investment and the level of interdependence has increased in last decade. Exports are the backbone of the country and our export performance has been impressive in last few years as shown by Figure 1.

Mauritius has benefited from a set of preferences throughout history under the ACP-EU and the Multi Fibre Agreements. The economy enjoyed preferential access to the EU and USA. The main commodities that Mauritius exports are clothing and textiles, sugar, cut flowers, fish and fish preparations, watches and clocks and molasses. The main export partners are UK, France, USA, Madagascar, Italy, South Africa, Reunion and Belgium. Further from Figure 2 below, export price index has been on the rising trend over the last decades. In fact, export prices had been increasing due to a rise in labour costs and enterprise rents. A rise in export prices negatively affects export demand. However, if a rise in export prices is coupled with a depreciating currency the effect can be neutralized. This is, in effect, what has happened in Mauritius.

Since Mauritius is an export-led economy, changes in the exchange rates of its major trading partners impact the external value of the rupee. The Bank of Mauritius has the task of safeguarding the external value of the rupee and its international convertibility by taking appropriate measures. To maintain external competitiveness of the economy, the Bank of Mauritius introduced a managed-float system in

¹ ARCH and GARCH Models and Moving Sample Standard Deviation

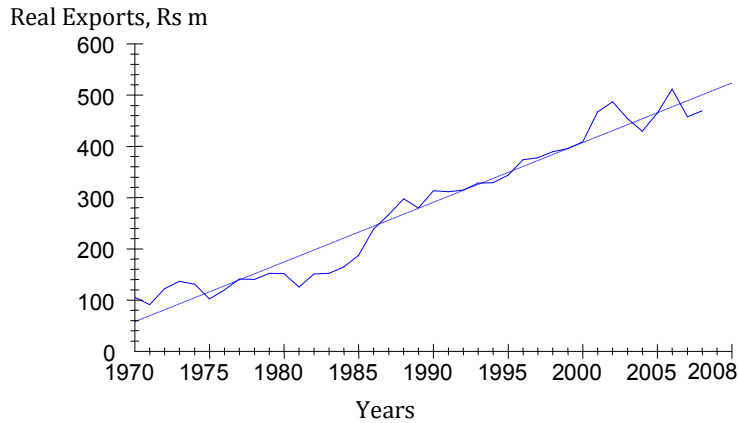


Figure 1: Real Exports (1970-2008)
Source: Central Statistical Office (Mauritius)

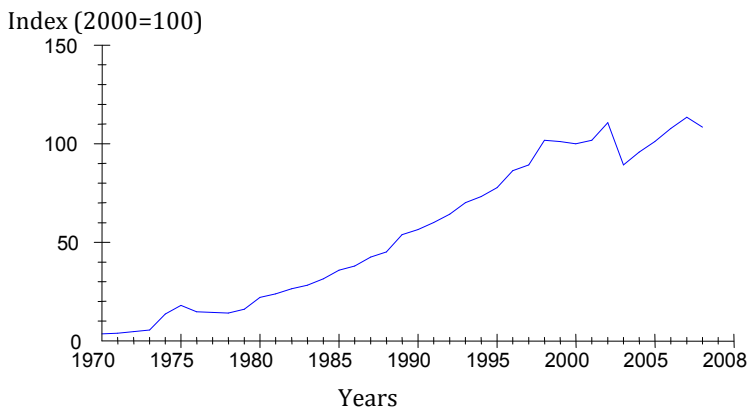


Figure 2: Export Price Index (1970-2008)
Source: International Financial Statistics

1994. As a result, the Bank intervenes in the market by buying and selling dollars to the interest of its exchange rate policy. Though the latter participates to fine tune the economy, the system is characterized by a flexible exchange rate regime.

The real effective exchange rate, which is composed of the currencies of Mauritius major export partners, shows that between 1970 and 1984 the Mauritian rupee was an overvalued currency vis-à-vis that of its partners (see Figure 3 below). As a result, when Mauritius embarked in the re-structural programme

of the IMF, it had to devalue its currency to be competitive in the international market. Therefore, to fine tune the economy the currency has been constantly depreciated. From 1988 to 1996, the real effective exchange rate was fairly stable. In 2003, the currency depreciated further to increase competitiveness in the EPZ sector as a result of the phasing out of the MFA. The rupee has been depreciating over the years to counter the effect of shocks on trade balance and to improve competitiveness.

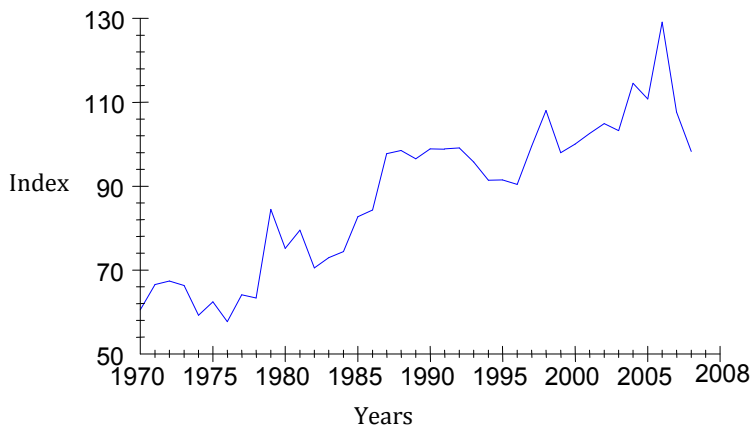


Figure 3: REER Index (1970-2008)
Source: International Financial Statistics

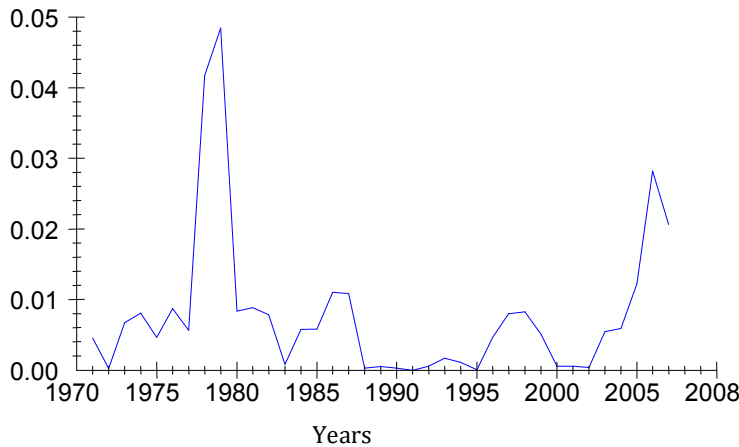


Figure 4: Exchange Rate Volatility (MASD)
Source: International Financial Statistics

Further as can be seen from Figure 4 below, the Mauritian currency has been fluctuating widely in the year 1970s. However, it became more or less stable from the late 1980s to the mid 1990s when it started to fluctuate again.

ANALYTICAL FRAMEWORK

Model Specification

From De Vita and Abbott (2004), the long run export demand is specified as follows:

where X is the natural logarithm of Mauritius' real

$$X_t = \beta_0 + \beta_1 REER_t + \beta_2 Y_t + \beta_3 V_t + \varepsilon_t \quad (1)$$

exports vis-à-vis its major export partners. $REER$ is real effective exchange rate that is the relative price which measures exports competitiveness. Y is real foreign income which encompasses the real GDP of main export partners. V is the measure of real

exchange rate volatility, t is the time dimension and ε_t is a white-noise disturbance term. One would expect increases in real GDP of trading partners to result in a greater volume of exports to those partners. In addition, the real exchange rate depreciation may lead to an increase in exports due to the relative price effect. The relationship between the volatility of the real exchange rate and the real exports is ambiguous. Thus, it is expected that $\beta_1 < 0$, $\beta_2 > 0$, and $\beta_3 < 0$ or > 0

DATA SOURCES AND VARIABLE DEFINITIONS

This study uses data for the period 1970 to 2008 from the International Monetary Fund's International Financial Statistics and the Central Statistical Office of Mauritius.

Export Volume

Export volume is a better measure than value of exports. It is thus deflated by unit value of exports as

$$X_t = \frac{Xv_t}{Xp_t}$$

where X_t is the volume of exports, Xv_t is the export values, and Xp_t is the unit value of exports.

Real Effective Exchange Rate (REER)

The REER is calculated by employing a weighted geometric average of real exchange rates of the national currency to the currencies of its major export partners. The weights are obtained in terms of

$$W_i = \frac{X_i}{\sum_{i=1}^n X_i}$$

where W_i is weight of country i in the overall export volume of Mauritius, X_i is exports of

Mauritius to country i and $\sum_{i=1}^n X_i$ denote exports of

Mauritius to the main export partners. The index of the nominal bilateral exchange rate (NBER) is calculated in the following way (for example, to the

U.S) as
$$NBER_{U.S.t} = 100 * \left(\frac{ER_{U.S.t}}{ER_{U.S_0}} \right)$$

where $ER_{U.S.t}$ is the nominal exchange rate of the rupee to the U.S. \$ for period t , and $ER_{U.S_0}$ denotes

the nominal exchange rate for the base year (year = 2000). Further, the formula for calculation of the bilateral real exchange rate (RBER) is

$$RBER_{U.S.t} = NBER_{U.S.t} * \left(\frac{CPI_{U.S.}}{CPI_{Mrt}} \right)$$

where $CPI_{U.S.t}$ is CPI of U.S for period t and CPI_{Mrt} is CPI of Mauritius for period t .

The Nominal Effective Exchange Rate (NEER) is obtained by applying the geometric average of the nominal bilateral exchange rate as follows:

$$NEER_t = (NBER_1)^{w1} * (NBER_2)^{w2} * \dots * (NBER_n)^{wn}$$

where NEER is the nominal effective exchange rate, $NBER_j$ represents nominal bilateral exchange rate index for country j and w^j is the weight of country j for period t . Finally, the REER is found as follows:

$$REER_t = (RBER_1)^{w1} * (RBER_2)^{w2} * \dots * (RBER_n)^{wn}$$

where $RBER_{it}$ is real bilateral exchange rate of the rupee to the U.S. \$ for period t . When the index of the REER is rising, it means that the local currency is depreciating in real terms relative to that of major exports partners. Accordingly, the competitiveness of the local goods rises.

Foreign Income

The real foreign income is a weighted average of the real GDP of respective trading countries. Real GDP

is calculated by dividing the nominal GDP of each country by the GDP deflator with base year 2000 of the respective countries. The weight used is as

$$Y_t = \sum_{i=1}^8 W_{it} * Y_{it}$$

where Y_t is the real foreign income, W_{it} is the weight of country i for period t , and Y_{it} is the real GDP of country i at time t .

Exchange Rate Volatility

The exchange rate volatility measure is the time varying measure of volatility that is the moving average standard deviation (MASD). The formula is as follows:

$$V_t = \left[\frac{1}{2} \sum_{i=1}^2 (LREER_{t+i-1} - LREER_{t+i-2})^2 \right]^{\frac{1}{2}}$$

where LREER is the log of REER and the moving average chosen is 2. The MASD. has been chosen over the standard deviation measure as it is a time varying measure of volatility. Further, given the low frequency data used, no GARCH effect was found.

Estimation Technique

The methodology used is the autoregressive distributed lag (ARDL) approach to cointegration proposed by Pesaran et al. (2001). The ARDL bounds cointegration technique has been selected to determine the long run and short run relationships between real exchange rate volatility and export performance. The procedures to carry out the ARDL approach to cointegration technique include the determination of the long run relationships among the variables used in the models; and the estimation of the coefficients of the long and short run relationships. To estimate the ARDL model is to test for the presence of long run relationships among the variables by using the Bounds F-Test. To implement the bound test procedure, equation (1) is modelled as a conditional ARDL error correction model (ECM) as follows:

$$\Delta X_t = \delta_0 + \sum_{i=1}^m \theta_i \Delta X_{t-i} + \sum_{j=1}^n \lambda_j \Delta Y_{t-j} + \sum_{k=1}^p \gamma_k \Delta REER_{t-k} + \sum_{l=1}^q \alpha_l \Delta V_{t-l} + \beta_1 X_{t-1} + \beta_2 Y_{t-1} + \beta_3 REER_{t-1} + \beta_4 V_{t-1} + \varepsilon_t$$

The short run dynamics are captured by the terms with the summation signs whereas the other terms represent the long run relationship. The bounds testing method is based on the F-statistics. The F-test is conducted to test the null hypothesis that $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$. The F-statistics computed are then compared to the critical F-values of Pesaran et al (2001), which follows an asymptotic non-standard distribution. If the computed statistics fall in the upper bound, it means there is long run relationship. If the computed F-statistics fall in the lower bound

then there is no cointegration. If the F-statistics lies within the bounds, the test is inconclusive.

After cointegration is found, the long run estimates of the ARDL model can be obtained. Furthermore, the existence of the cointegration property means that there is the presence of an error correction term, which shows the speed of adjustment back to the long run equilibrium as a consequence of a short term shock. As a result, an error correction model (ECM) is estimated. The ECM is expressed as follows:

$$\Delta X_t = \delta_0 + \sum_{i=1}^m \theta_i \Delta X_{t-i} + \sum_{j=1}^n \lambda_j \Delta Y_{t-j} + \sum_{k=1}^p \gamma_k \Delta REER_k + \sum_{l=1}^q \alpha_l \Delta V_{t-l} + \pi ECM_{t-1} + u_t \quad (3)$$

where π is the speed of adjustment parameter and ECM represents the lag residuals that are found from the estimated cointegration model. If π is negatively significant, then the variables tend to converge to their long run equilibrium. To establish the goodness of fit of the ARDL model, the diagnostic and stability tests are performed. The diagnostic tests check for serial correlation, functional form, normality and heteroscedasticity. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ), proposed by Brown et al. (1975) test the stability of the coefficients of the regression parameters.

FINDINGS

Unit Root Test

Prior to the application of the ARDL approach, all variables are tested for stationarity. The use of non-stationary variables in the time series analysis leads to misleading inferences (Libanio, 2005). The unit root test is applied to check the order of integration and it is a crucial requirement for the existence of cointegration links (John et al., 2005). We use the traditional Augmented Dicker Fuller (ADF) test to check for the unit root in each variable and thereby determine the order of integration (see Table 1 below).

Table 1: ADF Test Results

Variable	ADF Test Variable in levels	ADF Test On First difference
Export	-	I(1)
Income	-	I(1)
REER	-	I(1)
Volatility	I(0)	-

Source: Computed, 2011

Results in the above table confirm that all variables are I(1), with the exception of the measure of volatility which is I(0). Since the variables are either I(0) or I(1), the ARDL process is used.

Bound F-Test

The Bounds F test result in Table 2 below shows the results of the first stage with the estimated F-test

value indicative of the presence of the long run relationship among the variables. As the calculated F-statistic of 14.368 exceeds the upper bound critical value, then the null of no cointegration is rejected. As cointegration is confirmed, we move to the second stage where the ARDL model can be established to determine long run and short run relationships.

Table 2: Bound F Test Results

Model	Critical Values Band	Estimated F test value	Pass/Fail
Equation (2)	I(0) I(1)	14.368	Pass
	4.042 4.126		

Source: Computed, 2011

Long Run Analysis

Equation (2) is estimated by the ARDL (1, 2, 2, 2) model. The results are shown in Table 3 below.

Table 3: Estimated Long Run Coefficients using the ARDL Approach

ARDL (1,2,2,2) selected based on Akaike Information Criterion	Coefficients
Y	0.486*** (4.905)
REER	0.531 (1.609)
V	-6.958** (-2.38)
C	0.598 (0.594)
R-squared	0.88
Number of observations	33

Source: Computed

***significant at 1%. ** significant at 5% and * significant at 10%. The t-ratios are in brackets

We note that exchange rate volatility exerts a significant long run adverse effect on export volume. Our result is in line with Arize et al. (2000) for developing countries including Mauritius. One possible explanation for the fall in the volume of exports is the absence of hedging opportunities which cause risk-averse profit maximisation firms to reduce their exports in the face of high uncertainty. The REER is positive but insignificant in the long run. Foreign income is positive and significant, in line with Arize et al. (2000) results for Mauritius.

Short Term Dynamics

In addition to the ARDL results, we use the ECM representation to investigate the short run dynamics. Estimation results still based on Schwartz Bayesian Criteria are presented in Table 4 below.

Table 4: Error Correction Representation for the Selected ARDL Model

ARDL(1,2,2,2) selected based on Akaike Information Criterion	
Variables	Coefficients
dY	-0.369*** (-3.192)
dY1	-0.216 (-1.636)
dREER	0.858*** (4.021)
dREER1	0.539** (2.746)
dV	0.206 (0.177)
dV1	5.932*** (5.156)
dC	0.346 (0.618)
ecm(-1)	-0.578*** (-6.510)
R-Squared	0.859
Number of observations	33

Source: Computed, 2011

***significant at 1%. ** significant at 5% and * significant at 10%. The t-ratios are in brackets

The change in income variable has a highly significant negative impact on export in the short run. There are two plausible explanations for this. First, following negative growth in foreign income, major export partners take time to adjust and decrease their current import expenditure. The data shows that the magnitude of negative growth rate is quite high, for instance, in 1976 it was 12 percent and in 2003, it was 22 percent. Moreover, negative growth rate is intermittent happening every four to eight years but after 1999 it has become more frequent. Second, with a temporary rise in income, major export partners prefer to save. They will spend more only when their

permanent income rise. This is in line with the Modigliani life cycle hypothesis (Modigliani, 1975). The REER is positive and significant in the short run. A rise in depreciation will make exports more competitive. The rupee has been depreciated or devalued several times to counter the effect of rise in prices of domestic goods and services to remain competitive on the world market. In addition, the effect of exchange rate volatility is positively related to exports in the short run. Foreigners may take advantage of the volatility to increase their consumption. Moreover, foreigners being conscious of previous period variability make more appropriate decisions regarding their volume of imports. The coefficient of the estimated ECM is negative and significant. This is a further evidence of a stable long term relationship. The coefficient of the estimated ECM asserts that, on average, 57.75 percent of the departure from equilibrium value will be adjusted in the current period. The remaining 42.25 percent is still to be rectified as the variables are cointegrated. Thus, it is a fairly high speed of adjustment.

Stability

Finally, we examine the stability of the long-run coefficients together with the short-run dynamics by applying the CUSUM and CUSUMSQ (Brown et al., 1975). The CUSUM test uses the cumulative sum of recursive residuals based on the first set of observations and is updated recursively and plotted against break points. If the plot of CUSUM statistics stays within the critical bounds of 5 percent significance level (represented by a pair of straight lines drawn at the 5 percent level of significance Brown et al. 1975), the null hypothesis that all coefficients in the error correction model are stable cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the 5 percent level of significance. A similar procedure is used to carry out the CUSUMSQ test, which is based on the squared recursive residuals

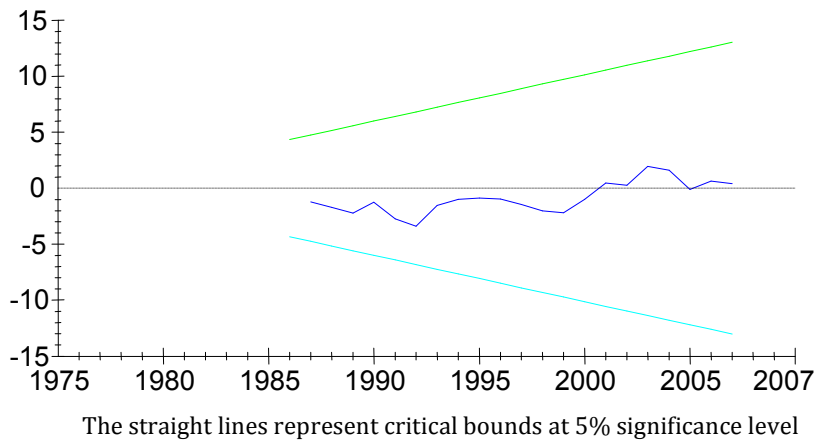


Figure 5: Plot of Cumulative Sum of Recursive Residuals

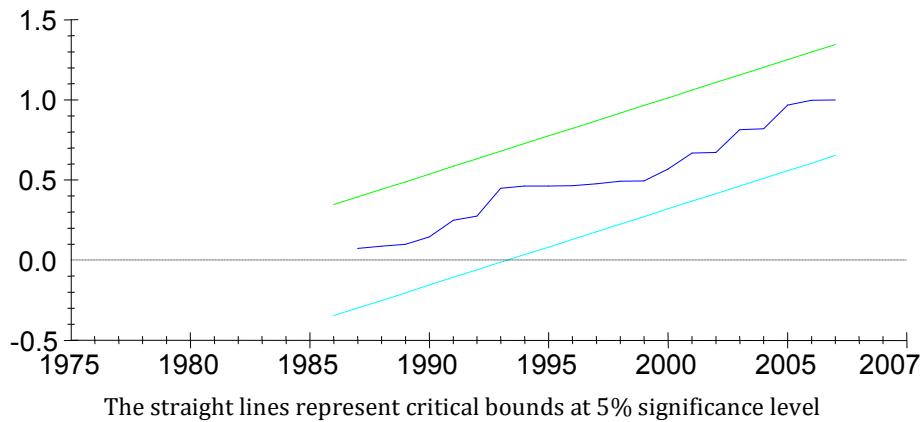


Figure 6: Plot of Cumulative Sum of Squares of Recursive Residuals

Figures 5 and 6 show the CUSUM and CUSUMSQ plots. Neither CUSUM nor CUSUMSQ plots cross the critical bounds, indicating no evidence of any significant structural instability.

CONCLUSION

This study analyses the impact of exchange rate volatility on Mauritian exports performance. The exchange rate volatility measure is the time varying measure of volatility that is the moving average standard deviation as no GARCH effect was found. Our findings based on the ARDL bounds testing procedures show that volatility has a positive and significant short run effect on exports, whilst in the long run; volatility adversely affects the Mauritian aggregate exports. We also observe that foreign income has a positive and significant long run effect on real exports and this is in line with Arize et al. (2000). However, in the short run foreign income turns out to be negative and insignificant showing that a permanent rise in income is most likely to increase demand for imported commodities relative to a temporary short run rise in earnings. Further real effective exchange rate has a positive and significant effect on exports in the short run which confirms the depreciating rupee of the Mauritian economy over the recent years. We also show that our results are stable over this time period.

In fact exchange rate volatility is one among many variables that influence export performance of the Mauritian economy. While the econometric exercise yields rather robust evidence in favour of a short run positive relationship between exchange rate volatility and exports performance and a long run negative link, the interdependence between exchange rate

stability, macroeconomic stability, institutional reforms and export performance cannot be fully disentangled. To maintain a stable currency and minimize the degree of volatility, institutional reforms are necessary to ensure a sufficient degree of macroeconomic stability. All these interdependent factors are likely to encourage capital inflows which boost exports and growth in a small island economy like Mauritius.

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