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Abstract

This paper applies two new tests for cointegration to re-estimate the import demand elasticities for Mauritius and South Africa. The data for Mauritius are for the period 1963 to 1995 while those for South Africa are for the period 1960 to 1996. Stability of the cointegration space is examined using the Hansen stability tests. Based on the bounds testing procedure for cointegration – the autoregressive distributed lag and the error correction test approaches – we find evidence of cointegration for both countries. Domestic income and relative prices have significant implications on import demands of the two countries in the long run, with the former having the most impact. The cointegration space appears stable for both countries. The dynamic relationship in the import demand model is also apparent from the results; this suggests that any shock to imports takes Mauritius three years and South Africa eight years away from the equilibrium level.

Keywords: Mauritius, South Africa, cointegration

JEL classification: F14; C32

Introduction

The literature on import demand is voluminous. A few studies have previously estimated the import demand elasticities for South Africa and Mauritius. For instance, Bahmani-Oskooee (1998) used the Johansen and Juselius (JJ) (1990) technique for cointegration to estimate the long run (1973-1990) import demand elasticities for South Africa. He found domestic income and relative price elasticities of import demand to be elastic. Using the same technique, but excluding the nominal exchange rate, Bahmani-Oskooee and Niroomand (1998) re-estimated the import demand model for South Africa over the 1960 to 1992 period. The income and relative price were found to be inelastic.

Senhadji (1998) used the Phillip-Hansen Fully Modified (FM) estimator to derive the long run elasticities for South African and Mauritius import demand for the period 1960 to 1993. His elasticities were somewhat larger than those reported by Bahmani-Okooee and Niroomand (1998) but smaller than those derived by Bahmani-Oskooee (1998). However, contrary to Bahmani-Oskooee (1998), and Senhadji (1998), Bahmani-Oskooee and Niroomand (1998) results indicate that imports are more responsive to relative prices than to income. In the case of Mauritius, Bahmani-Oskooee and Niroomand (1998) found a significant cointegration relationship between import demand variables with statistically significant income and relative prices elasticities.

From these studies it is clear that there are conflicting results on the relationship between imports, relative prices and income for South Africa and Mauritius. This has led us to reinvestigate the relationship using more robust recent econometric techniques. The contribution of this study to the literature is thus the use of recent advances in time series econometrics such as the bounds testing procedure to cointegration, developed by Pesaran and Shin (1995, 1999), within an autoregressive distributive framework (ARDL). We also use the Banerjee et al. (1998) test to cointegration based on the error correction model. These methodologies have not been used previously in the import demand literature on Mauritius and South Africa.

The import demand studies on Mauritius and South Africa have been based on relatively small sample sizes: Bahmani-Oskooee (1998) used data for the period 1973-1990; Bahmani-Oskooee and Niroomand (1998) used data for the period 1960-1992. They subjected these finite sample sizes to the JJ (1990) Maximum Likelihood test for cointegration. It is now widely known that the JJ test does not provide robust results with small sample sizes. On the other hand, an important advantage of the ARDL approach is that it has better properties for small samples than does the JJ test. Pesaran and Shin (1999) showed that with the ARDL framework, the OLS estimators of the short run parameters are $\sqrt{T}$-consistent and the ARDL based estimators of the long run coefficients are super consistent in small sample sizes.

In addition we are explicitly concerned about the stability of the long run import demand, which has important implications for the validity of the empirical results. Most previous studies including those on Mauritius and South Africa have presumed that the relationship is stable. Whether this is true is purely an empirical question; hence, there is no reason to believe *a priori* that the relative importance of factors influencing the relationship between imports, prices and income have remained unchanged. To ascertain parameter stability for the first time in the import demand literature we apply the Hansen (1992) stability test.

It follows, then, that the aims of the paper are twofold: first, to investigate whether a long run relationship exists between imports, prices and income for Mauritius and South Africa, using new cointegration techniques; second, to test for the stability of the cointegration relationship between imports, income and prices for the two countries.

The rest of the paper is organised as follows. In the next section, we present the import demand model and in the following section, we provide a brief discussion of the econometric methodologies used in this study. The results are presented and discussed in the penultimate section. The final section concludes.

Import Demand Model

Following previous studies, our import demand model for the long run takes the following form:

$$\ln M_t = \alpha + \beta_1 \ln RP_t + \beta_2 \ln Y_t + \varepsilon_t \qquad (1)$$

where, at period t, $\ln M_t$ is the log of imports of goods and services (real imports); $\ln RP_t$ is the log of the relative price, calculated as a ratio of import price index to domestic prices (here domestic prices are proxied by the consumer price index); and $\ln Y_t$ is the log of the activity variable proxied by the real gross domestic product. α is the constant; ε_t is the error term; and β_1 and β_2 are the price and the income elasticities, respectively. Consistent with demand theory, imports are negatively related to relative prices and positively related to income; hence, it is expected that $\beta_1 < 0$ and $\beta_2 > 0$.

This model is estimated using annual time series data, covering the period 1970 to 1999. The data are sourced from the IMF International Financial Statistics. The ARDL and the BDM techniques are used to test for the existence of any long-run relationships, while the ARDL technique is used to estimate the long-run elasticities. In what follows, we describe these methodologies.

ARDL Approach: The augmented autoregressive distributed lag (ARDL) $(p, q_1, q_2, \ldots, q_k)$ model can be written as follows (Pesaran and Pesaran, 1997: 397-399; Pesaran *et al.*, 2001):

$$\Omega(L,p)y_t = \alpha_0 + \sum_{i=1}^{k} \beta_i(L,q_i)x_{it} + \delta' w_t + \mu_t \quad (2)$$

where

$$\Omega(L,p)=1-\Omega_1\delta_1L^1-\Omega_2\delta_2L^2-\ldots-\Omega_pL^p, \tag{3}$$

$$\beta_i(L,q_i)=\beta_{io}+\beta_{i1}L+\beta_{i2}L^2+\ldots+\beta_{iqi}L^{qi},\ i=1,2,\ldots,\ k, \tag{4}$$

Here, y_t is the dependent variable; α_o is a constant; L is a lag operator such that $Ly_t=y_{t-1}$; and w_t is a $s\times 1$ vector of deterministic variables such as seasonal dummies, time trends, or exogenous variables with fixed lags. The x_{it} in equation (2) is the i independent variable where i=1,2,…,k. In the long run, we have $y_t=y_{t-1}=\ldots=y_{t-p}$; $x_{it}=x_{i,t-1}=\ldots=x_{i,t-q}$ where $x_{i,t-q}$ denotes the q^{th} lag of the i^{th} variable.

The long-run equation with respect to the constant term can be written as follows:

$$y=\alpha_o+\sum_{i=1}^{k}\beta_ix_i+\delta'w_t+v_t \qquad \Omega=\frac{\alpha_0}{\Omega(1,p)} \tag{5}$$

The long-run coefficient for a response of y_t to a unit change in x_{it} are estimated by:

$$\beta_i = \frac{\hat{\beta}_i(1,\hat{q}_i)}{\hat{\Omega}(1,\hat{p})} = \frac{\hat{\beta}_{i0} + \hat{\beta}_{i1} + \ldots + \hat{\beta}_{i\hat{q}}}{1 - \Omega_1 - \hat{\Omega}_2 - \ldots - \hat{\Omega}_{\hat{p}}}, \; i = 1,2,\ldots,k \tag{6}$$

Here, $\hat{p}$ and $\hat{q}_i$, $i = 1,2,\ldots,k$ are the selected (estimated) values of p and q_i, $i = 1,2,\ldots k$. Similarly, the long-run coefficients associated with the deterministic/exogenous variables with fixed lags are estimated by

$$\delta' = \frac{\hat{\delta}(\hat{p},\hat{q}_1,\hat{q}_2,\ldots,\hat{q}_k)}{1 - \hat{\Omega}_1 - \hat{\Omega}_2 - \ldots - \hat{\Omega}_p}, \tag{7}$$

Here, $\hat{\delta}(\hat{p},\hat{q}_1,\hat{q}_2,\ldots,\hat{q}_k)$ denotes the ordinary least squares estimate of δ in equation (2) - the selected ARDL model. The error correction (EC) representation of the ARDL$(\hat{p},\hat{q}_1.\hat{q}_{2,\ldots,}\hat{q}_k)$ model can be obtained by writing equation (2) in terms of the lagged levels and the first differences of $y_t, x_{1t}, x_{2t,\ldots,} x_{kt}$ and w_t:

$$\Delta y_t = \Delta\alpha_0 - \sum_{j=1}^{\hat{p}-1} \Omega_j^* \Delta y_{t-j} + \sum_{i=1}^{k} \beta_{i0}\Delta x_{it} - \sum_{i=1}^{k}\sum_{j=1}^{\hat{q}_i-1} \beta_{ij}^* \Delta x_{i,t-j} + \delta'\Delta w_t$$
$$- \Omega(1,\hat{p})ECM_{t-1} + \mu_t \tag{8}$$

Here, ECM_t is the correction term defined by

$$ECM_t = y_t - \hat{\alpha} - \sum_{i=1}^{k} \hat{\beta}_i x_{it} - \delta' w_t \tag{9}$$

and Δ is the first difference operator; Ω_j^*, β_{ij}^* and δ' are the coefficients relating to the short-run dynamics of the model's convergence to equilibrium while $\Omega(1,\hat{p})$ measures the speed of adjustment.

The bounds testing procedure involves two stages. The first stage is to establish the existence of a long-run relationship. Once a long-run relationship has been established, a two-step procedure is used in estimating the long-run relationship. An initial investigation of the existence of a long-run relationship predicted by theory among the variables in question (see equation 10 below) is preceded by an estimation of the short-run and long run parameters using equation (2). Suppose that with respect to equation 1, theory predicts that there is a long-run relationship among $\ln M_t, \ln Y_t$ and $\ln RP_t$. Without having any prior information about the direction of the long-run relationship among the variables, the following unrestricted error correction (EC) regressions are estimated (for equation 1), taking each of the variables in turn as a dependent variable:

$$\begin{aligned}\Delta ln M_t &= a_{0M} + \sum_{i=1}^{n} b_{iM} \Delta ln M_{t-i} + \sum_{i=0}^{n} c_{iM} \Delta ln Y_{t-i} \\ &+ \sum_{i=0}^{n} d_{iM} \Delta ln RP_{t-i} + \lambda_{1M} ln M_{t-i} + \lambda_{2M} ln Y_{t-i} + \lambda_{3M} ln RP_{t-i} + \varepsilon_{1t}\end{aligned} \qquad (10a)$$

$$\Delta \ln Y_t = a_{0Y} + \sum_{i=1}^{n} b_{iY} \Delta \ln Y_{t-i} + \sum_{i=0}^{n} c_{iY} \Delta \ln M_{t-i}$$
$$+ \sum_{i=0}^{n} d_{iY} \Delta \ln RP_{t-i} + \lambda_{1Y} \Delta \ln Y_{t-i} + \lambda_{2Y} \Delta \ln M_{t-i} + \lambda_{3Y} \ln RP_{t-i} + \varepsilon_{2t} \qquad (10b)$$

$$\Delta \ln RP_t = a_{0RP} + \sum_{i=1}^{n} b_{iRP} \Delta \ln RP_{t-i} + \sum_{i=0}^{n} c_{iRP} \Delta \ln Y_{t-i}$$
$$+ \sum_{i=0}^{n} d_{iRP} \Delta \ln M_{t-i} + \lambda_{1RP} \Delta \ln RP_{t-i} + \lambda_{2RP} \Delta \ln M_{t-i} \qquad (10c)$$
$$+ \lambda_{3RP} \ln Y_{t-i} + \varepsilon_{3t}$$

When a long-run relationship exists, the F test indicates which variable should be normalised. The null hypothesis for no cointegration amongst the variables in Equation 10a is $(H_0 : \lambda_{1M} = \lambda_{2M} = \lambda_{3M} = 0)$ denoted by $F_M(M|RP,Y)$ against the alternative $(H_1 : \lambda_{1M} \neq \lambda_{2M} \neq \lambda_{3M} \neq 0)$. Similarly, the null hypothesis for testing the 'nonexistence of a long run relationship' in equation (10b) is denoted by $F_{RP}(RP|M,Y)$; for equation (10c) the F test for testing the null hypothesis is denoted by $F_Y(Y|M,RP)$.

The F test has a non-standard distribution which depends upon; (i) whether variables included in the ARDL model are $I(0)$ or $I(1)$, (ii) the number of regressors and (iii) whether the ARDL model contains an intercept and/or a trend. Two sets of critical values are reported in Pesaran and Pesaran (1997) (see also Pesaran *et al.*, 2001). The two sets of critical values provide critical value bounds for all classification of the regressors into purely $I(1)$, purely $I(0)$ or mutually cointegrated.

If the computed F statistics falls outside the critical bounds, a conclusive decision can be made regarding cointegration without knowing the order of integration of the regressors. For instance, if the empirical analysis shows that the estimated $F_M(.)$ is higher than the upper bound of the critical values then the null hypothesis of no cointegration is rejected. Once a long-run relationship has been established, in the second stage, a further two step procedure to estimate the model is carried out. First the orders of the lags in the ARDL model are selected using an appropriate lag selection criteria such as the Schwartz Bayesian Criteria (SBC) and in the second step the selected model is estimated by the ordinary least squares technique.

Error correction mechanism (ECM) test: Banerjee, Dolado and Mestre (1998) propose a new test for cointegration within a single equation framework. The model is anchored to the autoregressive distributed lag specification – the advocates of which are Hendry and Richard (1982) and Hendry (1987) – with the choice of lagged dependent variable being crucial. Put differently, the procedure depends upon the significance of the lagged dependent variable, since this is equivalent to testing the significance of the error correction term in the ECM reparameterization of the model. The ECM test can be explained using a simple data generating process (Banerjee *et al.*, 1998: 269-270) as follows:

$$\Delta y_t = \alpha' \Delta x_t + \beta(y_{t-1} - \lambda' x_{t-1}) + \in_t \tag{11}$$

$$\Delta x_t = u_t \qquad t = 1, \ldots, T \tag{12}$$

where α, λ and x_t are $k \times 1$ vectors of parameters and explanatory variables. The regressand y_t is a univariate process, β is a scalar and T is the sample size. Here, the tests for cointegration relies upon some estimate of the parameter β. Under the assumption that x_t is strictly exogenous, non-linear least squares (NLS) can be applied to (12) producing consistent and asymptotically efficient estimates of α, β and λ. However, it has been shown by Banerjee *et al.*, (1993) that by adding x_{t-1} to equation (11) one can achieve a parameter-free distribution for the estimator of β. Then the ordinary least squares method can be used to estimate β. This is reasoned on the premise that, under the alternative hypothesis of cointegration, the true cointegrating slope λ is implicitly estimated when x_{t-1} is included as an additional regressor. It follows, then, that the following unrestricted dynamic model can be specified:

$$\Delta y_t = \alpha' \Delta x_t + \beta y_{t-1} + \theta' x_{t-1} + \in_t = \alpha' \Delta x_t + \phi' w_{t-1} + \in_t \tag{13}$$

where $w_t' = (y_t, x_t')$ and $\phi' = (\beta, \theta')$.

Since $\beta(1-\lambda') = \phi'$, the non-cointegrating restriction $\beta = 0$ implies $\phi = 0$ and so the ECM test can be based upon the OLS estimator of β in (13) or on its t ratio. The critical values for the t-test are derived from Pesaran *et al.*, 2001. They provide a bounds procedure whereby the asymptotic distribution of their statistics is obtained for cases in which all regressors are purely I(1) as well as when the regressors are purely I(0) or mutually cointegrated.

Empirical Results

Using the ARDL and BDM techniques, we test for the presence of long-run relationships. Under the ARDL approach, the calculated F-statistics are compared against the critical values, which are adopted from Table F in Pesaran and Pesaran, (1997: 484). For equation 11a, the calculated F-statistic $F_M(M|RP,Y)$ is higher than the upper bound critical value at the 5 per cent level for Mauritius and at the 10% level for South Africa. Thus, the null hypothesis of no cointegration must be rejected for both these countries. The BDM test for cointegration also supports the existence of a cointegration relationship in that the calculated t-statistics are greater (in absolute terms) than the 10% critical values (Table 1).

INSERT TABLE 1

Once we established that a long-run cointegration relationship existed for South Africa and Mauritius, equation (1) was estimated using the following ARDL (m,n,p,q) specification:

$$\begin{aligned} ln\ M_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1\ ln\ M_{t-i} + \sum_{i=0}^{n} \alpha_2\ ln\ RP_{t-i} + \\ + \sum_{i=0}^{q} \alpha_3\ ln\ Y_{t-i} + \mu_t \end{aligned} \tag{14}$$

For each model a maximum of 2 lags was used, such that i_{max}=2. The estimated model presented here is based on the SBC. The long run models estimated using the ARDL technique is presented in Table 2. Relative prices have a negative impact on imports and this relationship is statistically significant according to both techniques – *ceteris paribus*, a 1% increase in relative prices leads to a fall in import volume by 0.4% for Mauritius, and for South Africa by 0.6%. Domestic income on the other hand is positively related to import demand – *ceteris paribus*, a 1% increase in domestic income leads to 0.9% increase in imports in the case of Mauritius and 1.2% increase in South African imports.

INSERT TABLE 2

The short run results derived using the error correction mechanism are presented in Table 3. The dynamics of the equations saw that changes in relative prices and domestic income have significant impact on imports of the two countries. Evidence also suggests that there is a faster response to real income changes than to relative prices. The error correction term, ECM_{t-1}, which measures the speed at which import volumes adjust to changes in the explanatory variables before converging to their equilibrium levels, is negative for both countries and is statistically significant, ensuring that the series is non-explosive and that long-run equilibrium is attainable. The coefficient of –0.34 for Mauritius implies that a deviation from the long-run level of imports this period is corrected by about 34 percent in the next period. Convergence to equilibrium after a shock to South African imports however is relatively slower – any disequilibrium in imports is only corrected by some 12 percent in the following period.

INSERT TABLE 3

Having presented our long-run results, it is worth comparing it with those from previous studies on Mauritius and South Africa import demand. These results are presented in Table 4. Our results, based on the ARDL approach to cointegration are markedly differently from those obtained from the Johansen and Juselius and the FMOLS techniques by previous studies. On income elasticity, for instance, for South Africa our elasticity is 1.19; others have found it to be 2.17, 0.43 and 0.67. For Mauritius we find the income elasticity to be 0.87; others have found it to be 1.05 and 2.25. Similarly, our coefficient on relative price is –0.61 and –0.42 for South Africa and Mauritius respectively; others have found it to be –0.93 and –2.78 for Mauritius and –0.53 and –1.0 for South Africa.

INSERT TABLE 4

In order to test the reliability of the two error correction models a number of diagnostic tests, including, tests of autocorrelation, normality and heteroskedasticity in the error term, stability and accuracy of the model were applied (see Table 5). We found no evidence of autocorrelation in the disturbance of the error term. The ARCH tests suggest the errors are homoskedastic and independent of the regressors. The model passes the Jarque-Bera normality tests suggesting that the errors are normally distributed. The RESET test indicates that the model is correctly specified, while the F-forecast tests indicate the predictive power/accuracy of the model. Finally, the adjusted R-squared of the Mauritius and South African import demand model are 0.65 and 0.85, respectively. Hence, it is reasonable to claim that the two models have a good statistical fit.

INSERT TABLE 5

Constancy of Cointegration Space

The parameter non-constancy tests for $I(1)$ processes advocated by Hansen (1992) was employed as a check for parameter stability. Hansen (1992) proposes three tests – $SupF$, $MeanF$, and L_C – which all have the same null hypothesis but differ in their choice of alternative hypothesis. The $SupF$ test is predicated on ideas inherent in the classical Chow F-tests. The alternative hypothesis is a sudden shift in regime at an unknown point in time, and amounts to calculating the Chow F-statistic. This test statistic takes the following form: $SupF = SupF_{t/T}$, where $F_{t/T}$ is the F-test statistic. To perform the $SupF$ test requires truncation of the sample size T. We follow the approach in Hansen (1992) and use the subset $[0.15T, 0.85T]$.

The $MeanF$ test is appropriate when the question under investigation is whether or not the specified model captures a stable relationship (Hansen, 1992). It is computed as an average of the $F_{t/T}$. Finally, the L_C statistic is recommended if the likelihood of parameter variation is relatively constant throughout the sample. The test results and their probability values are reported in Table 6. They show evidence for parameter stability, since the probability values for each test are greater than 0.05.

INSERT TABLE 6

Conclusion

The objective of this research was to re-estimate the import demand elasticities for Mauritius and South Africa using recent developments in time series econometric techniques. The reason for doing this was because of the conflicting results of previous attempts to estimate the import demand elasticities. We notice that previous techniques – the Johansen and Juselius technique in particular – are not robust in finite samples. In this light, we employ two of the recent techniques – namely the bounds techniques to cointegration – which have been shown to produce reliable and robust results in small samples.

The ARDL and the ECM approaches indicate that the import demand for Mauritius and South Africa are cointegrated. By normalising on import volume, the long run elasticities associated with import demand were estimated. It turns out that both these techniques pointed to consistent results - a significant relationship between import volumes, relative prices and domestic income in the long run, with domestic income having the most impact on import volumes. Import demand functions for both the countries also have a significant dynamic relationship. The results show that a shock to the import demand model takes imports volumes three years (Mauritius) and eight years (South Africa) away from their equilibrium levels.

Finally our results, obtained from the ARDL approach to cointegration, are markedly different to those obtained from the Johansen and Juselius and fully modified ordinary least squares techniques. Given that Pesaran and Shin (1999) showed that with the ARDL framework, the estimators of the long run coefficients are super consistent in small sample sizes, we conclude that our results are reliable and our econometric technique is an advance over existing studies on Mauritius and South African import demand.

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TABLES

Table 1: Test for Cointegration Relationships

1. F-Test						
Critical value bounds of the F statistic: intercept and no trend						
	90% level		95% level		97.5% level	
k	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
2	3.182	4.126	3.793	4.855	4.404	5.524
Calculated F-statistic						
			Mauritius		South Africa	
$F_M(M\|RP,Y)$			6.3016		4.4691	
$F_{RP}(RP\|M,Y)$			4.5530		2.1518	
$F_Y(Y\|RP,M)$			0.9954		3.7808	

2. ECM t-test					
	t-statistic	Critical value: 5%		Critical value: 10%	
		I(0)	(1)	I(0)	I(1)
		-1.95	-	-1.62	-
		3.02		2.68	
Mauritius	-2.71				
South Africa	-2.96				

Note: Critical values for the F-test are from Pesaran & Pesaran (1997: 484); critical values for the t-test are from Pesaran *et al.*, 2001: Table 4.

Table 2: Long run results

	Coefficients	t-statistics
Mauritius		
Constant	0.9124	0.4693
ln RP	-0.4285**	-2.0983
lnY	0.8712***	4.6261
South Africa		
Constant	-2.5874	-1.4159
ln RP	-0.6092*	-1.9213
lnY	1.1903***	3.6544

Note: *(***) significance levels at 10% and 1% respectively.

Table 3: Error correction models of import demand

Variables	Mauritius ARDL(1, 2, 2)	South Africa ARDL (1, 1, 0)
Constant	-0.3065 (0.5078)	-0.3143 (-1.6476)*
$\Delta ln RP_t$	0.0113 (0.0629)	-0.0701 (-4.4145)***
$\Delta ln RP_{t-1}$	0.5362 (3.0291)***	-
$\Delta ln Y_t$	1.0650 (4.9002)***	3.0448 (12.8423)***
$\Delta ln Y_{t-1}$	0.6674 (2.7842)**	-
ECM_{t-1}	-0.3360 (-3.5313)***	-0.1215 (-2.2470)**

Notes: *(**)*** significance at 10 %, 5% and 1% levels respectively. The figures in parenthesis are the *t*-statistics.

Table 4: Results from previous studies on South African and Mauritius import demand

Variables	Bahmani (1998)	Bahmani and Noormand (1998)		Senhadji (1998)	
	South Africa	South Africa	Mauritius	South Africa	Mauritius
lnY	2.174	0.43	1.05	0.67	2.25
	(.78)	(4.05)	(8.75)	(11.45)	(1.03)
lnRP	-1.37	-0.53	-0.93	-1.00	-2.78
	(6.82)	(6.51)	(7.78)	(5.58)	(0.53)

Table 5: Results of diagnostic tests for the error correction model presented in Table 4

Diagnostics	Mauritius	South Africa
R^2	0.6757	0.8475
σ	0.0570	0.0467
$\chi^2_{Auto}(2)$	0.7422	7.8524
$\chi^2_{Norm}(2)$	0.3775	0.5365
$\chi^2_{ARCH}(2)$	0.6926	7.3003
$\chi^2_{White}(10 \text{ and } 6)$	10.3559	5.9186
$\chi^2_{RESET}(2)$	4.3416	1.8076
$F_{\text{Forecast}}(6,19)$	1.8936	0.8290

Table 6: Hansen Test for Parameter Stability

	L_C	Mean F	Sup F
Mauritius	0.4518	4.1429	6.8950
	(0.0546)	(0.0729)	(>0.20)
South Africa	0.0646	0.6813	1.0663
	(>0.20)	(>0.20)	(>0.20)

Note: probability values are in brackets.

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