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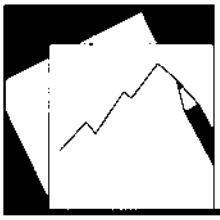

IMF Working Paper

Mauritius:
A Competitiveness Assessment

Patrick Imam and Camelia Minoiu

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African Department

Mauritius: A Competitiveness Assessment[1]

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Abstract

We assess the competitiveness of Mauritius in recent years using two approaches. First, we estimate the difference between the equilibrium and the actual real exchange rate using four methods: the macroeconomic balance approach, the single-equation fundamentals approach, the capital-enhanced approach, and the external sustainability approach. The methods consistently suggest that at the end of 2007 the exchange rate was aligned with its equilibrium value. Second, we undertake a comparative analysis of structural competitiveness indicators and find that Mauritius often fares better on business climate than other small island economies and high-growth Asian economies. Nevertheless, there are areas for improvement.

JEL Classification Numbers: F31, F41, E65

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I. INTRODUCTION

The Indian Ocean island nation of Mauritius, an open but relatively undiversified economy, has recently faced large negative terms of trade shocks, for three main reasons: the phasing out of the Multi-Fiber Agreement starting at the end of 2004, the European Union reduction of its sugar price guarantees starting in 2006, and recent higher world commodity prices, especially for food and petroleum products. As export growth dwindled and the economy began adjusting to the new environment, the current account (CA) deficit worsened to an average of 4 percent of GDP for 2004–07. Real GDP growth has been low by historical standards, averaging 3.6 percent between 2001 and 2007 compared to 4 percent in the 1990s and 5 percent in the 1980s. These facts raise questions about the competitiveness of the Mauritian economy and what might be done to ensure external stability and reduce vulnerabilities.

This paper examines the competitiveness of Mauritius from 1980 through 2007, paying particular attention to recent years. Assessing the equilibrium real exchange rate (ERER) through the prism of whether the real exchange rate is aligned with its equilibrium value is important because persistent misalignment can hinder growth, lead to currency crises, or more generally disturb macroeconomic equilibrium.[3] We employ a mix of panel and time series techniques to estimate the ERER using the macroeconomic balance approach (FEER–MB), the (country-specific) single-equation fundamental equilibrium exchange rate approach (FEER–SE), and the capital-enhanced equilibrium exchange rate approach (CHEER). We then supplement the analysis by applying the external sustainability (ES) approach. Nonprice indicators of structural competitiveness are also analyzed, especially the business climate, trade costs, and the information, technology, and communications (ITC) sector.

There are several elements of novelty in our study. First, we construct a large database (comprising 140 countries) to estimate the reduced-form relationship between the CA balance and its determinants in the FEER-MB approach. Second, we assess the robustness of our conclusions from this approach by computing alternative CA norms that reflect different sub-samples of countries and estimation methods. Third, in addition to the three methods put forward by the IMF's Consultative Group on Exchange Rate Issues (CGER), we apply the CHEER approach to better understand the recent evolution of the Mauritian rupee relative to its equilibrium value. Our analysis is made possible by the availability of reliable data at different frequencies for Mauritius.

[3] On the relationship between exchange rate misalignment and economic performance, see, e.g., Cottani, Cavallo, and Khan (1990), Dollar (1992), Razin and Collins (1997), Fosu (2000), Easterly (2001), and Gala and Lucinda (2006). Case studies on exchange rate misalignment followed by currency crises has been presented by, e.g., Kemme and Roy (1995), Kruger, Osakwe, and Page (2002), and Rajan, Sen and Siregar (2004). See Dornbusch (1982) for a review of theoretical contributions to exchange rate theory and empirical evidence.

We find that the real exchange rate at the end of 2007 was aligned with its equilibrium value as determined by economic fundamentals. Furthermore, little adjustment may be necessary over the medium term. The conclusion is broadly consistent across methods. We also find that Mauritius fares better than comparator countries (high-growth Asian economies, middle-income countries, and other small island economies) in terms of structural competitiveness. The analysis suggests that the country's competitiveness could be further improved by stimulating competition in goods markets, making labor markets more flexible, enhancing skills, and further reducing the cost of doing business.

In what follows, Section II describes the evolution of exchange rate regimes in Mauritius since its colonial past. Section III outlines the results of the four quantitative methods employed to estimate the ERER. Section IV surveys the country's competitiveness using nonprice structural competitiveness indicators. Section V draws conclusions.

II. The Evolution of the Exchange Rate in Mauritius[4]

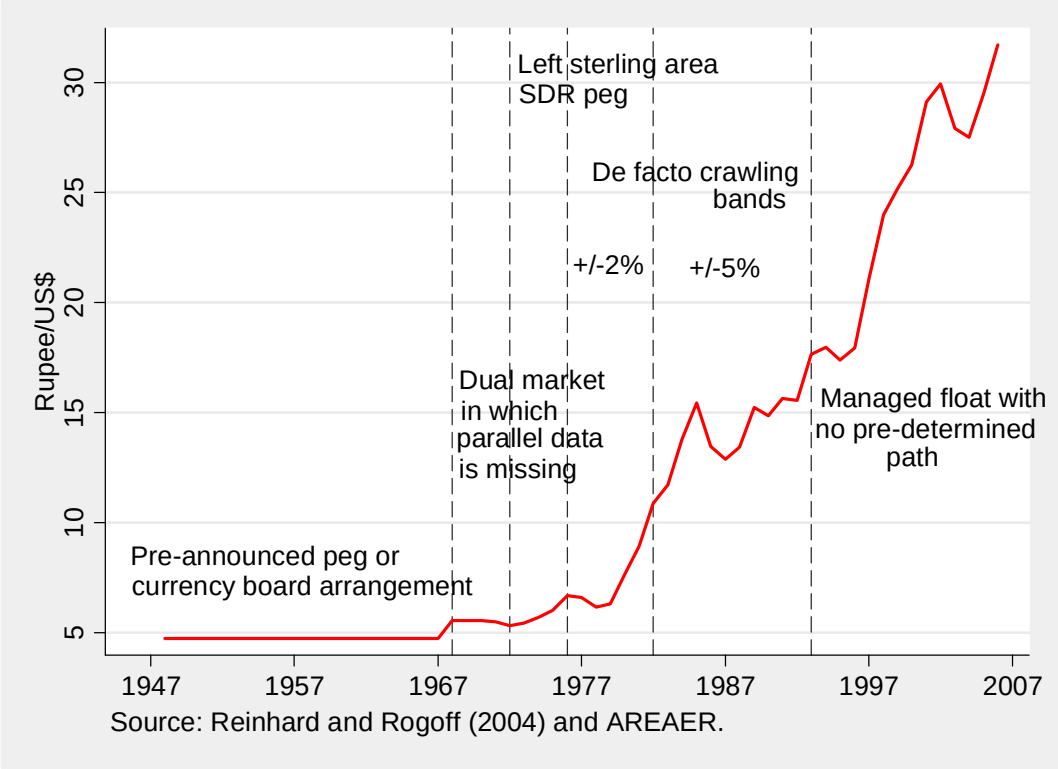
Mauritius has over time adopted a variety of exchange rate regimes. As part of the British Empire, though at first it did not have its own currency, the government established a currency-board-like system in 1848, the first of its kind in the world. Until 1870 Mauritius switched between the pound sterling (gold) and the Indian rupee (silver). Between 1878 and 1934 Mauritius was in a common monetary union with India with the Indian rupee as the legal tender. This reflected trade links with India and the inflow of Indian labor. Throughout the 19th and early 20th century, the currencies of British colonies were almost all linked to the pound sterling through currency boards; when the United Kingdom abandoned the gold standard in September 1931, most colonies did likewise. In 1934 Mauritius, like several other British colonies, introduced its own currency—but still under a currency board pegged to the pound sterling. This regime lasted until November 1967 (Figure 1).

In preparation for independence, in November 1967 Mauritius moved the rupee from a currency board to a peg to the pound sterling, but there was a dual foreign exchange market that separated capital account transactions from CA transactions. Capital transfers were subject to a stamp duty initially set at 15 percent. With gold convertibility ending when the dollar standard was abandoned in 1971, trade diversifying away from Britain, and the weakness of the pound sterling, Mauritius left the sterling area in June 1972 and established a central exchange rate with special drawing rights (SDRs). It maintained a second exchange rate for the stamp duty for capital transfers. In January 1976 Mauritius officially pegged the rupee to the SDR, with a 2 percent band, but in practice the exchange rate for official purposes was a crawling band around the US dollar. Following a period of overvaluation, the

[4] This section draws on Reinhard and Rogoff (2004); IMF, *Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER*); and IMF, Mauritius Staff Reports going back to the late 1960s.

rupee was devalued in 1979 and 1981. The stamp duty on transfer of capital was raised in July 1981 from 36 percent to 45 percent.

Figure 1. Exchange Rate Regimes and the Nominal Exchange Rate, 1948−2007

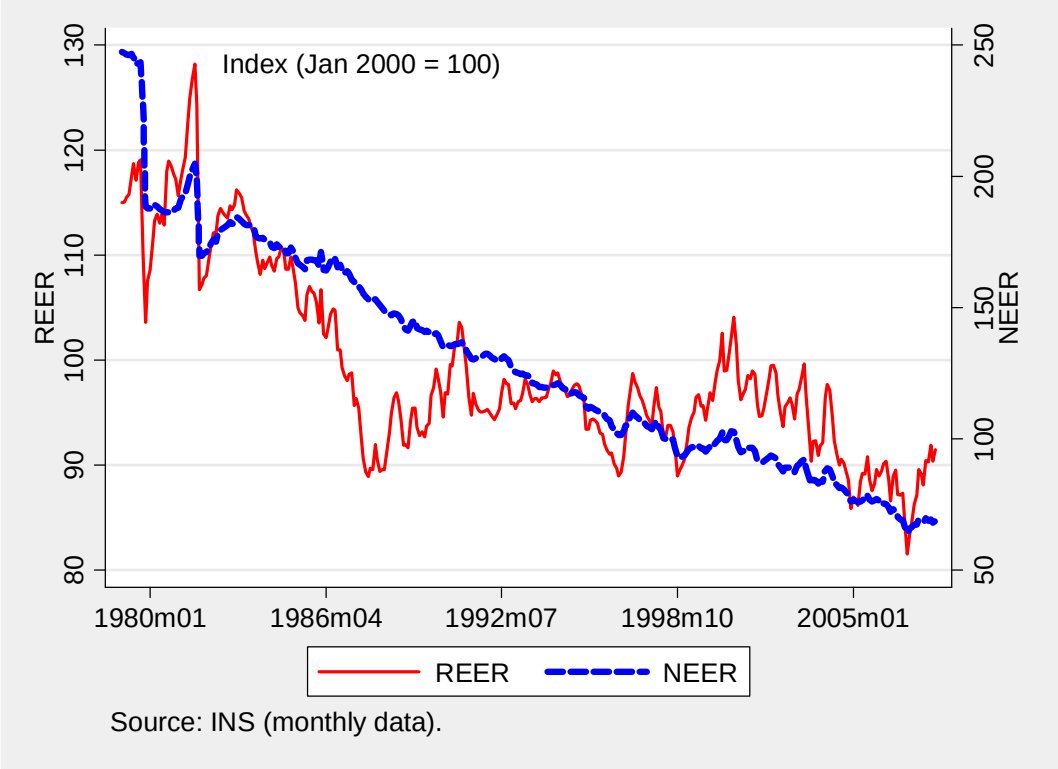


In June 1982 the Mauritian rupee was officially delinked from the SDR and pegged to a trade-weighted basket of the currencies of its major trading partners, but the composition of the basket was not disclosed. The change was part of a broad liberalization launched under an IMF program. The exchange rate remained pegged de facto to the US dollar, with a 5 percent band. The limit on the sale of foreign exchange for travel was administered as a capital control. Until the early 1990s Mauritius maintained a multiple currency practice in the form of a 15 percent tax on some capital remittances.

Exchange rate restrictions were lifted in 1992, and transactions involving foreign currencies were fully liberalized in July 1994. Beginning in 1992 the de facto crawling band around the US dollar was narrowed to 2 percent. The capital transfer tax was abolished. Since the mid-1990s Mauritius has maintained a managed float, and the Bank of Mauritius intervenes solely to smooth exchange rate fluctuations rather than alter the trend.

Post-Bretton Woods the nominal exchange rate (NER) continuously depreciated against the US dollar (Figure 2) because inflation was higher in Mauritius than in its trading partners. Monetary policy accommodated the higher inflation differentials by letting the NER depreciate to achieve a stationary REER.

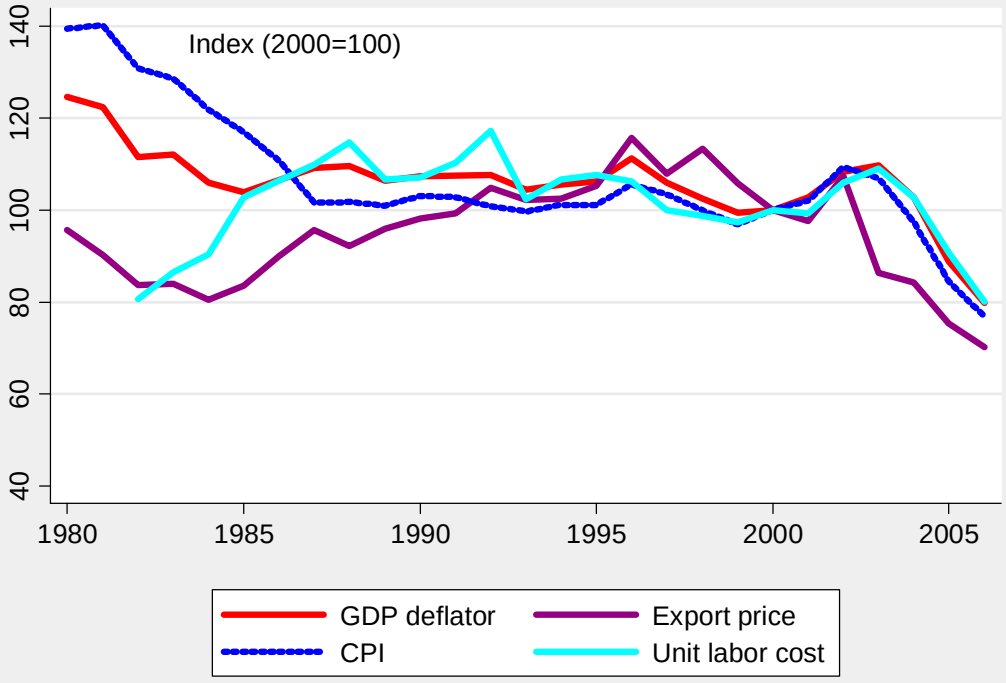
Figure 2. Nominal and Real Effective Exchange Rates, 1980−2007



An examination of various price-based REER indices relative to major trading partners indicates that the competitiveness of Mauritius has improved markedly since 2002 (Figure 3).[5] The indices (CPI, GDP deflator, manufacturing unit labor cost, and export prices) move closely together over time. After staying relatively flat throughout the 1990s they suggest considerable depreciation since 2002. This path is a natural consequence of negative terms of trade shocks, which required a depreciation to restore the economy to sustained growth (Funke, Granziera, and Imam, 2008).

[5] We use the terms “real depreciation” and “competitiveness” interchangeably. However, as the experience of Germany and Japan in the 1970s demonstrates, it is possible for the REER to appreciate even when competitiveness is rising. This happens, for instance, when productivity growth outpaces appreciation.

Figure 3. Price-based Real Effective Exchange Rate Indices, 1980−2006



Source: INS and authors' calculations (annual data).

III. Empirical Analysis of the Equilibrium Exchange Rate

Assessing the distance of the actual exchange rate from its equilibrium value is key to identifying potentially unsustainable external imbalances. While there is no consensus on what constitutes the best empirical approach to estimating the ERER, it is useful to employ as many models as possible so as to increase the likelihood of obtaining an accurate judgement. To arrive at robust conclusions, we employ four quantitative approaches to identifying the ERER and analyzing a country's competitiveness:

- the macroeconomic balance approach (FEER-MB), which assesses deviation from equilibrium by observing by how much the CA is projected to deviate from the sustainable norm implied by the fundamental determinants of saving and investment;

- the single-equation fundamental equilibrium exchange rate approach (FEER-SE), which assesses the equilibrium exchange rate based on a country's macroeconomic fundamentals;

- the capital-enhanced equilibrium exchange rate approach (CHEER), which adds the uncovered interest parity (UIP) condition to analyzing deviations from equilibrium; and

- the external sustainability (ES) approach, which observes the difference between the underlying CA balance and the net foreign asset (NFA)-stabilizing CA balance.

The four methods have several advantages. The FEER-MB and FEER-SE approaches—focusing on flow equilibrium concepts—employ economic fundamentals in reduced-form equations to arrive at the ERER. Estimated coefficients are thus easily interpretable from the policy lens. The FEER-MB approach also has the attractive feature that the exchange rate required across countries can be made internally consistent on a multilateral basis through a normalization.[6] The ES method can be a useful cross-check of the findings of the FEER-MB approach, as it derives the sustainable CA from a stable NFA position (hence is based on a stock equilibrium concept). Unlike the other methods, the CHEER approach takes the view that non-zero interest rate differentials can explain the persistence in real exchange rates, bringing capital account factors into to the analysis.[7]

Several conceptual limitations are shared by these methods. Notably, both the FEER-MB and ES approaches hinge on the *estimation* of a sustainable CA (or CA norm). In the literature, this is often derived based on the historical relationship between the CA balance (or NFA position) and a set of economic fundamentals. A key assumption is that the econometric estimates reflect the *equilibrium* relationship between the dependent variable and the economic fundamentals. While this assumption may be challenged, we take the view expressed by Chinn and Prasad (2003, p. 48) that this type of analysis "does provide an indication of the levels of current accounts that may be considered 'normal' for a country, based on a number of its macroeconomic attributes, including stage of development, demographic profile, and government budget balance, etc."

Another concern is that the calculated FEERs (in the FEER-MB method) are often sensitive to the assumed value for the sustainable CA balance. Different judgements about what constitutes a sustainable CA will lead to different FEER estimates. Furthermore, trade elasticities, which are the basis for calculating real exchange rate adjustments that align the underlying and sustainable CA balances, are often sensitive to the specification of trade equations.[8] In addition, uncertainties related to data quality (especially in developing economies) and estimation methods abound. For example, the country-specific FEER is often estimated on short time spans, making the results sensitive to the information set. It can also produce conservative estimates of misalignment since the actual and equilibrium (predicted)

[6] While we do not make the correction in our analysis, "this correction should be very small. In past CGER assessments, this correction has amounted to some 1−4 percentage points." (Lee et al., 2008, p. 7)

[7] It is noteworthy that all methods considered have a medium-term horizon, which means that they do not impose stock-flow equilibrium.

[8] See Driver and Wren-Lewis (1999) for a sensitivity analysis of the FEER estimates of the US dollar, Japanese yen, and German mark to different assumptions.

real exchange rate have, by nature of the estimation method (Least Squares), the same average over the period analyzed. Finally, misalignment may fail to be detected when important macroeconomic factors are not accounted for in country-specific equations due to the rapid loss of degrees of freedom in a short sample. For such reasons, assessing the robustness of the results is key.

Notwithstanding these considerations, our results are reassuring since the various methods employed to analyze the ERER for Mauritius lead to similar conclusions.

A. Macroeconomic Balance Approach (FEER-MB)

In the FEER-MB approach we estimate an ERER implied by a medium-term equilibrium CA. This, in turn, is determined by external and domestic macroeconomic fundamentals (Edwards, 1989; Wren-Lewis, 1992; Williamson, 1994; Isard and Faruqee, 1998; Faruqee, Isard, and Mason, 1999; Driver and Westaway, 2005). The CA position is deemed to be 'in equilibrium' or sustainable if current policies can maintain external and internal balance with no need for a major policy shift (Milesi-Ferretti and Razin, 1996).

The analysis consists of three steps.

1. We estimate a model of the determinants of the CA balance using panel data for 140 countries between 1980 and 2005.[9] The approach has the strength that a large cross-section of countries at different points on their development trajectory provides a wealth of information about the equilibrium relationship between the CA balance and its fundamentals. This also raises the precision of our estimates.

2. We project the CA norm for Mauritius over the medium term (2008−13) using coefficient estimates from the model and the IMF forecast for economic fundamentals (IMF, 2008, Table 1). The following specification is estimated:

$$\left(\frac{CA}{GDP}\right)_{it} = \alpha_i + \eta_t + \beta_1\left(\frac{FISC}{GDP}\right)_{it} + \beta_2\left(\frac{NFA}{GDP}\right)_{it} + \beta_3 RELGDP_{it} + \beta_4 GROWTH_{it} + \beta_5 POP_{it} + \varepsilon_{it} \quad (1)$$

where the time-varying fundamentals—a mix of factors affecting external and internal balance—are the overall fiscal balance (expressed as a ratio to GDP); the NFA position (relative to GDP); relative per capita GDP (expressed as the deviation from US income); per capita GDP growth; and population growth (a demographic control capturing fiscal pressures). Cross-sectional heterogeneity is addressed by including indicator variables for major fuel exporters, financial and offshore centers, Eurozone members (identifying years

[9] Summary statistics for all variables used in this analysis are shown in Appendix Table 1.

since membership), and countries affected by the East Asian crisis (identifying post-crisis years). Country-specific fixed effects (α_i) are included to account for unobserved heterogeneity. Year-specific shocks common to all cross-sectional units are captured by a set of time dummies (η_t).

3. We determine the exchange rate adjustment that would be needed to close the gap, if any, between the CA norm and the underlying CA (measured using WEO projections for the medium-term and stripped of temporary factors such as purchases of aircraft) based on estimated trade elasticities.[10]

To project the CA norm, coefficient estimates based on three panel estimators are considered: pooled OLS, random effects, and fixed effects (Appendix Table 2).[11] The results are reassuring: the coefficients do not vary much across estimation methods. Notably, a Hausman test yields no evidence of systematic differences between the random and fixed effects estimates. Notwithstanding several differences in terms of the underlying data, empirical specification, and estimation methods, our estimated coefficients are also similar to those obtained by Lee et al. (2008) in a sample of 54 economies for 1973−2004.

Coefficient estimates from the panel analysis accord with economic theory and intuition in terms of signs and magnitude. An increase in the overall fiscal balance-to-GDP ratio predicts a CA balance higher by ⅓ of a percentage point of GDP; and a higher NFA/GDP position is also associated with a higher CA balance, though the size of the coefficient is lower. While higher per capita income improves the CA balance, higher per capita growth causes it to deteriorate. The demographic variable shows that an increase in the population growth rate by 1 percentage point is associated with a CA balance that is lower by ½ a percentage point of GDP. Finally, countries that export fuel, have been affected by the East Asian crisis, or are global financial centers have substantially higher CA surpluses for the period; the reverse is true of offshore financial centers, such as Mauritius, whose CA balances are 5–6 percentage points lower than in onshore centers.

[10] Our underlying CA balance is based on a projected real appreciation of 2 percent per year that reflects the traditional Balassa-Samuelson effect and capital inflows. It is derived on the premise of continuation of established policies in Mauritius (see the 2007 Surveillance Decision for details) including an exchange rate policy of intervention in the market to manage short-term volatility but not affect the trend. This assumption should be borne in mind when assessing any RER adjustment that may be required to close the gap between the CA norm and the underlying CA.

[11] We restrict the analysis to 1980–2005 to obtain as large a sample of countries as possible. The panel analysis helps improve the precision of coefficient estimates by using both within- and between-country variation. Earlier data are also omitted because for most countries they are sparse.

To illustrate the workings of the FEER-MB approach, we report the coefficients estimated by the fixed effects estimator that are then employed to derive one CA norm (Appendix Table 2, column 3).

$$\left(\frac{\widehat{CA}}{GDP}\right)_{MUS,t} = -1.2 + \eta_t + 0.38 \times \left(\frac{FISC}{GDP}\right)_{MUS,t} + 0.02 \times \left(\frac{NFA}{GDP}\right)_{MUS,t} - 0.05 \times RELGDP_{MUS,t} - \\ - 0.09 \times GROWTH_{MUS,t} - 0.4 \times POP_{MUS,t} \quad (2)$$

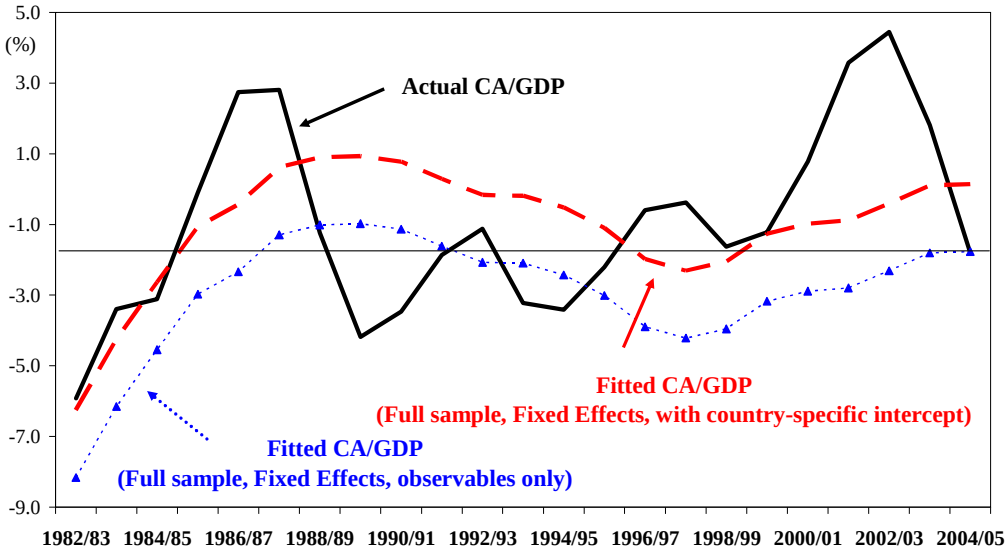
where $t = 1980,...,2005$ in the model, and $t = 2006/07,...,2012/13$ for the projection,[12] and the reported intercept is the fixed effect estimated for Mauritius. Note that the coefficients on time-invariant explanatory variables are absent from Equation 2 as they cannot be estimated with this method.

Figure 4 shows the fitted CA balance (using coefficients from Equation 2) for Mauritius relative to the actual balance. It appears that the REER has been close to its equilibrium value for much of the period and that the country's exchange rate policy has been appropriate given the observed economic fundamentals. Over the period analyzed, the average fitted CA balance derived from observables only (dotted line) is slightly below the average realized CA balance (solid line). To account for the effect of time-invariant unobservables, we adjust the fitted CA balance by adding the estimated fixed effect for Mauritius (dashed line). At the end of the time period considered (FY 2004/5), the fitted (equilibrium) CA balance is 0.14 percent (of GDP), compared to the actual CA balance of −1.8 percent (of GDP), suggesting a slight REER overvaluation.

The CA norm over the medium term (2007/8−12/13) is computed using coefficients from our estimated models at an average CA deficit of 4.7 percent of GDP using the fixed effects model (Equation 2) and 4.2 percent using the random effects model. Since the underlying CA (based on medium-term WEO projections) averages a deficit of 4.4 percent, the difference between the two balances (no more than ½ a percentage point) can be considered negligible. Therefore, the FEER-MB approach suggests that the REER is close to its equilibrium value because the CA norm is close to the underlying CA.

[12] We use fiscal years in the projection to keep in line with the budget cycle in Mauritius. Standard errors for the estimates are not reported in Equation 2 but are shown in Table 1.

Figure 4. FEER-MB Approach: Actual and Fitted CA balance



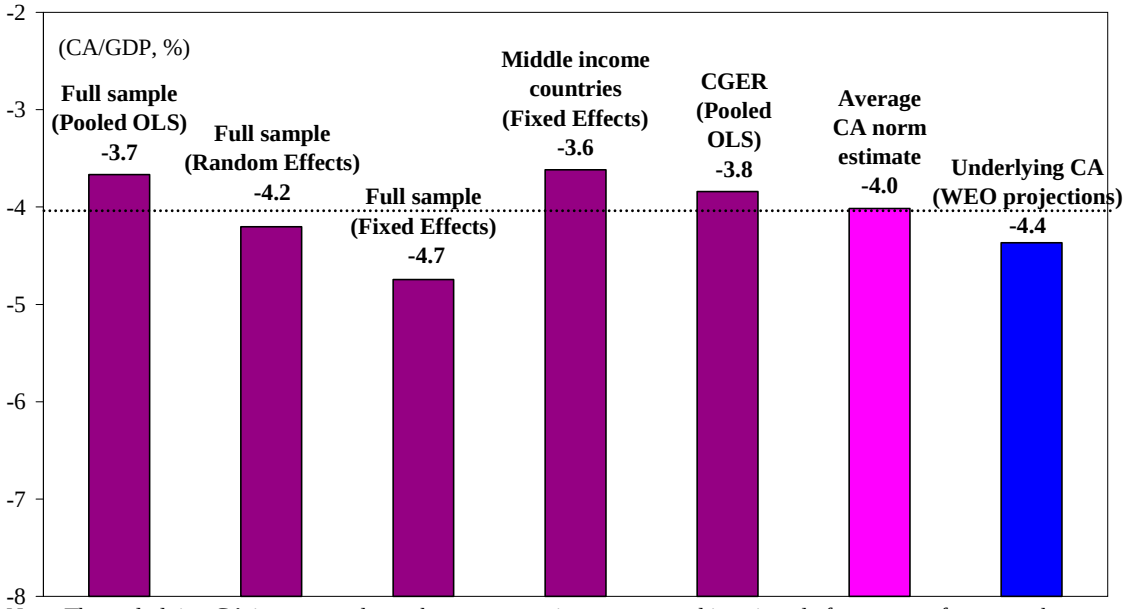
Note: The actual CA/GDP is expressed as a three-year moving average.
Source: Authors' estimates.

To check the robustness of this result, we also calculate CA norms using alternative coefficients that describe the equilibrium relationship between the CA balance and economic fundamentals. One set of coefficients arises from a fixed effects model estimated on the sub-sample of middle-income countries (shown in the last column of Appendix Table 2). Another comes from the pooled OLS model of Lee et al. (2008, Table 1). Finally, we consider the average of our various CA norm estimates.[13] Figure 5 summarizes the results by plotting all our estimates of the CA norm derived using different estimators and samples of countries, and demonstrates that they are close to the country's underlying CA (within 1 percentage point). To conclude, this method predicts that little or no additional real exchange rate adjustment—over and above the real appreciation incorporated in the underlying CA on the basis of established policies (see footnote 10)—should be necessary over the next five years.[14]

[13] Due to statistical uncertainty, confidence intervals for the CA norms and the FEER itself would indeed be more reliable than point estimates.

[14] We estimated trade elasticities using single-equation error correction models for exports and imports (not shown for brevity). We obtained an export elasticity of 1.6 and an import elasticity of –1.1 over the longest period for which we have complete data (1977–2006). Using the formula *(export elasticity)*×*(EXP/GDP)-(import elasticity)* × *(IMP/GDP)* and average trade ratios over the same period (of 57 and 60 percent), we found that the CA elasticity with respect to the exchange rate is 1.6. Barkbu (2006) presents an alternative set of estimates (3.5 for exports and –0.8 for imports) based on a vector error correction model with two vectors estimated on a shorter sample (1980–2004).

Figure 5. FEER-MB Approach: CA Norms vs. Underlying CA



Note: The underlying CA is expressed as a three-year moving average and is stripped of temporary factors such as purchases of aircraft and ships. It is predicated on an exchange rate appreciation of 2 percent per year. The CGER-based CA norm is derived using coefficient estimates from the pooled OLS estimation (Lee et al, 2008). The average CA norm estimate represents the average across all five CA norms.
Source: Authors' estimates.

B. Single-Equation Fundamental Equilibrium Exchange Rate Approach (FEER-SE)

Here we analyze the ERER by estimating a country-specific, reduced-form structural relationship between the real exchange rate and a vector of economic fundamentals. The approach is typically applied to the REER and is similar to estimating a behavioral equation in which expected future movements in the real exchange rate are determined by fundamentals and short-run behavior by the risk premium and the interest rate differential (also known as the BEER). However, the focus of this section is on medium-term determination of the ERER rate rather than short-term.[15]

We undertake a country-specific analysis for Mauritius because reliable data for a sufficiently long time-span (1960–2007) is available. For purposes of estimation, we use the autoregressive distributed lag (ARDL) approach to cointegration developed by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001).[16]

[15] Estimating a BEER was also hindered by the lack of data on the interest rate differential for the earlier years of the sample.

[16] This framework allows testing for cointegration when it is not known with certainty whether regressors are stationary, integrated of order 1, or mutually cointegrated.

The starting point is a general model comprising the following variables: terms of trade (the ratio of export price index to import price index), government consumption (relative to GDP), openness (the ratio of total trade to GDP), relative productivity (proxied by the GDP per capita relative to the average of main trading partners), NFA position, and a capital controls dummy for post-1994 liberalization. Using a general-to-specific methodology, we eliminate those variables that do not appear to have a cointegrating relationship with the REER. We also find that the NFA/GDP ratio, the capital account liberalization dummy, and relative productivity do not yield statistically significant or meaningful results in the long-run model.

We identify long-run cointegrating relationships between the REER and three variables: terms of trade, openness, and government consumption.[17] We report only one parsimonious specification (which preserves degrees of freedom), as follows:

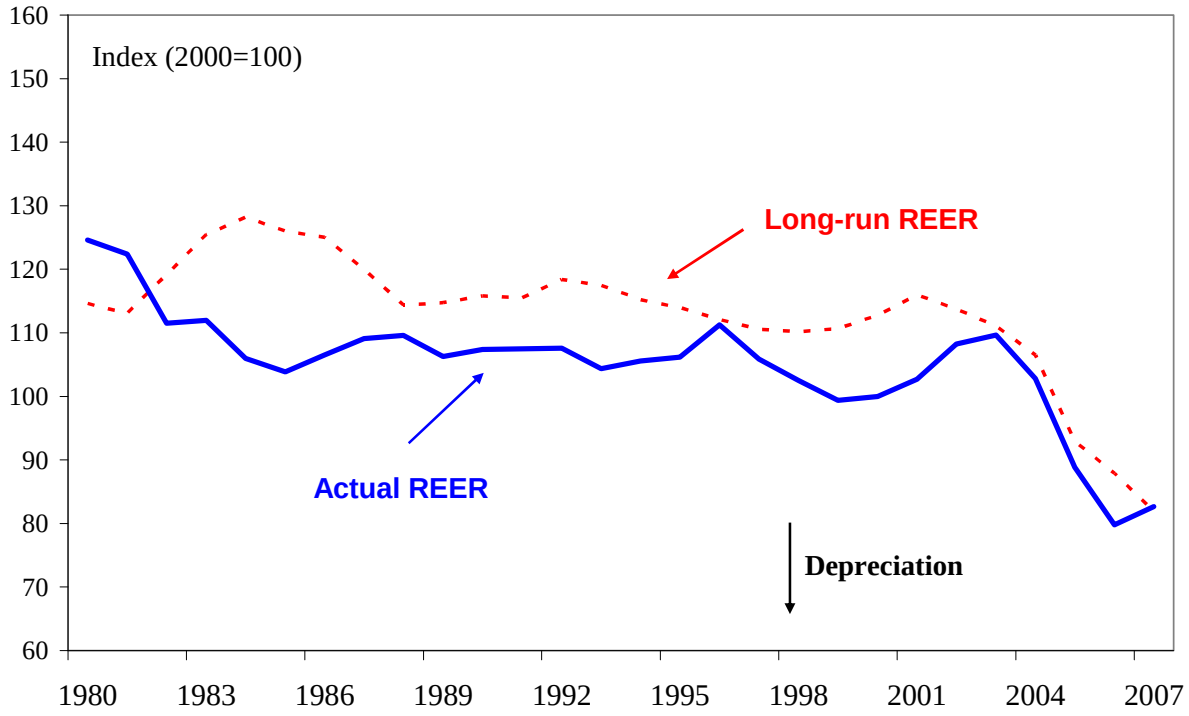
$$\begin{array}{lllll} \ln(\widehat{REER})_t = 0.53\times\ln(TOT)_t - 0.97\times\ln(OPEN)_t - 0.92\times\ln(GCONS)_t & & & & \\ \text{[t-stat]} \qquad [2.22]^{***} \qquad [-3.51]^{***} \qquad [-2.19]^{***} & & & & \end{array} \tag{3}$$

First, as expected, the terms of trade of goods have a positive coefficient, since a positive shock improves the trade balance and the resulting higher domestic demand pushes up the prices of nontradables, so the real exchange rate appreciates. Second, an increase in openness, which can be seen as a proxy for the easing of trade restrictions, is associated with lower domestic prices, hence a real depreciation. Third, a rise in government consumption (about 15 percent of GDP) is associated with real depreciation. This suggests that government spending composition in Mauritius may favor the tradable sector, imposing downward pressure on the trade balance, and requiring a real depreciation to maintain the external balance.

The FEER-SE analysis suggests that the Mauritian rupee has been close to its equilibrium value since 2003 (Figure 6). It follows that exchange rate policy has been generally appropriate for the past several years.

[17] The estimation was undertaken using the ARDL program developed by Chudik and Mongardini (2007) with a lag structure given by ARDL(1,0,0,0). The SBC (Schwartz Bayesian Criterion) is the information criterion that helped select the model. Linear interpolation was used to fill in short gaps in the data series. According to the bounds test for the existence of a level relationship, the null hypothesis of no such relationship is comfortably rejected at the 1 percent level for all models. Augmented Dickey-Fuller (ADF) tests for unit roots are shown in Appendix Table 3.

Figure 6. FEER-SE Approach: Actual vs. Equilibrium REER



Note: The estimation is undertaken for the period 1960−2007.
Source: Authors' estimates.

C. Capital-Enhanced Equilibrium Exchange Rate Approach (CHEER)

To better assess the recent evolution of the Mauritian rupee and to employ higher frequency data in our assessment of the ERER, we also consider the CHEER approach (Johansen and Juselius, 1990; Juselius, 1995; MacDonald and Marsh, 1997, 1999; Juselius and MacDonald, 2004). Detailed expositions of the method can be found in MacDonald (2000, 2007). Heerah-Pampusa and Hurree-Gobin (2006) applied it to the Mauritian rupee and found a small degree of overvaluation between 2003 and 2005. Our sample consists of monthly data from July 1995 through December 2007.

In brief, the CHEER approach is based on the idea that the exchange rate may deviate from its purchasing power parity (PPP)-determined value due to non-zero interest rate differentials. These are allowed to have a medium-term as opposed to a transitory effect on the exchange rate. The slow adjustment of the CA to relative prices means that the CA must be financed by the capital account (through the balance of payments condition). Thus, persistence observed in the real exchange rate should be reflected in persistence in the nominal interest rate differential.

The method thus combines the PPP with another parity condition: the uncovered interest parity (UIP). The CHEER approach, unlike the previous ones, captures capital flows as a factor affecting the ERER, but ignores real determinants such as relative output and NFA. Therefore, the extent of over- or undervaluation is defined as the variation in the real exchange rate that is unexplained by the interest rate differential. This approach is particularly useful here because Mauritius has opened up its capital account in recent years and is attracting significant capital flows.

First, note that the UIP condition equalizes nominal rates of return on domestic and foreign currency assets. Therefore, the expected change in the nominal exchange rate is determined by the interest rate differential and any risk premium (e.g., for country risk) as follows:

$$s_t = E_t s_{t+1} + (i_t - i_t^*) + \sigma_t \tag{4}$$

where s_t is the (log) nominal exchange rate (MUR/US$); $(i_t - i_t^*)$ is the interest rate differential for T-bills; σ_t is the risk premium; and E_t is the expectations operator. Assuming $\sigma_t = 0$ (justified because the interest rate differential on sovereign debt already incorporates the country risk premium), it follows that if domestic interest rates are above foreign rates, the domestic currency is expected to depreciate to equalize rates of return. Imposing $\sigma_t = 0$ and subtracting the expected inflation differential from both sides of the equation, we have

$$e_t = E_t e_{t+1} + (r_t - r_t^*) \tag{5}$$

where e_t is the real exchange rate and $(r_t - r_t^*)$ is the real interest rate differential. (For a visual interpretation of the two parities relative to the US, see Appendix Figure 1.)

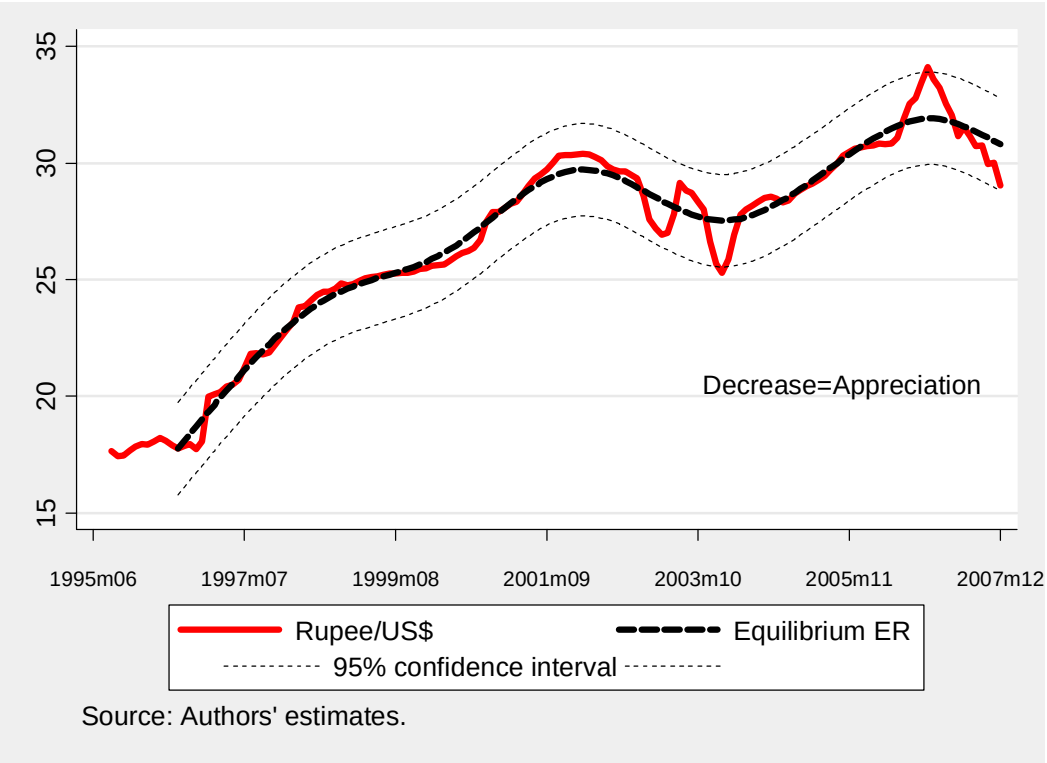
We estimate a vector autoregressive model (VAR) of the nominal exchange rate, the inflation differential, and the interest rate differential. The vector of monthly variables is given by

$$\left[e_t, p_t, p_t^*, i_t, i_t^*\right] \sim I(1) \tag{6}$$

where p_t and p_t^* are the consumer price indices (CPIs) of Mauritius and the US. The interest rates (i_t and i_t^*) are yields on the 90-day T-bill.

As a first step, all variables considered (nominal exchange rate, prices, and interest rates) are tested for unit roots (Appendix Table 4). All are integrated of order one in levels, but the results for prices are slightly ambiguous. We test for the existence of cointegrating relationships using the Johansen method and find strong evidence of one cointegrating vector (Appendix Table 5). Finally, we use the Hodrik-Prescott filter to obtain the equilibrium nominal exchange rate.

Figure 7. CHEER Approach: Actual vs. Equilibrium NER



Source: Authors' estimates.

The CHEER approach reveals that deviations from the equilibrium MUR/US$ exchange rate explained by the interest rate differential have been relatively small since July 1995. (In general, the actual exchange rate has remained within the 95 confidence interval for the equilibrium exchange rate.) In December 2007 the MUR/US$ exchange rate was 29.04 and the equilibrium value was 31.7 with a corresponding 95 percent confidence interval given by [28.8, 32.8]. Since the actual value falls within the confidence interval, we conclude that the estimated deviation from equilibrium was not statistically significant. Our findings using the CHEER approach therefore confirm those from the previous methods, reinforcing the conclusion that exchange rate policy in Mauritius has been appropriate in recent years.

Note that the nominal exchange rate has recently been somewhat volatile around the estimated equilibrium, depreciating above the trend in mid-2006 because of a large real interest rate differential with the US dollar. The rupee started to appreciate again at the end of 2006 because monetary policy became more credible when an independent Monetary Policy Committee was appointed. The cuts in US interest rates since August 2007—the beginning of the rupee's deviation from long-run equilibrium—were not followed by commensurate drastic reductions in Mauritian interest rates, so the interest rate differential was increasingly positive. This explains the continued appreciation of the rupee against the US dollar and its slight deviation from trend toward the end of 2007.

D. External Sustainability Approach (ES)

The ES approach is a variant of the external-internal balance approach which compares the underlying CA balance with the NFA-stabilizing CA balance (Lee at al., 2008).[18] The aim is to identify what, if any, real exchange rate correction is needed to close the gap between the two CA paths. In most applications the ES approach is applied by choosing (somewhat arbitrarily) a desirable NFA position and making assumptions about the main determinants of the country's external position—growth, inflation, and return on external assets and liabilities—to compute the CA balance consistent with it. Both the FEER-MB approach and the ES approach focus on a medium-term concept of equilibrium for the real exchange rate. However, in the former case the CA norm is derived based on a reduced-form equation (that identifies the main determinants of the CA balance) whereas in the latter, a benchmark NFA position is first specified.

Several approaches can be considered in choosing a benchmark NFA position. One option is to employ a backward-looking target such as the latest NFA position observed (for an application to industrialized and emerging economies, see Lee at al., 2008). A second approach is to assume that the medium-term CA projection represents a sustainable level (in which case, no real exchange rate adjustment is necessary), calculate the NFA position consistent with it, and determine whether it is plausible (given the country's investment outlook and capacity to save). A third approach is to specify a reduced-form model of NFA positions in a large cross-section of countries, and obtain estimates of the equilibrium NFA to GDP ratios conditional on country characteristics (Calderon, Loayza, and Serven, 1999; Lane and Milesi-Ferretti, 2001). A fourth method assesses sustainability of the balance of payments components in determining the desired NFA position (applied for the WAEMU region by Weisfeld et al., 2008).

We apply the ES method using the first approach and considering two NFA/GDP benchmarks. The first is the end-June 2006 (observed) NFA position (of slightly above 85 percent of GDP). Assuming a medium-term GDP growth rate of 5 percent and an inflation rate of 5 percent, we obtain a CA norm that stabilizes the NFA position at that level of 7.9 percent. The second is the net external position estimate from Lane and Milesi-Ferretti (2006) of 21 percent (of GDP) at end-2004. Stabilizing the NFA stock at that level over the medium term would imply a CA surplus of 2 percent of GDP (against an underlying CA of −4.4 percent of GDP; see Section III.A). Both findings suggest that the real exchange rate is slightly overvalued (by 4 to 7.7 percent using the elasticities discussed in footnote 14) if Mauritius were to target a medium-term NFA stock in this range.

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[18] In the ES approach, the level of the CA that stabilizes the NFA/GDP position is calculated as $ca^s = \frac{g+\pi}{(1+g)(1+\pi)} b^s$ where ca^s is the stabilizing level of the CA/GDP ratio, g is the growth rate of real GDP, π is the inflation level and b^s is the benchmark NFA/GDP level.

However, this analyis should be interpreted with caution for two reasons. First, neither of the two benchmarks carries much normative content. Furthermore, official net external position statistics in Mauritius are affected by the activity of Global Business Licenses (GBLs), which are offshore vehicles resident in the country that invest abroad to take advantage of double taxation avoidance treaties. Currently, these statistics fail to capture the liability side of GBL activity, reflecting only the foreign assets of the commercial banks sourced from the GBLs (IMF, 2008). This creates a positive bias in the NFA estimate for Mauritius; a correction would imply that lower (or negative) NFA/GDP ratios could be taken as benchmark in the ES approach, in which case the resulting CA norm would be lower than those considered here.

IV. Structural Competitiveness Analysis

In addition to equilibrium exchange rate methods, a comparative analysis of nonprice indicators can be useful in analyzing a country's relative competitiveness. Indicators like institutional quality (reflecting labor market flexibility, access to finance, or rule of law) can offer valuable insights on where bottlenecks lie and may help policymakers to formulate policy responses. Caution is required in interpreting this section's results: though useful in identifying binding constraints on growth, structural indicators of competitiveness often conceal problems because economic agents often adapt to the environment by themselves addressing binding constraints directly. For example, power outages are known to be a problem in Mauritius, but surveys fail to show them as a problem because most firms have bought expensive power generators, thus bypassing the constraint (Clarke et al., 2006). While typical surveys, and indicators based on them, would thus suggest that power outages are not an impediment to normal business functioning, in reality an upgrade of the power system is desirable to bring down input costs.

In analyzing several composite competitiveness indicators we find that Mauritius is one of the best performers in sub-Saharan Africa and often outranks comparator economies. We look at the four most popular indicators: (i) the Global Competitiveness Index of the World Economic Forum; (ii) the World Governance Indicators of the World Bank; (iii) the Doing Business Report indicators of the World Bank; and (iv) the Corruption Perception Index of Transparency International.

Mauritius fares well on structural competitiveness. Figure 8 plots standardized scores for Mauritius and three comparator groups. The country ranks in the top third most competitive countries in the world according to the Global Competitiveness Index. It is ahead of comparator small-island economies for which data are available though it trails high-growth Asian economies (South Korea, Hong Kong, Singapore, Taiwan, Malaysia, Thailand, and Indonesia). The World Governance Indicators summarize survey opinions on several dimensions of institutional quality: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. Again, Mauritius

ranks high by international standards, outperforming high-growth economies as well as small island states. The Doing Business Report 2008 named Mauritius the best-performing country in sub-Saharan Africa and ranked it 27th in the world. Compared to other nations, it fares particularly well on institutional variables related to commerce and entrepreneurship, such as starting a business and securing a license.

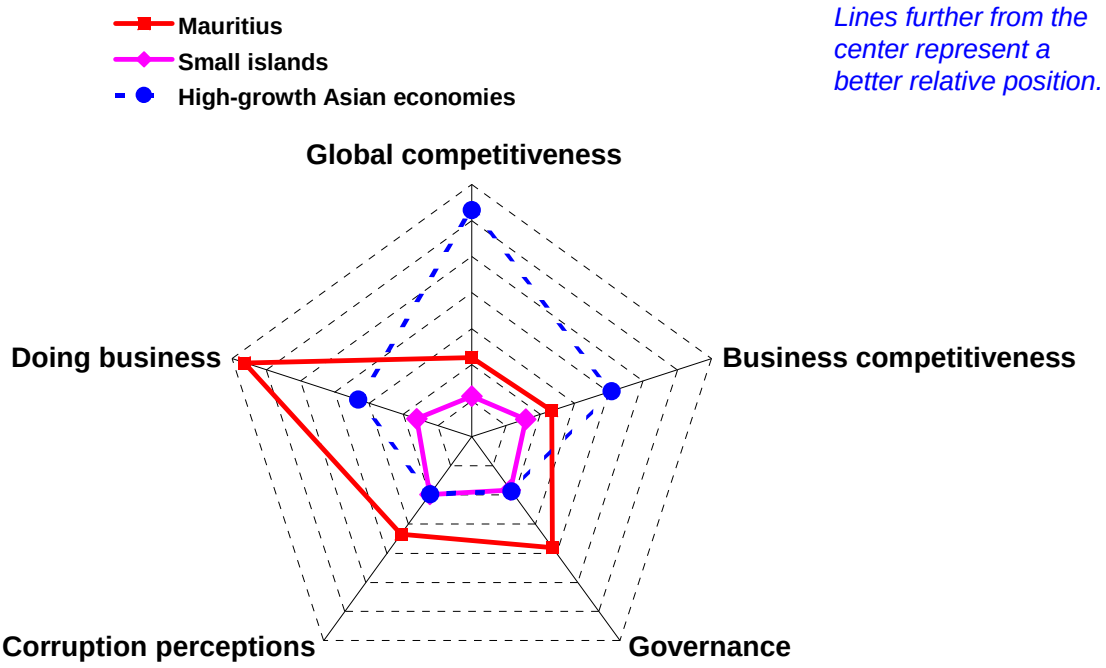
The analysis of structural competitiveness indicators helps identify areas where Mauritius can improve. According to the 2007/08 Global Competitiveness Report, the main problems are the relatively inefficient government bureaucracy, limited labor flexibility, and an underskilled workforce. The 2008 Doing Business Report flags a need for progress in registering property and the cost of closing businesses.[19] The same report highlights the relatively limited access to credit.

Considering its performance in trade and the ICT sector, Mauritius again fares well compared to both high-income countries and regional averages. We consider a subindex of the Global Competitiveness Index, the trading across borders measure, to determine how Mauritius stands in terms of exporter and importer costs of doing business. Djankov, Freund, and Pham (2006) have documented the trade cost of delays in shipments and highlighted the importance of reducing them as well as tariff barriers to stimulate exports. In number of documents required for a transaction, cost in US$ per container, and time to export, Mauritius is outperformed only by the OECD countries (Figure 9 and Appendix Table 6).

In access, quality, affordability, and institutional efficiency and sustainability, ICT sector services fare relatively well (Appendix Table 7). Mauritius seems to be outperformed only by high-income countries (though by a large margin); it has clearly outpaced other income-based country groupings (including the upper-middle-income group). Still, progress is needed in the area of quality, notably in broadband access to the Internet and minimizing telephone faults.

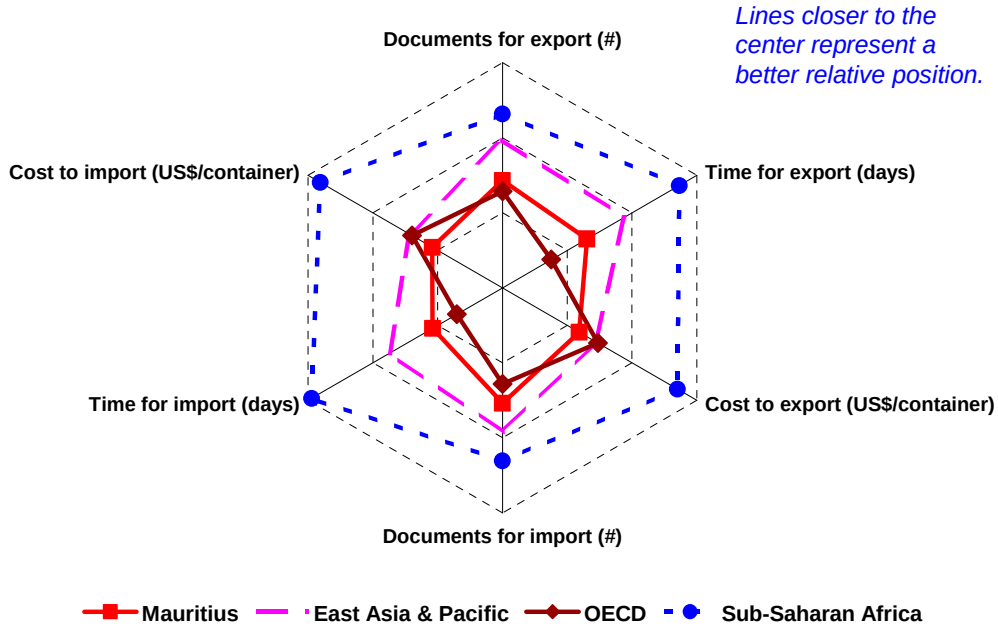
[19] A caution is in order when using the Doing Business indicators as a basis for policy advice related to labor markets. According to the recent report of the World Bank's Independent Evaluation Group (World Bank, 2008), the Doing Business indicator on Employing Workers tends to give lower scores to countries that have chosen policies for greater job protection and should therefore not be seen as a benchmark of labor regulation performance.

Figure 8. Composite Indicators of Structural Competitiveness



Source: World Economic Forum, World Bank World Governance Indicators, World Bank Doing Business Indicators, and Transparency International.

Figure 9. Relative Performance on Trade Costs



Source: World Economic Forum.

V. CONCLUSIONS

With the phasing out of the European Union sugar protocol, the elimination of the Multi-Fiber Agreement, and rising world commodity prices, Mauritius has to deal with a triple terms of trade shock. To identify external vulnerabilities, this study analyzed the country's equilibrium exchange rate using four quantitative approaches—the macroeconomic balance, the single-equation, the capital-enhanced equilibrium exchange rate, and the external sustainability approach—and also analyzed the business climate, trade, and ICT costs in comparative terms.

Our analysis demonstrates that the Mauritian rupee appears to be close to its equilibrium value. The following findings support this conclusion:

- The macroeconomic balance approach (FEER-MB) used parameters from a model estimated on panel data for 140 countries and the IMF forecast of economic fundamentals to project the Mauritius CA norm over the medium term. We found that the CA norm is close to the underlying CA stripped of temporary factors, suggesting that little or no exchange rate adjustment may be necessary. The results held up to a series of robustness checks, such as different estimators and samples of countries.

- The single-equation fundamentals approach (FEER-SE) used time series methods to compute the equilibrium REER using variation in openness to trade, terms of trade shocks, and government consumption. It concluded that the REER and the equilibrium level have been aligned since 2003.

- The capital-enhanced approach (CHEER) brought the uncovered interest parity condition into the analysis by investigating the relationship between monthly exchange rate variations and the interest rate differential with the US. Despite some volatility, the nominal exchange rate appeared close to equilibrium at the end of 2007.

- The external sustainability approach (ES) observed that estimates of the country's net external asset position in 2004 and 2006—interpreted illustratively as benchmarks—are consistent with a CA balance that indicates a slight real exchange rate overvaluation.

Given that the exchange rate regime is a managed float, the main policy recommendation that emerges from our analysis is that interventions in the foreign exchange market should continue to be aimed solely at reducing volatility rather than affecting the trend. This is likely to keep the real exchange rate close to its equilibrium level as determined by the economy's fundamental macro-variables. Alternative target levels of the CA balance, and the NFA position, over the medium term may require small exchange rate corrections, but these can be minimal if accompanied by measures to address structural bottlenecks and bolster competitiveness.

Structural competitiveness indicators offer a glimpse into areas that require attention, such as labor market reforms, ICT, and certain dimensions of institutional quality. While the government's reform program has gone far in restoring competitiveness, action may be needed to stimulate competition in goods markets, make labor markets more flexible, raise the average skill level, and further reduce the cost of doing business. As Mauritius embarks on its ambitious plan to become a business and financial services hub, such measures are essential for making the country more competitive.

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DATA SOURCES AND DEFINITIONS

Econometric analysis: The data have been extracted from *International Financial Statistics* (IFS), *Information Notice System* (INS), *World Economic Outlook* (WEO), *World Development Indicators* (WDI), and Penn World Tables Mark 6.2. Data on the Mauritius 90-day average T-bill yield have been drawn from the *Bank of Mauritius Monthly Statistical Bulletin* (1994 to 2007).

Trading partners: Mauritius's trading partners for purposes of calculating the REER are, in descending order of importance, France, Germany, the US, the UK, Japan, South Africa, Italy, Belgium, Singapore, the Netherlands, Taiwan Province of China, Hong Kong SAR, Spain, Switzerland, India, Korea, Canada, China, and Thailand. Trade weights have been obtained from the INS.

Comparator countries: Regional and income country groupings have been obtained from the WDI.

- **Small island economies**: Comoros, Madagascar, Maldives, and Seychelles
- **High-growth Asian economies**: Hong Kong, SAR, Singapore, South Korea, Taiwan Province of China, Malaysia, Thailand, and Indonesia

Structural competitiveness indicators:

- Global Competitiveness Index and Business Competitiveness Index 2007/80, World Economic Forum. (http://www.weforum.org)

- World Governance Indicators 2007, World Bank. (http://info.worldbank.org/governance/wgi2007/)

- World Bank Doing Business Indicators 2008. (http://www.doingbusiness.org/)

- Corruption Perception Index 2007. Transparency International. (http://www.transparency.org/)

APPENDIX

Table 1. Summary Statistics for FEER-MB Approach

Full sample:

Variable	Obs	Mean	Std. Dev.	Min	Max
CA/GDP	3191	-3.07	6.05	-19.95	19.12
Overall balance/GDP	3221	-3.31	4.58	-24.96	13.61
NFA/GDP	3550	9.52	24.03	-83.02	147.43
Relative income	3818	26.59	27.46	1.41	153.77
Per capita GDP growth	3861	1.52	4.67	-32.47	47.49
Population growth	4644	1.61	1.53	-44.41	11.52
1=Fuel exporting	4698	0.13	0.33	0.00	1.00
1=Financial center	4698	0.03	0.18	0.00	1.00
1= Offshore fin. center	4698	0.05	0.22	0.00	1.00
1=Asian Crisis	4698	0.01	0.11	0.00	1.00
1=Euro zone	4698	0.02	0.14	0.00	1.00

Middle income countries:

Variable	Obs	Mean	Std. Dev.	Min	Max
CA/GDP	1522	-3.36	6.24	-19.92	18.42
Overall balance/GDP	1576	-3.43	4.79	-24.40	13.24
NFA/GDP	1993	-0.45	4.89	-7.57	14.03
Relative income	1706	11.52	23.61	-66.19	147.43
Per capita GDP growth	1863	1.69	5.18	-30.80	47.49
Population growth	1844	18.36	9.57	1.98	49.82
1=Fuel exporting	2295	0.19	0.39	0.00	1.00
1= Offshore fin. center	2295	0.08	0.27	0.00	1.00
1=Asian crisis	2295	0.02	0.12	0.00	1.00

Note: Financial centers are Belgium, Luxembourg, the Netherlands, Singapore, Switzerland, and Hong Kong. Offshore financial centers are St. Vincent & Grenadines, Dominica, St. Lucia, Grenada, St. Kitts & Nevis, Antigua and Barbuda, Barbados, the Bahamas, and Mauritius. To account for the large current account deficits up to the East Asian crisis and the surpluses thereafter, the East Asian crisis dummy takes value 1 for the following countries starting in 1998: Thailand, Indonesia, Korea, Malaysia, Laos, the Philippines, and Hong Kong. The Euro zone dummy takes value 1 for the countries that have adopted the Euro (in 1999 except for Greece, which adopted it in 2001). Fuel-exporting economies are Algeria, Angola, Bolivia, Cameroon, Ecuador, Egypt, Gabon, Indonesia, Iran, Iraq, Libya, Mexico, Oman, Syria, Trinidad & Tobago, and Venezuela, RB. To minimize the impact of outliers and measurement errors, outliers for the CA and overall government balance to GDP ratios are trimmed asymmetrically (around the 95th percentile). NFA/GDP is trimmed symmetrically at the 99th percentile. All variables are expressed as three-year moving averages to eliminate short-term fluctuations.
Source: Authors' calculations.

Table 2. Correlates of the Current Account Balance—Panel Estimates (1980–2005)

	Full sample: 140 countries			Sub-sample: 69 middle-income countries
	Pooled OLS	Random Effects	Fixed Effects	Fixed Effects
	[1]	[2]	[3]	[4]
Overall budget balance/GDP	0.372***	0.388***	0.377***	0.335***
	(0.030)	(0.035)	(0.037)	(0.051)
Net foreign assets/GDP	0.039***	0.027***	0.024***	0.006
	(0.006)	(0.008)	(0.008)	(0.011)
Relative income	0.048***	0.035***	-0.054*	-0.124**
	(0.004)	(0.010)	(0.030)	(0.057)
Per capita GDP growth	-0.073**	-0.101***	-0.093***	-0.019
	(0.035)	(0.034)	(0.035)	(0.042)
Population growth	-0.028	-0.350**	-0.403**	-0.601**
	(0.099)	(0.144)	(0.180)	(0.265)
1=Fuel exporting	2.528***	3.337***		
	(0.315)	(0.982)		
1=Financial center	4.248***	4.316**		
	(0.660)	(1.943)		
1=Offshore center	-5.954***	-6.240***		
	(0.680)	(1.707)		
1=East Asian crisis	5.611***	5.651***	6.231***	8.320***
	(0.811)	(0.781)	(0.773)	(0.898)
1=Euro zone	-0.858	-1.825***	-1.764***	
	(0.550)	(0.537)	(0.522)	
Constant	-5.465***	-4.704***	-0.929	-0.418
	(0.652)	(0.742)	(1.181)	(1.537)
Observations	2474	2474	2474	1173
No. of countries	140	140	140	69
Time fixed effects?	Yes	Yes	Yes	Yes
Country fixed effects?	No	No	Yes	Yes

Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

Note: The dependent variable current account to GDP ratio. The old-age dependency ratio (defined as the ratio of population over 65 years of age to population between 15 and 64 years of age) as well as a measure of financial deepening (M2/GDP) were insignificant in most specifications and thus excluded from the model. Middle income countries were identified using the World Bank Atlas method and have a per capita gross national income in 2007 between $936 and $11,455.

Source: Authors' estimates.

Table 3. Unit Root Tests for the FEER-SE Approach

Series:	REER	Terms of trade	Openness	Gov-Cons.
Augmented Dickey-Fuller				
level				
p-value	41.5%	38.0%	27.1%	94.0%
1st difference				
p-value	0.3%	0.0%	0.0%	0.0%
2nd difference				
p-value	0.0%	0.0%	0.0%	0.0%

Note: All variables in logs. Constant and trend included. Openness is defined as total trade to GDP. Government consumption is expressed in ratio to GDP. The null hypothesis for the Augmented Dickey-Fuller is of a unit root.
Source: Authors' estimates.

Table 4. Unit Root Tests for the CHEER Approach

	NER	**MUS CPI**	**US CPI**	**ΔMUS CPI**	**ΔUS CPI**	**MUS T-bill**	**US T-bill**
Number of obs:	150	150	150	150	150	149	150
Philips-Perron							
level	-1.31	-1.24	-2.46	-11.32	-7.96	-1.86	-1.24
MacKinnon approximate p-value	0.89	0.90	0.35	0.00	0.00	0.67	0.90
1st difference	-7.85	-11.32	-7.96	-27.74	-15.34	-7.26	-7.81
MacKinnon approximate p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Conclusion	**I(1)**	**I(1)**	**I(1)**	**I(0)**	**I(0)**	**I(1)**	**I(1)**
Augmented Dickey-Fuller							
level	-1.30	-1.25	-0.94	-2.94	-8.40	-2.03	-2.21
MacKinnon approximate p-value	0.88	0.90	0.95	0.15	0.00	0.58	0.48
1st difference	-7.74	-2.93	-8.34	-19.27	-13.11	-5.71	-2.00
MacKinnon approximate p-value	0.00	0.16	0.00	0.00	0.00	0.00	0.60
2nd difference	-15.24	-19.08	-13.03	-25.52	-17.74	-16.39	-19.06
MacKinnon approximate p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Conclusion	**I(1)**	**I(2)**	**I(1)**	**I(1)**	**I(1)**	**I(1)**	**I(2)**

Note: All variables except interest rates are in logs. The null hypothesis for both tests is that of a unit root. The number of autoregressive lags is based on the Akaike Information Criterion (AIC). For the VAR, the likelihood-ratio test and the AIC indicate that the optimal lag length is 12. To secure valid statistical inference, we include in the VAR dummy variables for large outlier observations (and seasonal dummies).
Source: Authors' estimates.

Table 5. Johansen Cointegration Test for the CHEER Approach

Sample (adjusted): 1996M09 2007M12
Included observations: 136 after adjustments
Trend assumption: Linear deterministic trend (intercept, no trend in CE)
Series: ln(NER), ln(MUS CPI), ln(US CPI), MUS T-bill, US T-bill
Lags interval (in first differences): 1 to 12

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CEs	Eigenvalue	Trace Statistic	0.01 Crit. Val.	Prob.**
None *	0.27	97.56	77.82	0.00
At most 1	0.18	53.88	54.68	0.01
At most 2	0.13	26.40	35.46	0.12
At most 3	0.04	6.90	19.94	0.59
At most 4	0.01	1.12	6.63	0.29

Trace test indicates 1 cointegrating eqn(s) at the 0.01 level
* denotes rejection of the hypothesis at the 0.01 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CEs	Eigenvalue	Max-Eigen Statistic	0.01 Crit. Val.	Prob.**
None *	0.27	43.68	39.37	0.00
At most 1	0.18	27.48	32.72	0.05
At most 2	0.13	19.50	25.86	0.08
At most 3	0.04	5.77	18.52	0.64
At most 4	0.01	1.12	6.63	0.29

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.01 level
* denotes rejection of the hypothesis at the 0.01 level
**MacKinnon-Haug-Michelis (1999) p-values

Selected (0.01 level*) Number of Cointegrating Relations by Model

DataTrend:	None	Linear	Linear
Test Type	Intercept No Trend	Intercept No Trend	Intercept Trend
Trace	2	1	2
Max-Eig	1	1	1

*Critical values based on MacKinnon-Haug-Michelis (1999)

1 Cointegrating Equation(s):

Log likelihood 1718.941

Normalized cointegrating coefficients

NER	MUS CPI	US CPI	MUS T-bill	US T-bill
1	1.32	-5.17	-0.14	0.19
SEs	(1.42)	(3.19)	(0.02)	(0.03)
test-stats	**0.9**	**1.6**	**7.0**	**6.0**

Note: The results of the trace and maximum eigenvalue tests, and the number of cointegrating vectors corresponding to different deterministics are highlighted in yellow.
Source: Authors' estimates.

Table 6. The Relative Performance of Mauritius on Trade Costs

Note: Documents for export and import refer to filing documents, customs declaration, and clearance documents.

	Mauritius	East Asia & Pacific	Eastern Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	OECD	South Asia	Sub-Saharan Africa
Documents for export (#)	5	7	7	7	7	5	9	8
Time for export (days)	17	25	29	22	25	10	33	36
Cost to export (US$/container)	728	885	1393	1108	992	905	1180	1660
Documents for import (#)	6	8	8	8	8	5	9	9
Time for import (days)	16	26	31	26	29	10	32	44
Cost to import (US$/container)	763	1015	1551	1228	1129	986	1418	1986

Cost to export and import measures the fees levied on a 20-foot container in US$ (including costs for documents, administrative fees for customs clearance and technical control, terminal handling charges, and inland transport; it does not include tariffs or trade taxes).

Source: World Bank Doing Business Indicators and authors' estimates.

Table 7. The Relative Performance of the Mauritius ICT Sector

	Mauritius	Upper middle income group	High income group	Lower middle income group	Low income group
ACCESS					
Telephone main lines (per 1,000 people)	289	230	503	205	37
International voice traffic (minutes per person)	92	46	171	14	5
Mobile subscribers (per 1,000 people)	574	671	835	306	77
Internet users (per 1,000 people)	146	196	527	95	44
Personal computers (per 1,000 people)	162	113	579	45	11
Households w/ television (%)	93	91	97	84	15
QUALITY					
Telephone faults (per 100 main lines per year)	41.5	21.2	5.8	25	…
Broadband subscribers	2.2	21	163.2	23.1	0.9
Interantional internet bandwidth (bits per person)	50	218	4537	116	15
AFFORDABILITY					
Price basket for fixed line (US$ per month, residential)	7.9	12.1	…	8.5	8.7
Mobile	4.2	9.5	27.6	10.2	9.6
Internet	17.5	17	17.8	16.8	30.1
Price of call to the US (US$ per 3 minutes)	1.59	1.06	19.9	2.08	1.99
INSTITUTIONAL EFFICIENCY AND SUSTAINABILITY					
Total TC revenue (% of GDP)	3.2	3.6	4.5	1.9	0.7
Total telephone subscribers per employee	451	583	586	444	141
ICT expenditure (% of GDP)	…	5.2	7.2	5.5	5.9

Source: World Bank ICT at a Glance Tables.