Exchange Market Pressure in African Lusophone Countries[1]

Jorge Braga de Macedo,[2] Luís Brites Pereira[3] & Afonso Mendonça Reis[4]

14 September 2007

Abstract

This paper explores the credibility of exchange rate arrangements for the five African Portuguese-speaking (PALOP) countries. Our working hypothesis is that credibility necessarily implies low mean exchange market pressure (EMP), low EMP conditional volatility and low-severity EMP crises. In addition, economic fundamentals must account for EMP dynamics. We also seek evidence of a risk-return relationship for mean EMP and of "bad news" (negative shocks) having a greater impact on EMP volatility than "good news" (positive shocks). Using our econometric models, we are able to rank PALOP countries' conditional volatility in ordinal terms. Our main conclusion is that countries with currency pegs, such as Guinea-Bissau (GB) and Cape Verde (CV), clearly have lower volatility when compared to those with managed floats and are therefore more credible. Moreover, EMP crises episodes under pegs are much less severe. We find that economic fundamentals correctly account for mean EMP in all countries and that the risk-return relationship is much more favourable for investors under currency pegs, as the increase in volatility is lower for the same rate of return. The exception to this finding is Mozambique (MOZ), which apparently has a risk-return profile akin to that enjoyed by countries with pegs. A plausible reason is that MOZ has the only managed float in our sample implementing monetary and exchange rate policy within the confines of an IMF framework, which establishes floors for international reserves and ceilings for the central bank's net domestic assets. This intuition needs to be tested, however. EMP conditional volatility is generally driven by changes in domestic credit (lowers it) and foreign reserve changes (raises it). The first effect is more pronounced under currency pegs, but also under MOZ's managed float. "Bad news" increases volatility more that "good news" only in the case of CV's currency peg, which we take to be another sign of its credibility. A few striking cross-country comparisons also emerge in our analysis. Among countries with managed floats, we find that Angola (ANG) has the most severe EMP crises whilst MOZ has the least severe. São Tomé & Princípe (STP), meanwhile, lies between these two extremes but its EMP crises behaviour is clearly much closer to that of MOZ. STP's credibility may also be improving since its volatility has declined as of 2002 and its level is now much closer to that of MOZ, whose managed float has lowest volatility of such arrangements.

Keywords: Exchange Rate Regime, Exchange Market Pressure, EGARCH-M

JEL Classification: C22, F31, F33

[1] First draft of paper to be presented at the African Economic Conference 2007 in Addis Ababa, Ethiopia on 15-17 November.

[2] Professor of Economics at Nova University, President of the Tropical Research Institute (IICT), both in Lisbon.

[3] Assistant Professor, Faculty of Economics at Nova University and Research Fellow of the Tropical Research Institute (IICT), both in Lisbon. Corresponding author's email address: lpereira@fe.unl.pt

[4] Graduate Student at Nova University, Lisbon

1. Introduction

Global financial markets change the environment for economic policymaking, most visibly in the choice of exchange rate regime. When capital markets are integrated, the main issue becomes that of the relative importance attached to exchange rate stability and domestic monetary independence. At the heart of this issue is the so-called "impossible trinity" dilemma, which holds that a country can only attain two of the following three goals simultaneously: exchange rate stability, monetary independence and financial-market integration. Monetary independence is clearly greater under floating exchange rates, as the value of a currency is allowed to vary continuously in response to prevailing exchange market pressure (EMP), which reflects the excess demand for a currency arising when the total value of foreign goods and assets demanded by domestic residents is higher than that demanded by foreigners at the prevailing exchange rate. However, the benefit of greater independence has to be balanced against the cost of greater volatility and uncertainty in real exchange rates.

For many developing countries, limiting exchange rate variability by fixing a domestic currency's value to that of a sounder foreign currency is often seen as desirable. The reason is that fixing the exchange rate provides a nominal anchor that has two important benefits. First, it fixes the inflation rate for internationally traded goods, and so contributes to controlling inflation. Second, it anchors domestic inflation expectations to the anchor country's inflation rate. As a result, domestic inflation falls in line with that of the anchor country, as do interest rates. Under free capital mobility, a credible currency-peg implies that a country has in effect adopted the anchor country's monetary policy and, consequently, its low expected inflation. Under fixed exchange rates, the burden of adjustment to prevailing EMP thus falls exclusively on foreign reserves and interest rate changes.

With respect to intermediate arrangements, a major policy debate in the literature is whether these are viable or not. Under such arrangements, EMP is relieved by some combination of changes in the exchange rate, in foreign reserves and in domestic credit. The focus on intermediate arrangements is particularly relevant given that almost all currency crises in the past decade took place against a background of fixed but adjustable exchange rates, i.e. arrangements allowing a step change in the value of a currency as a result of a discretionary decision by domestic monetary authorities.

It is noteworthy that currency crises often became financial crises as sovereign credit ratings plummeted and access to international capital was lost following a currency's collapse. In this regard, the East Asian "twin" financial and currency crashes of the 1990s underscored the relative ease with which it was possible to implement the "wrong" combination of currency pegs and economic policy under a given degree of financial-market integration. The commitment of authorities who seek exchange rate stability, through the adoption of fixed but adjustable exchange rate regimes, is therefore likely to be tested under financial-market integration.[5] More recently, this policy debate has become more prominent in connection with the so-called "benign peg" of the Chinese currency to the US dollar.[6]

[5] The relevance of the European Payments Union is pointed out in Braga de Macedo & Eichengreen (2001c). The "Eurocentric" view has been presented as evidence of an intermediate exchange rate system which helps acquire financial reputation and is applied to the Franc zone and to Latin America in Braga de Macedo, Cohen & Reisen (2001b). The "Eurocentric" view essentially extends an interpretation of the first European attempts at promoting a multilateral payments system into an argument for improving regional monetary and fiscal surveillance. While the quantitative relevance of multilateral surveillance to international lenders and credit rating agencies' scrutiny has not been tested directly, the European experience does signal when it is bound to be especially intense.

[6] Indeed, a possible explanation of the current international monetary system goes back to the Bretton Woods system. This was discussed at a conference at the University of Santa Cruz in May 2006 on "The Euro and the

The literature also highlights the consensual view that policymakers will always have to take into account financial markets' responses to their policy actions in seeking an optimal trade-off between exchange rate stability and domestic monetary independence. After a country has chosen its exchange rate policy regime (fixed, floating, or fixed-but-adjustable) under a given degree of financial market integration, it then has the task of adapting its domestic economic policy and institutional environment in accordance with that choice. Indeed, the extent to which it is able to establish a credible interaction between a country's financial-market integration, exchange rate arrangements and the accompanying policy and institutional responses will be paramount in establishing its reputation in international financial markets.[7]

For any country, establishing financial reputation is important for two reasons: First, it leads to a low-risk borrower profile and improved credit terms when seeking foreign capital, as reflected in its international credit rating. Second, it is conducive to low and more stable domestic interest rates, especially under fixed exchanges. Given that interest rates are an inter-temporal price, and, as such, heavily influenced by agent's expectations, low interest rate spreads are considered to be an indicator of financial reputation.

The range of reforms required to establish financial reputation is very broad, but the scrutiny of international lenders and credit rating agencies usually focuses on monetary and fiscal issues.[8] Moreover, when the exchange rate regime is chosen based on a social concern for financial reputation, the choice is not necessarily restricted to the two corner solutions of a hard peg or a pure float.[9] Intermediate regimes can thus be justified in spite of the logic behind the so-called "impossible trinity" dilemma, contrary to the dominant conventional wisdom of the late 1990s. Intermediate solutions do, however, raise the issue of the effectiveness and durability of capital controls, an issue we do not pursue here.

The observation that acquiring financial reputation necessarily implies a positive interaction between financial-market integration, exchange rate regime and economic policy motivates our collective research interest. An additional motive is the absence of empirical studies that characterises existing literature, which is especially relevant in the case of many African countries. In the past, we researched the Portuguese Escudo's entry into the Euro, the credibility of Macau's currency board and of Cape Verde's currency peg.[10] Building upon our

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Dollar in a Globalised Economy", where one of us commented on a presentation by Michael Dooley on Interest rates, Exchange Rates and International Adjustment based on a joint paper with David Folkerts-Landau and Peter Garber. The argument that, under a fixed exchange rate between the Yuan and the US Dollar, China becomes a periphery of the US is based on the persistence of effective capital controls between the two currency areas and on perfect substitutability between euro and dollar denominated assets. As discussed in Kouri & Braga de Macedo (1978) and Krugman (1981), these assumptions are questionable to the extent that there is imperfect substitutability between euro and dollar denominated assets and that capital controls are quickly eroded under financial globalisation.

[7] For a central bank, credibility is usually associated with the perception of inflation aversion, even though other meanings such as incentive compatibility or pre-commitment have been pointed out. See Goldberg & Klein (2006).

[8] Three related points come to mind in this connection. First, the design of reforms may help speed up the process of earning financial reputation, not least by sustaining the growth process, see Braga de Macedo & Oliveira Martins (2006). Second, the scrutiny mentioned in the text has been close enough to reveal a positive relationship between globalisation and governance, measured by trade flows and corruption indices in Bonaglia, Braga de Macedo & Bussolo (2001). Third, the international monetary system may help or hinder the process: an historical perspective between the gold and the euro standards is provided in Braga de Macedo, Eichengreen & Reis (1996).

[9] Monetary transitions on the part of the new EU member states are therefore described as "float in order to fix" in Braga de Macedo & Reisen (2004).

[10] Braga de Macedo (1996, 2001), Braga de Macedo, Catela Nunes and Covas (1999, 2004a), and using intervention data, Braga de Macedo, Catela Nunes & Brites Pereira (2003), and Brites Pereira (2005a, b); Braga de Macedo, Braz, Brites Pereira & Catela Nunes (2006); Braga de Macedo & Brites Pereira (2006);

past experience, we now intend to analyze exchange market pressure (EMP) for the case of African Portuguese-speaking, or Lusophone, countries, namely: Angola (ANG), Cape Verde (CV), Guinea-Bissau (GB), Mozambique (MOZ) and São Tome and Principe (STP), hereafter PALOP countries.[11] While sharing a common development challenge, this group of countries encompasses different institutional options and economic policies.

In particular, their exchange rate arrangements differ. ANG, MOZ and STP operate managed floats with no pre-determined path for the exchange rate. MOZ, in addition, has the only managed float that implements monetary and exchange rate policy within the confines of an IMF framework establishing floors for international reserves and ceilings for the central bank's net domestic assets. CV and GB, meanwhile, both have pegs against the Euro. In the case of GB, this implies the absence of separate legal tender as it is a member of the West African Economic and Monetary Union (WAEMU), whose currency is the West African CFA franc.

As such, it will particularly interesting to assess the credibility of exchange rate arrangements for each PALOP country. Our working hypothesis is that credibility necessarily implies low mean EMP, low EMP conditional volatility and low-severity EMP crises. In addition, economic fundamentals must account for EMP dynamics. We also seek evidence of the risk-return relationship for mean EMP and of "bad news" (negative shocks) having a greater impact on EMP volatility than "good news" (positive shocks), as discussed below.

The rest of the paper is as follows. In section 2, we measure EMP and identify crises episodes for each country. Section 3 looks at the stochastic properties of EMP and explores to what extent these can be explained by economic fundamentals. We present our conclusions in section 4. The appendix contains the country files, each containing tables and figures relating to EMP estimates, EMP descriptive statistics, EMP crises episodes, econometric results and diagnostics, and also the description of data used in the estimations.

2. Measuring EMP

The literature identifies two ways of measuring EMP.[12] The first, following Girton & Roper's (1977) seminal contribution, measures EMP as a weighted sum of changes in foreign reserves and exchange rate changes. The insight underlying this summary statistic is that exchange rate changes necessarily reflect a central bank's passive adjustment to EMP while its purchases/sales of foreign assets are its active response. The precision weights adopted in this measure are typically estimated from a structural model of the economy, implying that these EMP measures are model-dependent.

A second approach, proposed by Eichengreen, Rose & Wyplosz (1995, 1996 – ERW, hereafter), holds that model-dependency is undesirable given the tenuous connection between the exchange rate and economic fundamentals. As such, a model independent or *ad-hoc* EMP measure is calculated based on the channels through which EMP is relieved, which can include the interest rate channel unlike the first approach. EMP is measured as a weighted linear combination of these channels, where the precision weights are typically chosen so as to equalise the conditional volatilities of EMP measure's constituent components.

Our choice of summary statistic falls on the ERW approach for two reasons: first, the importance of the interest rate channel in altering the relative supply of domestic money *vis-*

[11] The acronym is Portuguese for Portuguese-speaking African Countries. All five countries are also members of the Community of Portuguese-Speaking Countries (*Comunidade dos Países de Língua Portuguesa - CPLP*).
[12] For a comprehensive review of EMP literature, refer to Weymark (1995, 98) and Spolander (1999).

à-vis foreign monies, especially under fixed exchange arrangements; second, the severe lack of data needed to estimate structural models, and hence model-based precision weights, for PALOP countries. As such, our EMP summary statistic assumes that the strain on a country's external imbalance is absorbed by changes in the exchange rate (Δe_t[13]), in foreign exchange reserves (Δr_t) and in the interest rate differential $\Delta(i_t - i^*_t)$. It is calculated as a weighted linear combination of these observed changes:

$$EMP_t = \Delta e_t + \eta_r \Delta r_t + \eta_i \Delta(i_t - i^*_t)$$

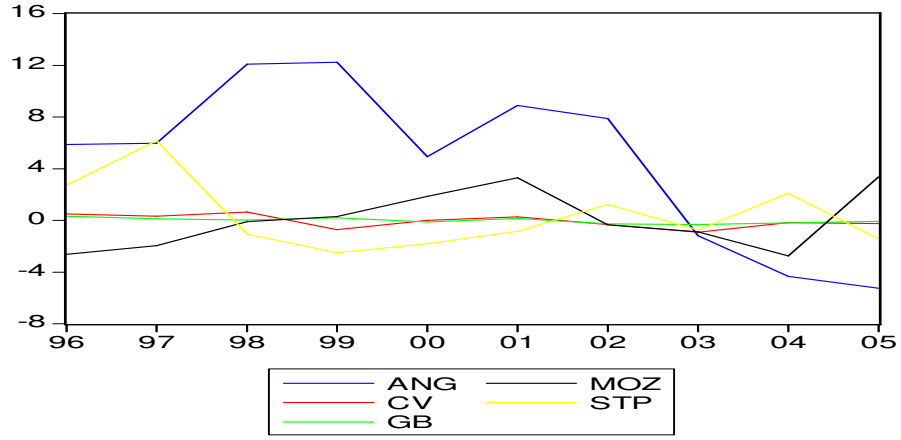
In accordance with the ERW approach, we equalise volatilities of the EMP measure's constituent components because one of the components will dominate EMP measures in the absence of this procedure.[14] Here, Δe_t is the reference variable and so the precision weights are calculated as $\eta_r = -SD(\Delta e_t)/SD(\Delta r_t)$ and $\eta_i = SD(\Delta e_t)/SD(\Delta(i_t - i^*_t)$, where *SD* denotes the standard deviation of the variable under consideration. The weights take on the signs $\eta_r < 0$ and $\eta_i > 0$ as central banks intervene by selling (purchasing) foreign reserves in response positive (negative) EMP while the interest rate differential increases (decreases) as domestic interest rates are raised (lowered).

Table 1 - EMP Descriptive Statistics (% per month)

Country	ANG	CV	GB	MOZ	STP
Mean	5,06	-0,05	-0,01	-0,07	0,43
SD	34,87	1,46	0,73	4,31	7,07
Max	190,66	4,86	3,12	12,84	24,06
Min	-210,6	-5,31	-2.90	-19,85	-27,14

Note: Statistics are calculated using the full sample. See the appendix for additional statistics.

Figure 1 - EMP Mean (% p.a.)



Note: Annual values are calculated as average of monthly EMP estimates.

[13] $\Delta e_t > 0$ denote exchange rate depreciations.

[14] Recent research highlights that EMP summary statistics calculated using the ERW approach are sensitive to the assumptions regarding their constituent components (see Bertoli, *et al.,* 2006 and also Li *et al.,* 2006). The assumptions of relevance to our analysis have to do with the manner in which exchange rate variations are computed (exact formula versus logarithmic approximation), the different definitions of reserves (gross versus net), the constancy of precision weights over time and the choice of anchor currency. Our robustness analysis indicates that EMP summary statistics obtained under a different set of assumptions are broadly similar to the ones used in the analysis. As such, they will not change the ordinal ranking of PALOP countries' conditional volatility presented here. The robustness analysis results, which also include estimated precision weights, are available from the authors upon request.

The descriptive statistics of our estimated EMP measures are given in Table 1.[15] Looking at mean EMP values, we observe that CV, GB and MOZ are characterised by slightly negative EMP (close to zero) over the sample period, which is of a very similar order of magnitude for all these countries. The other two countries, meanwhile, have positive EMP but the mean for ANG is much larger than that of STP, as is also clear from Figure 1. The unconditional standard deviation and EMP range statistics allows us to refine this observation. Indeed, now we are able to classify the five countries into two distinct groups based on the ranking of these last two descriptive statistics. The countries with currency pegs clearly exhibit lower volatility and a smaller range of EMP variation. The countries with managed floats are much more volatile. ANG exhibits the greatest unconditional volatility (34.87%), followed by STP (7.07%) and then MOZ (4.31%). This classification is confirmed upon inspection of Figure 2, which shows the annual average of monthly EMP standard deviations for the two types of exchange rate arrangements.

Figure 2a - EMP Unconditional Volatility (% p.a.)
Managed Floats

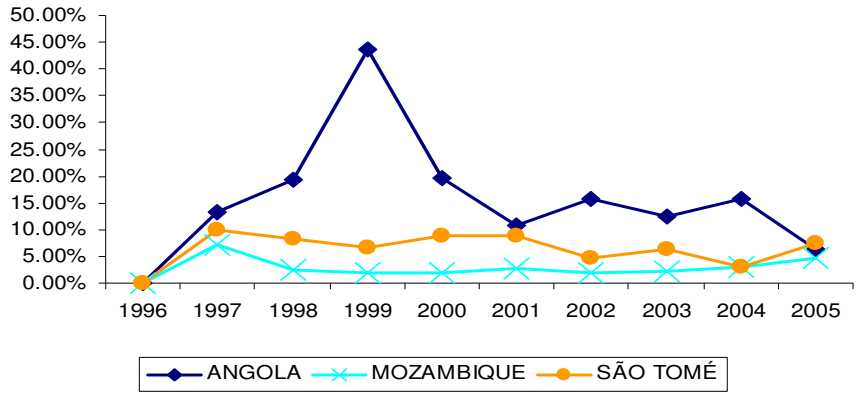
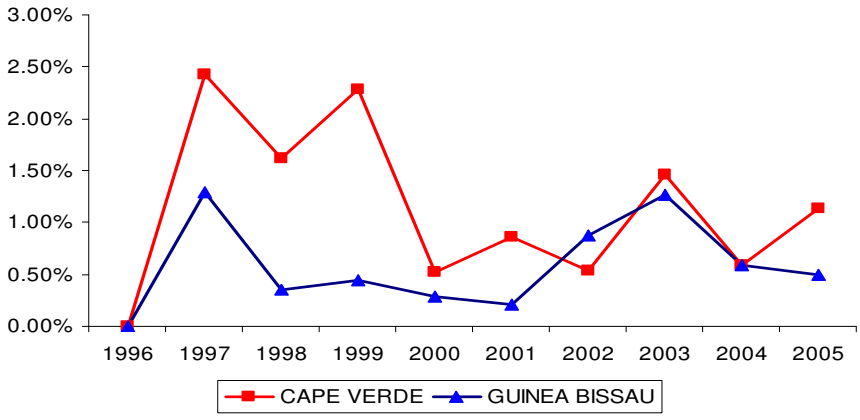


Figure 2b - EMP Unconditional Volatility (% p.a.)
Currency Pegs



Next, we proceed to identify crisis episodes, which we take to be those EMP values exceeding some pre-established critical threshold. We bear in mind, however, that the definition of these thresholds entails using a discretional "rule of thumb". As such, we consider three different thresholds to ensure a more robust analysis. A crisis episode is thus

[15] See the appendix for estimated EMP values, their constituent components and their graphical representation.

identified when an EMP measure exceeds mean EMP by 1.5 SD, 2.5 SD and 3.5 SD respectively. Accordingly, we classify EMP crises as having a low, moderate or high severity. Note that these classifications will not correspond to the same magnitudes of EMP when comparing across countries, given their different levels of mean EMP. The EMP crises statistics are given in Table 2 while EMP crises tables for each country are provided in the appendix.[16]

Table 2 - EMP Crises Statistics

Country	ANG	CV	GB	MOZ	STP
			Low		
EMP Mean	114,56%	3,26%	2.21%	9,48%	17,20%
EMP SD	56.57%	1.13%	0.85%	2.80%	3.37%
Crises	4	7	8	5	7
			Moderate		
Mean EMP	--	4.81%	--	12.05%	24.06%
EMP SD	--	0.08%	--	1.13%	--
Crises	2^{+}	2	1^{+}	2	1
			High		
Mean EMP	156.14%	--	4.22%	--	--
EMP SD	48.82%	--	--	--	--
Crises	2^{+}	0	1^{+}	0	0

Note: The symbol ($^{+}$) denotes that the same events are being considered in the calculations.

Our first observation is that the number of crises varies across countries but not significantly. However, the severity of crises differs substantially. In the case of ANG, for example, we identify four crises at the lower threshold of which two are classified as severe. In contrast, GB experienced eight crises but only one of these was a high-severity crisis having a similar order of magnitude as CV's single moderate-severity crisis. The finding that the severity of crisis differs substantially is reinforced when looking at the average values of EMP during crises episodes. GB and CV had positive EMP crises of magnitude 2.21% and 3.26% respectively at the 1.5SD threshold. The comparable figures for MOZ and STP are 9.48% and 17.20% while that of ANG is 114.56%.

Two findings thus emerge from our crises analysis. First, EMP crises under currency pegs are much less severe than those under managed floats at all threshold levels. Second, ANG has the most severe EMP crises whilst MOZ has the least less severe ones among countries with managed floats. STP, meanwhile, lies between these two extreme but its EMP behaviour is clearly much closer to that of MOZ. We note that these findings corroborate those established in our descriptive analysis above. In order to better understand these findings, we now turn to the study of EMP's stochastic properties in the next section.

3. EMP Dynamics

Our modelling approach is dictated by two concerns: first, we want to capture possible heteroscedasticity effects, volatility clustering and leverage effects associated with asymmetric responses shocks of the EMP series; second, we want to be able to compare EMP behaviour for the five PALOP countries within an economically meaningful framework. Given these objectives and following the modelling approach adopted in related work (Braga de Macedo *et al.* (2006), we estimate exponential GARCH in the mean (EGARCH-M) models. These models allow mean EMP to depend on its own conditional variance à la Engle

[16] In the tables, crises episodes are identified in **bold** type while the colours **black**, **blue** and **red** indicate that EMP exceeds the 1.5 SD, 2.5 SD and 3.5 SD thresholds respectively.

et al. (1987), thereby capturing the basic insight that risk-averse agents will require compensation for holding a country's risky assets, especially as these are typically denominated in domestic currency. Given that an asset's riskiness can be measured by the variance of returns, the risk premium is an increasing function of the returns' conditional variance. The actual specification adopted is as follows:

$$EMP_t = \mu \ln \sigma_t^2 + \theta x_t + \sum_{i=1}^{m} \xi_i EMP_{t-i} + \sum_{j=1}^{n} \psi_j \epsilon_{t-j} + \epsilon_t$$

$$\ln \sigma_t^2 = \lambda s_t + \sum_{j=1}^{p} \beta_j \ln \sigma_{t-j}^2 + \sum_{i=1}^{q} \left(\alpha_i \left| \frac{\epsilon_{t-i}}{\sigma_{t-i}} \right| + \gamma_i \frac{\epsilon_{t-i}}{\sigma_{t-i}} \right)$$

$$\epsilon_t = \sigma_t z_t$$

$$z_t \sim D_{\vartheta}(0, 1)$$

where ϵ_t is the error disturbance term, assumed to have a zero mean and to be serially uncorrelated, and $D_{\Theta}(0, 1)$ is a probability density function with zero mean and unit variance.[17]

The EMP mean equation incorporates the effect of economic fundamentals, whose impact is captured by the $k \times 1$ vector of explanatory variables x_t (includes a constant term where necessary), with θ being the respective $1 \times k$ coefficient vector. The risk-return relationship, meanwhile, is captured by the parameter μ. All explanatory variables are lagged one period in order to avoid the problem of contemporaneous simultaneity with the dependent variable. We also allow for *ARMA (m, n)* terms given the lack of data pertaining to economic fundamentals for all countries in our sample, as discussed below. In the conditional variance equation, s_t is an $r \times 1$ vector of explanatory variables (includes a constant term), and λ is the respective $1 \times r$ coefficient vector. Note that the left-hand side above is the logarithm of the conditional variance, which implies that the associated leverage effect is exponential rather than quadratic. In addition, forecasts of the conditional variance are guaranteed to be non-negative under this specification.

The literature identifies various macroeconomic fundamentals that could be considered as possible explanatory variables in our model. Some of these include:[18] a) the rate of inflation, as it is associated with high nominal interest rates and may proxy macroeconomic mismanagement that adversely affects the economy (Demirguc-Kunt & Detragiache, 1997); b) the real exchange rate, given that currency over-valuations may deteriorate the current account and have historically been associated with currency crises (Berg *et al.*, 1999); c) import and export growth which, when problematic, may lead to current account deteriorations that trigger currency crises (Dowling & Zhuang, 2000, Berg & Patillo, 1999); d) growth in monetary aggregates, e.g. excessive M1 growth might indicate excess liquidity and, hence, increased EMP that leads to speculative attacks (Eichengreen *et al.*, 1995); e) domestic credit, given that high debt levels are conducive to banking sector fragility (Kaminsky & Reinhart, 1998); f) public debt, as higher public indebtedness is expected to raise vulnerability to a reversal in capital inflows, and hence to raise the probability of a crisis (Lanoie & Lemarbre, 1996). g) current account, as deficits are associated with large capital inflows, which indicate a diminished probability to devalue and thus lower the probability of a crisis (Berg & Patillo 1999); h) fiscal balance, as deficits are expected to raise the probability

[17] Optionally, Θ are additional distributional parameters that can be used to describe a distribution's skew and shape. For a full discussion of this class of models, refer to Engle (1982) and Bollerslev (1986). In practice, we found that models were best estimated assuming normally-distributed errors.

[18] For more details, refer to Feridun (2007), who provides a useful summary that also includes several indicators describing banking sector vulnerability. See also Flood & Marion (1998).

of crisis since they increase the vulnerability to shocks and investor's confidence (Demirguc-Kunt & Detragiache, 1997).

For PALOP countries, however, our choice of explanatory variables is severely restricted by the lack of data. At best, the publicly available data have a trimesterly or annual frequency, which is too low to use in our econometric models. More frequently, the data simply do not exist. In practice, we are able to use two fundamentals for the mean equation that have the desired monthly frequency (see the appendix for the data description): domestic credit growth rate (dc_t) and the real depreciation rate (q_t).[19] In the conditional variance equation, we include foreign reserve changes (r_t) in addition to the afore-mentioned variables, given their important role in EMP dynamics, especially under currency pegs.[20] For ANG, changes in oil prices are also used due to the importance of oil exports in its economy. Explanatory variables are lagged at least one period to avoid possible simultaneity bias in our estimations. The presence of a time trend in our monthly model of EMP is meant to capture the lower frequency trend that may exist in exchange rates due to aggregation of data, in particular, and omitted variables, in general.[21]

Where appropriate, we test for the inclusion of dummy variables that are related to the occurrence of known economic events, e.g., CV's adoption of a currency peg in 1999:01, GB's implementation of its accession agreement with the WAEMU in 1997:05, etc. (see appendix the for dummy variable definitions). We also consider dummies that capture observed idiosyncratic events which clearly impact our estimations, e.g. the influx of MOZ's donor aid arrears in late 2004 and the subsequent need for depreciation of the MZM in 2005:04/05. In the conditional variance equation, the dummy variables included are identified using Inclan & Tiao's (1994) CSUM test, which tests for structural breaks in volatility.

Turning to the expected signs of the mean equation's explanatory variables, domestic credit growth necessarily lead to greater EMP, hence estimated coefficients will be positive. On the other hand, real depreciation leads to lower EMP, implying that expected signs are negative. In an EMP context, the risk-return relationship implies that holding assets of a country in which EMP-volatility is high (large σ^2_t) should be compensated by a larger return (lower EMP), implying that μ is negative.[22] Note also that μ is interpretable as the semi-elasticity of changes in EMP for a given percentage change in conditional volatility.

As for conditional variance, the expected signs of the explanatory variables are not easily predictable *a priori* on theoretical grounds but their effects are easily interpretable upon estimation. In the case of foreign reserves, for example, a negative coefficient indicates that an increase in foreign reserves lowers conditional volatility. Finally, the impact of shocks is asymmetric if γ is different form zero while the presence of leverage effects can be tested under the hypothesis that γ is negative, which implies that negative shocks increase volatility more than positive ones of an equal magnitude.[23] A plausible explanation for this asymmetric

[19] Note that it was not possible to calculate q_t for STP due to lack of data regarding prices changes for this country.

[20] Changes in reserves and in the interest rate differential are not included in the mean equation as they are already present in the EMP measure.

[21] The first situation may lead to persistence that induces slight regime switching behaviour, due to agents' perceptions of the market and of policy actions, and possibly by the exchange-rate policy stance.

[22] For exchange rates, the risk premium associated with the underlying volatility can be either positive or negative. Engel (1996), for example, shows that the direction of the effect of conditional variance on risk premiums depends on the variance of nominal consumption. Fukuta & Saito (2002), meanwhile, shows that the signs of the coefficients on risk premiums depend on the covariance between consumption growth and inflation, the inter-temporal marginal rate of substitution, and the variances of inflation in Japan and the United States.

[23] Standard GARCH models assume that positive and negative error terms have a symmetric effect on the volatility. i.e. good and bad news have the same effect. In practice this assumption is frequently violated, in particular by stock returns, as noted by Black (1976). A likely reason for stock returns' asymmetric leverage effect

leverage effect in the case of EMP is that risk perceptions of negative EMP tend to increase when upside volatility increases more than downside volatility. Moreover, this behaviour is to be expected mainly in mature financial markets, as opposed to those which are less sophisticated and underdeveloped.

Our econometric analysis comprises the relatively short period of 1996:01 to 2005:09, as the adoption of a common analysis period required for cross-country comparisons reduces the effective sample size. In estimating our EGARCH-M models, we started with a general specification of the mean and variance equations. The orders of the variance equation and ARMA process in the mean equation were determined by the partial autocorrelation and the autocorrelation function of the EMP series. Non-significant variables are excluded from estimated equations where appropriate. We use the Schwartz Information Criterion (SIC) to assess a model's relative fit, implying that we choose those models for which the (negative) SIC is smallest. The final EGARCH-M specifications are decided by looking at the properties of standardised residuals (SR) and squared standardised residuals (SSR).

The models are estimated using E-Views 5.0, and we employ the Marquardt nonlinear optimization algorithm to compute maximum likelihood parameters. Bollerslev & Wooldridge (1992) note that maximising a mis-specified likelihood function in a GARCH framework provides consistent parameter estimates, even though standard errors will be understated. Accordingly, we use their consistent variance-covariance estimator to correct the covariance matrix. As such, we report asymptotic standard errors for estimated parameters which are robust to departures from normality.

Correctly specified EGARCH-M models will have SR and SSR that are white noise, i.e. they are independent and identically distributed random variables with mean zero and variance one. As model diagnostic tools, we use the modified Box-Ljung (B-L) procedure on the SR series to test for remaining serial correlation in the mean equation. To detect remaining ARCH effects in the variance equation, we use the B-L test as well as the ARCH-LM test on SSR. Based on the results of the diagnostic tests, we find ample support for our model specification. The B-L Q-statistics are insignificant at the 5% level for both the mean and variance equation, as are those of the ARCH-LM test.

The summary of our EGARCH-M estimation's results is given in Table 3.[24] For all countries, we find economic fundamentals to be significant in the mean equation, as monetary expansions are associated with higher EMP while real exchange rate depreciations lead to lower EMP. The degree of response appears to differ across countries, however. Our estimations suggest that the effect of a 1% increase in domestic credit on EMP is greatest in CV (5.81%) and MOZ (3.60%, at lag 6).[25] This finding apparently suggests that conditions in monetary and exchange rate markets are more closely related in CV and MOZ than in the other countries.

The fact that we do not any find such evidence for GB is probably not unsurprising given the unit of analysis being considered. We are confident that were we to consider changes in domestic credit for whole of the CFA currency area, instead of only those in GB, similar evidence is likely to emerge. For ANG, the apparent weakness of linkages between these markets is reinforced by the fact that estimated coefficients are only significant at the 5% level, which contrasts with the case of other PALOP countries. With regards to real exchange rate depreciations, the evidence is broadly similar across countries with the exception of GB,

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is that negative returns imply a larger proportion of debt through a reduced market value of the firm, hence higher volatility.

[24] Full estimation results and diagnostics are provided in the appendix.

[25] A degree of caution must be exercised when interpreting this result, as changes in domestic credit that arise from monetary authorities' sterilisation activities cannot be identified using publicly available data.

where these have a smaller effect on EMP, in all likelihood due to the same reason given above.

Table 3a - Summary of EGARCH-M Estimation Results - Mean Equation

	Variables	ANG	CV	GB	MOZ	STP
Risk-return relationship	Estimated return (%) *(annual equivalent)*	-3.59** *(-43.08)*	-0.23** *(-2.76)*	-0.05** *(-0.60)*	-0,11* *(-1.32)*	-1.58** *(-18.96)*
Economic fundamentals	Effect of 1% increase in domestic credit (%)	*lag(-1)* 0.47* *lag(-8)* 0.35*	*lag(-4)* 5.81**	*lag(-4)* 0.61**	*lag(-6)* 3,60** *lag(-9)* 3,20**	*lag(-8)* 0.48** *lag(-11)* 0.90**
	Effect of 1% real exchange rate depreciation (%)	*lag(-4)* -28.05** *lag(-7)* -15.35**	*lag(-3)* -18.96**	*lag(-7)* -4.65**	*lag(-3)* -23,79** *lag(-8)* -38,95**	--
Dummies	D_ER_LIB	1.27**	--	--	--	--
	D_R_SHIFT	0.45**	--	--	--	--
	D_AID_CONCENT	--	--	--	0.10**	--
	D_05_97	--	--	-0.01**	--	--
	D_08_97	--	--	--	-0.08**	--
	D_12_97	--	--	--	--	-0.10**
Time Trend		- 0.002**	--	--	--	--

Note: (--) not applicable due to lack of data or relevance. A double (single) asterisk indicates that the estimated parameter is significantly different from zero at the 1% (5%) level.

We also find evidence of the risk-return relationship but it differs across countries rather significantly. While GB has the lowest estimate 0.60% p.a., the estimates CV and MOZ's estimates are of a close order of magnitude, as a 1% increase in volatility is associated with a reduction in mean EMP of 2.76% and 1.32% p.a. respectively. In contrast, the risk-return relationship in ANG and STP is clearly more extreme, as our estimates imply that holders of these countries assets would respectively expect to be compensated by a 43.08% and a 18.96% p.a. EMP reduction for the same increase in volatility.

The estimates for dummy variables provide additional insight into mean EMP dynamics. The liberalisation of ANG's exchange rate on 2002:12 (dummy D_ER_LIB), possibly coupled with other foreign exchange-market policy management mechanisms introduced around this period, lead to a strong AOA depreciation and significant positive EMP. In addition, during 1999:05, an unexplained and large reduction in ANG's foreign reserves, which fell from 741.26 to 375.55 million USD, increased EMP (dummy D_R_SHIFT). The same occurs when the MZM depreciates in 2005:04/05 (dummy D_AID_CONCENT), thereby partially reversing the currency's appreciation streak that resulted from the concentration of donors payment arrears at the end of 2004. GB's entry to the WAEMU, agreed upon in 1996:12 but only effective as of 1997:05, is clearly associated with a reduction in EMP volatility (dummy D_05_97) and so is MOZ's substantial reduction in interest rates in 1997:07 (dummy D_8_97). In the case of STP, an inspection of its exchange rate data suggests that some sort of "regime change" takes place toward the end of 1997, which marks the end of period of relatively large STD depreciations (dummy D_12_97). The respective dummy's estimate

confirms this intuition, as it indicates that this "regime change" effectively lowered EMP as of 1998:01. There is no evidence of time trend behaviour with the exception of ANG, where the estimated coefficient is significant but has a very small magnitude.

Table 3b - Summary of EGARCH-M Estimation Results - Variance Equation

	Variables	ANG	CV	GB	MOZ	STP
Economic Variables	Changes in domestic credit	*lag(-3)* -0.10**	*lag(-3)* -25.91**	*lag(-3)* -2.86**	*lag(-2)* -3.31** *lag(-3)* -1.27**	*lag(-3)* -0.36**
	Changes in real exchange rate	--	*lag(-1)* -19.97**	--	--	--
	Changes in foreign reserves	--	*lag(-4)* 2.20** *lag(-8)* 3.86**	*lag(-2)* 2.13**	*lag(-1)* 11.30** *lag(-12)* 10.39**	*lag(-6)* -1.48* *lag(-8)* 2.39**
	Changes in oil prices	*lag(-4)* 4.23**	--	--	--	--
Dummies	D_08_97	--	--	--	-2.42**	--
	D_12_97	--	--	--	--	-3.29**
	D_10_99	-1.76**	--	--	--	
	D_06_01	--	--	--	--	-2.86**
Asymmetric Leverage Effect		0.44**	-0.71**	--	0.66**	--
Time Trend		0.02**	-0.03**	--	0.02**	0.04**

Notes: (--) not applicable due to lack of data or relevance. A double (single) asterisk indicates that the estimated parameter is significantly different from zero at the 1% (5%) level.

Addressing the conditional variance, we find that increases in domestic credit are always associated with lower volatility. This effect seems to be more pronounced in CV, GB and MOZ, as was also the case for mean EMP, and is less pronounced in ANG and STP. Real exchange rate changes have the same effect but only for CV. Foreign reserve changes generally increase volatility with the exception of ANG, where changes oil prices have the same impact.[26] Evidence of asymmetric effects of shocks on volatility is found for ANG, CV and MOZ while negative shocks increase volatility more that positive ones only for CV. The absence of the last effect for GB is again probably due to the reason earlier.

Various structural breaks are also found to be associated with lower volatility: 1999:10 (ANG), 1997:08 (MOZ), 1997:12 and 2001:06 (STP). Some of these breaks appear to be associated with known economic events. For instance, the break identified for MOZ in 1997:08 in all likelihood reflects the introduction of the Maputo inter-bank offered rate (MAIBOR) during the previous month, which fell substantially from 35.80% to 13.35%. With the exception of GB, time trend variables are significant for PALOP countries, which

[26] STP presents mixed results as foreign reserve changes *decrease* volatility at lag 6 but increase it at lag 8.

suggests that our model of conditional volatility will benefit from the inclusion of other economic variables should these become available.

Finally, we look at the conditional volatility series resulting from our model estimations in order to determine whether our initial finding that countries with currency pegs have lower volatility is confirmed. In Figure 3, we again group countries according to their exchange rate regime but now include MOZ in both in order to facilitate comparisons. Overall, we confirm this finding and the ordinal ranking that emerges from observing unconditional volatility (Figure 2). Moreover, two additional observations can be made. First, "pre-peg" CV and MOZ exhibit similar volatility prior to 1999. CV's currency peg has had markedly lower volatility since then, with the exception of 2000. Since 2002, this difference has been accentuated as MOZ's volatility has increased further. While the reason for this is unclear, this change might reflect the economic aftermath of the 2000-1 floods that severely affected MOZ. Second, STP's volatility level has declined since 2002 and is now much closer to that of MOZ, which has the managing float with the lowest conditional volatility.

Figure 3a - EMP Conditional Volatility (% p.a.)
Managed Floats

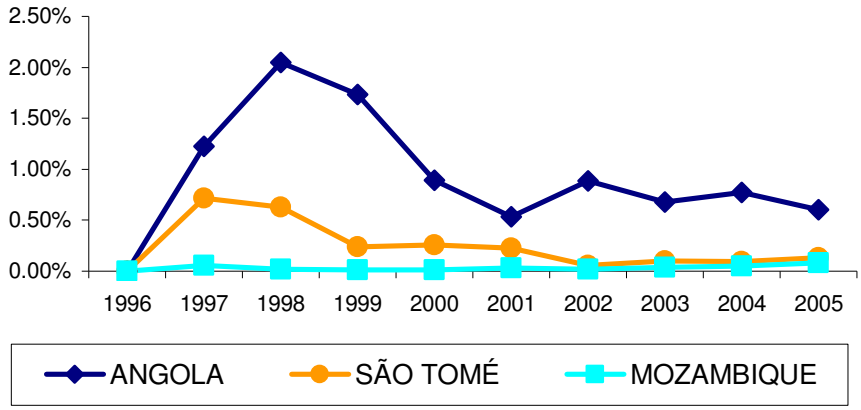
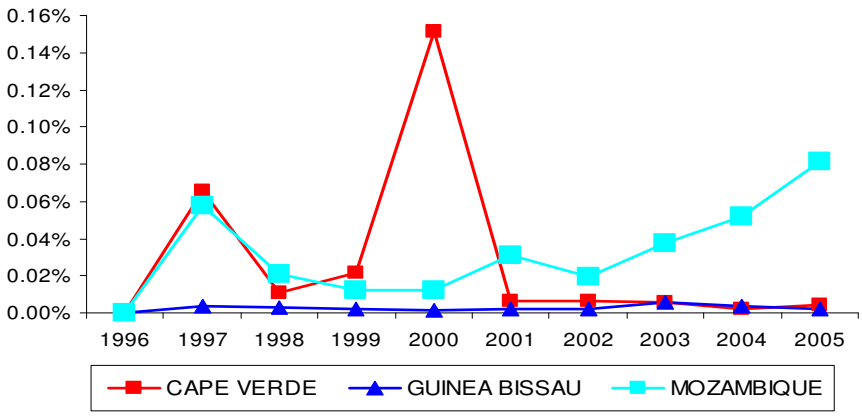


Figure 3b - EMP Conditional Volatility (% p.a.)
Two Currency Pegs, One Managed Float



4. Conclusion

Our main conclusion is that PALOP countries with currency pegs clearly have lower volatility when compared to those with managed floats. Moreover, EMP crises under pegs are much less severe. We find that economic fundamentals correctly account for mean EMP for all countries. The response of mean EMP to changes in domestic credit, however, is greatest in CV and MOZ, which apparently suggests that conditions in monetary and exchange rate markets for these countries are closely related. While the evidence is not as strong for GB, this is possibly due to the fact that this country is the only one in our sample which formally belongs to a monetary and currency union having the same legal tender for its members.

We also find that the risk-return relationship is much more favourable for investors under currency pegs, as the increase in volatility is lower for the same rate of (EMP) return. The exception to this finding is MOZ, which apparently has a risk-return profile akin to that enjoyed by countries with pegs. A plausible reason is that MOZ has the only managed float in our sample implementing monetary and exchange rate policy within the confines of an IMF framework, which establishes floors for international reserves and ceilings for the central bank's net domestic assets. This intuition needs to be tested, however, and as such is included in our future research agenda.

EMP conditional volatility, meanwhile, is generally driven by changes in domestic credit (lowers it) and foreign reserve changes (raises it). The first effect is more pronounced under currency pegs, but also under MOZ's managed float. Evidence of asymmetric effects of shocks on volatility is found for ANG, CV and MOZ while "bad news" increase volatility more that "good news" only for CV's currency peg, which we take to be a further sign of its credibility.

A few striking cross-country comparisons also emerged in our analysis. We find that ANG has the most severe EMP crises whilst MOZ has the least severe among countries with managed floats. STP, meanwhile, lies between these two extremes but its EMP crises behaviour is clearly much closer to that of MOZ. Our econometric models also permit us to rank PALOP countries' conditional volatility in ordinal terms. Based on these findings, it appears that MOZ's managed float has the greatest credibility for such arrangements as it has lowest volatility while ANG has the highest. STP's credibility may also be improving since its volatility has declined as of 2002 and its level is now much closer to that of MOZ.

Our future research agenda seeks to refine the above insights by seeking more data and better institutional knowledge for PALOP countries. This will allow us, for example, to fully explore crises episodes and structural breaks, and then relate these to policy and institutional changes. We also plan to undertake a comparative analysis using multivariate techniques, which might be instructive in terms of better policy design in the future. Hopefully, the techniques developed for this undertaking will also allow us to investigate other cases of interest in Africa, such as the CFA arrangement and the South African Rand's monetary zone.

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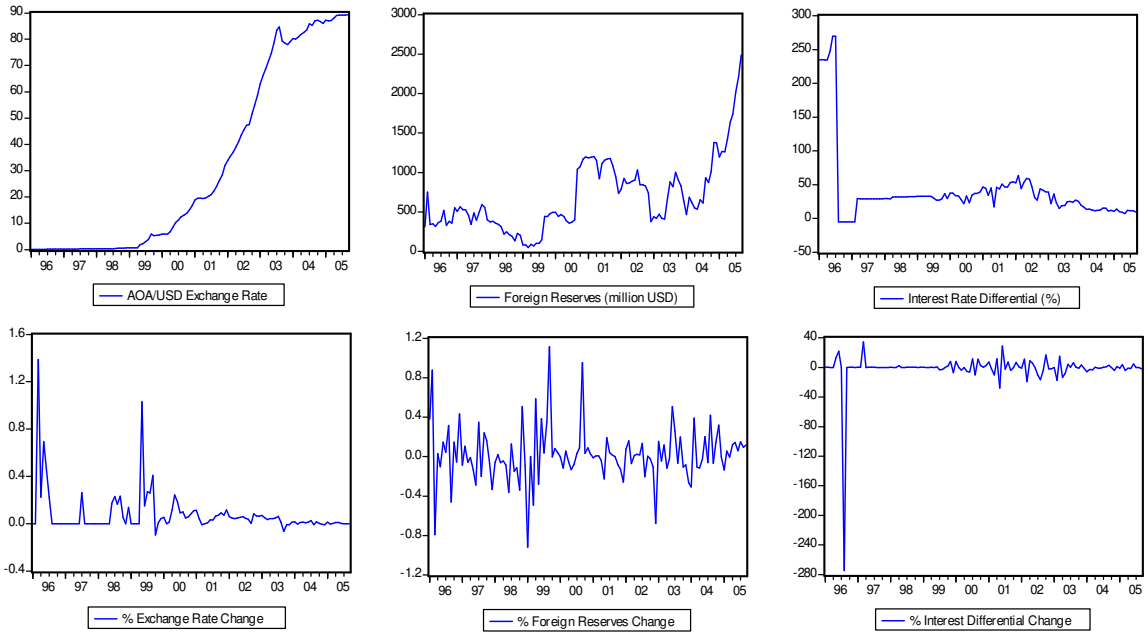
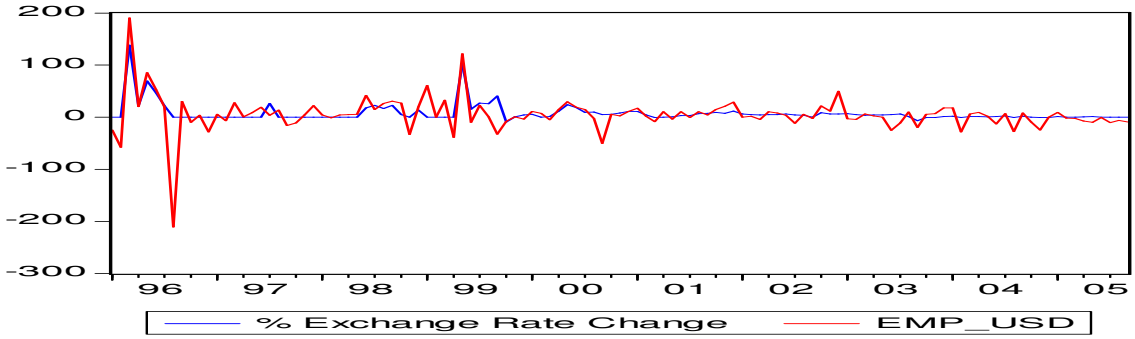
APPENDIX – Country Files

ANG – EMP Constituent Components



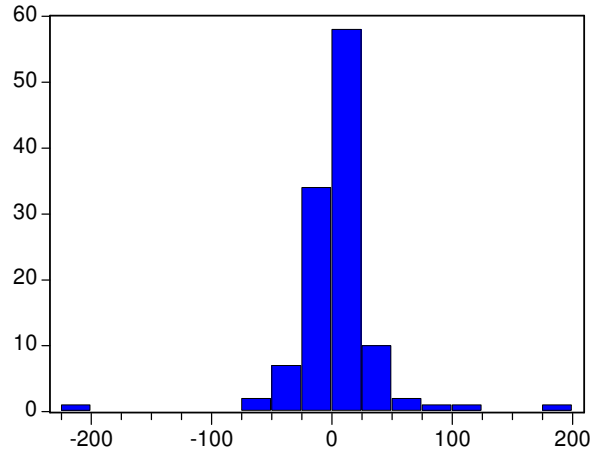
ANG – EMP and Changes in Exchange Rate (%)



ANG – EMP Estimates & Crises

Date	EMP	Δe	Δr	Δ(i-i*)
1996 JAN	-24.844	0.000	37.994	0.230
1996 FEB	-57.623	0.000	87.816	0.240
1996 MAR	190.662	138.629	-79.215	-0.140
1996 APR	20.368	22.314	2.883	-0.070
1996 MAY	**85.290**	**69.315**	**-10.550**	**13.000**
1996 JUN	52.617	47.000	14.587	21.900
1996 JUL	19.585	22.314	4.073	-0.070
1996 AUG	-211.421	0.000	31.586	-274.370
1996 SEP	30.281	0.000	-46.129	-0.110
1996 OCT	-9.561	0.000	14.633	0.100
1996 NOV	3.597	0.000	-5.434	0.030
1996 DEC	-28.335	0.000	42.993	-0.060
1997 JAN	5.729	0.000	-8.696	0.010
1997 FEB	-6.816	0.000	10.421	0.060
1997 MAR	27.743	0.000	-5.901	34.340
1997 APR	0.478	0.000	-0.917	-0.180
1997 MAY	8.958	0.000	-13.602	0.010
1997 JUN	19.113	0.000	-29.002	0.040
1997 JUL	3.424	26.236	34.729	0.060
1997 AUG	13.270	0.000	-20.164	0.000
1997 SEP	-15.705	0.000	23.865	0.000
1997 OCT	-10.749	0.000	16.281	-0.050
1997 NOV	4.331	0.000	-6.676	-0.090
1997 DEC	21.921	0.000	-33.374	-0.060
1998 JAN	4.292	0.000	-6.248	0.260
1998 FEB	-1.217	0.000	1.849	0.000
1998 MAR	4.071	0.000	-6.229	-0.040
1998 APR	4.779	0.000	-4.622	2.500
1998 MAY	5.710	0.000	-8.687	-0.010
1998 JUN	41.480	17.589	-36.314	-0.010
1998 JUL	14.700	22.957	12.559	0.010
1998 AUG	26.276	16.508	-14.833	0.010
1998 SEP	30.750	23.180	-11.323	0.170
1998 OCT	27.474	5.043	-33.874	0.200
1998 NOV	-33.241	0.000	50.481	-0.030
1998 DEC	20.061	13.762	-9.466	0.100
1999 JAN	**60.676**	**0.000**	**-91.937**	**0.250**
1999 FEB	-0.120	0.000	0.172	-0.010
1999 MAR	32.356	0.000	-49.177	-0.010
1999 APR	-38.439	0.000	58.443	0.030
1999 MAY	121.620	102.962	-28.395	-0.040
1999 JUN	-9.801	15.123	38.307	0.410
1999 JUL	22.567	27.110	3.493	-3.230
1999 AUG	0.979	26.056	35.287	-2.670
1999 SEP	-32.434	40.890	111.325	-0.090
1999 OCT	-7.974	-9.514	-0.365	1.870
1999 NOV	1.001	0.750	7.939	7.880
1999 DEC	-3.524	4.209	4.044	-7.300
2000 JAN	11.271	5.407	-0.327	8.130
2000 FEB	7.720	0.000	-11.794	-0.060
2000 MAR	-4.751	1.349	5.490	-3.580
2000 APR	14.931	11.685	-5.481	-0.520
2000 MAY	29.424	24.233	-13.304	-5.130
2000 JUN	19.169	18.427	-7.716	-6.240
2000 JUL	15.037	9.194	3.031	11.280
2000 AUG	-2.749	9.958	8.814	-9.940
2000 SEP	-50.139	4.860	95.199	11.010
2000 OCT	5.433	5.797	3.224	2.530
2000 NOV	2.702	8.243	8.609	0.180
2000 DEC	11.250	11.186	2.436	2.400
2001 JAN	17.114	11.288	-1.336	7.120
2001 FEB	2.188	4.059	0.784	-1.950
2001 MAR	-8.344	-0.665	0.805	-10.290
2001 APR	10.268	-0.103	-4.072	11.070
2001 MAY	-3.587	0.870	-22.822	-28.030
2001 JUN	10.521	3.159	19.241	28.820
2001 JUL	-0.915	3.301	3.851	-2.420
2001 AUG	10.532	6.517	1.310	7.020
2001 SEP	4.469	7.456	0.199	-4.110
2001 OCT	14.687	9.236	-8.314	-0.030
2001 NOV	20.786	7.511	-13.024	6.770
2001 DEC	29.104	11.532	-25.921	0.740
2002 JAN	0.127	5.865	7.400	-1.250
2002 FEB	1.827	4.755	15.842	10.790
2002 MAR	-4.460	4.243	-7.152	-19.300
2002 APR	10.477	4.870	0.983	9.000
2002 MAY	7.968	5.255	2.170	5.960
2002 JUN	3.991	5.916	1.680	-1.180
2002 JUL	-11.569	-11.569	1.680	-10.510
2002 AUG	5.631	5.631	13.345	-16.730
2002 SEP	-2.357	-2.357	-20.393	-3.620
2002 OCT	21.353	21.353	0.368	16.470
2002 NOV	11.875	11.875	-2.183	-2.160
2002 DEC	49.677	49.677	-10.784	-2.070
2003 JAN	-3.268	-3.268	-67.996	-0.270
2003 FEB	-4.117	-4.117	15.307	-17.660
2003 MAR	6.278	6.278	-4.668	14.830
2003 APR	2.687	2.687	11.573	-13.430
2003 MAY	-0.151	-0.151	-11.803	-8.420
2003 JUN	-25.482	-25.482	-2.220	4.250
2003 JUL	-10.865	-10.865	50.768	0.080
2003 AUG	10.013	10.013	25.976	6.030
2003 SEP	-19.647	-19.647	-6.717	0.180
2003 OCT	5.531	5.531	19.956	-1.110
2003 NOV	6.765	6.765	-10.828	3.020
2003 DEC	17.857	17.857	-8.333	-1.560
2004 JAN	17.880	17.880	-26.614	-5.880
2004 FEB	-27.926	-27.926	-31.013	-2.830
2004 MAR	5.825	5.825	38.765	-3.310
2004 APR	9.306	9.306	-10.646	0.270
2004 MAY	1.697	1.697	-11.914	-1.180
2004 JUN	-12.716	-12.716	-2.531	-0.910
2004 JUL	7.000	7.000	20.118	0.110
2004 AUG	-27.743	-27.743	-6.288	0.820
2004 SEP	8.115	8.115	41.994	2.740
2004 OCT	-9.049	-9.049	-6.686	-0.100
2004 NOV	-24.442	-24.442	14.116	-4.200
2004 DEC	0.151	0.151	31.851	0.940
2005 JAN	9.424	9.424	-0.451	-1.400
2005 FEB	-1.454	-1.454	-13.693	3.530
2005 MAR	-2.375	-2.375	5.657	-4.140
2005 APR	-7.516	-7.516	-0.622	-1.010
2005 MAY	-9.576	-9.576	11.935	-1.660
2005 JUN	-0.462	-0.462	14.446	4.620
2005 JUL	-9.981	-9.981	5.922	-0.450
2005 AUG	-6.148	-6.148	14.725	-0.030
2005 SEP	-8.903	-8.903	9.311	-1.850

ANG – EMP Descriptive Statistics



Series: EMP_USD
Sample 1996M01 2005M09
Observations 117

Mean	5.063191
Median	4.291403
Maximum	190.6627
Minimum	-210.6031
Std. Dev.	34.82329
Skewness	-0.376357
Kurtosis	21.51951
Jarque-Bera	1674.751
Probability	0.000000

ANG – EGARCH-M Estimation Results

$$EMP_t = \mu \ln\sigma^2 + \text{Dummies} + \theta_1 \Delta dc_{t-1} + \theta_2 \Delta dc_{t-8} + \theta_3 q_{t-4} + \theta_4 q_{t-7} + \theta_5 trend + \xi_1 EMP_{t-2} + \xi_2 EMP_{t-3} + \varepsilon_t + \xi_3 \varepsilon_{t-2}$$

Parameter	Estimate	Std. Error	t-Statistic	p-value
μ	-0.035880	0.005544	-6.471381	0.0000**
D_ER_LIB	1.266598	0.093339	13.56991	0.0000**
D_R_SHIFT	0.450566	0.017936	25.12039	0.0000**
θ_1	0.004743	0.002137	2.219570	0.0264*
θ_2	0.003540	0.001580	2.241065	0.0250*
θ_3	-0.280504	0.081915	-3.424354	0.0006**
θ_4	-0.153451	0.056601	-2.711125	0.0067**
θ_5	-0.001997	0.000353	-5.663922	0.0000**
ξ_1	-0.621861	0.096220	-6.462932	0.0000**
ξ_2	-0.171173	0.045946	-3.725557	0.0002**
ε_{t-2}	0.756265	0.090967	8.313628	0.0000**

$$\ln \sigma_t^2 = \text{DUMMY} + \lambda_0 + \lambda_1 \Delta dc_{t-3} + \lambda_2 \Delta oil_{t-4} + \alpha_1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \alpha_2 \ln \sigma_{t-1}^2 + \gamma_1 \frac{\varepsilon_{t-1}}{\sigma_{t-1}}$$

D_10_99	-1.776190	0.435467	-4.078814	0.0000**
λ_0	-6.140849	0.417547	-14.70697	0.0000**
λ_1	4.232692	1.351095	3.132786	0.0017**
λ_2	-0.095852	0.020470	-4.682682	0.0000**
$\ln\sigma^2_{t-1}$	-0.634700	0.097083	-6.537693	0.0000**
α_1	0.320883	0.148388	2.162460	0.0306*
γ_1	0.442317	0.090149	4.906518	0.0000**

Diagnostics

	L-B Standardised Residuals		L-B Squared Residuals		ARCH-LM Statistic	
Lag	**Q**	**p-value**	**Q^2**	**p-value**	**LM**	**p-value**
Lag4	2.0716	0.150	1.8103	0.178	0.135892	0.2705
Lag5	2.0751	0.354	1.8394	0.399	0.000934	0.9926
Lag6	2.3794	0.497	1.9752	0.578	-0.024754	0.7787
Lag7	2.8713	0.580	2.0955	0.718	-0.055129	0.6503
Lag8	7.1675	0.208	3.3038	0.653	0.027496	0.8028
Lag9	8.8914	0.180	3.3038	0.770	0.019331	0.8729
Lag10	11.338	0.125	3.3226	0.854	-0.026169	0.8375
Lag11	11.346	0.183	3.6091	0.891	0.043421	0.7131
Lag12	11.360	0.252	4.3461	0.887	0.066988	0.5932
Lag13	11.773	0.301	5.2516	0.874	-0.156820	0.0759
Lag14	13.228	0.279	7.2139	0.782	-0.143736	0.1594
Lag15	13.336	0.345	7.9415	0.790	-0.025106	0.8390
	No. of Observations		**Log-Likelihood**		**SIC**	
	117		78.96751		-0.698048	

ANG – Data Description[27]

Variables	
e_t	Bilateral AOA/USD exchange rate. Source: IMF – International Financial Statistics
Δe_t	Depreciation rate of AOA vis-à-vis the USD (log).
Δr_t	Change in ANG's international reserves (log). Source: IMF – International Financial Statistics.
i_t	ANG 3-Month Deposit Rate (%). Source: IMF – International Financial Statistics.
i_t^*	USA 3-Month CDs (secondary market), an average of dealer bid rates on nationally traded certificates of deposit (%). Source: US Federal Reserve.
$\Delta(i_t - i_t^*)$	Change in interest rate differential (%).
p_t	ANG Consumer Price Index. Source: IMF – International Financial Statistics.
Δp_t	$\Delta p_t = (p_t - p_{t-1})/p_{t-1}$
p_t^*	US Consumer Price Index. Source: Bureau of Labour Statistics - All Urban Consumers - (CPI-U) U.S. city average. All items 1982-84=100.
Δp_t^*	$\Delta p_t^* = (p_t^* - p_{t-1}^*)/p_{t-1}^*$
q_t	Real exchange rate depreciation = $\Delta e - \Delta p_t + \Delta p_t^*$
dc_t	Domestic credit growth rate. Source: IMF – International Financial Statistics.
Δdc_t	$\Delta dc_t = (dc_t - dc_{t-1})/dc_{t-1}$
oil_t	Crude Oil (Petroleum), Simple Average Of Three Spot Prices; Dated Brent, West Tx Intermediate, & The Dubai Fateh, USD per Barrel – World. Source: Wood Mackenzie.
Δoil_t	$\Delta oil_t = (oil_t - oil_{t-1})/oil_{t-1}$
D_10_99	Dummy variable that takes on value one for all t ≥ 1999:10 and zero otherwise.
ER_LIB	Dummy variable that takes on value one for all t = 1999:05 and zero otherwise.
D_ER_SHIFT	Dummy variable that takes on value one for all t = 2002:12 and zero otherwise.

Unit Root Test:
MacKinnon Critical Values

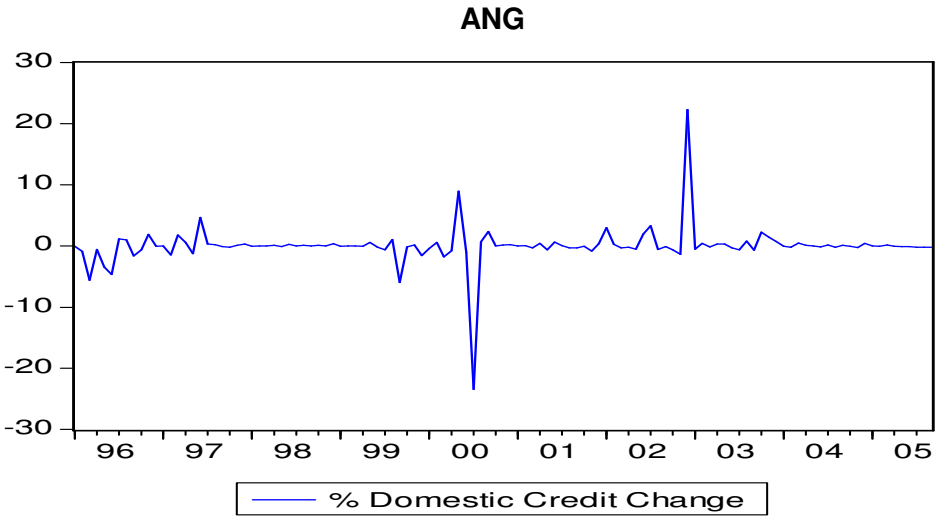
Significance Level	No Intercept or Trend	Intercept	Intercept and Trend
1%	-2.5830	-3.4861	-4.0373
5%	-1.9426	-2.8857	-3.4478
10%	-1.6171	-2.5795	-3.1488

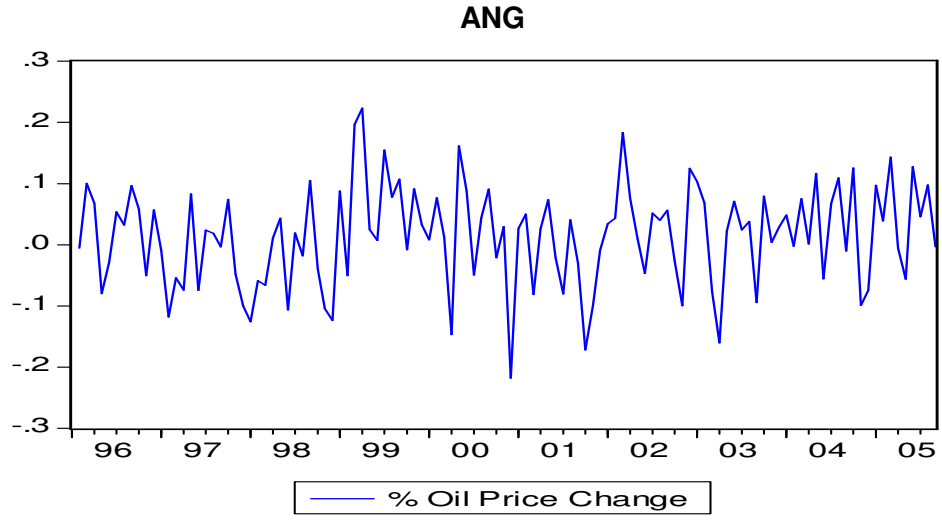
[27] The data used in the analysis are monthly and the sample period runs from 1996:01 until 2005:09. Where appropriate, Δ denotes percentage changes between two consecutive months, which are calculated using the exact formula or log difference approximation (excepting interest rate data).

ANG – Phillips-Perron Test Statistic

Series	Level	Test Specification	First Difference	Test Specification
p_t	-1.219924	Intercept & Trend	-4.870490**	Intercept & Trend
p_t^*	-0.382614	Intercept & Trend	-4.732785**	No Intercept or Trend
e_t	-2.456632	Intercept & Trend	-8.137548**	No Intercept or Trend
i_t-i_t^*	-3.757466**	Intercept & Trend	-10.97336**	No Intercept or Trend
r_t	-0.731256	Intercept & Trend	-11.03994**	No Intercept or Trend
dc_t	-2.032350	Intercept & Trend	-11.61337**	No Intercept or Trend
oil_t	-0.252769	Intercept & Trend	-10.25041**	No Intercept or Trend

Notes: The Phillips-Perron procedure tests the null hypothesis of a unit root. All tests were conducted using four lags. A double (single) asterisk indicates that the test statistic is significant at the 1% (5%) level.





ANG – Country Overview[28]

Angola's monetary authority is the *Banco Nacional de Angola* (BNA, National Bank of Angola in English) and the national currency is the Kwanza (AOA). From the BNA's webpage the exchange rate on 21.8.07 was of 74.784 AOA/USD according to the available information on the Central Bank. The Kwanza was introduced after the independence of ANG from Portugal substituting the Angolan Escudo entering circulation on the 8th of January 1977, even though the emission date of some of the currency was 1976. On the 25th of September 1990 the New Kwanza (AON) was introduced, then on 1st of July 1995 the readjusted Kwanza (AOR) and on the 1st of December 1999 the Kwanza (AOA) as we know it.

In March 1999 the government started implementing a programme to ensure conditions for economic development and mitigate the negative impact of resumption of the domestic conflict from 1998-1999. Therefore, since May 1999 the BNA, has floated the kwanza, created an interbank foreign exchange market, liberalized foreign exchange purchase for imports as well as established commercial banks interest rates, and to allow for indirect monetary control, created central bank bills. Several steps towards opening the economy were made such as reducing the level and number of import tariff rates and domestic subsidies on fuel prices were eliminated. According to the IMF's (PIN) No. 05/85 July 6, 2005, on September 2003 the authorities started implementing what is known as the strong kwanza policy and in order to implement this policy, according to the before quoted source, absorption of domestic liquidity was performed through central banks sales of foreign reserves, tightening in the monetary policy along with improvements in fiscal control and domestic debt sales. Altogether it resulted in a considerable reserves shortfall that soon recovered by 2004 and 2005. In fact it is visible on the series that starting on September 2003, for 3 consecutive months the Kwanza appreciates and from December onwards the fluctuation was considerably lower than before this policy shift.

ANG had a GDP of 13.825 million USD in 2003 and 838 USD per capita according to the Public Information Notice (PIN) No. 05/85, July 6. Following on the World Bank's (WB) country brief August 2007, 12 month inflation was of 12.2% in December 2006, when according to the IMF 10% was targeted. The country has been struggling to contain inflation, in 1998 the country had 135% and reached 330% in 1999 (IMF's (PIN) No. 00/62, August 10) due to increase of hostilities in 1998 and 1999. The authorities endured in a Staff Monitored Programme (SMP) from April – December 2000 and by June 2001 inflation was of 175% even though 150% was programmed on a January-June 2001 SMP based on the Preliminary Conclusions of the IMF Mission, August 14, 2001. This divergence was a result of excessive foreign borrowing and public spending. However after the peace process of 2002, inflation fell from 106% to 31% in 2004, reaching 12.2% in 2006. The strong export performance along with the strong kwanza policy set the ground for the inflation reduction.

On April the 4th of 2002, the Angolan armed forces and the National Union for the Total Independence of Angola (UNITA) signed an agreement to end the 27-year long civil war. The months that followed witnessed a rapid demobilization and the beginning of the resettlement of ex-combatants across the country, in the context of a government-led initiative that was supported by various UN agencies and the World Bank. The country in general, and especially the government are very dependent on oil revenue whether we speak of foreign

[28] Information Source: Public Information Notice No. 05/85 - July 6, 2005; No. 03/114 - September 10, 2003; No. 00/62 - August 10, 2000.
Angola -2007 Article IV Consultation Preliminary Conclusions of the Mission, Luanda June 6, 2007
Angola -006 Article IV Consultations - Preliminary Conclusions of the IMF Mission - March 29, 2006
Angola - 2002 Article IV Consultation - Preliminary Conclusions of the IMF mission – Feb. 19, 2002
Angola - Article IV Consultation - Preliminary Conclusions of the IMF Mission August 14, 2001
Angola - Memorandum of Economic and Financial Policies - April 3, 2000

reserves harness or public revenue having reached around 80% in 2001, and no less than 75% in both 2002 and 2003. Regarding IMF's ANG—2007 Article IV Consultation Preliminary Conclusions of the Mission, June 6, the country's challenges lie in starting to use a non oil primary deficit to ensure macroeconomical sustainability and to protect the government from oil price float instability. In 2006 the non oil primary fiscal deficit moved to 50.8 from 61.5 in 2005 % of non oil GDP, due to a less than 50% of governmental programmed expenditure executed. Moreover Sonangol, the public oil company, was estimated to manage US$660 million on behalf of the government at end 2004.

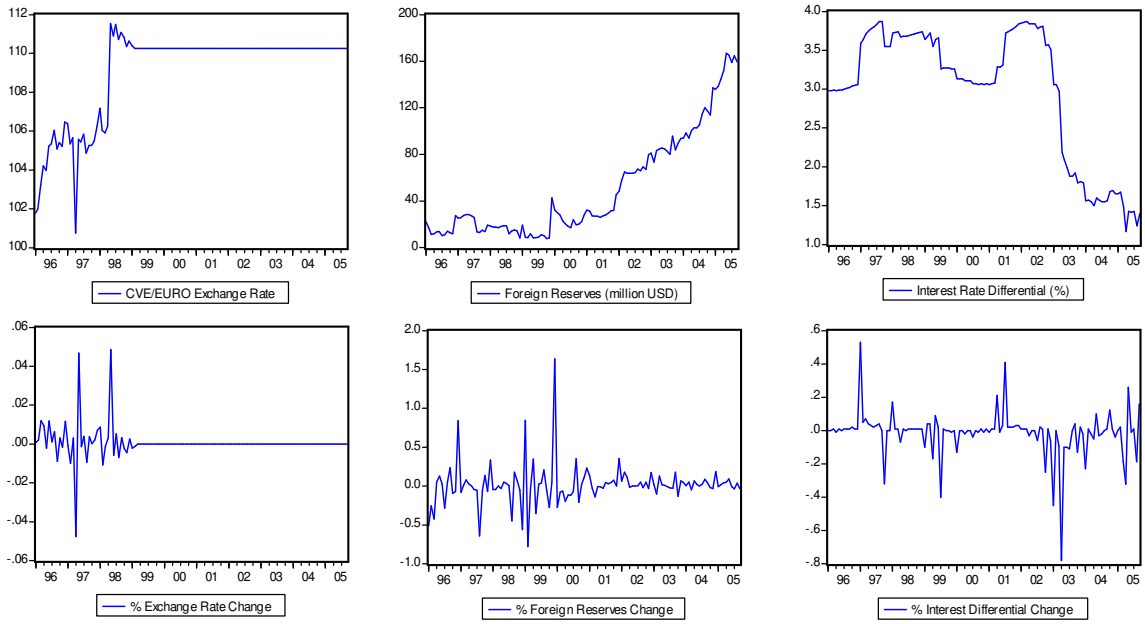
The public external debt to exports ratio has been falling considerably from 365.5 in 2002 to 112.8 in 2004 while the public external debt service to exports was of 141.1 in 2002 and reached 23.4 in 2004. Public debt weight is decreasing, commercial surplus is increasing, foreign reserves augmenting and the government knows that on the following years revenues will have a constant upward trend. The challenge will lie on the prudence of fiscal policy and how it will contribute to long term capacity building. The more the government remains dependent on oil revenue the higher is the risk regarding long term sustainability. Recently there has been an upward trend in oil price and production along with an increase in diamond prices in 2005, projections on the IMF's, ANG—2007 Article IV Consultation Preliminary Conclusions of the Mission Luanda June 6, say that by 2010 oil production will be 90% above 2005, which represented already an 81% increase in value from 2004. This would imply, according to the same report, an estimated GDP average growth of 13% during 2007-2010 and public oil revenues would almost double from 2005 to 2010 even considering an oil price fall from the long-term trend.

The country has a commercial surplus due to oil and diamond exports which we will address more in detail on the following paragraph. In 2002 the country had a 150.1 million dollars commercial deficit and reached a 5137.9 surplus in 2005. Even though oil exploitation is likely to increase and prices to remain high in the next years, it does not ensure long term sustainability if the revenues are not used carefully. The oil revenue inflow represents the country's opportunity to invest in training and skill improvement (human capital) as well as to purchase and build the infrastructures (Physical Capital) to a long term economic development. Using BNA's available data on exports and imports from 2002-2005, oil and diamonds accounted on average for more than 99.00% of the exports. Oil is the most representative good with 91.34% (out of total exports of 8.530.40 Million USD) in 2003 and 94.79% in 2005, which amounted to 22583.2 Million USD. This is a consequence of price as well as production increase. The diamond sector has been increasing in value but losing weight in total exports, while representing 8.29% in 2003 and a value of 788.1 US Million dollars, it moved up to 1092 Millions Dollars and 4.53% of total in 2005. The main partners of ANG's oil exports in 2004 were the USA 31.40% and China 29.83%, although the US accounted for 42.61% in 2000 while China 19.31%[29].

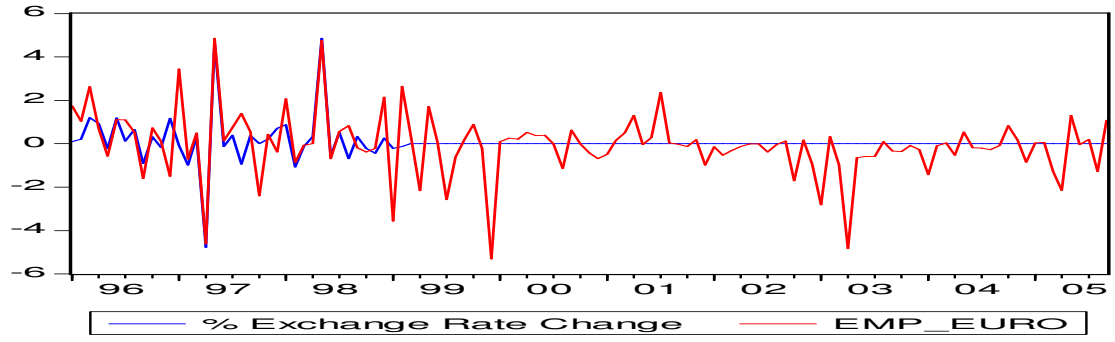
Following on Paul Collier (May, 2006), ANG' strong natural resources revenue may give room for what is called in the literature the Dutch Disease, which in the short run, due to a agricultural sector growth of 26% in 2006 according to the World Bank's (WB) country brief of August 2007, we are inclined to discard. However, it may well be a temporary pick up that in fact, is the result of the return of the domestic conflict dislocated, that returned after 2002. Notwithstanding it will be of relevance to monitor progression on the production factors cost increase. The Council of Ministers adopted in 2007 a reserve fund for oil where the difference between the world price for ANG's oil and the budgeted oil price (US$45 in 2007) will be automatically channelled. It may constitute an important step in avoid excess liquidity in the economy as well as make discretionary use of oil revenue less tempting.

[29] Presented as the percentage of total oil exports in that given year.

CV – EMP Constituent Components



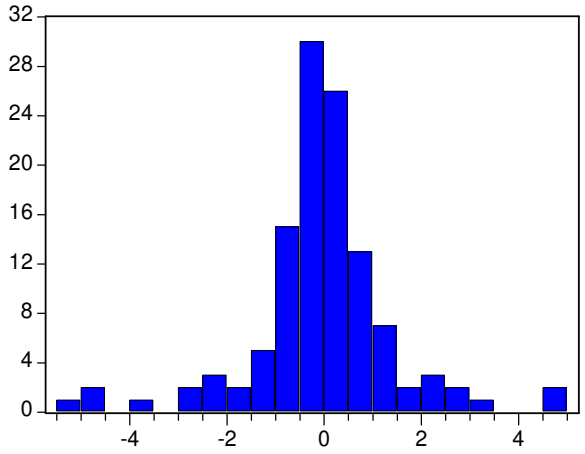
CV – EMP and Changes in Exchange Rate (%)



CV – EMP Estimates & Crises

Date	EMP	Δe	Δr	Δ(i-i*)
1996 JAN	1.750	0.085	-51.300	0.000
1996 FEB	1.040	0.216	-25.378	0.000
1996 MAR	**2.634**	**1.201**	**-42.249**	**0.010**
1996 APR	0.692	0.929	5.415	-0.010
1996 MAY	-0.570	-0.219	12.706	0.010
1996 JUN	1.106	1.183	2.367	0.000
1996 JUL	1.097	0.123	-28.094	0.010
1996 AUG	0.526	0.653	5.792	0.010
1996 SEP	-1.602	-0.902	23.454	0.010
1996 OCT	0.732	0.313	-9.154	0.020
1996 NOV	0.107	-0.177	-6.853	0.010
1996 DEC	-1.498	1.173	84.154	0.010
1997 JAN	**3.438**	**-0.080**	**-8.233**	**0.530**
1997 FEB	-0.700	-0.983	0.702	0.050
1997 MAR	0.487	0.309	7.743	0.070
1997 APR	-4.615	-4.776	2.582	0.040
1997 MAY	**4.862**	**4.688**	**0.303**	**0.030**
1997 JUN	0.134	-0.128	-4.300	0.020
1997 JUL	0.740	0.392	-5.065	0.030
1997 AUG	1.386	-0.941	-64.110	0.040
1997 SEP	0.547	0.378	-5.204	0.000
1997 OCT	-2.390	0.006	13.349	-0.320
1997 NOV	0.432	0.214	-6.727	0.000
1997 DEC	-0.371	0.714	33.429	0.000
1998 JAN	2.071	0.878	-4.631	0.170
1998 FEB	-0.872	-1.076	-4.380	0.010
1998 MAR	-0.072	-0.124	0.314	0.010
1998 APR	0.003	0.327	-3.247	-0.070
1998 MAY	**4.755**	**4.863**	**5.231**	**0.010**
1998 JUN	-0.684	-0.575	3.335	0.000
1998 JUL	0.568	0.522	0.454	0.010
1998 AUG	0.828	-0.688	-44.798	0.010
1998 SEP	-0.187	0.330	17.805	0.010
1998 OCT	-0.380	-0.223	6.750	0.010
1998 NOV	-0.220	-0.446	-5.055	0.010
1998 DEC	**2.144**	**0.262**	**-56.080**	**0.010**
1999 JAN	-3.567	-0.214	84.379	-0.100
1999 FEB	**2.639**	**-0.124**	**-77.547**	**0.040**
1999 MAR	0.398	0.000	-4.692	0.040
1999 APR	-2.169	0.000	34.695	-0.170
1999 MAY	1.708	0.000	-35.614	0.090
1999 JUN	0.042	0.000	2.497	0.020
1999 JUL	-2.575	0.000	3.769	-0.400
1999 AUG	-0.617	0.000	20.897	0.010
1999 SEP	0.193	0.000	-5.929	0.000
1999 OCT	0.890	0.000	-27.413	0.000
1999 NOV	-0.215	0.000	4.745	-0.010
1999 DEC	-5.312	0.000	163.606	0.000
2000 JAN	0.091	0.000	-27.361	-0.130
2000 FEB	0.251	0.000	-7.718	0.000
2000 MAR	0.213	0.000	-6.574	0.000
2000 APR	0.518	0.000	-19.742	-0.020
2000 MAY	0.378	0.000	-11.649	0.000
2000 JUN	0.384	0.000	-11.825	0.000
2000 JUL	-0.017	0.000	-7.026	-0.040
2000 AUG	-1.140	0.000	35.095	0.000
2000 SEP	0.625	0.000	-21.132	-0.010
2000 OCT	-0.017	0.000	2.419	0.010
2000 NOV	-0.428	0.000	11.300	-0.010
2000 DEC	-0.689	0.000	23.123	0.010
2001 JAN	-0.489	0.000	13.167	-0.010
2001 FEB	0.152	0.000	-2.787	0.010
2001 MAR	0.509	0.000	-13.802	0.010
2001 APR	1.308	0.000	-0.627	0.210
2001 MAY	-0.034	0.000	-0.857	-0.010
2001 JUN	0.281	0.000	-2.989	0.030
2001 JUL	**2.368**	**0.000**	**4.511**	**0.410**
2001 AUG	0.029	0.000	2.871	0.020
2001 SEP	-0.025	0.000	4.532	0.020
2001 OCT	-0.124	0.000	7.594	0.020
2001 NOV	0.181	0.000	0.078	0.030
2001 DEC	-0.978	0.000	35.783	0.030
2002 JAN	-0.143	0.000	6.306	0.010
2002 FEB	-0.521	0.000	17.924	0.010
2002 MAR	-0.303	0.000	11.225	0.010
2002 APR	-0.137	0.000	-1.451	-0.030
2002 MAY	-0.004	0.000	0.114	0.000
2002 JUN	-0.003	0.000	0.087	0.000
2002 JUL	-0.384	0.000	0.485	-0.060
2002 AUG	-0.030	0.000	4.716	0.020
2002 SEP	0.131	0.000	-2.139	0.010
2002 OCT	-1.700	0.000	5.134	-0.250
2002 NOV	0.167	0.000	-3.253	0.010
2002 DEC	-0.926	0.000	17.191	-0.060
2003 JAN	-2.809	0.000	1.519	-0.450
2003 FEB	0.324	0.000	-9.982	0.000
2003 MAR	-0.970	0.000	12.865	-0.090
2003 APR	-4.834	0.000	1.568	-0.780
2003 MAY	-0.646	0.000	1.009	-0.100
2003 JUN	-0.581	0.000	-0.978	-0.100
2003 JUL	-0.590	0.000	-2.595	-0.110
2003 AUG	0.095	0.000	-2.912	0.000
2003 SEP	-0.330	0.000	17.728	0.040
2003 OCT	-0.367	0.000	-13.239	-0.130
2003 NOV	-0.086	0.000	6.423	0.020
2003 DEC	-0.271	0.000	4.555	-0.020
2004 JAN	-1.424	0.000	0.405	-0.230
2004 FEB	-0.095	0.000	4.826	0.010
2004 MAR	0.034	0.000	-4.822	-0.020
2004 APR	-0.522	0.000	6.638	-0.050
2004 MAY	0.543	0.000	2.150	0.100
2004 JUN	-0.188	0.000	0.113	-0.030
2004 JUL	-0.206	0.000	2.569	-0.020
2004 AUG	-0.283	0.000	8.713	0.000
2004 SEP	-0.079	0.000	4.335	0.010
2004 OCT	0.831	0.000	-2.227	0.124
2004 NOV	0.164	0.000	-3.171	0.010
2004 DEC	-0.852	0.000	18.672	-0.040
2005 JAN	0.029	0.000	-0.883	0.000
2005 FEB	0.064	0.000	1.797	0.020
2005 MAR	-1.274	0.000	4.306	-0.185
2005 APR	-2.145	0.000	5.163	-0.323
2005 MAY	1.299	0.000	9.111	0.260
2005 JUN	-0.032	0.000	-0.908	-0.010
2005 JUL	0.189	0.000	-3.940	0.010
2005 AUG	-1.270	0.000	3.690	-0.188
2005 SEP	1.089	0.000	-3.310	0.160

CV – EMP Descriptive Statistics



Series: EMP_EURO
Sample 1996M01 2005M09
Observations 117

Mean	-0.054409
Median	-0.017172
Maximum	4.862051
Minimum	-5.312469
Std. Dev.	1.463486
Skewness	-0.297722
Kurtosis	6.751392
Jarque-Bera	70.33402
Probability	0.000000

CV – EGARCH-M Estimation Results

$$EMP_t = \mu \ln\sigma^2 + \theta_0 + \theta_1 \Delta dc_{t-4} + \theta_2 q_{t-3} + \varepsilon_t + \xi_1 \varepsilon_{t-1} + \xi_2 \varepsilon_{t-3}$$

Parameter	Estimate	Std. Error	t-Statistic	p-value
μ	-0.002277	0.000386	-5.897669	0.0000**
θ_0	-0.024604	0.004236	-5.809010	0.0000**
θ_1	0.058132	0.019334	3.006672	0.0026**
θ_2	-0.189549	0.040841	-4.641149	0.0000**
ξ_1	-0.138642	0.054641	-2.537328	0.0112*
ξ_2	0.166011	0.043016	3.859268	0.0001**

$$\ln\sigma_t^2 = \lambda_0 + \lambda_1 \Delta rer_{t-1} + \lambda_2 \Delta dc_{t-3} + \lambda_3 \Delta r_{t-4} + \lambda_4 \Delta r_{t-8} + \lambda_5 trend + \alpha_1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \gamma_1 \frac{\varepsilon_{t-1}}{\sigma_{t-1}}$$

λ_0	-7.968517	0.288702	-27.60115	0.0000**
λ_1	-19.57058	7.308292	-2.677860	0.0074**
λ_2	-25.91903	2.776526	-9.335060	0.0000**
λ_3	2.198588	0.329649	6.669473	0.0000**
λ_4	3.858875	0.411063	9.387552	0.0000**
λ_5	-0.027584	0.004062	-6.789853	0.0000**
α_1	0.591598	0.200617	2.948892	0.0032**
γ_1	-0.705408	0.107218	-6.579214	0.0000**

Diagnostics

	L-B Standardised Residuals		L-B Squared Residuals		ARCH-LM Statistic	
Lag	**Q**	**p-value**	**Q^2**	**p-value**	**LM**	**p-value**
Lag3	1.6805	0.195	3.2580	0.071	0.023585	0.8099
Lag4	1.8140	0.404	3.9167	0.141	-0.062074	0.5390
Lag5	1.8140	0.612	3.9216	0.270	0.041375	0.6311
Lag6	3.7235	0.445	3.9216	0.417	-0.080680	0.4229
Lag7	5.0334	0.412	3.9491	0.557	0.031201	0.8111
Lag8	5.0407	0.539	4.1989	0.650	-0.071455	0.6091
Lag9	5.5784	0.590	4.2108	0.755	-0.067852	0.4711
Lag10	6.0199	0.645	5.2979	0.725	-0.128773	0.1187
Lag11	7.1475	0.622	5.6028	0.779	-0.046155	0.7623
Lag12	7.8967	0.639	5.9442	0.820	-0.043482	0.6835
Lag13	7.9255	0.720	6.1949	0.860	-0.075333	0.4101
Lag14	7.9256	0.791	6.4396	0.892	-0.061972	0.4485
	No. of Observations		**Log-Likelihood**		**SIC**	
	117		350.2359		-5.8238	

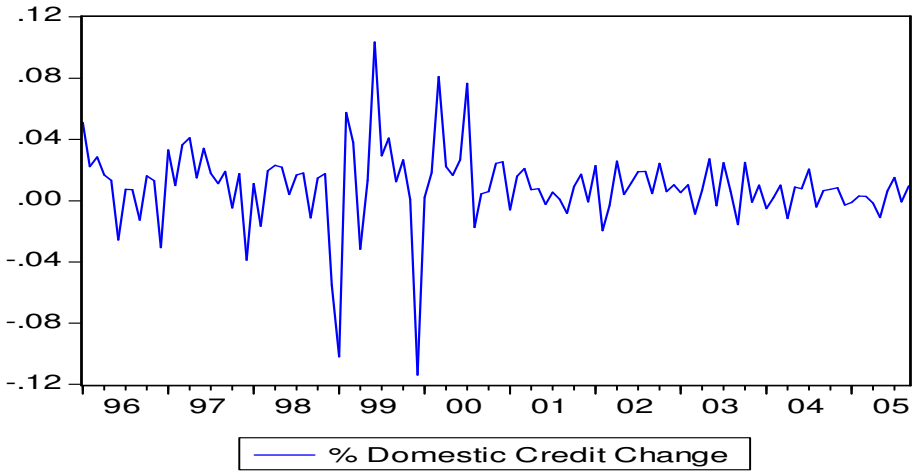
CV – Data Description

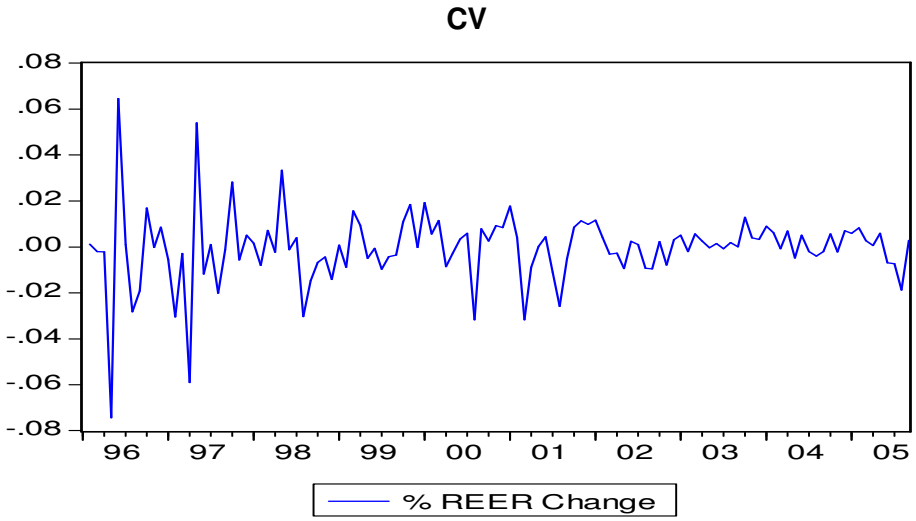
Variables	
e_t	Bilateral CVE/EUR exchange rate. Source: Banco de Cabo Verde (BCV).
Δe_t	Depreciation rate of CVE vis-à-vis the EUR (log).
Δr_t	Change in CV's international reserves (log) Source: BCV.
i_t	CV 3-Month Deposit Rate (%). Source: BCV.
i_t^*	Eurozone 3-Month Deposit Rate (%). Source: European Central Bank.
$\Delta(I_t - i_t^*)$	Change in interest rate differential (%).
p_t	CV Consumer Price Index. Source: BCV.
Δp_t	$\Delta p_t = (p_t - p_{t-1})/p_{t-1}$
p_t^*	German Consumer Price Index Source: Deutsche Bundesbank.
Δp_t^*	$\Delta p_t^* = (p_t^* - p_{t-1}^*)/p_{t-1}^*$
q_t	Real exchange rate depreciation = $\Delta e - \Delta p_t + \Delta p_t^*$
dc_t	Domestic credit. Source: BCV.
Δdc_t	$\Delta dc_t = (dc_t - dc_{t-1})/dc_{t-1}$
D_1_99	Dummy variable that takes on value one for all t ≥ 1999:01 and zero otherwise.

CV – Phillips-Perron Test Statistic

Series	Level	Test Specification	First Difference	Test Specification
p_t	-3.087410	Intercept & Trend	-10.75042**	No Intercept or Trend
p_t^*	-2.383996	Intercept & Trend	-11.04016**	No Intercept or Trend
e_t	-3.261669***	Intercept & Trend	-15.70297**	No Intercept or Trend
i_t-i_t^*	-1.747065	Intercept & Trend	-10.40285**	No Intercept or Trend
r_t	-1.239519	Intercept & Trend	-12.31291**	No Intercept or Trend
dc_t	-2.899659	Intercept & Trend	-9.234167**	No Intercept or Trend

CV





CV – Country Overview [30]

As of January 1999, the Cape Verdian Escudo (CVE) has been pegged to the Euro at the nominal exchange rate of 110.27 CVE/EUR. The CVE was first issued on July 1, 1977 by the Banco Central de Cabo Verde (BCV), the country's central bank. At that point in time, the CVE was pegged to a basket of currencies following its unlinking from the Portuguese Escudo (PTE) in the wake of the latter's depreciation. The CVE was again pegged to PTE at a rate of 0.50 CVE/PTE following of the signing of the *Acordo de Cooperação Cambial* (Exchange Cooperation Agreement) between CV and Portugal on March 13, 1998. Prior to the agreement becoming operational in July 1998, the CVE was devalued to the rate of 0.55 CVE/PTE on March 30, 1998.

As for CV's economy, Weber (2005) finds that the main economic and financial indicators reveal a strong performance in terms of real and nominal growth with a GDP of 1.036,4 millions USD (1.930,2 USD per capita) in 2005 using figures from the Banco de Cabo Verde. CV has enjoyed high economic growth, low inflation and generally favourable macroeconomic conditions. The fiscal slippages that occurred in 2000 were not repeated subsequently, and the government has formally recognised the need to consolidate monetary and fiscal policy through the adoption of the Maastricht criteria as reference values. Foreign reserves have increased gradually since 1999, large attributable to increased foreign grants and, since 2001, less expansionary fiscal policies.

The analysis of CV's balance of payments situation, reveals that the existence of a structural account deficit. The trade deficit has been relatively unchanged since 1996, at roughly 35-37% of Gross Domestic Product (GDP), which mainly reflects CV's dependence on imports, most of which are from the Eurozone, Portugal 48.64% on average during 1996-2006 and from the Netherlands 15.03% for the same period. Indeed, such imports have increased more than five fold in value during the period 1990-2003, and from 52.9% to 77.7% of total imports. Exports, meanwhile, are mostly directed at Portugal, whose share has risen from an average of 65.9% during 1990-97 to an average of 82.72% during 1998-2004; after 2004 the share drops below the 70% threshold. More recently Portugal represented 51.55% of total

[30] Information Source: IMF Memorandum of Economic and Financial Policies - February 22, 2000

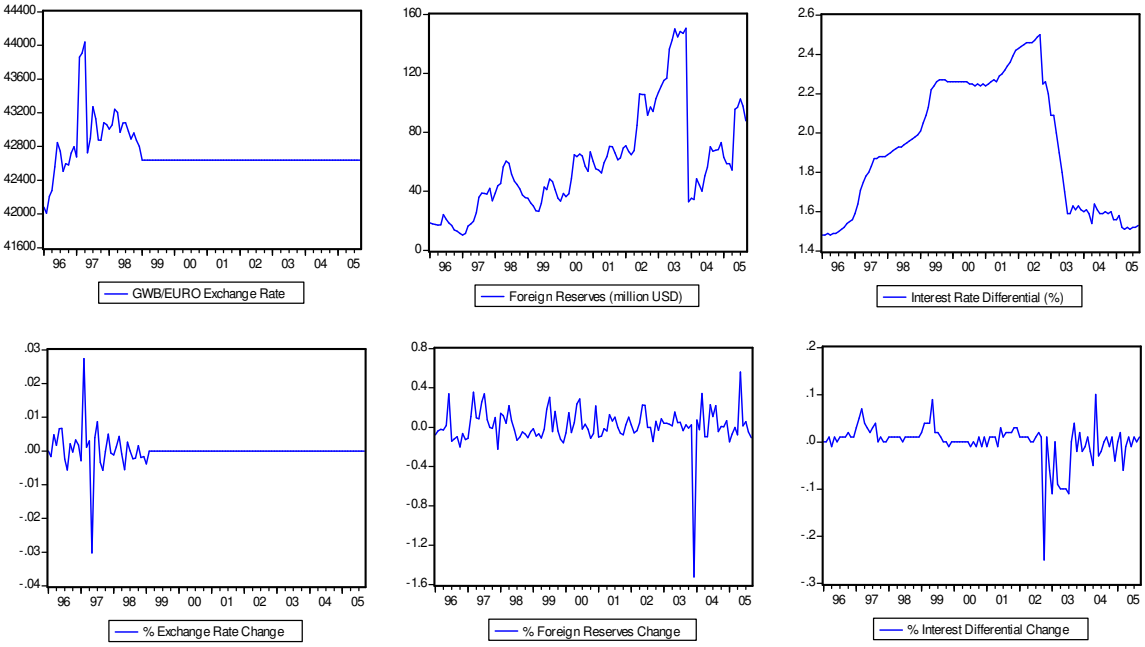
exports in 2005, and 53.23% in 2006, while Spain represented 21.32% and 27.31% for the same period.

The financial account exhibits near zero portfolio investment, indicative of the fact that CV currently engages in little trading in international financial and capital markets. In addition, there is low foreign direct investment (FDI) and some capital inflows in the form of foreign loans. The geographical distribution of emigrant's remittances is skewed towards Euro transfers, which make up almost 70% of total remittances. Needless to say, the importance of these remittances for CV is paramount as the current exchange rate regime is difficult to sustain without substantial monetary transfers by private individuals. Indeed, remittances are the major channel through which the BCV's interest rate policy attracts foreign capital and, as such, they are instrumental in sustaining the peg. As a result, CV's monetary authorities have sought to improve the peg's credibility in order to attract these private transfers.

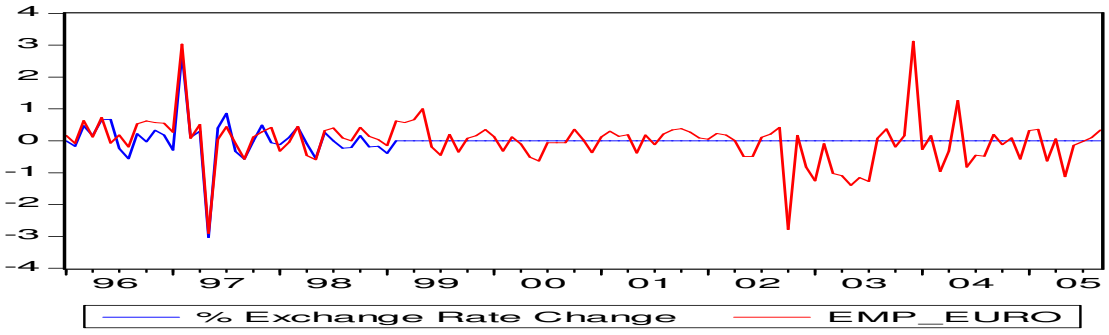
As for the economic impact of the peg itself, Weber (2005) finds that the exchange rate anchor has lead to benefits such as lower inflation and price volatility, a steady build-up of foreign reserves and an increased degree of integration with the Eurozone, as evidenced by the changes in CV's trade pattern and the geographical distribution of remittances. The peg's impact on price stability is also reflected in the depreciation of the real effective exchange rate, which is tantamount to a rise in external competitiveness.

Weber (2005) notes, however, that these benefits come at the cost of having to leave domestic interest rates high so as to attract foreign capital, which inhibits private investment and economic growth somewhat. Based on his analysis, he concludes that CV's prevailing currency peg is capable of reaping more economic benefits, some akin to those only achievable under full Eurosation, given its significant room for manoeuvre and scope for further improvement.

GB – EMP Constituent Components



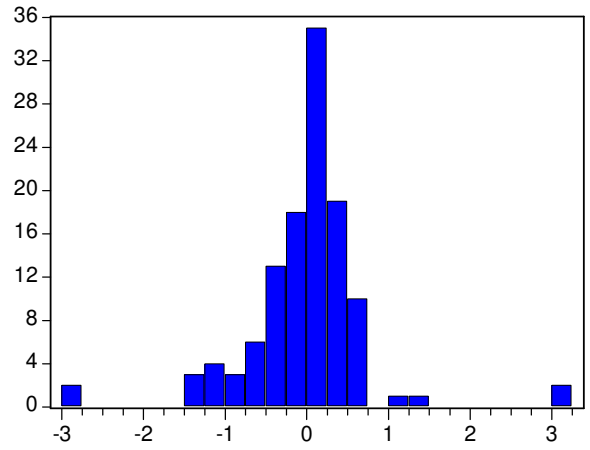
GB – EMP and Changes in Exchange Rate (%)



GB – EMP Estimates & Crises

Date	EMP	Δe	Δr	Δ(i-i*)
1996 JAN	0.172	0.000	-7.848	0.000
1996 FEB	-0.083	-0.171	-4.029	0.000
1996 MAR	0.632	0.477	-2.247	0.010
1996 APR	0.119	0.163	-2.824	-0.010
1996 MAY	0.735	0.665	1.623	0.010
1996 JUN	-0.071	0.668	33.787	0.000
1996 JUL	0.179	-0.237	-14.165	0.010
1996 AUG	-0.193	-0.561	-11.985	0.010
1996 SEP	0.533	0.215	-9.670	0.010
1996 OCT	0.622	-0.031	-20.152	0.020
1996 NOV	0.574	0.329	-6.373	0.010
1996 DEC	0.555	0.175	-12.537	0.010
1997 JAN	0.275	-0.287	-11.184	0.030
1997 FEB	3.030	2.742	11.010	0.050
1997 MAR	0.074	0.110	35.467	0.070
1997 APR	0.512	0.297	9.525	0.040
1997 MAY	-2.899	-3.026	8.697	0.030
1997 JUN	0.043	0.399	25.935	0.020
1997 JUL	0.438	0.867	34.100	0.030
1997 AUG	-0.079	-0.337	7.564	0.040
1997 SEP	-0.570	-0.575	-0.207	0.000
1997 OCT	0.120	-0.014	-1.277	0.010
1997 NOV	0.277	0.493	9.855	0.000
1997 DEC	0.427	-0.060	-22.231	0.000
1998 JAN	-0.325	-0.120	14.221	0.010
1998 FEB	-0.038	0.114	11.787	0.010
1998 MAR	0.454	0.433	3.882	0.010
1998 APR	-0.462	-0.087	21.944	0.010
1998 MAY	-0.597	-0.553	6.813	0.010
1998 JUN	0.318	0.262	-2.575	0.000
1998 JUL	0.401	0.004	-13.295	0.010
1998 AUG	0.089	-0.232	-9.853	0.010
1998 SEP	0.000	-0.211	-4.788	0.010
1998 OCT	0.420	0.160	-7.051	0.010
1998 NOV	0.143	-0.194	-10.587	0.010
1998 DEC	0.036	-0.170	-4.564	0.010
1999 JAN	-0.148	-0.389	-1.351	0.020
1999 FEB	0.619	0.000	-8.949	0.040
1999 MAR	0.571	0.000	-6.764	0.040
1999 APR	0.664	0.000	-10.998	0.040
1999 MAY	1.003	0.000	-2.322	0.090
1999 JUN	-0.193	0.000	18.491	0.020
1999 JUL	-0.456	0.000	30.493	0.020
1999 AUG	0.203	0.000	-4.439	0.010
1999 SEP	-0.353	0.000	16.127	0.000
1999 OCT	0.080	0.000	-3.639	0.000
1999 NOV	0.162	0.000	-12.245	-0.010
1999 DEC	0.345	0.000	-15.755	0.000
2000 JAN	0.126	0.000	-5.746	0.000
2000 FEB	-0.323	0.000	14.765	0.000
2000 MAR	0.121	0.000	-5.510	0.000
2000 APR	-0.106	0.000	4.861	0.000
2000 MAY	-0.517	0.000	23.640	0.000
2000 JUN	-0.628	0.000	28.712	0.000
2000 JUL	-0.066	0.000	-1.823	-0.010
2000 AUG	-0.062	0.000	2.822	0.000
2000 SEP	-0.061	0.000	-2.055	-0.010
2000 OCT	0.356	0.000	-11.412	0.010
2000 NOV	0.031	0.000	-6.263	-0.010
2000 DEC	-0.370	0.000	21.743	0.010
2001 JAN	0.114	0.000	-10.049	-0.010
2001 FEB	0.301	0.000	-8.920	0.010
2001 MAR	0.137	0.000	-1.423	0.010
2001 APR	0.189	0.000	-3.783	0.010
2001 MAY	-0.387	0.000	12.841	-0.010
2001 JUN	0.179	0.000	6.340	0.030
2001 JUL	-0.122	0.000	10.418	0.010
2001 AUG	0.215	0.000	-0.142	0.020
2001 SEP	0.342	0.000	-5.975	0.020
2001 OCT	0.379	0.000	-7.649	0.020
2001 NOV	0.270	0.000	2.159	0.030
2001 DEC	0.094	0.000	10.220	0.030
2002 JAN	0.055	0.000	2.305	0.010
2002 FEB	0.232	0.000	-5.746	0.010
2002 MAR	0.181	0.000	-3.455	0.010
2002 APR	0.012	0.000	4.271	0.010
2002 MAY	-0.495	0.000	22.621	0.000
2002 JUN	-0.489	0.000	22.347	0.000
2002 JUL	0.114	0.000	-0.359	0.010
2002 AUG	0.214	0.000	-0.095	0.020
2002 SEP	0.419	0.000	-14.328	0.010
2002 OCT	-2.777	0.000	5.980	-0.250
2002 NOV	0.174	0.000	-3.136	0.010
2002 DEC	-0.825	0.000	8.681	-0.060
2003 JAN	-1.257	0.000	4.251	-0.110
2003 FEB	-0.087	0.000	3.997	0.000
2003 MAR	-1.021	0.000	3.142	-0.090
2003 APR	-1.091	0.000	1.492	-0.100
2003 MAY	-1.398	0.000	15.517	-0.100
2003 JUN	-1.159	0.000	4.598	-0.100
2003 JUL	-1.272	0.000	4.944	-0.110
2003 AUG	0.079	0.000	-3.622	0.000
2003 SEP	0.368	0.000	2.531	0.040
2003 OCT	-0.193	0.000	-0.873	-0.020
2003 NOV	0.160	0.000	2.377	0.020
2003 DEC	3.118	0.000	-152.195	-0.020
2004 JAN	-0.267	0.000	7.352	-0.010
2004 FEB	0.160	0.000	-2.488	0.010
2004 MAR	-0.959	0.000	34.151	-0.020
2004 APR	-0.320	0.000	-9.580	-0.050
2004 MAY	1.267	0.000	-9.520	0.100
2004 JUN	-0.819	0.000	22.935	-0.030
2004 JUL	-0.454	0.000	11.067	-0.020
2004 AUG	-0.485	0.000	22.155	0.000
2004 SEP	0.202	0.000	-4.385	0.010
2004 OCT	-0.123	0.000	0.798	-0.010
2004 NOV	0.092	0.000	0.631	0.010
2004 DEC	-0.570	0.000	6.705	-0.040
2005 JAN	0.322	0.000	-14.729	0.000
2005 FEB	0.365	0.000	-7.009	0.020
2005 MAR	-0.635	0.000	-0.017	-0.060
2005 APR	0.061	0.000	-7.612	-0.010
2005 MAY	-1.124	0.000	56.216	0.010
2005 JUN	-0.137	0.000	1.402	-0.010
2005 JUL	-0.018	0.000	5.655	0.010
2005 AUG	0.106	0.000	-4.822	0.000
2005 SEP	0.338	0.000	-10.620	0.010

GB – EMP Descriptive Statistics



Series: EMP_EURO
Sample 1996M01 2005M09
Observations 117

Mean	-0.011675
Median	0.089224
Maximum	3.118420
Minimum	-2.898738
Std. Dev.	0.726165
Skewness	0.103766
Kurtosis	10.38594
Jarque-Bera	266.1512
Probability	0.000000

GB – EGARCH-M Estimation Results

$$EMP_t = \mu \ln\sigma^2 + \text{DUMMY} + \theta_1 \Delta dc_{t-4} + \theta_2 q_{t-7} + \varepsilon_t$$

Parameter	Estimate	Std. Error	t-Statistic	p-value
μ	-0.000536	8.62E-06	-62.25163	0.0000**
D_5_97	-0.006708	0.000206	-32.63759	0.0000**
θ_1	0.006067	0.001566	3.874420	0.0001**
θ_2	-0.046472	0.002107	-22.05940	0.0000**

$$\ln\sigma_t^2 = \lambda_0 + \lambda_1 \Delta dc_{t-3} + \lambda_2 \Delta r_{t-2} + \alpha_1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \alpha_2 \ln\sigma_{t-1}^2 + \alpha_3 \ln\sigma_{t-2}^2$$

λ_0	-13.58991	0.005822	-2334.153	0.0000**
λ_1	-2.856574	0.609767	-4.684695	0.0000**
λ_2	2.130448	0.320162	6.654273	0.0000**
α_1	1.698640	0.055331	30.69965	0.0000**
α_2	-0.355731	0.001158	-307.1049	0.0000**
α_3	0.182010	4.36E-05	4177.698	0.0000**

Diagnostics

	L-Bo Standardised Residuals		L-B Squared Residuals		ARCH-LM Statistic	
Lag	**Q**	**p-value**	**Q^2**	**p-value**	**LM**	**p-value**
Lag1	1.4940	0.222	0.6428	0.423	-0.093768	0.2277
Lag2	1.4985	0.473	1.9863	0.370	0.119513	0.4922
Lag3	1.5744	0.665	2.4040	0.493	0.074359	0.4551
Lag4	3.8546	0.426	2.9722	0.562	-0.050547	0.5907
Lag5	4.7447	0.448	2.9826	0.703	-0.000852	0.9926
Lag6	6.9611	0.324	3.2093	0.782	0.066816	0.4312
Lag7	7.0170	0.427	3.2186	0.864	0.053219	0.5359
Lag8	7.5428	0.479	3.3680	0.909	0.057482	0.4945
Lag9	7.5534	0.580	3.3731	0.948	0.009046	0.9030
Lag10	9.5067	0.485	5.9059	0.823	-0.177390	0.0272
Lag11	11.055	0.439	5.9071	0.879	-0.040061	0.5147
Lag12	11.245	0.508	7.2679	0.839	0.140196	0.4831
	No. of Observations		**Log-Likelihood**		**SIC**	
	117		426.6483		-7.3980	

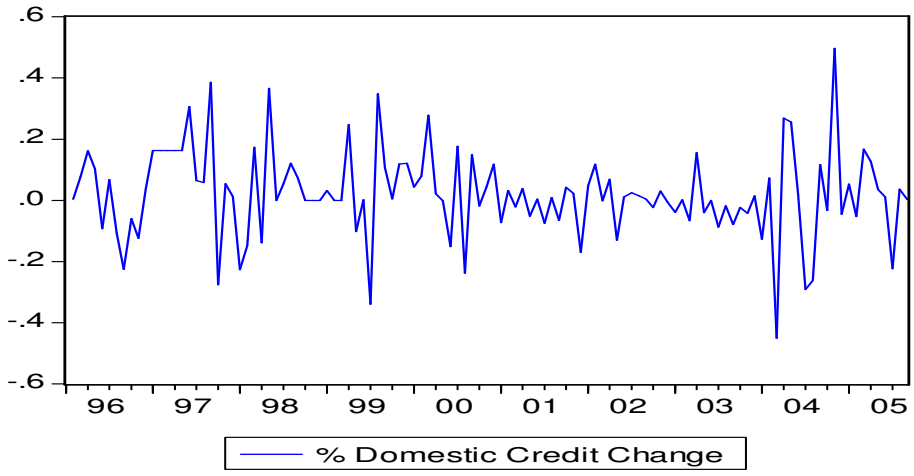
GB – Data Description

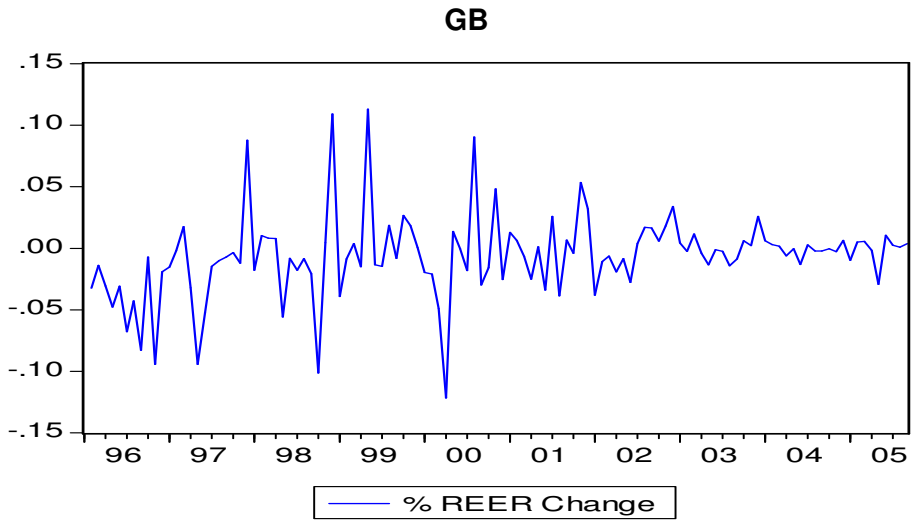
Variables	
e_t	Bilateral GBW/EUR exchange rate. Source: Calculated using data from http://www.oanda.com/convert/fxhistory
Δe_t	Depreciation rate of GWB vis-à-vis the EUR (log).
Δr_t	Change in GB's international reserves (log). Source: IMF – International Financial Statistics.
i_t	GB 3-Month Deposit Rate (%). Source: IMF – International Financial Statistics.
i_t^*	Eurozone 3-Month Deposit Rate (%). Source: European Central Bank.
$\Delta(i_t - i_t^*)$	Change in interest rate differential (%).
p_t	GB Consumer Price Index. Source: IMF – International Financial Statistics.
Δp_t	$\Delta p_t = (p_t - p_{t-1})/p_{t-1}$
p_t^*	German Consumer Price Index. Source: Deutsche Bundesbank.
Δp_t^*	$\Delta p_t^* = (p_t^* - p_{t-1}^*)/p_{t-1}$
q_t	Real exchange rate depreciation = $\Delta e - \Delta p_t + \Delta p_t^*$
dc_t	Domestic credit. Source: IMF – International Financial Statistics.
Δdc_t	$\Delta dc_t = (dc_t - dc_{t-1})/dc_{t-1}$
D_5_97	Dummy variable that takes on value one for all t ≥ 1997:05 and zero otherwise.

GB – Phillips-Perron Test Statistic

Series	Level	Test Specification	First Difference	Test Specification
p_t	-3.656467**	Intercept	-10.50532**	No Intercept or Trend
p_t^*	-2.383996	Intercept & Trend	-11.04016**	No Intercept or Trend
e_t	-4.275929**	Intercept	-13.06109**	No Intercept or Trend
i_t-i_t^*	-1.32507	Intercept & Trend	-8.621472**	No Intercept or Trend
r_t	-3.129516	Intercept & Trend	-10.57881**	No Intercept or Trend
dc_t	-1.418726	Intercept & Trend	-13.62803**	No Intercept or Trend

GB





GB – Country Overview [31]

GB's national currency was the Peso (GWP) until its entrance to the West African Economic and Monetary Union (WAEMU). The country signed its entry into the WAEMU in December 1996 while the official conversion of the Peso (GWP) into CFA francs (XOF) took place on the 2nd of May 1997, nowadays the exchange rate between the CFA and the EURO is of 655.957 under the fix peg. This implies that the country delegates the rule and execution of the monetary policy to an authority, Banque des Etats d'Afrique de l'Ouest (BCEAO), Central Bank of the Western African States, that manages it at a regional level altogether for GB as all the other member states: Benin, Burkina Faso, Cote d'Ivoire, Mali, Niger, Senegal and Togo.

Following on Veyrune (2007) the Franc zone is a result of the cooperation between France and 15 African countries established in 1972 through the *conventions de cooperation*. This cooperation takes place between the French treasury, the WAEMU, Central Africa Economic Monetary Community (CAEMC) and the Comoros that established a fix peg towards the French Franc and implicitly, later on to the Euro. The exchange rate arrangement involves 6 central banks: the Banque de France, responsible for the French monetary policy, *Institut d'Emission d'Outre-Mer* (IEOM) and *Institut d'émission des départements d'Outre Mer* (IEDOM), two monetary institutions that depend on French authorities that are responsible for the French franc overseas, the Banque des Etats d'Afrique Centrale (BEAC), the (BCEAO) and the Central Bank of the Comoros.

Not all members are former French colonies such as GB and Equatorial Guinea and vice-versa, Algeria, Tunisia and Morocco to name a few. This cooperation main feature is the French Treasury's unlimited contingency credit line that allows these institutions to signal credibility and sustain the peg even though requiring fewer foreign reserves. Even though the acronym CFA is the same, the agreements were undertaken and are executed separately, the CAEMC CFA stands for "*Coopération Financière en Afrique*" and the CFA for WAEMU for "*Communauté Financière Africaine*". When France joined the Euro, EU Commission

[31] Information Source: Public Information Notice No. 06/99 - August 17, 2006; No. 04/138 - December 10, 2004; No. 99/94 - October 8, 1999; No. 98/20 - March 26, 1998; No. 97/34 - July 25, 1997.
IMF Country Report No. 05/94 - March 2005; No. 05/69 - March 2005; No. 03/70 - March 2003; No. 01/193 - October 2001

declared the compatibility of these agreements on the 23rd November 1998, in Bank of France's webpage.

The country followed a centrally planned economy after its independence in 1974, having suffered from a high external debt, inefficient public enterprises, and stagnating economic growth. Highly dependent on foreign aid, public debt constitutes a heavy burden that was about 339.1% in 1996 and of 317% in 2006. Following on the Bank of France's report, GB had in 2005 a 192 USD GDP per capita while inflation was at 1.6% in 2006, IMF's (PIN) No. 06/99. Structural reforms toward a market-oriented economy in the mid-1990s were supported by a SMP 1993-1994 and under the Enhanced Structural Adjustment Facility (ESAF) 1995-1998. This period, according to the IMF (PIN) No. 98/20 March 26, was marked by a good economic performance with real annual GDP growing 4.33% on average during 1994-1997. The large depreciations of the peso in 1996 were related high price level along with speculation regarding the terms of accession of GB in the WAEMU. Inflation was increasing from 1994 until 1996 reaching 66% but dropping in 1997 to 16.2%.

In spite of a period marked by a good economic growth, an armed conflict arose in 1998-99 that lead to widespread destruction. In 1999 and 2000, the Fund assisted the authorities' post-war reconstruction effort through Emergency Post-Conflict Assistance (EPCA) and in the beginning of 2000 a new government had taken office. On December 2000 a new poverty reduction and growth facility had been approved. After the conflict, important structural reforms were abandoned being the main political focus, power consolidation. The outcome was that by 2001 the programme started going off track, having the staff given up by mid2002 and finally having expired by 2003. As a consequence of not obeying by the agreements with the IMF, debt relief stopped after 2001 which accrued pressure on its weak financial stability. Real GDP growth in 2000 was of 7.6%, and according to (PIN) No. 06/99 August 17, it went to 0.2% in 2001 and -7.1% in 2002. Inflation remained low with a period average of 2.93% during 1999-2003, having peaked in 2000 with 8.6%. 2003 marked the inversion of the tendency on real GDP growth in spite of a shut of -0.6%.

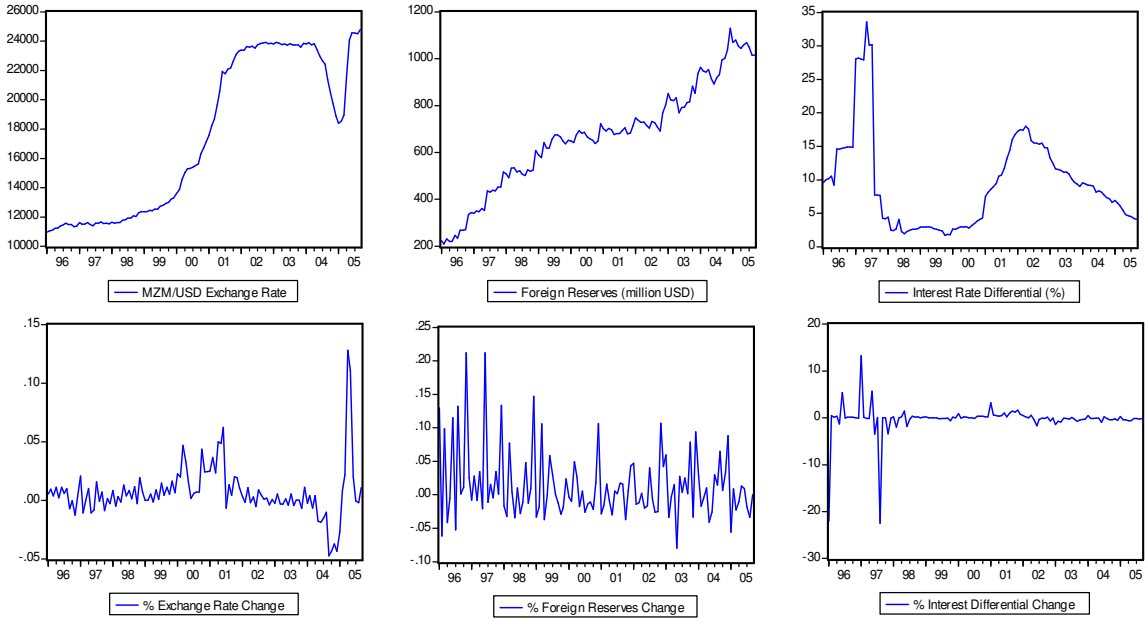
In spite of the inversion of 2003, with the aggravation of the economic conditions, a deficient fiscal management and public sector wage delays opened the way for a pacific military coup that deposed President Kumba Yala. Parliamentary elections were held in March 2004 while an interim President was settled until the June-July 2005, time when the country went to the poles electing João "Nino" Vieira. As a result of the conflict only one of the three operating banks is in business and in only Bissau. Not surprisingly the country denotes low financial intermediation considering regional standards. The government progressed well in our time frame, moving from a current primary fiscal balance deficit of 3.3% in 1994 into a surplus of 5.5% (of GDP) in 1997. To this result tariff, taxes modernization and simplification, contributed to improve the fiscal machine. This progress got somewhere lost due to the conflicts that were responsible for donor's fund demobilization[32], loss of public administrative ability altogether with a large wage increase in 2000 after the conflict. In the period during 1999-2003 the average primary fiscal balance deficit was of -6.54%, being the most noticeable -8.4% in 1999 and -11.1% in 2000. In 2004 the deficit reached -7.6% but it has been recovering to -3.6% in 2006. The situation improvement in 2005, according to the Banque de France – Rapport Zone Franc 2005, was due to tighter fiscal control, centralisation of expenses authorization and closure of public bank accounts outside the Central Bank. The next few years will be an opportunity to continue to profit on higher stability and regain some of the policy achievements of the before 1997. The country's public external debt is one of the highest, 339.1% of the GDP in 1996. However, as a result of the

[32] Namely: demobilization and re-insertion of ex-soldiers (PDRRI) and clearance of domestic supplier arrears (DASP).

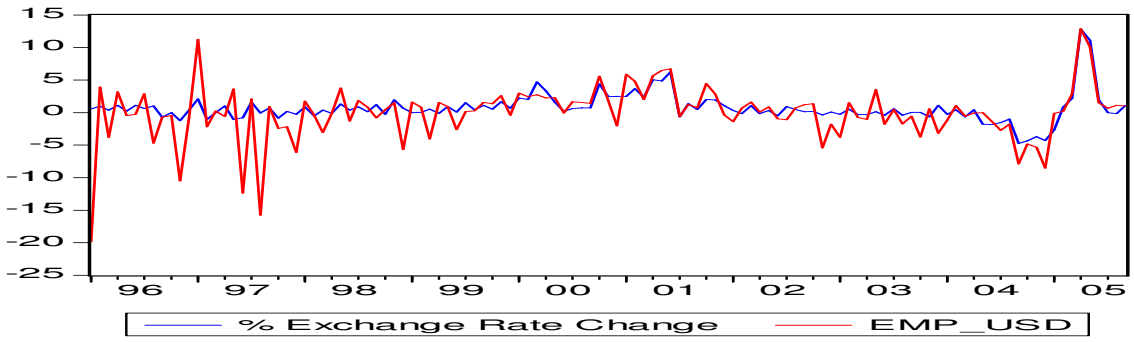
mild economic pick up after 2004, the situation got relatively better, 418% in 2002 to 317% of the GDP in 2006.

When looking into the commercial balance, the country is close to being a mono-exporter of cashew nuts accounting for 85% of total export revenue and 12% of the world production in 2005. Its commercial balance was of -33 millions of USD on average between1994-1997. Export/import performance, using the Banque de France – Rapport Zone Franc 2005, from 2002-2005 was of 93.1%, 99.7%, 91.3% and 83.1% respectively. The situation in 2003 was exceptionally marked by an export increase along with imports stagnation. In 2005 cashew nuts sales increased 16.5% and even though exports increased 30%, as imports augmented 43.2%, the trade deficit deteriorated from a deficit of 2,493 to 6,953 thousand euros. In fact the country has a chronicle commercial deficit as it needs to import capital goods, consumption goods such as medicine and the export sector has not been ensuring sufficient and sustainable revenue to cope with the needs. Economic activity has been recovering since 2004-2006 on a 3.3% real GDP growth having each year growing at a higher rate than the one before. Along with growth, inflation is also picking up reaching positive levels in 2005 and 1.6% in 2006. A new SMP was set into place between April-December 2005 as economic activity exceeded expectations.

MOZ – EMP Constituent Components



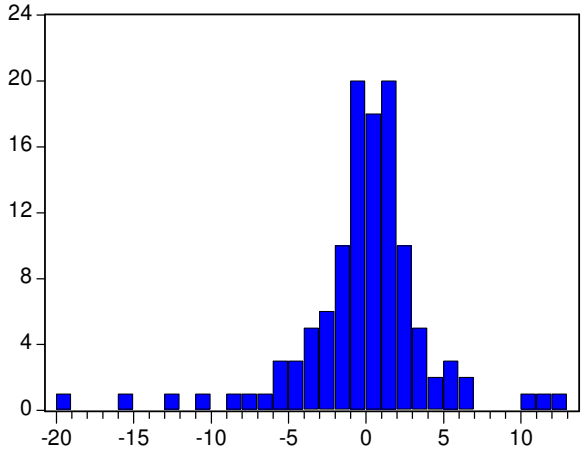
MOZ – EMP and Changes in Exchange Rate (%)



MOZ – EMP Estimates & Crises

Date	EMP	Δe	Δr	Δ(i-i*)
1996 JAN	-19.846	0.568	12.988	-22.070
1996 FEB	3.914	0.945	-6.133	0.440
1996 MAR	-3.804	0.397	9.879	0.160
1996 APR	3.168	1.129	-4.170	0.330
1996 MAY	-0.446	0.214	-0.480	-1.300
1996 JUN	-0.280	1.131	11.511	5.400
1996 JUL	2.858	0.613	-5.255	-0.070
1996 AUG	-4.674	1.017	13.249	0.130
1996 SEP	-0.724	-0.720	0.145	0.090
1996 OCT	-0.447	-0.035	1.097	0.100
1996 NOV	-10.470	-1.245	21.200	0.030
1996 DEC	-0.806	0.361	2.585	-0.060
1997 JAN	11.251	2.079	-0.788	13.210
1997 FEB	-2.162	-1.047	2.802	0.160
1997 MAR	0.237	-0.017	-0.830	-0.160
1997 APR	-0.618	1.004	3.444	-0.180
1997 MAY	3.643	-1.065	-2.047	5.710
1997 JUN	-12.368	-0.795	21.233	-3.460
1997 JUL	2.117	1.593	-1.110	0.060
1997 AUG	-15.755	-0.060	1.554	-22.470
1997 SEP	0.909	0.723	-0.425	0.000
1997 OCT	-2.415	-0.870	3.466	-0.050
1997 NOV	-2.167	0.173	0.124	-3.420
1997 DEC	-6.138	-0.268	13.367	-0.060
1998 JAN	1.740	0.845	-1.653	0.260
1998 FEB	-0.403	-0.491	-3.252	-1.990
1998 MAR	-3.044	0.353	7.729	-0.040
1998 APR	-0.128	-0.121	0.384	0.240
1998 MAY	3.783	1.335	-3.408	1.440
1998 JUN	-1.305	0.390	1.052	-1.850
1998 JUL	1.860	0.843	-2.791	-0.300
1998 AUG	0.837	0.151	-1.082	0.320
1998 SEP	-0.791	1.191	4.807	0.170
1998 OCT	0.412	-0.265	-1.246	0.200
1998 NOV	1.512	1.965	0.993	-0.030
1998 DEC	-5.651	0.690	14.693	0.100
1999 JAN	1.616	0.000	-3.322	0.250
1999 FEB	0.803	0.032	-1.783	-0.010
1999 MAR	-4.066	0.548	10.566	-0.010
1999 APR	1.531	-0.113	-3.724	0.030
1999 MAY	0.926	0.897	-0.126	-0.040
1999 JUN	-2.615	0.080	5.858	-0.210
1999 JUL	0.143	1.495	2.932	-0.110
1999 AUG	0.295	0.431	0.052	-0.170
1999 SEP	1.563	1.112	-1.173	-0.090
1999 OCT	1.359	0.517	-2.898	-0.630
1999 NOV	2.572	1.640	-1.937	0.130
1999 DEC	-0.437	0.641	2.397	-0.050
2000 JAN	2.981	2.260	-0.320	0.870
2000 FEB	2.409	2.016	-0.995	-0.060
2000 MAR	2.722	4.707	4.920	0.240
2000 APR	2.250	3.312	2.666	0.150
2000 MAY	2.316	1.583	-1.742	-0.040
2000 JUN	-0.068	0.163	0.547	0.010
2000 JUL	1.644	0.619	-2.581	-0.150
2000 AUG	1.526	0.712	-1.346	0.340
2000 SEP	1.386	0.707	-1.068	0.320
2000 OCT	5.565	4.378	-2.155	0.370
2000 NOV	1.788	2.434	1.847	0.240
2000 DEC	-2.032	2.478	10.649	0.200
2001 JAN	5.857	2.486	-2.824	3.200
2001 FEB	4.818	3.682	-1.625	0.640
2001 MAR	1.982	2.364	1.596	0.470
2001 APR	5.624	5.026	-0.820	0.360
2001 MAY	6.489	4.867	-2.954	0.500
2001 JUN	6.708	6.231	0.530	1.060
2001 JUL	-0.619	-0.664	0.173	0.180
2001 AUG	1.248	1.352	1.770	1.000
2001 SEP	0.703	0.440	1.604	1.440
2001 OCT	4.453	2.026	-3.694	1.220
2001 NOV	2.808	1.943	0.531	1.640
2001 DEC	-0.369	1.036	4.325	0.720
2002 JAN	-1.365	0.349	4.727	0.520
2002 FEB	0.655	-0.148	-1.441	0.260
2002 MAR	1.588	1.089	-1.189	-0.030
2002 APR	0.083	-0.180	0.226	0.540
2002 MAY	0.885	0.308	-1.981	-0.430
2002 JUN	-0.954	-0.523	-1.647	-1.720
2002 JUL	-1.093	0.897	4.042	-0.340
2002 AUG	0.703	0.443	-0.719	-0.080
2002 SEP	1.186	0.120	-2.597	-0.100
2002 OCT	1.364	0.195	-2.482	0.130
2002 NOV	-5.438	-0.364	10.655	-0.640
2002 DEC	-1.796	0.076	4.200	-0.060
2003 JAN	-3.827	-0.247	5.941	-1.480
2003 FEB	1.516	0.536	-3.381	-0.740
2003 MAR	-0.776	-0.296	-0.263	-0.890
2003 APR	-1.044	-0.318	1.526	-0.090
2003 MAY	3.512	0.127	-7.990	-0.150
2003 JUN	-1.793	-0.411	2.724	-0.290
2003 JUL	0.455	0.565	0.345	0.060
2003 AUG	-1.740	-0.440	2.520	-0.300
2003 SEP	-0.555	0.021	0.172	-0.750
2003 OCT	-3.732	0.025	7.880	-0.480
2003 NOV	0.558	-0.667	-3.315	-0.330
2003 DEC	-3.181	1.114	9.389	-0.300
2004 JAN	-1.132	-0.248	2.794	0.500
2004 FEB	1.080	0.423	-1.689	-0.120
2004 MAR	-0.569	-0.641	-0.441	-0.180
2004 APR	-0.067	0.424	1.033	-0.060
2004 MAY	-0.029	-1.774	-4.108	-0.070
2004 JUN	-1.356	-1.833	-2.551	-0.950
2004 JUL	-2.708	-1.531	2.990	0.190
2004 AUG	-1.765	-1.009	1.487	-0.160
2004 SEP	-7.863	-4.729	6.496	-0.450
2004 OCT	-4.860	-4.338	0.629	-0.370
2004 NOV	-5.298	-3.717	3.302	-0.210
2004 DEC	-8.514	-4.320	8.819	-0.520
2005 JAN	-0.093	-2.699	-5.562	0.270
2005 FEB	0.170	0.817	0.903	-0.380
2005 MAR	2.866	2.192	-2.236	-0.450
2005 APR	12.843	12.806	-1.021	-0.610
2005 MAY	10.088	11.093	1.339	-0.630
2005 JUN	1.509	2.025	0.906	-0.180
2005 JUL	0.662	-0.043	-1.799	-0.120
2005 AUG	1.092	-0.179	-3.359	-0.290
2005 SEP	0.983	1.095	-0.004	-0.170

MOZ – EMP Descriptive Statistics



Series: EMP_USD
Sample 1996M01 2005M11
Observations 117

Mean	-0.069004
Median	0.294741
Maximum	12.84318
Minimum	-19.84583
Std. Dev.	4.313411
Skewness	-1.119534
Kurtosis	8.230905
Jarque-Bera	157.8320
Probability	0.000000

MOZ – EGARCH-M Estimation Results

$$EMP_t = \mu \ln\sigma^2 + \text{Dummies} + \theta_1 \Delta dc_{t-6} + \theta_2 \Delta dc_{t-9} + \theta_3 q_{t-3} + \theta_4 q_{t-8} + \xi_1 EMP_{t-1} + \xi_2 EMP_{t-2} + \xi_3 EMP_{t-4} + \varepsilon_t$$

Parameter	Estimate	Std. Error	t-Statistic	p-value
μ	-0.001111	0.000408	-2.720960	0.0065**
D_AID_CONC	0.095706	0.013277	7.208212	0.0000**
D_8_1997	-0.083265	0.020951	-3.974368	0.0001**
θ_1	0.036008	0.006675	5.394406	0.0000**
θ_2	0.032004	0.005957	5.372645	0.0000**
θ_3	-0.237890	0.072678	-3.273214	0.0011**
θ_4	-0.389466	0.080988	-4.808910	0.0000**
ξ_1	0.171410	0.056766	3.019601	0.0025**
ξ_2	0.271044	0.067864	3.993912	0.0001**
ξ_3	0.247548	0.029615	8.358759	0.0000**

$$\ln \sigma_t^2 = \text{Dummy} + \lambda_0 + \lambda_1 \Delta dc_{t-2} + \lambda_2 \Delta dc_{t-3} + \lambda_3 \Delta dr_{t-1} + \lambda_4 \Delta dr_{t-12} + \lambda_5 trend + \alpha_1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \gamma_1 \frac{\varepsilon_{t-1}}{\sigma_{t-1}}$$

D_8_97	-2.421679	0.425431	-5.692299	0.0000**
λ_0	-7.405693	0.366634	-20.19912	0.0000**
λ_1	-3.307525	0.606509	-5.453378	0.0000**
λ_2	-1.272954	0.468581	-2.716614	0.0066**
λ_3	11.29571	3.171785	3.561309	0.0004**
λ_4	10.39159	1.984151	5.237297	0.0000**
λ_5	0.027186	0.004597	5.914081	0.0000**
α_1	0.230000	0.150110	1.532214	0.1255
γ_1	0.662871	0.122989	5.389698	0.0000**

Diagnostics

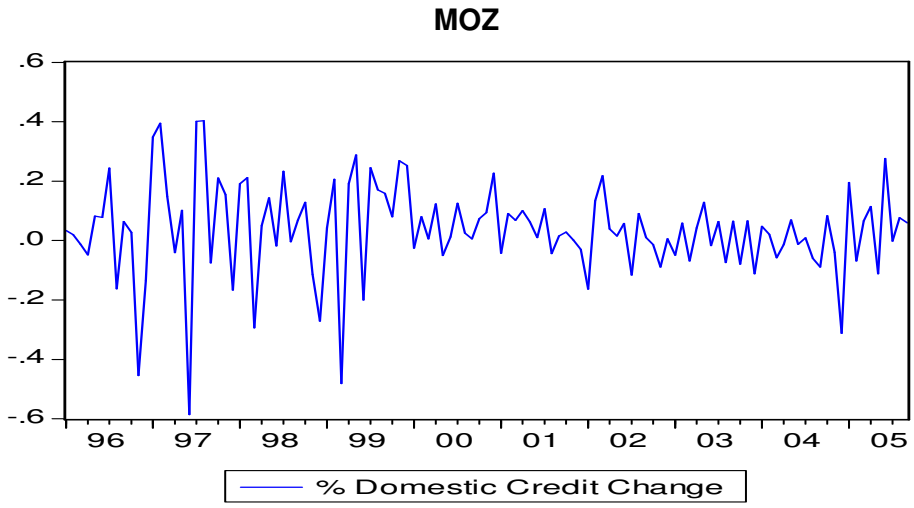
	L-B Standardised Residuals		L-B Squared Residuals		ARCH-LM Statistic	
Lag	**Q**	**p-value**	**Q^2**	**p-value**	**LM**	**p-value**
Lag4	3.0904	0.079	0.7990	0.371	-0.016112	0.8938
Lag5	3.7874	0.151	0.8002	0.670	0.002794	0.9824
Lag6	4.1964	0.241	0.8612	0.835	-0.009189	0.9192
Lag7	4.2347	0.375	1.2024	0.878	0.045356	0.7130
Lag8	4.2788	0.510	1.2220	0.943	-0.067660	0.4516
Lag9	4.6136	0.594	2.4725	0.872	-0.114566	0.2387
Lag10	4.9034	0.672	2.5249	0.925	-0.085440	0.3958
Lag11	4.9066	0.768	2.7913	0.947	0.024275	0.7777
Lag12	5.2214	0.815	3.1857	0.956	-0.090433	0.3921
Lag13	5.2710	0.872	4.3555	0.930	-0.055324	0.6045
Lag14	5.4720	0.906	4.3555	0.958	0.003271	0.9771
Lag15	5.5001	0.939	5.9249	0.920	0.203304	0.1424
	No. of Observations		**Log-Likelihood**		**SIC**	
	117		253.9199		-4.034581	

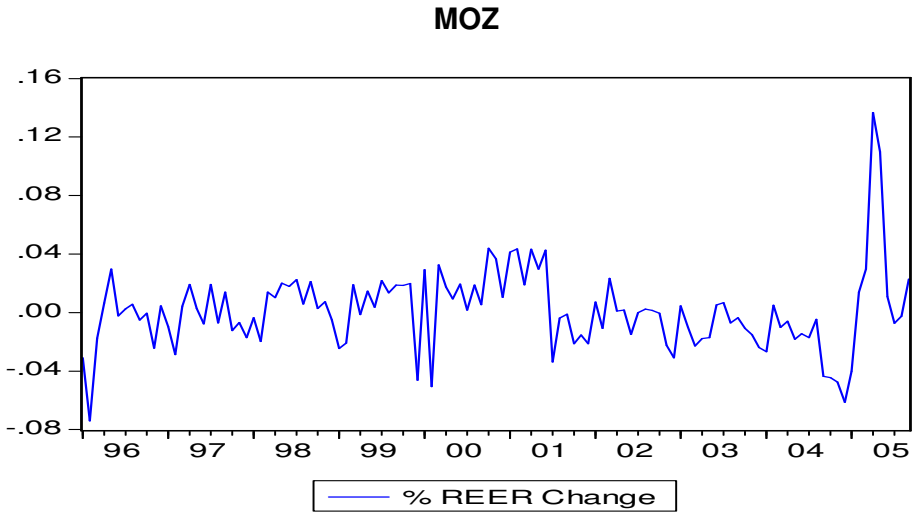
MOZ – Data Description

Variables	
e_t	Bilateral MZM/USD exchange rate. Source: IMF – International Financial Statistics
Δe_t	Depreciation rate of MZM vis-à-vis the USD (log).
Δr_t	Change in MOZ's international reserves (log). Source: IMF – International Financial Statistics.
i_t	MOZ 3-Month Deposit Rate (%). Source: IMF – International Financial Statistics.
i_t^*	USD America's 3-Month CDs (secondary market), an average of dealer bid rates on nationally traded certificates of deposit (%). Source: US Federal Reserve.
$\Delta(i_t - i_t^*)$	Change in interest rate differential (%).
p_t	MOZ Consumer Price Index. Source: IMF – International Financial Statistics.
Δp_t	$\Delta p_t = (p_t - p_{t-1})/p_{t-1}$
p_t^*	USA's Consumer Price Index. Source: Bureau of Labour Statistics - All Urban Consumers - (CPI-U) U.S. city average. All items 1982-84=100.
Δp_t^*	$\Delta p_t^* = (p_t^* - p_{t-1}^*)/p_{t-1}^*$
q_t	Real depreciation rate = $\Delta e - \Delta p_t + \Delta p_t^*$
dc_t	Domestic credit growth rate. Source: IMF – International Financial Statistics.
Δdc_t	$\Delta dc_t = (dc_t - dc_{t-1})/dc_{t-1}$
D_8_97	Dummy variable that takes on value one for all t ≥ 1997:08 and zero otherwise.
D_AID_CONCENT	Dummy variable that takes on value one for all t = 2005:04/5 and zero otherwise.

MOZ – Phillips-Perron Test Statistic

Series	Level	Test Specification	First Difference	Test Specification
p_t	-1.160281	Intercept	-7.134658**	No Intercept or Trend
p_t^*	-0.382614	Intercept & Trend	-4.732785**	No Intercept or Trend
e_t	-1.772598	Intercept & Trend	-4.800054**	No Intercept or Trend
i_t-i_t^*	-2.321646	Intercept & Trend	-10.88693**	No Intercept or Trend
r_t	-2.811424	Intercept & Trend	-11.63864**	No Intercept or Trend
dc_t	-1.951027	Intercept & Trend	-13.10733**	No Intercept or Trend





MOZ – Country Overview [33]

The Republic of Mozambique's monetary authority is the Banco de Moçambique (BM), Bank of Mozambique, and the national currency Metical (MZM) which was introduced in June 1980 and on the 1st of July 2006 the new metical was presented dividing the former metical for 1000, for which the exchange rate of the MTN/USD is of 25.71 on the 10.9.07 according to the available information on the Central Bank. Being one of the poorest countries in the world, the Mozabiquean authorities have been working with the IMF in several ways in order to pursue macroeconomic stability and financial credibility. The programmes the authorities followed with the IMF intend to promote growth, low inflation, accumulation of foreign reserves and make available resources to fight poverty. The country is very dependent on foreign aid which accounted for half of the governments' expenditure in 2003. A long way

[33] Information Source: Press Release No. 07/135 - June 18, 2007; No. 06/289 - December 18, 2006; 05/282 - December 19, 2005; No. 05/149 - June 22, 2005; No. 05/27 - February 11, 2005; No. 04/120 - June 21, 2004; No. 00/73 - December 19, 2000; 97/28- June 24, 1997, 96/33 - June 21, 1996.
Press Information Notice (PIN) No. 98/33 - April 30, 199
News Brief No. 02/48 - June 17, 2002; 01/93 - September 20, 2001
IMF Country Report No. 06/254 - July 2006; No. 03/288 - September 2003
African Economic Outlook AfDB/OECD 2005

was been covered and the World Bank country brief June 2007, identifies MOZ as a strong economic and social performer in Africa.

According to the IMF during the period between 1987 to 1995 in spite of controversies such as the war and natural disasters, a long way has been covered to consolidate the market economy and there was an average annual growth of 6.7%. In 1996 the first 3 year Enhanced Structural Adjustment Facility (ESAF) was approved in recognition of the before mentioned efforts while in 1997, about one year after the beginning of the programme, the IMF stated "commendable achievements" by the country's policy. Moreover, the executive boards of the IMF and the World Bank, after their preliminary discussions, recognized that MOZ qualified for assistance under the Heavily Indebted Poor Countries (HIPC) Debt Initiative in September 1997 (having been approved by April 1998). Performance on the late decade has remained strong and is likely to continue, according to the World Bank Country Brief 2007, the economy grew 8% on an annual average between 1996 and 2006. In 2004, according to the National Institute of Statistics the country had a GDP per capita of 313 USD.

On what exchange rate policy is concerned, according to the Fund, by 1996 liberalization of exchange rates, prices, interest rates and trade policies were close to completion and in 1997, the Bank of Mozambique and the six major commercial banks signed an agreement in order to establish the Maputo Inter-Bank Offered Rate (MAIBOR); having been signed in June it was officially implemented in July of the same year. The floods that affected the country in 2000 and 2001 showed, on a revealed preference basis, that maintaining foreign reserves was a priority to the other channels through which pressure can be relieved, depreciation of the Metical and interest rate differential increase. Additionally, after the massive floods episode, interest rates differential has been reduced consistently to former levels. The IMF Press Release No. 04/120, June 21, stated that the local authorities have been implementing an informal fix peg to the USD since half of 2002. In fact, in late 2004 there was a concentration of donors' payments in the last four months of the year which resulted in an excessive appreciation of the MT versus the USD. The identified crisis in April and May 2005 support the peg thesis as they are a consequent readjustment of the metical versus the USD as documented by the African Development Bank and the Organisation for Economic Cooperation and Development report, Joint Perspective for Africa 2004/2005.

Regarding prices, following on Press Release No. 98/35 August 25, Money and credit (in percent of opening M2) fell by -27.2% in 1996, moved from 33.8% in 1994 to an 2.3% in 1997 and consequently CPI fell from 63.1% in 1994 to 6.4% in 1997. In 1999 inflation remain on 6.2%, Press Release No. 00/73 December 19. The massive floods of 2000 and 2001 unleashed inflationary pressure, mostly in 2001 for which monetary policy tightening was required. In 2002 inflation was considerably lowered from over 20% in 2001 to below 10%. A positive signal of the authorities' achievement was the fact that together with foreign direct investment, economic growth resumed in 2001. Inflation since 2002 has been on average around 10%. The strong economic growth that the country has been experiencing is a source of inflationary pressure but is closely monitored by a prudent monetary policy.

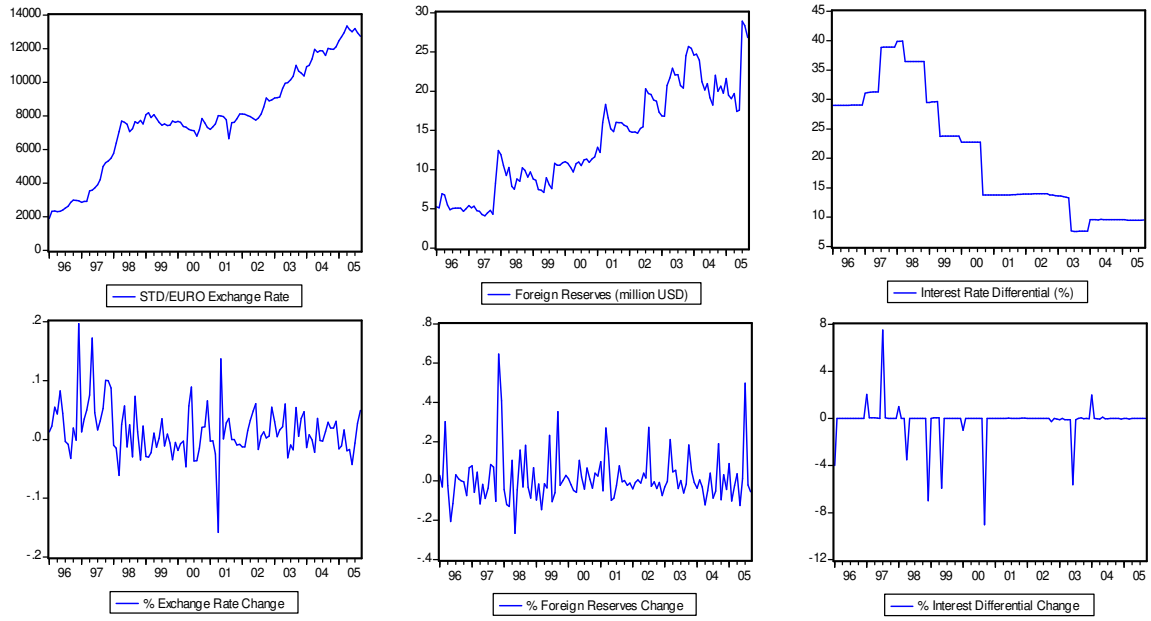
The government has been working closely with the IMF binding their fiscal performance to the programme targets. Using the fiscal data available on the Central Bank of Mozambique's webpage, the fiscal deficit without accounting for donors' funds has been of 18.34% on average between 1998 and 2006. Moreover the average weight of current expenditure over total expenditure is of 50.92% 1998-2006. From 1999 till 2004 this balance had been aggravating and by 2005 total revenue was sufficient to sustain current expenditure with a balance just over 0 having further improved in 2006. Authorities after the monetary policy broader achievements were encouraged to pursue fiscal management and sustainability improvement in order to continue the strong economic performance. Computer software to manage accountability and procedure improvement has been at the heart of the efforts. The

net present value of total public external debt outstanding has been decreasing from 4308.3[34] in 1995 to 691.4 in 1997 and 96.0 in 2002. The fact that the GDP has been growing and exports as well is generous to this indicator although it also shows that debt is progressively loosing weight having into reference the country's income and resources.

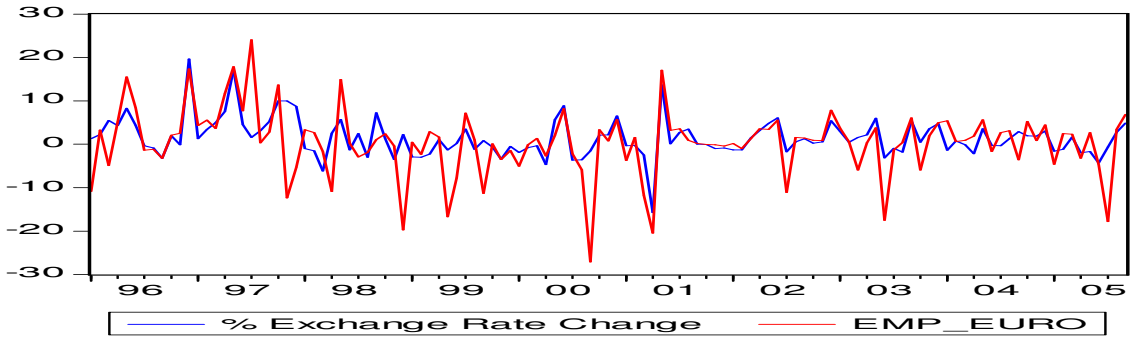
To address the commercial balance we use the data available on the webpage of the Central Bank of Mozambique. The country has been maintaining a situation of trade deficit with a yearly average of 491.37 millions of USD from 1995-2006, although the weight of Exports on Imports has been increasing through time, from an annual average of 31.08% in 1995-2000 to 73.62% 2001-2006. The increase in exports was a result of the known "Mega Projects" such as aluminium and in spite of the underlying import increase (capital goods for instance), since 2001 the "Mega Projects" commercial balance has been consolidating and increasing a surplus. These projects have been boosting exports representing 70.92% of their total in 2006.

34 This refers to publicly guaranteed debt after rescheduling, which is expressed as a percentage of three-year export average.

STP – EMP Constituent Components



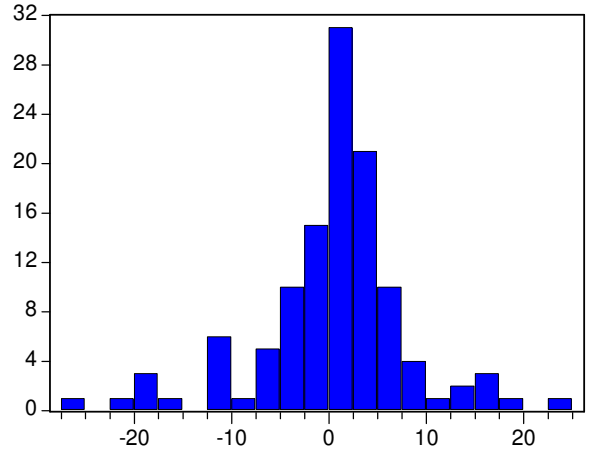
STP – EMP and Changes in Exchange Rate (%)



STP – EMP Estimates & Crises

Date	EMP	Δe	Δr	Δ(i-i*)
1996 JAN	-10.892	1.279	2.687	-3.770
1996 FEB	3.275	2.212	-3.077	0.240
1996 MAR	-4.948	5.486	30.271	-0.140
1996 APR	5.143	4.313	-2.484	-0.070
1996 MAY	**15.480**	**8.260**	**-20.809**	**0.000**
1996 JUN	8.405	4.405	-11.574	-0.100
1996 JUL	-1.402	-0.386	3.021	-0.070
1996 AUG	-1.204	-0.890	0.987	0.130
1996 SEP	-3.198	-3.226	0.000	-0.110
1996 OCT	2.109	1.916	-0.394	0.100
1996 NOV	2.522	-0.125	-7.578	0.030
1996 DEC	**17.315**	**19.632**	**6.786**	**-0.060**
1997 JAN	4.343	1.282	7.652	2.010
1997 FEB	5.574	3.402	-5.878	0.060
1997 MAR	3.635	4.957	4.394	-0.160
1997 APR	11.694	7.543	-11.685	-0.180
1997 MAY	**17.856**	**17.185**	**-1.695**	**0.010**
1997 JUN	7.662	4.518	-8.935	0.040
1997 JUL	**24.063**	**1.582**	**-3.810**	**7.560**
1997 AUG	0.334	3.116	8.377	0.000
1997 SEP	2.806	5.262	7.107	0.000
1997 OCT	**13.686**	**10.024**	**-10.513**	**-0.050**
1997 NOV	-12.364	9.999	64.707	-0.090
1997 DEC	-5.365	8.718	40.748	-0.060
1998 JAN	3.334	-1.040	-4.442	1.260
1998 FEB	2.692	-1.535	-12.147	0.000
1998 MAR	-1.658	-6.166	-12.960	-0.040
1998 APR	-10.901	2.524	10.460	-3.500
1998 MAY	**14.942**	**5.670**	**-26.744**	**-0.010**
1998 JUN	0.272	-1.302	-4.555	-0.010
1998 JUL	-2.928	2.444	15.624	0.010
1998 AUG	-1.902	-2.969	-3.006	0.010
1998 SEP	1.033	7.259	18.095	0.170
1998 OCT	2.408	1.280	-3.184	0.200
1998 NOV	-0.410	-3.506	-8.876	-0.030
1998 DEC	-19.725	2.247	6.730	-6.900
1999 JAN	0.485	-2.944	-9.759	0.250
1999 FEB	-2.362	-3.030	-1.607	-0.010
1999 MAR	2.894	-2.247	-14.551	-0.010
1999 APR	1.642	1.064	-1.348	0.030
1999 MAY	-16.709	-1.339	-3.592	-6.040
1999 JUN	-7.808	0.167	23.238	-0.210
1999 JUL	7.193	3.482	-10.573	-0.110
1999 AUG	0.964	-1.138	-6.001	-0.170
1999 SEP	-11.310	0.867	35.232	-0.090
1999 OCT	0.118	-0.658	-2.245	-0.630
1999 NOV	-3.497	-3.436	0.095	0.130
1999 DEC	-1.472	-0.506	2.796	-0.050
2000 JAN	-5.078	-1.889	1.097	-0.900
2000 FEB	-0.124	-0.790	-1.928	-0.060
2000 MAR	1.387	-0.320	-4.939	-0.130
2000 APR	-2.679	-4.688	-5.813	-0.140
2000 MAY	2.009	5.661	10.567	-0.430
2000 JUN	8.214	8.913	2.022	-0.020
2000 JUL	-2.199	-3.648	-4.276	0.060
2000 AUG	-5.871	-3.615	6.525	0.060
2000 SEP	-27.139	-1.510	0.886	-8.990
2000 OCT	3.355	2.054	-3.682	-0.070
2000 NOV	0.764	2.156	3.947	0.020
2000 DEC	5.742	6.525	2.347	0.200
2001 JAN	-3.739	-0.319	9.812	0.830
2001 FEB	1.531	-0.264	-5.113	0.360
2001 MAR	-11.757	-2.500	26.865	0.370
2001 APR	-20.518	-15.780	13.791	0.360
2001 MAY	**17.056**	**13.656**	**-9.919**	**0.510**
2001 JUN	3.210	0.078	-8.816	0.280
2001 JUL	3.593	2.760	-2.331	0.080
2001 AUG	0.900	3.510	7.714	0.180
2001 SEP	0.183	-0.003	-0.375	0.610
2001 OCT	-0.069	-0.060	0.188	0.560
2001 NOV	-0.125	-0.973	-2.212	0.280
2001 DEC	-0.432	-0.894	-1.092	0.200
2002 JAN	0.131	-1.286	-4.020	0.090
2002 FEB	-0.967	-1.298	-0.878	-0.080
2002 MAR	1.381	1.516	0.474	-0.090
2002 APR	3.606	3.178	-1.155	0.040
2002 MAY	3.450	4.793	3.885	0.050
2002 JUN	5.535	6.054	1.500	0.010
2002 JUL	-11.098	-1.725	27.203	0.020
2002 AUG	1.601	0.559	-2.851	0.060
2002 SEP	1.455	1.234	-0.560	-0.030
2002 OCT	0.897	0.251	-3.902	0.030
2002 NOV	0.852	0.566	-0.745	0.340
2002 DEC	7.879	5.439	-7.547	0.050
2003 JAN	3.715	2.993	-2.984	0.050
2003 FEB	0.568	0.466	-0.297	0.020
2003 MAR	-5.954	1.568	21.032	0.040
2003 APR	0.297	2.160	4.575	-0.010
2003 MAY	3.815	5.987	5.472	0.020
2003 JUN	-17.567	-3.137	-3.871	-5.330
2003 JUL	-1.307	-0.951	0.136	-0.010
2003 AUG	0.371	-1.794	-6.264	-0.030
2003 SEP	6.064	5.380	-1.654	0.000
2003 OCT	-5.917	0.486	18.363	-0.020
2003 NOV	1.964	3.547	4.743	-0.010
2003 DEC	4.961	4.720	-0.860	0.010
2004 JAN	5.451	-1.400	-3.638	2.040
2004 FEB	0.590	0.772	0.609	0.010
2004 MAR	0.926	-0.098	-3.124	0.000
2004 APR	1.844	-2.231	-12.197	-0.030
2004 MAY	5.609	3.572	-5.080	-0.120
2004 JUN	-1.677	-0.230	3.941	-0.260
2004 JUL	2.678	-0.333	-8.875	-0.110
2004 AUG	3.105	1.311	-5.190	-0.110
2004 SEP	-3.603	2.919	18.953	-0.180
2004 OCT	5.213	1.932	-9.576	-0.180
2004 NOV	0.812	1.889	3.198	-0.220
2004 DEC	4.447	3.037	-4.406	-0.190
2005 JAN	-4.637	-1.592	8.811	-0.160
2005 FEB	2.472	-1.140	-10.289	-0.160
2005 MAR	2.264	1.625	-2.338	-0.200
2005 APR	-3.223	-1.963	3.564	-0.120
2005 MAY	2.654	-1.702	-12.523	-0.130
2005 JUN	-4.714	-4.291	1.144	-0.160
2005 JUL	-17.823	-0.667	49.720	-0.190
2005 AUG	3.447	2.734	-2.061	-0.200
2005 SEP	6.835	4.914	-5.477	-0.100

STP – EMP Descriptive Statistics



Series: EMP_EURO
Sample 1996M01 2005M09
Observations 117

Mean	0.431140
Median	0.925789
Maximum	24.06257
Minimum	-27.13908
Std. Dev.	7.649228
Skewness	-0.495508
Kurtosis	5.335611
Jarque-Bera	31.38129
Probability	0.000000

STP – EGARCH-M Estimation Results

$$EMP_t = \mu \ln\sigma^2 + \text{DUMMY} + \theta_1 \Delta dc_{t-8} + \theta_2 \Delta dc_{t-11} + \xi_1 EMP_{t-2} + \varepsilon_t + \xi_2 \varepsilon_{t-2}$$

Parameter	Estimate	Std. Error	t-Statistic	p-value
μ	-0.015778	0.001181	-13.36239	0.0000**
DUMMY (d_12_97)	-0.100697	0.009560	-10.53324	0.0000**
θ_1	0.004815	0.001550	3.107102	0.0019**
θ_2	0.009001	0.001437	6.263291	0.0000**
ξ_1	-0.820385	0.052763	-15.54838	0.0000**
ξ_2	0.857573	0.054739	15.66662	0.0000**

$$\ln\sigma_t^2 = \text{Dummies} + \lambda_0 + \lambda_1 \Delta dc_{t-3} + \lambda_2 \Delta r_{t-6} + \lambda_3 \Delta r_{t-8} + \lambda_4 trend + \alpha_1 \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \alpha_2 \ln\sigma_{t-1}^2$$

D_12_97	-2.859691	0.641670	-4.456639	0.0000**
D_6_01	-3.285768	0.469490	-6.998586	0.0000**
λ_0	-8.379134	0.802998	-10.43482	0.0000**
λ_1	-0.358151	0.052207	-6.860237	0.0000**
λ_2	-1.482998	0.618503	-2.397722	0.0165*
λ_3	2.392812	0.841404	2.843834	0.0045**
λ_4	0.035233	0.009529	3.697295	0.0002**
α_1	0.814423	0.156087	5.217762	0.0000**
α_2	-0.594424	0.062765	-9.470581	0.0000**

Diagnostics

	L-B Standardised Residuals		L-B Squared Residuals		ARCH-LM Statistic	
Lag	**Q**	**p-value**	**Q^2**	**p-value**	**LM**	**p-value**
Lag3	2.0558	0.152	2.9084	0.088	-0.034395	0.7137
Lag4	3.5552	0.169	3.0871	0.214	-0.090009	0.3061
Lag5	3.5827	0.310	3.5895	0.309	0.157226	0.3461
Lag6	4.2890	0.368	5.8949	0.207	-0.041139	0.7874
Lag7	5.7630	0.330	7.1629	0.209	-0.129071	0.0563
Lag8	7.1623	0.306	7.5241	0.275	0.155879	0.1869
Lag9	9.4233	0.224	7.5989	0.369	0.104902	0.3420
Lag10	9.6555	0.290	9.8810	0.273	-0.003631	0.9732
Lag11	11.385	0.250	9.9344	0.356	-0.102794	0.3163
Lag12	11.387	0.328	9.9642	0.444	-0.217494	0.0069
Lag13	11.408	0.410	10.035	0.527	-0.029446	0.7454
Lag14	13.778	0.315	10.172	0.601	-0.081835	0.4781
	No. of Observations		**Log-Likelihood**		**SIC**	
	117		161.6857		-2.464568	

Notes: The parameters are as defined in the main text. A double (single) asterisk indicates that the estimated parameter is significantly different from zero at the 1% (5%) level.

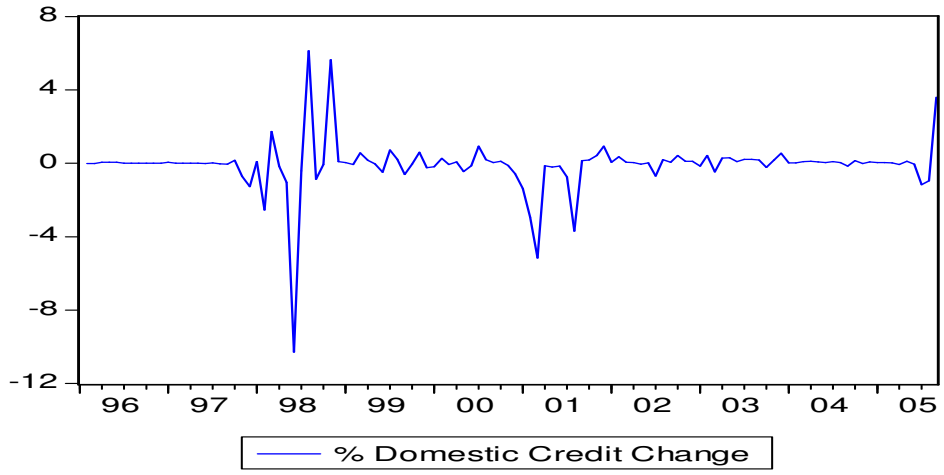
STP – Data Description

Variables	
e_t	Bilateral STD/USD exchange rate. Source: IMF – International Financial Statistics
Δe_t	Depreciation rate of STD vis-à-vis the USD (log).
Δr_t	Change in STP's international reserves (log). Source: IMF – International Financial Statistics.
i_t	STP3-Month Deposit Rate (%). Source: IMF – International Financial Statistics.
i_t^*	USD 3-Month CDs (secondary market), an average of dealer bid rates on nationally traded certificates of deposit (%). Source: Source: US Federal Reserve.
$\Delta(i_t - i_t^*)$	Change in interest rate differential (%).
p_t	STP Consumer Price Index. Source: IMF – International Financial Statistics.
Δp_t	$\Delta p_t = (p_t - p_{t-1})/p_{t-1}$
p_t^*	US Consumer Price Index. Source: Bureau of Labour Statistics - All Urban Consumers - (CPI-U) U.S. city average. All items 1982-84=100.
Δp_t^*	$\Delta p_t^* = (p_t^* - p_{t-1}^*)/p_{t-1}^*$
q_t	Real exchange rate depreciation = $\Delta e - \Delta p_t + \Delta p_t^*$
dc_t	Domestic credit growth rate. Source: IMF – International Financial Statistics.
Δdc_t	$\Delta dc_t = (dc_t - dc_{t-1})/dc_{t-1}$
D_12_97	Dummy variable that takes on value one for all t ≥ 1997:12 and zero otherwise.
D_6_01	Dummy variable that takes on value one for all t ≥ 2001:06 and zero otherwise.

STP – Phillips-Perron Test Statistic

Series	Level	Test Specification	First Difference	Test Specification
e_t	-4.386125**	Intercept	-8.847658**	No Intercept or Trend
i_t-i_t^*	-1.967276	Intercept & Trend	-10.58118**	No Intercept or Trend
r_t	-4.263279**	Intercept & Trend	-11.17796**	No Intercept or Trend
dc_t	-2.548944	Intercept & Trend	-11.66125**	No Intercept or Trend

STP



STP – Country Overview [35]

The responsible authority for the monetary policy is the Banco Central de São Tomé e Príncipe, Central Bank of STP while the national currency is the Dobra (STD) since 1977, being the exchange rate on the 10.9.07 of 18,885.45 STD/EURO according to the available information on the Central Bank. The economy is very dependent on external assistance, tourism and monoculture of cocoa production. The most recent challenges have been oil management, containing inflation and increasing the real GDP while strengthening public management and further pursue of privatizations. Using figures from the Central Bank the country had a GDP of 505.4 USD per capita in 2006.

Under an IMF SMP, the local authorities were commended for their policy performance in order to stabilize the economy in 1998-1999 after a decade of considerable macroeconomical imbalances, IMF Press Release No. 00/33 April 28. Tight monetary and fiscal policies based on a market exchange rate regime delivered a primary fiscal balance surplus of 1.3% of GDP in 1999 from a deficit of 2.2% in 1997 and inflation fell from 81% in 1997 to 13% in 1999. The spread between the official exchange rate and the black market ratio was reduced from 6.5% in 1997 to 1.5% in 1999. A 3 year (2000-02) Poverty Reduction and Growth Facility (PRGF) was approved in April 2000. The programmes STP pursued with the IMF are concerned at delivering an adequate and stabilising exchange rate policy, while building solidly on foreign reserves, prudent monetary policy in order to prevent inflationary pressure and discretionary policy use while making resources available to fight poverty.

On the fourth quarter of 2000 and throughout the first three quarters of 2001, policy implementation went of track as fiscal slippages took place, which resulted into a primary budget deficit of 2.1% of GDP in 2001, compared with a targeted surplus of 2.7% under the program. Although monetary policy remained tight in 2000-01, the budget deficit caused net bank credit to the government to exceed its quantitative performance criteria in December 2000 and June 2001.

The public deficit accentuated in 2003 due to the expansion of spending, situation which is believed to be related with the expectation of signing the first oil exploitation contract which in the end did not take place. The overall fiscal deficit had been aggravating from 2002 till 2004 while in 2005 the situation improved as deficit reduction was met even not accounting for the oil signature bonus. The Executive Board of the IMF approved in August 2005 a three year PRGF mounting up to SDR 2.96 million (40% of the quota) for STP. This programme is to allow financing of the government's programme for 2005-2007. More recently, STP economic growth stood in 2004 around 4% as did in the preceding year. Inflation accentuated throughout the year reaching 15.2% in 2004, 17.4% in 2005, when in the preceding period of 2000-2003, in stood around a yearly average of 9.43%. The opening of 3 new commercial banks in 2004 made credit concession more than double increasing inflationary pressure. The external as the public accounts deteriorated.

In May 2000 STP got a re-scale of the debt burden under the terms of Naples until the verification of the completion point[36] of the HIPC initiative. STP reached the decision point

[35] Information Source: Press Release No. 07/142 - June 25 2007; No. 07/52 - March 16, 2007; No. 07/5 - January 17, 2007; No. 06/44 - March 7, 2006; No. 05/187 - August 5, 2005; No. 00/74 - December 20, 2000; No. 00/33 - November 2006
Public Information Notice (PIN) No. 02/17 - February 28, 2002
News Brief No. 00/119 - December 19, 2000
São Tomé—Letter of Intent, and Technical Memorandum of Understanding - January 9, 2002
Memorandum of Economic and Financial Policies for 2000 - March 24, 2000
IMF Country Report No. 07/102 - March 2007; No. 06/400 - November 2006; No. 06/349 - October 2006, No. 06/329 - September 2006; No. 02/30 – February 2002; No. 00/66 – May 2000

under the enhanced HIPC Initiative in December 2000. The net present value of total external debt in % of government revenue, has been over 6 times the government's revenue, mildly improving from 693.2% in 2002 to 619.7% in 2005, IMF Press Release No. 05/187 August 5.

STP, using information of the Central Bank's webpage, the balance of payments has been aggravating its deficit since 1998 till 2005 and, on average, 75% of the deficit came from the commercial imbalance. The import average coverage from 1999 till 2006 is of 10.94%, which means that only 10.94% of the imports are paid by the exports. The country is also a mono-exporter as cacao represents 69.78% of total exports in weight. However the country has oil reserves that are expected to boost exports. Geographically wise Portugal is the largest import partner with 57.07% in 2005 and 67.15% in the first trimester of 2007; ANG is the second with a 20.11% average from 2005 till the first quarter of 2007. As for exports the Netherlands and Portugal represented 77.15% in 2005 and 60.37% in 2006.

Oil management will be under the responsibility of the Agencia Nacional do Petroleo de São Tomé e Príncipe (ANP-STP), the National Agency for Oil of São Tomé e Príncipe which responds to the government and operates under its guidance. Drilling was announced to start on July 2008 in the joint Economic Exclusive Zone reserves with Nigeria. The "Fundo Permanente do Petróleo", the Permanent Oil Fund will be an important tool for the macroeconomic stability of the country. It will constitute further insurance for a non discretionary use of oil revenue while preventing excess liquidity in the economy. This issue has been on the agenda of the cooperation between the government of STP and the present International Institutions.

[36] Completion point – is the time at which the country has proven adequate use of the debt relief, by achieving pre-settled objectives, and is given the final and definitive debt pardon.