Faculdade de Economia da Universidade Nova de Lisboa

"Comparing Exchange Market Pressure in West and Southern African Countries"

José Mário Lopes

Fábio Santos

Abstract. We compare the performance of Cape Verde and Mozambique concerning financial credibility as measured by Exchange Market Pressure, an institutional feature that has often been overlooked in the literature as a relevant institution for economies. Drawing on previous research by Macedo et al. (2009), we expand their analysis and, using several definitions of "financial credibility", all related to different angles on Exchange Market Pressure indices, we conclude that - against reasonable benchmarks in their respective regions - financial credibility has been very good for Cape Verde and fairly good for Mozambique.

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Corresponding author: José Mário Guerreiro Lopes (jmlopes@fe.unl.pt)

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Comparing Exchange Market Pressure in West and Southern African Countries[1]

José Mário Lopes and Fábio Santos

1. Introduction

This paper is part of a NBER project described in Macedo and Pereira (2009) which assesses the extent to which Cape Verde and Mozambique should be perceived as successful development cases in Africa and the extent to which this is due to a positive interaction between globalization and governance in the orientation and predictability of economic policies. The institutional context is provided by cooperation agreements to which Cape Verde and Mozambique belong, notably in their corresponding sub regions, West and Southern Africa respectively. Specifically, Macedo and Pereira (2009) define policy regimes according to the combination of convergence to the income frontier and export diversification and compare regimes across both sub regions, concluding that ECOWAS countries are becoming more diversified whilst SADC countries are becoming more specialized. Opening up to trade is an important driver of convergence and diversification for ECOWAS. In SADC, the driver of convergence is economic and political freedom. The project also includes comparisons of monetary financial aspects of the two economies. This is a topic which is commonly discarded for developing countries, namely in sub-Saharan Africa, perhaps even more so than the topic of export diversification and sophistication which is the contribution of Cabral and Veiga (2010) to the same project.

It is sometimes argued that African economies are too separated from each other to give the financial channel between those economies any relevance at all. Moreover, the credit system in poor countries tends to be of less importance than in rich countries, which may also hinder the financial links between those economies. Instead we argue that, for some of the African countries, openness is already a relevant feature. Indeed, even in an economy not as open as one in the developed world, there is a positive institutional effect, through which monetary stability brings about credibility, and credibility may bring with it higher investment and growth. Furthermore, the stability of exchange market pressure, EMP, which we may understand as enhanced financial credibility, may have a positive effect on growth for those economies. It is this institutional feature we explain, both in a descriptive way and in an econometric framework. We conclude that Cape Verde has a high degree of financial credibility in all accounts and that Mozambique, although lagging Cape Verde, displays positive features about its financial

credibility. The recent growth experiences of Cape Verde and Mozambique signal that these two countries are indeed cases of success in terms of growth performance.

New estimates of EMP are presented so as to help identify whether and how Cape Verde and Mozambique stand out relative to their partners in ECOWAS and SADC. The numeraire is taken to be the euro for ECOWAS - where a number of currencies have adopted the Franc CFA as described in Macedo (1986) - and the dollar for SADC. This paper uses as motivation and draws on the methodology used by Macedo et al. (2009) for the five Portuguese speaking countries (PALOP). Accordingly, the data for São Tomé e Príncipe, located in central Africa, is found in Country Appendix 16, between ECOWAS and SADC member countries. The paper is organized as follows. Section 2 defines the EMP variable, section 3 discusses the main findings one can infer from the simple descriptive analysis of the two growth experiences and from the inspection of the descriptive statistics for EMP, section 4 presents the model and the estimation techniques and section 5 discusses the results of the model, including the conditional mean and standard deviations derived from the model. Subsections from sections 3 through 5 present evidence first for PALOP, then for ECOWAS (basic data in Country Appendix 1 through 15) and then for SADC (basic data in Country Appendix 17 through 30). Section 6 concludes.

2. Measuring EMP

We can find in the literature two ways of computing Exchange Market Pressure (EMP). Following Girton and Roper (1977), EMP can be computed as a weighted sum of the depreciation rate and of the foreign reserves changes, where these weights are computed from a structural open economy monetary model. Weymark (1998) follows this line of reasoning.

A model-independent way of estimating EMP was designed by Eichengreen et al. (1996), who compute EMP as a weighted sum of the depreciation rate, foreign reserves change and changes in the interest rate differential, ie

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

where the weights for reserves r and for the interest rate differential $\Delta(i_t - i_t^*)$ were computed as follows:

$$\eta_r = -stdev(\Delta e_t) / stdev(\Delta r_t)$$

$$\eta_i = stdev(\Delta e_t) / stdev(\Delta (i_t - i_t^*))$$

These weights are designed to avoid that the most volatile components of EMP dominates the others. Their use has been criticized by Bertoli et al. (2006), who warn us for the

ad hoc nature of this weighting scheme. As a benchmark, we computed a measure of EMP with equal weights and we recognize that this measure changes significantly. The broader definition, including the interest rate differential, is the standard in Eichengreen et al. (1996) as it contains more information. Nevertheless, we also computed the measure of EMP without the presence of the interest rate differential and the results are broadly similar[2].

We associate low EMP with financial credibility: a financially credible economy will have a lower mean EMP with lower volatility and fewer "crises" (defined below as EMP exceeding the mean by more than 1.5 standard deviations). Following previous research by Macedo et al. (2009), our goal is to analyze EMP first in a descriptive sense and then in a model-dependent framework[3]. Data, such as exchange rates, interest rates and foreign reserves (excluding gold) presented in the Country Appendixes was drawn mostly from the IMF's *International Financial Statistics*. Domestic credit and CPI (necessary for the computation of the real exchange rate depreciation) were drawn from IFS and domestic sources (e.g, for Cape Verde, we drew domestic credit from the Central Bank's webpage). Institutional variables were drawn from the World Bank's *Worldwide Governance Indicators*, available on-line.[4]

3. Descriptive analysis

3.1. The broader picture

The growth performance of Cape Verde and Mozambique is described in Macedo and Pereira (2009, Figures 2a and 2b respectively) using the Maddison database on GDP per capita in PPP 1990 GK dollars and comparing it to the average for Sub-Saharan Africa. Indeed, GDP per capita in Cape Verde reached above the ECOWAS average in the early eighties and has widened the gap since. We can also see that, institutionally, Cape Verde is sound when compared to other ECOWAS nations, now using the Worldwide Governance Indicators (for a reference on the WGI, see Kauffman et al (2009)). This is clear from Table 1a. This institutional portrait, however, misses the "financial credibility factor" which we start analyzing in the next section. As for Mozambique, it has had several hard years after independence, when undoubtedly the war has heavily hurt the economy, but has shown evident signs of catching-up. Indeed, after nearly thirty years below average, it surpassed SADC GDP per capita from 2002 onwards. In institutional terms, using the Worldwide Governance Indicators, we see that

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[2] They are available from the authors upon request.
[3] Other useful references are Macedo et al. (2006a; 2006b; 2004 and 2003), the latter with the use of foreign exchange intervention data.
[4] For some of the countries in question, data was not available for the whole sample period. We were forced to use smaller sample periods than the whole decade for Zambia (October 2000 to December 2006), Zimbabwe (January 1996 to December 2002), Madagascar (October 1999 to December 2006), Liberia (February 1997 to May 2006) and Guinea (October 1997 to December 2002) due to data constraints.

Mozambique has a mixed record but behaves well in terms of political stability and voice and accountability compared to SADC countries (Table 1b). Figure 1 shows the tremendous improvements in Mozambique as soon the war is over, compared to SADC and Great Britain. Yet this misses the "financial credibility" factor, which is the focus of this paper.

Before presenting the institutional and financial details deemed most relevant for these two economies, we compare their EMP to benchmarks for ECOWAS and SADC dating back to the late eighties / early nineties. Although our focus for both cases is the period between 1996 and 2006, we will now draw on larger samples, dating back to 1989 and 1993 respectively. Given the lack of data for most of the other countries we also analyzed, we took specific countries in each region as representatives of the currency pegs and the currency floaters. Figures 2 and 3 show that, compared to Benin (a "pegger") and Sierra Leone (a floater), Cape Verde has low EMP mean and volatility. Cape Verde has for a long time displayed sound institutions, reflected in a solid democratic culture and political stability as the Worldwide Governance Indicators tell us, but also good "macroeconomic governance", which can be perceived by its historically low inflation rate by regional standards. Similarly, Mozambique compares well to South Africa, a floater, and Seychelles, a fixer (Figures 4 and 5). Nevertheless, particularly in terms of volatility, the Seychelles present a better behavior overall, which shouldn't be surprising given that Seychelles is pegged to the dollar and also given that the Seychelles display good institutions as reported by the Worldwide Governance Indicators.

Having analyzed the major trends in Cape Verde and Mozambique in the recent years, we present now a brief account of institutional details about the recent economic and financial history of Cape Verde and Mozambique, which will serve as a background for our estimations and results.

In 1976, the Bank of Cape Verde started to operate fully, succeeding to the "Banco Nacional Ultramarino" and the "Banco de Fomento Nacional". A peg with the Portuguese Escudo was in place. However, in 1977, following a devaluation of the Portuguese Escudo, the Cape Verdean Government decided to start pegging to a basket of currencies. During the eighties, several reforms were put in place, namely informatization of the central services, a significant spreading of the banking network throughout the country and the creation of an Investment Department by the Government that managed programs of support to the productive activities. From 1988 on, a vast program of reforms began promoting trade liberalization and privatizations leaving the government's role mainly devoted to the building up of infrastructures. The successive governments in Cape Verde have made it their goal to continue these sets of reforms. Also, an increasing concern with the role of education and good governance indicators have led Cape Verde to several high growth years, much of which

originated in the services sector, namely transports, hotel and restaurants and communications. In fact, by 1980 Cape Verde already depended significantly on the services sector.

It was only in 1990 that a new Law was passed, that reinforced the central banking activity of the Bank, ie the monetary and exchange rate policies and its role as a lender of last resort. Commercial and development activities were still allowed, though, for some time. Until 1993, the conditions were put in place for a complete loss of these roles by the Central Bank, which eventually happened in September 1993. All supervision was also laid in the hands of the Central Bank. Starting April 1st, 1998, the Cape Verde Escudo was fixed to the Euro. Institutionally and regarding the Millennium Development Goals, Cape Verde has also behaved well. To give an example, primary school enrolment is the highest in ECOWAS and child mortality is the lowest.

Mozambique has also a success history, albeit more recent. The Metical was created in June, the 16th, 1980 by Law 2/80 and the colonial administration's banknotes ceased to circulate. The first credit conceded by the International Development Association, though, was only granted in 1985; the second was in 1987 and successive agreements were signed in the following years. Mozambique has benefited widely of the support of the IDA, either financially, or through its technical expertise. The main accomplishments, as reported in IDA (2007), involve the liberalization of trade, financial sector reform (with a separation between the commercial and Central Banking functions of the Central Bank, with the introduction of competition in the commercial banking sector), improvement in health conditions, good investment climate and privatizations in several sectors. In January, 31st, 1987, the Metical stopped being pegged to a basket of six currencies and started being pegged to the dollar. However, in April 1988, authorities reversed to a basket of ten currencies representative of the foreign goods and services transactions of Mozambique.

In the late eighties/early nineties, policymakers started aiming at transforming Mozambique in a market economy. Throughout 1989, several capital account liberalization measures were pursued: agencies of the Bank were allowed to conduct foreign operations (April) and private financial firms were given more freedom to conduct foreign exchange operations (July). On November, 30, finally, the new Constitution declared that Mozambique would aim at being a market economy.

In May 1993, interest rates were semi-liberalized and left to the free market, with the Central Bank determining maximum and minimum bounds. On June, exchange rates from the Secondary and Official Exchange Markets were unified. By 1994, the interest rates were completely liberalized. Through the following years, several liberalizing measures were undertaken and the legal foundations of the exchange market were perfected.

In June 1999, in a move that was very important for Mozambique's development, the external debt is pardoned in the amount of $ 3.7 billion, in an initiative know as HIPC5 (Heavily Indebted Poor Countries Initiative, pushed forward by the IMF). Later, in 2000, a reinforced HIPC was put in place to the favour of Mozambique. In 2003, further measures were taken to ease capital operations by non-residents in the Stock Exchange. In fact, it has to be said that much of the development Mozambique is experiencing today would never have occurred had that debt relief not occurred in the early 2000's (see African Economic Outlook 2008).

In 2005, the Central Bank started intervening in the Interbank Foreign Exchange Market through weekly auctions of foreign exchange. Also in 2005, a Multilateral Debt relief Initiative (MDRI) was launched to help achieve the MDG's. In this respect, Mozambique has shown significant improvements even though it started behind most of the SADC countries[6].

3.2. EMP in PALOP

Following Macedo et al. (2009), we calculate the EMP mean and unconditional volatility per month, as well as the number of crises identified in the sample period, classified as low, moderate or high, depending on whether EMP exceeded the mean EMP by 1.5, 2.5 or 3.5 standard deviations respectively. Table 2 presents EMP mean, unconditional volatility per month and the number of EMP crises in PALOP, 30 low crises and 12 moderate ones are recorded while Angola and Guinea-Bissau record two high crises. Cape Verde fares well in comparison to the other currency peg in the group of Portuguese-speaking countries (Guinea-Bissau). This is noticeable both in terms of the level of the mean EMP and in terms of its volatility. Also, the number of crises may seem high but, actually, Cape Verde displays mostly low crises, whereas Guinea-Bissau has had two severe crises. Also, the behavior of Cape Verde during crises is much better than Guinea-Bissau's. One should however, notice the good evolution in Guinea-Bissau since May 1997, the year in which Guinea-Bissau adopted the currency board.[7] Figures 6 and 7 illustrate the evolution throughout the sample period of the unconditional EMP mean and volatility of the currency pegs.

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[5] The IMF outlines in its website the conditions under which a country is eligible to the HIPC: *"To be considered for HIPC Initiative assistance, a country must: (1) be International Development Association-only and Poverty Reduction and Growth Facility-eligible; (2) face an unsustainable debt burden, beyond traditionally available debt-relief mechanisms; (3) establish a track record of reform and sound policies through IMF- and IDA-supported programs; and (4) have developed a Poverty Reduction Strategy Paper (PRSP) through a broad-based participatory process."*
[6] This section drew on information available in the webpages of the Bank of Mozambique and of the Bank of Cape Verde.
[7] We should notice that our sample is, for most countries, a full year larger in length than in Macedo et al. (2009), which ends in September 2005. Nevertheless, results are broadly in line, namely for the

As for the managed floats (Mozambique, São Tomé and Angola), we can see in Table 2 that Mozambique is the best both in terms of mean EMP and in terms of volatility, definitely outperforming Angola in most of the sample, even though in recent years Angola has shown a significant increase in credibility which we can trace by looking at the tremendous decrease in EMP and in volatility. We can also see from that table that Mozambique did not have severe crises, much to the contrary of Angola. Figures 8 and 9 display the evolution in the managed floats in our sample in terms of unconditional EMP mean and volatility, respectively. We can see how, from a high EMP and volatility Angola has converged to the situation in the other managed floats, where financial credibility seems to have been higher for some time. Nevertheless, the sheer comparison of both indicators in these floating regimes to their value in the currency pegs hints us that, in this sample period, at least for the Portuguese-speaking countries, "pegging" enhances financial credibility.

Inspecting Figures 8 and 9, we can see that Angola's EMP has been the highest but it has been falling across the sample period. We can also see that, among the Managed floats (Mozambique, Angola, São Tomé), Mozambique has displayed the smallest EMP during this period and, among the currency pegs (Cape Verde and Guinea-Bissau), Cape Verde has done so. Apart from Mozambique, one can also see that EMP is greater in Managed floats than in Currency pegs.

As for volatility, comparing among managed floats, we see that, not only has Mozambique shown a smaller EMP, but Mozambique has also a smaller volatility during the sample period, ranking this country as the most "financially sound" of all the managed floats involved here. In the group of the currency pegs, which, as expected, have much smaller volatility than the managed floats, Guinea-Bissau has a slightly smaller volatility than Cape Verde.

3.3. EMP in ECOWAS

The same analysis was, then, conducted for the whole of ECOWAS region. The purpose of this lies in finding out how well does Cape Verde fit in the region and, particularly, in ascertaining how well does Cape Verde compare to other currency pegs in the region, namely the CFA Franc region. Table 3a and b present a full country-by-country comparison of all the descriptive statistics in ECOWAS (Monthly EMP mean, maximum, minimum, median, unconditional volatility (standard deviation) and the number of Low, Moderate and High EMP crises) .The descriptive stats for Cape Verde as compared to the ECOWAS (Pegged and Float currency countries mean) and Nigeria are presented in Table 4. Nigeria was left out because

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descriptive statistics in the overall sample and in the number of crises estimated, but not for the magnitude of Guinea-Bissau's EMP during crises situations.

keeping it would make the average look excessively similar to Nigeria's EMP. EMP in Cape Verde is very much in line with other fixers in the region, as is its volatility. Floaters in ECOWAS (Ghana, Nigeria, Sierra Leone, and Gambia) behave rather poorly when compared to the fixers such as the Franc CFA countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo). As for the severity of crises, Cape Verde has a good behavior overall, with no severe crises and a good performance in crises periods, outperforming even a number of fixers in the region.

The evolution of these EMP and the corresponding standard deviations over time, displayed in Figures 10 and 11, also tells us that Cape Verde is very similar to other fixers in the region and that it is the floaters who have presented a rather dismal performance in the region. This may be a sign for the floaters in the region to integrate further and follow the example of the fixers. Finally, looking at the period since 1989, as done in Figures 2 and 3, in order to have a medium-run overview, we see that Cape Verde has behaved notoriously well in the past two decades, both against a fixer and against a floater from the region.

3.4. EMP in SADC

We turn now to Mozambique and its behavior inside SADC. We use Tables 5 a and b to show the descriptive stats for fixers and floaters, and Table 6 for a summed up view of the region as a comparison benchmark to Mozambique. As shown in table 6, Mozambique's performance, which we have seen to be reasonably good compared to Angola is still good when compared especially to the floaters. Once again, we have to take the large country South Africa from the comparison; otherwise, our weighted average would give us virtually a comparison between Mozambique and South Africa. We also present a pegged currency, Seychelles. There are other pegs (Botswana, Lesotho, Namibia, Swaziland), but since these peg to the South African rand, we think it will be more informative to compare with the Seychelles, that pegs to the dollar.[8] Nevertheless, as said earlier, a full country-by-country comparison of all the descriptive statistics in SADC (Monthly EMP mean, maximum, minimum, median, unconditional volatility (standard deviation) and the number of Low, Moderate and High EMP crises) was performed and is available in Table 5a and b. One can see that Mozambique mingles with the floaters with only slightly higher volatility and actually behaves better in terms of Mean EMP. Seychelles, of course, being pegged to the dollar, has a markedly smaller volatility. Analyzing Table 5b, we can see that Mozambique, although far from being the best of the group of the floaters inside SADC, performs rather well in the group: it has the third lowest mean and the third lowest standard deviation.

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[8] Zimbabwe through some of the sample period also pegs to the dollar, but it is quite different, given that huge devaluations occurred in 1998 and 2000.

We can understand, by inspection of Figures 12 and 13 that Mozambique has performed similarly to other floaters but its volatility has converged to the volatility of Seychelles, a fixer. The fixers, when taken as a whole, behave very similarly to South Africa, given that some of those fixers are either pegged to the South African rand (Lesotho, Namibia) or they're pegged to a basket of currencies where the South African rand has an overwhelming weight.[9] Interestingly enough, looking to a broader sample, from 1994 to 2008, as we do in Figures 4 and 5, we can see that although Mozambique's EMP mean has behaved similarly to the one of South Africa, its volatility has converged more sharply towards the one of Seychelles, from 1999 on. Finally, coming back to Table 5b, we can see that Mozambique has a good performance in terms of the number and severity of crises (few crises, none of which severe), behaving better in this account than several economies in the region, such as Tanzania, Mauritius and Malawi. Actually, when we compare to a fixer such as Seychelles, although the mean EMP is higher, the number of crises is lower than Seychelles', even if crises in Seychelles are smoother.

4. Modeling EMP

4.1. The model

Having a deeper interpretation of the database we built in mind, we modeled EMP using an EGARCH-M model, described in Hamilton (1994). Autoregressive conditional heteroskedasticity (ARCH) models (see Engle (1982)) have been used extensively due to the possibility of modeling the mean and the conditional variance simultaneously through them Bollerslev (1986) extended Engle's analysis by allowing the variance to follow an ARMA process, the variance would depending not both on lags of the squared residuals and on lags of itself. Engle, Lilien and Robins (1987) later included the variance in the process for the mean, thus introducing the ARCH-M or ARCH in mean.

The base model we estimated has the following structure:

$$EMP_t = \mu \ln \sigma_t^2 + \alpha_0 + \lambda_1 \Delta Domcredit_{t-1} + \lambda_2 \Delta \rho_{t-1} + \varepsilon_t$$

$$\ln \sigma_t^2 = \beta_0 + \sum_{j=1}^{p} \ln \sigma_{t-j}^2 + \sum_{i=1}^{q} \left(\alpha_i \left| \frac{\varepsilon_{t-i}}{\sigma_{t-i}} \right| + \gamma_i \frac{\varepsilon_{t-i}}{\sigma_{t-i}} \right) +$$

$$+ \theta_1 \Delta Domcredit_{t-1} + \theta_2 \Delta \rho_{t-1} + \theta_3 \Delta r_{t-1} + \theta_4 \Delta \left(i_{t-1} - i_{t-1}^* \right)$$

$$\varepsilon_t = \sigma_t z_t$$

$$z_t \sim N(0,1)$$

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[9] This is beyond the scope of this paper but it could be taken into account by analyzing explicitly the EMP of these currencies *vis-à-vis* the rand, although for Lesotho and Namibia this would require a redefinition of the index given that the exchange rate is fixed through the whole sample. For Botswana that is not required; computing this, we get for Botswana, a mean EMP of -0.2%, similar to the one we found *vis-à-vis* the dollar and an unconditional standard deviation of 4.9%, lower than the one we found *vis-à-vis* the dollar. Additional information could thus be extracted from a redefinition of the EMP for these countries.

where ρ denotes the real exchange rate, given by $\dfrac{EP*}{P}$, where E stands for the exchange rate, P for the Consumer Price Index(CPI) in home country and P* for the benchmark country's CPI. *Domcredit* gives the domestic credit in each country.

We depart from the basic structure as little as possible, but, whenever hypothesis testing pointed us that way, we added a further lag. Hence, in Tables 7 to 11, λ_{11} stands for the coefficient in the mean of variation of lagged (one month) domestic credit and λ_{12} stands for the coefficient in the mean of variation of lagged (two months) domestic credit. The remaining notation follows the same reasoning.

Occasionally, when needed, we add an MA representation to the mean equation and we sometimes use different distributions for z_t whenever we feel the data require us to do so (namely, if the presence of "fat tails" is so marked in the data that we are too far away from a Normal distribution, as a Jarque-Bera test is able to reveal). All series are stationary, as given by the Phillips-Perron unit root test.

Our interpretation of the parameters is one of efficiency of the markets and perception of credibility of the policymakers in each country.

Moving to the expected signs of the mean equation's coefficients, we expect that a country where arbitrage works will be signaled by a negative variance coefficient (μ) which can be interpreted as a measure for risk-return relationship. This means that wherever EMP volatility is high, there should be a larger return as compensation, which will imply a lower EMP.

For the conditional variance equation's coefficients, the asymmetric shocks coefficient (γ) adds a further degree of sophistication in that, if positive, "bad" shocks (positive error in EMP) would increase volatility more than "good" shocks, due to the risk perception. We consider this indicator, together with the risk-return relationship, as the key elements for credibility. This behavior is expected in countries with more trustful financial systems, as opposed to those that are underdeveloped and less sophisticated. The coefficients for the variation of foreign exchange reserves (θ_3) and for the variation of the interest rate differential (θ_4) should come negative for a credible country: a country accumulating foreign reserves or increasing its interest rate should be able to reduce the volatility.

In both mean and variance equations, the signs of the coefficients on the variation of domestic credit and real depreciation are hard to discern *a priori*, since there are plausible explanations for each possibility, depending on the perception of financial reputation. In the

case of a credible financial system, an increase in domestic credit is not expected to create a bubble. The expansion of credit signals low EMP mean and volatility. In contrast, in non-credible countries, spikes in domestic credit would cause EMP mean or volatility to rise. With respect to real depreciation, a credible country does not face financial pressure since economic agents will not expect an uncontrolled depreciation. Moreover, through improved competitiveness, demand for domestic currency would increase which would alleviate EMP. On the contrary, in a country whose financial structure is non-credible a real depreciation would generate speculation over future depreciation which would increase EMP. In conclusion, for a credible country we expect that coefficients for domestic credit variation and real depreciation are negative in our model, both in mean and variance equations. To facilitate the interpretation of results in Tables 7 through 11, values in green and bold mean that the coefficient is significant and meaningful for establishing the country's credibility. Conversely, values in red and italics/underlined mean that the coefficient is significant but running contrary to what financial credibility would require, ie, it means that the coefficient indicates a feature typical of an economy with a reduced level of financial credibility.

4.2. Estimating countries models

As each and every one of the above mentioned criteria cannot be met by every model for every country, we took a more general approach and globally looked at the results. By doing this, we expected to be able to compare the countries, judging the financial credibility of each, thereby ascribing an institutional meaning to the model itself.

Given that our main purpose was to establish comparisons between countries, the model to be estimated should be fairly similar across countries. Care was taken to estimate the model as parsimoniously as possible instead of defining a lag structure too specific for each country that would depend on the path followed while estimating the model and, given that significant differences would be allowed between countries, would render comparisons across different regressions somewhat debatable. This said, we must acknowledge that it would be impossible to estimate the exact same model for every country, so we kept ourselves some freedom in changing the specification inside some boundaries of reasonability. In this regard, the freedom allowed for the structure of the EGARCH models in Macedo et al. (2009) seems to us to lead to arbitrary results.

This excessive freedom concerns not only the decision to include or exclude such deterministic terms as linear trends, but also the lag structure, which varies widely from country to country. Conversely, distorting the lag structure in order to force significance for all coefficients should not be a concern. As mentioned, we follow an alternative procedure. The basic tenet of the results, that Mozambique outperforms Angola in the major features associated

with financial credibility, is valid here as it was in Macedo et al. (2009), even though the main difference in our results compared to Macedo et al. (2009) resides in the estimation for Angola.

The strategy we adopted to estimate the EGARCH models went as follows. First, we looked at the correlogram of EMP to see if some suggestion of the number of lags could be extracted from there; then, we took care of seasonality in the data (since we had monthly data, this could be an issue, even though it is not likely to find seasonality in EMP, but it can appear in the real depreciation rate or even in the variation of reserves, as it did for a minority of the countries in our sample). Next, we estimated the model through maximum likelihood, using a Normal distribution to start with and, later, a t or GED with the number of degrees of freedom being treated as an estimable parameter whenever necessary (ie, when the Jarque-Bera test concluded for the non-normality of the residuals estimated with the maximization of the Normal Log-Likelihood); to check the quality of the model, the correlogram of the standardized residuals and the correlogram of the squared standardized residuals were analyzed, by means of the Ljung-Box Q test. Whenever the correlogram of the squared residuals displayed spikes, new lags were added to the ARCH and GARCH components of the model, never exceeding the number of three.

To improve the quality of the model, we looked for time dummies suggested by the Inclán-Tiao (1994) test and we added dummies ourselves, whenever a significant event was known to have taken place for that economy at a certain point in time (this information was mostly derived from national sources, namely the Central Banks websites). In certain cases, there were outliers that were frustrating any attempt to estimate a meaningful model; in such cases, those outliers were taken care of using specific dummies; this was done after careful consideration and, to our view, only after exhausting any other way of correctly estimating the model.[10]

The estimation results for PALOP are presented in Table 7 while floaters and fixers are presented separately in Tables 8 through 11 respectively for ECOWAS and SADC (as mentioned, the values in green and bold mean that the coefficient indicates credibility, those in red and italics/underlined mean that the coefficient does not suggest credibility).

Figures 14 through 21 plot EMP mean and volatility for the same groups, conditional on the model, to be discussed next.

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[10] We used EViews 5.1 and we employed the Marquardt nonlinear optimization algorithm (which is a numerical algorithm which may be seen as a combination of steepest descent and the Gauss-Newton method, being closest to steepest descent when far from the correct solution in order to assure convergence). We also had the care of using the robust standard errors (whenever estimating with a Normal distribution) by Bollerslev and Wooldridge (1992), who note that the maximization of a poorly specified likelihood function (such as the Normal distribution with fat-tailed variables) would understate the standard errors while maintaining consistency.

5. Discussion of the results

5.1. EMP in PALOP

We can see, going through the results for our model that, among the Portuguese-speaking countries (Table 7, Figures 14 through 17), Cape Verde is the one nation that displays the best set of results from all five. Guinea-Bissau results denote also a good behavior.

For the risk-return relationship all Portuguese-speaking countries show significant negative coefficients apart from Angola, which shows a significant positive risk-return relationship. This represents the inability of Angola to respond to negative pressures with higher returns in order to compensate risk. This result is not surprising since Angola, as seen previously, faced the most severe crises among these countries which increase the difficulty to control them.

For the impact of domestic credit in EMP variance (θ_1), we can see that Cape Verde shows a strong negative relationship which indicates that this country is able to increase domestic credit while relieving the volatility of monetary pressure, a strong sign of credibility. However, São Tomé and Mozambique appear with a positive relationship that indicates the opposite of Cape Verde. It seems that these countries did not avoid the volatility and uncertainty on EMP with monetary expansions through domestic credit. But if we complement this result with the one obtained for the coefficient of domestic credit variation in the mean equation (λ_1) for Mozambique we might conclude that this volatility is not so harmful given that λ_1 appeared negative, which tells us that Mozambique was able to reduce its EMP when credit was expanded, although they did not behaved so well in controlling the volatility. In Guinea-Bissau, credit expansions were also accompanied by a decrease in EMP.

In respect to real depreciation coefficient λ_2, we conclude EMP mean is negatively affected by a real depreciation in Cape Verde and Guinea-Bissau, a behavior that is a sign of credibility. Mozambique presents again the opposite scenario. A positive (lagged) real depreciation coefficient means that the initial real depreciation is followed by nominal depreciations, which will increase the EMP. This gives us a clue that Mozambique real depreciations are not credible and incite speculation.

The asymmetric leverage effect appeared significant only in Cape Verde and Guinea-Bissau. For the other Portuguese-speaking countries it seems that there isn't difference between positive and negative shocks. For Cape Verde and Guinea-Bissau, the sign for the asymmetric effect appeared positive, which indicates that positive shocks in EMP (ie, negative pressures)

have more impact on volatility when compared to negative shocks with the same magnitude. This behavior is usually connected to mature financial markets.

One interesting fact about the equation for Angola is that the variation in the price of oil eases EMP, natural for an oil-producing country. Angola has also some degree of credibility through reserves[11].

We can conclude that, in PALOP, Cape Verde and Guinea-Bissau show the most significant signs of credibility. Still, Mozambique and (in a less extent) São Tomé show also some positive signs. This cleavage between these countries is not unfamiliar with the fact that Cape Verde and Guinea-Bissau are countries with pegged currency to the Euro, which makes them less vulnerable to speculative attacks contrasting with managed floating countries like the others within this group.

5.2. EMP in ECOWAS

We now look at the results for ECOWAS (Tables 8 and 9, Figures 18 and 19), distinguishing managed floats from fixed exchange regimes. Analyzing the graphs with conditional mean and volatility of ECOWAS groups, we can see that the fixers behave better than the floaters, assuming that low and stable EMP is required for classifying a country as credible. This is not a surprise since the computation of EMP is affected by the variation in the exchange rate, an infrequent observation in countries that peg their currency, like those in ECOWAS that peg their currency to the euro (some of them are in the CFA).

Cape Verde not only has a good position inside Portuguese-speaking countries, but also within ECOWAS. If we compare Cape Verde to other fixers, we see that not only the asymmetric coefficient and risk-return relationship have the right signs of credibility but also other coefficients indicate the expected signs for a credible country while not all other countries do so. For instance, the negative sign of the interest rate differential variation indicates that Cape Verde's policymakers are capable of reducing volatility of EMP when there is an increase of the interest rate differential. This behavior is similar to other peggers such as Benin, Guinea-Bissau, Mali and Guinea. The rest of the group does not present evidence of a positive sign nor negative. All countries present the credible sign for the risk-return relationship, but not all of them show up with a positive asymmetric effect. Together with Cape Verde, a positive sign appears in Benin, Guinea-Bissau, Senegal, Mali. Niger's model provides no evidence for this sign and Côte d'Ivoire, Guinea, Burkina Faso and Togo show up with a negative asymmetric coefficient.

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[11] Other models for Angola, estimated while performing robustness analysis, detected this effect, while ascribing an ambiguous sign to the impact of the real exchange rate over volatility. The main features of the estimation, namely the positiveness of the variance coefficient in the mean equation and the absence of an asymmetric effect always held.

Confirming the analysis of the descriptive statistics, the floaters in ECOWAS show worse results than the fixers. Only Liberia achieves the credible signs for risk-return relationship and asymmetric effect simultaneously. Nigeria achieves the correct sign for risk-return relationship and Ghana has the negative asymmetric coefficient. All other countries fail on both indicators. Moreover, almost all other coefficients associated to each explanatory variable are either insignificant or significant but pointing to no credibility. Fixers, with Cape Verde as benchmark, are clearly more credible than floaters.

5.3. EMP in SADC

In SADC (Tables 10 and 11, Figures 20 and 21)**,** the pattern is harder to discern than in ECOWAS. Nevertheless, nations usually regarded as institutionally sound have good results. The gap between fixers and floaters is not as wide in SADC as in ECOWAS. This occurs since some fixers in SADC are pegged to a basket of currencies that does not include the dollar and the euro, which are used as reference to compute the EMP. Therefore, they behave somehow as floaters, even if it is an indirect effect.

Within those currencies pegged to a basket of currencies, Botswana (and Swaziland to a lesser degree) present the most credible signs for the risk-return relationship and the asymmetric effect (key indicators) and have also the right signs for the effect of interest rate differential in volatility. Namibia and Lesotho present the risk-return relationship that reveals no credibility as well as all other indicators, although Namibia has the correct asymmetric coefficient. The remaining fixers, Seychelles and Zimbabwe, are pegged to the dollar. Zimbabwe's results are worse than Seychelles', which is not surprising since they had strong devaluations in 1998 and 2000. Seychelles presents strong evidence for credibility, since almost all coefficients point in that direction.

In the SADC floaters group, we may conclude that Mauritius and South Africa comprise the most credible results on our key indicators, as well as other coefficients. However, as we discussed in Portuguese-speaking results, Mozambique has also some positive conclusions, as the risk-return relationship or the domestic credit effect on the EMP mean. Other countries present worse results, with only some positive indicators.

In SADC we can conclude that Seychelles has the most credible policies. Nevertheless, there are some floaters with great credibility, such as Mauritius and South Africa and even Mozambique has conquered some.

6. Conclusion and future research

This paper has presented the development experiences of Cape Verde and Mozambique and has made a strong case of the success of their experiences. Either looking at the descriptive

statistics (EMP Mean, EMP Volatility and the Severity of Crises occurring in each case) or at the econometric estimations, the conclusion remains that Cape Verde has had a remarkable degree of credibility and sophistication of its exchange markets, undoubtedly due to the quality of the institutional framework. This is not only true in the "WGI-sense" but also in a financial, "expectational" way. Due to its natural focus on political freedom and accountability, WGI probably overlooks the effect of such expectations. Mozambique, too, despite lagging behind Cape Verde, has also some good results, very much in line with other floaters in the region, and better in some accounts (namely, the absence of any severe crises, a conditional volatility close to a fixer's and a risk-return effect pointing the right way unlike many other countries in the region). Much remains to be done, especially in Mozambique, where the credibility of policymakers is not as solid as in Cape Verde. Nevertheless, we believe to have uncovered leads that Mozambique is heading the right way.

Also, for the rest of ECOWAS and SADC, other findings were uncovered. Generally speaking, SADC has higher EMP than ECOWAS. Also, and quite understandably, fixers have, generally, a better performance in terms of credibility than floaters. However, in SADC, those fixers pegged to the South African rand behave in a more erratic way, following the rand.

In the future, we believe that a relevant research agenda can be drawn from this paper. Moving forward in both the descriptive and econometric parts, expanding the scope of econometric modeling from a single equation analysis to a multivariate one in order to establish the existence of connections between the degree of credibility in different countries, and upgrading the models to incorporate endogenous-switching whenever possible would deepen our understanding of financial credibility in these sub regions of Sub-Saharan Africa.

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Country Appendix 14: Sierra Leone

Country Appendix 15: Togo

Country Appendix 16: São Tome and Principe

Country Appendix 17: Angola

Country Appendix 18: Botswana

Country Appendix 19: Lesotho

Country Appendix 20: Madagascar

Country Appendix 21: Malawi

Country Appendix 22: Mauritius

Country Appendix 23: Mozambique

Country Appendix 24: Namibia

Country Appendix 25: Seychelles

Country Appendix 26: South Africa

Country Appendix 27: Swaziland

Country Appendix 28: Tanzania

Country Appendix 29: Zambia

Country Appendix 30: Zimbabwe

Tables

Table 1 a: Institutional characterization of Cape Verde versus ECOWAS, according to the Worldwide Governance Indicators

Cape Verde versus ECOWAS 1996-2007		
	Cape Verde	**ECOWAS**
Rule of Law	_0.48_	-0.75
Voice and Accountability	_0.65_	-0.51
Political Stability & Absence of Violence/Terrorism	_0.96_	-0.49
Government Effectiveness	_0.11_	-0.77
Regulatory Quality	_-0.25_	-0.65
Control of Corruption	_0.33_	-0.67
Source: Macedo and Pereira (2009, Table 5.4, based on WGI)		

Table 1 b: Institutional characterization of Mozambique versus SADC, according to the Worldwide Governance Indicators

Mozambique versus SADC 1996-2007		
	Mozambique	**SADC**
Rule of Law	-0.74	_-0.44_
Voice and Accountability	_-0.08_	-0.30
Political Stability & Absence of Violence/Terrorism	_0.05_	-0.24
Government Effectiveness	_-0.33_	-0.38
Regulatory Quality	-0.47	_-0.45_
Control of Corruption	-0.65	_-0.39_
Source: same as table 1a		

Table 2: EMP mean, unconditional volatility per month and the number of EMP crises - Portuguese-speaking countries

Descriptive Statistics(% per month)					
Country	**Angola**	**Cape Verde**	**Guinea-Bissau**	**Mozambique**	**São Tomé**
Std. Deviaton	31.43%	1.65%	4.33%	4.85%	7.36%
Max	158.33%	5.55%	23.90%	13.15%	23.64%
Mín	-211.29%	-7.39%	-15.08%	-23.86%	-27.21%
Mean	4.17%	-0.09%	-0.01%	-0.18%	0.46%
Median	2.39%	-0.04%	0.32%	0.27%	0.74%
EMP Crises Statistics					
Low					
EMP Mean	97.14%	3.65%	12.82%	11.64%	15.86%
EMP SD	42.90%	0.93%	7.02%	1.65%	3.81%
Crises	5	8	6	4	7
Moderate					
EMP Mean	122.55%	4.55%	18.32%	13.05%	23.64%
EMP SD	35.46%	0.87%	5.68%	0.14%	.
Crises	3	3	3	2	1
High					
EMP Mean	140.12%	.	21.21%	.	.
EMP SD	25.76%	.	3.81%	.	.
Crises	2	0	2	0	0

Table 3 a: Description of ECOWAS Fixed

Descriptive Statistics(% per month)

Country	Benin	Burkina Faso	Cape Verde	Côte d'Ivoire	Guinea	Guinea-Bissau	Niger	Mali	Senegal	Togo
Std. Deviaton	1.85%	1.85%	1.65%	1.77%	7.77%	4.33%	1.76%	1.84%	1.79%	1.78%
Max	5.05%	4.74%	5.55%	5.06%	22.69%	23.90%	4.70%	4.26%	4.65%	4.66%
Mín	-7.58%	-7.78%	-7.39%	-5.78%	-34.39%	-15.08%	-6.96%	-6.04%	-6.33%	-6.43%
Mean	-0.20%	-0.11%	-0.09%	-0.14%	-0.12%	-0.01%	-0.10%	-0.21%	-0.24%	-0.12%
Median	-0.06%	0.00%	-0.04%	-0.04%	0.52%	0.32%	0.09%	-0.13%	-0.29%	-0.04%

EMP Crises Statistics

Low

	Benin	Burkina Faso	Cape Verde	Côte d'Ivoire	Guinea	Guinea-Bissau	Niger	Mali	Senegal	Togo
EMP Mean	3.62%	3.50%	3.65%	3.68%	22.69%	12.82%	3.31%	3.58%	3.37%	3.88%
EMP SD	0.87%	0.60%	0.93%	0.75%	.	7.02%	0.68%	0.57%	0.79%	0.89%
Crises	7	8	8	9	1	6	7	9	8	7

Moderate

	Benin	Burkina Faso	Cape Verde	Côte d'Ivoire	Guinea	Guinea-Bissau	Niger	Mali	Senegal	Togo
EMP Mean	4.77%	4.74%	4.55%	22.69%	.	18.32%	4.70%	.	4.59%	4.55%
EMP SD	0.40%	.	0.87%	.	.	5.68%	.	.	0.08%	0.12%
Crises	2	1	3	1	0	3	1	0	2	3

High

	Benin	Burkina Faso	Cape Verde	Côte d'Ivoire	Guinea	Guinea-Bissau	Niger	Mali	Senegal	Togo
EMP Mean	.	.	.	.	.	21.21%	.	.	.	.
EMP SD	.	.	.	.	.	3.81%	.	.	.	.
Crises	0	0	0	0	0	2	0	0	0	0

Table 3 b: Description of ECOWAS Float

Descriptive Statistics(% per month)

Country	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
Std. Deviaton	7.19%	5.56%	11.63%	23.25%	8.61%
Max	29.91%	27.95%	35.56%	138.91%	25.15%
Mín	-22.65%	-11.63%	-33.05%	-56.59%	-26.95%
Mean	0.87%	0.80%	-0.57%	-2.55%	0.64%
Median	0.05%	0.84%	0.25%	-4.30%	1.42%

EMP Crises Statistics

Low

	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
EMP Mean	17.02%	12.71%	22.64%	55.55%	18.92%
EMP SD	5.98%	6.40%	6.11%	39.51%	3.18%
Crises	8	8	8	7	6

Moderate

	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
EMP Mean	22.72%	27.95%	35.56%	106.32%	25.15%
EMP SD	6.23%	.	.	46.08%	.
Crises	3	1	1	2	1

High

	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
EMP Mean	29.91%	27.95%	.	138.91%	.
EMP SD	.	.	.	.	.
Crises	1	1	0	1	0

Table 4: Description of Cape Verde, Nigeria, ECOWAS Floating currency countries (without Nigeria) and ECOWAS Pegged currency countries

	Cape Verde	ECOWAS Floating Currency Countries (Without Nigeria)	Nigeria	Pegged Currency Countries
Mean	-0.09%	0.81%	-2.55%	-0.16%
Std. Deviation	1.65%	5.07%	23.25%	1.58%
Máx	5.55%	24.74%	138.91%	4.46%
Mín	-7.39%	-10.76%	-56.59%	-6.33%
Median	-0.04%	0.73%	-4.30%	-0.07%

EMP Crises Statistics

Low

	Cape Verde	Floating (Without Nigeria)	Nigeria	Pegged
EMP Mean	3.65%	11.75%	55.55%	3.19%
EMP SD	0.93%	5.54%	39.51%	0.76%
Crises	8	8	7	9

Moderate

	Cape Verde	Floating (Without Nigeria)	Nigeria	Pegged
EMP Mean	4.55%	19.30%	106.32%	4.17%
EMP SD	0.87%	7.70%	46.08%	0.41%
Crises	3	2	2	2

High

	Cape Verde	Floating (Without Nigeria)	Nigeria	Pegged
EMP Mean	.	24.74%	138.91%	.
EMP SD	.	.	.	.
Crises	0	1	1	0

Table 5 a: Description of SADC Fixed

Descriptive Statistics (% per month)

Country	Botswana	Lesotho	Namibia	Seychelles	Swaziland	Zimbabwe
Std. Deviaton	6.23%	7.67%	7.82%	2.61%	8.36%	11.43%
Max	17.81%	19.09%	30.69%	7.26%	35.21%	43.07%
Mín	-14.76%	-21.13%	-20.80%	-10.72%	-17.56%	-35.15%
Mean	-0.06%	-0.02%	-0.06%	-0.14%	0.22%	2.79%
Median	-0.43%	-0.11%	-0.29%	-0.32%	0.43%	1.68%

EMP Crises Statistics

	Botswana	Lesotho	Namibia	Seychelles	Swaziland	Zimbabwe
Low						
EMP Mean	13.52%	15.32%	17.19%	5.30%	18.39%	30.36%
EMP SD	3.72%	2.44%	5.91%	1.04%	6.53%	9.3%
Crises	8	12	9	10	9	5
Moderate						
EMP Mean	17.54%	.	26.21%	7.04%	35.21%	39.41%
EMP SD	0.25%	.	6.35%	0.31%	.	5.18%
Crises	3	0	2	2	1	2
High						
EMP Mean	.	.	30.69%	.	35.21%	43.07%
EMP SD	.	.	.	.	.	.
Crises	0	0	1	0	1	1

Table 5 b: Description of SADC Float

Descriptive Statistics(% per month)

Country	Angola	Madagascar	Malawi	Mauritius	Mozambique	South Africa	Tanzania	Zambia
Std. Deviaton	31.43%	6.51%	9.14%	3.91%	4.85%	9.24%	2.89%	8.74%
Max	158.33%	19.76%	38.59%	14.42%	13.15%	41.07%	12.95%	21.21%
Mín	-211.29%	-18.63%	-35.27%	-14.77%	-23.86%	-25.31%	-11.88%	-30.47%
Mean	4.17%	0.27%	1.19%	0.33%	-0.18%	-0.45%	0.12%	-0.65%
Median	2.39%	0.11%	1.49%	0.20%	0.27%	-1.14%	-0.01%	0.17%
EMP Crises Statistics								
Low								
EMP Mean	97.14%	15.25%	22.25%	10.12%	11.64%	29.17%	6.72%	18.19%
EMP SD	42.90%	3.11%	7.87%	3.21%	1.65%	10.45%	2.56%	2.61%
Crises	5	5	7	7	4	5	8	3
Moderate								
EMP Mean	122.55%	18.22%	38.59%	12.56%	13.05%	36.42%	12.95%	21.21%
EMP SD	35.46%	2.19%	.	1.42%	0.14%	4.49%	.	.
Crises	3	2	1	4	2	3	1	1
High								
EMP Mean	140.12%	.	38.59%	14.42%	.	36.42%	12.95%	.
EMP SD	25.76%	.	.	.	.	4.49%	.	.
Crises	2	0	1	1	0	0	1	0

Table 6: Description of Mozambique, South Africa, Seychelles and SADC Floating currency countries (without South Africa)

	Mozambique	SADC Floating Currency Countries (Without South Africa)	South Africa	Seychelles - Pegged Currency Country
Mean	-0.18%	0.60%	-0.45%	-0.14%
Std. Deviation	4.85%	4.27%	9.24%	2.61%
Máx	13.15%	14.37%	41.07%	7.26%
Mín	-23.86%	-26.34%	-25.31%	-10.72%
Median	0.27%	0.42%	-1.14%	-0.32%

		EMP Crises Statistics		
		Low		
EMP Mean	11.64%	9.98%	29.17%	5.30%
EMP SD	1.65%	2.75%	10.45%	1.04%
Crises	4	7	5	10
		Moderate		
EMP Mean	13.05%	13.65%	36.42%	7.04%
EMP SD	0.14%	1.03%	4.49%	0.31%
Crises	2	2	3	2
		High		
EMP Mean	.	.	36.42%	.
EMP SD	.	.	4.49%	.
Crises	0	0	3	0

Table 7: Portuguese-speaking countries table with the results of the Econometric Model

	Angola	Cape Verde	Guiné-Bissau	Mozambique	São Tomé
μ	*0.0550* **	**-0.0009** **	**-0.0040** **	**-0.0034** **	**-0.0607** **
λ_{11}	0.0037	0.0034	**-0.0158** **	**-0.0126** *	0.0258
λ_{21}	0.1703	**-0.1664** **	**-0.0697** *	*0.7048* **	
Dummy 1	-0.0060	-0.0058 *	-0.0253 **	0.0014	-0.0599 **
Dummy 2			0.0018		-0.0832 **
Dummy 3			0.0148 *		
varoil	-0.3135 **				
γ	0.0941	**0.7830** **	**1.4495** **	0.2048	-0.0533
θ_{11}	**-0.0621** **	**-38.1824** **	1.4939	*1.5348* **	*0.3569* **
θ_{21}	-0.5520	4.4542	**-14.9006** **	**-9.3070** **	
θ_{31}	**-0.9679** *	-1.1800	*2.1610* **	3.6666	**-0.7767** *
θ_{41}	0.0069	**-7.5390** **	**-48.6304** **	*0.1895* **	*0.9616* **
Dummy 1	-0.0057	-1.8273 **	-0.3880	0.3010	-2.4759 **
Dummy 2			0.1202		0.3873
Dummy 3			1.2355 **		
varoil	-0.9631				
Loglikelihood	61.9993	386.3900	279.4219	260.4622	179.1957
ARCH effects (F- 1 lag)	0.2536	0.8406	0.8341	0.6555	0.6711
Distribution	t-distribution	t-distribution	t-distribution	Normal	Normal
Dummies: Dummy 1	May05 on (liberalization)		May 97	96to98; 05and06	December 97
Dummy 2			2000 to 2003		June 2001
Dummy 3			OctAgo96, Oct00, Dec03		

* denotes significance at the 10% level; ** denotes significance at the 5% level.
values in green and bold mean that the coefficient indicates credibility
values in red, italics and underlined mean that the coefficient indicates no credibility

Table 8: ECOWAS Floating currency countries table with the results of the Econometric Model

	Gambia	Ghana	Liberia	Nigeria	Sierra Leone
μ	*0.0041* **	*0.0439* **	**-0.0396** **	**-0.0762** **	*0.0330* **
λ_{11}		-0.1312		*0.1945* **	
λ_{12}					
λ_{21}	*0.3943* **	0.1071		**-0.0515** **	
λ_{22}	-0.0059				
Dummy 1	0.0004		0.0636 **	0.0897 **	-0.0656 **
Dummy 2	-0.0093 **		3.8215 **	1.2216 **	
AR(1)			-0.2420 **		
γ	-0.0017	**0.2805** **	**0.8074** **	0.1527	0.1594
θ_{11}		1.4768		*3.3505* **	
θ_{12}					
θ_{21}		1.0617		1.8107	
θ_{22}					
θ_{31}	-2.0145	*1.8684* **	*1.8549* **	*3.1888* **	-0.4521
θ_{32}	-3.8048		-0.3999		
θ_{41}	0.0847	-0.0319	-0.4090	-0.0739	*0.3519* **
θ_{42}	0.0531		0.3046		
Dummy 1	1.0135 **		0.2142	0.1390	0.9066 **
Dummy 2	0.3761 **		-3.1690 **	-3.5261	
Loglikelihood	188.3794	205.2405	-23.7940	52.2117	151.7575
ARCH effects (F test- 1 lag)	0.6302	0.8367 **	0.2030	0.1565	0.8155
Distribution	Normal	Normal	Normal	Normal	Normal
Dummies	Jan04 on		War 99-03	2001 on	War (up to May 02)
	Jan99-Dez03		January 98	Jan-99	

* denotes significance at the 10% level; ** denotes significance at the 5% level.
values in green and bold mean that the coefficient indicates credibility
values in red, italics and underlined mean that the coefficient indicates no credibility

Table 9: ECOWAS Fixed currency countries table with the results of the Econometric Model

	Benin	Burkina Faso	Cape Verde	Côte d'Ivoire	Guinea	Guinea-Bissau	Mali	Níger	Senegal	Togo
μ	**-0.0475** **	**-0.0007** **	**-0.0009** **	**-0.00215** **	**-0.0082** **	**-0.004** **	**-0.1957** **	**-0.002785** **	**-0.005529** **	**-0.001** **
λ_{11}			0.0034			**-0.0158** *				
λ_{12}										
λ_{21}	*1.2175* **	**-0.0525** **	**-0.1664** **	-0.27075		**-0.0697** *	6.89313	*0.105318* **	-0.299652	-0.0415
λ_{22}		*0.1108* **						*0.366375* **	-0.337672	
Dummy 1		-0.0678	-0.0058 *	0.006235 **	-0.3329 **	-0.0253 **		-0.061456 **	-0.023168 **	0.0031 **
Dummy 2		-0.0832		-0.04277 **		0.0018		-0.015161 **	-0.053739 **	-0.0623 **
Dummy 3						0.0148 *			-0.00404	
γ	**0.2** **	*-0.4528* **	**0.783** **	*-0.86022* **	*-0.6989* **	**1.4495** **	**0.0599** **	-0.060582	**0.364938** *	*-0.3292* **
θ_{11}			**-38.1824** **			1.4939				
θ_{12}										
θ_{21}	*27.9139* **	-5.7537	4.4542	-23.3573		**-14.9006** **	*34.5568* **	*32.08057* **	10.69427	**-1.5759** **
θ_{22}	- -	**-24.1059** **						9.747359	-36.46947	
θ_{31}	*0.626* **	**-9.352** **	-1.18	**-4.58738** **	**-8.4016** **	*2.161* **	*0.50117* **	**-0.547593** **	-4.685375	*35.2173* **
θ_{32}		**-2.7954** **						*1.218201* **	-3.45251	
θ_{41}	**-3.8093** **	-3.8173	**-7.539** **	9.368822	**-0.1896** **	**-48.6304** **	**-1.25017** **	0.303105	2.055358	-0.8836
θ_{42}		-2.5543						**-7.629225** **	-2.218094	
Dummy 1		-4.8638 **	-1.8273 **	1.034221 **	-0.642	-0.388		-1.406229 *	-2.172968 **	-0.8273 **
Dummy 2		-3.7776 **		-1.28689		0.1202		-1.057447 **	0.084066	1.4626 *
Dummy 3						1.2355 **			0.603512	
Loglikelihood	335.925	363.935	386.39	364.9803	103.427	279.422	339.272	398.223	359.3746	361.998
ARCH effects (F test- 1 lag)	0.1558 **	0.1907	0.8406	0.634044	0.4574	0.8341	0.80013	0.690265	0.890765	0.9329
Distribution	Normal	Normal	t	t	Normal	t	Normal	Normal	GED	Normal
Dummies		Oct02	January 99		Nov97, Apr98	May 97		Aug97, Apr98, Oct00, Oct02, Dec03	Aug97, Apr98, Oct00, Oct02, Dec03	Jul01-Set02
		Dez-03				2000-03		99 on	Jul96, Ago97, Ago98, Oct02	96 (jan,feb) and Oct 02
						OutAgo96, Oct00, Dec03			2002 on	

* denotes significance at the 10% level; ** denotes significance at the 5% level. values in green and bold mean that the coefficient indicates credibility. Values in red, italics and underlined mean that the coefficient indicates no credibility

Table 10: SADC Floating currency countries table with the results of the Econometric Model

	Angola	Madagascar	Malawi	Mauritius	Mozambique	South Africa	Tanzania	Zambia
μ	*0.055* **	**-0.017 **	**-0.0005 **	**-0.0185 **	**-0.0034 **	**-0.0762 **	*0.0077* **	*0.0267* **
λ₁₁	0.0037			*0.4388* **	**-0.0126 ***	0.1684	*0.0843* **	-0.0823
λ₁₂	0.1703							
λ₂₁		*0.4* **	*0.3307* **	-0.0586	*0.7048* **	*0.5033* **	-0.03	0.064
λ₂₂								
Dummy 1	-0.006		0.0316 **	-0.0006	0.0014	0.2459 **	0.03	
Dummy2							-0.0587 **	
varoil	-0.3135 **							
γ	0.0941	-0.1343	*-1.5061* **	**0.5996 **	0.2048	**0.521 **	**0.3789 **	-0.7896
θ₁₁	**-0.0621 **			*23.5129* **	*1.5348* **	5.9906	**-7.8031 **	5.538
θ₁₂								
θ₂₁	-0.552	*9.5422* **	**-9.5753 **	-17.8716	**-9.307 **	**-4.1793 **	**-21.3745 **	9.9867
θ₂₂								
θ₃₁	**-0.9679 ***	**-9.8338 **	**-3.9787 **	19.3079 **	3.6666	*2.8716* **	1.6613	-1.5247
θ₃₂								
θ₄₁	0.0069	*0.4415* **	*0.3875* **	-0.3915	*0.1895* **	**-0.6138 **	-0.1085	*1.1971* **
θ₄₂								
Dummy 1	-0.0057		-0.8586	0.6398	0.301	3.3442 **	0.9819	
Dummy 2							-8.8016 **	
varoil	-0.9631							
Loglikelihood	61.9993	140.212	172.5847	270.525	260.462	171.75	322.94	100.03
ARCH effects (F test - one lag)	0.2536	0.2336	0.842	0.836	0.6555	0.6499	0.8115	0.5417
Distribution	t-distribution	Normal	t-distribution	GED	Normal	Normal	Normal	GED
Dummies	May05 on (liberalization)		1998 on	Jan97, Nov 98, Jun00-Dez00	96to98; 05and06	Apr 1996, 1998 Jun and Aug-Oct)	July97	

* denotes significance at the 10% level; ** denotes significance at the 5% level.
values in green and bold mean that the coefficient indicates credibility
values in red, italics and underlined mean that the coefficient indicates no credibility

Table 11: SADC Fixed currency countries table with the results of the Econometric Model

	Botswana	Lesotho	Namibia	Seychelles	Swaziland	Zimbabwe
μ	**-0.0748** **	*0.0375* **	*0.1262* **	**-0.0027** **	**-0.3291** *	*0.014466* **
λ_{11}	0.0175	**-0.0047** **	**-1.8548** **	0.0601	0.3352	
λ_{12}	0.0328					
λ_{21}	0.6878			*0.4284* **	-0.1248	
λ_{22}	1.1808					
Dummy 1	0.0254 **			-0.0073 **		-0.209508
Dummy 2						0.153296
Dummy 3						0.122121
γ	**0.2582** **	0.0299	**0.1276** **	**0.863** **	**0.0735** **	**0.289713** **
θ_{11}	0.0777	*0.1521* **	*20.4684* **	**-2.5687** **	*1.1998* **	
θ_{12}	*0.4996* **					
θ_{21}	3.4987			**-20.3369** **	-1.5302	
θ_{22}	*11.559* **					
θ_{31}	0.7644	-0.7605	*1.9436* **	*2.1137* **	-0.3868	0.001072
θ_{32}	-2.3586					
θ_{41}	**-1.2752** **	-0.0801	*0.4405* **	**-0.7534** **	**-0.1474** **	-0.013408
θ_{42}	-0.0554					
Dummy 1	0.2459			-0.3112 *		-3.534798
Dummy 2						-0.294489
Dummy 3						-3.095638
Loglikelihood	215.12	156.641	170.552	303.012	156.6894	97.83333
ARCH effects (F test - one lag)	0.9141	0.9785	0.9535	0.1046	0.8336	0.733719
Distribution	Normal	Normal	Normal	Normal	Normal (q-max)	Normal
Dummy 1	Feb 99			2004 (autonomy)		2001
Dummy 2						devaluation in 1998
Dummy 3						devaluation in 2000

* denotes significance at the 10% level; ** denotes significance at the 5% level

values in green and bold mean that the coefficient indicates credibility

values in red, italics and underlined mean that the coefficient indicates no credibility

Figure 1: Political Stability and Absence of Violence/Terrorism in Mozambique versus SADC and Great Britain, according to WGI
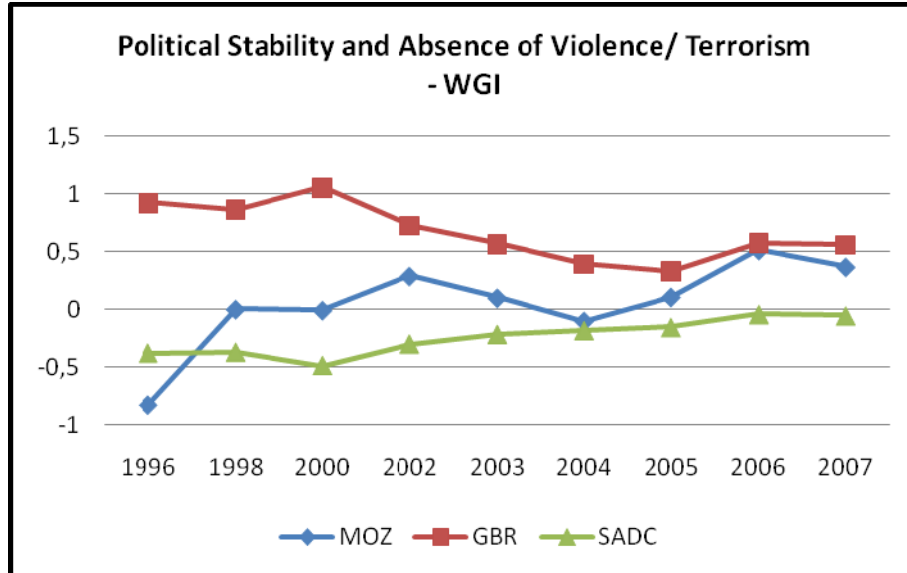
Figure 2: EMP mean in large samples Cape Verde, Benin and Sierra Leone
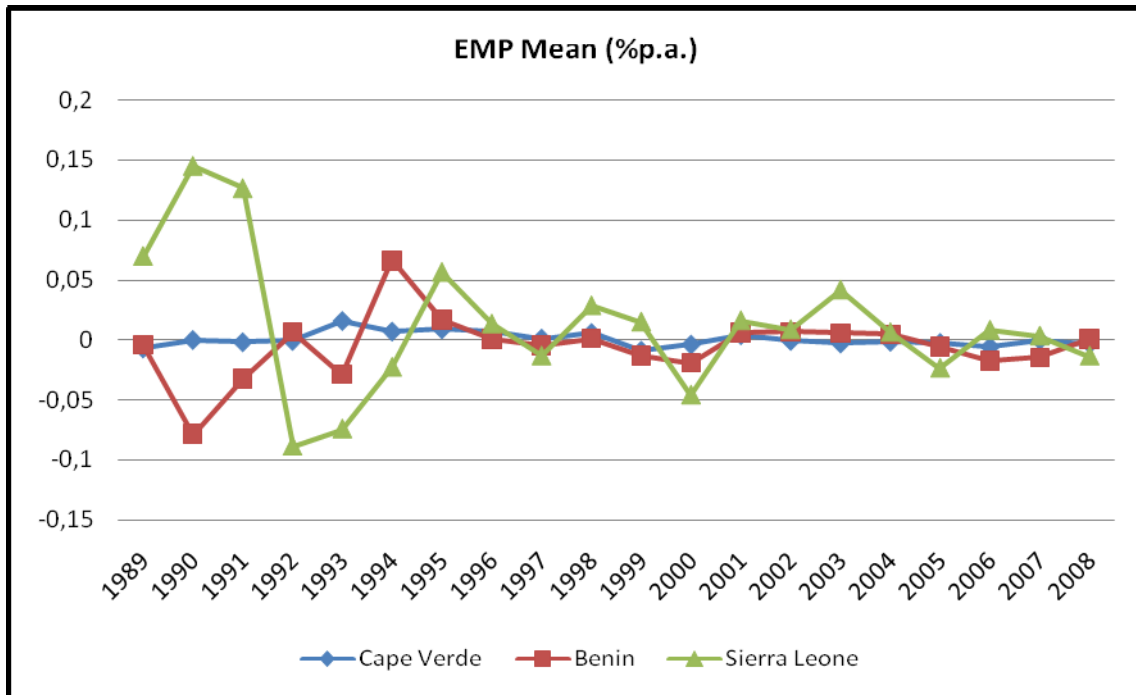
Figure 3: EMP volatility in large samples Cape Verde, Benin and Sierra Leone
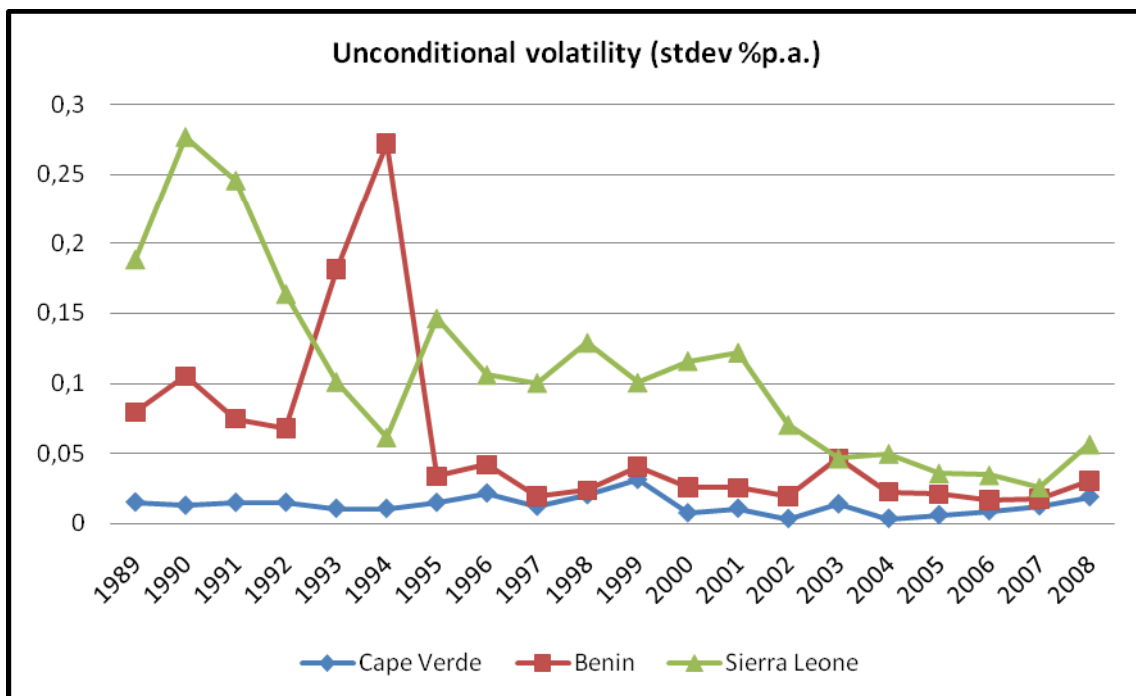
Figure 4: EMP mean in large samples Mozambique, Seychelles and South Africa
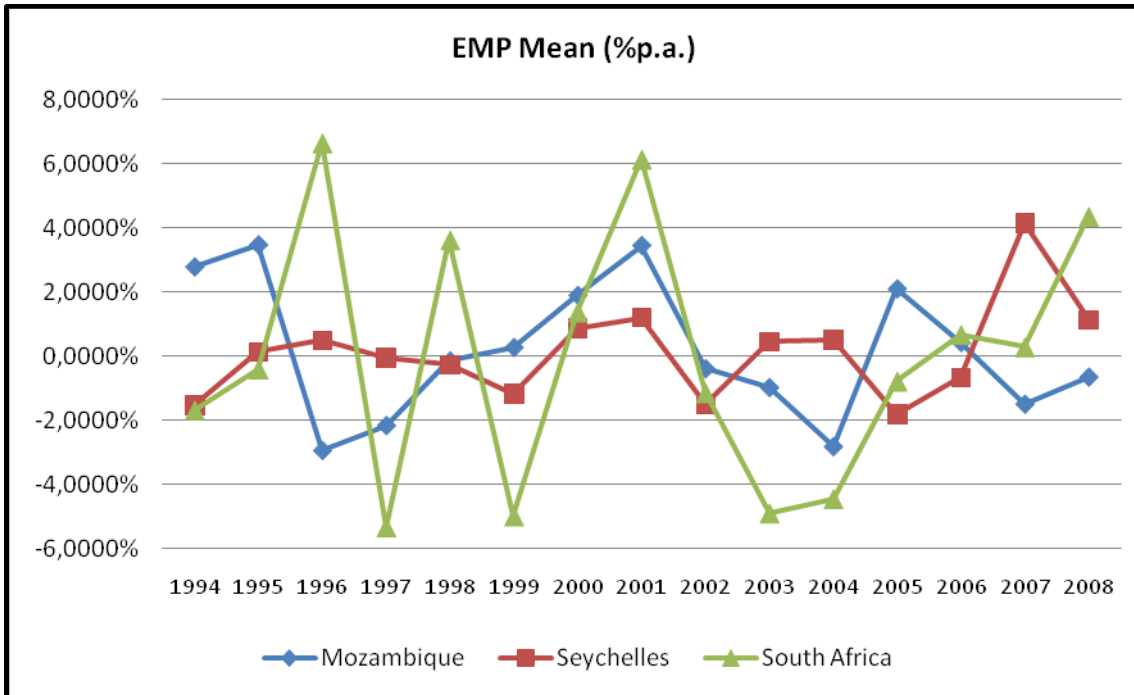
Figure 5: EMP volatility in large samples Mozambique, Seychelles and South Africa
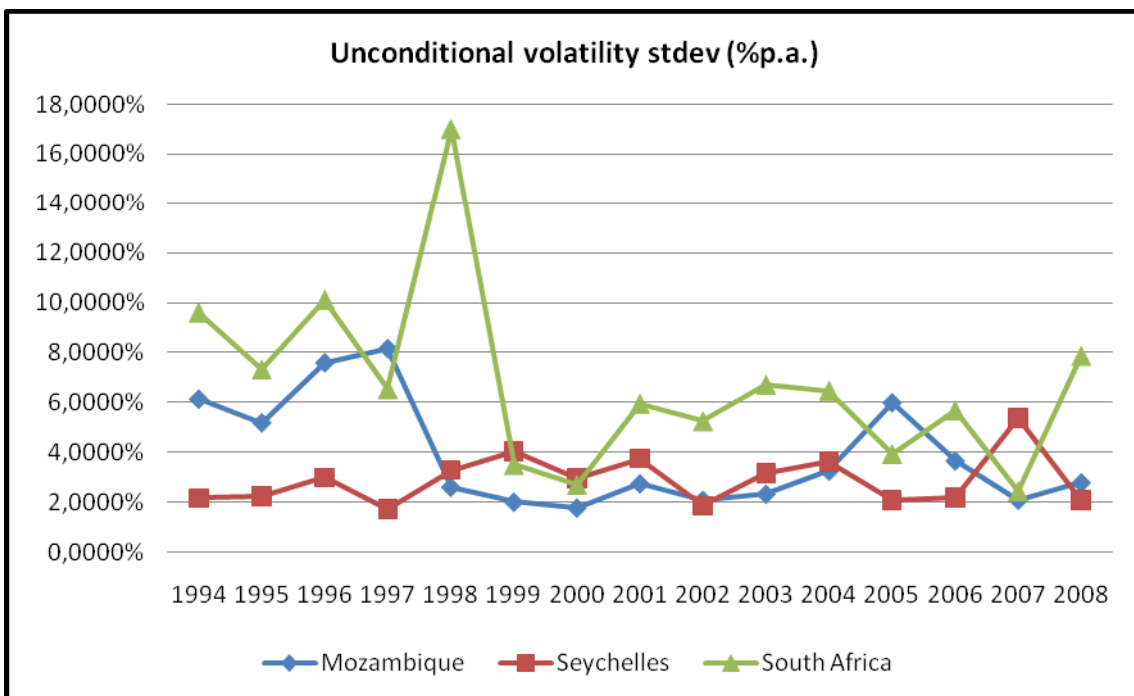
Figure 6: Unconditional mean of EMP for the currency pegs - Portuguese-speaking countries
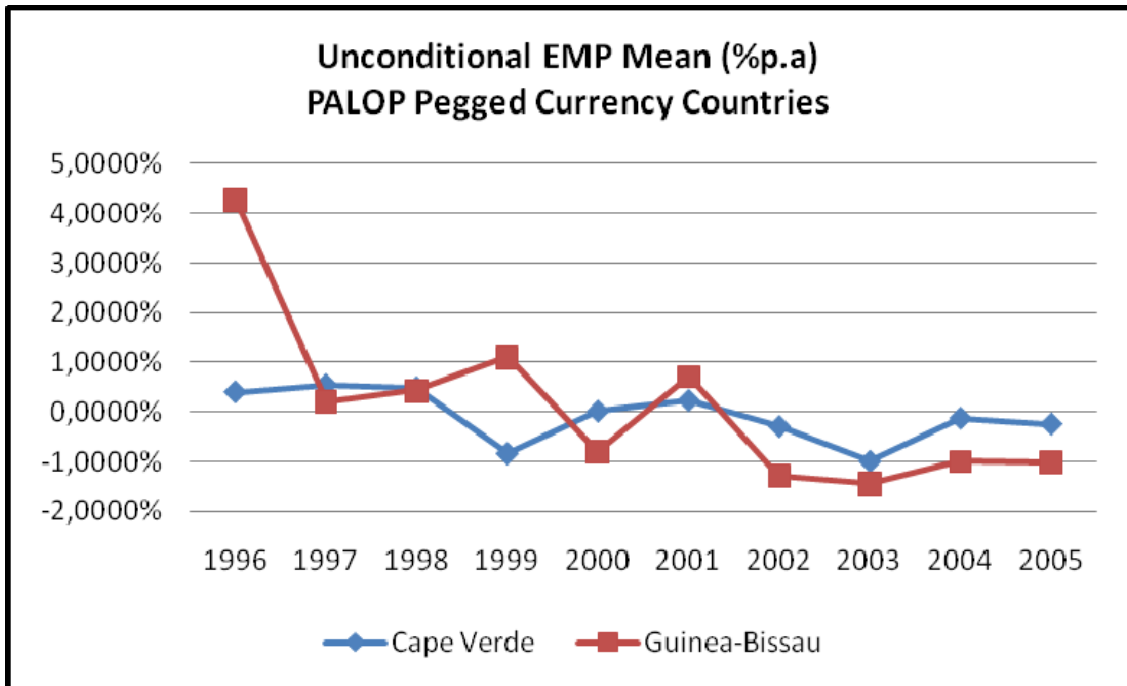
Figure 7: Unconditional volatility of EMP for the currency pegs - Portuguese-speaking countries
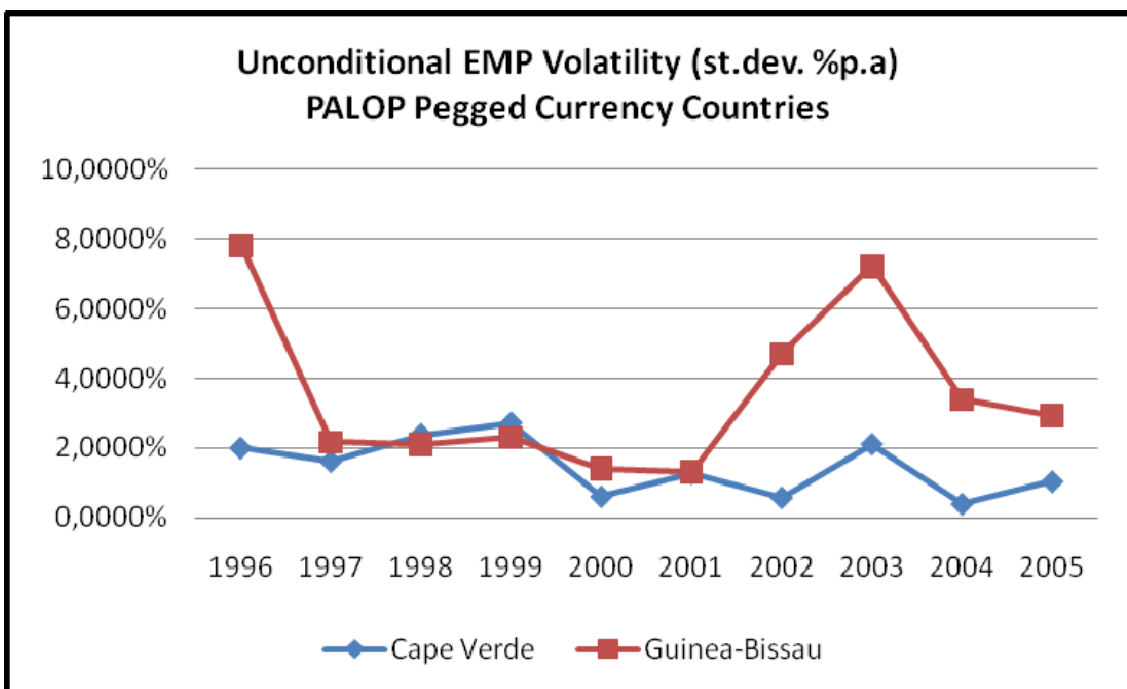
Figure 8: Unconditional mean of EMP in the managed floats - Portuguese-speaking countries
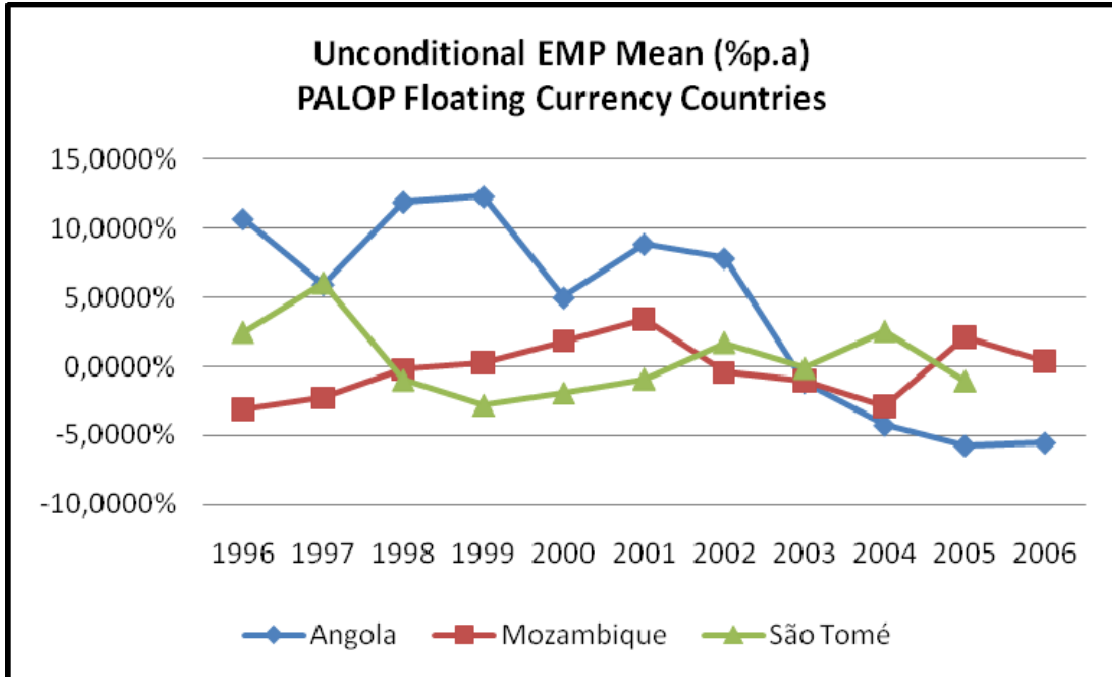
Figure 9: Unconditional volatility of EMP in the managed floats - Portuguese-speaking countries
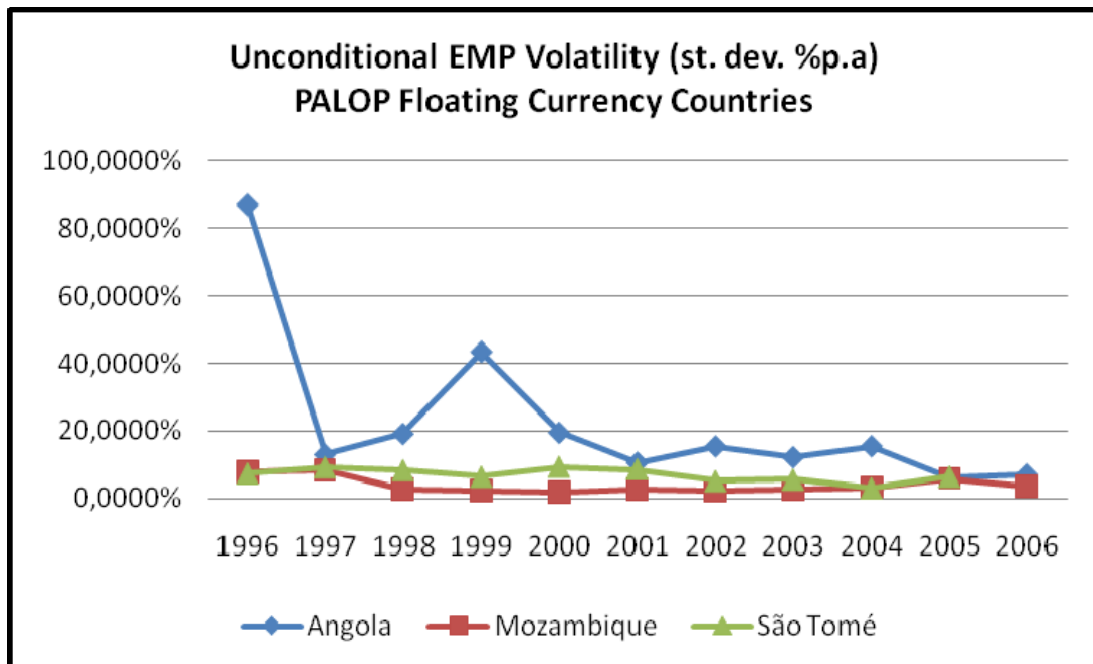
Figure 10: Unconditional volatility of EMP - ECOWAS
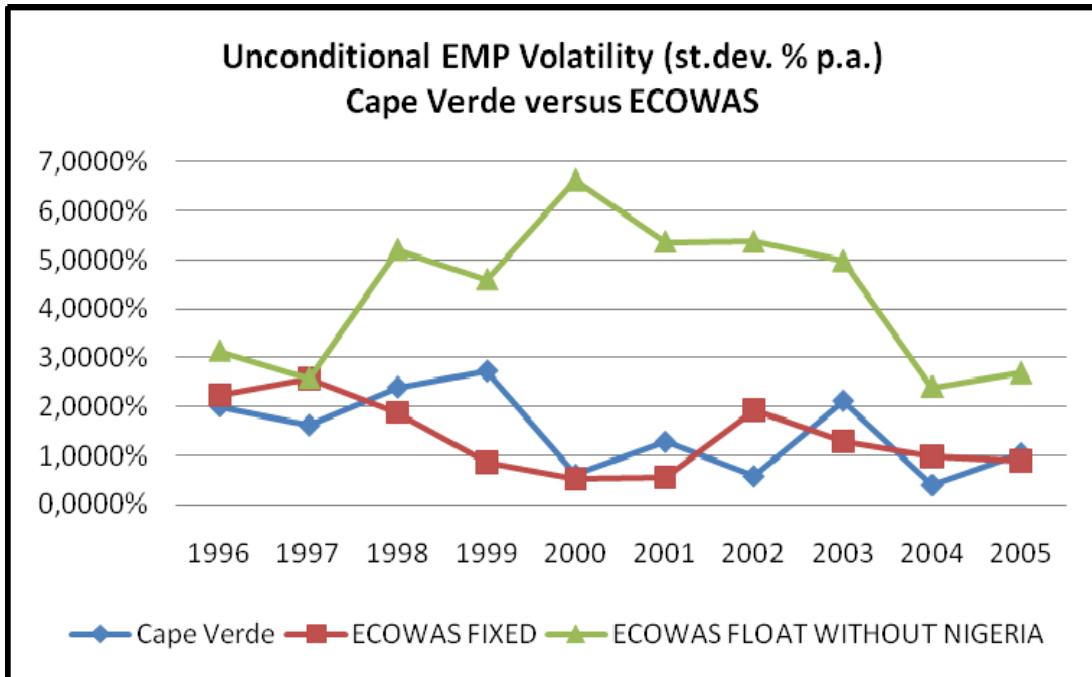
Figure 11: Unconditional mean of EMP - ECOWAS
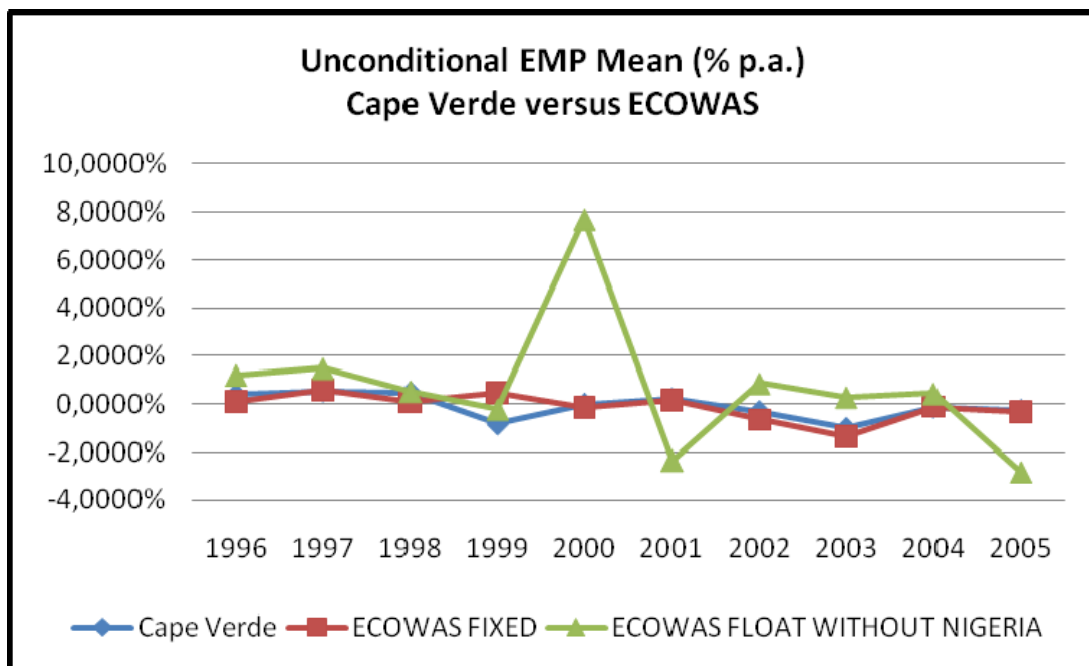
Figure 12: Unconditional volatility of EMP - SADC
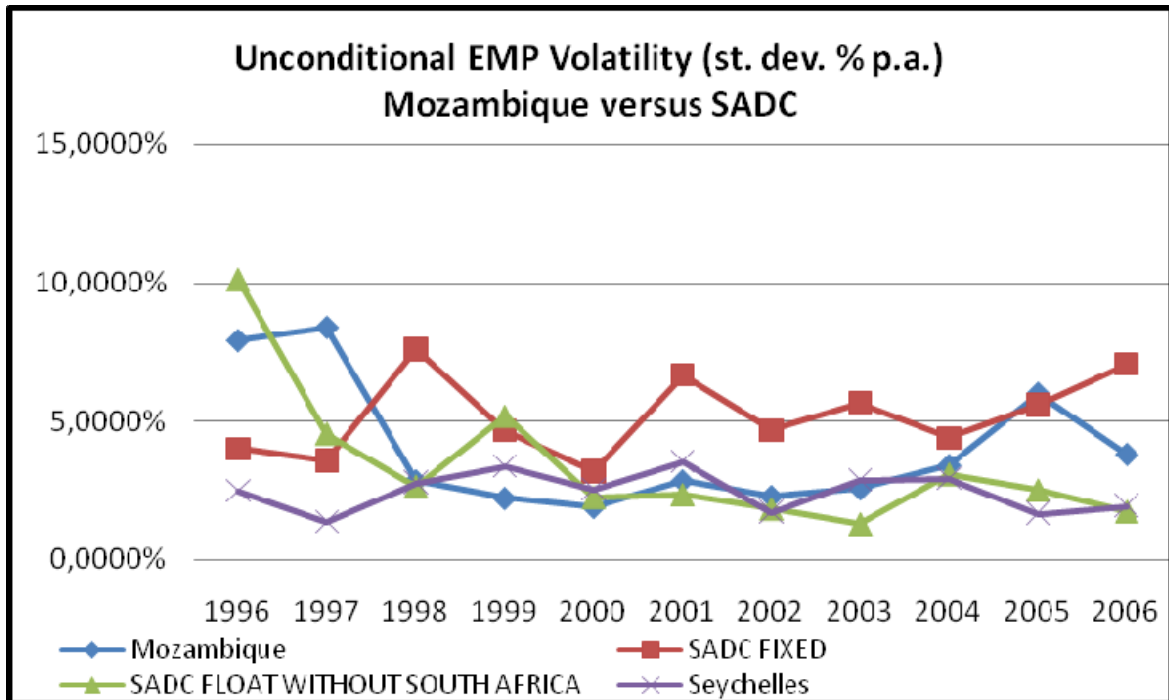
Figure 13: Unconditional mean of EMP - SADC
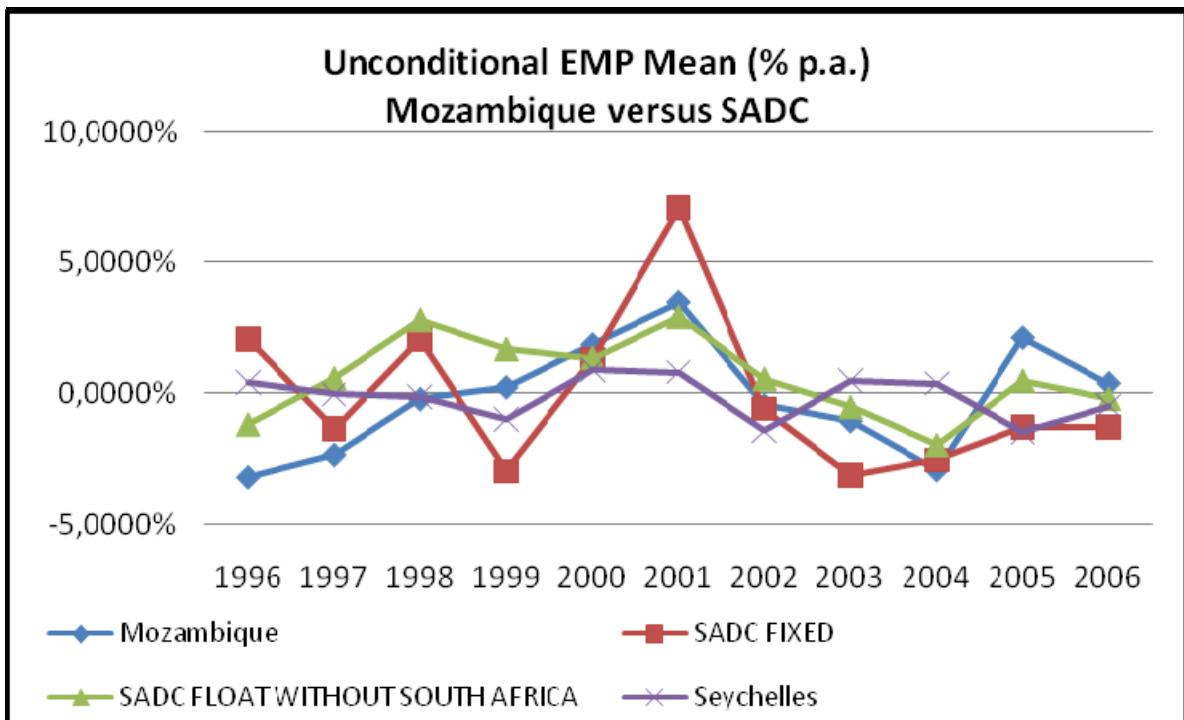
Figure 14: Conditional mean of EMP in the managed floats - Portuguese-speaking countries
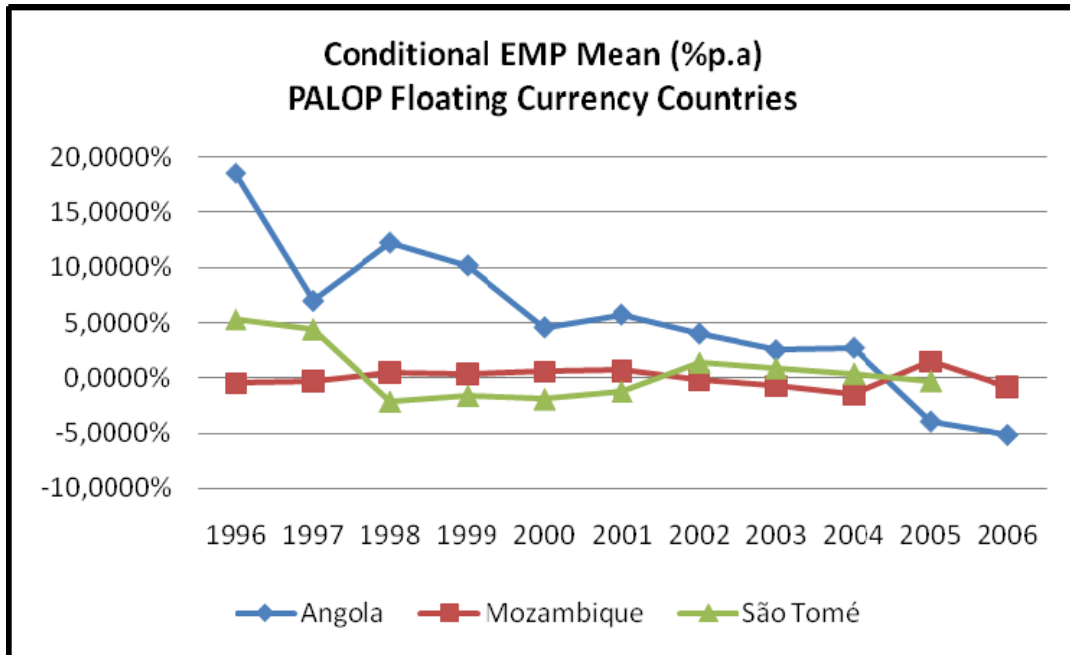
Figure 15: Conditional volatility of EMP in the managed floats - Portuguese-speaking countries
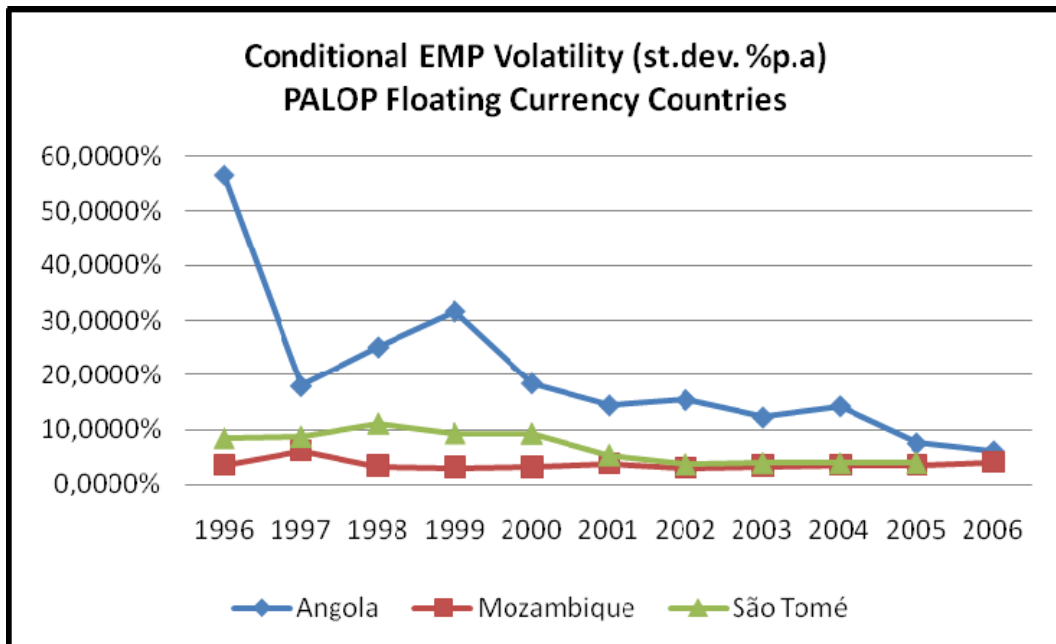
Figure 16: Conditional mean of EMP for the currency pegs - Portuguese-speaking countries
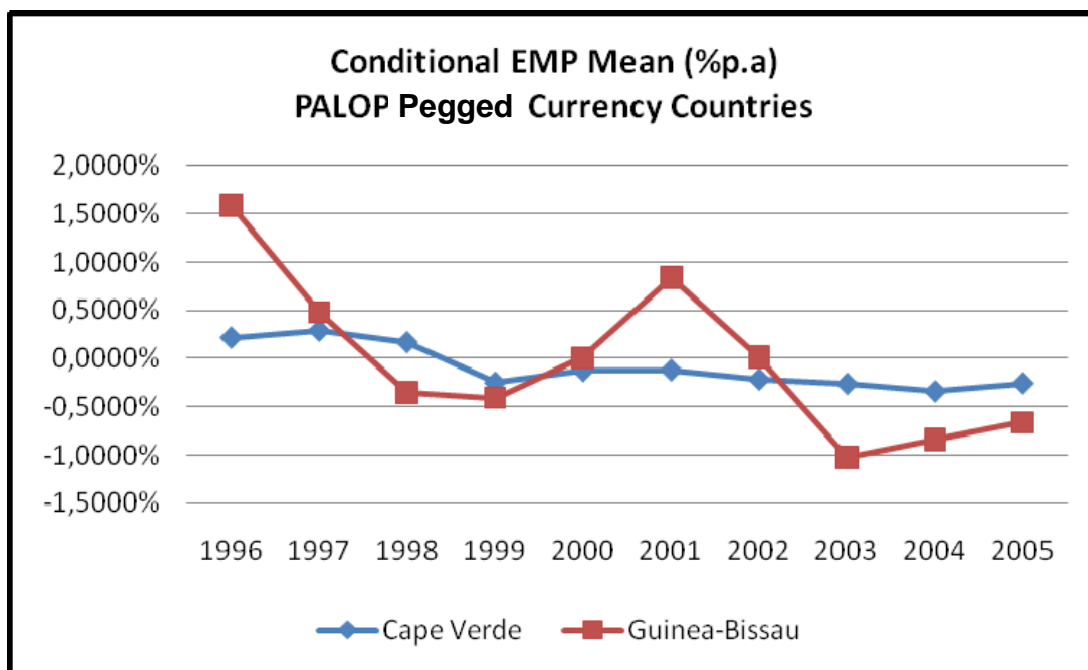
Figure 17: Conditional volatility of EMP for the currency pegs - Portuguese-speaking countries
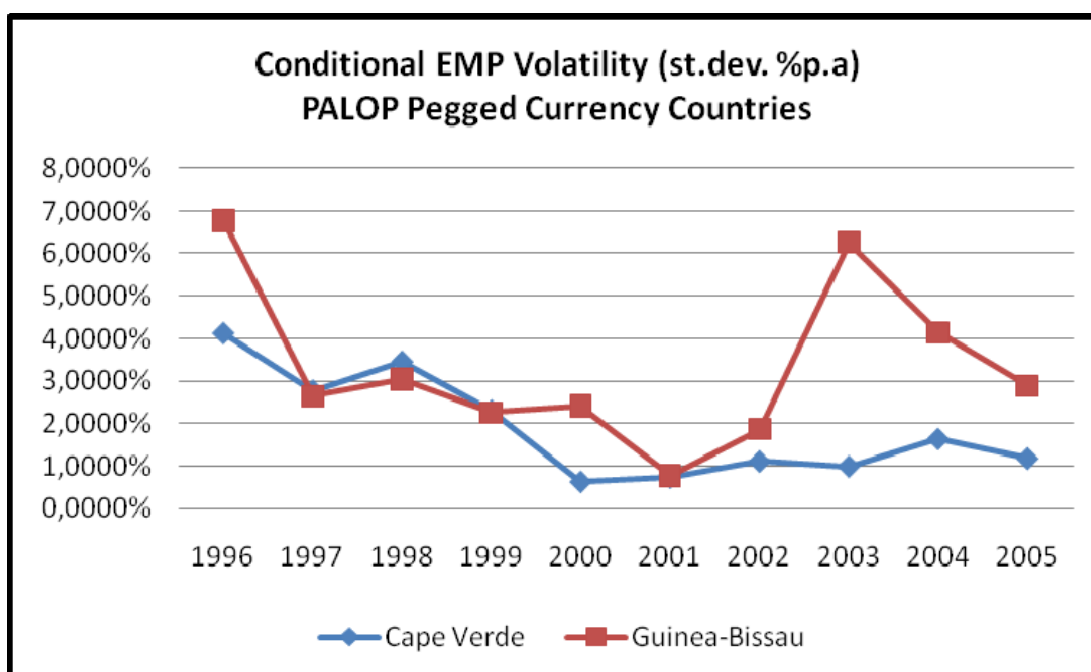
Figure 18: Conditional mean of EMP - ECOWAS
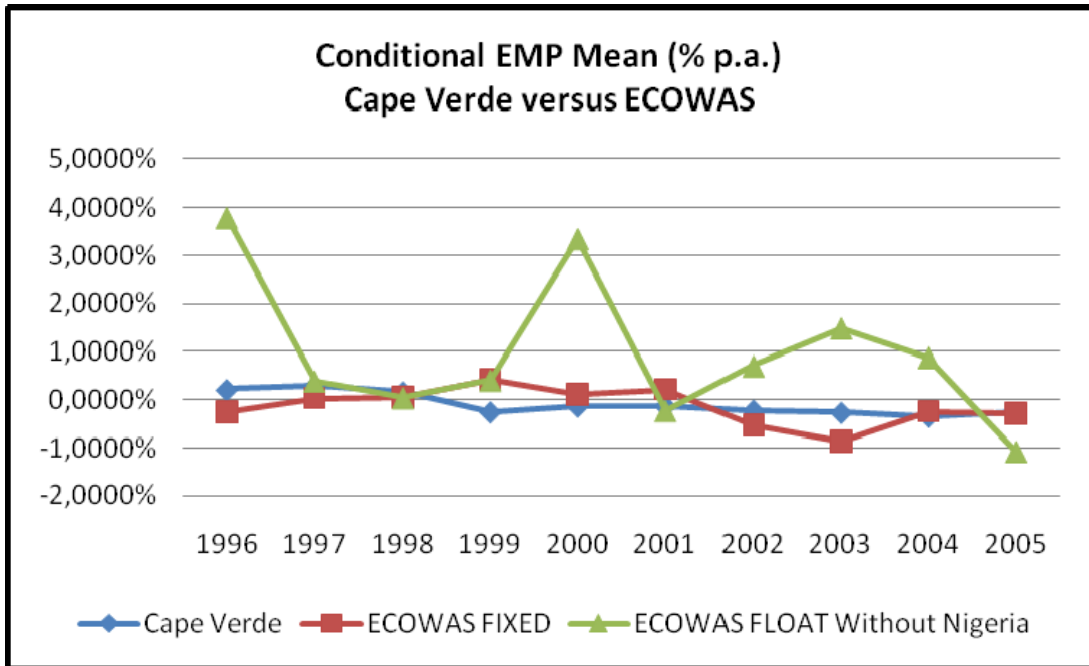
Figure 19: Conditional volatility of EMP - ECOWAS
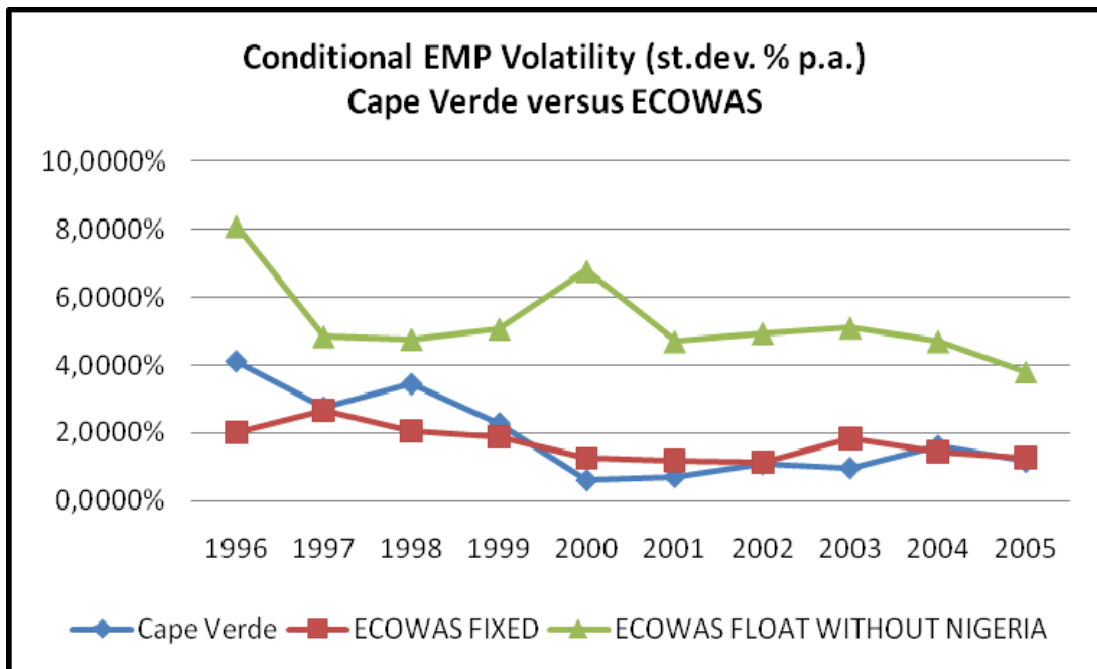
Figure 20: Conditional mean of EMP - SADC
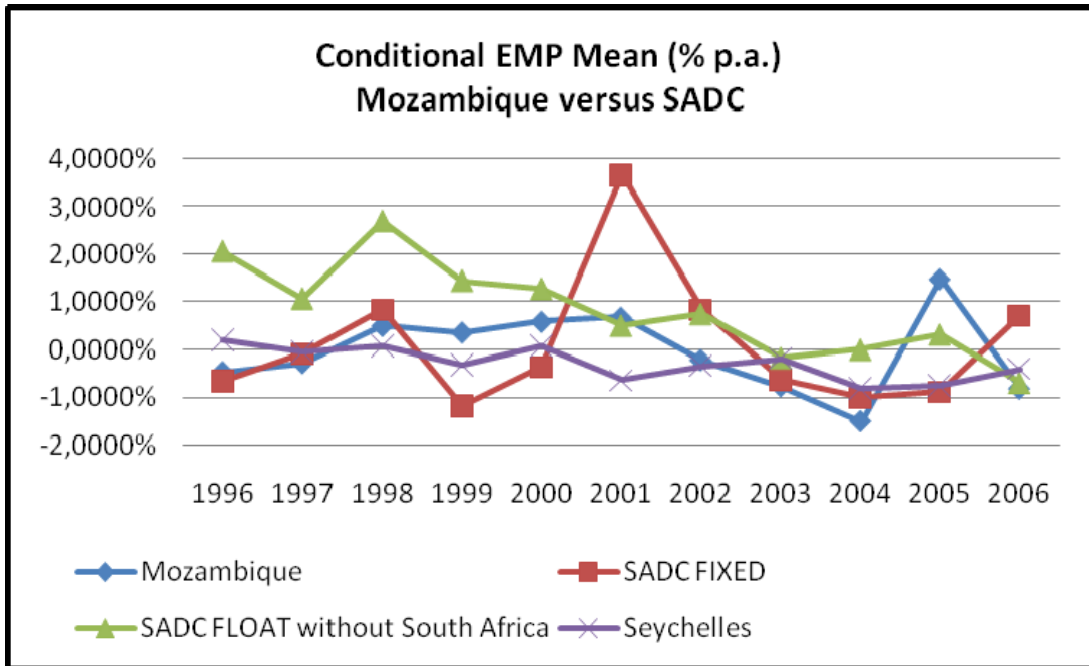
Figure 21: Conditional volatility of EMP - SADC
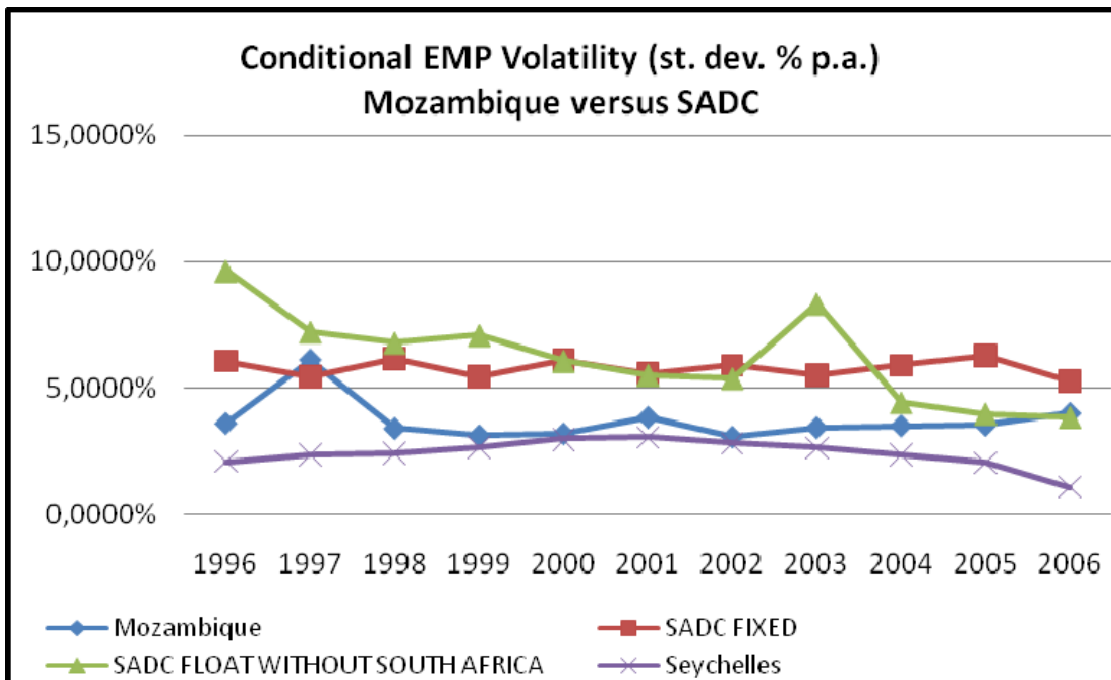
Country Appendix 1: Benin
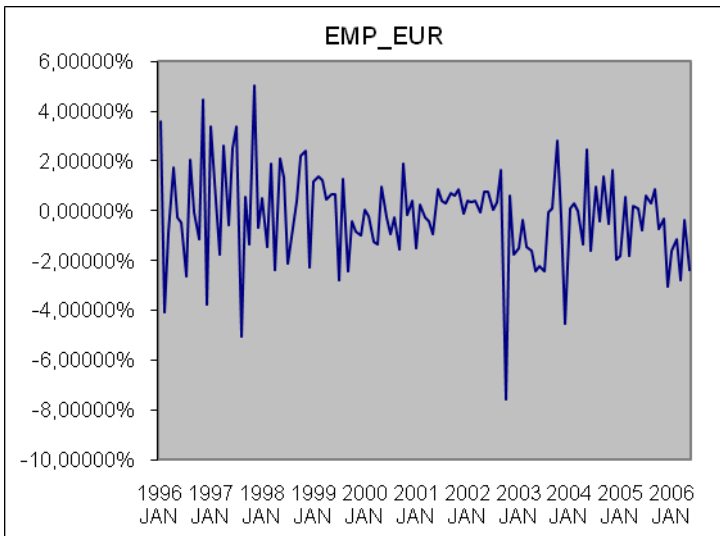
EMP_EUR
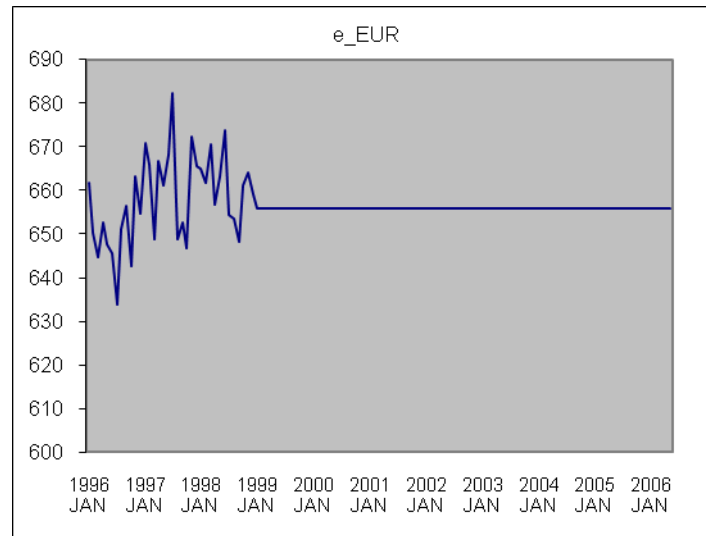
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

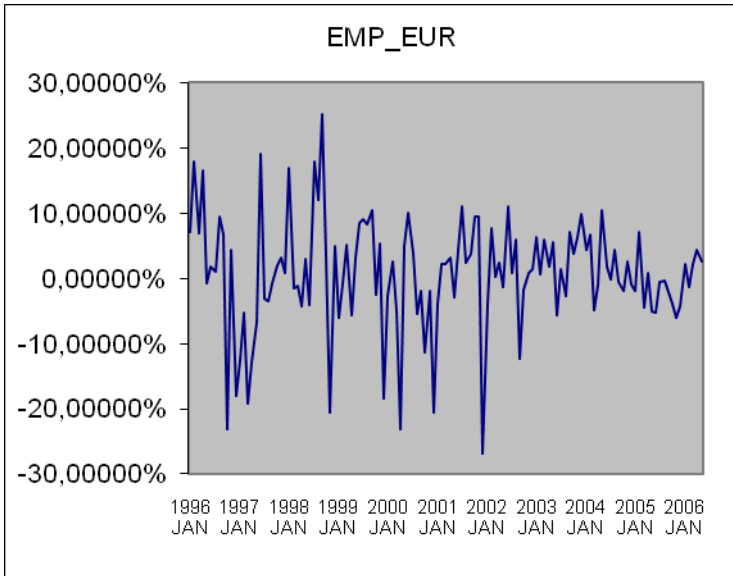Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)
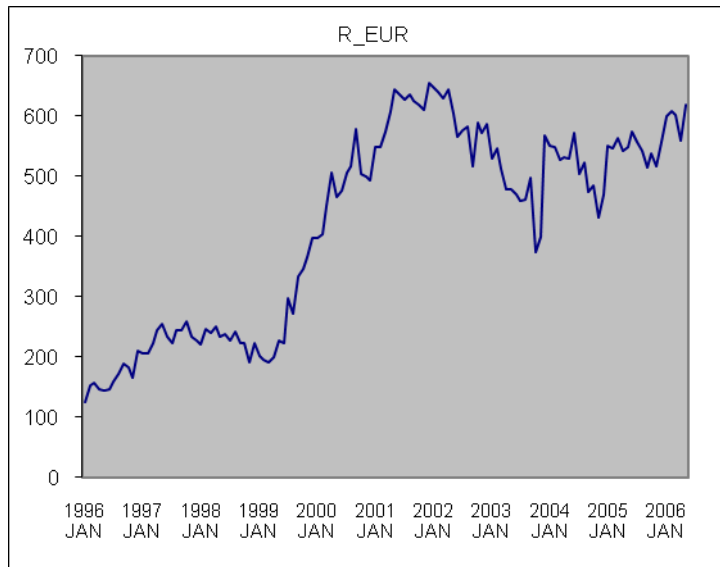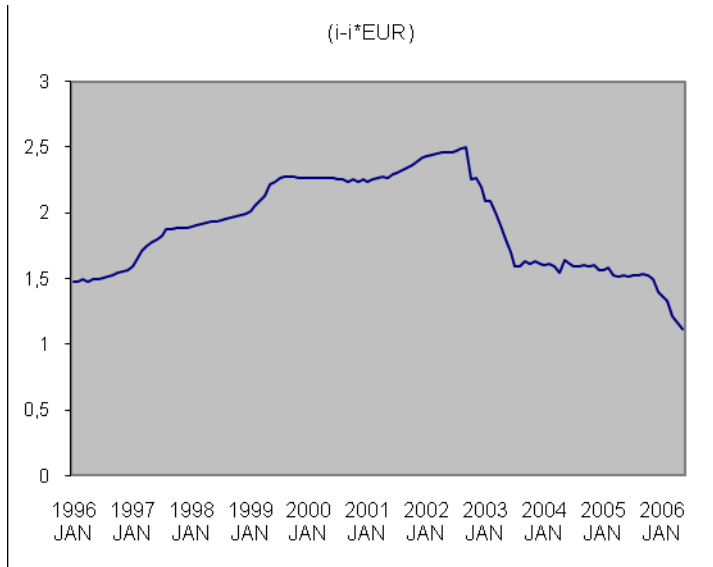
Interest rate differential
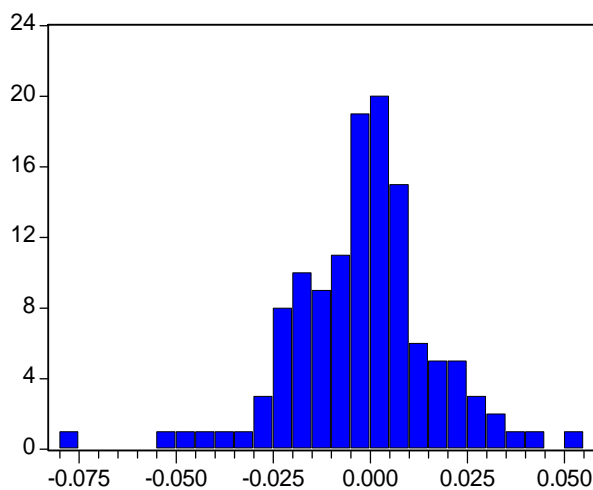
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.001978
Median	-0.000630
Maximum	0.050534
Minimum	-0.075844
Std. Dev.	0.018459
Skewness	-0.379499
Kurtosis	4.895051
Jarque-Bera	21.70466
Probability	0.000019

Exchange Market Pressure histogram

Country Appendix 2: Burkina Faso
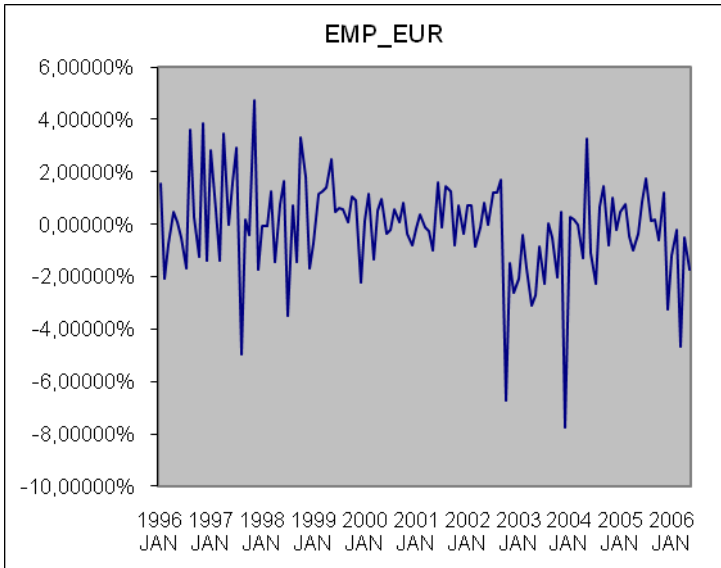
EMP_EUR
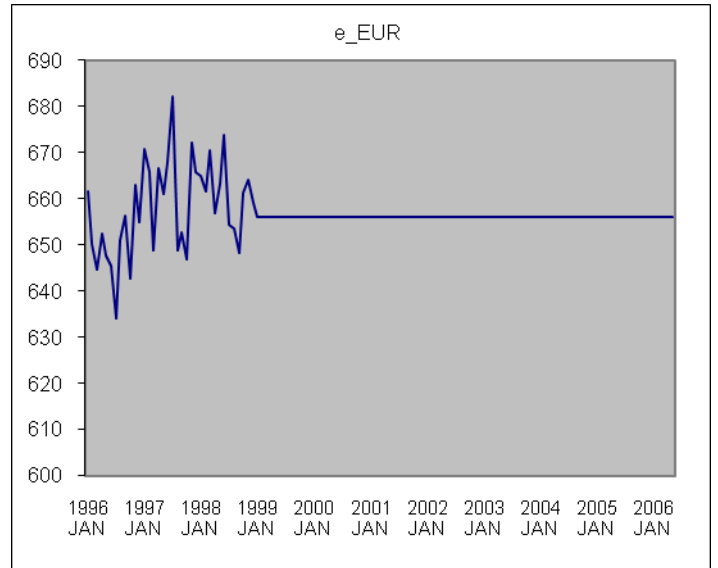
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.001117
Median	4.46e-05
Maximum	0.047371
Minimum	-0.077754
Std. Dev.	0.018478
Skewness	-0.860891
Kurtosis	6.049422
Jarque-Bera	63.87243
Probability	0.000000
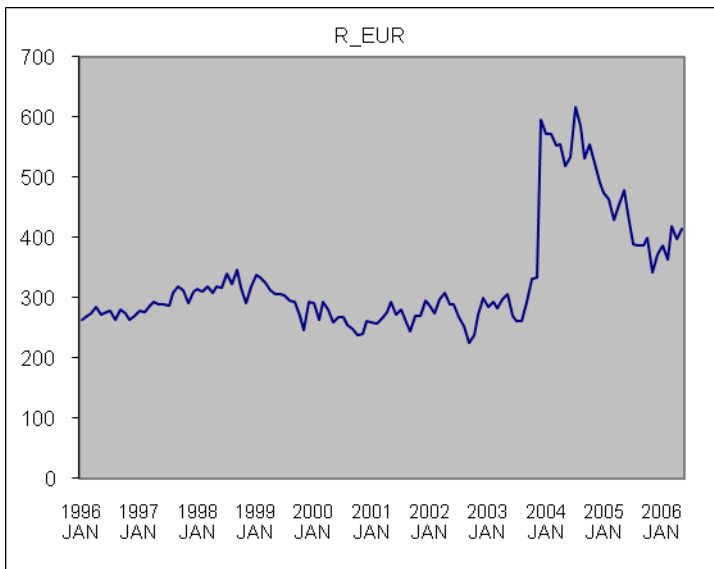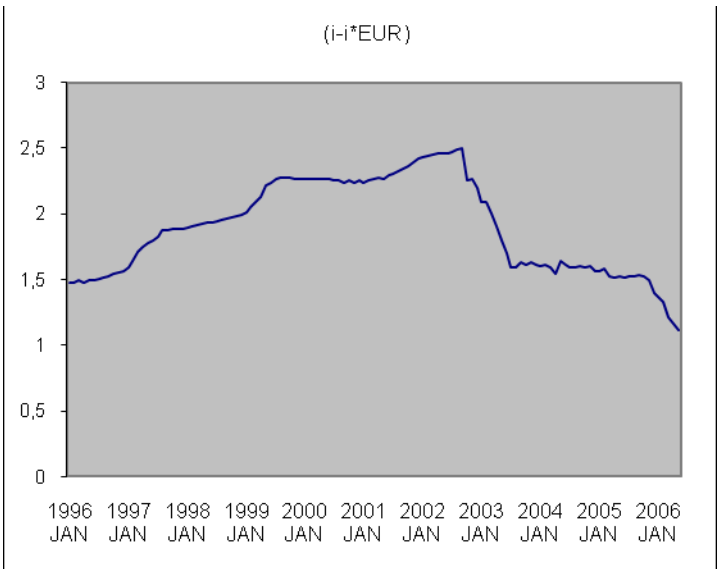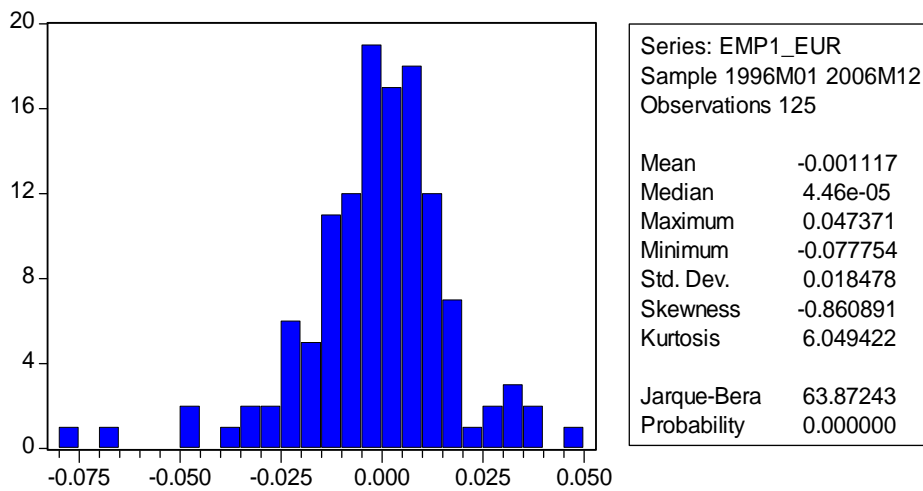
Exchange Market Pressure histogram

Country Appendix 3: Cape Verde
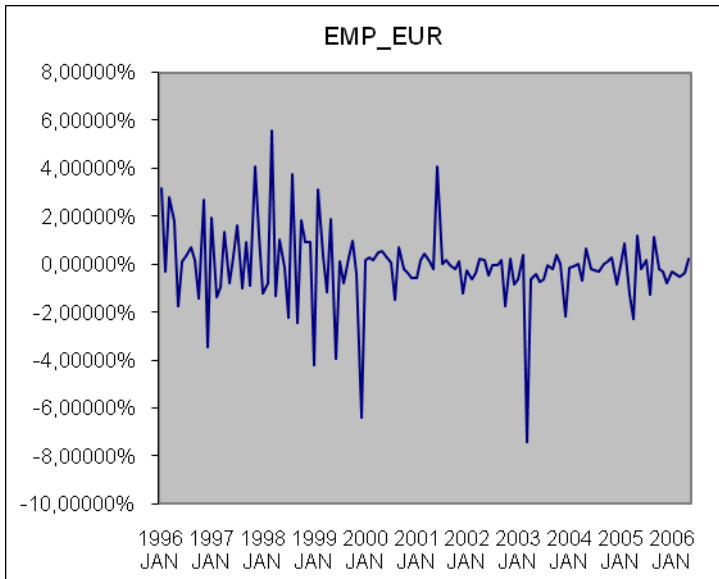
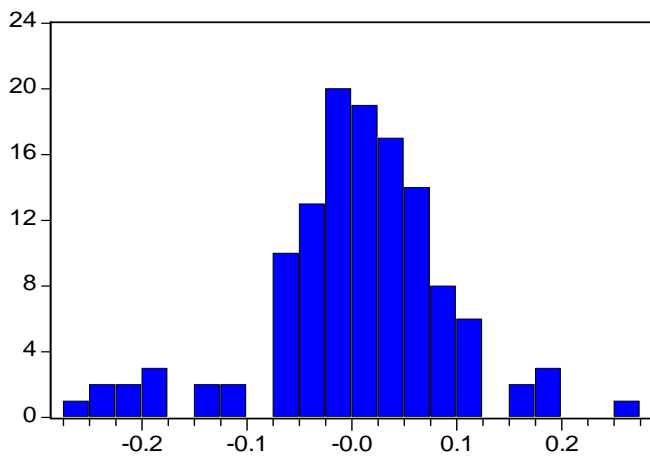Exchange Market Pressure, monthly evolution
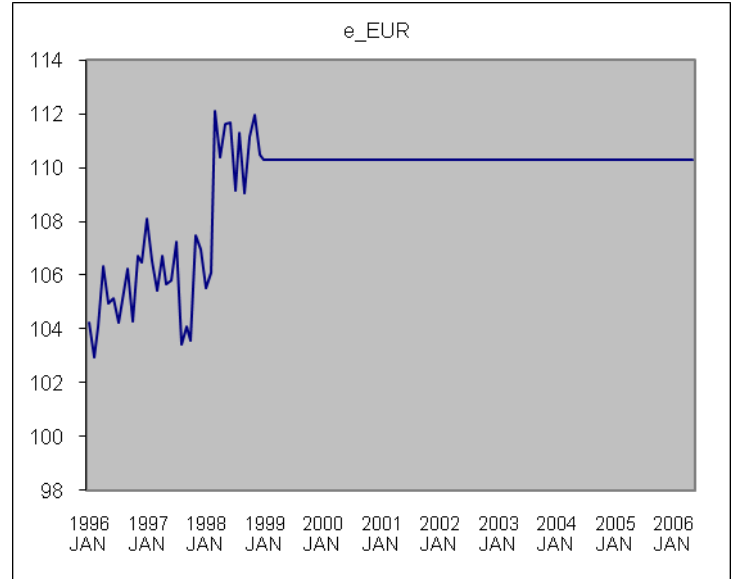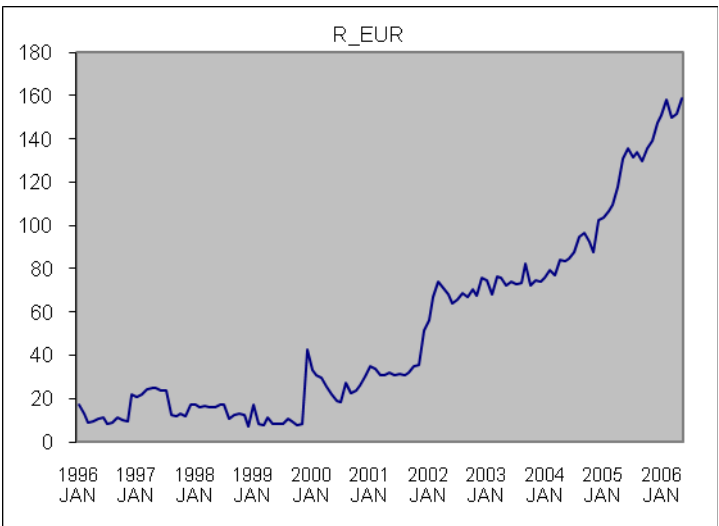
Exchange Rate Nominal Currency per Euro

Foreign Reserves (excluding gold) measure in Euro
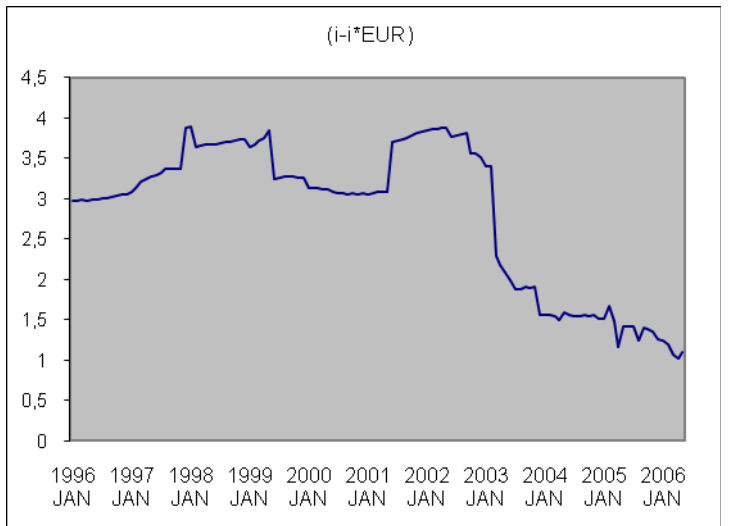
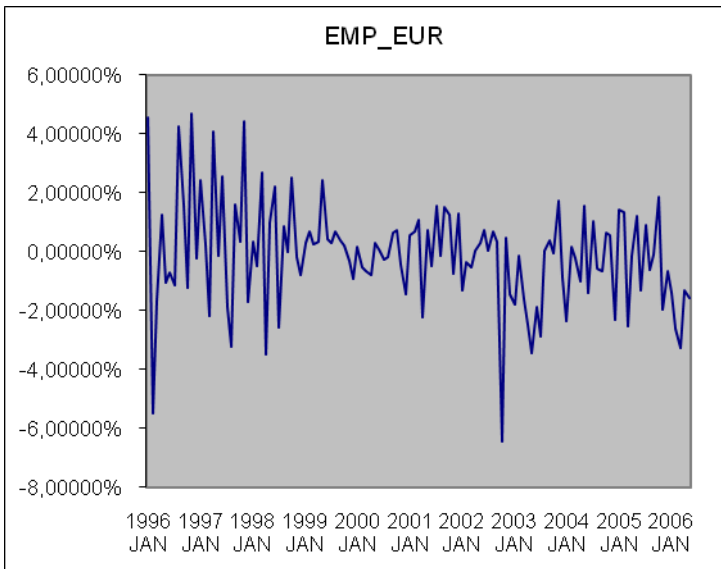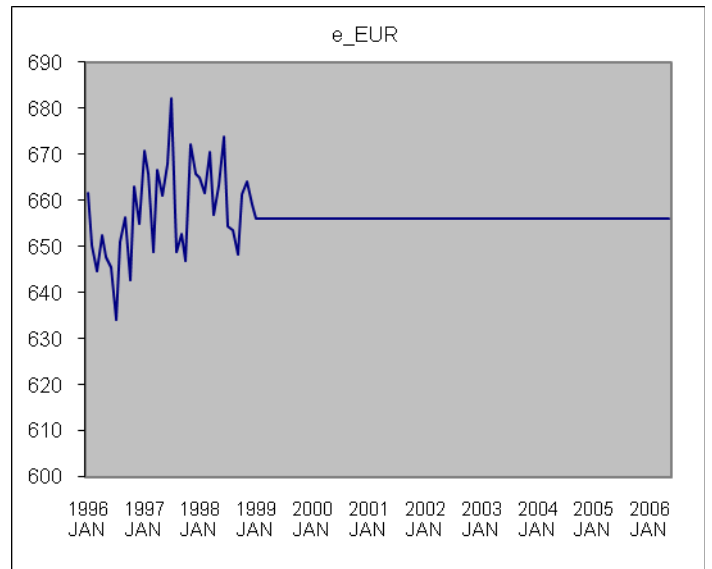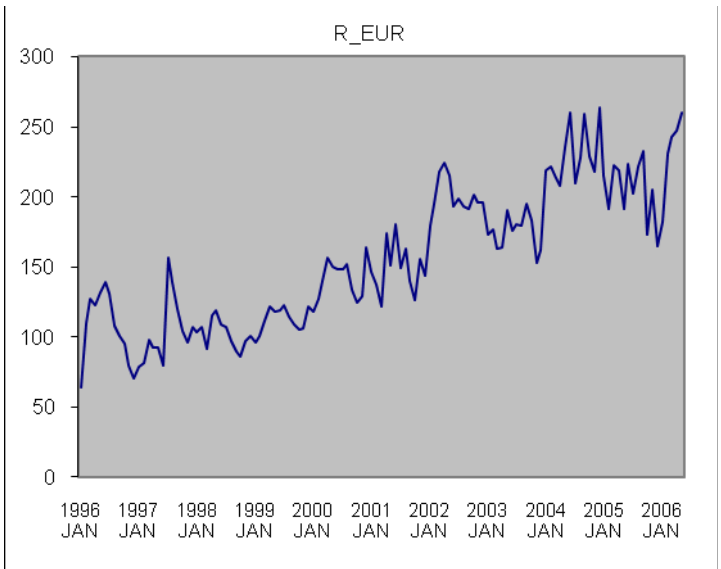Interest rate differential
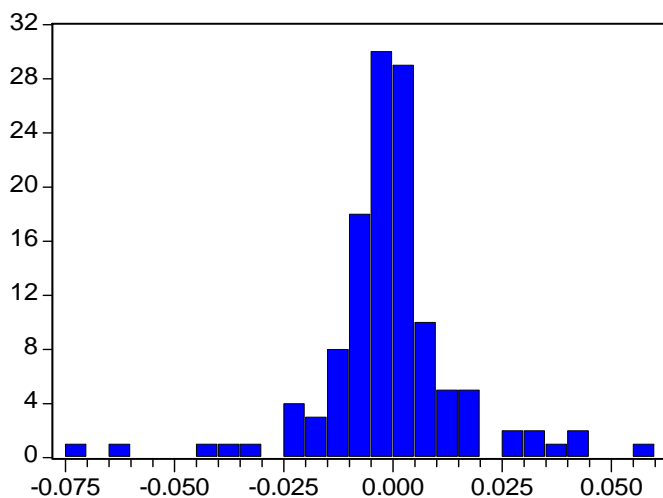
Series: EMP1_EUR
Sample 1996M01 2006M12
Observations 125

Mean	-0.000931
Median	-0.000381
Maximum	0.055536
Minimum	-0.073892
Std. Dev.	0.016522
Skewness	-0.591091
Kurtosis	8.106736
Jarque-Bera	143.1058
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 4: Côte d'Ivoire
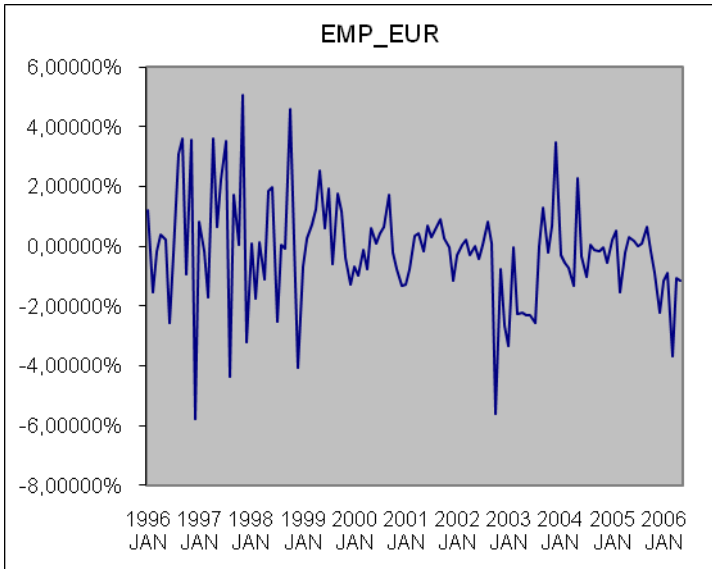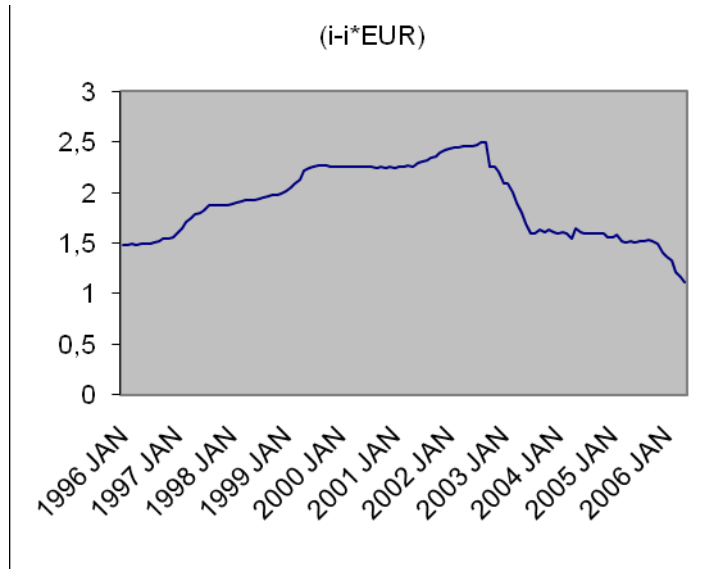
EMP_EUR
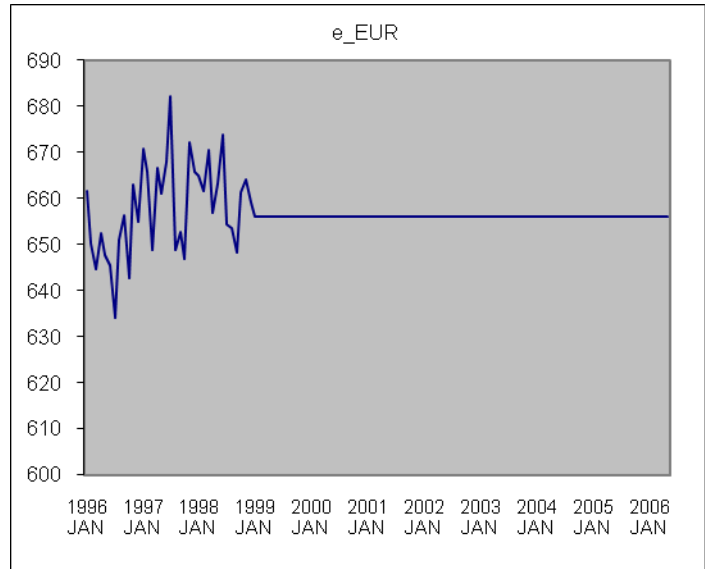
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)
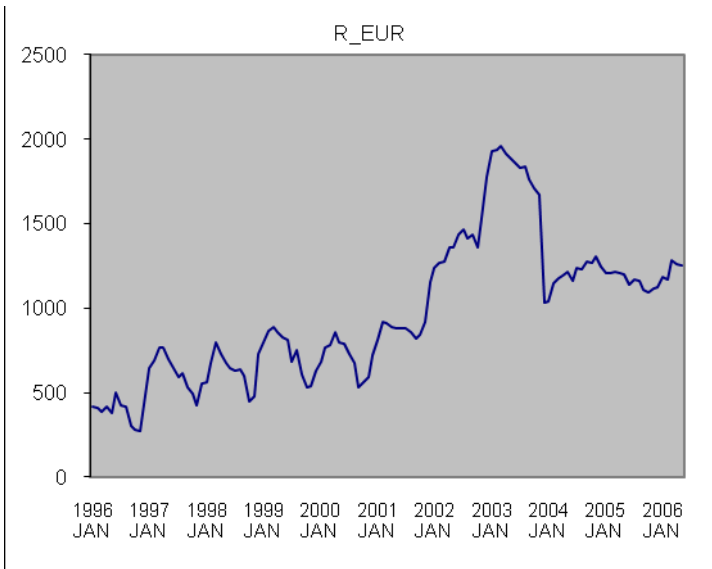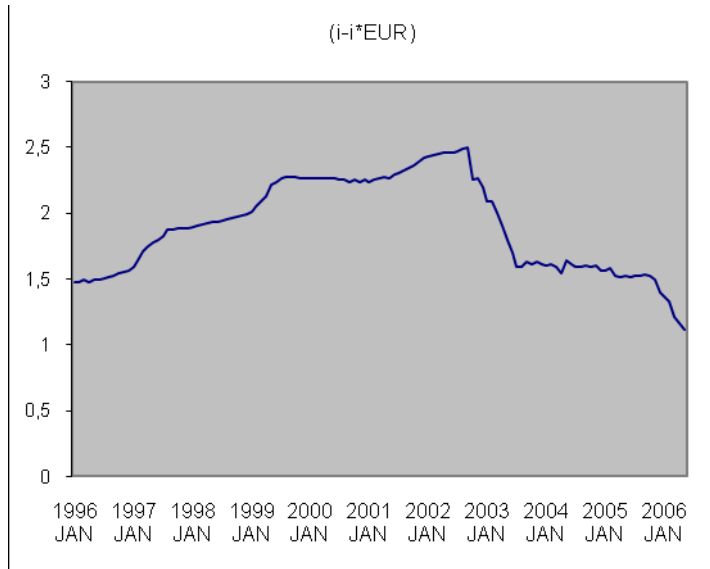
Interest rate differential
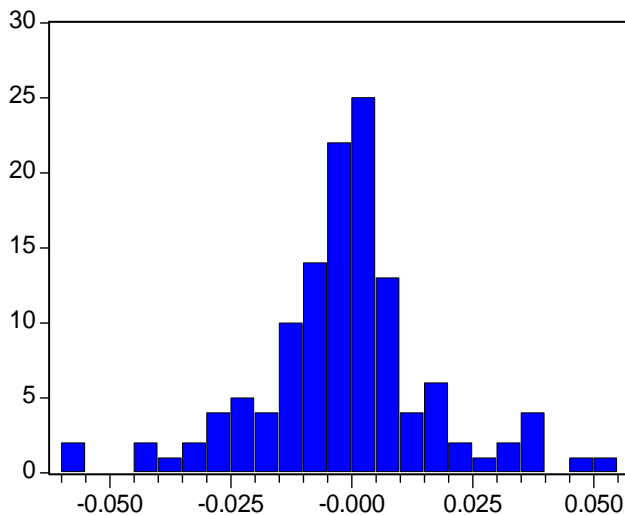
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.001415
Median	-0.000421
Maximum	0.050592
Minimum	-0.057835
Std. Dev.	0.017726
Skewness	-0.101518
Kurtosis	4.614593
Jarque-Bera	13.79236
Probability	0.001012

Exchange Market Pressure histogram

Country Appendix 5: Gambia
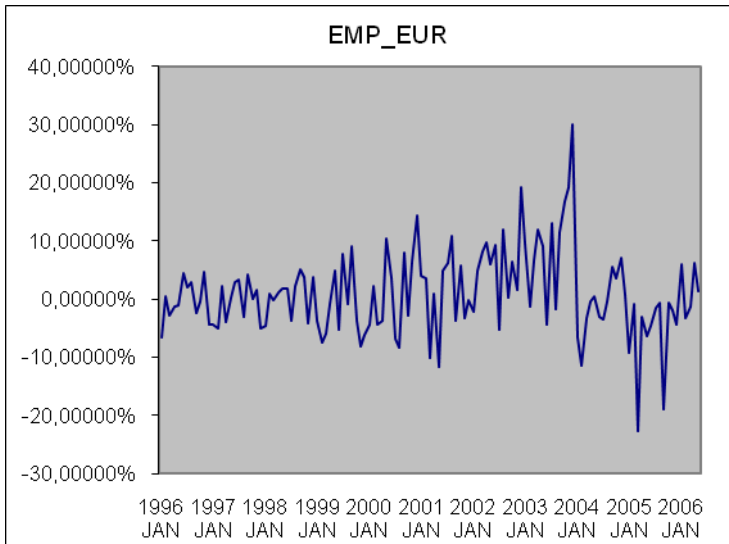
EMP_EUR
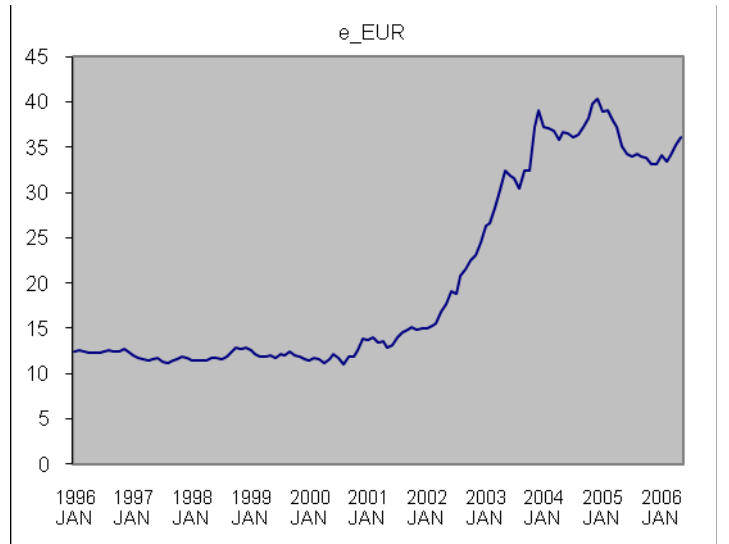
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

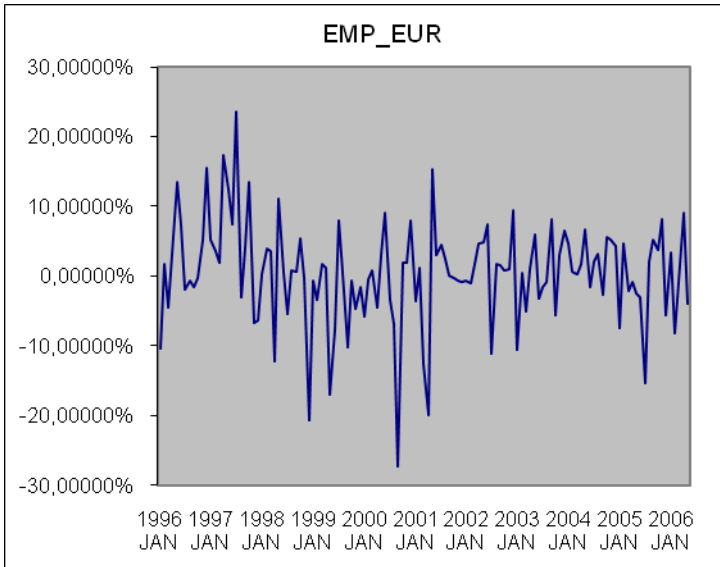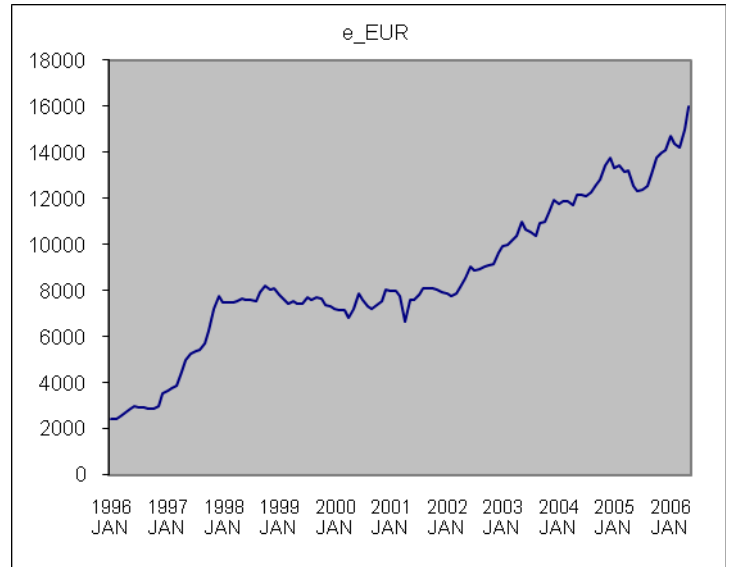Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	0.008676
Median	0.000466
Maximum	0.299131
Minimum	-0.226524
Std. Dev.	0.071869
Skewness	0.475569
Kurtosis	5.326181
Jarque-Bera	32.89471
Probability	0.000000
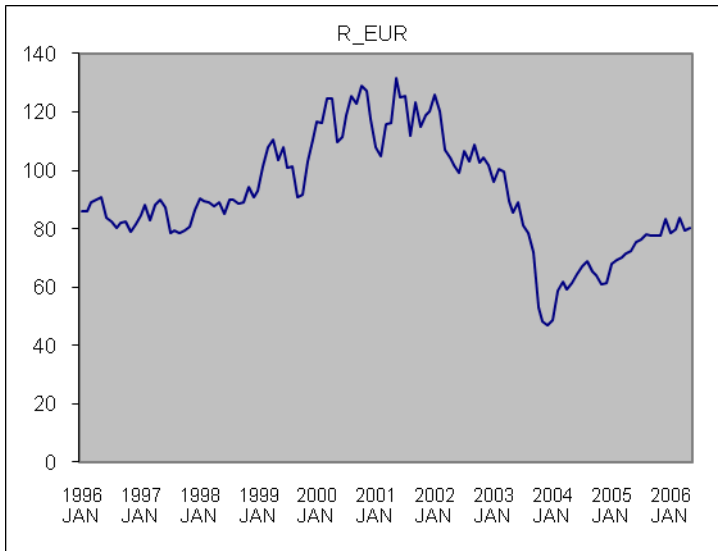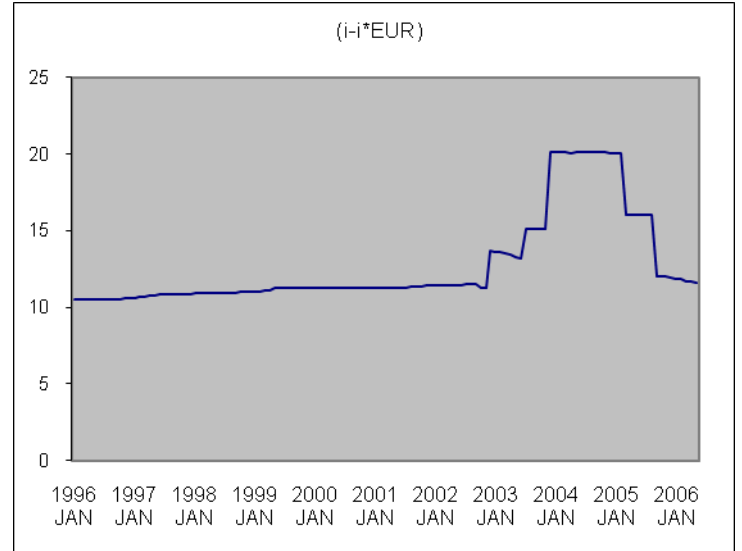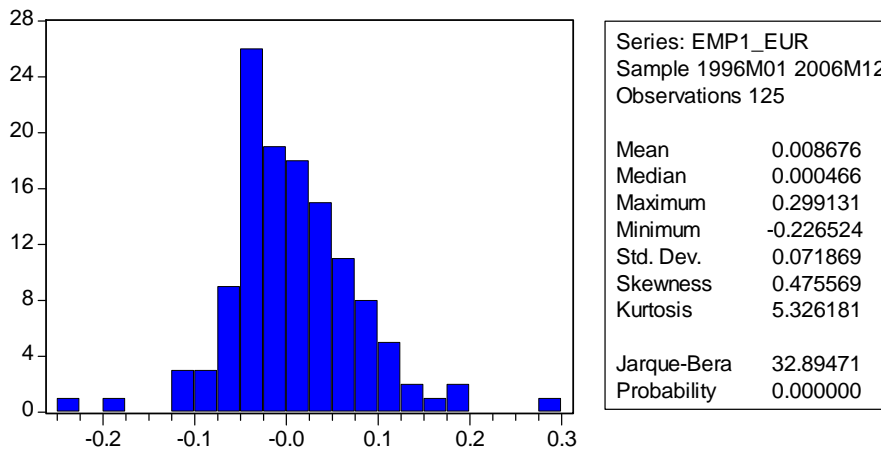
Exchange Market Pressure histogram

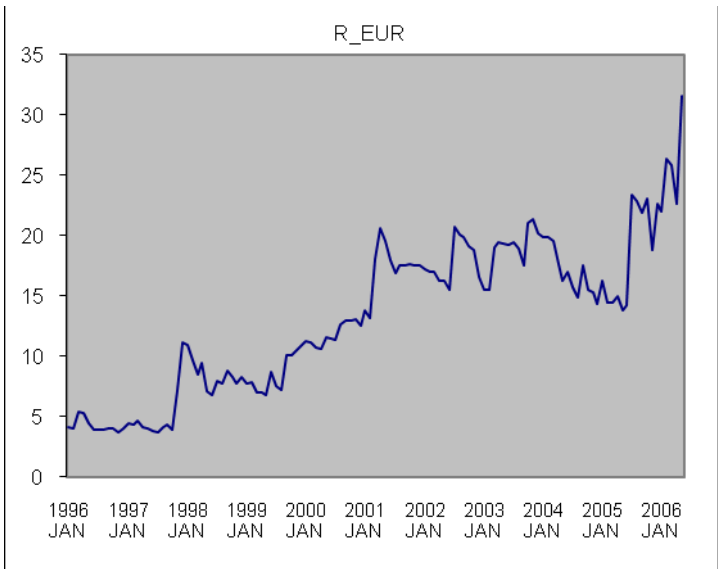# Country Appendix 6: Ghana
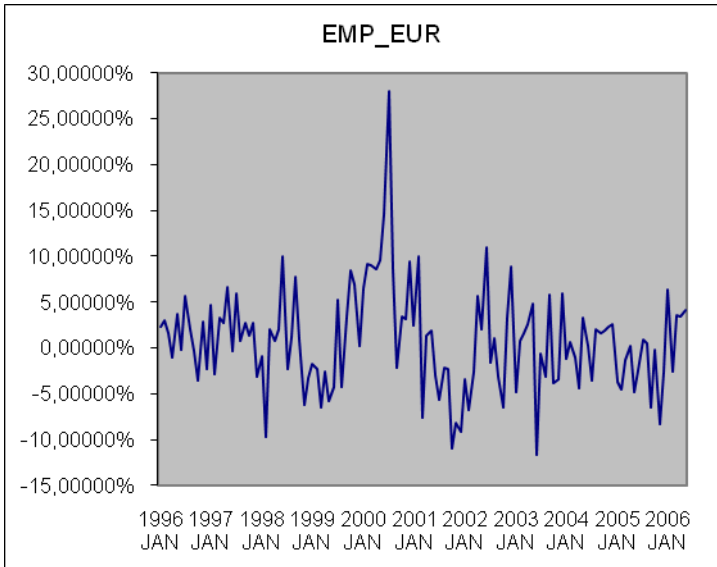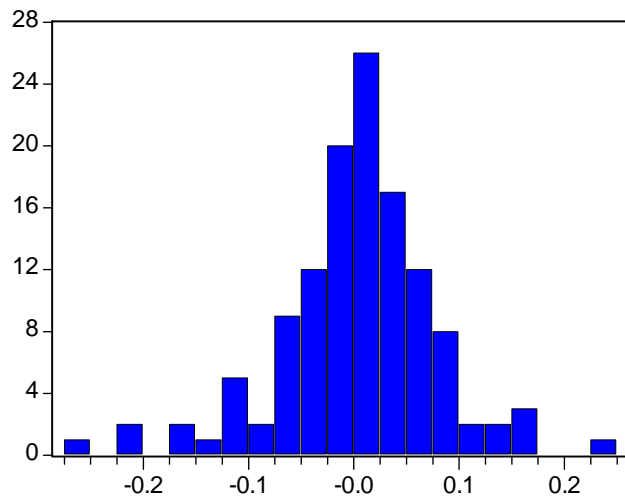

Exchange Market Pressure, monthly evolution
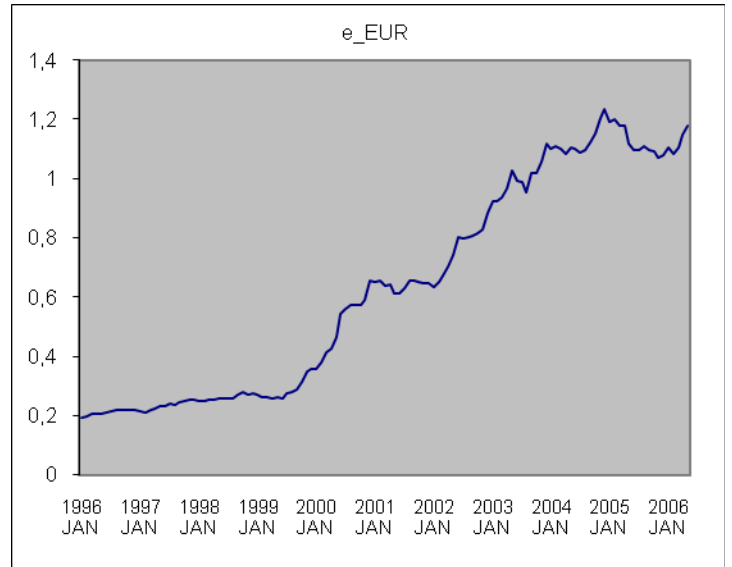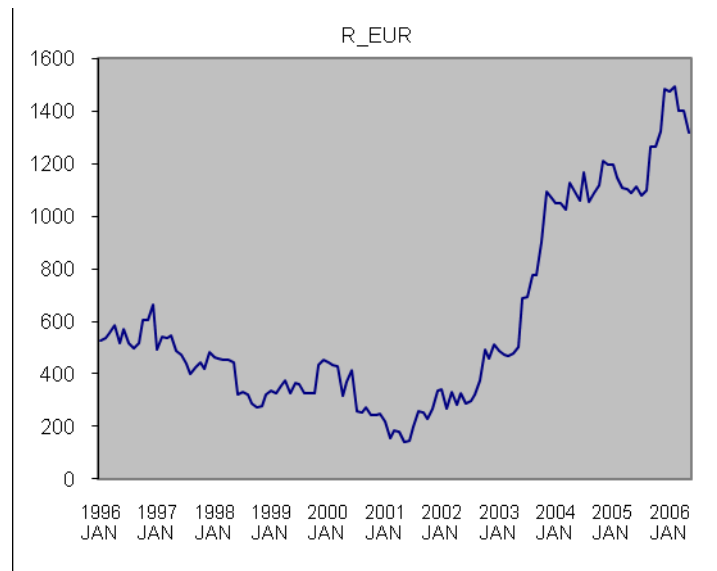
Exchange Rate Nominal Currency per Euro
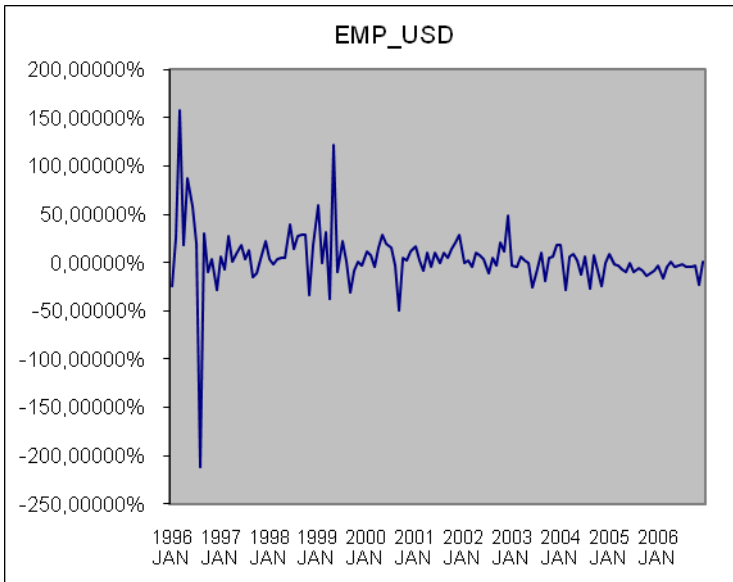

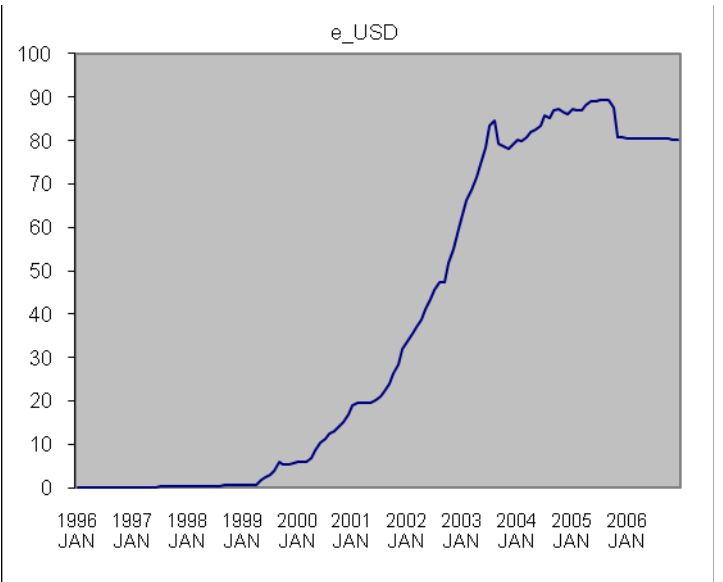Foreign Reserves (excluding gold) measure in Euro
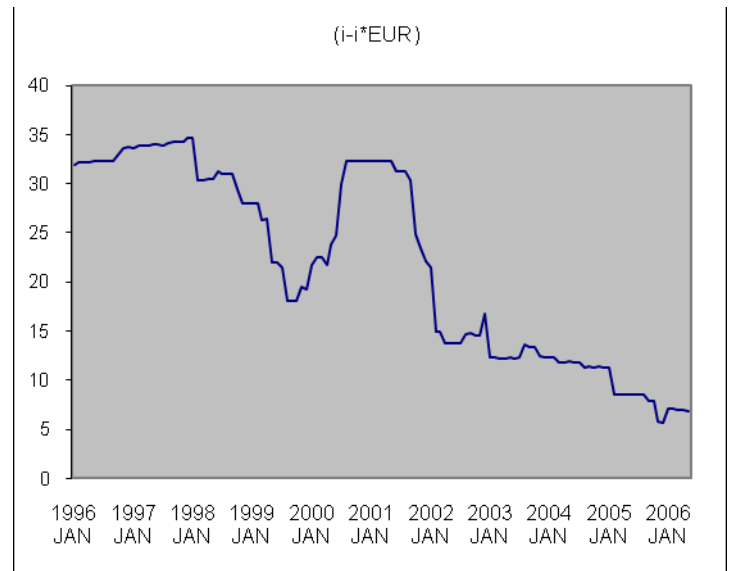
Interest rate differential
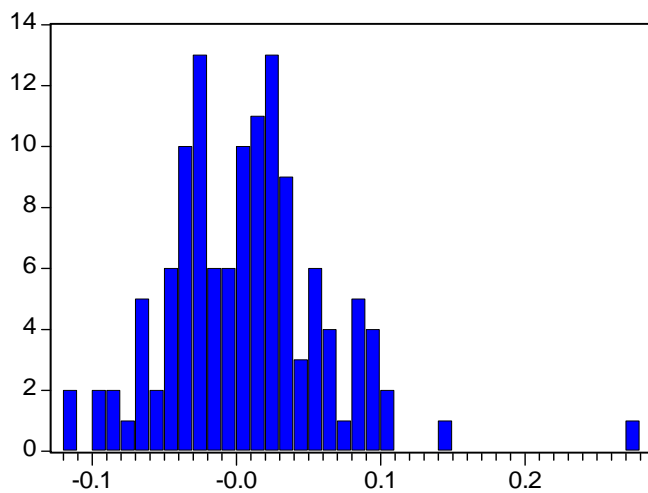
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	0.007986
Median	0.008355
Maximum	0.279527
Minimum	-0.116297
Std. Dev.	0.055569
Skewness	0.915278
Kurtosis	6.515778
Jarque-Bera	81.83141
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 7: Guinea
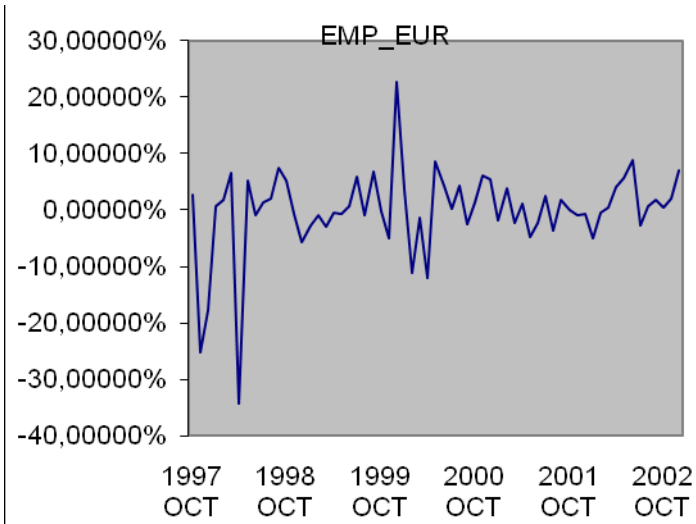
EMP_EUR
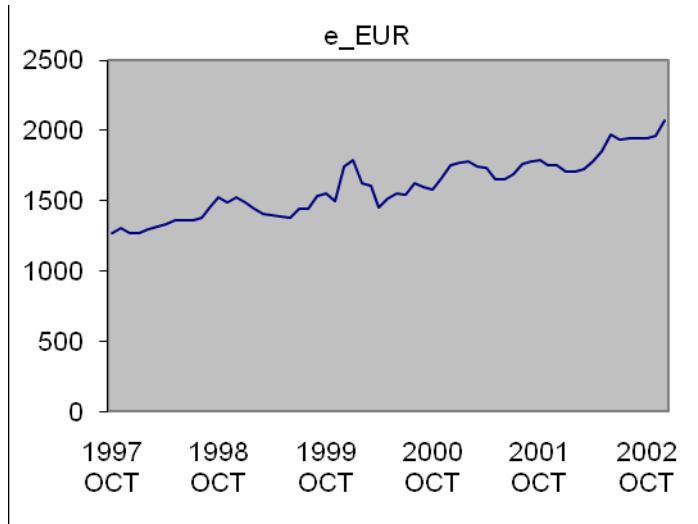
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 63	
Mean	-0.001186
Median	0.005236
Maximum	0.226938
Minimum	-0.343862
Std. Dev.	0.077708
Skewness	-1.699354
Kurtosis	9.953276
Jarque-Bera	157.2356
Probability	0.000000
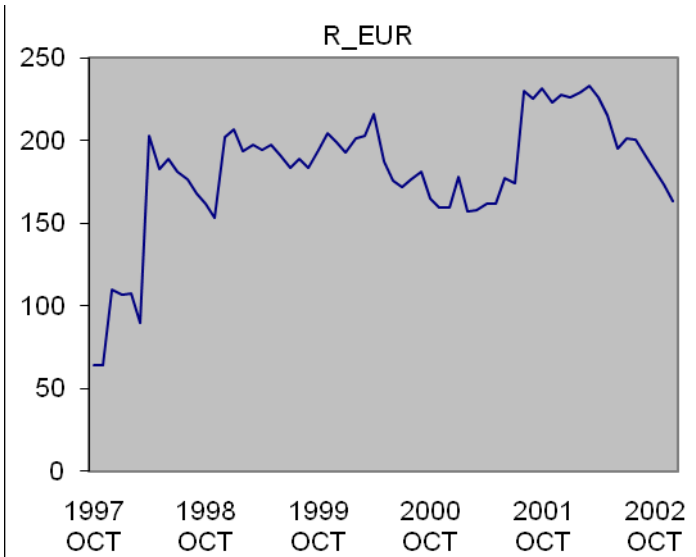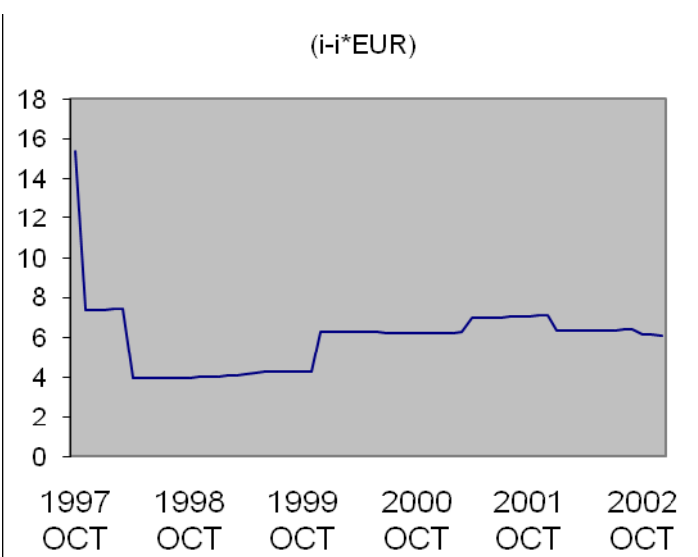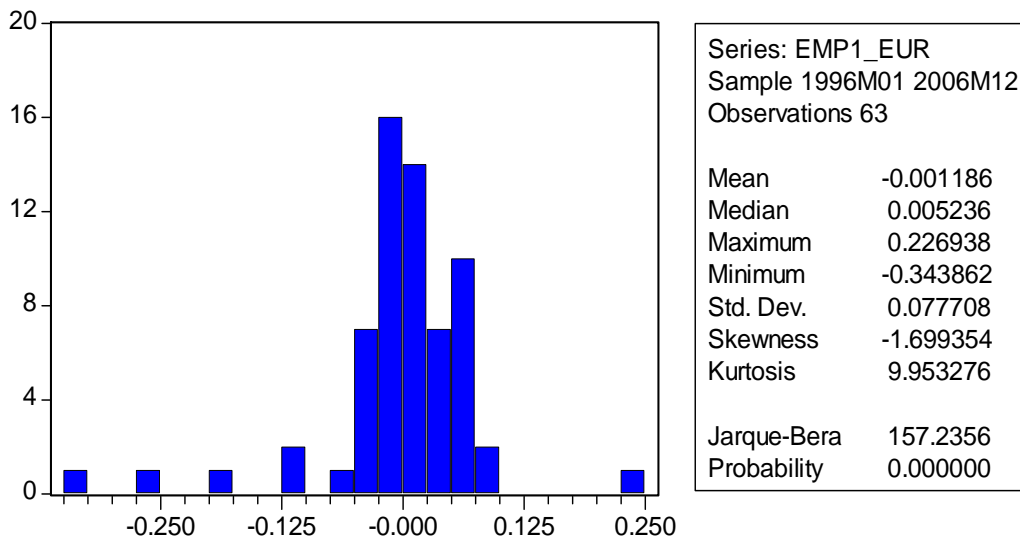
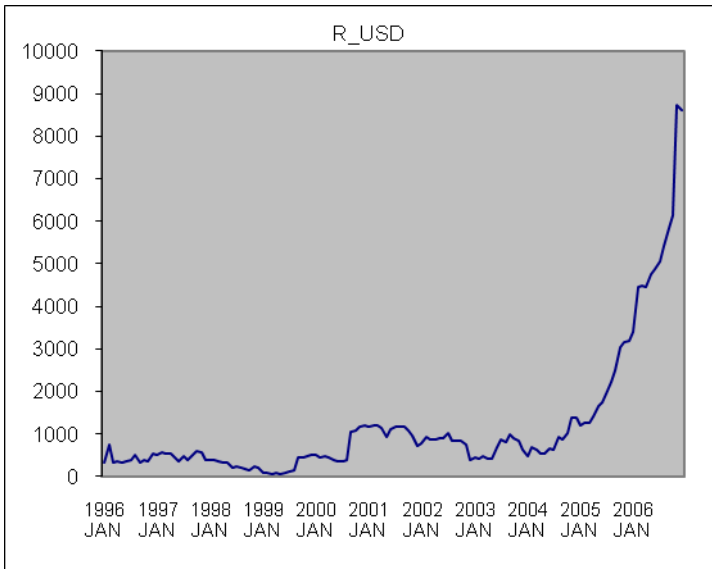Exchange Market Pressure histogram
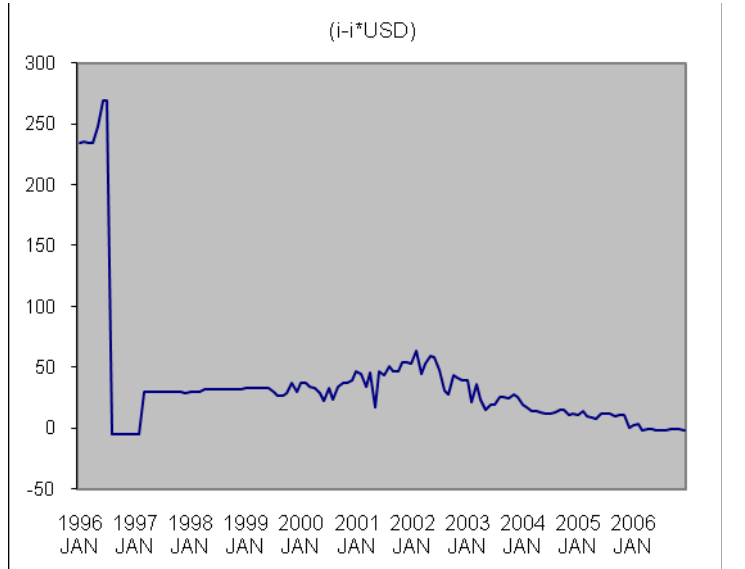
Country Appendix 9: Guinea-Bissau
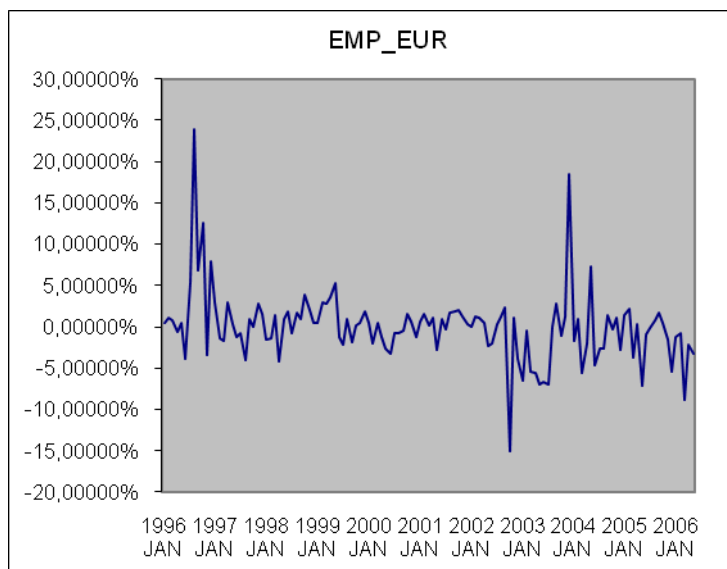
Exchange Market Pressure, monthly evolution
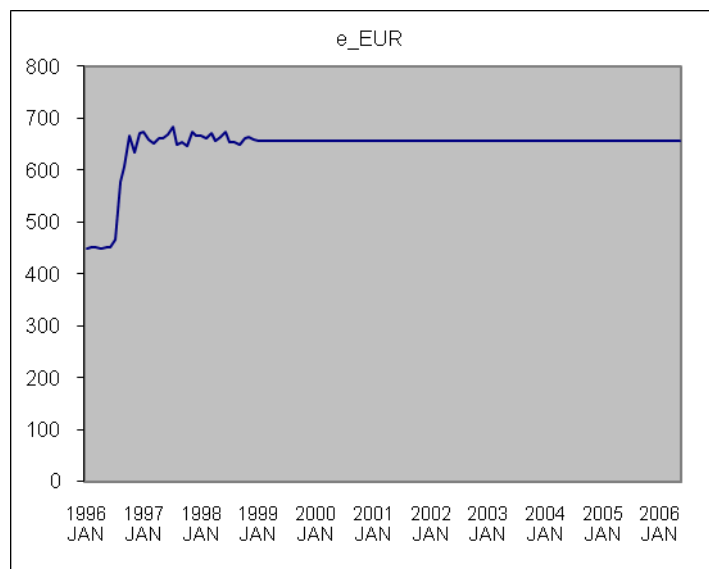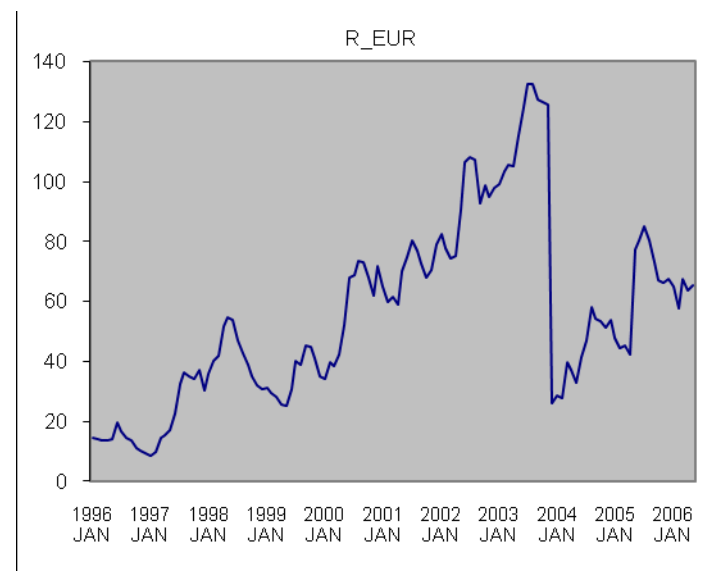
Exchange Rate Nominal Currency per Euro
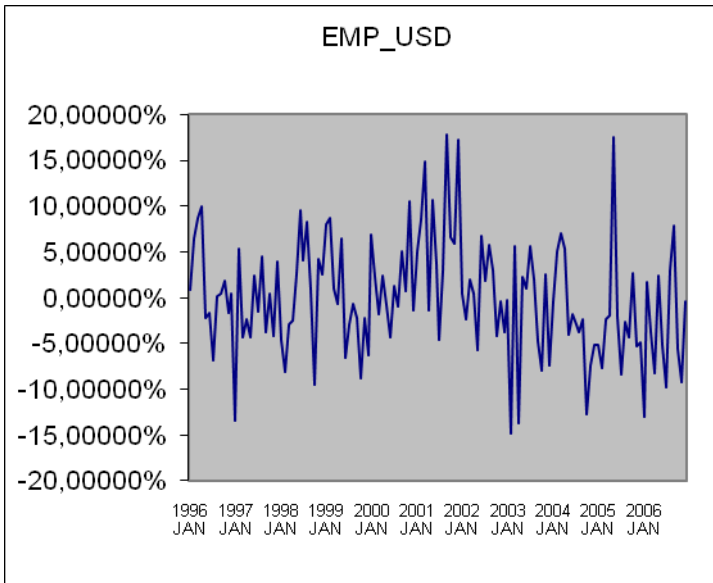

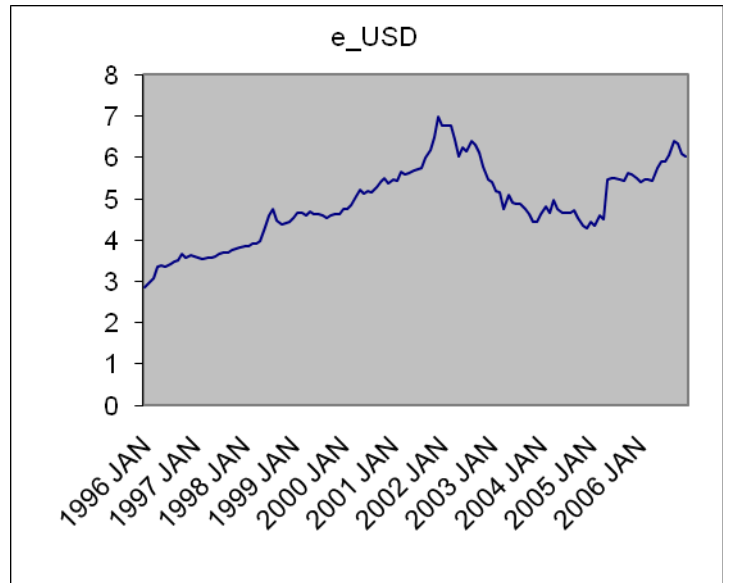Foreign Reserves (excluding gold) measure in Euro
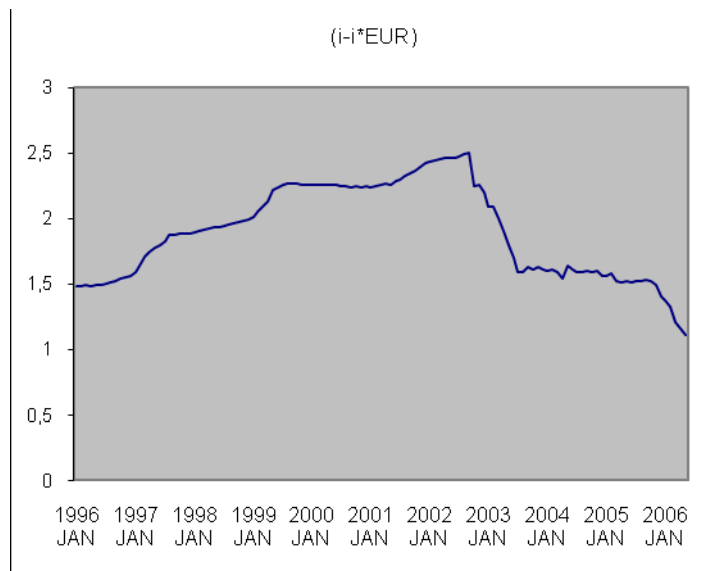
Interest rate differential
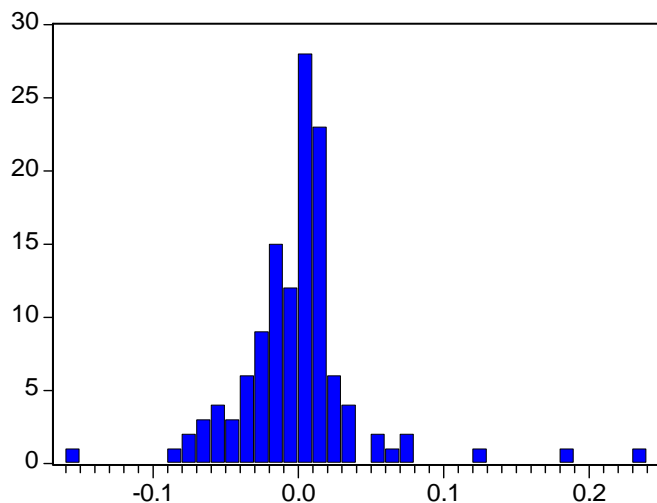
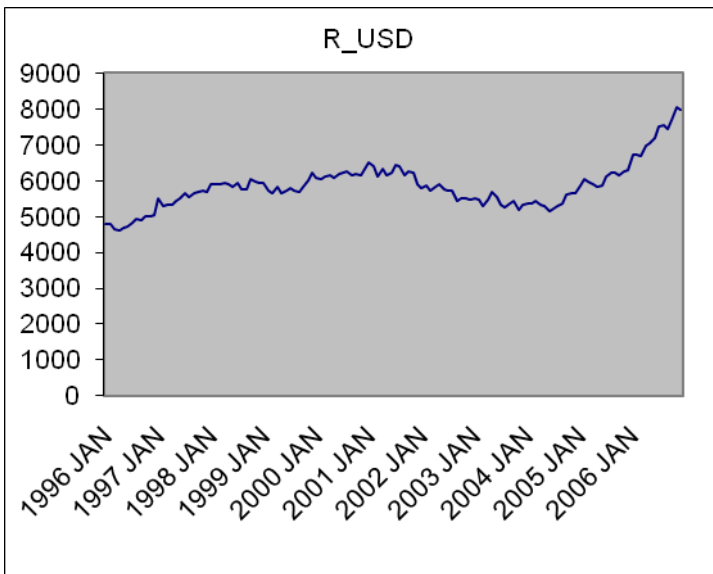| Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.000107
Median	0.003240
Maximum	0.239035
Minimum	-0.150758
Std. Dev.	0.043349
Skewness	1.668190
Kurtosis	12.79991
Jarque-Bera	558.1751
Probability	0.000000

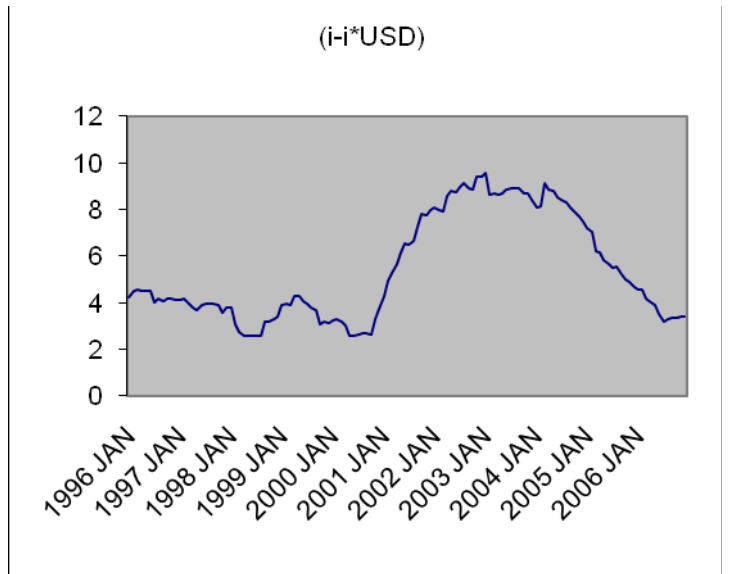Exchange Market Pressure histogram

Country Appendix 10: Liberia
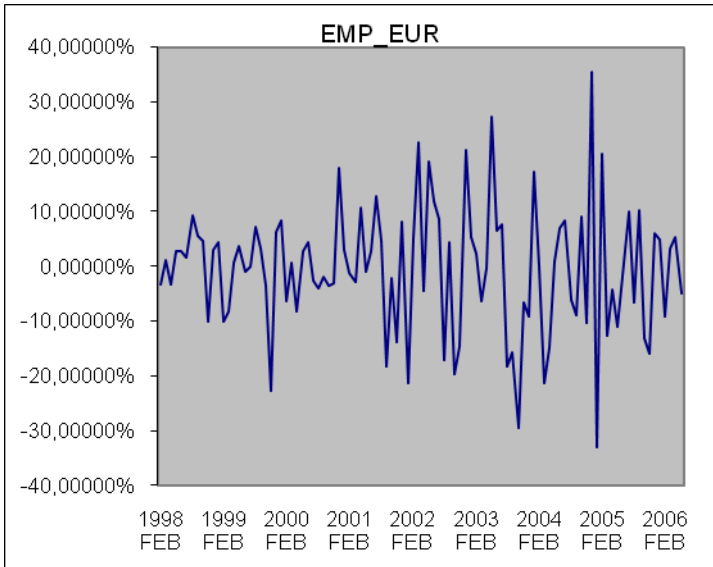
Exchange Market Pressure, monthly evolution
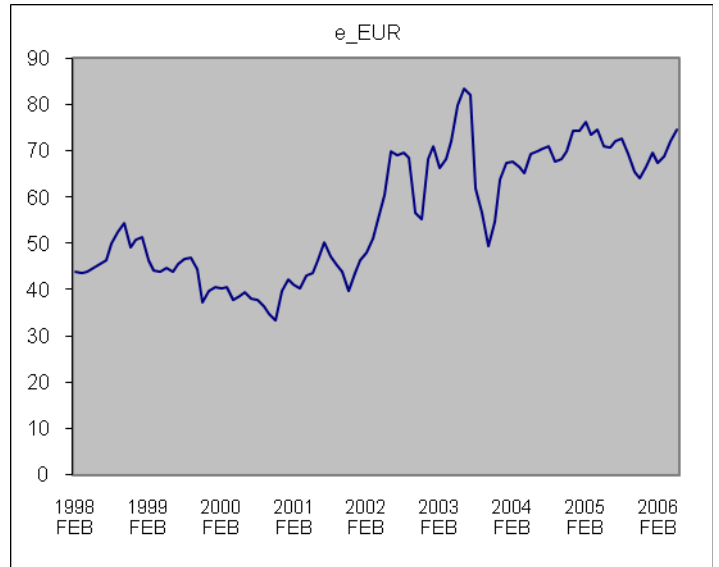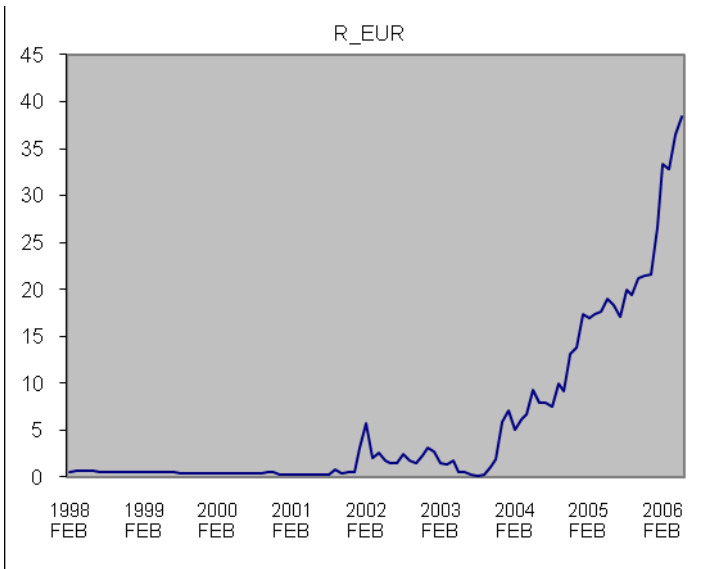
Exchange Rate Nominal Currency per Euro
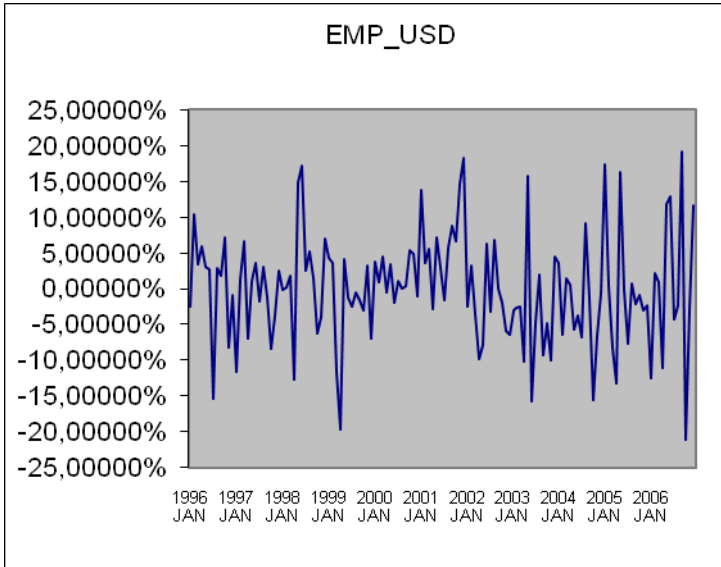

Foreign Reserves (excluding gold) measure in Euro
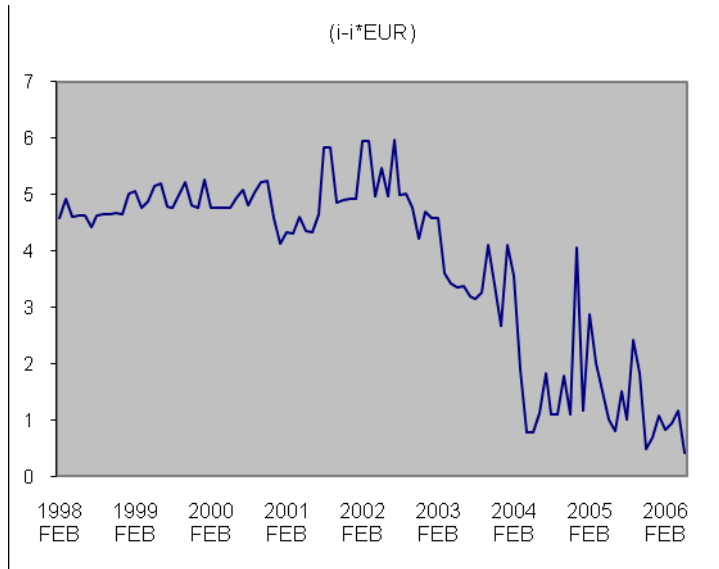
Interest rate differential
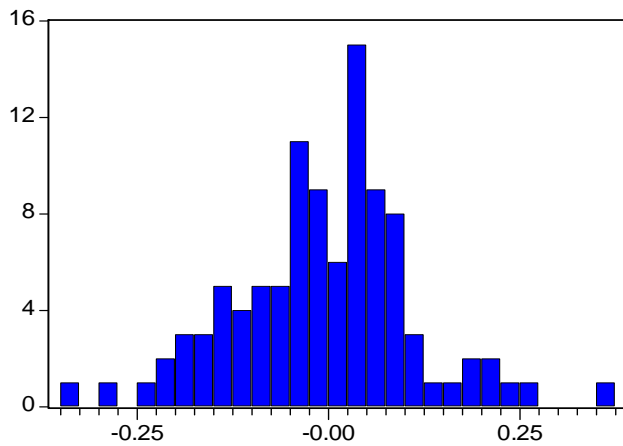
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 100	
Mean	-0.005688
Median	0.002480
Maximum	0.355553
Minimum	-0.330522
Std. Dev.	0.116281
Skewness	0.004983
Kurtosis	3.746679
Jarque-Bera	2.323451
Probability	0.312946

Exchange Market Pressure histogram

Country Appendix 10: Mali
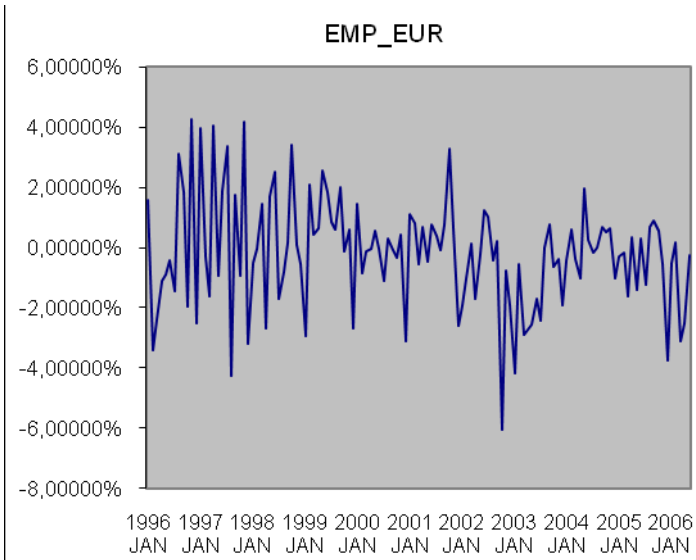
EMP_EUR
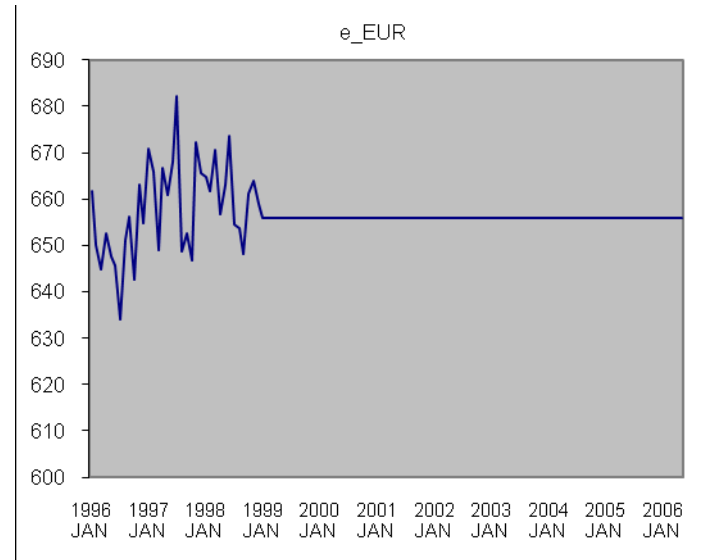
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)
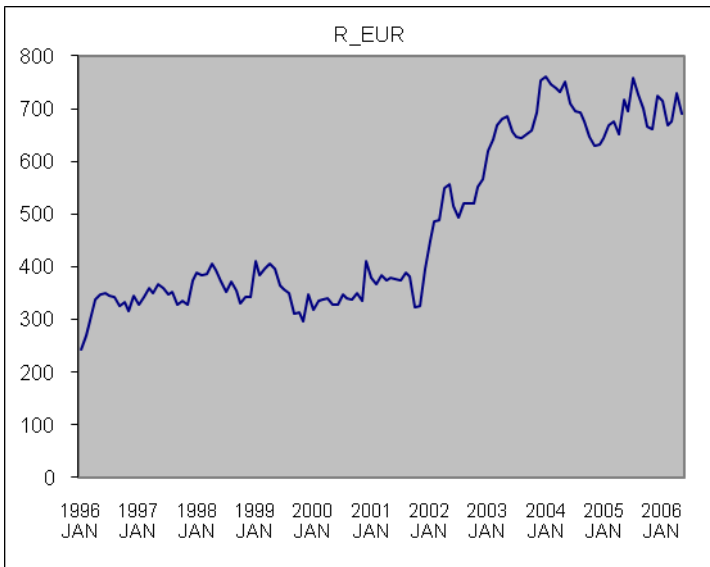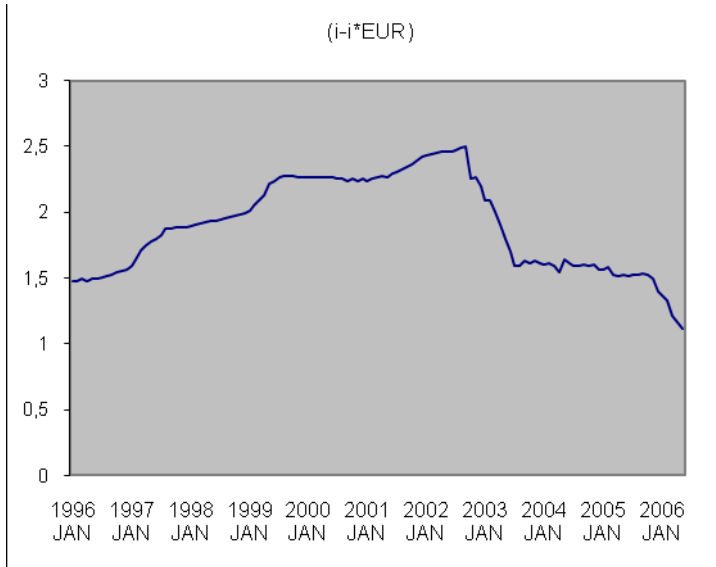
Interest rate differential
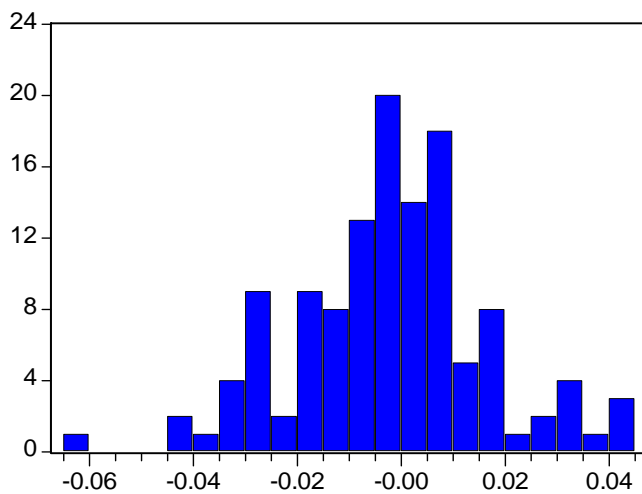
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.002057
Median	-0.001278
Maximum	0.042570
Minimum	-0.060354
Std. Dev.	0.018382
Skewness	-0.044221
Kurtosis	3.516077
Jarque-Bera	1.427904
Probability	0.489705

Exchange Market Pressure histogram

Country Appendix 11: Niger
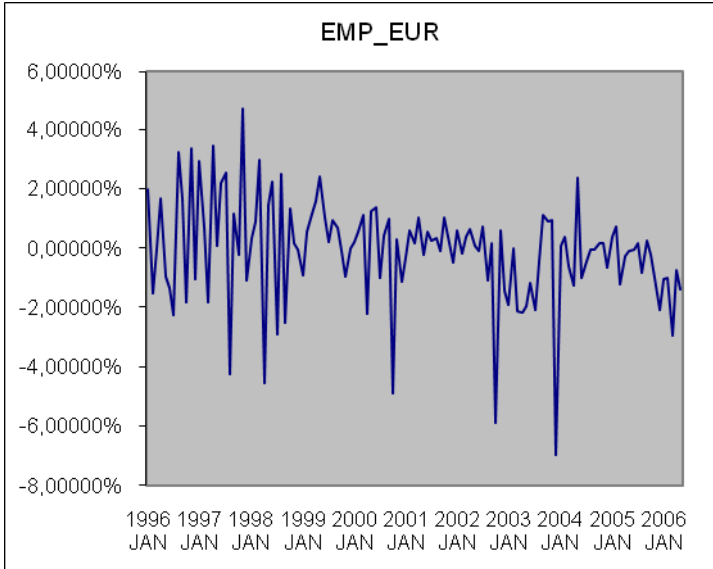
Exchange Market Pressure, monthly evolution
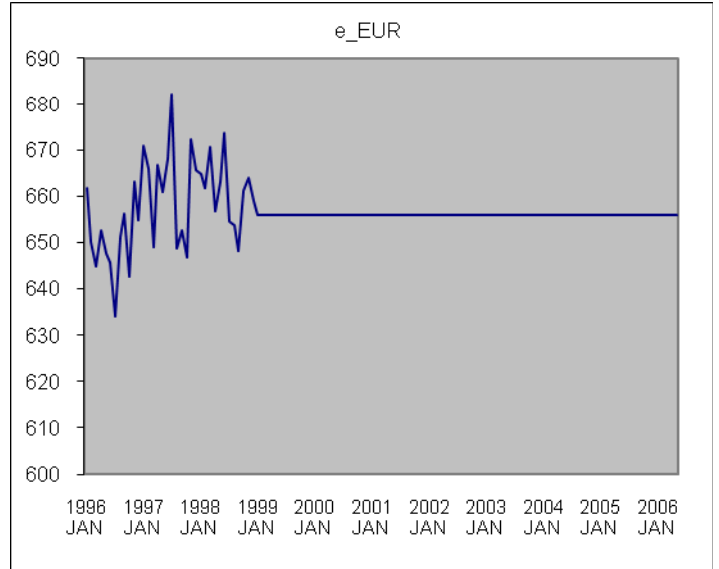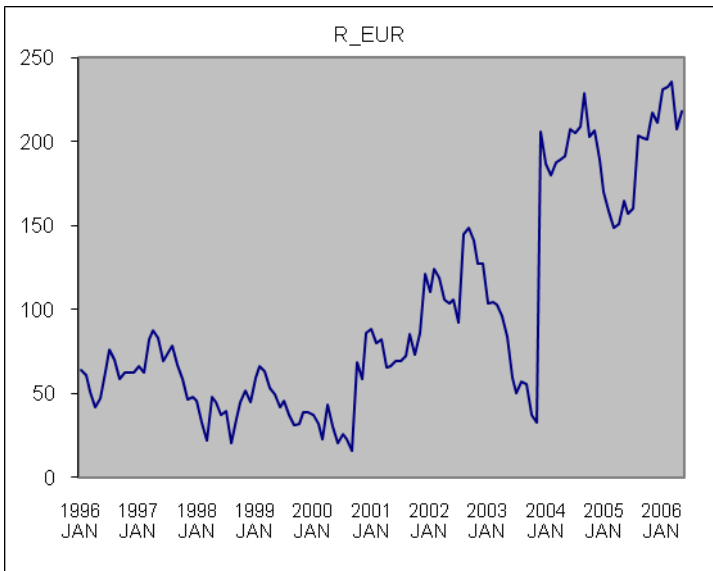
Exchange Rate Nominal Currency per Euro

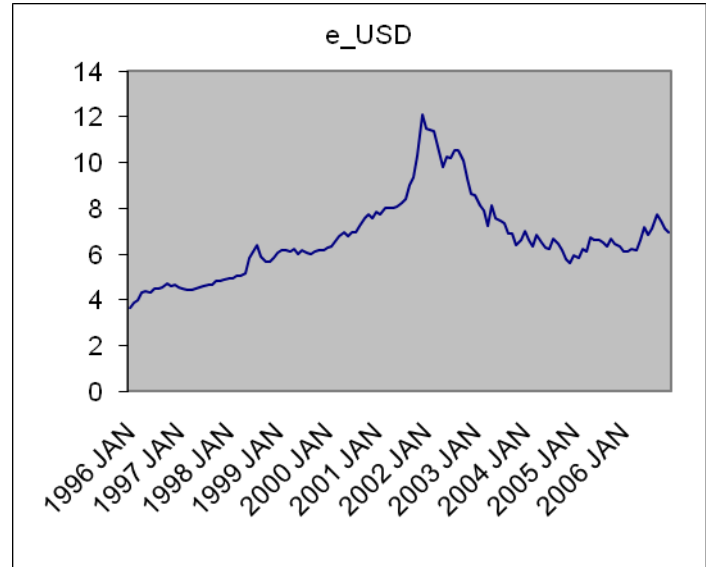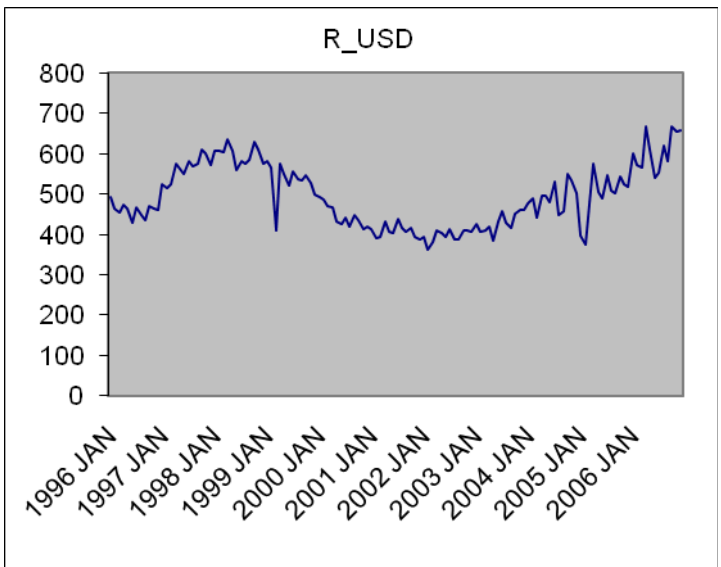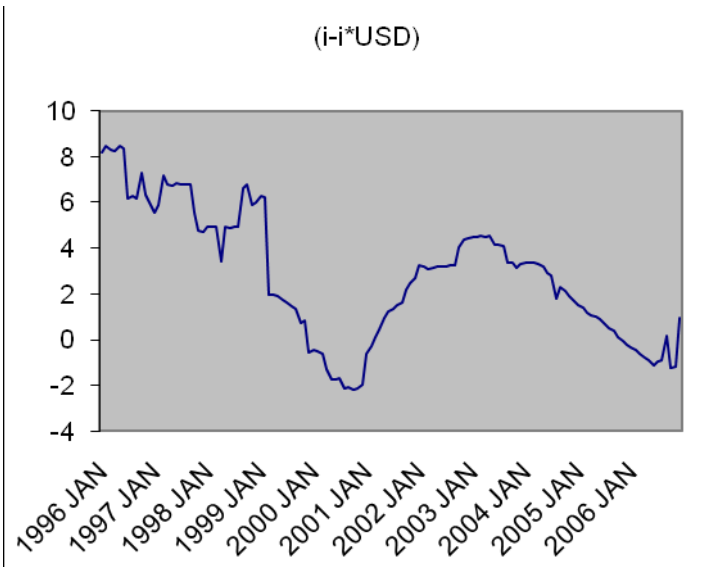Foreign Reserves (excluding gold) measure in Euro
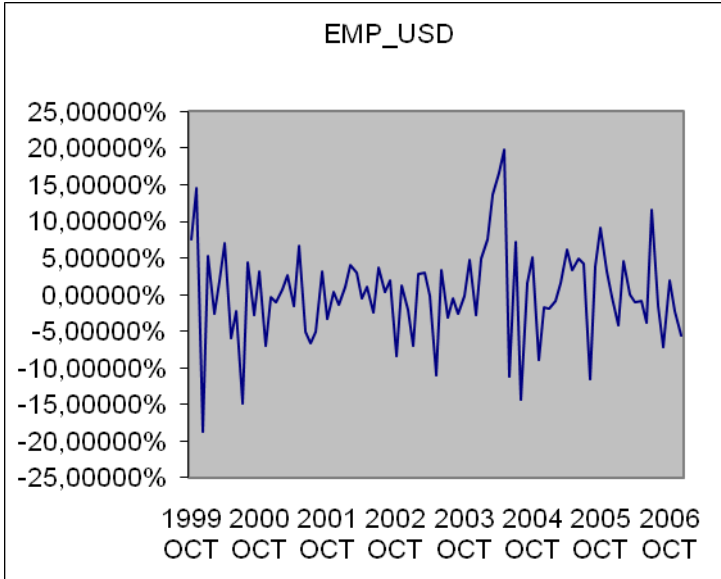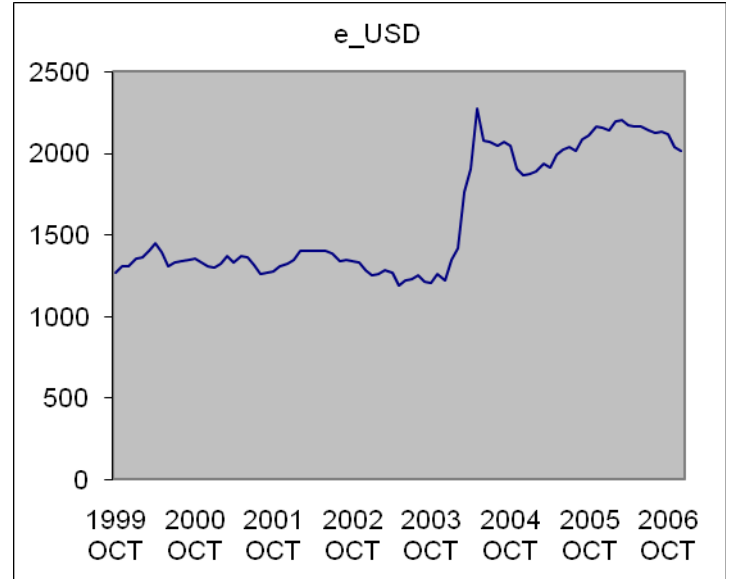

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.000973
Median	0.000900
Maximum	0.047039
Minimum	-0.069592
Std. Dev.	0.017599
Skewness	-0.752857
Kurtosis	5.382084
Jarque-Bera	41.36196
Probability	0.000000
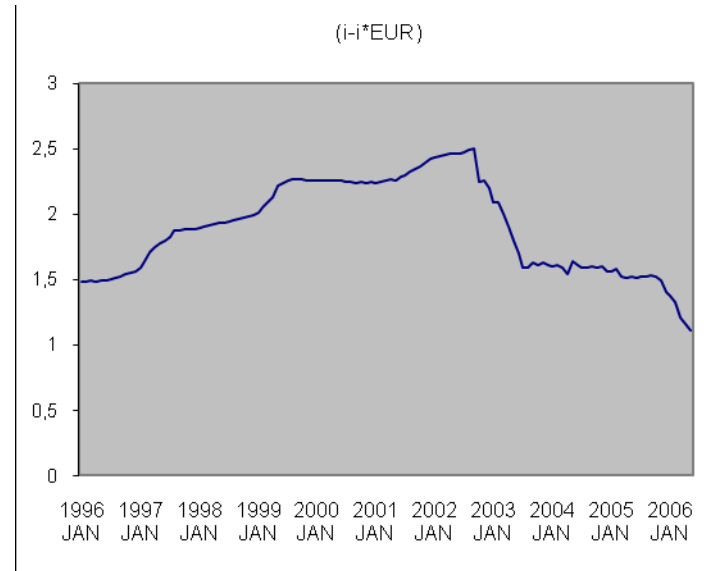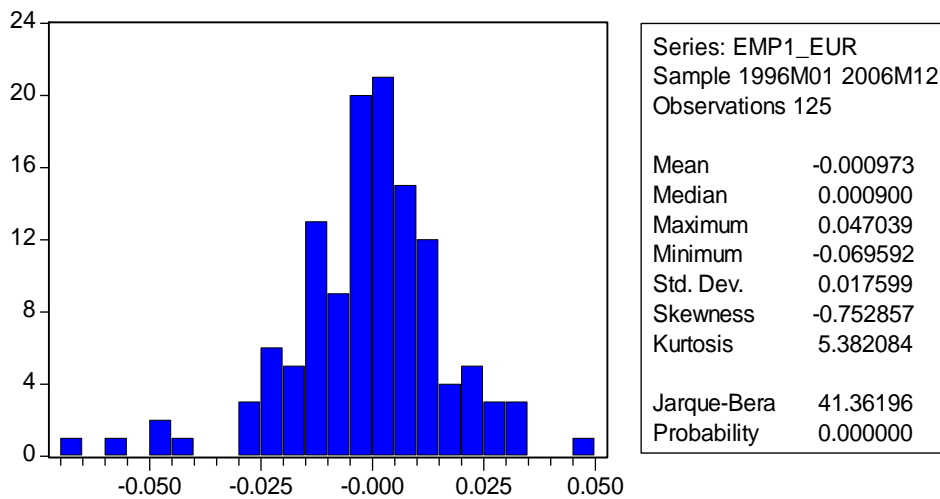
Exchange Market Pressure histogram

Country Appendix 12: Nigeria
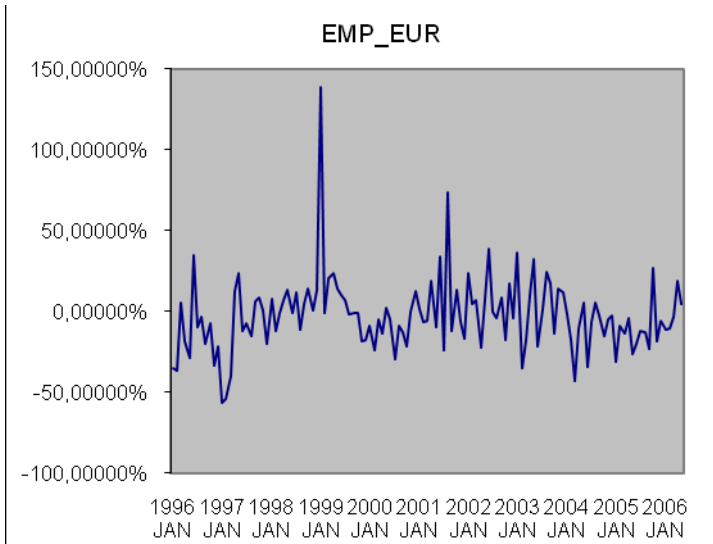
EMP_EUR
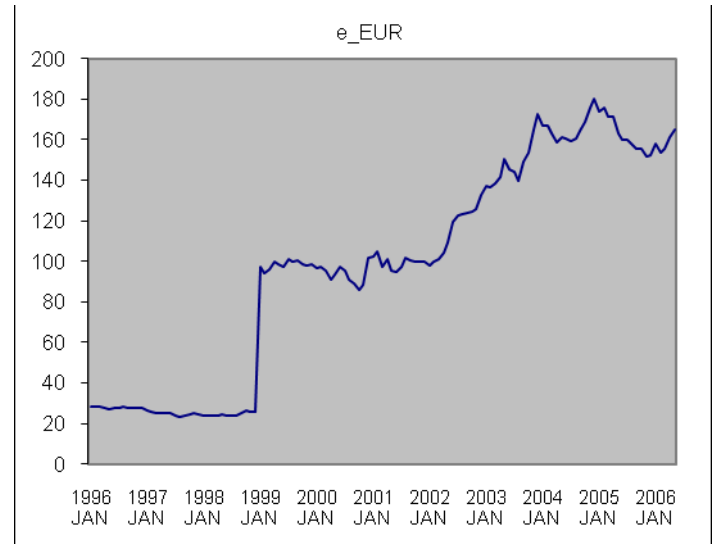
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)
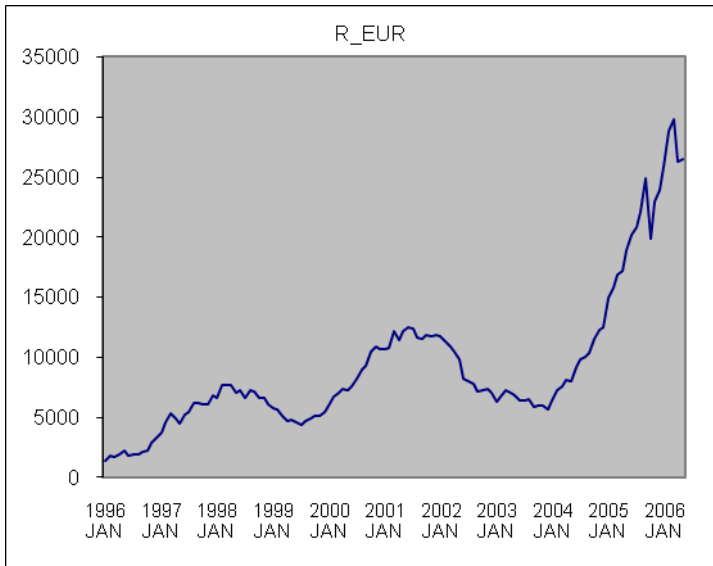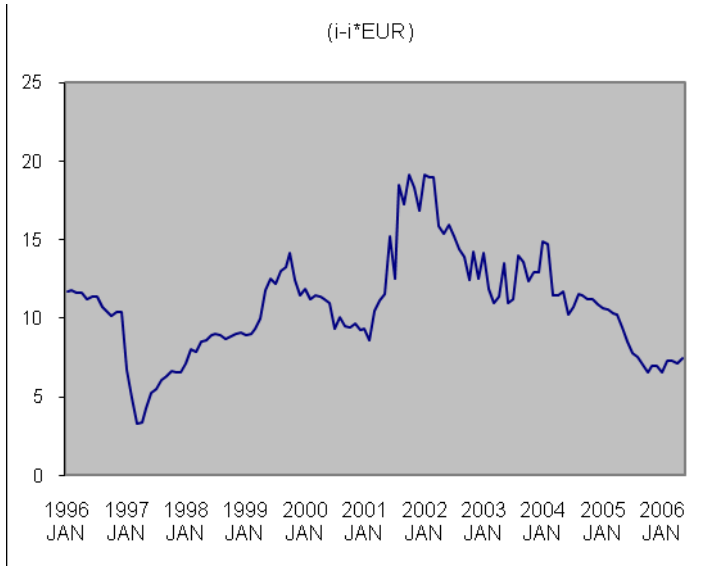
Interest rate differential
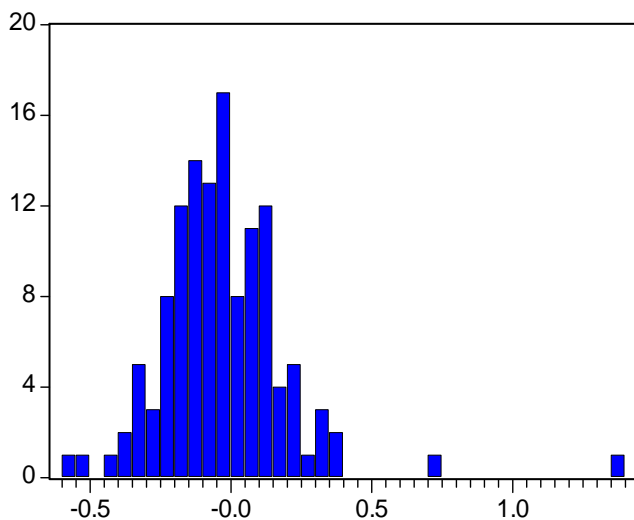
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.025486
Median	-0.042971
Maximum	1.389106
Minimum	-0.565863
Std. Dev.	0.232470
Skewness	1.917735
Kurtosis	13.32473
Jarque-Bera	631.8277
Probability	0.000000

Exchange Market Pressure histogram
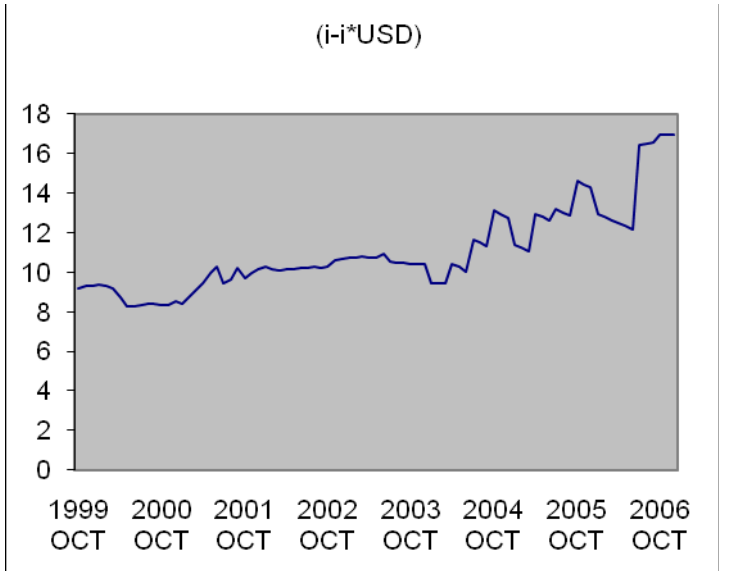
Country Appendix 13: Senegal
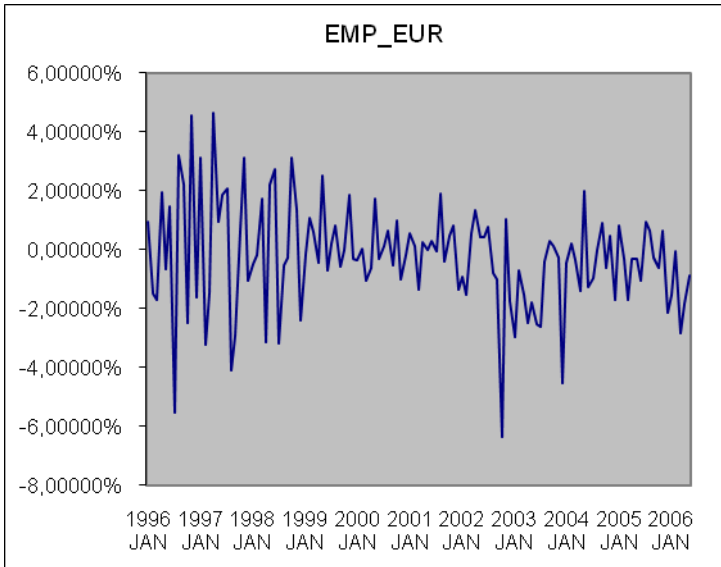
EMP_EUR
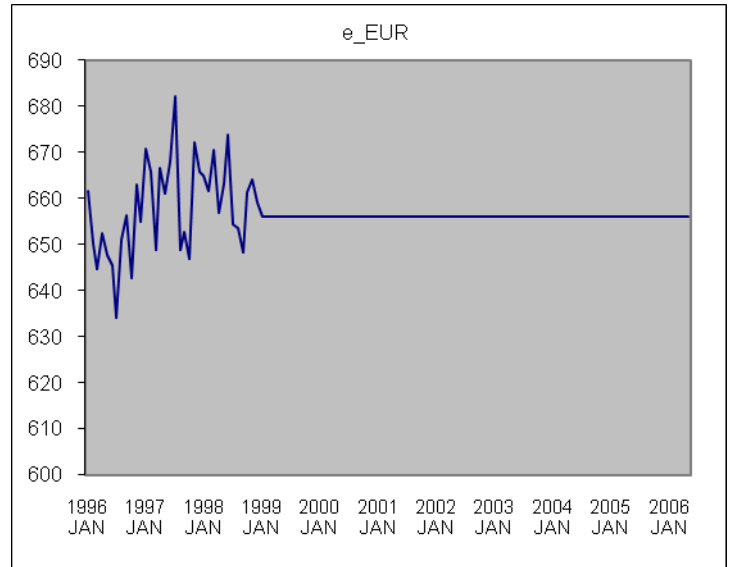
Exchange Market Pressure, monthly evolution

e_EUR

Exchange Rate Nominal Currency per Euro

R_EUR

Foreign Reserves (excluding gold) measure in Euro

(i-i*EUR)
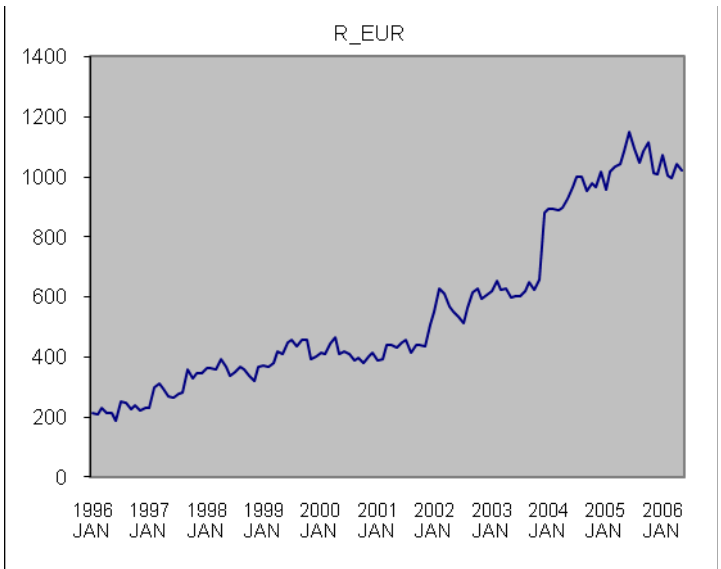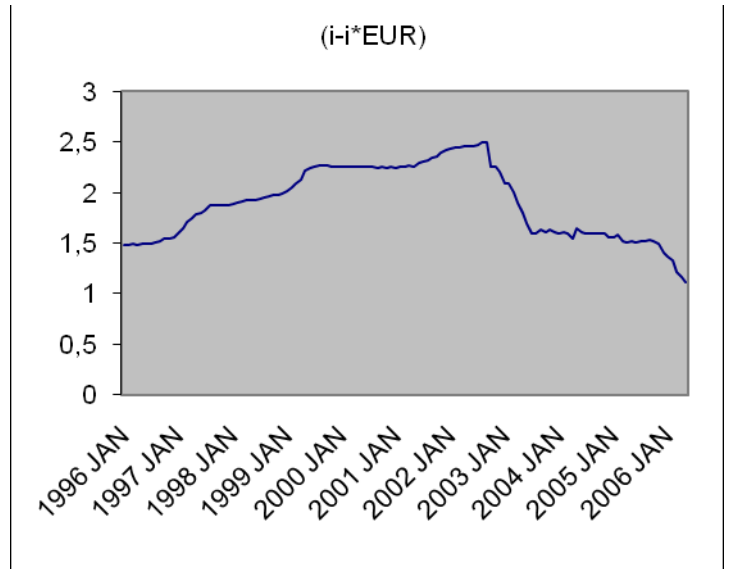
Interest rate differential
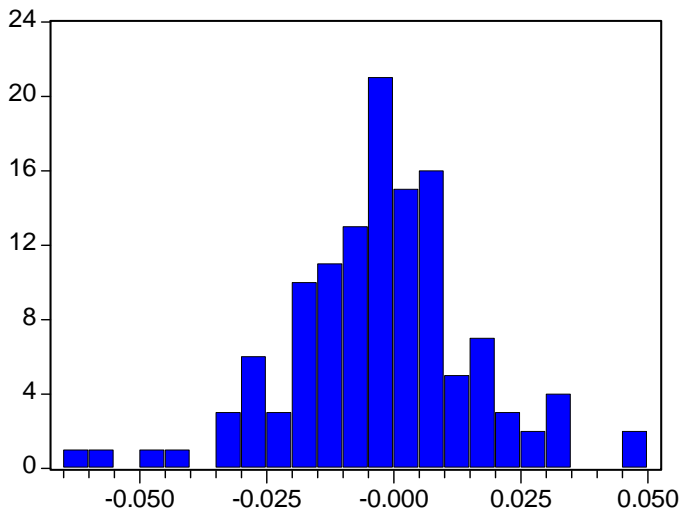
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.002444
Median	-0.002920
Maximum	0.046479
Minimum	-0.063335
Std. Dev.	0.017915
Skewness	-0.251016
Kurtosis	4.204980
Jarque-Bera	8.875057
Probability	0.011825

Exchange Market Pressure histogram

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Country Appendix 14: Sierra Leone

Exchange Market Pressure, monthly evolution
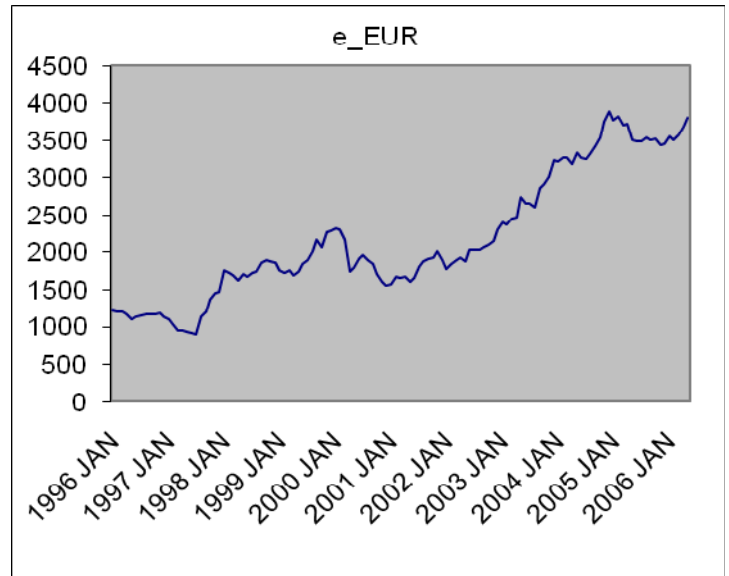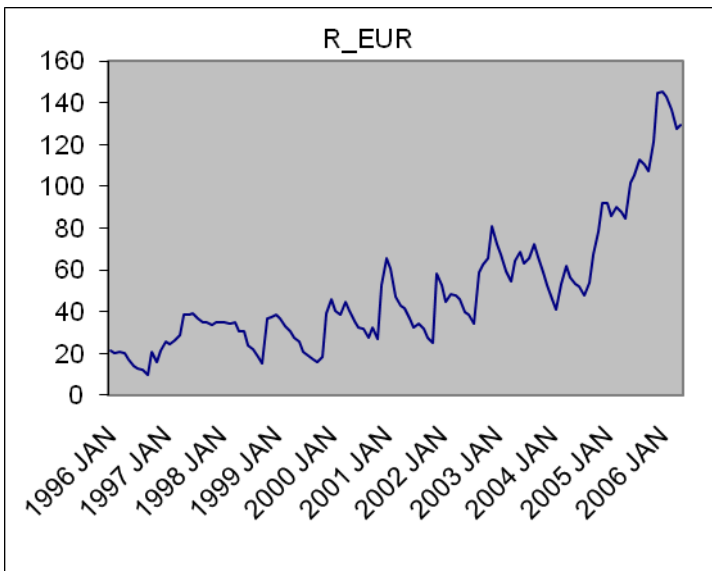
Exchange Rate Nominal Currency per Euro

Foreign Reserves (excluding gold) measure in Euro
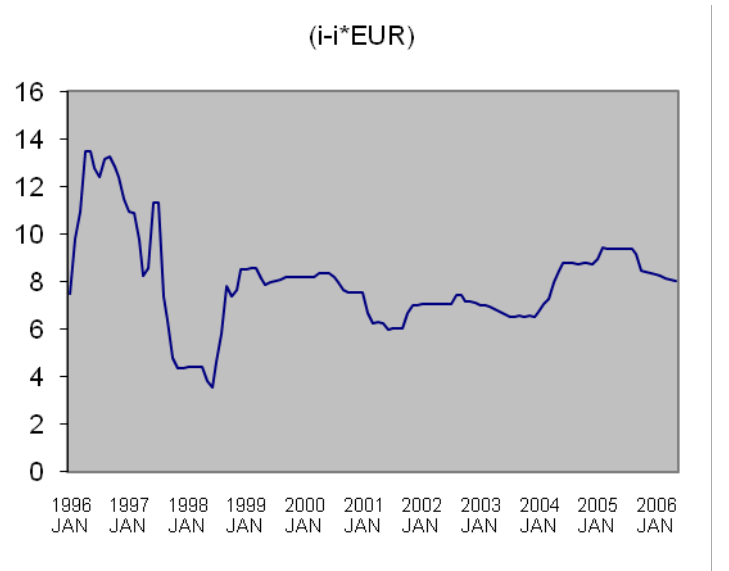
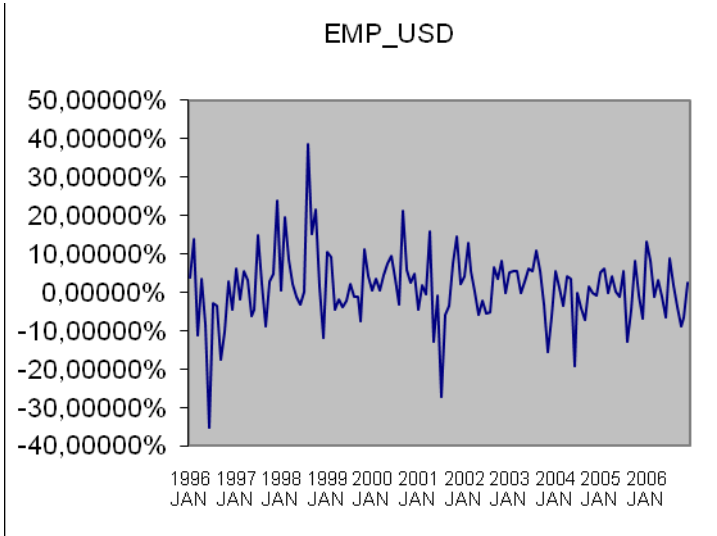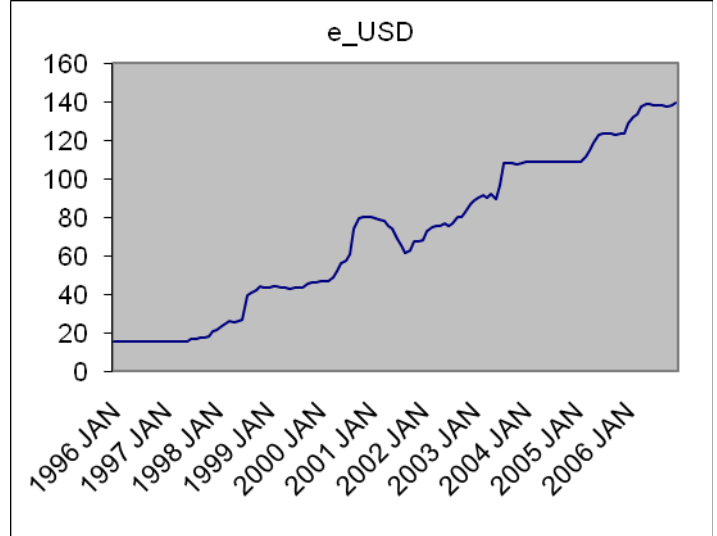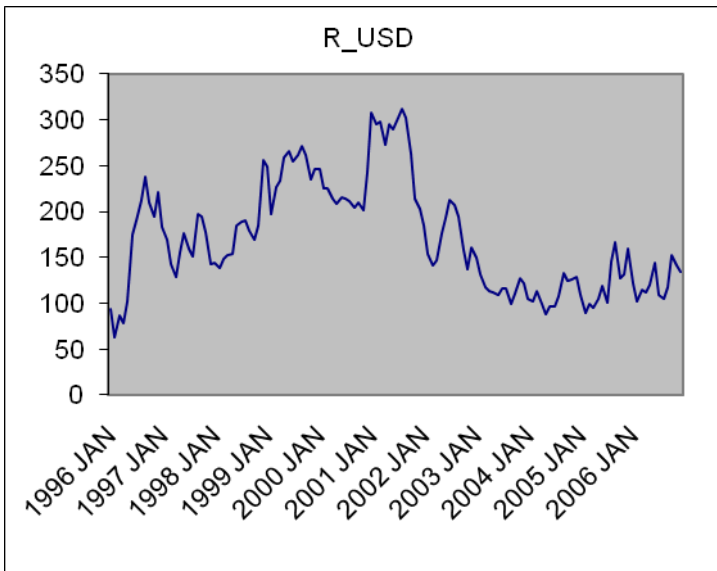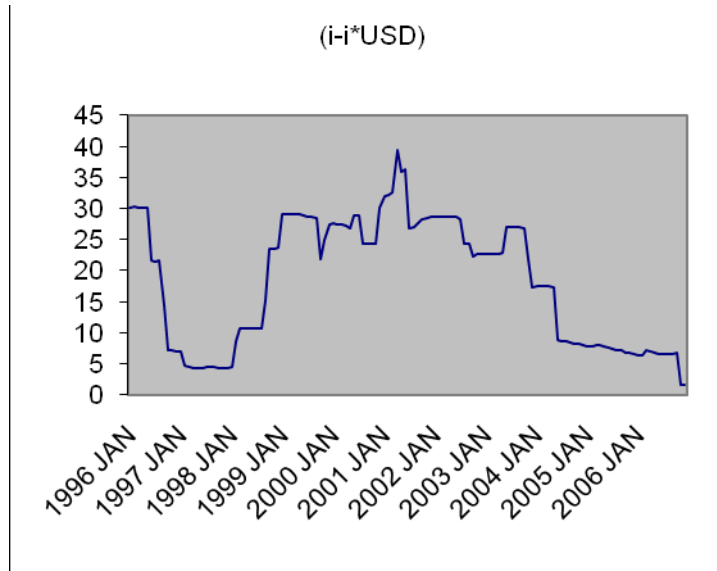Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	0.006373
Median	0.014159
Maximum	0.251491
Minimum	-0.269482
Std. Dev.	0.086081
Skewness	-0.596511
Kurtosis	4.575973
Jarque-Bera	20.34892
Probability	0.000038

Exchange Market Pressure histogram

Country Appendix 15: Togo

Exchange Market Pressure, monthly evolution

Exchange Rate Nominal Currency per Euro
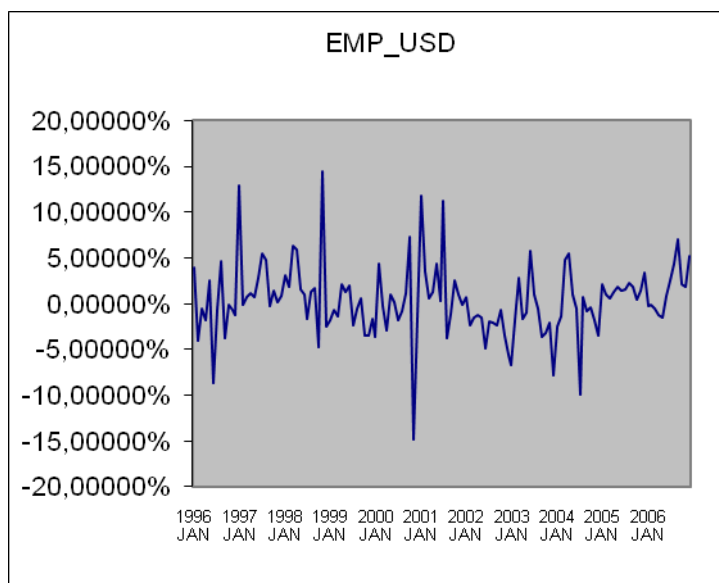

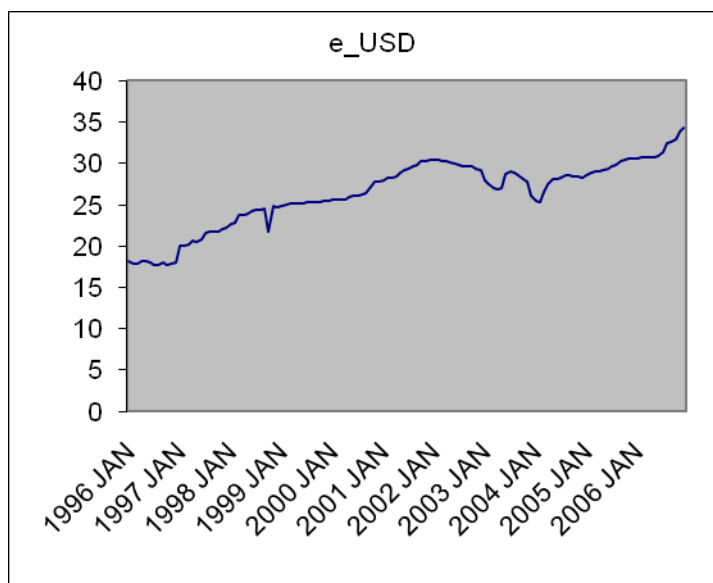Foreign Reserves (excluding gold) measure in Euro

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	-0.001202
Median	-0.000416
Maximum	0.046614
Minimum	-0.064286
Std. Dev.	0.017819
Skewness	-0.115186
Kurtosis	4.593440
Jarque-Bera	13.50063
Probability	0.001171
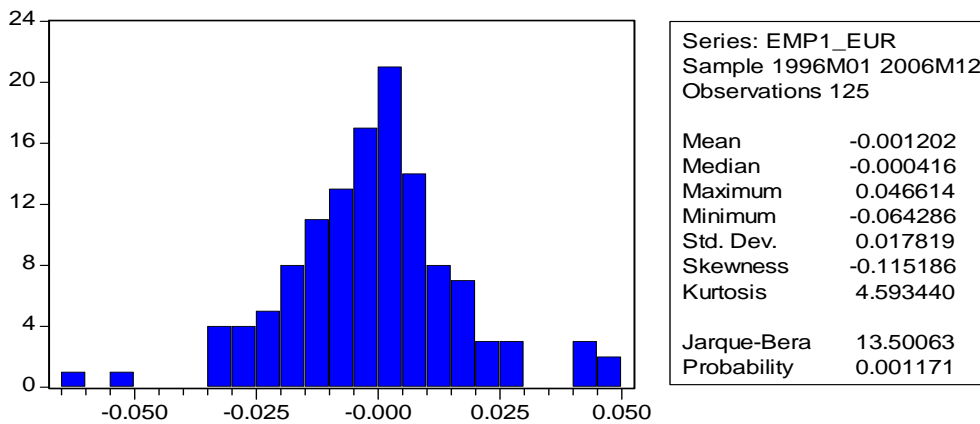
Exchange Market Pressure histogram

Country Appendix 16: São Tomé and Principe
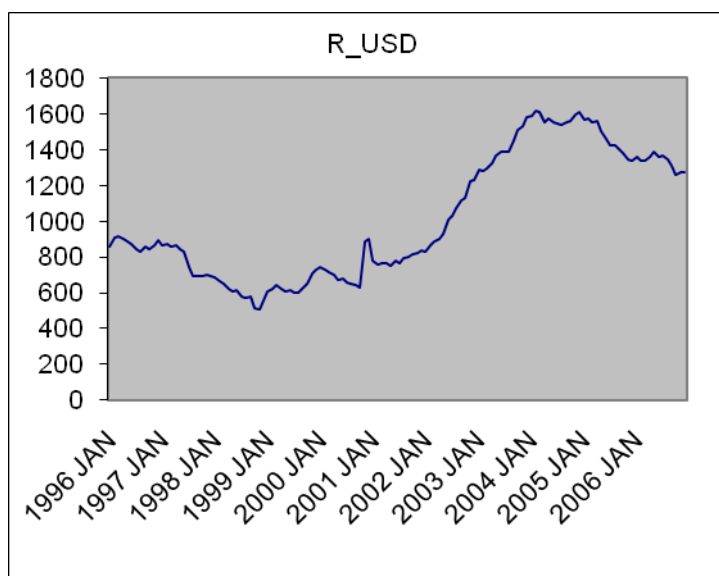

Exchange Market Pressure, monthly evolution

Exchange Rate Nominal Currency per Euro

Foreign Reserves (excluding gold) measure in Euro
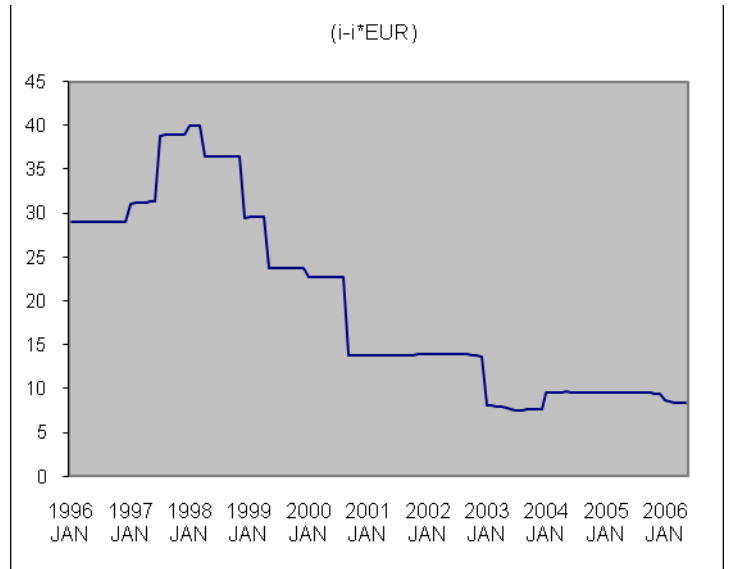
Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 125	
Mean	0.004587
Median	0.007374
Maximum	0.236426
Minimum	-0.272134
Std. Dev.	0.073641
Skewness	-0.493172
Kurtosis	5.152033
Jarque-Bera	29.18811
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 17: Angola

Exchange Market Pressure, monthly evolution


Exchange Rate Nominal Currency per Dollar
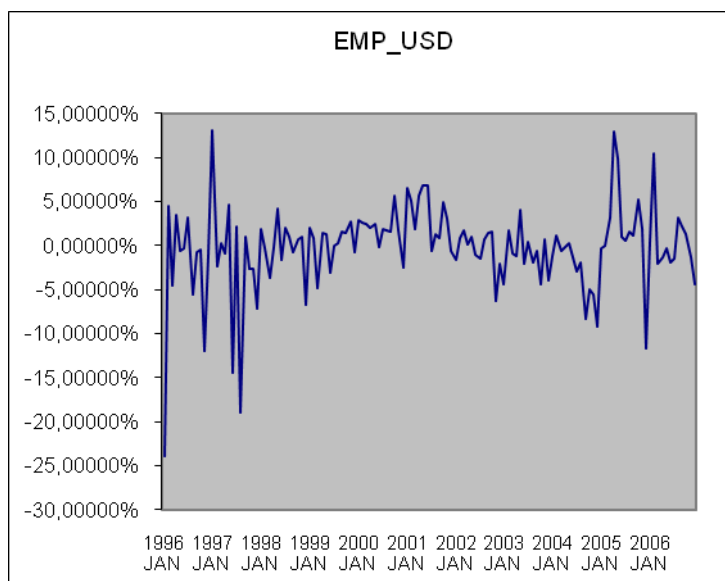

Foreign Reserves (excluding gold) measure in Dollars
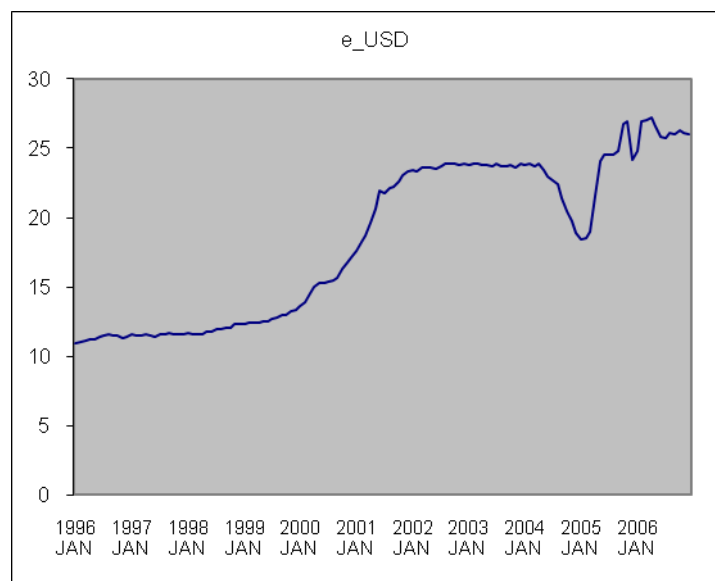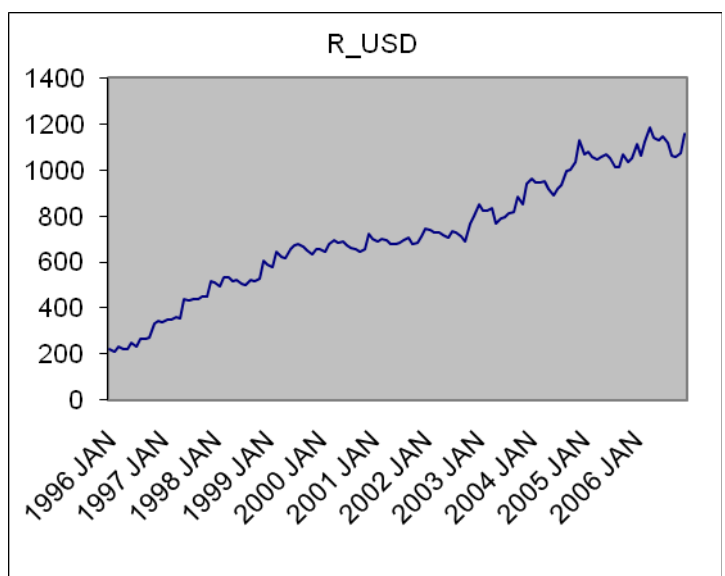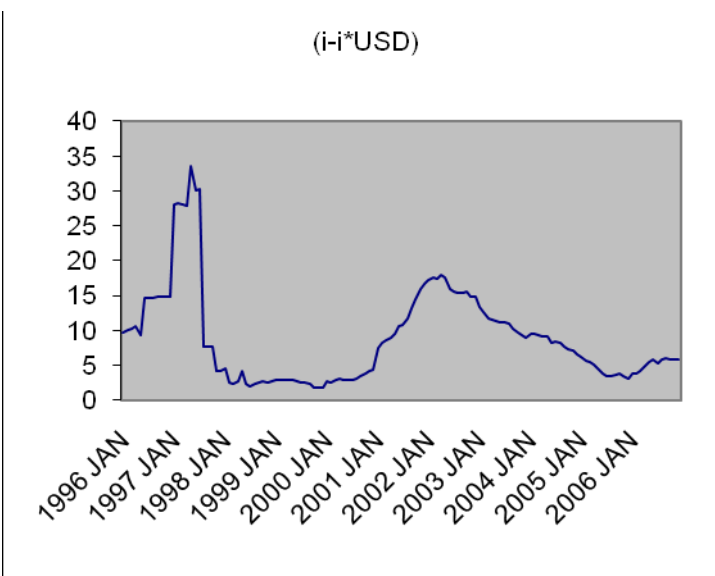

Interest rate differential

Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	0.041700
Median	0.023863
Maximum	1.583338
Minimum	-2.112894
Std. Dev.	0.314297
Skewness	-1.005968
Kurtosis	23.72968
Jarque-Bera	2385.722
Probability	0.000000
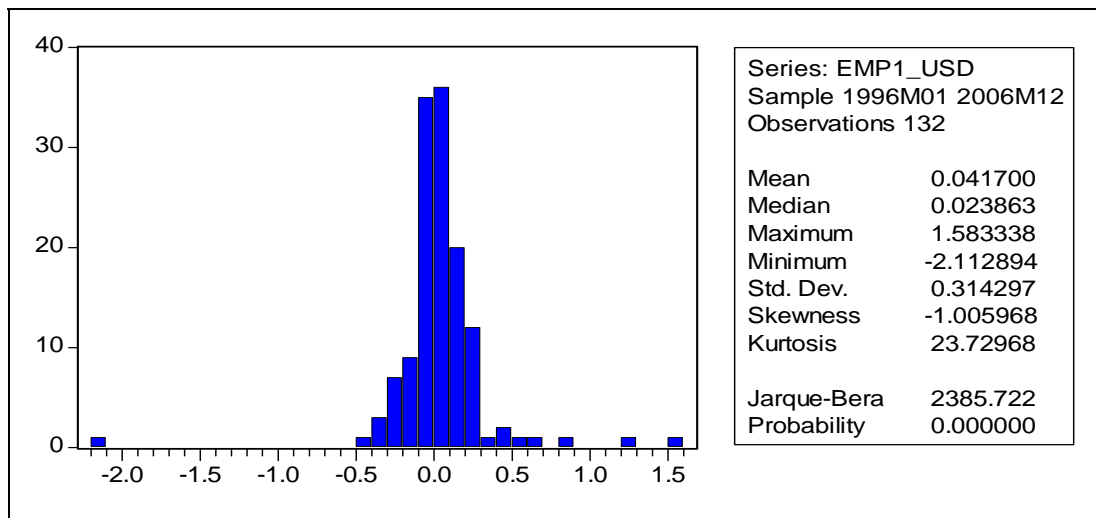
Exchange Market Pressure histogram

Country Appendix 18: Botswana

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential
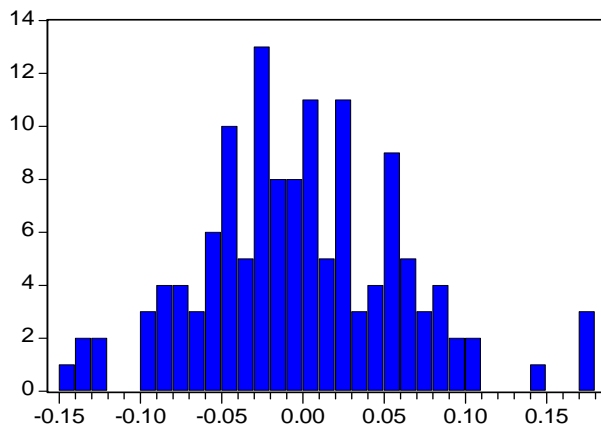
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.000636
Median	-0.004282
Maximum	0.178127
Minimum	-0.147585
Std. Dev.	0.062263
Skewness	0.308892
Kurtosis	3.450306
Jarque-Bera	3.214379
Probability	0.200450

Exchange Market Pressure histogram

Country Appendix 19: Lesotho

Exchange Market Pressure, monthly evolution
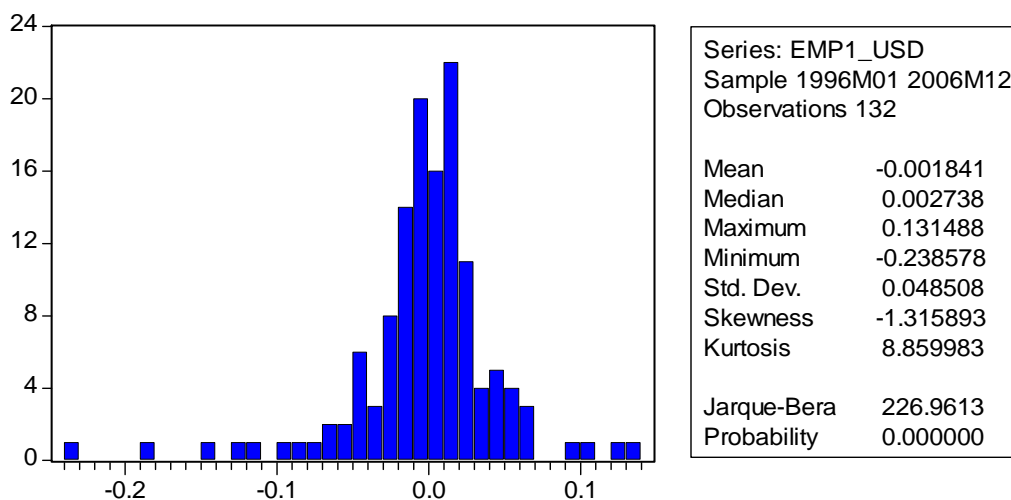

Exchange Rate Nominal Currency per Dollar
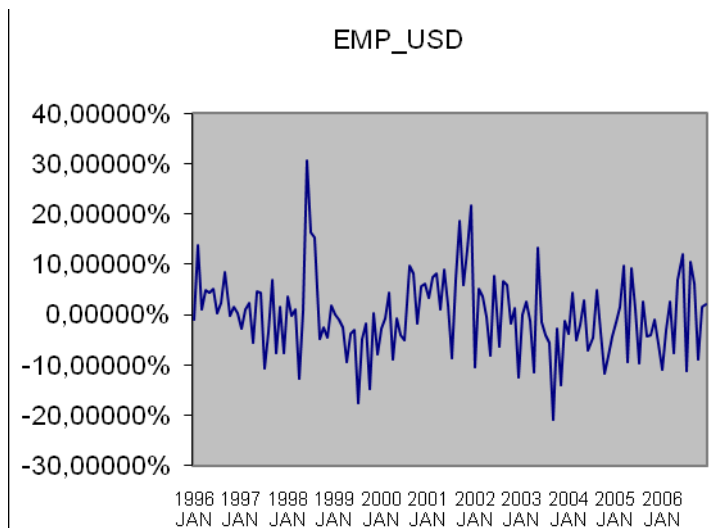

Foreign Reserves (excluding gold) measure in Dollars
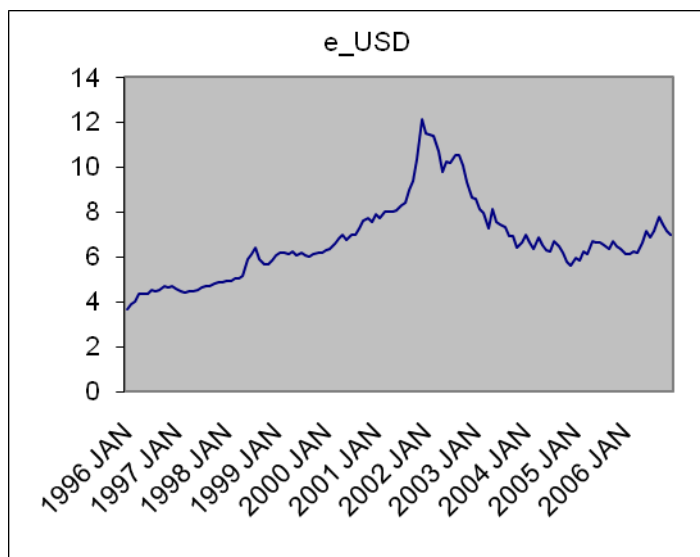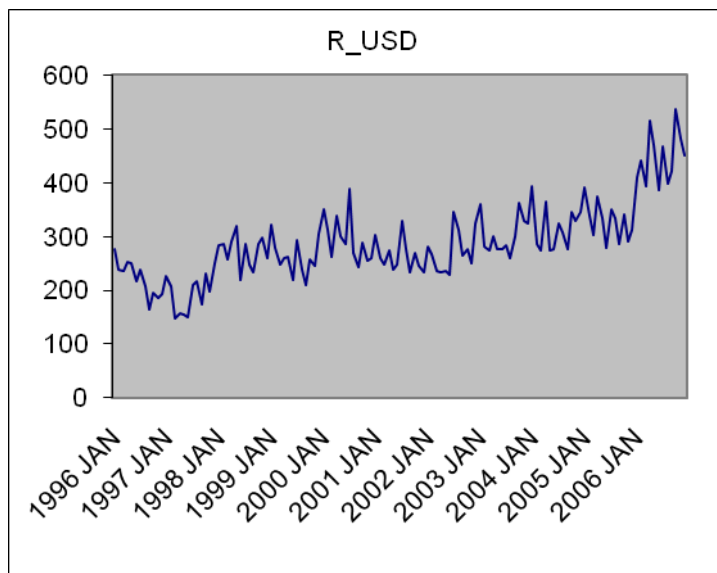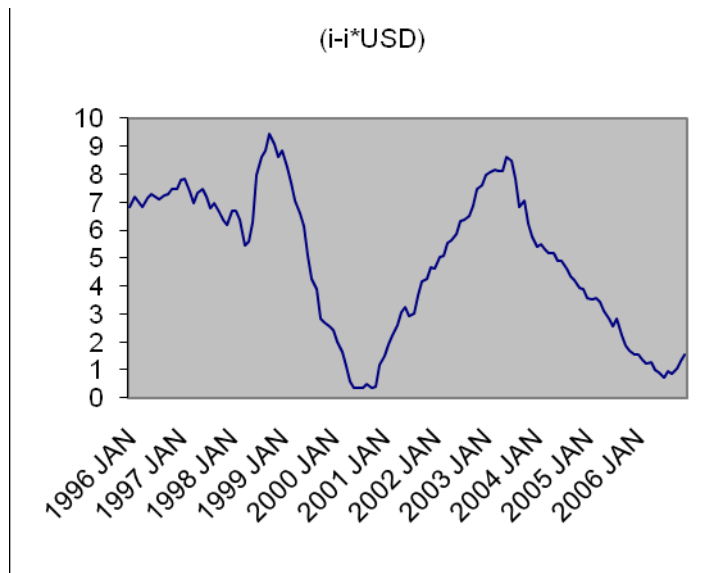

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.000239
Median	-0.001081
Maximum	0.190891
Minimum	-0.211341
Std. Dev.	0.076726
Skewness	0.071757
Kurtosis	3.425734
Jarque-Bera	1.110151
Probability	0.574029

Exchange Market Pressure histogram

Country Appendix 20: Madagascar

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

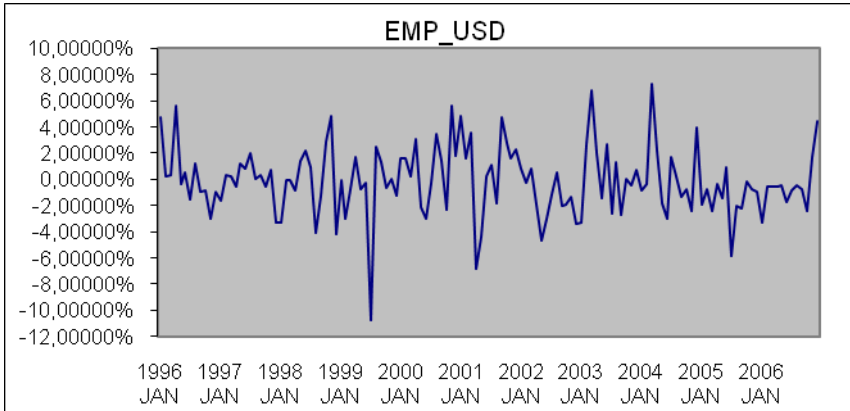Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 87	
Mean	0.002731
Median	0.001092
Maximum	0.197622
Minimum	-0.186332
Std. Dev.	0.065067
Skewness	0.011196
Kurtosis	4.190716
Jarque-Bera	5.141357
Probability	0.076484
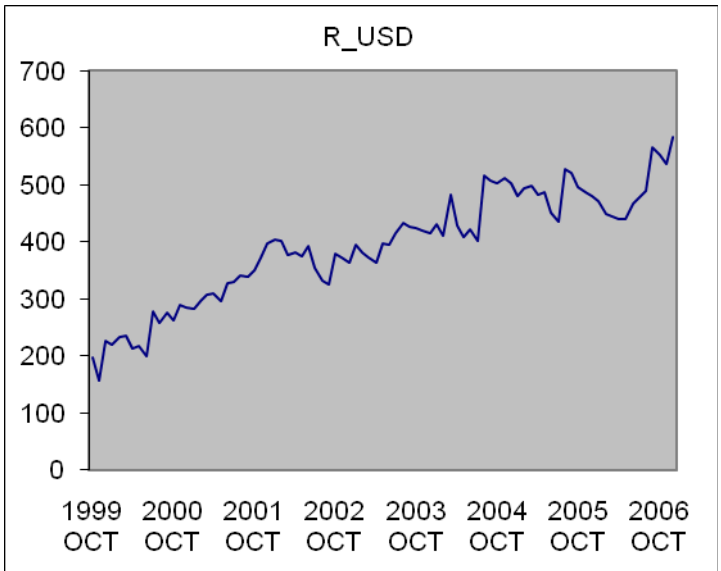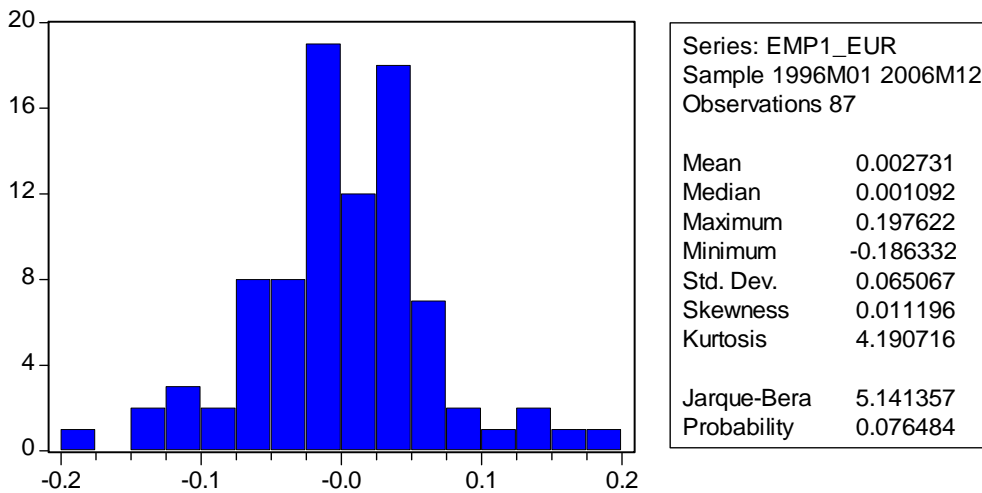
Exchange Market Pressure histogram

Country Appendix 21: Malawi

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential
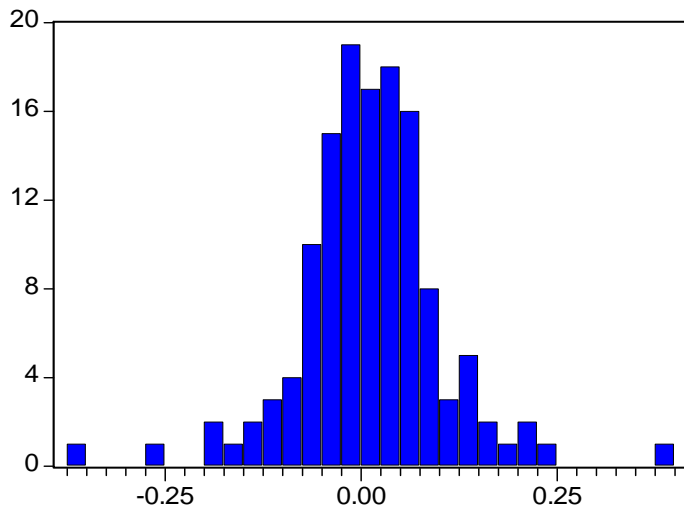
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	0.011894
Median	0.014944
Maximum	0.385919
Minimum	-0.352685
Std. Dev.	0.091376
Skewness	-0.028245
Kurtosis	6.604071
Jarque-Bera	71.45886
Probability	0.000000

Exchange Market Pressure histogram

# Country Appendix 22: Mauritius

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

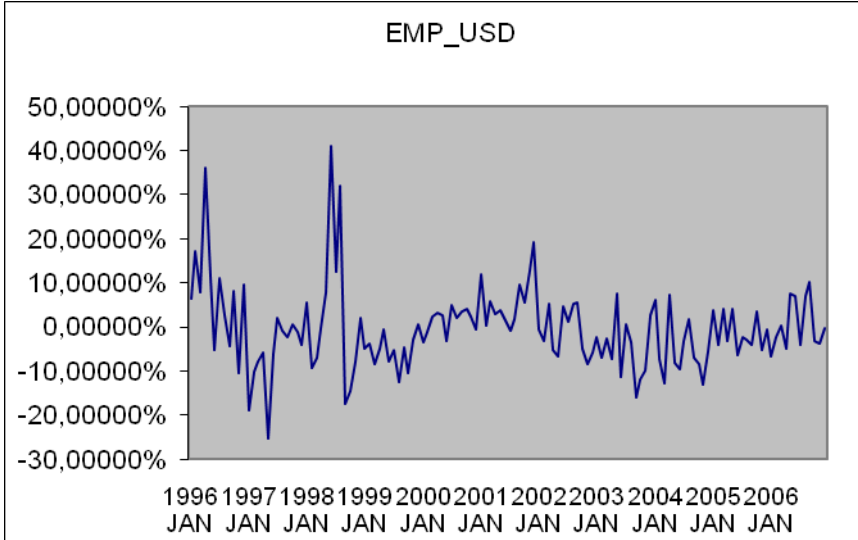Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)
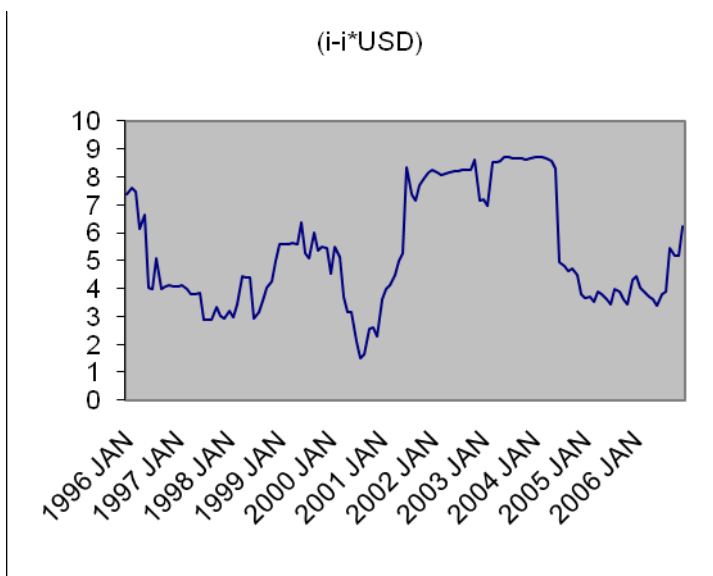
Interest rate differential
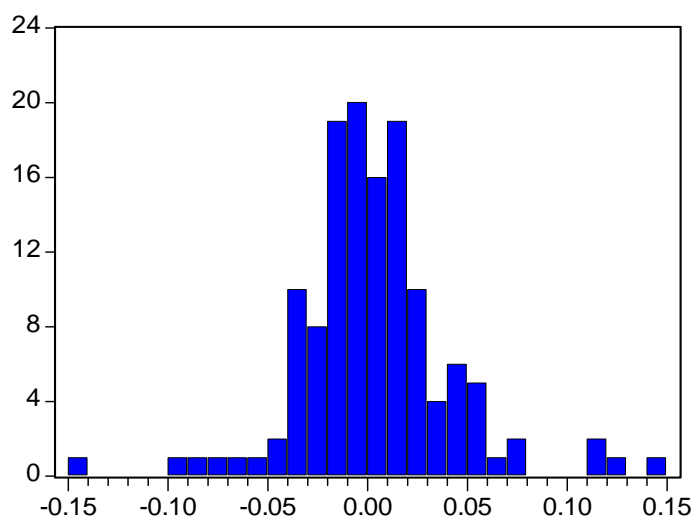
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	0.003333
Median	0.002040
Maximum	0.144153
Minimum	-0.147714
Std. Dev.	0.039122
Skewness	0.286358
Kurtosis	6.217374
Jarque-Bera	58.73725
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 23: Mozambique

Exchange Market Pressure, monthly evolution

Exchange Rate Nominal Currency per Dollar

Foreign Reserves (excluding gold) measure in Dollars
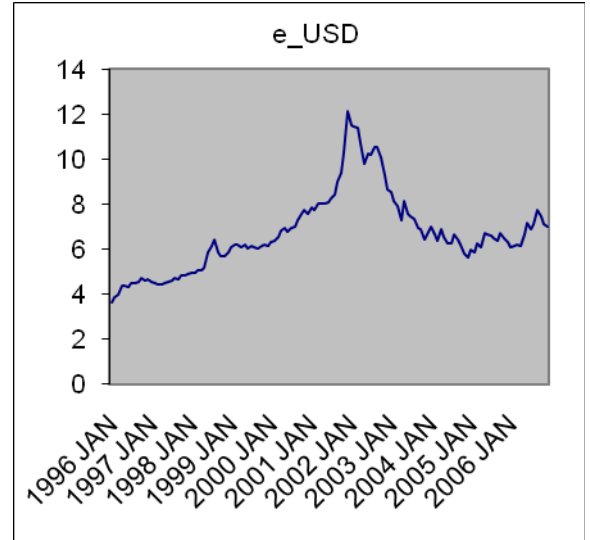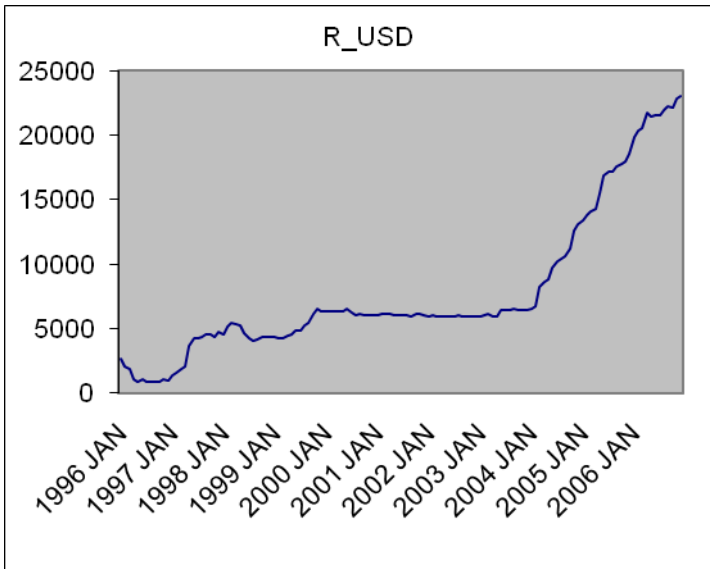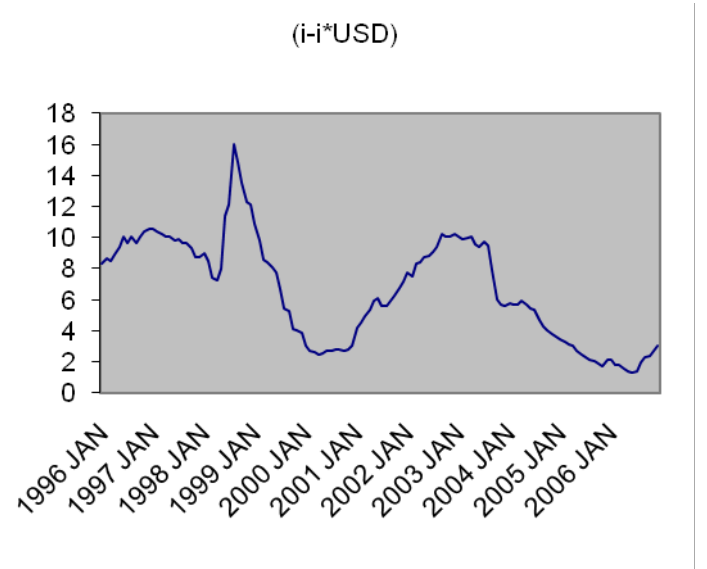

Interest rate differential

Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.001841
Median	0.002738
Maximum	0.131488
Minimum	-0.238578
Std. Dev.	0.048508
Skewness	-1.315893
Kurtosis	8.859983
Jarque-Bera	226.9613
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 24: Namibia

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

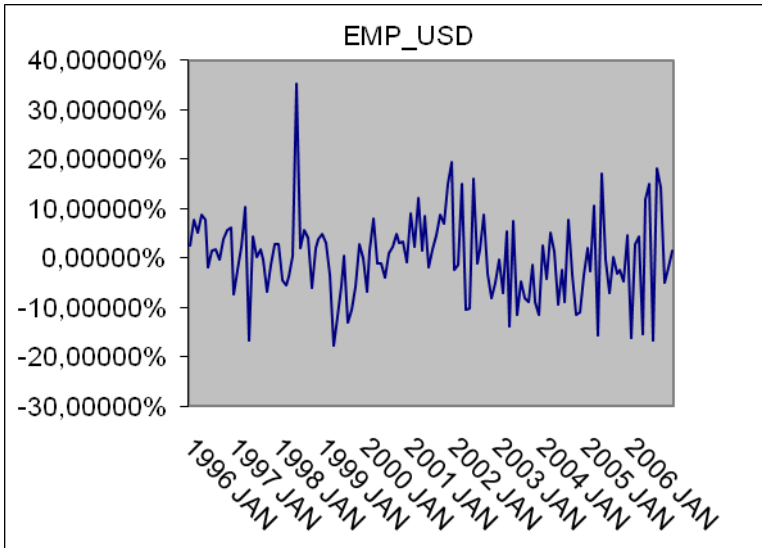Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential
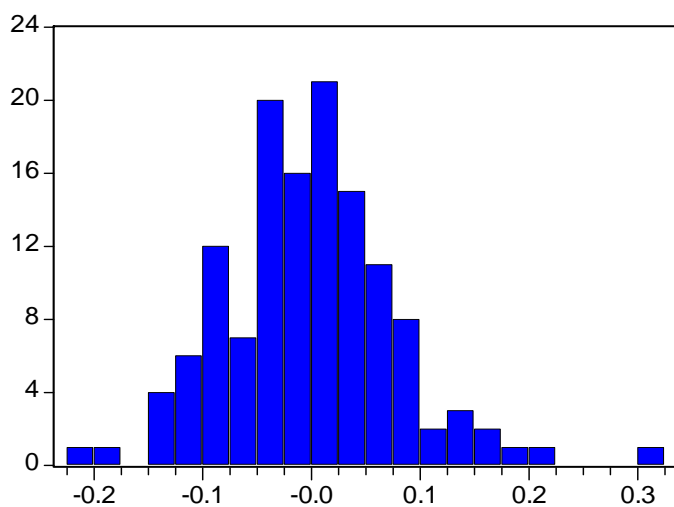
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.000563
Median	-0.002871
Maximum	0.306923
Minimum	-0.208018
Std. Dev.	0.078250
Skewness	0.504518
Kurtosis	4.412795
Jarque-Bera	16.57779
Probability	0.000251

Exchange Market Pressure histogram

Country Appendix 25: Seychelles

Exchange Market Pressure, monthly evolution
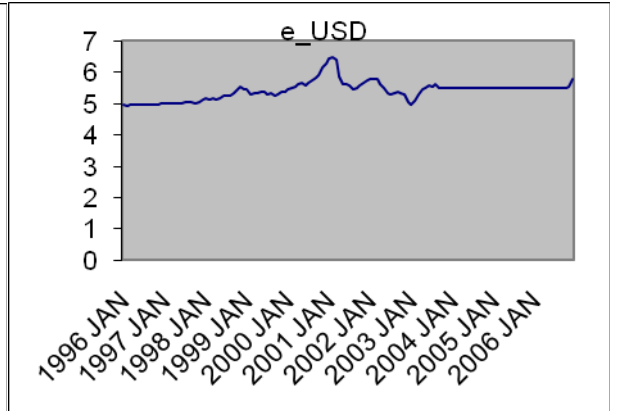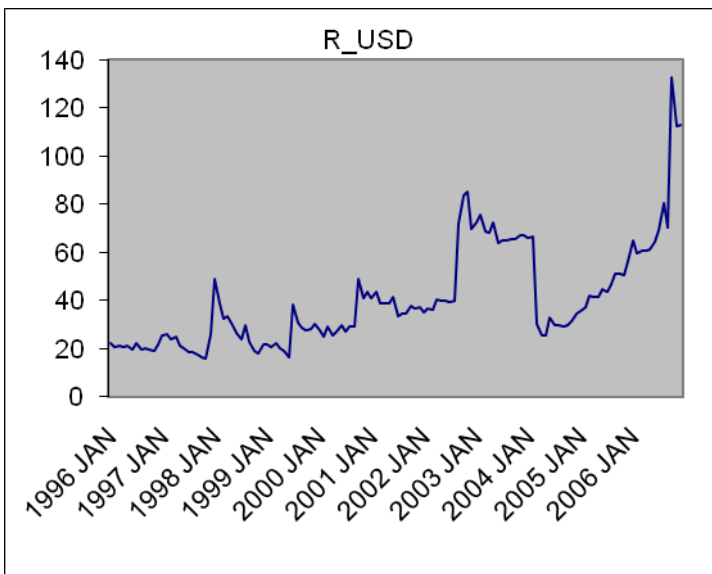
Exchange Rate Nominal Currency per Dollar

Foreign Reserves (excluding gold) measure in Dollars
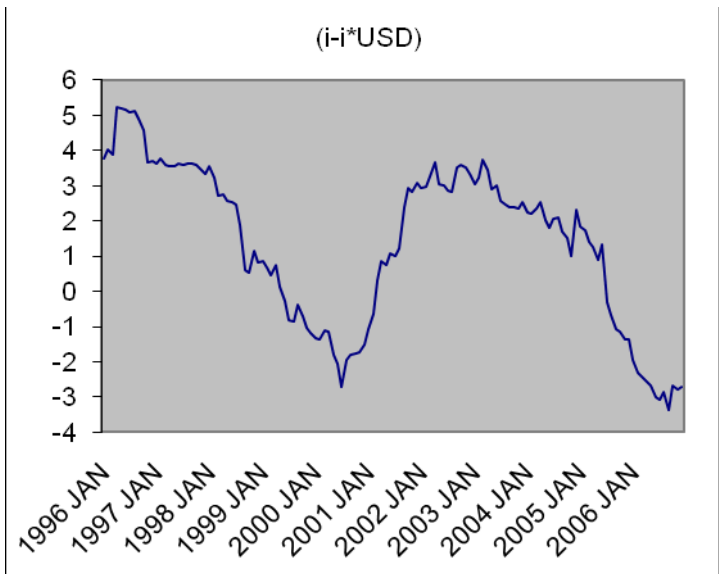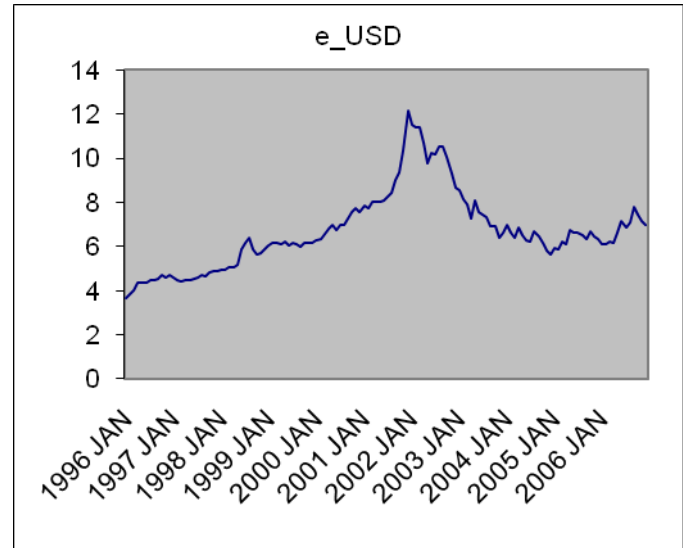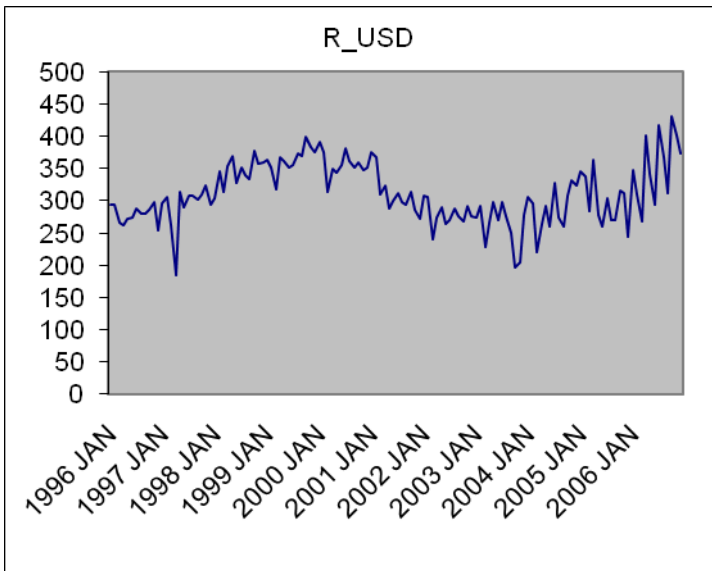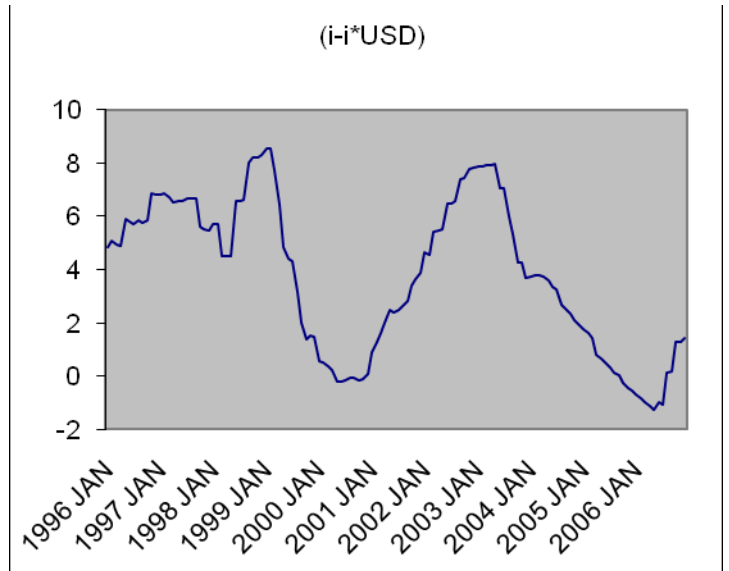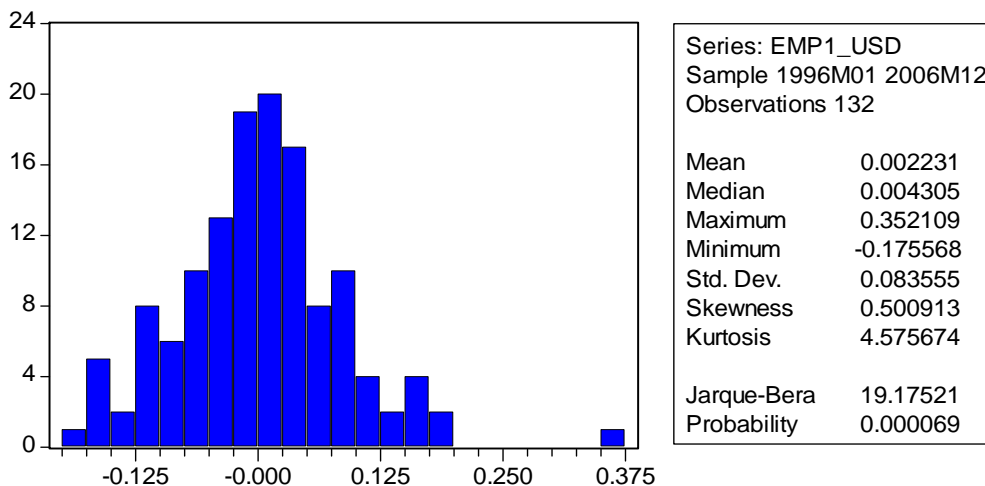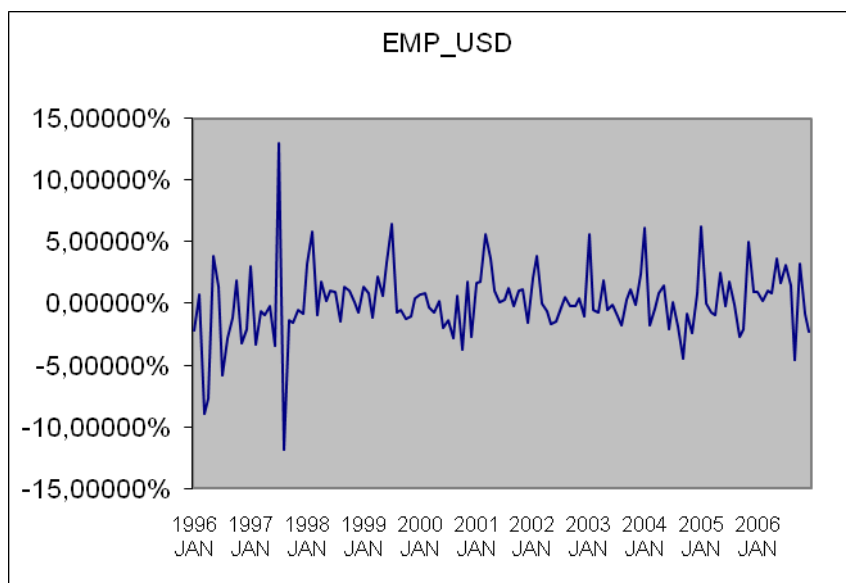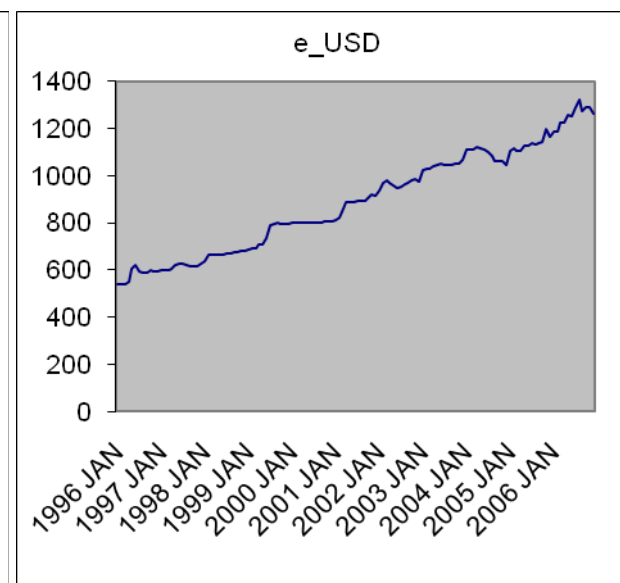

Interest rate differential
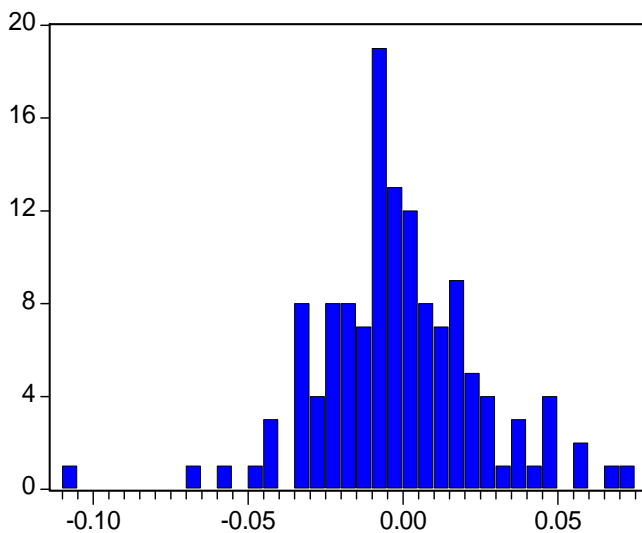
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.001350
Median	-0.003216
Maximum	0.072628
Minimum	-0.107163
Std. Dev.	0.026125
Skewness	-0.103796
Kurtosis	4.886749
Jarque-Bera	19.81604
Probability	0.000050

Exchange Market Pressure histogram

Country Appendix 26: South Africa

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential
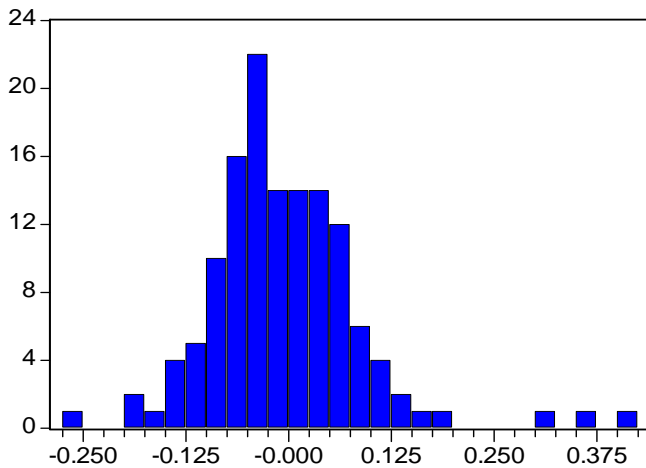
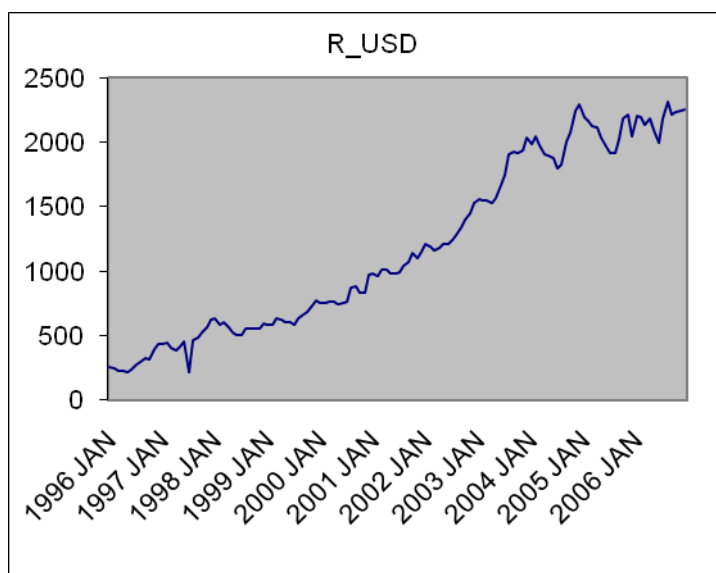| Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	-0.004456
Median	-0.011426
Maximum	0.410659
Minimum	-0.253067
Std. Dev.	0.092400
Skewness	1.298073
Kurtosis	7.604885
Jarque-Bera	153.6972
Probability	0.000000

Exchange Market Pressure histogram

## Country Appendix 27:Swaziland


Exchange Market Pressure, monthly evolution

Exchange Rate Nominal Currency per Dollar
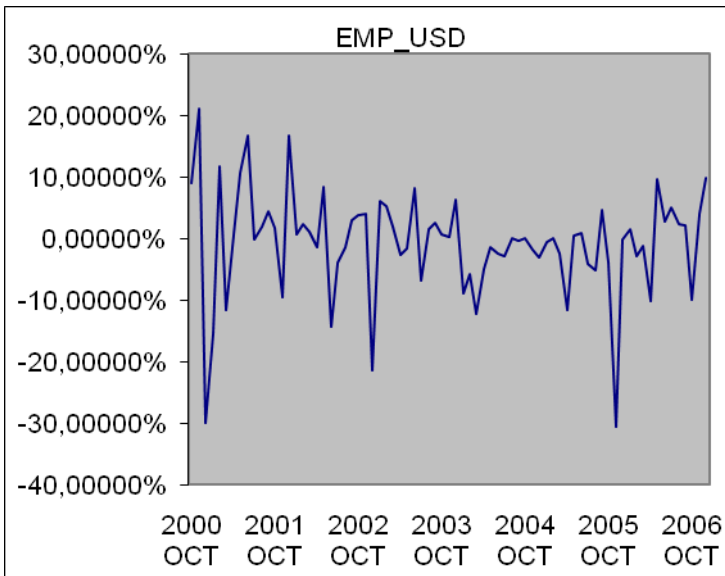

Foreign Reserves (excluding gold) measure in Dollars
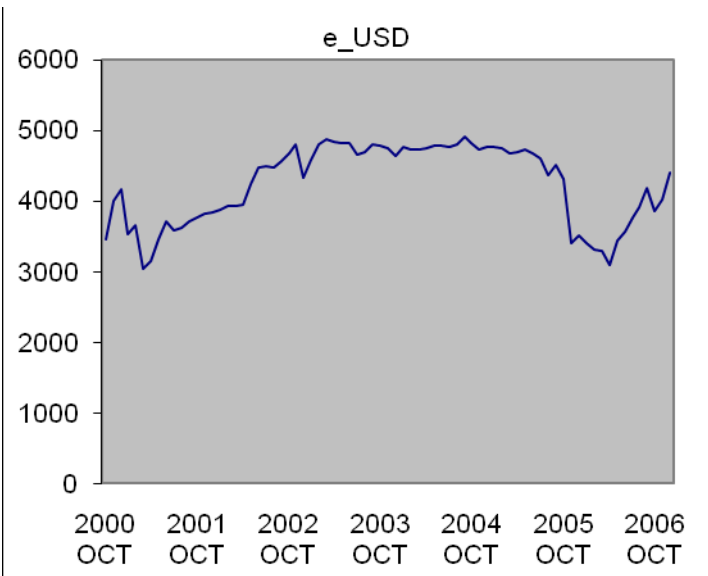

Interest rate differential

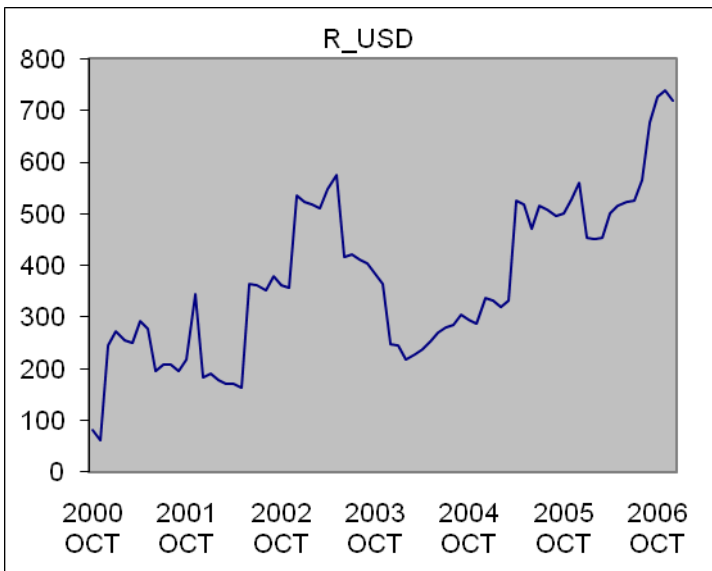| Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	0.002231
Median	0.004305
Maximum	0.352109
Minimum	-0.175568
Std. Dev.	0.083555
Skewness	0.500913
Kurtosis	4.575674
Jarque-Bera	19.17521
Probability	0.000069

Exchange Market Pressure histogram

Country Appexdix 28: Tanzania

Exchange Market Pressure, monthly evolution


Exchange Rate Nominal Currency per Dollar

Foreign Reserves (excluding gold) measure in Dollars
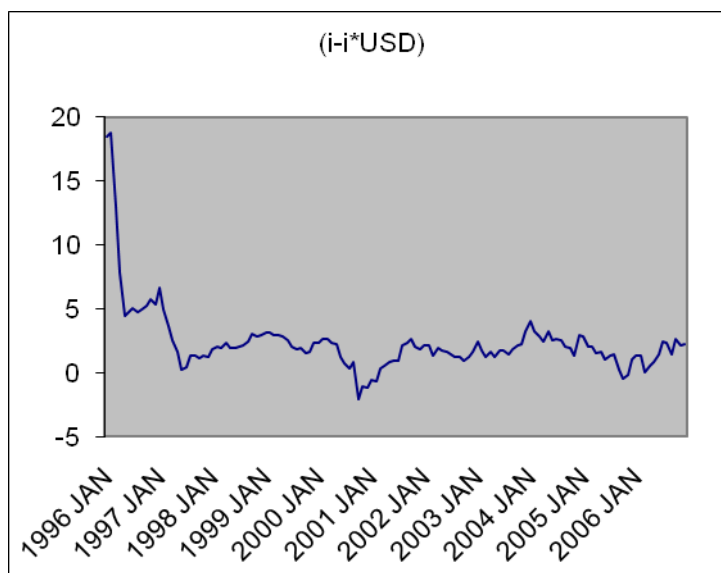
Interest rate differential
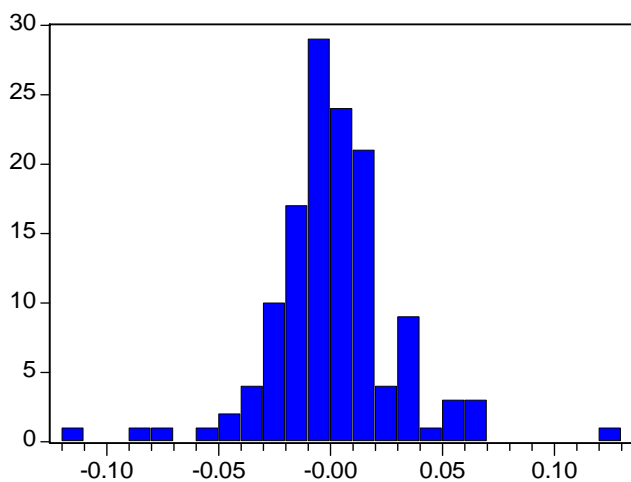
Series: EMP1_USD	
Sample 1996M01 2006M12	
Observations 132	
Mean	0.001204
Median	-6.79e-05
Maximum	0.129507
Minimum	-0.118839
Std. Dev.	0.028918
Skewness	0.022709
Kurtosis	7.794101
Jarque-Bera	126.4201
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 29:Zambia

EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar
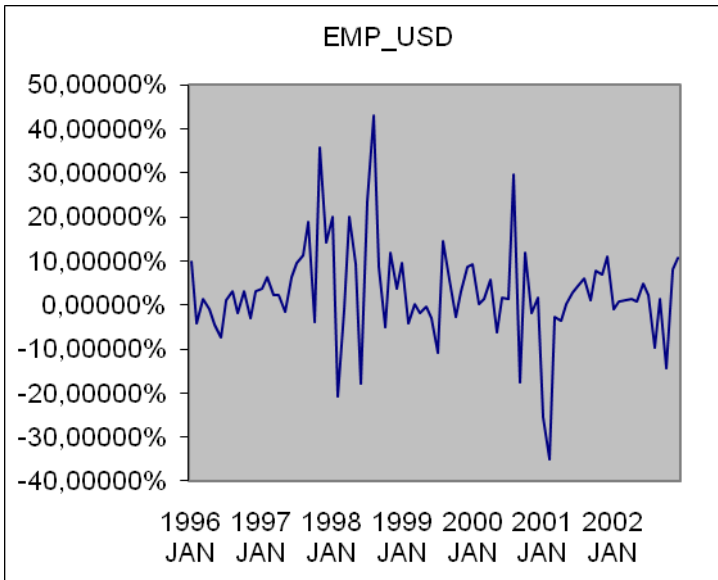
R_USD

Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)
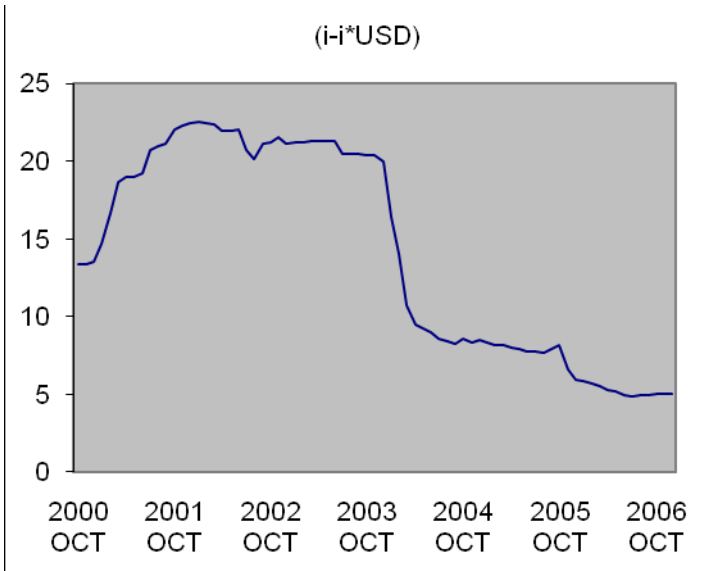
Interest rate differential
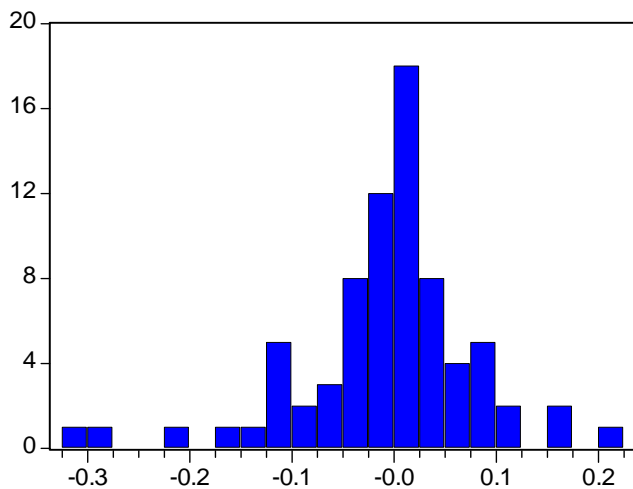
Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 75	
Mean	-0.006547
Median	0.001659
Maximum	0.212090
Minimum	-0.304683
Std. Dev.	0.087387
Skewness	-0.877269
Kurtosis	5.558306
Jarque-Bera	30.07291
Probability	0.000000

Exchange Market Pressure histogram

Country Appendix 30:Zimbabwe
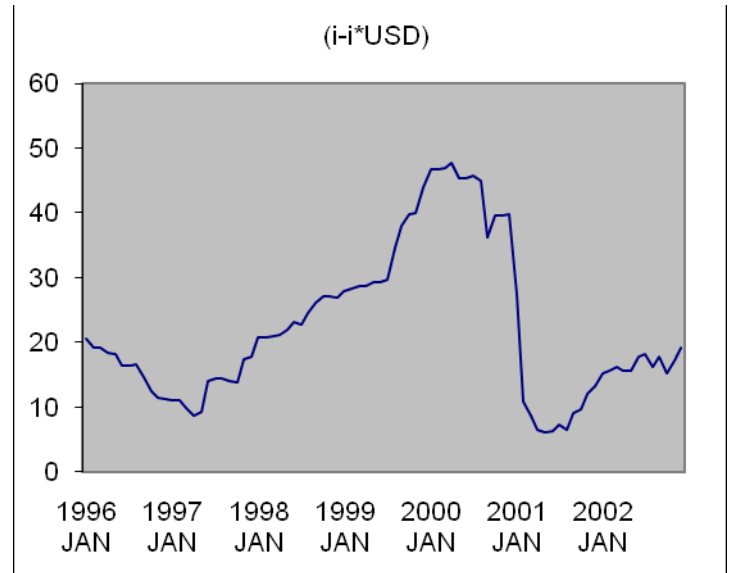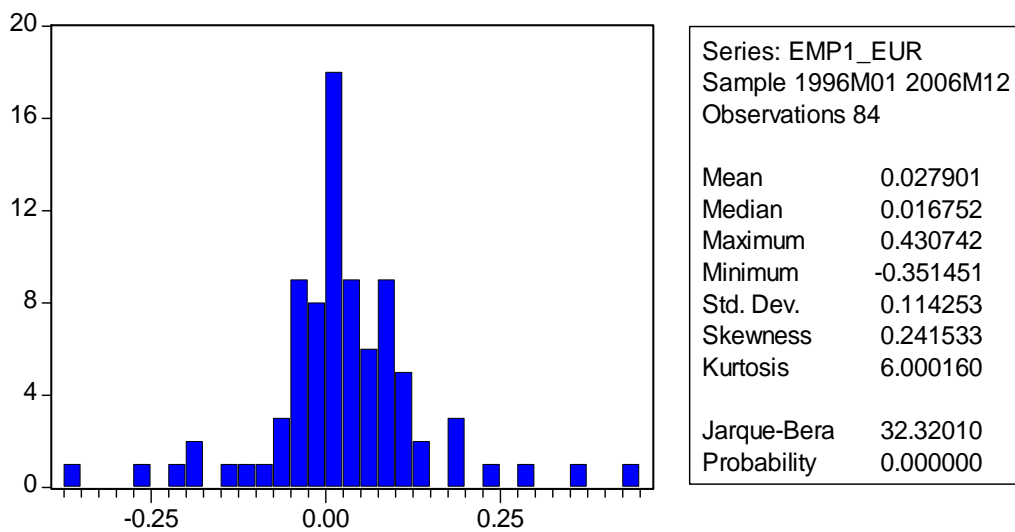
EMP_USD

Exchange Market Pressure, monthly evolution

e_USD

Exchange Rate Nominal Currency per Dollar

R_USD

Foreign Reserves (excluding gold) measure in Dollars

(i-i*USD)

Interest rate differential

Series: EMP1_EUR	
Sample 1996M01 2006M12	
Observations 84	
Mean	0.027901
Median	0.016752
Maximum	0.430742
Minimum	-0.351451
Std. Dev.	0.114253
Skewness	0.241533
Kurtosis	6.000160
Jarque-Bera	32.32010
Probability	0.000000

Exchange Market Pressure histogram