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Exchange Rate Misalignment and Growth: The Case of Sub-Saharan Africa

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Exchange rate misalignment for developing countries often concerns overvaluations of the domestic currencies. The general consensus has been that misalignment (undervaluation) spurs economic growth. Recently, Gonclaves and Rodriques found this not to be so compelling with the inclusion of domestic savings in their model. However, we replicate the same methodology for sub-saharan countries and found the domestic savings rate not to be relevant, leaving the argument that misalignment is good for economic growth, at least in the case of sub-Saharan Africa.

Keywords: Economic growth, misalignment, and exchange rate, sub-Saharan Africa,

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1. Introduction

Exchange rate misalignment is the deviation of the Real Effective Exchange Rate (REER) from the long term trend or not in line with the economic fundamentals. This paper investigates the effects of exchange rate misalignment on economic growth in sub-Saharan African countries using data from the World Bank Development Indicators.

The paper was motivated by the work of Gonclaves and Rodriques (2017) in which the authors challenged the validity of the long standing consensus in the literature that an undervalued exchange rate has a positive effect on economic growth. A significant limitation of their work is that data was a large pool of countries with emphasis on Emerging markets and exclusion of sub-Saharan Africa as a sub-sample where exchange rate misalignment is a main stay of policy discussions with International Monetary Fund emphasing policy measures for automatic adjustments of the Current Account towards the so-Called Exchange rate norm/Equilibrium. Therefore, we replicated the same methodology used by the authors for sub-Saharan countries with a prior expectation that an overvalued exchange rate harms growth, and that an undervalued currency is good for growth. We found that the argument that an undervalued exchange rate is good for economic growth, at least in the case of sub-Saharan Africa to be true contrary to the results of Gonclaves and Rodriques (2017)

With a slight departure from the influential Rodrik (2008) paper that has been instructive in the debate on exchange rate misalignment and growth, we follow Gonclaves and

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Deputy Director, Economic Research Department, Central Bank of the Gambia Rodriques (2017) with the addition of domestic savings rate in the model. Gonclaves and Rodriques with their novel approach found contrasting results to the general view that a more depreciated currency supports economic growth.We follow the same methodology as in Gonclaves and Rodriques for sub-Saharan Africa but found contrasting results to their study. We conclude then that the savings rate in the presence of a misaligned currency doesn't distort the impact of RER on economic growth.

At the core of the role of exchange rate misalignment and growth is the famous scale effect against the selection effect. It is posited that whichever effect is greater will be the direction of the effect. A more depreciated (appreciated) currency often results in expansion (reduction) of output. Thus, an increase (decrease) in efficiency. On the other hand, a more appreciated currency will likely result in a more competitive environment for firms in an economy leading to more efficiency. Based on the aforementioned reasons, it is clear that the impact of RER on growth is ambiguous.

On that background, as global value chains are spread across regions, competing within the context of international trade, it is paramount for governments to be mindful of distortions in the economy that could impact negatively on the economy in an increasingly globalized world. And exchange rate distortions are one of the challenging macroeconomic phenomena. Governments of leading economies are constantly on the watch for purported currency manipulations. Using the same methodology as in Rodrik (2008) using data from the World Trade Table (PWT 9.0), Gonclaves and Rodriques showed that the relationship between real exchange rate misalignment and growth is non-existent or wanes away after controlling for an omitted variable such as the savings rate. The inclusion of the savings rate is a novel approach which if found to be robust across all regions would have far reaching implications in policy circles. The inclusion of the savings rate is motivated by empirical evidence that savings rate through Foreign Direct investment and impact on the reduced current account deficit could be responsible for the relationship between misalignment and growth (Aghion et al 2016).

This paper investigates the impact of REER misalignment on economic growth in sub-Saharan Africa using this novel approach that incorporates the domestic savings rate. This Both approach is a novel application of the investigation of REER misalignment on growth in our region, to the best of our knowledge.

The remainder of the paper is organized as follows. Section 2 takes us through the Literature Review. Section 3 describes our data and model, which allowed us to do the empirical analysis. Section 4 presents the different empirical results, and Section 5 concludes.

2. Literature Review

The literature on the impact of REER misalignment on economic growth in sub-Saharan Africa goes back to the pioneering work of World Bank (1984), that concluded that poor

economic management through exchange rate policies contributed to the drag on most African countries' economies. Cottani et al (1990) also found evidence on the negative impact of REER misalignment on the economy.

Klau (1998) empirically examine the effect of misalignment on economic growth in the CFA Zones in the 80s and 90s. The study found that overvaluations of the CFA franc have a significantly negative impact on economic growth. It was on the backdrop of similar arguments in both policy and academic circles that led to the CFA Franc devaluations of the 80s and 90s. On a broader scale involving 33 sub-Saharan countries, Ghura and Grennes (1993) found negative relationship between REER misalignment and economic performance. Overall, although the studies on the region are not vast, most of the studies seem to have a consensus on the impact of REER misalignment on growth in the sub-Saharan Africa context.

Moving further afield from the sub-Saharan context, a vast body of studies found harmful effect of misalignment on growth. These studies include Sachs and Werner (1995), Razin and Collins (1997), Easterly, (2005); Rajan and Subramanian (2011). Through the channels of savings, investment and employment, Gluzman, Levy-Yegati and Sturzenegger (2012) found evidence of a positive impact on economic growth from an undervalued currency. These findings were consistent with later work by Sturzenegger and Gluzman (2013), which found evidence of interventions to avoid overvaluations are positively related to growth.

The most influential paper in this debate has been Rodrik (2008) that influenced policy in the emerging economies over the years. He found evidence that indeed REER depreciations are good for economic growth, which supports most of the earlier findings. Gonclaves and Rodriques poke holes in the research by arguing that savings rate was an important omitted variable that resulted in a biased positive impact. This novel approach to the misalignment debate by adding the savings rate is a new approach, which this paper takes to the sub-Saharan context with a view to shed more light on the heterogeneous impact of exchange rate on growth. Our prior expectation is that earlier findings in literature that an undervalued exchange rate has positive effect on growth, at least for sub-Saharan countries. The limitations of earlier studies are that there was possibly an omitted variable bias in Savings rate. Our hypothesis is that an undervalued exchange rate has positive impact on economic growth even in the presence of a high domestic savings rate

3. Model and Data

A distortion of Real Exchange Rate away from the macroeconomic fundamentals is one of the most influential policy levers in economic management. Consequently, policy makers are concerned with estimating the Equilibrium Real Exchange rate, as it is not observed. There is a constant need to analyze whether the real exchange rate is correctly valued.

We use data on thirty-four (34) sub-Saharan African Countries (based on data availability). The Sample size consists of annual data from 1992-2016. The justification

of our model is the novelty in its approach. None of the previous studies employed this model except the Gongclaves and Roriques. Applying this novel approach for the sub-region is an improvement on the past studies that never address the confounder issue. The data is an unbalanced panel sourced from the World Bank Development Indicators.

We estimate the following equation:

$$l\,rer_{it} = \alpha + \beta lgpc_{it} \;\; + \; \mu_{it} \; + \lambda_t + \; e_{it} \qquad (1)$$

Where: $lrer_{it}$ represents log of bilateral real exchange rates of country (i) relative to USD at PPP (US CPI taken to be 1) and the index has been rebased to 2010.$\beta lgpc_{it}$ is the log of gdp per capita of country (i) at time (t) ; μ and ʎ are country and time fixed effects respectively.

We follow Rodrik (2008) and Gonclaves and Rodriques(2017) to consider the residuals from equation (1) as the Real Exchange Deviation (our measure of misalignment). The residuals from the first stage regression represent exchange rate deviation (ex_dev) in the second stage estimation.
In the second stage, we regressed the following model with both country and time effects.

$$gpc_{it} = \; \alpha + \; \beta gpc_{it-1} + ex\_dev_{it} + gds_{it} + \; \mu_i + \lambda_t + \; e_{it}$$

where gpc_{it} is the annual growth of GDP per capita (PPP), βgpc_{it-1} is the lagged log level of GDP per capita, $gds_{it}$is the gross domestic savings and ex_dev_{it} is the real exchange rate deviation (obtained from the residuals from the first stage regression) of country (i) at time (t).

As in Gonclaves and Rodriques, the inclusion of the domestic savings rate is to avoid an omitted variable biased, as the supposed impact of the savings rate on growth could be mistaken for the impact of undervaluation on growth. This is the usual confounder problem in any econometric analysis.

4. Regression Results

4.1 First Stage Regressions

Our findings in the first stage estimation are similar to Goncalves and Rodrigues (2017). Log-levels of GDP per capita are inversely related to the log-levels of real exchange rate (see Table 1). Goncalves and Rodrigues associated this outcome only to develop economies based on the argument that more developed countries tend to have higher exchange rates. In our case, however, we relate this to foreign aid flow to developing economies. The regression results are presented on Table 1. We argue that the inverse relationship between real exchange rate and income growth in developing countries could be related to the amount of foreign aid to those countries. Our argument is based on existing literature that foreign aid flows could lead to undue appreciation of the

domestic currency and may not deliver the desired output growth. For example, Shen, Yang and Zanna (2017) concluded that significant amount of foreign aid related inflows triggers premature appreciation of the domestic currency and hurt the tradable sector. This will negatively affect output growth especially if the capital inflows are not efficiently spent on the productive sectors of the economy. Therefore, in a developing country context, a strong currency may not necessarily be due to strong economic development.

Table 1: The Impact of GDP Per Capita on Real Exchange Rate

Dependent variable: LRER

Variables	Coefficient	Std. Error	t-Statistic	Prob
Constant	*6.013137*	*0.236934*	*25.37891*	*0.0000*
LGPC	*-0.154704*	*0.030864*	*-5.01206*	*0.0000*
Observations	*842*			
R^2	*0.649620*	*-*		
Rw-Squared	*-*	*0.47*	*-*	

Table 2: Descriptive Statistics

	GDP per growth	Exchange rate deviation	Gross domestic savings	Change in ODA
Mean	3.490793	-5.87E-18	13.35328	0.435045
Median	3.518869	0.002337	9.969539	0.448019
Maximum	89.45249	0.894265	83.28704	362.3007
Minimum	-62.91359	-0.999030	-125.6813	-296.5273
Std. Dev.	6.896369	0.193592	16.90161	45.57401
Skewness	1.389971	-0.198522	-0.054883	0.592399
Kurtosis	49.53827	6.975784	10.88764	13.81779
Observations	850	842	843	844

4.2 Second Stage Regressions

In our first approach, we ran the regression without the control variable of domestic savings. The results, as presented on Table 3, shows a positive coefficient Growth Per Capita significant at the 1 per cent level.

Table 3: Second Stage Growth Regression

Dependent variable: GPC_Growth

Variables	Coefficient	Std. Error	t-Statistic	Prob
Constant	*75.82172*	*5.782291*	*13.11275*	*0.0000*
LGPC(-1)	*-9.456715*	*0.756721*	*-12.49696*	*0.0000*
EX_Dev2	*3.816746*	*0.942854*	*4.048078*	*0.0000*
Observations	*842*			
R^2	*0.387318*	*-*		

The next stage is to add the control variable to the regression and evaluate the impact on growth. In contrast to Goncalves and Rodrigues (2017), where the added variable diminished the impact of misalignment, the result plays down the role of domestic savings for sub-Saharan countries. It shows that exchange rate still has strong impact on growth even with inclusion of domestic savings in the equation.

Table 4: Second Stage Growth Regression

Dependent variable: GPC_Growth

Variables	Coefficient	Std. Error	t-Statistic	Prob
Constant	*80.04386*	*6.746505*	*11.86449*	*0.0000*
LGPC(-1)	*-10.06928*	*0.756721*	*-11.15304*	*0.0000*
EX_Dev2	*3.644808*	*0.962005*	*3.788761*	*0.0002*
GDS	*0.025109*	*0.019882*	*1.262895*	*0.2070*
Observations	*835*			
R^2	*0.388585*			
	-			

In fact, Table 4 shows very low correlation between domestic savings and exchange rates in sub-Saharan Africa.

Table 5: Covariance Matric

Covariance Analysis: Ordinary						
Sample (adjusted): 1992 2016						
Included observations: 835 after adjustments						
Balanced sample (listwise missing value deletion)						
		Correlation	t-Statistic	Probability	Cases	Observ.
EX_DEV2	EX_DEV2	1.000000	-----	-----	835	835
GDS	EX_DEV2	0.046048	1.330444	0.1837	835	835
GDS	GDS	1.000000	-----	-----	835	835

4.3 Impact of Overvaluation and Undervaluation

One of the principal tools at the core of the International Monetary Fund's Surveillance mission is External Balance Assessment that is competitiveness related. Basically, assessments of over/undervaluation are done to assess if the exchange rate is in line with macro fundamentals. This is paramount as exchange rate overvaluations usually preclude sudden stops and as well as high current account deficits.
To assess the impact of both undervaluttion as well as overvaluation, we follow Goncalves and Rodrigues (2017) as follows:

$$gpc\_growth_{it} = \alpha + \beta lgpc_{it} + \delta EX\_Dev_{it} + \eta P_{it} * EX_{Dev_{it}} + \mu_{it} + \lambda_t + \epsilon_{it}$$

where: gpc_growth_{it} is gross per capital growth; $\beta lgpc_{it}$ is log of gross per capita growth; EX_Dev_{it} is exchange rate deviation

P is over/under valuation (P=1 if EX_Dev_{it}>= 1 and 0 if EX_Dev_{it}<0)

If δ > 0, the impact of overvaluation is positive on growth
If (δ+ ŋ) <0, then the impact of undervaluation on growth is negative.

The marginal impact of overvaluation is positive(δ= 4.93,which is greater than zero), as could be seen on Table 6, and statistically significant. However, as posited earlier on, we suspect that this result could be influenced by the impact of foreign aid inflows which often leads to undue appreciation of the currencies in low income countries. Latey (2007) asserted that the influence of foreign aid on real exchange rate could be greater compared to FDI.

The sum of (δ+ ŋ) <0, implied a positive impact on growth for undervaluation. This is equivalent to 1.6. This is consistent with our message that an undervalued currency has positive impact on growth for sub-Saharan Africa. This is in line with the second stage

regression outputs and reaffirms earlier assertion by Rodrik (2008). We therefor accept the hypothesis that exchange rate misalignment has a positive impact on growth in sub-Saharan Africa even in the presence of high savings rate.

Table 6: The Impact of Overvaluation/Undervaluation

Dependent variable: gpc_growth_{it}

Variables	Coefficient	Std. Error	t-Statistic	Prob
Constant	*97.37399*	*7.872502*	*12.36887*	*0.0000*
LGPC(-1)	*-12.22976*	*1.047029*	*-11.68044*	*0.0000*
EX_Dev2	*4.932082*	*2.077142*	*2.374456*	*0.0178*
P*EX_Dev2	*-3.337990*	*3.954605*	*-0.844077*	*0.3989*
Gross_Dm_Sav	*0.027758*	*0.020254*	*1.370491*	*0.1710*
Observations	*768*			
R^2	*0.396302*	*-*		

5. Conclusion

Exchange rate misalignment, as in overvaluations, has always concern sub-Saharan African countries in particular and developing countries in general. The use of exchange rate as policy levers has always been a hot debate in policy circle. We studied the impact of misalignment on growth in sub-Saharan Africa. We take the novel approach of Gonclaves and Rodriques (2017) to the aforementioned regional context. Their findings seem to contravene popular consensus that a more depreciated currency spurs growth, following the seminal work of Rodrik (2008). This could be a major deviation for policy direction if found to be robust for all regions and context.

We used data from the World Development indicators and used the same methodology as in the aforementioned paper. Our first estimate was in line with Rodrik (2008) and found misalignment to be positively related to per capita growth. Then, we added the domestic saving ratio as a control variable, as suggested by Gonclaves and Rodriques (2017). In contrast their results and in line with Rodrik, we found that a more depreciated currency has a positive impact on growth.

We therefore conclude that the influential work of Rodrik is relevant to the sub-Saharan context. The new findings of Gonclaves and Rodriques are not robust for our sub-Region. It is therefore of paramount importance that sub-Saharan countries implement

policies to avoid misalignment (overvaluations) of their currencies as this will reduce their competitiveness in the global value chains of goods and services. However, we recognize important limitation of this paper could be the quality of data from sub-Saharan Africa and the fact that absence of variable for foreign aid in the model. Foreign aid inflows could lead to undue appreciation of the domestic currency and may not deliver the desired output growth. We, therefore, recommend further work on this to include foreign aid. Finally, we believe that the conclusion of our study will add value to policy discussions particularly in sub-Saharan Africa.

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