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THE IMPACT OF DEDOLLARIZATION IN THE ANGOLAN BANKING SECTOR  
BANCO DE FOMENTO DE ANGOLA CASESTUDY

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## ABSTRACT

It is the scope of this project to analyse how the past and current economic conjuncture in Angola, mainly driven and characterized by the Dedollarization process that is undergoing, has been impacting the Angolan Banking Sector, one of the biggest pillars of the Angolan economic activity.

Given the known data constraints, this project only focused on the analysis of the Dedollarization impact in one of Angola's biggest banks: Banco de Fomento de Angola.

The statistical approach consisted on two multi-factor regression models to analyse the impact on two different Key Performance Indicators of the bank: Return on Equity and Regulated Solvency Ratio.

Although it was complicated to derive statistical significance for the two models, mainly due to a reduced number of observations and the quality of the model, the results converged to what a financial economics analysis led later on the final part of the project.

The final remarks regarding the role of Dedollarization in the Banking sector, with a focus on BFA, are extremely eye-opening. Unlike what was thought à priori, the overall impact on BFA's results is positive, mainly in the back of the high inflation environment that is being felt in Angola, which increases the spread of the assets' returns in national currency versus in foreign currency on the bank's balance sheet.

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## 1.INTRODUCTION

Angola, a country that is widely known as a nation of extremes. In the capital, Luanda, one can easily find one of the nation's richest men passing by one of the nation's poorest men. With a weakly diversified GDP and still relying in close to 50% on Oil-related activities, the golden days of Angola have been putting to test during the last three years.

Going through a process of Dedollarization since 2011 with the purpose of regaining flexibility on monetary and fiscal policies, BNA was able to reduce the Dollarization levels to historical minimums while maintaining a stable economy.

However, with the crash on Oil Prices during 2014, Angola started to enter in a turbulent period, exposing a fragile Angolan economy alongside with a depreciating Kwanza.

## 2.LITERATURE REVIEW

Akcay et al. (1997) developed a method which showed that as the degree of currency substitution increases, the greater the volatility of the exchange rate. They conclude the study by showing that as there is an increment on the level of currency substitution, there is a required increase on the change of the exchange rate.

Moreover, it is known that depending if the economy is free of black market regarding the exchange market and if the domestic money supply has a certain degree of flexibility, we can infer that in a partially dollarized economy there will be or not stability in the exchange rate.

Mercedes García Escribano (2011) defined Dollarization empirically as a series based on a constant value of nominal exchange rate.

This study defines both Deposit and Loan Dollarization as follows:

$$dd_t = \frac{d_t^{fx} \left( \frac{S_{Constant}}{S_t} \right)}{d_t^{fx} \left( \frac{S_{Constant}}{S_t} \right) + d_t^n} \quad ld_t = \frac{l_t^{fx} \left( \frac{S_{Constant}}{S_t} \right)}{l_t^{fx} \left( \frac{S_{Constant}}{S_t} \right) + l_t^n}$$

where  $dd_t$  stands for Deposits Dollarization in a given moment of time  $t$  and  $ld_t$  stands for Loan Dollarization in a given moment of time.  $l_t^{fx}$  refers to the amount of loans in foreign currency at  $t$ . The same reasoning applies to  $d_t^{fx}$ , with the exception that it refers to the total amount of Deposits in foreign currency but already converted into local currency. In this case, it will consist the amount of Deposits in USD converted in AKZ.  $S_{Constant}$  refers to the nominal exchange rate where the analysis is based and that will be the reference point for all the other exchange rates in order to transform the Dollarization from nominal to real. Additionally,  $S_t$  refers to the nominal exchange rate at a given period  $t$ . By multiplying the  $d_t^{fx}$  by the ratio  $\frac{S_{Constant}}{S_t}$ , the FCD (Foreign Currency Deposits) is adjusted, so that the Dollarization can correct for the exchange rate movements, which can cause big swings in the Dollarization ratios.

By doing this extra step, the real amount of foreign currency that was in fact added or taken from the economy is what results from this approach. Otherwise, the swings and movements on the exchange rate that can occur without a single change on the FCD level would result in a biased analysis.

García Escribano (2011) also highlights how the evolution of the dollarization levels from a period to another is achieved (if the variation is negative, then there is the presence of Dedollarization):

$$dd_t - dd_\tau = \sum_{i=1}^I dd_{it} \frac{d_{it}}{d_t} - \sum_{i=1}^I dd_{i\tau} \frac{d_{i\tau}}{d_\tau} = \sum_{i=1}^I (dd_{it} - dd_{i\tau}) \frac{d_{it}}{d_t} + \sum_{i=1}^I dd_{i\tau} \left( \frac{d_{it}}{d_t} - \frac{d_{i\tau}}{d_\tau} \right)$$

Lastly, Mauro Mecagni et al. (2015) analysed the main differences and common factors between a group of successfully dedollarized countries and another group of unsuccessfully dedollarized countries.

The main takebacks are that the successful countries outperformed the unsuccessful ones in the parameters of macroeconomic stability, higher levels of growth, enhanced fiscal balance and accounts and low levels of debt.

This study also points out benchmarks regarding a successful Dedollarization process, namely:

an overall reduction of 14% on the inflation level, unchanged exchange rates and a reduction on public and external debt levels.

### 3.DOLLARIZATION

The process of Dollarization occurs when the local currency is substituted by a foreign currency, usually US Dollar, and adopts the forms of store of value, unit of account and means of payment.

It consists in a measure that most under-developed countries apply when they are facing hyperinflation levels and a domestic currency depreciation, translating in economic instability. Countries where there is a high level of inflation, which creates a real exchange rate instability, tend to motivate residents to turn themselves to the foreign currency as it ensures a steadier purchasing power regarding domestic consumption.

Dollarization ends up being perceived as a natural result of the progressive openness of the emerging countries' economies to the global economy. Starting in the 80's, several emerging economies went through Dollarization processes in the back of new exogenous shocks resulting from a bigger level of exposure of the economy. There are several examples where the process of Dollarization has been applied, especially in the emerging economies, namely: Russia in 1998, Peru in mid-70s and in 1990, among several others.

#### 3.2 ADVANTAGES AND DISADVANTAGES OF DOLLARIZATION

There are several advantages on dollarizing an economy: asset substitution when a government opens the economy and liberalizes the financial market, enhancement of the integration within the international markets and most of the times it has an important role in the development of domestic financial markets. Moreover, Dollarization mitigates the exchange rate risk for foreign investors, attracting more investments for the country and allowing for a diversification effect on the residents' portfolio. Lastly, it has a positive impact in Investment and domestic

consumption and thus in economic growth, through a reduction on the cost of credit.

Nevertheless, Dollarization also carries several disadvantages, like the limitation of a country's monetary policy efficiency. It also implies that the country loses its seigniorage and has to pay it to the foreign currency issuer. Moreover, the country's efficiency on the daily transactions and payments can be lost, since the central bank can no longer adapt their banknotes to the population's needs. Other aspect to take into account is the fact that dollarized economies are highly exposed to the risk of occurring both a financial and currency crisis because of the lack of power and control over their monetary policy. Lastly, by dollarizing an economy, the liquidity risk will grow, meaning that small lenders only have access to unlimited funding in domestic currency, so, in the case of general panic and bank runs, BNA cannot supply unlimitedly the population with foreign currency, which can trigger a currency crisis.

Concluding, one can see that there is always a different and optimal level of dollarization to be applied to a country, specially based on the economy's size, openness, the degree of financial integration and market development.

### 3.3 ANGOLA'S SITUATION WHEN DOLLARIZATION WAS INTRODUCED

By late 1990's, Angola was in a very difficult and unstable economic period. The country was suffering a sharp devaluation on their currency: Kwanza (AKZ) and the inflation was very high. This bad economic shape was in part due to the civil war that was taking place at this period. Since the purchasing power was dropping excessively in the eyes of the Angolan people, the role of USD started to grow exponentially and got strong as the Government started to induce the population to start using USD in order to stabilize the economy, i.e, inflation levels. Therefore, in 2001, the Government decided to start the process of Dollarization of the economy by applying several measures in order to counter attack the 241% inflation level that was being seen at the time. As a result of this introduction, the real GDP growth took off in 2003 when it started at a 3.5% and quickly evolving for an 11% in 2004.

In the case of Angola, the economy became partially dollarized, which implies a De facto Dollarization, as an individual could easily use AKZ or USD to make a domestic payment or transaction simultaneously. Additionally, by the fact that the overall banking system substituted their structures to USD, it was in fact, a Financial Dollarization. Moreover, the foreign currency, i.e. the USD, was used in domestic transactions, showing a characteristic of Transaction Dollarization.

## 4.DEDOLLARIZATION

As already stated in the Literature Review, macroeconomic stabilization and stable and low inflation are key ingredients for a successful dedollarization.

### 4.1 ANGOLA'S SITUATION WHEN DEDOLLARIZATION WAS APPLIED

During 2009, the majority of African countries were affected by the 2008 international crisis. Due to its GDP exposure to Oil prices, Angola suffered a bigger hit, but also was able to rebound quicker than the average, mainly because of the quick jump on Oil prices during the mid of 2009. Angola continued to recover during the year of 2010 especially after the signature of Stand-by deals with the IMF, which gave a boost to the process of stabilizing the economy, namely the rebalancing of the Government accounts. The latter was a major happening for Angola to achieve a degree of credibility amongst the rest of the Sub-Saharan African economies. Furthermore, for this economic recovery, factors like the rebalancing of the Government budget in the Non-Oil Sectors and the initiative of public and private debt regularization, played a major role.

Ultimately, in 2010 Angola was an economy that had re-gained the confidence of economic agents, registering an astonishing increase in foreign investments.

Nevertheless, a Dollarization process also carries drawbacks and they were determinant in the BNA decision of pursuing a De-dollarization process. Some of the the disadvantages appointed



by BNA's analysis were the drop on Government's liquidity because of the high share of Foreign currency assets and liabilities compared to the national currency levels; the inefficiency with payments in local currency; and the loss of control on the monetary policy of the Angolan central bank. Adding the drawbacks of Dollarization that BNA was starting to realize to the economy stability in terms of inflation and GDP growth, the decision of dedollarizing the Angolan economy was voted and put into practice.

4.2 BNA'S MEASURES REGARDING DEDOLLARIZATION

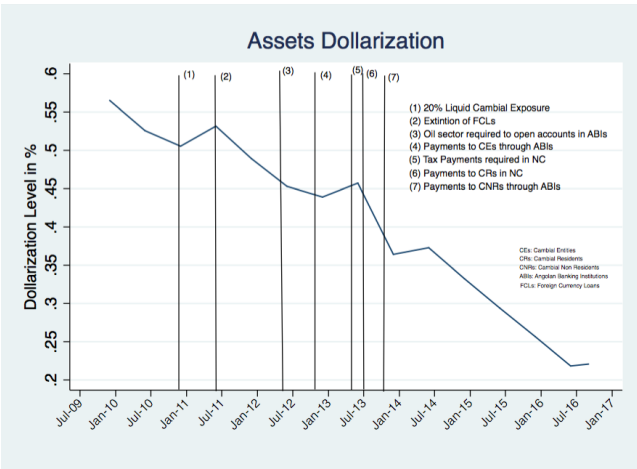


Figure 1 Source: BNA

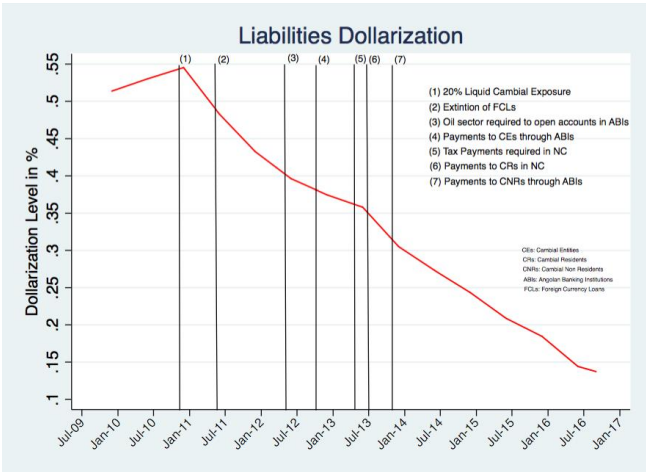


Figure 2 Source: BNA

After the decision of Dedollarizing the Angolan economy, BNA started to implement several prudential measures. The willingness of the Angolan Central Bank to better the scenarios for the national currency usage started from early 2010, period when BNA started to manage

closely the required level of reservoirs regarding the deposits. This influence was expected to reduce the financing costs of the economic agents in order to incentivize the use of Kwanzas.

In terms of regulations sent out by BNA with the intention to promote a De-dollarizing process in the Angolan economy, there are five promulgations that are worth to mention.

Chronologically, *Aviso 5/2010 de 5 de Novembro – Exposição cambial* was the first sizable regulation introduced in the Angolan banking system. This law limited the liquid cambial exposure (foreign currency assets minus foreign currency liabilities) to 20% of a regulated financial institution's ROF (Regulated Own Funds).

Secondly, *Aviso 4/2011 de 8 de Junho – Crédito em moeda estrangeira*, regulated the concession and classification of loans given by BNA-regulated financial institutions.

They implemented a risk-grading system from A to G, starting in the riskless (A) and finishing in the loss level (G) and forbidden the following credit operations in foreign currency.

Lastly, given the size and impact of Oil related investments and activities in Angola's GDP, it became obvious the need to differentiate the cambial legislation concerning the Oil sector from the other economic activities. In this context, BNA published the *Aviso 20/2012 de 25 de Abril – Regime Cambial Sector Petrolífero*, the biggest step taken towards the Dedollarization process. It was designed to regulate the liquidation of equity and goods operations, and the cash flows resulting from R&D, development and production of crude oil and natural gas.

## 5.THE BANKING SECTOR IN ANGOLA

This research project is based in the Banking sector especially because it is a perfect benchmark for the country's economic situation and performance. Angola has always had a significant Financial Services Sector, however it intensified largely in the early 2000s, with a market consolidation that today contemplates more than 30 Banking Institutions. Regarding the analysis of the Banking Sector, it consists in three main components: the profitability, solvency and liquidity. Starting on the profitability area, it can be seen in *Figure 3*, that during the period

after 2010 until 2014, almost all the major banks represented in the graphic suffered a drop on their profitability.

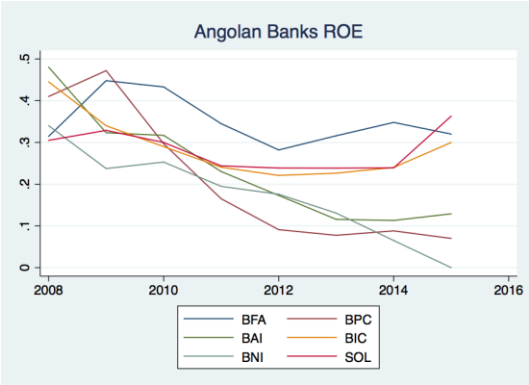


Figure 3 Source: BNA and Bank's Annual Reports

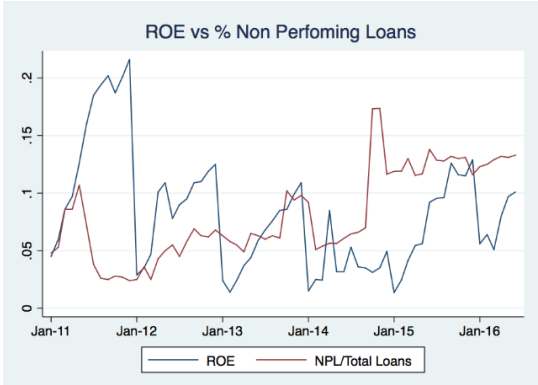


Figure 4 Source: BNA

It was precisely during this period that the Dedollarization regulations started to show and applied, showing à priori some sort of causality. Additionally, *Figure 4* shows the average ROE of all the Angolan Banking sector and how it has decreased throughout the period 2011-2015. It can be also noted that from the last year and half, the sector has been regaining confidence and strength. Nevertheless, a worrying aspect is the fact that the % of Non Performing Loans is presenting an upward trend, a risk that represents nowadays represents 15% of loss on Banks' returns coming from Loans.

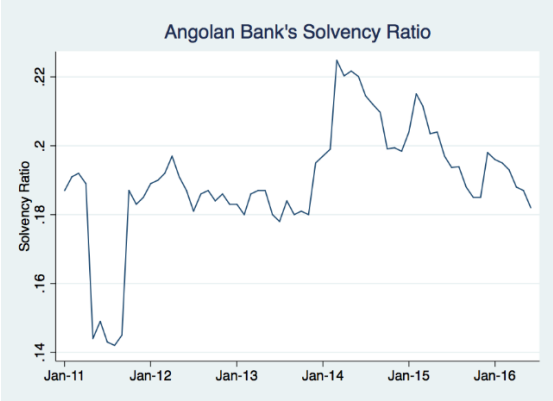


Figure 5 Source: BNA

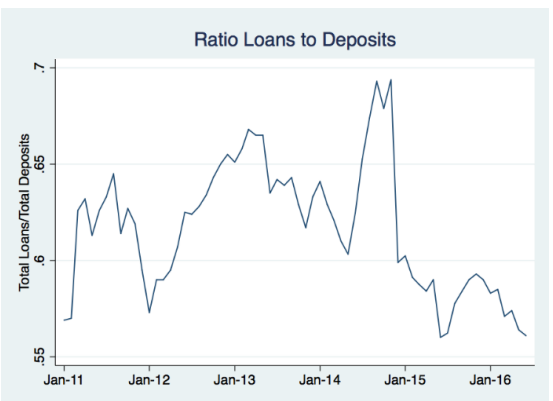


Figure 6 Source: BNA

Concerning the Solvency of the Angolan Banking Sector, the data presented in *Figure 5* does not seem to stand any trend. The only aspect that stands out is that the ratio has been oscillating between 14% and 22%, showing a high level volatility which does not imply a bad level of solvency, as the minimum requirement of BNA is easily attained at 14%. Lastly, when it comes

to the Liquidity, *Figure 6* is very enlightening in the sense that the Banking system is already assimilating a trend of more liquidity (less Loans), especially when the Non-Performing Loans is increasing, which translates in a loss in the medium term. This trend is mostly visible after January 2013 until June 2016.

### 6.BANCO DE FOMENTO DE ANGOLA - BFA

The fact that Angola has a data collection problem was determinant in the approach chosen for this project in two ways. On one hand, it meant that a study about the impact on all the major Angolan Banks would be literally impossible due to the inconsistency and lack of data, even on the annual reports. On the other hand, the choice of BFA was achieved as it was the institution that had a better control and records of their figures. Furthermore, besides the data implications, BFA was a clear winner at the time of choosing an institution as it is one of the most recognized and respectable Banks in Angola.

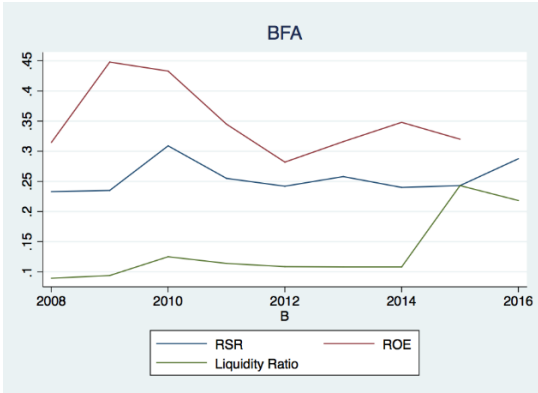


Figure 7 Source: BFA Annual Reports

The *Graph 7* shows BFA’s evolution from 2008 until 2016 regarding the three previously

analysed components: Regulated Solvency Ratio, ROE and Liquidity Ratio. What immediately stands out is the flat RSR, or at least, less volatile as the Banking sector average value. In fact, if we take a look at *Figure 8*, we see how solid BFA is when compared to the Angolan average.

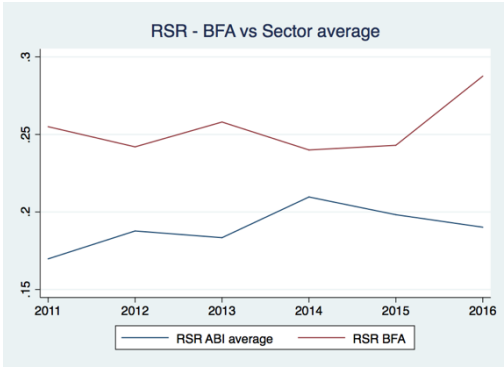


Figure 8 Source: BFA Annual Reports

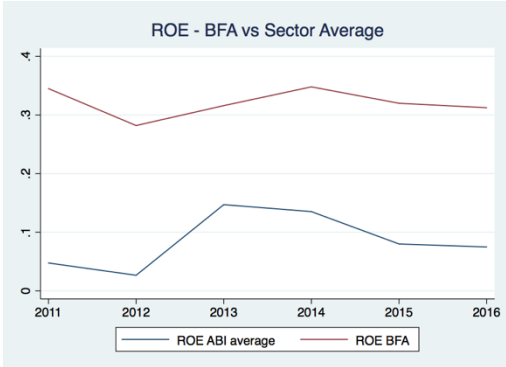


Figure 9 Source: BFA Annual Reports

The same applies when examining the ROE, with BFA attaining a spread of 20% compared with the average of the Angolan Banking Sector. After the financial performance analysis is done, it is required an overlook on the topic to which we are trying to evaluate the existence of a relationship: Dollarization levels. The following *Figure 10* shows the evolution of the both levels of Dollarization (Deposits and Loans) on the bank’s Balance sheet. The calculation of these ratios followed the same guidelines as García Escribano (2010) and BNA’s study, and therefore were adjusted for the Exchange rate ( $S_{Constant} = 2010$ , in order to mirror the moment right before the introduction of regulatory measures).

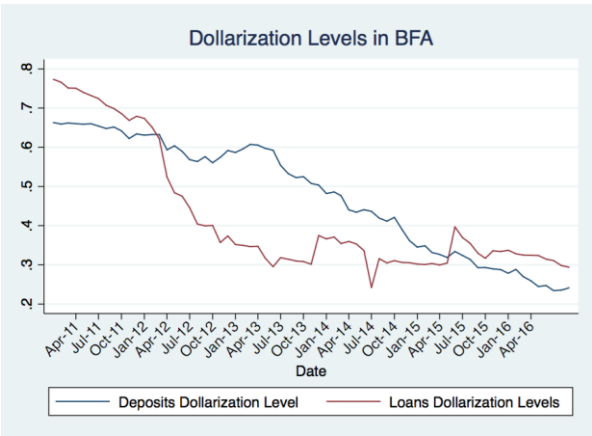


Figure 10 Source: BFA Annual Reports

Following the same path as the Dollarization in the Angolan economy, BFA’s levels have registered a downward trend in both Deposits and Loans. Nevertheless, it is also important to explore the type of impact that the Dedollarization had in the bank’s balance sheet, if it pressured the transfer of Assets and Liabilities from Foreign currency to national currency or if it had an impact and fomented the growth in both Loans and Deposits. *Figure 11* represents BFA’s Balance sheet evolution by assets and liabilities, showing that Deposits grew more than 100% since mid 2010. Furthermore, the total amount of Loans astonishingly jumped between 2013 and 2014 which is a very curious fact as by then it had already been released the regulation forbidding the ABIs to provide Foreign Currency Loans to their clients.

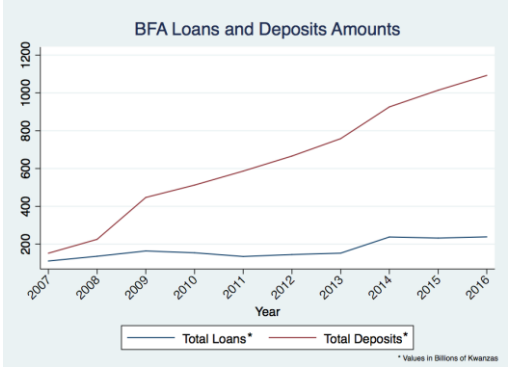


Figure 11 Source: BFA Annual Reports

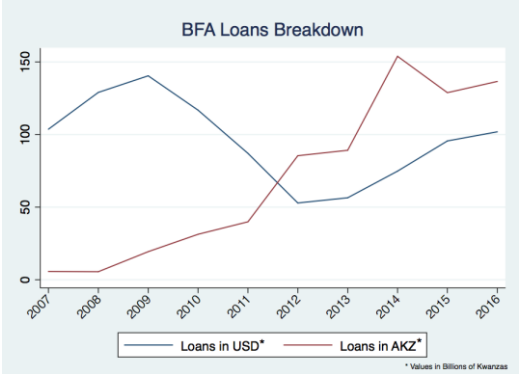


Figure 12 Source: BFA Annual Reports

Analysing a breakdown of the Loans evolution in FCL and DCL, it is perceived on *Figure 12* that in fact during 2013 and 2014 there was an increase in the component of FCL. After a careful examination on the annual reports of those years it was finally discovered that these two jumps were due to two loans to the Angolan government, with a global value close to \$300 millions, who is not included in the previously stated regulation.

## 7.METHODOLOGY

After carefully researching the several ratios that can truly show us how healthy an institution is, it was defined a bundle of three that are crucial to analyse a bank’s health: Solvency, Profitability and Liquidity. From these three, the choice was to analyse to analyse and model

the Solvency and Profitability components, i.e. the Regulated Solvency Ratio and ROE. The Regulated Solvency Ratio was chosen as it was the only explained variable with an acceptable sample of 68 observations.

#### 7.1.Regulated Solvency Ratio: RSR

$$RSR = \left( \frac{\textit{Regulated Own Funds}}{\textit{Risk - Weighted Assets}} \right) * 100$$

*Regulated Own Funds*, corresponds to the sum of Capital Tier 1 and Capital Tier 2.

*Risk-Weighted Assets*, concerns the value of the assets exposed to credit risk weighted by their own risks.

*Capital Tier 1*, is translated in the difference between two components. The first corresponds to the sum of the Net Income generated in the current period, the transitioned results from previous years, legal reserves and equity. The second component is the sum of loans, participations values and other intangible assets.

#### 7.2.Return On Equity: ROE

$$ROE = \frac{\textit{Net Income}}{\textit{Equity}}$$

As already outlined, the purpose of this project is to analyse the influence or impact that Dedollarization has on BFA's shape. Besides Solvency, one of the most important KPIs and benchmarks for a bank's success and profitability, is the Return on Equity. This ratio is essential to figure out the efficiency and quality of the profits being generated, therefore by analysing the impact of Dedollarization on this ratio, will be a good way of reaching our goal.

#### 7.3.Variables Choice

As already mentioned, in order to test for an impact of De-dollarization in BFA's health, the best variables to represent the bank's shape were defined as the Regulated Solvency Ratio (RSR) and Return on Equity (ROE).

Furthermore, instead of only testing for the impact of De-Dollarization in Deposits and Loans

in these BFA's KPIs, this approach will also try to analyse exogenous variables to the bank, as they are also being affected by the Dedollarization process at some extent.

Therefore, I divided the explanatory variables in three main groups: BFA-related variables, macroeconomic variables and prudential measures variables. Concerning the BFA-related variables, I chose BFA's Loans (LD) and Deposits Dollarization (DD) Levels as two predictors for the Dedollarization level. As we know, a decrease in the Dollarization ratio represents an increase in the Dedollarization of the economy. When it comes to the Macroeconomic variables, I opted to include five different variables so that they could mirror the Angolan's economy performance at a given period. Thus, I decided to use: Exchange Rate (EX), as it reflects the appreciation (Dedollarization) or not of the Kwanza and impacts the Bank's results and solvability; Inflation (INF), in order to assess the direct relation that it has on the bank, as its increase puts a pressure on BFA clients' Kwanzas Deposits; Oil Prices (OIL), which was an external event that brought a massive shock to the Angolan GDP, therefore having an impact on the banking sector; Exchange Rate Spread (EX\_SPREAD), so that I am able to see whether the credibility and trust that the Angolans affects BFA; and finally, 3 month Angolan Treasury Bills (BT) which will work as a benchmark of Angola's risk evolution. Lastly, regarding the prudential measures variables, instead of creating dummy variables in order to incorporate the three main regulations that BNA launched towards a Dedollarization process, I decided to come up with endogenous variables that work as proxies to the effects of these measures, namely: Foreign Currency Loans Level (FCL), which refers to the *Aviso 4/2011 de 8 de Junho*, which stated that financial institutions would no longer be able to concede loans in USD to their clients; and Domestic Currency Deposits Level (DCL), which is related to *Aviso 20/2012 de 25 de Abril*, the major regulation directed to the Oil sector. The latter variable helps to reflect the impact in the sense that this regulation made Oil companies to not only open Kwanzas accounts, but it also made them to transfer funds from their USD accounts to Kwanzas accounts.



The approach taken for building both models was the same and based in four main steps:

- 1) Create a correlation matrix between every variable with the main purpose to identify the ones with a low absolute correlation factor to the dependent variables and cut some of the variables that do not contribute for the problem being studied.
- 2) Before starting the model, it is necessary to test for stationarity in all the variables as they are time-series, using the Augmented Dickey Fuller Unit Root test and correct them for stationarity, so that a biased conclusion on the model's significance is avoided.
- 3) Construct a multi-factor regression model and obtain the one that maximizes the Adjusted  $R^2$ . For this stage, a stepwise backwards approach was undertaken, starting by the full model and decreasing at each time the number of insignificant variables until an optimal level was reached.
- 4) Finally, take conclusions on the statistical meaning of the findings based on the significance levels of each of the variables and their economic meaning.

#### 7.4.RSR Multi-factor Regression

For this model, the sample considered ranged from September 2011 until September 2016 on a monthly basis, meaning an  $N= 60$  observations. This sample size is explained by the fact that BFA only started to calculate its Regulated Solvency Ratio on a monthly basis in 2011 and that the calculation of RSR took a major improvement in September 2011.

After proceeding with previously detailed approach, the final model obtained was the following (see *Appendix I* for the regression output):

$$D\_RSR_{t-1} = \alpha + \beta_1 \cdot D_{DD_{t-1}} + \beta_2 \cdot D_{LD_{t-1}} + \beta_3 \cdot D_{FCL_{t-1}} + \beta_4 \cdot D\_EX\_SPREAD_{t-1} + \beta_5 \cdot INF_t + \beta_6 \cdot D\_BT_t + \mu_t$$

$D\_RSR_{t-1}$  : First Difference of Variable RSR with Lag 1.

$D\_DD_{t-1}$  : First Difference of Variable DD with Lag 1.

$D\_FCL_{t-1}$  : First Difference of Variable FCL with Lag 1.

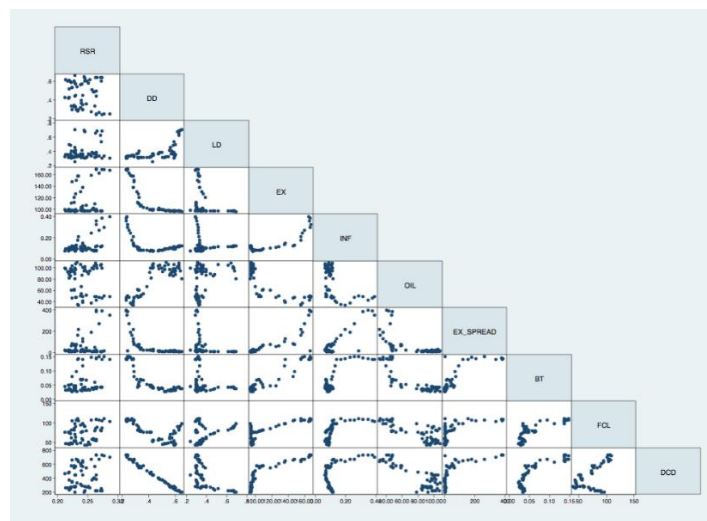
$D\_EX\_SPREAD_{t-1}$  : First Difference of Variable  $D\_EX\_SPREAD$  with Lag 1.

$INF_t$ : Variable INF

$D\_BT_t$ : First Difference of Variable BT

(see *Appendix Extra* for the ADF output for each of the variables above tested)

Taking a look at the Correlation Matrix between the variables at Step 1 (see *Figure 13*), one can see the low correlation factors that variables OIL and DCD have, which explains why they were not considered when running the model. Focusing on these two variables, it is seen that  $\rho_{OIL} = -0.1193$  and  $\rho_{DCD} = 0.1825$ , being both lower than a Pearson coefficient of 0.2. Although  $\rho_{DD} = -0.1643$ , it was decided that it would remain in the analysis as it consists on one of the most important predictors to test.



*Figure 13 Correlation Matrix on RSR model*

After the final model was regressed, the only variables that were considered to be significant at a 10% significance level were the Deposit Dollarization with a negative relation with RSR, Loan Dollarization with a positive impact on the RSR and Foreign Currency Level a small, yet negative, impact on the RSR. However, it needs to be stated that the model's quality is very poor, presenting an  $R^2 = 0.1646$ , meaning that the set of these 6 predictors are only able to explain 16% of the RSR behaviour. Ultimately, this means that despite both the Dollarization Levels had a significant impact on the RSR, it only contributed for explaining a small fraction of the Regulated Solvency Ratio, which leads to the main conclusion that the overall impact of Dedollarization in this KPI is very small, if not null. Nevertheless, analysing the different impacts in the RSR, it is easy to see why an increase on the Deposits Dedollarization level (drop

on the Deposits Dollarization Level) would lead to an increment in the Regulated Solvency Ratio: given that the bank's solvency is seen as its ability to repay its debt obligations in the medium-long term, a decrease in the USD obligations (USD deposits) is a positive event for the bank, as it becomes more solid. This is explained by the fact that at the current state of the Angolan economy, BNA struggles a lot to provide USD to the economy, so if a bank's obligations sheet is in Kwanzas, it will be a lot easier for BNA to support it.

### 7.5.ROE Multi-factor Regression

For this model, the sample considered ranged from 2007 until 2016 on a yearly basis, meaning a N= 9 observations. Though the size of sample was remarkably low, an attempt to establish a relation between BFA's Return on Equity and the change in the Dollarization levels was undertaken. The main reason for such initiative relies on the fact the component of profits and equity structure captured by ROE is the most important for the analysis of the bank's situation. After proceeding with the previously detailed approach, the final model obtained was the following (see *Appendix II* for the regression output):

$$ROE_{t-1} = \alpha + \beta_1 \cdot D\_DD_{t-2} + \beta_2 \cdot D\_EX\_SPREAD_{t-2} + \beta_3 \cdot D\_FCL_{t-1} + \mu_t$$

$ROE_{t-1}$  : Variable ROE with Lag 1.

$D\_DD_{t-2}$  : First Difference of Variable DD with Lag 2.

$D\_EX\_SPREAD_{t-2}$  : First Difference of Variable D\_EX\_SPREAD with Lag 1.

$D\_FCL_{t-1}$  : First Difference of Variable FCL with Lag 1.

(see *Appendix Extra* for the ADF output for each of the variables above tested)

Taking a look at the Correlation Matrix between the variables at Step 1 (see *Figure 14*), a different approach was followed due to the low number of observations for each variable. Therefore, the criteria to take variables out of the model dropped to all the correlation coefficients lower than 0.1. In this sense, variables INF and OIL were kept out of the model, with  $\rho_{INF} = 0.0072$  and  $\rho_{OIL} = 0.0922$ , respectively. Nevertheless, despite the fact that EX had a correlation coefficient  $> 0.1$  ( $\rho_{EX} = -0.1795$ ), it was removed from the model due to its correlation with EX\_SPREAD. This procedure was only performed in this model in order

to ensure the maximum quality and significance possible given the sample size constraint.

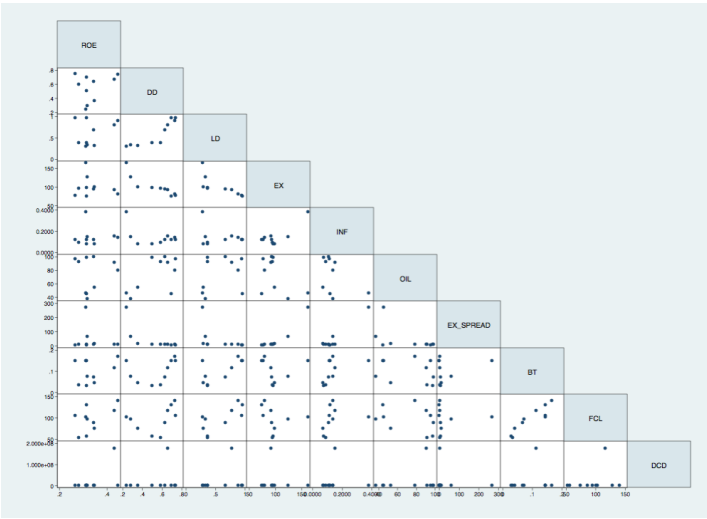


Figure 14 Correlation Matrix on ROE model

After the final model was regressed, only Deposits Dollarization and the Exchange Rate Spread were considered to be significant at a 10% significance level. Contrary to the previous model, this model presented a  $R^2 = 0.9511$ , a clear sign of significance and relevance of the two predictors. Taking into account the problem of sample size, this result only means that there might exist a positive impact on BFA’s ROE. Taking a look at Figure 15, which shows the spread in returns in both AKZ and USD deposits that BFA has to pay to their clients, only during the last year and half the return on USD deposits surpassed the Kwanza’s return. Thus, implying an average positive spread between DCD and FCD. Given that Deposits represent a liability for BFA, the higher the Dollarization Level, the lower will be the cost that BFA will have to pay to their clients’ portfolio.

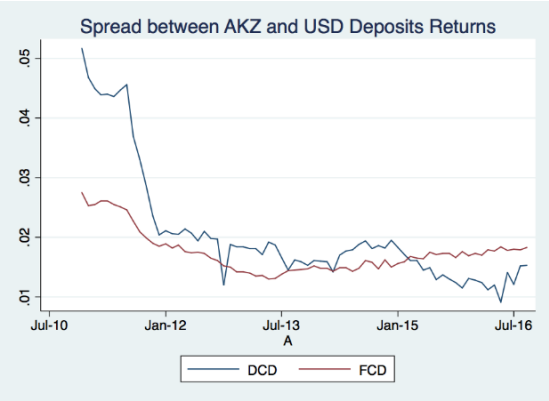


Figure 15 Source: BFA

## 8.MAIN CONCLUSIONS

As previously explained, a Dedollarization process is undertaken in order to restore monetary and fiscal policy autonomy. Usually, it means that the foreign currency is swapped by the local currency and re-gains use in most of its forms: store of value, means of payment and unit of account. Nevertheless, in the case of Angola there has been a successful transition from USD to Kwanzas in the forms of means of payment and unit of account. By recalling *Figures 1 and 2*, it is easily seen how the impact of BNA's prudential measures had a statement in bringing down the Dollarization Levels in both Deposits and Loans to levels close to 20% in only 5 years. As Departamento de Estudos Económicos (2014) state in their article, until 2013 Angola was being very successful on Dedollarizing its economy, mainly due to the role of BNA, which, back in 2013, was able to achieve a stable macroeconomic environment and a working stimulus to take the USD out of the economy. Ultimately, the department was able to prove in their study, that Dedollarization and macroeconomic stability share an interdependent relation.

However, fast-forwarding to 2016, it is seen that the process was not fully completed: inflation levels close to 40%, a never-ending Kwanza devaluation and yet, the banking system presents a balance-sheet with low levels of USD Assets and Liabilities. Additionally, the shock on oil prices brought high levels of inflation and an abrupt devaluation of Kwanza which made people to pursuit the USD, as it is known that on a recent dollarized economy, whenever there is an external shock, people tend to protect themselves with foreign currency. This event was critical in making the population of Angola very cautious regarding Kwanza as a form of store of value. Taking a look at *Figure 16*, the increasing values for Kwanza that are being exchanged in the Parallel Market are pushing the exchange rate to astonishing levels, showing the low level of credibility that Kwanza has close to the population. Moreover, this trend can be also seen by the fact that most of the Angolans are buying USD indexed Treasury Bill at a very large growth rate, to protect from a depreciating Kwanza.

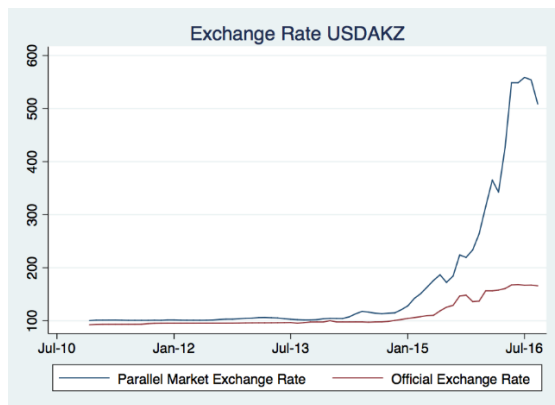


Figure 16 Source: BFA and BNA

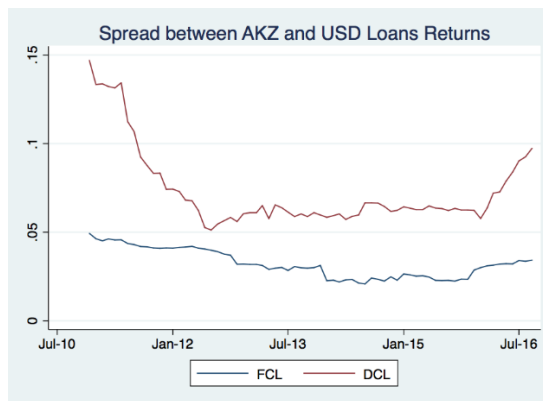


Figure 17 Source: BFA and BNA

Concerning the effective impact that Dedollarization has on BFA, and despite the fact the statistical model approach did not provide a viable significant conclusion, there are several important remarks to be made, based on the current economic conditions.

Firstly, Dedollarization for banks means better liquidity and solvency levels, which is aligned with the statistical findings of the RSR model. In the case of BFA's Assets, the bank is in a better position when its assets are in national currency. Moreover, a Bank in Angola with Assets in USD has a high exposure level to several risks: credit risk, since it is not foreseeable that the client will be able to repay a loan in USD; and balance sheet risk, due to risk that a possible default from a client represents on a bank's liabilities, i.e. deposits.

Secondly, this process of Dedollarization brought an opportunity for banks to capitalize on the change of Loans from USD to Kwanza, as from 2011 onwards, the supply of loans in USD was blocked. By analysing *Figures 16 and 17*, it is obvious the spread that the Bank earns an excess for having the asset or liability in national currency than if it was in foreign currency. This fact is extremely important when understanding the impact of Dedollarization on BFA's results, as it allowed BFA to take advantage of this rise of Kwanza's interest rate, due to the high depreciation and inflation.

Thirdly, the biggest advantage for an Angolan bank with a low level of USD balance-sheet is that the bank is easily helped by BNA during an emergency, as the foreign currency is very scarce nowadays and almost impossible for BNA to be able to help and provide support in the

case of an unexpected event.

Lastly, there is a last remark that deserves to be mentioned: the impact of Oil prices on the Banking system results and on the Dedollarization’s success path. Resorting to *Figure 18*, it can be immediately detected that when the crash on oil prices occurs, during the thirist trimester of 2014, there is an immediate jump on the percentage of clients that defaulted their payments on their obligations. This evidence is a statement of the huge impact that an exogenous shock on a very little diversified economy can create.

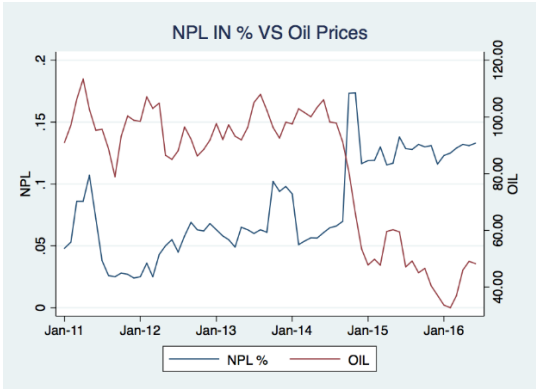


Figure 18 Source: BFA and Bloomberg

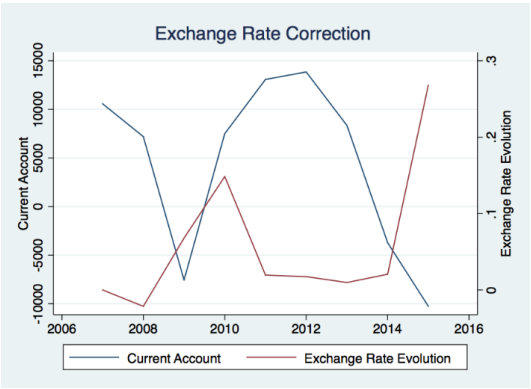


Figure 19 Source: BNA

However, the Banking system was not the only affected as this shock shook the Angolan economy from the bottom to the top, also affecting the Angolan budget and reserves. Taking a close look on *Figure 19*, it shows a very particular relationship between the Angola’s Current Account and the evolution of the Exchange rate. After the oil shock, which resulted in a negative current account in 2014, the Government had to rely on its international reserves in order to correct for the deficit, which increases the stock of national currency versus the stock of foreign currency. Thus, leading to an increase in the exchange rate, i.e. the Kwanza depreciates. With this analysis, it is obvious how the oil shock had a direct impact on the change of course in the Dedollarization process. In this sense, the Angolan GDP diversification must be viewed as a priority in order to avoid a similar situation in the future.

Concluding, this project enabled the understanding of how the Dedollarization has a positive impact on the Banking System balance sheets on a high inflation environment which makes the

spread between the return on assets in National currency versus Foreign currency to remain at attractive levels. Continuing on the same logical path, it would be interesting from a statistical point of view to forecast the impact of continuing with a De-Dollarization process but with a low inflation environment, close to the levels prior 2014, as the Angolan economy is finally showing signs of starting to recover.

## APPENDIX I

### RSR MULTI-FACTOR REGRESSION OUTPUT

```
. reg D_RSR1 D_DD1 D_LD1 D_FCL1 D_EX_SPREAD1 INF D_BT
```

Source	SS	df	MS	Number of obs	=	59
Model	.002332873	6	.000388812	F(6, 52)	=	1.71
Residual	.011843385	52	.000227757	Prob > F	=	0.1379
Total	.014176258	58	.000244418	R-squared	=	0.1646
				Adj R-squared	=	0.0682
				Root MSE	=	.01509

D_RSR1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
D_DD1	-.4521712	.202606	-2.23	0.030	-.8587299 -.0456125
D_LD1	.1958289	.0850396	2.30	0.025	.0251845 .3664733
D_FCL1	-.0010141	.0004696	-2.16	0.035	-.0019564 -.0000719
D_EX_SPREAD1	-.0000408	.0000334	-1.22	0.228	-.0001079 .0000263
INF	.0256641	.0255673	1.00	0.320	-.0256405 .0769686
D_BT	.392888	.2963931	1.33	0.191	-.2018682 .9876441
_cons	-.00319	.003909	-0.82	0.418	-.0110341 .004654

## APPENDIX II

### ROE MULTI-FACTOR REGRESSION OUTPUT

```
. reg ROE1 D_DD2 D_EX_SPREAD2 D_FCL1
```

Source	SS	df	MS	Number of obs	=	7
Model	.013084609	3	.004361536	F(3, 3)	=	19.44
Residual	.000673164	3	.000224388	Prob > F	=	0.0181
Total	.013757774	6	.002292962	R-squared	=	0.9511
				Adj R-squared	=	0.9021
				Root MSE	=	.01498

ROE1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
D_DD2	.9900517	.1529065	6.47	0.007	.5034349 1.476668
D_EX_SPREAD2	-.0009703	.0003787	-2.56	0.083	-.0021756 .0002349
D_FCL1	.9105376	.3931186	2.32	0.103	-.3405413 2.161617
_cons	.393863	.0130383	30.21	0.000	.3523694 .4353566



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