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Enowbi Batuo, Michael and Mlambo, Kupukile

University of Westminster, African Development Bank

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Financial liberalisation, Banking Crises and Economic Growth in African Countries

Michael Batuo Enowbi*
University of Westminster

Kupukile Mlambo‡
African Development Bank

Abstract

While financial liberalisation is considered to be good for economic growth in that it promotes the development of the financial sector, banking crises on the other hand tend to be inimical for economic growth. Moreover, banking crises tend to be preceded by financial liberalisation, as noted in a number of studies. This is because financial liberalisation tends to induce greater risk-taking behaviour by agents, thus leading to banking crises. In this paper we study the effect of financial liberalisation and banking crises on the economic performance of African countries during the period covering 1985 to 2010. Using a treatment effect, two step methods and a panel probit method, our results show that banking crises have a negative impact on economic growth meanwhile financial liberalisation tends to reduce the likelihood of banking crises in African countries.

Keywords: Economic Growth , Financial Development, Financial instability and Africa
JEL classifications: O16, O47,G23, O55

* enowbim@wmin.ac.uk

‡ k.mlambo@afdb.org

1. Introduction

In the late 80s and the early 90s, African countries under the framework of the IMF and the World Bank, structural adjustment program, implemented economic reforms. Financial liberalisation was the major part of these reforms, with the aim to allow countries to remove the distortions in domestic financial markets to permit higher competition and more efficient allocation of capital; increasing financial intermediation; to increase access to external markets especially long term investment capital, and to reduce corruption through deregulation of the financial system. Financial systems play an important role in economic development. They attract funds from savers in the surplus sector and channel these to borrowers for purposes of profitable investment. A repressed financial system fragments domestic capital market with adverse effects on the quality and quantity of real capital accumulation. The adoption of financial liberalisation under these circumstances has been suggested in order to enhance economic growth, a suggestion which many African countries have implemented to various degrees.

The general consensus is that financial liberalisation improves financial development and contribute to economic development (e.g. Bakaert and Harvey 2000; Levin, Henry, 2000) However, some observers are of the view that the openness of the financial sector can make economies more vulnerable to financial instability and may cause banking crises (Demirguc-Kunt and Detragiache, 1998, 2000; Caprio and Klingebiel, 1996, ; Kaminsky and Reinhart, 1999).

The objective of this paper is to analyse and assess empirically the effect of banking crises on the financial liberalisation and Economic Growth of a restricted sample of African countries over the period spanning from 1985-2010. Firstly we adopt a treatment effect method that can consider the contradictory twofold effect of financial liberalisation. On one

hand, it promotes financial development and enhances economic growths, and the other hand, it encourages risk taking, generating financial instability and increasing the probability of banking crises. We then employed the panel probit model to estimate the likelihood of banking crises on financial liberalisation and economic growth. Our results suggest that financial liberalisation has a positive effect on economic growth while banking crises tend to be harmful to economic growth but due to financial liberalisation the likelihood of banking crises are lower.

The rest of the paper is organised as follows. Section 2 provides a look at the effect of banking crises occurrence on the adjustment of some macroeconomic variables before to and after to the banking crises. Section 3 provides the literature review on the determinant of banking crises and their link to financial liberalisation and their consequence on economic growth. In Section 4, provides a description of the empirical method and data. Section 5 reports the results of the findings and in section 6 we have the conclusion.

2. Banking crises and Macroeconomic Adjustment in African Countries

Africa was initially believed by many experts to be somehow insulated from the recent global financial crisis, because of the relatively limited level of integration of most African financial markets with global financial markets. However, the continent has witnessed some adverse effects, evidenced in a slowdown in the rate of growth from 4.9% in 2010 to 3.7% in 2011.

The current financial crisis is now undermining the steady progress that African countries had made over the last decade. The consequences are affecting all sectors of these economies such as firms, mines, jobs, revenues and livelihoods, resulting in a development crisis. For the first time in a decade there will be zero growth per capita. The macroeconomic outlook has deteriorated severely, with many countries facing widening current accounts and budget deficits. The crisis is reducing trade, the foundation of recent strong growth in Africa. The

expected loss in export revenues amount to USD251 billion and USD277 billion in 2010 for the continent as a whole, (World Economic Outlook, 2010). In addition, capital inflows are also declining, including working remittances and tourism receipts and even the stock of the foreign reserve is running low, jeopardising some countries capacity to import even basic commodities such as food, medical supplies and agricultural inputs. The private sector has been affected by shortage of liquidity in international market, with an adverse impact on trade and investment. With some International banks failing to issue lines of credit.

In this section, we are going to examine the historical banking crises episodes in African countries between the 1980s and the 1990s and underline and the macroeconomic adjustment paths experienced before and during the crises. We are going to identify the characteristics of banking crisis episodes, by looking at the pattern of principal macroeconomic variables as if they were eventually affected by the economic downturn before the banking crises, or whether the economic slump was caused by banking crises.

Bordo et al (2001), define banking crises as a period of financial stress resulting in the erosion of most or all of the aggregate banking system capital, meanwhile according to Reinhart and Rogoff (2008a), banking crises should be one of the following types of events. Bank runs that lead to closure, merger or takeover by the public sector of one or more financial institutions, or in the absence of runs, closure merger, takeover, or large scale government assistance of an important financial institution that marks the start of a similar outcome for other financial institutions.

In this analysis we are going to use 37 African countries that have experienced banking crises, of which 29 were systemic banking crises (Caprio at al (2005) and Leaven and Valencia, (2008), most of which occurred in the 90s, between 1990 and 1993 when there were about 20 episodes of banking crises in each year (see Figure 1) . Our analysis on the

main macroeconomic adjustments will be based on two sections which are the condition prior to banking crises and the conditions during the banking crises.

Table 1 shows the average, median and standard deviation of the peak of GDP growth rate, output gap, real credit growth rate and real interest rate before the banking crises. The peak has been identified as five years before the occurrence of the banking crises in each country. Most of the countries experienced economic boom that generated positive output gaps and a high rate of credit growth. More than 17 countries had a growth rate of GDP more than 5% and 10% of the growth rate of real credit. When the average growth of credit to GDP is in excess of 10% per annum for three year is known as credit boom. Empirical literature shows that banking crises are typically preceded by a lending boom (Gourinchas et al. (2004), Tornell and Westermann (2002), Bordo and Jeanne (2002), and IMF (2004)).

The real credit growth average peak for African Countries that have experienced banking crises was around 19% with some countries such as Burundi (38%), Cape Verde (19%), Kenya (21%), Nigeria (31%) ,and Mali (21%), having above the medium . One of the factors that could have contributed to these expansions is the process of financial liberalisation that most countries were implementing in the 80s and 90s. The capital account liberalisation period coincided with openness in the banking sector, letting banks to have greater access foreign capital to fund the growth in credit. This allowed many countries to run huge current account deficits over the pre-crisis years. Some countries that experienced banking crises, had a current account deficit as a per cent of GDP that was 10% as a result the central bank had to reducing interest rate in response to the overheating economic.

The economic slowdown associated with banking crises, (see Table 2) illustrates the main macroeconomic component having a considerable decline, with the real credit growth falling substantially. This implies a loss of trust between the lenders and the creditors over the scale of losses because of the less credit worthy lending that took place, reducing the funding

available to banks. In response, lenders seek to tighten the supply of credit in the market provoking a credit crunch, which is a key feature associated with banking crises and economic slowdown. Table 7 points out that about 15 countries (Algeria, -101.87%; Burkina Faso, -17%; Cameroon,-11%; Niger, -27% and Ethiopia, -30% among others) had a drastic collapse of their real credit growth during the banking crises. Most importantly, the average of the output gap also fell as a result of the sharp contraction of GDP growth. The economic downturn associated with banking crises tended to slowdown the GDP growth which has a similar effect on consumption growth.

Table 3 looks at the composition of domestic spending adjusted around the banking crises and the change in the share of investment in GDP and household consumption growth between the peak and the trough in the output gap. The most significant change occurred in the trade balance, with a drastic reduction of -354%, demonstrating that African traders are more vulnerable to international trade. Behind this high balance of trade deficit are some structural weaknesses, which could be due to the possibility that African countries are specialised in sectors that are particularly vulnerable to financial crisis. In particular, they are more concentrate more on primary good and raw materials, trades which may be more dependent on the financial system. If the low level of development of the financial system forces African firms to rely more heavily on trade financing from importing countries and if this type of financing is particularly hit by banking crises then this would explain the fragility of African exporters to financial crisis in importer countries. When banks are facing high level uncertainty, trust and liquidity are low, banks and firms in the importer country, would cut exposure and credit to countries that are consider to be more risky first.

The main reason for the reduction of investment during banking crises is due to a lack of demand and the deterioration of the firms' credit conditions, therefore their access to credit is lower, forcing them to scale back their investment plans. Governments sometimes have to

intervene using public funds to rescue the banking system and as a consequence reducing public investment in the productive sector.

3. Literature Review

The themes of financial liberalisation, banking crises and economic growth in African countries has not been tackle empirically but has been done in separate stands. Most of the studies dealing with African countries have focused on identifying the effects of financial liberalisation on their economies. Such research can be broadly classified into three groups based on the transmission mechanisms of financial liberalisation into the economy, this is expected to affect the economy by improving saving and investment and these increases are then channelled into faster economic growth rates. Thus, the effects of financial liberalisation can be felt by saving, investment and economic growth. Most of the empirical evidences were inconclusive and challengeable.

For instance, studies such as Oshikoya (1992), Kariuki (1995), Mwege (1997) and Ziroklu and Barbee (2003) did not find any significant effect of financial liberalisation on saving. Other researchers such as Seck and El Nil (1993) and Azam (1996) found that liberalisation has had a significantly positive effect on savings. The contradiction of these results can be attributed to the type of estimation techniques that were used in deriving the saving equation. Mason et al (1993) pointed out that the conclusions concerning the significance of one or another factor have often depended on the importance of the choice of time series or cross sectional estimation. One other factor that can be credited is the uncertain nature of the effect of interest rate changes on saving. Even if there is some ambiguity in the literature with respect to the causality between financial liberalisation and growth; the general consensus is that liberalisation is a requirement for increased intermediation associated with financial development (see Ranciere et al (2006) and Tressel and Detragiache (2008)).

There are others studies, explicitly the model incorporating the effects of financial development on economic growth as well as on the likelihood of banking crises which means understanding the theory of the financial system and banking in general. The most significant act of financial intermediation is the creation of liquidity. Diamond and Rajan (2001) argue that banks need a fragile bank structure to be able to credibly commit to pay back fund to depositor. As a result, the risk of a banking crisis may be a necessary disciplinary tool in an imperfect market. If such a risk materialises, a banking crises arises, due to the various macroeconomic origins of banking crises such as inflation, cyclical output downturns, terms of trade deterioration, exchange rate crashes, and currency as well as asset and real estate devaluations (see Lindgren et al., 1996; Dooley and Frankel, 2003; and Collins and Kincaid, 2003) . While a banking crisis is on-going, the credit crunch hypothesis predicts that decreased bank credit to firm decreases investment and expenditure, which results in decreased economic output and demand (Kaminsky and Reinhart, 1999; Demirguc-Kunt and Detragiache, 2005). Government intervention in the banking crises will on the other hand result in fiscal costs. Therefore, government face a trade-off between fiscal and economical costs as higher fiscal spending on government interventions is expected to decrease the cost of crises and vice versa (Laeven and Valencia, 2008) .

Jones and Daniel (2007) have developed a model of a transition period following liberalisation showing that financial liberalisation can increase the likelihood of banking crises in the medium term while also enhancing economic efficiency. In the model the immediate effect of liberalisation is to lower the cost of capital and thereby, to increase real investment activity. Banks finance more risky projects and over time projects with lower returns will be accepted. At this point, when the capital stock has increased and marginal projects offer lower returns, banks become more vulnerable and the likelihood of crises increases.

Kaminsky and Reinhart (1999) found that problems in the banking sector typically precede a currency crisis and that a currency crisis deepens the banking crises, activating a vicious spiral. They also found that financial liberalisation often precedes banking crises. Similar results were replicated in several papers using different methodologies.

Demirguc-kunt and Detragiache (1998) studied the empirical relationship between banking crisis and financial liberalisation in 53 countries during 1980 and 1995. They found that banking crises is more likely to occur in liberalised financial systems. The impact of financial liberalisation on the fragility of banks is weaker, however, when the institutional environment is strong. They found that bankers franchise values decline after financial liberalisation. Hence, the intensification of the moral hazard associated with lower franchise values may be one of the sources of increased banking sector fragility. Financial liberalisation is followed by improved financial development, while banking crises tend to slow it down. In countries that liberalise from a position of financial repression, financial development improves even if a banking crisis tends to slow it down. Their results support the view that financial liberalisation should be approached cautiously where the institution necessary to ensure law and contract enforcement and effective prudential regulation and supervision are not fully developed, even if macroeconomic stabilisation has been achieved.

Eichengreen and Arteta (2002) extend the analysis in Demirguc-Kunt and Detragiache by distinguishing between the effect of internal and external financial liberalisation. The latter is captured by a 0/1 dummy. They find that capital account liberalisation does not contribute to a banking crises but the internal financial liberalisation does. Furthermore, they find that capital account liberalisation increases the likelihood of banking crises for countries that liberalize internally. Caprio and Summers (1993) and Stiglitz (1994) express the concern that financial liberalisation may lead to great financial fragility as banks find greater opportunities for risk taking. Through limited liability, lax regulation and supervision, eroding bank capital

and implicit as well as explicit guarantees, banks face only little downside risk and therefore often as well as explicit guarantees beyond socially desirable limits.

4. Empirical methods and Data

We use the treatment effect model to assess the outcome of financial liberalisation and banking crises on the economic performance of African countries following the model employed by R.Ranciere & al, (2006) in which they simultaneously apply a growth model and a crisis model. In order to do that, we add to the standard growth regression a financial liberalisation variable and a banking crisis dummy. In particular, we treat that banking crises dummy as an endogenous variable that depends on other variables among which is the financial liberalisation dummy.

The literature on the effect of financial liberalisation and explanation of banking crises is dominated by the view that increasing financial liberalisation leads to boosting the possibility of banking crises. An explanation could be that openness and competition in the financial sector would increase the possibility that banking crises erupt as a result of speculative performance, as well as sudden shifts in portfolio preferences. In addition, high leverage could contribute to the vulnerability of the banking system and may build up during periods of optimistic sentiment in the market. But the main point contradicting this argument is that all type of financial liberalisation contributes to more competitive situation wherein banks are subject to market discipline providing an incentive for improved governance, risk management and innovation. For market discipline to be effective, financial liberalisation must be promoted until a setting level. On these grounds the following hypotheses would be verified. The effect of financial liberalisation on the likelihood that banking crises can occur controlling others macroeconomic variables. We also verify the effect of financial liberalisation and the occurrence of banking crises on the economic performance of African

countries. In this scenario, the growth model has the following panel form with i indexing the country and t indexing the time period:

$$y_{i,t} = \alpha\chi_{i,t} + \beta FL_{i,t} + \gamma B_{i,t}^{crisis} + \varepsilon_{i,t} \quad (1)$$

Where $y_{i,t}$ is real per capita GDP growth, $\chi_{i,t}$ is a set of control variables standard in the growth regression, $FL_{i,t}$ is for the financial liberalisation variables, and $B_{i,t}$ is a dummy variable denoting the value of one if a country i has had banking crises in period t and zero if not. Finally, $\varepsilon_{i,t}$ is a random component. The crisis model treats the financial liberalisation $B_{i,t}^{crisis}$ as an endogenous variable which depends on the realisation of an unobserved latent variable D_{jt} in the following way:

$$B_{i,t}^{crisis} = \begin{cases} 1, & \text{if } D_{jt}^* > 0 \\ 0, & \text{otherwise} \end{cases} \quad (2)$$

$$D_{jt}^* = \delta Z_{i,t} + \varphi FL_{i,t} + \eta_{it}$$

The latent variable B_{jt}^* is assumed to depend linearly on a set of control variables $Z_{i,t}$, on the banking crises dummy $B_{i,t}^{crisis}$ and on a random component η_{it} . Under the assumption that $\eta_{it} \sim N(0,1)$, the probit equation model can be represented as:

$$\begin{aligned} B_{i,t}^{crisis} &= \begin{cases} 1 & \text{with probability: } \Pr(D_{jt} > 0) = \Phi(\delta Z_{i,t} + \varphi B_{i,t}^{crisis}) \\ 0 & \text{with probability: } \Pr(D_{jt} > 0) = 1 - \Phi(\delta Z_{i,t} + \varphi B_{i,t}^{crisis}) \end{cases} \end{aligned}$$

Where Φ is the cumulative distribution function of standard normal. Thus, the parameters of the crisis model can be estimated using a probit model. This mixed model described above is known as a treatment effect model for which standard estimation techniques have been

developed (see Heckman (1973) and Maddala (1993)). The model can be consistently estimated using a two step procedure under the assumption that the error term $\varepsilon_{i,t}$ and η_{it} are bivariate normal but not independent. In the first step, one obtains probit estimates of the probability of crisis: $\Pr (B_{i,t}^{Crisis} = 1) = \Pr(W_{it}^* > 0) = \Phi(\delta Z_{i,t} + \varphi B_{i,t}^{Crisis})$

Where Φ is the cumulative distribution function of standard function.

Using the probit estimates $\hat{a}\hat{b}$, one computes a hazard $h_{i,t}$ for each observation. In the second step, one obtains consistent estimates for the parameters (α, β, γ) of the growth model by augmenting regression (1) with the hazard $h_{i,t}$.

The equation (1) is the treatment effect model, the banking crises dummy captures the treatment, the growth regression is the outcome equation while in the equation (2) is the treatment equation representing the likelihood to receive the treatment (see S. Edwards, (2004)).

Our sample consists of 53 African countries for which we have information on the dates of banking crises and financial liberalisation over the period 1985-2010.

For the banking crises occurrence which is our dependent variable for the crisis model, we adopt a zero-one anecdotal indicator of banking crises, suggested by Caprio and al. (2005) and Laeven and Valencia (2008). The onset of banking crises dummy, based on the years of banking crises equal to 1 for each banking crises episode (both system and non system banking crises), and 0 otherwise. A systemic banking crises is defined as the situation when much or all of the banking capital is exhausted, while a non systemic or smaller banking crises is identified when there is evidence of a significant banking problem such as a government intervention in banking problem and financial institutions. But in this paper we are not going to differentiate the various types of banking crises occurrence.

The extent of financial liberalisation is measured using the capital account openness index; *KAOPEN* developed by Chinn and Ito (2008). *KAOPEN* is the first principle component of the four IMF binary variables, and higher values indicate greater financial openness. One of the merits of this index is that it attempts to measure the intensity of capital controls, insofar as the intensity is correlated with the existence of other restriction on international transactions.

The dependent variable in the growth model is computed as log difference in real GDP per capita. The set of controls for the growth equation is the standard empirical growth variables (see Barro, 1987) such as the initial per capita income, government size, trade openness and inflation. To account for the financial development we include broad money (M2 as a percent GDP) and liquid liabilities as a per cent of GDP. More detail on the countries in our sample and on all the variables is given in the appendix.

5. Empirical Finding Results

Our discussions on the estimation focus on the regression results pertaining to financial liberalisation, banking crises and economic growth, simply because they are the main focus of this study. Two different types of estimation methods, the treatment effect model and the panel probit model, yielded the same outcome which is that financial liberalisation has a negative impact on the likelihood of banking crises in African countries.

In the treatment method estimation (table 5), we have the growth model on the top and a crisis model on the bottom. Both of them including the financial liberalisation variable, in the growth equation include the banking crises dummy variable and the capital account openness index as a proxy of financial liberalisation. While the crisis model presents the estimates of the probit equation with the de facto financial liberalisation dummy. The main results suggest that financial liberalisation has positive and significant effects on economic growth at a 10% level of significance. Banking crises has a negative effect on growth meaning that countries

that experience banking crises have a reduction of their growth between the range of (-0.05, -0.06). The other standard control variables in growth have the expected signs and are significant. More importantly, the coefficients of government expenditure and inflation rate are negative and significant while real openness and M2 are always positive and significant. The crises equation presented in the lower panel in table 5. The results indicate that the probability of experiencing banking crises is significantly negative with financial liberalisation. This provides some strong evidence suggesting that countries with a higher degree of financial openness have a lower probability of facing banking crisis. Meanwhile countries that have large changes in terms of trade, large current accounts and a high volatility of interest rates have a high probability of having banking crises.

Table 6 shows results using the panel data probit model and the occurrence of banking crises as the dependent variable. In columns 1 and 2, we use a capital account openness index as proxy for financial liberalisation while in columns 3 and 4, the years when financial liberalisation occurred are used as dummy variables. Our main findings can be summarized as follows. Overall financial liberalisation has a negative impact on the likelihood of banking crisis, suggesting that liberalisation of financial sector does lower the probability of banking crises.

The effect of growth of GDP per capita on banking crises is negative and significant at 5% confidence level, which reduces the likelihood of banking crisis meanwhile GDP per capita level does not have a clear sign even though most of the coefficients are positive but insignificant. Other control variables such as the inflation rate, real openness and government size have a positive and significant effect on the likelihood of banking crises, suggesting that countries with a high inflation rate, large government size and well integrated in international trade are more likely to have banking crises.

Moreover those that have well developed financial sectors have a lower probability of banking crises. Our variable uses a proxy for financial development (M2) and has a negative and a significant effect on banking crises in all the estimations. The likelihood ratio and Wald test for all the specifications are significant at 1% level of confidence.

6. Conclusion

The aim of this paper is to examine the effect of financial liberalisation and economic growth on the likelihood of banking crises in African countries, using data restricted only to African countries for the period spanning 1985-2010 and applying the treatment effect method and panel probit model. Our empirical results show that financial liberalisation has a positive and statistically significant effect on economic growth while the latter has a negative and statistically significant effect on banking crises. Moreover financial liberalisation reduces the likelihood of banking crises, which is in contrast to conventional wisdom.

The repercussions of this result is that African countries that have liberalised the financial sector to eliminate financial repression and develop better functioning financial markets promote economic growth, and have the additional benefit of lowering the probability of banking crisis, which has a dismal effect on growth.

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Table 1 – Conditions Prior to Banking Crises with Economic Slowdowns: descriptive statistics

	Peak in GDP growth Rate (%) ^a	Peak in output gap (% GDP)	Peak in real credit growth rate (%)	Peak in real Interest rate (%)
Average	5.188	5.284	19.776	12.680
Median	6.29	4.56	13.487	13.21
St. dev.	5.833	4.710	20.328	19.079

Notes. All peaks have been identified in the 5 years before the occurrence of banking crises.

Table 2 – Economic slowdowns associated with banking crises

	Real credit growth (% pts change)	GDP average growth (%) ^a	Output gap (%pts change)	Years from peak to trough in output gap
Average	-3.740	0.878	-1.414	3.76
Median	-6.894	1.657	0.31	3
St.dev.	45.19	5.245	17.049	2.422

Notes. It represents the average growth of GDP during the crisis. B It has been calculated by using the Hodrick-Prescott filter (Hodrick and Prescott, 1981)

Table 3 – Expenditure and the Current account. Change in each variable from the Peak to the Trough in the Output gap

	Household consumption growth (% pts change)	Investment share (%pts GDP change)	Trade balance(% pts GDP change)	Current account (%pts GDP change)
Media	-0.890	-0.848	-353.808	-14.283
Median	0.027	-0.061	-12.683	-13.283
Dev.St.	4.851	4.879	1985.007	11.842

Notes. All variables refer to the changes between the peak and the trough in the output gap around the banking crises.

Table 4: Summary Statistics

Variable	Mean	S.Dev.	Min.	Max.	Observations
Growth GDP per Capita.	0.007	0.06	-0.69	0.65	1150
Log. GDP per Capita.	6.2	1.07	4.05	9.06	1197
Log. Government Consumption.	2.6	0.41	0.71	3.86	1113
Inflation rate	4.7	0.35	4.4	10.1	1079
Log.M2	3.2	3.2	-0.77	4.7	1150
Openness	68.8	33.8	10.8	256.4	1153
Capital account openness	-0.67	1.08	-1.84	2.47	1110
Change term of trade	-0.55	9.9	-107.3	42.9	1105
Banking Crisis	0.18	0.38	0	1	1222
Capital account %GDP	-5.5	11.72	-64.5	73.81	996
Volatility real interest rate	20.3	43.68	0.53	261.3	860
Dummy of financial liberalization	0.69	0.46	0	1	1222

Table 5 :Banking Crises and Economic Growth in African Countries (1985-2010)		
Estimation technique : Treatment Effect model ,two step estimation		
Dependent Variable Panel A : Real per capita GDP Growth		
	1	2
Lag. log Real per capita GDP	-0.018 (0.02)	-0.01 (0.019)
Log. Government Size	-0.017 (0.05)***	-0.014 (.005)***
Inflation rate	-0.01 (0.003)	-0.012 (0.016)
Real openness	0.015 (0.004)***	0.013 (0.005)***
Log.M2	0.007 (0.003)**	0.007(0.003)**
Financial liberalisation index	0.012 (0.07)*	0.013 (0.06)*
banking crises	-0.056 (0.005)**	-0.055 (0.025)**
Hazard Lambda	0.04 (4.7)**	0,05 (5.7)**
Dependent Variable Panel B : Banking Crises		
Financial liberalisation dummy	-0.42 (0.12)***	-0.45(0.12)***
Changes in term of trade		0.002(0.006)
volatility real interest rate	0.001 (0.02)	0.001 (0.002)
Lag inflation	-0.11 (0.022)	
Current account % GDP	-0.011 (0.005)**	0.10(0.005)***
Rho	0.45	0.41
Sigma	0.043	0.044
lambda	0.017	0.05
number of observations	564	539
number of countries	41	39

Note: the standard errors in parentheses. *, **, and*** indicate statistically significant at the 10%, 5% and 1% level respectively.

Table 6: Banking Crises, Financial liberalization and Economic Growth in African Countries				
Estimation technique : Panel Data Probit Model				
Dependent Variable : Banking Crisis				
	1	2	3	4
Log Real per capita GDP	0.08 (0.22)	0.07 (0.36)	0.04 (0.25)	0.28 (0.33)
Growth Real GDP per capita	-3.72 (1.35)**	-4.0 (1.9)**	-3.14 (1.5)**	4.2 (1.9)**
Inflation rate	0.79 (0.29)***	0.65 (0.88)	0.57(0.3)**	1.4 (0.81)*
Real openness	0.02 (0.004)***	0.009 (0.006)	0.02(0.006)***	0.004(0.006)
Log.M2	-0.52(0.21)**	-0.85 (0.4)**	-0.57(0.25)**	0.81(0.39)**
Log. Government Size	0.093 (0.020)***	0.09 (0.028)	0.09(0.02)***	0.003(0.03)
Current account % GDP		-0.02 (0.01)**		-0.01(0.01)
Volatility real interest rate		0.007 (0.008)		0.005(0.006)
Financial liberalisation index	-1.22 (7.1)***	-0.83 (0.16)***		
Financial liberalisation dummy			-1.09(0.33)***	-0.72 (0.20)***
Constant	-3.66 (1.9)*	-1.38 (4.8)	-3.1 (1.9)	
Numbers of observation	863	540	919	579
Wald chi square	64.78***	39.52 ***	74.95***	38.34***
LR-ratio test	107.51***	98.98***	129.94***	122.33***

Note: the standard errors in parentheses. *, **, and*** indicate statistically significant at the 10%, 5% and 1% level respectively.

Definitions and Sources of Variables used in Regression Analysis

Variable	Definitions and Construction	Source
Real GDP per Capita.	Ratio of real gross domestic product over total population. Real growth product is constant local currency unit	Author's calculations using International Financial Statistics (2011)
Log. GDP per Capita.	Log of real GDP per Capita.	Author's calculations using International Financial Statistics (2011)
Real GDP per Capita growth	Log difference of real GDP per Capita	Author's calculations using International Financial Statistics (2011)
Government Size.	Ratio of government consumption to GDP	World Development indicators (2011)
Inflation rate	Log(100 + annual percent change in consumer price index)	Author's calculations using International Financial Statistics (2011)
Log.M2	Log. of the ratio M2 as Percentage GDP	Author's calculations using International Financial Statistics (2011)
Openness trade	The sum of Export and Import as percentage GDP	World Development indicators (2011)
Financial Liberalisation	Is an index measuring a country is degree of capital account openness, based on binary dummy variables that codify that tabulation of restriction on cross border financial transaction reports in the IMF annual report on exchange arrangement and exchange restriction (AREAER)	The Chinn –Ita index
Changes in terms of trade	Differences in terms of trade	World Development indicators (2011)
Banking Crises	The onset of banking crises dummy, which is equal to 1 in years of banking crises episode and 0 otherwise.	Caprio et al (2005) and Laeven and Valencia (2008)
Current account %GDP	Current account balance (% of GDP)	World Development indicators (2011)
Volatility real interest rate	Standard deviation of real interest rate	Author's calculations using International Financial Statistics (2011)
Dummy of financial liberalisation	Dummy variable based on the year of liberalisation sector.	IMF
Credit Growth	The natural log difference of the ratio of domestic credit provided by the banking sector(% of GDP)	Author's calculations using International Financial Statistics (2011)

Table 7 – Conditions Prior to Banking Crises with Economic Slowdowns

Banking crises	Peak in GDP growth Rate (%)	Peak in output gap (% GDP)	Peak in real credit growth rate (%)	Peak in real Interest rate (%)	Current account (%GDP in pre-crisis year)
Algeria (1990-1992)	7.55	0.67	0.909	NA	0.31
Benin (1988-1990)	2.17	4.80	-7.41	20.370	-2.51
Burkina Faso (1988-1994)	7.95	4.91	4.19	21.190	-3.43
Burundi (1994-1995)	5.50	10.61	37.193	16.980	-3.26
Cameroon (1987-1995)	6.77	6.29	4.978	13.296	-4.27
Cape Verde (1993-1999)	5.99	4.17	19.787	7.50	-3.83
Comoros (1994-1995)	8.53	4.16	25.967	10.85	5.01
Congo, Dem. Rep. (1991-1994)	4.71	9.82	42.928	7.85	2.01
Congo, Rep. (1992-2000)	2.59	4.95	52.82	57.425	-16.12
Cote d'Ivoire (1988-1991)	3.25	2.45	12.034	18.32	-12.01
Djibouti (1991)	2.1	3.86	0.45	12.01	-5.6
Egypt, Arab Rep. (1985-1992)	7.56	4.56	6.25	12.6	-10.6
Ethiopia (1993-1995)	13.85	8.93	14.243	13.219	-2.26
Gabon (1986-2002)	6.3	8.59	12.6	14.12	-4.01
Guinea (1985-1993)	NA	NA	NA	NA	-30.961
Guinea-Bissau (1993-1995)	6.1	1.65	24.757	11.90	-48.950
Kenya (1985-1993)	6.25	4.56	21.3	11.01	-32.25
Liberia (1991-1995)	-51.30	25.81	15.301	18.227	-12.3
Madagascar (1988-1992)	1.95	-0.46	0.595	2.3	-4.78
Malawi (1988-1994)	1.62	3.31	NA	8.669	-5.388
Mali (1987-1994)	8.43	3.99	21.322	24.974	-17.26
Mozambique (1987-1991)	NA	2.71	12.01	21.684	-21.864
Niger (1987-1994)	6.36	1.17	11.161	10.23	-11.03
Nigeria (1990-1993)	9.89	3.06	31.011	11.632	3.37

Senegal (1988-1992)	6.09	3.67	-1.308	15.334	-12.73
Sierra Leone (1990-1992)	7.23	5.28	74.79	-51.617	-6.086
Togo (1993-1995)	6.64	6.47	19.425	14.860	-13.58
Tunisia (1991-1995)	7.94	5.55	12.5	19.56	-3.78
Zambia (1989-1996)	6.28	4.84	12.731	-29.998	-9.53
Zimbabwe (1991-2003)	6.98	2.88	71.825	41.192	-2.454

Source: World Development Bank and authors' own elaborations

Table 8 – Economic slowdowns associated with banking crises

	Real credit growth (% pts change)	GDP average growth (%)	Output gap (%pts change)	Years from peak to trough in output gap
Algeria (1990-1992)	-101.87	1.168	0.03	2
Benin (1988-1990)	1.614	1.254	-1.78	2
Burkina Faso (1988-1994)	-17.713	3.06	-0.70	6
Burundi (1994-1995)	-11.704	-5.87	0.59	1
Cameroon (1987-1995)	-10.980	-3.022	-2.01	7
Cape Verde (1993-1999)	22.471	6.698	-0.35	6
Central Afr Rep (1985-1999)	-84.424	1.088	-0.31	7
Chad (1985-1992)	-3.628	3.750	3.26	5
Comoros (1994-1995)	-6.894	-0.833	-1.31	1
Congo, Dem. Rep. (1991-1994)	-29.590	-9.072	-4.07	2
Congo, Rep. (1992-2000)	-57.651	1.388	-0.49	7
Cote d'Ivoire (1988-1991)	-6.344	0.757	0.10	2
Djibouti (1991)	-5.074	-4.27	1.87	1
Egypt, Arab Rep. (1985-1992)	9.567	3.807	0.66	7
Equatorial Guinea (1984-1994)	-41.263	-7.211	29.58	6
Ethiopia (1993-1995)	-30.615	7.486	-1.89	2
Gabon (1986-2002)	-12.594	1.657	-0.72	11
Ghana (1985-1989)	85.703	5.177	0.59	3
Guinea (1985-1993)	15.6	4.123	0.04	7
Guinea-Bissau (1993-1995)	-19.058	3.233	0.77	2
Kenya (1985-1993)	-1.072	3.649	0.43	5
Lesotho	-58.978	3.51	7.27	1
Liberia (1991-1995)	-12.42	-21.662	-100.27	3
Madagascar (1988-1992)	1.585	1.097	1.65	2
Malawi (1988-1994)	-8.867	1.580	-1.70	3
Mali (1987-1994)	-32.082	2.449	0.53	5
Mauritania (1985-1993)	24.239	2.734	0.41	3

Morocco (1985-1990)	21.32	4.514	0.34	3
Mozambique (1987-1991)	-17.421	7.059	5.09	1
Niger (1987-1994)	-27.473	1.01	0.31	4
Nigeria (1990-1993)	3.354	4.517	4.43	2
Senegal (1988-1992)	3.858	1.301	1.301	3
Sierra Leone (1990-1992)	-4.853	-4.436	-4.436	1
Togo (1993-1995)	-18.261	2.577	2.577	2
Tunisia (1991-1995)	2.841	3.886	3.886	3
Zambia (1989-1996)	42.840	-0.121	-0.121	3
Zimbabwe (1991-2003)	166.831	-0.592	-0.592	8

Table 9 – Expenditure and the Current account. Change in each variable from the Peak to the Trough in the Output gap

	Household consumption growth (% pts change)	Investment share (%pts GDP change)	Trade balance(% pts GDP change)	Current account (%pts GDP change)
Algeria (1990-1992)	-0.06	-0.061	-0.04	-13.488
Benin (1988-1990)	-3.38	-3.380	-30.318	-8.777
Burkina Faso (1988-1994)	-0.83	-0.827	-26.958	-2.200
Burundi (1994-1995)	-0.20	-0.197	1.18	-0.669
Cameroon (1987-1995)	1.03	1.039	1.849	-9.352
Cape Verde (1993-1999)	8.135	8.135	-74.452	-14.110
Central Afr Rep (1985- 1999)	1.12	1.127	-11.761	-5.717
Chad (1985-1992)	-0.597	-0.597	-34.706	-9.290
Comoros (1994-1995)	0.287	0.287	-51.977	-14.078
Congo, Dem. Rep. (1991- 1994)	0.072	0.072	-1.525	NA
Congo, Rep. (1992-2000)	-22.771	-22.771	15.968	-18.486
Cote d'Ivoire (1988-1991)	0.034	0.034	6.003	-24.458
Djibouti (1991)	NA	NA	-24.233	NA
Egypt, Arab Rep. (1985- 1992)	1.055	1.055	-20.107	-3.369
Equatorial Guinea (1984- 1994)	-13.12	-13.12	-81.167	-10.599
Ethiopia (1993-1995)	0.145	3.24	-3.01	-0.234

Gabon (1986-2002)	0.533	0.533	-3.686	-39.724
Ghana (1985-1989)	0.193	0.193	-14.123	-6.407
Guinea (1985-1993)	-1.946	-0.162	1.820	-20.848
Guinea-Bissau (1993-1995)	-0.608	-1.377	-47.323	-46.862
Kenya (1985-1993)	0.194	0.281	-10.483	-6.433
Liberia (1991-1995)	-0.995	-0.995	NA	NA
Madagascar (1988-1992)	0.027	-0.185	-19.708	-14.498
Malawi (1988-1994)	-3.417	-3.417	-38.148	-31.499
Mali (1987-1994)	-0.671	-0.671	-35.910	-18.215
Mauritania (1985-1993)	-0.162	-0.162	-17.633	-16.217
Morocco (1985-1990)	0.321	0.321	-8.829	-4.437
Mozambique (1987-1991)	-0.116	-0.116	-53.97	-36.706
Niger (1987-1994)	2.441	-2.101	-7.740	-21.87
Nigeria (1990-1993)	-4.235	-3.692	11.542	5.306
Senegal (1988-1992)	-0.449	0.189	-14.837	-20.467
Sierra Leone (1990-1992)	1.785	1.785	-1.781	0.825
Togo (1993-1995)	2.143	2.961	-12.683	-20.858
Tunisia (1991-1995)	1.926	1.926	-10.835	-13.283

Zambia (1989-1996)	1.308	1.308	-10.768	-12.11
Zimbabwe (1991-2003)	-0.369	-0.369	-3.702	-12.25

Source: World Development Bank and authors' own elaborations

Timing Banking Crises and Financial liberalization in African countries

Country	Year of financial liberalisation	Year of banking crises	Comment	Systemic Crises: Yes/No?
Algeria	1990	1990-1992	In 1989, five government-owned banks were granted managerial and financial autonomy from the central government. In the transition to a market economy, nonperforming loans (equivalent to 30% of total loans) created problems for some banks in 1990, and the Central bank had to provide discount financing to these banks.	Yes
Benin	1989	1988-1990	All three commercial banks collapsed.	Yes
Burkina Faso	1989	1988-1994	In 1989, the system of sectoral credit ratios was abolished, and deposit and lending rates were partially liberalized. During 1990, the financial condition of the banking sector deteriorated sharply. Nonperforming loans increased to 23 percent of total credit, and commercial banks' deposits in the money market declined sharply. Three major commercial banks urgently needed restructuring, while two other large banks continued to experience liquidity problems. In 1991, the government merged these three major commercial banks into one bank with minority government participation and rehabilitated the two other banks, while assuming nonperforming assets.	Yes
Burundi	1986	1994-1995	In 1995 one bank was liquidated.	Yes
Cameroon	1990	1987-1995	Five commercial banks were closed and three banks were restructured.	Yes
Cape Verde		1993-1999	In 1993, the former monobank was split into a Central Bank and a commercial bank, with 90 percent of banking system deposits. The commercial bank had accumulated a large fraction of nonperforming assets and was recapitalized by the government in 1994 by converting its portfolio of nonperforming loans into interest-bearing notes to the equivalent of 17.5 percent of GDP. All commercial banking interest rates were liberalized in 1994, with the exception of one benchmark interest rate on time deposits.	Yes

Central African Rep.	1990	1985-1999	The two largest banks, accounting for 90% of assets, were restructured.	Yes
Chad	1990	1985-1992	The Chadian banking system came close to collapse in 1992, owing mainly to the vulnerable state of the economy and an expansionary credit policy. To avoid a major financial crisis, the monetary authorities embarked on a comprehensive rehabilitation program of the banking system, involving enhancement of central bank supervision through the COBAC, and the liberalization of banking activity. In addition, they eased the liquidity crisis of the commercial banks in 1993 by consolidating into a long-term loan to the Government the rediscounted commercial bank loans that had been extended mainly to public enterprises. Credit policy was tightened; the amount of direct advances to the Treasury by the Central Bank was stabilized; and the Banque Internationale pour le Commerce et l'Industrie du Tchad was liquidated. As a result, the net foreign assets position of the banking system was strengthened and the liquidity position of the banks was gradually restored.	Yes
Congo, Dem. Rep.		1991-1994	Four state-owned banks were insolvent; a fifth bank was to be recapitalized with private participation. Two state-owned banks have been liquidated and two other state banks privatized. In 1997, 12 banks were having serious financial difficulties.	Yes
Congo, Rep.	1990	1992-2000	Between 2001 and 2002, two large banks were restructured and privatized. The remaining insolvent bank is in the process of being liquidated. Situation aggravated by the civil war.	Yes
Côte d'Ivoire	1989	1988-1991	The recession of 1987 and problems with the cocoa and coffee markets (main exports) substantially increased private sector's non-performing loans. These problems were aggravated by a large amount of nonperforming loans in the public enterprise sectors, the large accumulation of government payment arrears, the substantial decline in public and private deposits in the banking system, reduction in credit lines from abroad, and poor management in some banks. Four large banks affected, accounting for 90% of banking system loans; three definitely and one possibly insolvent. Six government banks closed.	Yes

Djibouti		1991	Two of six commercial banks ceased operations in 1991–92; other banks experienced difficulties.	Yes
Egypt	1991	1985-1992	The government closed several large investment companies.	Yes
Equatorial Guinea		1984-1994	Two of the country's largest banks were liquidated.	Yes
Ethiopia		1993-1995	A government-owned bank was restructured, and its nonperforming loans were taken over by the government.	No
Gabon	1990	1986-2002	One bank was temporarily closed in 1995.	No
Ghana	1987	1985-1989	Seven of eleven audited banks insolvent; rural banking sector affected.	Yes
Guinea		1985-1993	Six banks—accounting for 99% of system deposits—deemed insolvent. Repayment of deposits amounted to 3% of 1986 GDP.	Yes
Guinea Bissau	1989	1993-1995	At end-1996, the Central Bank's had a negative capital position and Guinea-Bissau's two commercial banks had substantial nonperforming loans. In March-April 1997, the treasury recapitalized the Central Bank.	Yes
Kenya	1991	1985-1993	Four banks and twenty-four nonbank financial institutions—accounting for 15% of financial system liabilities—faced liquidity and solvency problems.	Yes
Lesotho		1988-1991	One of four commercial banks suffered from large nonperforming loans.	No
Liberia		1991-1995	Seven of eleven banks not operational; in mid-1995 their assets accounted for 64 percent of bank assets.	
Madagascar	1994	1988-1992	After the formal abandonment in 1985 of the previous policy of bank specialization and the appointment in 1986 of separate boards of directors to replace the single board that was shared by all commercial banks, the rehabilitation of the banking system gained speed with the enactment in 1988 of a new banking law, which opened the system to private capital, and the decision in 1989 to write off most of the nonperforming loans of the existing banks.	Yes

Mali	1989	1987-1994	Mali's economic and financial prospects for 1986 and the medium term changed significantly due to the collapse in late 1985 of the world market price of cotton, Mali's major export commodity. In 1987, although the Government undertook some corrective measures, the economic and financial situation deteriorated rapidly. The expansion of credit was significantly higher than programmed, and as a result, nonperforming loans at banks increased rapidly. Owing primarily to the overexposure of the largest commercial bank in terms of its loans and guaranteed letters of credit, a liquidity crunch emerged in the banking system. The financial situation of the largest commercial bank deteriorated further in 1987, reflecting the heavy losses of the public enterprise sector that it had financed over the years, defaults by the private sector on unsecured loans, and inappropriate management. By mid-November 1997, the bank had become virtually illiquid and ceased functioning normally. Its nonperforming loans amounted to some 70 percent of its outstanding credit.	Yes
Mauritania	1990	1985-1993	In 1984 five major banks had nonperforming assets ranging from 45–70 percent of their portfolios.	Yes
Morocco	1989	1995-1990	Banking sector experienced solvency problems. Debt crisis 1980-83	Yes
Mozambique	1994	1987-1991	Main commercial bank experienced solvency problems that became apparent after 1992.	Yes
Niger	1987	1987-1994	In the mid-1980s banking system nonperforming loans reached 50 percent. Four banks were liquidated and three restructured in the late 1980s. In 2002, a new round of bank restructuring was launched. Four banks were experiencing serious difficulties. Two of them were to be restructured and the other two might be liquidated.	Yes
Nigeria	1991	1990-1993	In 1993 insolvent banks accounted for 20 percent of banking system assets and 22 percent of deposits. In 1995 almost half the banks reported being in financial distress.	Yes
Senegal	1989	1988-1992	In 1988, 50 percent of banking system loans were nonperforming. Six commercial banks and one development bank closed, accounting for 20–30 percent of financial system assets.	Yes
Sierra Leone	1991	1990-1992	One bank's license was suspended in 1994. Bank recapitalization and restructuring are ongoing.	Yes
Togo	1989	1993-1995	Banking sector experienced solvency problems.	Yes
Tunisia	1990	1991-1995	In 1991 most commercial banks were undercapitalized. During 1991-94, the banking system raised equity equivalent to 1.5% of GDP and made provisions equivalent to another 1.5%.	No
Zambia	1992	1989-1996	Meridian Bank, accounting for 13% of commercial bank assets, became insolvent.	Yes
Zimbabwe	1993	1991-2003	Two of five commercial banks have high nonperforming loans.	Yes

Sources: Caprio and Klingebiel (1996, 1999); Laeven and Valencia, (2008). Reinhart & Tokatlidis (2003); Demirguc-Kunt & Detragiache

Figure 1. Frequency of Banking Crises in African Countries, 1985-2005

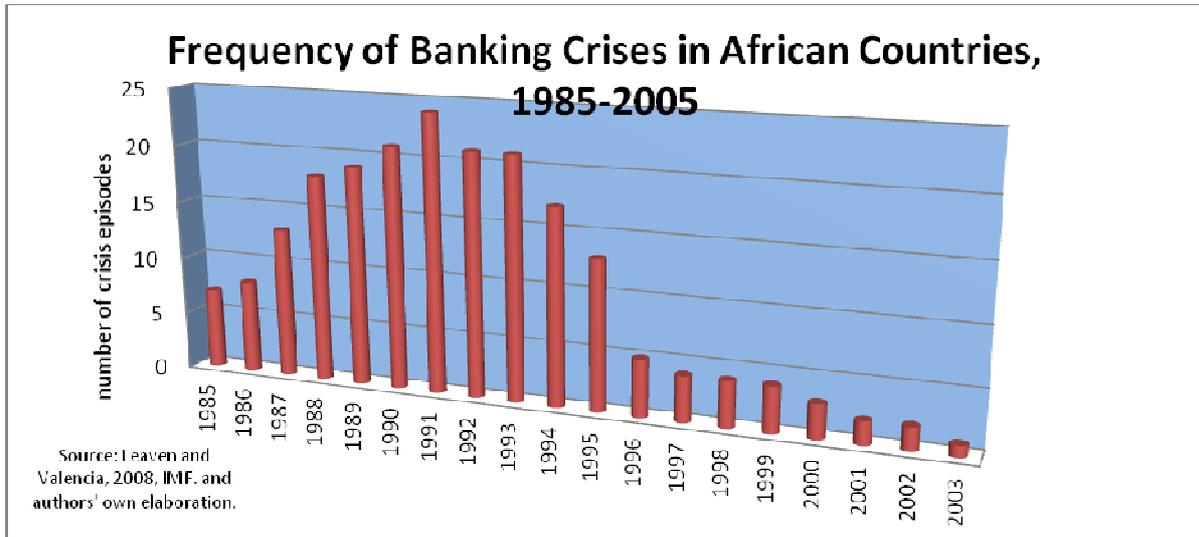
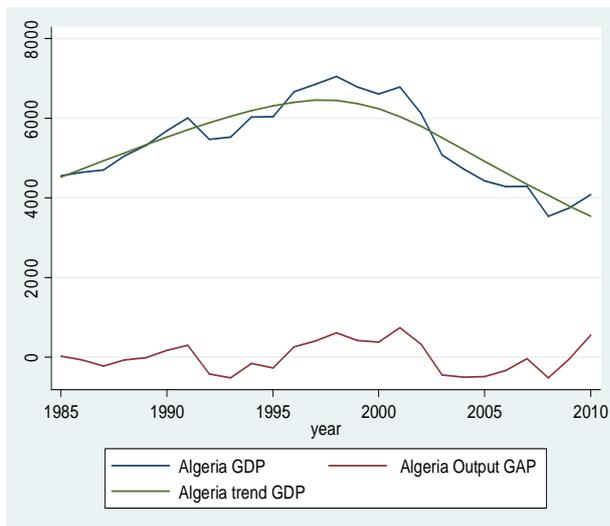
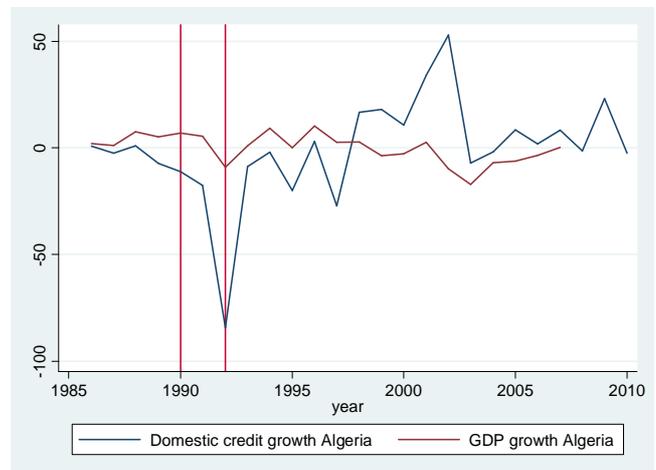


Figure 2 –
Algeria GDP (million US\$), 1985-2010

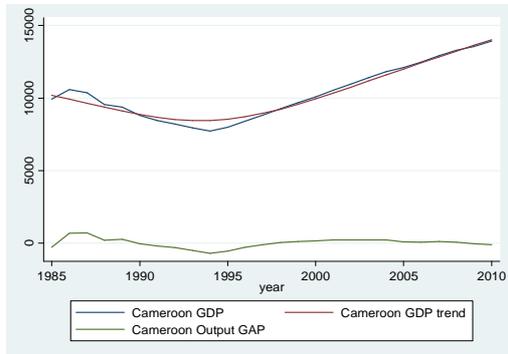


Rate of Growth of GDP and domestic credit in Algeria, % values

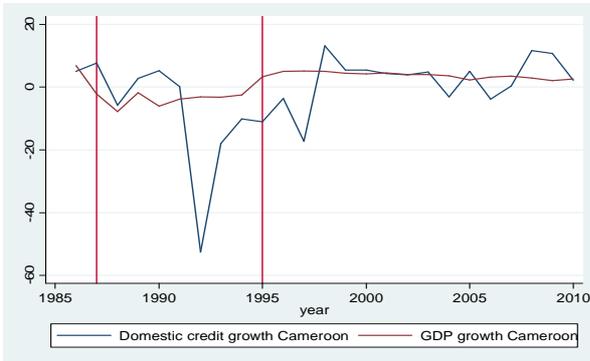


Notes: the two vertical lines indicate the banking crisis period 1990-1992.

Figure 3 – Cameroon GDP (million US\$), 1985-2010

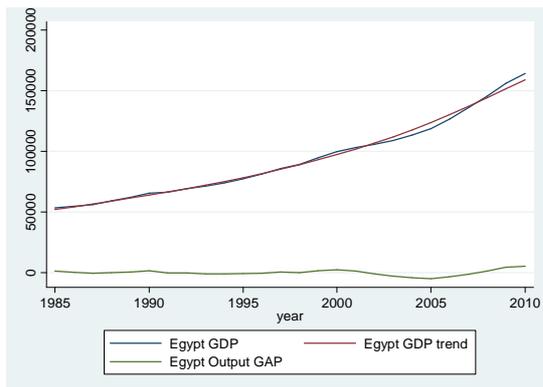


Rate of Growth of GDP and domestic credit in Cameroon, % values

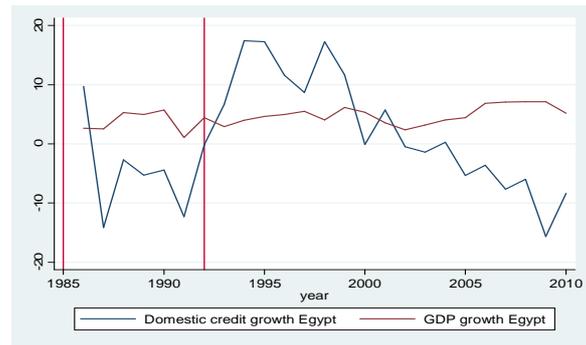


Notes: the two vertical lines indicate the banking crisis period 1987-1995.

Figure 4 – Egypt GDP (million US\$), 1985-2010

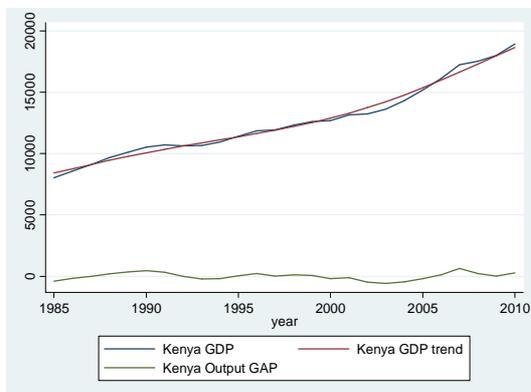


Rate of Growth of GDP and domestic credit in Egypt, % values

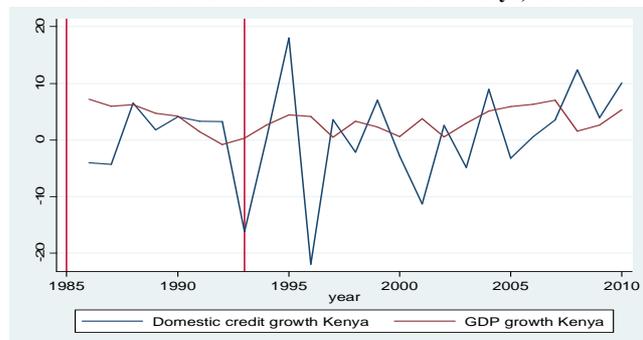


Notes: the two vertical lines indicate the banking crisis period 1985-1992

Figure 6– Kenya GDP (million US\$), 1985-2010

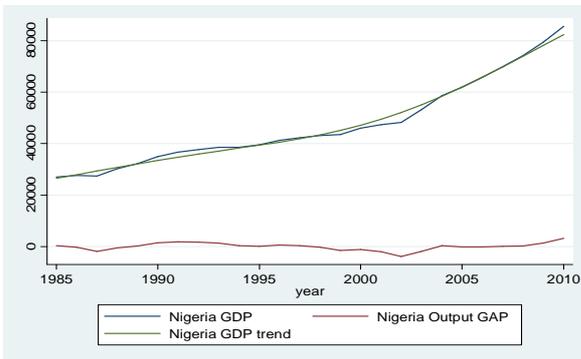


Rate of Growth of GDP and domestic credit in Kenya, % values

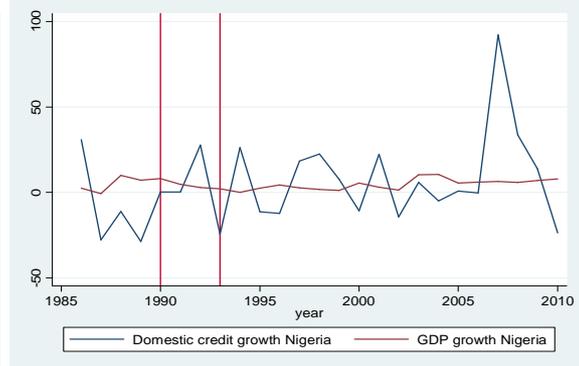


Notes: the two vertical lines indicate the banking crisis period 1985-1993.

Figure 7 – Nigeria GDP (million US\$), 1985-2010

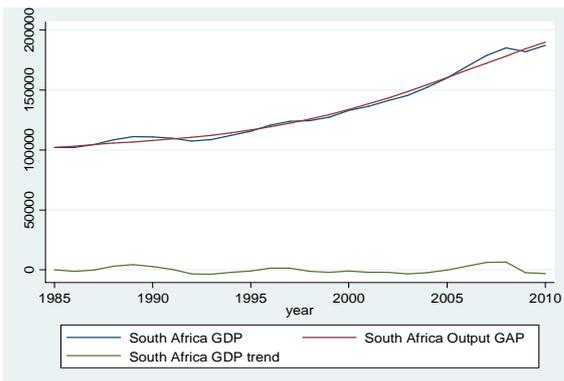


Rate of Growth of GDP and domestic credit in Nigeria, % values



Notes: the two vertical lines indicate the banking crisis period 1990-1993.

Figure 7 – South Africa GDP (million US\$), 1985-2010 values



Rate of Growth of GDP and domestic credit in South Africa, % values

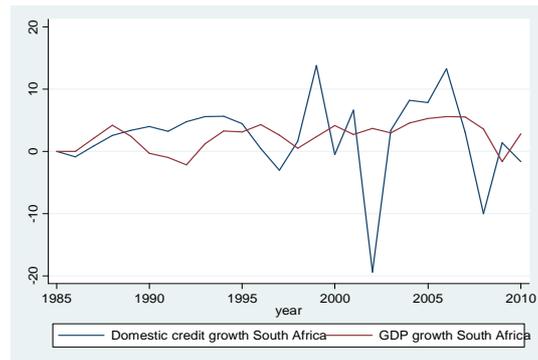
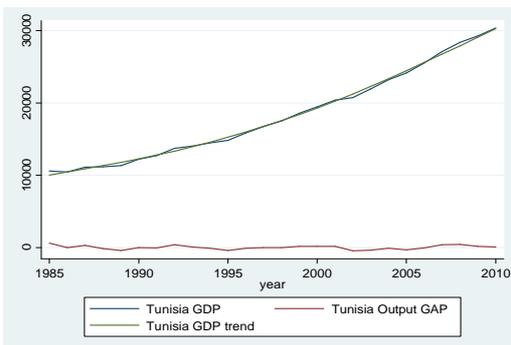
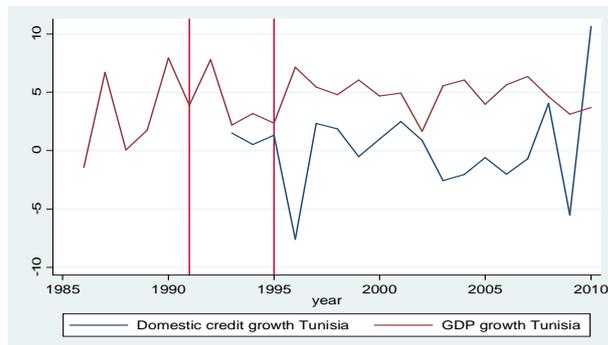


Figure 13 – Tunisia GDP (million US\$), 1985-2010



Rate of Growth of GDP and domestic credit in Tunisia, % values



Notes: the two vertical lines indicate the banking crisis period 1991-1995.

