
Financial Liberalisation Policies and Bank Profitability in Sub Saharan Africa

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ABSTRACT

This paper investigates the effects of financial liberalization policies on bank profitability in selected countries in Sub Saharan Africa (SSA). This study is motivated by claims in literature that decline in bank franchise values is a possible conduit through which liberalization could affect financial sector stability. The paper employs a two-step General Method of Moments (GMM) approach in a dynamic panel framework, to examine the impact of seven financial liberalisation policies on different measures of bank profitability. The empirical evidence presented in this paper suggests that some liberalisation policies that significantly impact on the competitive environment in which banks have a negative effect on bank profitability. However, an index for total liberalisation does not seem to have operate in any explanatory power for bank profitability. On the contrary, reforms on prudential regulation and bank supervision, as well as bank privatization significantly increase bank profit levels. Furthermore, the empirical results also highlight that bank specific, macroeconomic and institutional variables are important determinants of bank profitability in SSA. The results show evidence of moderate profit persistence, implying significant competitive conditions in SSA banking sectors.

Keywords: Financial Liberalisation Policies, Bank Profitability, Profit Persistence, Sub Saharan Africa.

INTRODUCTION

The debate on the link between financial liberalisation and banking crises prompted researchers to investigate possible conduits through which the effects of liberalisation are transmitted to banking sector fragility/stability. A large body of scholarly work asserts that financial liberalisation produces banking systems that are more vulnerable to systemic risk (Caprio Jr and Honohan, 2009; Hellmann et al., 2000; Kaminsky and Reinhart, 1999; Caprio and Klingebiel, 1996). This is partly based on the negative impact of post-liberalisation competition on the capitalised value of expected future profits (bank franchise or charter value). Low profits following financial liberalisation transmit to low bank franchise value, which in turn increases bank risk-taking incentives (Hellmann et al. 2000, Demsetz et al. 1996, and Keeley, 1990). In response to thinner margins, banks are forced to branch into riskier new lines of business to sustain their profits¹. For instance, in his model, Keeley (1990) argues that reforms in the US laws governing state branching, multibank holding company, and interstate expansion led to increased competition and erosion of bank monopoly profits.

In addition, the literature on bank regulation points out the effect of controls such as presence of entry barriers in enhancing profitability through protecting banks from competition, unsafe and unsound banking practices and bank failures (Athanasoglou et al., 2006). Banks protected from competition gain monopoly power and acquire high profit margins. However, when laws that restrict inter-bank

¹ This view has however been recently challenged. New evidence exists on the beneficial impact of bank competition on financial stability. This is based on the effect of competition on a borrower's behavior. By reducing loan rates, bank competition makes it easier to repay loans, which reduces loan defaults.

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competition, as well as competition from non-bank firms are relaxed, competition increases and there is a general decline in bank profits (Claessens et al., 2001; Berger, 1995)

Conversely, some sections in the literature suggest that financial liberalisation positively affects bank profitability. For instance, proponents of financial liberalisation argue for the removal of operating obstacles in the banking sector in order to foster competition and efficiency. In accordance with this theory, more (cost) efficient firms earn more profits. This is supported by the Industrial Organisation (IO) theories on banking which posit that efficiency drives profitability. Therefore, financial liberalisation through enhancing efficiency in the banking sector, fosters bank profitability. This leaves the debate on the link between financial liberalisation and bank profitability open for empirical verification.

Despite established theoretical effects of liberalisation on bank profitability, little in-depth empirical research has been undertaken on this link. The literature that focuses on SSA is scant. While countries in SSA are characterised by the dominant role of the banking sectors, financial reforms aimed at liberalising these sectors have witnessed development of stock markets and non-financial intermediaries such as life insurance companies and pensions funds. Implementation of these reforms has brought about changes in the legal, institutional, structural, regulatory, and supervisory frameworks of the financial systems, with consequent effects on banking activities and performance. As a result, investigating bank profitability in SSA has become more relevant.

The goal of this study is to test how financial liberalisation policies, implemented across SSA countries, influenced market structure and bank profitability, while accounting for macroeconomic, institutional, and bank-specific determinants of bank profitability. Several studies have examined determinants of bank profits in several countries and geographic regions; focus on SSA region has been limited. Furthermore, the current study specifically accounts for the effects of financial liberalisation policies implemented in countries in SSA since the late 1980s. The hypothesis for this study is that financial liberalisation, by increasing competition in the banking sector, erodes market power and previously earned abnormal bank profits. This hypothesis draws on both theoretical and empirical literature that examines the impact of financial liberalisation on competition, which is then linked to literature on bank profitability.

The study hypothesis focuses on changes in market structures induced by financial liberalisation. Therefore, it is necessary to test this model using data that covers the period when liberalisation policies were expanding in both scope and intensity. In this regard this paper uses annual country and bank level data from an unbalanced panel of 144 banks from 25 SSA countries over the period 1996 to 2006. A list of the countries and the details of the banks from each country is in Table A1 in the appendix. In specifying the model, the study accounts for profit persistence by employing a dynamic panel framework using the Arellano-Bond (1991) two-step GMM approach.

This study finds mixed results regarding the relationship between financial liberalization policies and bank profitability. While competitive liberalisation significantly reduces bank returns, total liberalisation does not seem to have any explanatory power for bank profitability. Furthermore, the results show a negative and significant relationship between specific liberalisation policies including relaxing entry and activity restrictions, scrapping of controls on interest rates, and relaxing controls on security market policies. On the contrary, reforms on prudential regulation and bank supervision, as well as bank privatization, significantly increases bank profit levels.

The empirical results also highlight that bank specific, macroeconomic and institutional variables are important determinants of bank profitability in SSA. The results show evidence of moderate profit persistence, implying significant competitive conditions in SSA financial markets. Bank capital,

credit risk and bank size have positive effects on bank profitability, while bank costs have the opposite effect. Economic growth, GDP per capita, and inflation significantly increase bank profits while the other measures of institutional and regulatory environment have no significant effects on bank profits.

The rest of this paper is organised as follows: The next section outlines a brief overview of the stylised facts on financial liberalisation and bank profit trends in SSA. Section 3 provides the theoretical framework, outlines the empirical strategy, presents the data and describes the variables used in the empirical analysis. Section 4 presents the model estimation, analysis of results as well as some sensitivity analyses. Finally, section 5 summarises and concludes.

FINANCIAL LIBERALISATION AND BANK PROFITABILITY TRENDS IN SSA

Commercial banks in countries in SSA perform better, in terms of return on assets and net interest margin, than banks in other developing countries (Flamini et al., 2009). Return on assets averaged 3% in the last two decades for the African continent. Different countries and regional groups reported varying profitability during the period 1990 to 2005. For instance, countries in west and southern Africa reported average profit rates of about 5%. This compares to an average rate of about 1% recorded in North African countries. Net interest margins, a measure of bank efficiency, provides a similar picture.

Figure 2.1 shows the trends in three measures of bank profitability as well as total financial liberalisation in SSA between 1990 and 2006. The scales are normalised between 0 and 1. Return on equity ROE shows a general upward trend and reaches a peak in 1998, and thereafter takes a gradual decline. A similar trend is observed for net interest margins NIM, though this measure is not as volatile as return on equity. Return on assets ROA shows a gradual decline throughout the 1990 to 2005 period. On the other hand, financial liberalisation finref shows an upward trend from 1990 and reaches a peak in 2000, before taking a slight decline in 2004.

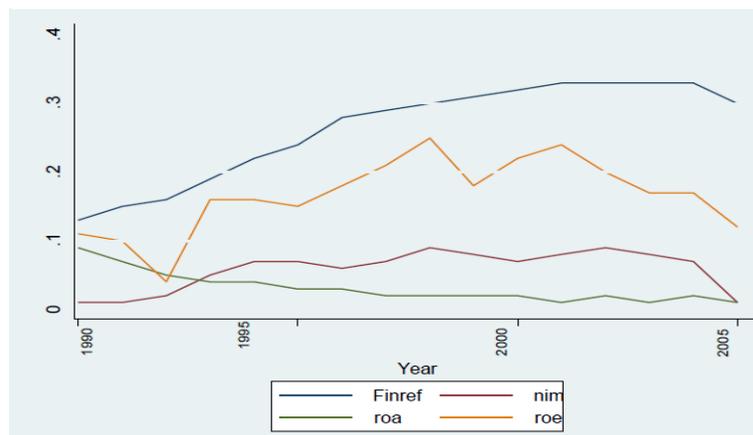


Figure 2.1. Financial Liberalization and Bank Profit Measures in SSA (1990-2005)

Source: Beck et.al (2010) and authors calculations using Bankscope data. Finref is the financial liberalisation index of seven liberalization policies.²

ESTIMATION STRATEGY

This section first presents the theoretical framework from which the empirical models used for the empirical analysis are drawn. In addition, this section discusses the data employed, and gives a description of the variables used in the econometric analysis.

² These policies include reforms of controls on credit, entry, interest rate, capital account, security markets as well as improvements in supervision and bank privatization.

Theoretical Framework

The pioneering work of Bain (1951) provides a basic framework for firm behaviour in a competitive environment, under the neoclassical theory of competition. This theory views competition as a state that would prevail if there were no entry and exit controls in the market. Firms take prices as given. The larger the number of firms the more effective their competitive behaviour and the less concentrated the market structure. Conversely, the fewer the number of buyers and sellers, the more oligopolistic and monopolistic their behavior, and consequently the more the profits realised.

While most early theories of bank competition were drawn from the neoclassical assertions, the Industrial Organisation (IO) approach to the economics of banking considers banks as firms that react optimally to the environment in which they operate. The Klein-Monti model (Monti,(1972), Klein (1971), hereafter KM), forms the basis of the IO models of banking competition.

The KM imperfect or oligopolist competition model assumes banks operate in monopolistically competitive markets, with a finite number of other banks, N . In this model, banks have a linear cost function $C_n(L, D) = \gamma_L L + \gamma_D D$ where $n=1, \dots, N$ while D and L represents the production costs of bank deposits and loans respectively.

The central bank reserve coefficient is α . The aggregate compulsory reserve is expressed as $R = \alpha D$. As such, the net interbank position of each individual bank is $R = (1-\alpha)D - L$. The bank faces a downward sloping demand for loans $L(r_L)$ and upward sloping deposit function $D(r_D)$. Therefore, the inverse demand and supply functions are $r_L(L)$ and $r_D(D)$. The bank decides on the amount of loans L and deposits D which affect the corresponding interest rates (r_L , and r_D). The money market rate is denoted by r .

Each bank takes the amount of loans and deposits chosen by other banks as given. A bank chooses its own amount of loans and deposits and maximises the following profit function.

$$\pi = \{(r_L(L_n + \sum_{m \neq n} L_m) - r)L_n + (r(1-\alpha) - r_D(D_n + \sum_{m \neq n} D_m))D_n - C(L_n, D_n)\} \quad (1)$$

Freixas and Rochet (1997) show that by solving the objective function, the Cournot equilibrium gives a vector for N firms, of the stock of loans and deposits, $(L_n^*, D_n^*)_{n=1, \dots, N}$, such that for every n , the stock of loans and deposits (L_n^*, D_n^*) maximises profits for each bank. The solution derived gives a unique equilibrium. In equilibrium, each bank's stock of loans and deposits are $L_n^* = \frac{L}{n}$ and

$D_n^* = \frac{D}{n}$. Maximising the profit function, the first order conditions can be re-written in terms of elasticities as follows:

$$\frac{r_L^* - (r + \gamma_L)}{r_L^*} = \frac{1}{N \varepsilon_L(r_L^*)}$$

$$\frac{r(1-\alpha) - r_D^* - \gamma_D}{r_D^*} = \frac{1}{N \varepsilon_D(r_D^*)} \quad (2)$$

The left hand sides of both lines in equation (2) are the Lerner indices (price minus marginal cost divided by price) for loans and deposits respectively. In the banking literature, the Lerner indices reflect market power in the loan and deposit markets. The greater the market power, the smaller the elasticities, the higher the Lerner index, and hence, the higher the intermediation margins (lower deposit rates and high lending rates).

The equilibrium solutions in equation (2) can signify the bipolar case of monopoly where $N = 1$. In liberalised financial sectors, the regulations that limited competition are removed, and more financial intermediaries enter the market. As $N \rightarrow +\infty$, then the market structure becomes very competitive, intermediation margins are low and so are bank profits. Conversely, when competition is weak (N

small), the Lerner index is large and banks have more market power. When $N = 1$, and price is higher than marginal cost, the bank earns more profits. Intuitively, if $N > 1$, and a firm decides to leave the industry, quantity falls, and price rises, and hence profits for the remaining firms increase. Financial sector reforms should ideally promote competition in the banking sector (N increases).

Empirical Model Specification

Research on determinants of bank profitability faces three main challenges. The first challenge pertains to potential endogenous bias that may arise from some of the profitability determinants. For instance, more profitable banks are capable of increasing their equity and therefore enhance profitability. Similarly, more profitable banks hire more employees and incur higher operating expenses and may become less efficient compared to less profitable banks. The second problem is the unobserved heterogeneity which likely arises from omitted variables and may cause correlations between some explanatory variables and the error term. Lastly, high persistence in profitability implies the inclusion of past profit levels as regressors in current profitability regressions. To address these potential problems, this paper uses a two-step GMM estimator developed for dynamic panel models by Arellano and Bond (1991). The two step GMM is adopted to correct for the errors and bias arising from the unobserved panel level effects and the lagged dependent variable. The empirical model to be estimated is thus:

$$BP_{ict} = \alpha + \theta BP_{ict-1} + \beta X_{ict} + \gamma RIM_{ct} + \mu_i + e_{it} \quad (3)$$

BP_{ict} represents profits for bank i in country c at time t and BP_{ict-1} is the one period lagged profitability captured by either ROAA (return on average asset), ROAE (return on average equity), or NIM (net interest margin). X_{ict} is a vector of bank specific variables, while RIM_{ct} is a vector of regulatory, institutional and macroeconomic control variables. μ_i is the unobserved panel effect, and e_{it} is the idiosyncratic error. β and γ are slope coefficients.

Data and Variable Description

The study is based on data from an unbalanced panel of 144 banks from 25 SSA countries over the 1996 to 2006 period. Table A2 in the appendix provides the summary statistics for the entire sample data while Table A3 presents the variables and data sources that are used in this paper. All the annual bank balance sheets and income statement data are obtained from the Bankscope database. Macroeconomic data is from the World Bank's World Development Indicators and International Financial Statistics from the IMF. Data on liberalisation variables is drawn from the database by Abiad et al. (2008), and extended in this study. The database by Beck et al. (2010) provides some of the microeconomic annual banking data as well as data on bank concentration levels.

MODEL ESTIMATION AND RESULT ANALYSIS

Table 4.1 presents results from estimating the model in equation (3)³. The Wald tests for the different regressions report statistics that reject the null hypothesis of joint insignificance of parameters. This confirms that the estimated models fit the data well. Arellano-Bond test that rejects the null hypothesis of no first order autocorrelation in first differenced errors. The results show no second order serial correlation which confirms that the moment conditions used to identify parameters are valid. Thus, there is no evidence of model misspecifications. The Sargan test reports insignificant chi-square for all the 7 regressions reported in Table 4.1, indicating that the overidentifying restrictions are valid.

³ Year dummy variables included to account for potential unobservable time effects were generally not statistically significant, hence were dropped from the final estimations.

Table 4.1 reports mixed results on the relationship between measures of financial liberalisation (*finref*, *complib*, and *crgdp*), and bank profitability. Columns (2) and (5) show a negative and significant relationship between *complib* and bank return on assets and return on equity respectively. This seems to suggest that as competition intensifies, banks face declining returns. This result concurs with that presented by Athanasoglou et al. (2006). The current result is further substantiated by results presented in columns (2) and (6), which show a negative relationship between *crgdp* and bank *ROAA* and *ROAE* respectively. The ratio of domestic credit to GDP (*crgdp*) is used as an alternative proxy for financial liberalisation.

Table 4.1. Financial Liberalisation and Bank profitability: Two-step GMM Estimation Results.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ROAA_1	0.25***	0.24**	0.27***				0.28***
	-0.09	-0.1	-0.04				0.08
ROAE_1				0.19***	0.22***	0.23***	
				-0.07	-0.06	-0.07	
Capital	0.08*	0.16**	0.08**	-0.85**	-0.72*	0.14**	0.13*
	-0.07	-0.08	-0.16	-0.43	0.4	-0.09	0.08
Cr_risk	0.15***	0.19**	0.14**	0.16	0.14*	0.55	0.09*
	-0.05	-0.07	-0.05	-0.19	-0.09	-0.56	0.04
Costs	-2.8**	-2.74***	-2.9***	-2.2***	-1.9**	-2.0*	-2.20***
	-0.8	-0.89	-0.9	-0.71	-0.6	-0.7	0.88
Size	2.3***	4.21*	5.02**	-1.3*	-0.45*	-0.4	-1.39***
	-1.5	-2.21	-2.5	-0.37	-0.36	-0.3	0.3
Size2	-0.28*	-0.34*	-0.29*	0.10*	0.40*	0.22*	-0.35**
	-0.2	-0.2	-0.2	-0.04	-0.2	-0.07	0.17
gdpg	0.13***	0.07**	0.11***	1.17**	1.21**	0.08**	0.10***
	-0.04	-0.03	-0.03	-0.57	-0.53	-0.04	0.04
Infn	0.03**	0.01**	0.03**	0.23**	0.21**	0.18**	0.03**
	-0.01	-0.01	-0.01	-0.09	-0.1	-0.08	0.01
Conc	-0.85	-1.6	-5.6	-0.4	-0.49	-0.6	-1.11
	-0.58	-0.57	-2.8	-0.35	-0.38	-0.4	0.56
Finref	0.46			0.18			
	-0.22			-1.8			
Complib		-0.24**			-0.31*		-0.42**
		-0.08			-0.1		0.13
Crgdp			-0.14***			-0.34*	
			-0.05			-0.09	
fown	-0.07	-0.05	-0.08	0.16*	0.08	0.09	0.07
	-0.04	0.04	-0.04	-0.46	-0.61	-0.07	0.04*
gdppc	0.63**	0.71**	0.68**	0.56*	0.70*	0.40*	0.38**
	-0.15	0.21	-0.19	-0.21	-0.23	-0.2	0.17
pressf	-0.22	-0.34	-0.72	-0.18	0.15	-0.2	-0.45
	-1.4	-1.33	-1.3	-0.11	-0.38	-0.3	1.06
gov	-0.16	-0.41	0.18	-0.11	-0.2	0.1	-0.11
	-1.06	-1.4	-1.35	-1.55	-0.39	-0.31	0.86
cir							-0.04**
							0.01
Wald Chi2(1)	124.01***	101.18***	100.12***	134.45***	104.25***	145.11**	169.14***
AR(1) ²	-3.06***	-2.62**	-2.6***	-2.4**	-3.2***	-3.0***	-2.65**
AR(2) ³	0.4	0.18	0.31	0.3	1.1	0.21	-0.35
Sargan Test ⁴	112	107	112	114	111	107	101
Windmeijer-Corrected robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1. 1 Wald statistic: H0 All coefficients are zero.							
2,3 AR(1) and AR(2) tests for 1st and 2nd-order autocorrelation, H0 No autocorrelation of residuals							
4 Sargan Test of over-identifying restrictions: H0 Over-identifying restrictions are valid							

By contrast, the coefficient on total financial liberalisation bears a positive sign, albeit not statistically significant for both measures of bank profitability (columns 1 and 4). This seems to suggest that financial liberalisation in total may increase bank returns. A possible explanation for this result may be that as financial systems adopt liberalisation policies, initial competition may force them to take on risky portfolios that yield high returns. However, the risky portfolios may yield less return later on as competition intensifies. In addition, high levels of competition may increase efficiency which in turn increase profit levels.

Effects of Individual Liberalisation Policies

Table A4 in the appendix presents results pertaining to the effects of individual liberalisation policies on bank profitability⁴. Contrary to theoretical predictions, the results in column (1), though not statistically significant, suggest that removal of controls on credit allocation has a negative effect on bank profitability. Directed credit policies are expected to reduce bank profitability given that banks are forced to charge below-market clearing interest rates for loans to priority sectors. As such, removal of such controls is expected to have a positive effect on bank profitability. A possible explanation for this unexpected result may be that removal of directed lending requires new standards of credit and risk management for banks which imposes some cost on banks. Together with other operating expenses, such costs negatively affect bank profits.

Columns (2) and (3) show a negative and statistically significant relationship between removal of entry and interest rate controls and bank profitability. This suggests that as more players enter the market, the competitive pressure increases, and these force banks to offer increasingly competitive margins on loans and deposits, thereby lowering bank profitability. This result is comparable to findings by Keeley (1990) and Goddard et al. (2011) Similarly, Koeva (2003) finds that entry deregulation is associated with decline in bank profitability in India.

Reforms in prudential regulation and bank supervision significantly increase bank profitability. This result supports observations that most banks in SSA economies with weak regulatory structures face large numbers of irrecoverable loans as they have little or no recourse against delinquent borrowers (Brownbridge and Harvey, 1998). Table A4 column (5) presents positive and significant results on the relationship between privatisation of former state-banks and bank profitability. This result is in line with observations made by Brownbridge and Harvey (1998) that state owned banks in a majority if liberalizing African countries perform dismally compared to privately owned banks.

With regard to capital account liberalisation and reforms in securities markets (columns 6 and 7), these policies have the effect of reducing bank profits. While the effect of removal of controls on international capital movement is insignificant, liberalisation of security market policies has a significant effect. Stock market development and lowering barriers to international investment are expected to enhance bank performance through their positive effect on economic development and hence firm performance. However, the negative results seem to support the argument provided by Angkinand et al. (2009) that relaxing restrictions on these two policies has the same impact on the competitive environment in the banking sector. The stock market offers an alternative financing option for firms.

Regarding, the effect of concentration, the empirical results presented in Table A4 suggest a negative but insignificant effect of market concentration on both measures of bank profitability. Perhaps this

⁴ For results presented in Table A4, profitability is measured by ROAA. Results obtained from using bank return on equity are not significantly different and hence are not reported.

suggests that high concentration levels in SSA banking systems do not necessarily indicate low competition. Instead, presence of competition in concentrated markets lowers bank profitability through reduction in loan rates or increase in deposit rates. In this regard, Demircuc-Kunt et al. (2003) argue that any positive relationship between bank concentration and bank margins is expected to vanish once regulations pertaining to entry and activity restrictions are controlled for. Flamini et al. (2009) find no significant relationship between market concentration measures and bank profitability in SSA banking sectors.

The value of the coefficient on lagged profits measured by return on assets is higher in regressions for individual liberalisation policies compared to regressions on total liberalisation (*finref*) and competitive liberalisation (*complib*). For instance, when considering removal of credit controls only, the coefficient is 0.27 as shown in Table A4 compared to 0.25 and 0.24 shown in columns (1) and (2) of Table 4.1, where the measure of financial reform is the total liberalisation and competitive liberalisation indices respectively. This suggests that persistence levels are negatively related to comprehensive levels of financial liberalisation.

Overall, the results on the lagged dependent variables in all regressions are consistent with findings by Goddard et al. (2011) that profit persistence is positively related to the size of entry barriers. Goddard et al. (2004) similarly find high persistence in profits for countries where high levels of government regulation seem to have insulated banks from competition. Similar results were also found by Biekpe (2011), Mwege (2011) and Flamini et al. (2009) for banks in Ghana, Kenya and SSA countries respectively.

The coefficient of credit risk is generally positive and significant. This is consistent with assertions that banks ask for high premiums for investments in perceived high risk assets. Naceur and Omran (2011) similarly find a positive relationship between credit risk and net interest margins for banks in the Middle East and North African (MENA) region.

On the other hand, overhead costs present a negative and significant impact on profitability of either bank assets or equity. This result suggests that high costs in SSA banks have the effect of eroding bank profits.

The empirical results pertaining to the effect of bank size show a positive and significant effect of bank size on bank return on assets. The implication is that big banks benefit from efficiency gains as well as the relative degree of market power that they have. The negative, though weakly significant coefficients on *size2* (columns (1) to 3) suggest that the impact of size on bank return on assets is non-linear. The results in columns (4) to (6) suggest that large banks are less profitable when considering return on equity. However this effect is statistically not significant.

Most of the macroeconomic variables have expected signs and are generally significant. Real GDP growth shows a positive impact on bank profits. Inflation has a positive and significant effect on bank profitability as expected.

Robustness Checks

This study performs several tests to confirm the main empirical results of this study. Firstly, the study employs Net Interest Margins NIM as the dependent variable. The results presented in Table A5 do not differ much from the ones reported previously. One notable exception is the positive coefficient on the variable for market concentration which suggests that concentrated markets earn higher. In addition, together with the negative and significant coefficient on *cir*, the result suggests that the increase in profitability in concentrated markets maybe a result of improved efficiency. Higher

efficiency (low *cir*) translates to high profitability, resultantly, efficient and profitable banks may gain market share and hence the market becomes concentrated. Otherwise the coefficient on *cir* remains negative and insignificant in the other 3 specifications, confirming our earlier results.

Another exception is the positive coefficient on the cost variable. This result suggests that bank net interest margins increase with overhead expenses. As such, banks in SSA pass on most of their overhead costs to customers through higher spreads. On the other hand, wider margins are usually associated with riskier loans which entail high monitoring costs.

The size of the coefficients on lagged values of net interest margins are larger (as high as 0.53) than those on lagged return on assets as well as equity. This suggests that profit persistence is higher for net interest margins than for return on assets and equity. The implication of this result is that there is less competition using interest rates, probably suggesting that interest rates are not completely liberalised in SSA banking systems. The financial liberalisation variables have negative and significant coefficients. This confirms the results reported previously, that financial liberalisation causes banks to offer increasingly competitive margins on loans and deposits, which in turn reduces bank profitability.

Secondly, the study estimates a linear regression model in the spirit of Bourke (1989) and Athanasoglou et al. (2006)⁵. After performing the relevant diagnostic tests, this paper estimates a linear model applying the least squares methods of fixed effects. The results agree to a greater extent with those presented earlier.

SUMMARY AND CONCLUSION

This study investigated the determinants of bank profitability in SSA, accounting for the effects of financial liberalisation policies. A majority of SSA countries implemented financial liberalisation policies in varying degrees over the past few decades, which significantly affected the market structures banks operated in. A survey of the literature highlights that research on the impact of these reforms on bank performance has focused mostly on developed countries, emerging markets, and developing countries outside SSA. This has left a knowledge gap regarding the profitability of SSA banks following implementation of a wide array of liberalisation policies.

This study uses annual bank and country level data in 25 SSA countries to assess the extent to which seven liberalisation policies, (and indices constructed from these seven policies) and market structure determines bank profitability. The main profitability measure employed in the econometric analysis is return on average assets, while return on average equity is employed as an alternative profitability measure. The analysis covers the 1996 to 2006 period and controls for bank specific, macroeconomic as well as institutional factors.

The study tests the hypothesis that liberalisation policies have a negative impact on the levels of bank profitability. Empirical results affirm that the extent of financial liberalisation in different financial markets provides one of the most important explanations for bank returns in the region. While the variable for total liberalisation does not seem to have any explanatory power for bank profitability per se, the one for competitive liberalisation policies suggests a negative impact on bank profitability. Pertaining to individual liberalisation dimensions- removal of controls on entry, interest rates, and security market policies significantly decrease bank returns. On the other hand reforms directed at prudential regulation and bank supervision, and bank privatisation significantly increase bank returns.

Low profit persistence, as indicated by a positive and significant result on lagged profitability confirms significant levels of competition in the banking sectors in SSA economies. Furthermore, an

⁵ The results are available on request.

analysis of results indicates that persistence levels are negatively related to comprehensive levels of financial liberalisation. In sum, the results indicate that following financial liberalisation, structural changes set in, which gave rise to changes in competition and profit levels. The results also indicate a positive causal effect of bank size, capital, and credit risk on bank profit measures. On the other hand, overhead costs have a negative impact, while foreign ownership, market concentration and institutional variables have no significant effect on bank profits.

The analysis carried out in this study produced results from which valuable policy lessons can be derived. While financial liberalisation increases competition that in turn erodes bank profits, the results presented here do not advocate for policies that stifle competition. Instead, policy makers should consider policies that strengthen institutional capacities to curb risk-taking incentives that may arise due to decline in profits. This way, both bank efficiency and stability goals can be attained concurrently.

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APPENDIX

TableA1. Countries in Sample

Country	Banks	Country	Banks	Country	Banks
Botswana	3	Kenya	14	Sierra Leone	4
Burkina Faso	7	Lesotho	3	Swaziland	5
Cameroon	7	Madagascar	6	South Africa	6
Chad	3	Malawi	3	Seychelles	2
Cote d’Ivoire	7	Mali	3	Tanzania	6
Ethiopia	7	Mauritius	7	Uganda	7
Ghana	12	Mozambique	5	Zambia	8
Gabon	3	Nigeria	7	Zimbabwe	3
Gambia	3	Senegal	7		

Source: Bankscope Data

TableA2. Summary statistics for the entire sample

Variable	Obs	Mean	Std. Dev	Min	Max
ROAA	1266	2.2	4.26	-56.7	49.46
ROAE	1246	19.98	35.08	-317	454
NIM	1281	7.06	6.88	-6.57	107.34
Size	1288	5.54	2.9	2.3	15.8
Size ²	1288	39.33	44.9	0	251.1
Costs	1260	3.06	2.92	-3.21	13.4
Capital	1118	12.67	9.75	-40.7	80.2
Cr_risk	1034	42.9	19.56	0.03	89
risk	824	9	14	0	108
Conc	1343	0.77	0.18	0.38	1
fown	1255	50.54	27.5	0	100
fown1	1193	53.74	31.73	0	100
Finref	1343	12.68	4.58	0	20
Finlib	1343	0.99	0.54	0	1
Complib	1231	5.8	1.47	1	9
Crgdp	1343	21.18	26.04	2.07	157.1
gdp	1343	4.19	4.2	-17.6	33.6
Inf	1343	13.32	37.32	-30.16	495.3
lgdpp c	1343	6.2	0.96	4.7	9.3
pressf	1343	0.73	0.68	0	2
gov	1343	-0.1	1.22	-4.15	2.69
rlaw	1343	-0.64	0.64	-2.27	0.93

Source: Author’s calculations

Table A3: Variables and Data Sources

Variable symbol	Variable Description	Source
Profitability measures		
ROA	Return on average assets	Bankscope, FSDD*
ROE	Return on average equity	Bankscope, FSDD
NIM	Net interest margin	Bankscope, FSDD
Bank Specific Measures		
Size	Logarithm of total assets	Bankscope, FSDD
Size ²	(Logarithm of total assets) ²	Bankscope, FSDD
Capital	Equity/total assets	Bankscope, FSDD
Cr_risk	Credit risk= net loans/total assets	Bankscope, FSDD
Risk	Non-performing loans/total assets	Bankscope, FSDD
F.own	Share of assets of foreign banks in total bank assets.	Claessens et.al (2008) **, authors calculations
Conc	Concentration ratio= assets of three Largest banks/ total bank assets.	FSDD
cir	Cost to income ratio.	Bankscope
costs	Log(bank overhead costs).	Bankscope, FSDD
Regulatory, institutional, and macroeconomic measures		

Finref; cr, ent, ir, intk, sup, pvt, secmkt	Financial reform index; reform of controls on credit, entry, interest rate, capital account, supervision, privatization, and security markets.	
complib	Competitive liberalization index.	
gdppc	Log of GDP per capita.	
gov	Governance; Index ranging from -2.5 to 2.5 with higher values corresponding to better outcomes.	
Press freedom	Freedom of media ranging from 0 to 2, with higher values corresponding to more freedom.	
rgdp	Rate of growth of real GDP	
infn	Rate of change of GDP deflator	
*FSDD refers to the Financial Structure and Development Database, Beck. Et.al (2010)		
**Foreign bank has at least 50% foreign ownership, see Claessens et.al. (2008)		

TableA4. Financial Liberalisation and Bank Profitability: Two-step GMM Estimation Results

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ROA_1	0.27***	0.26**	0.28***	0.25**	0.27***	0.29***	0.26***
	-0.09	-0.06	-0.06	-0.1	-0.11	-0.07	0.09
Capital	-0.09*	0.09	-0.11**	-0.07*	0.08	-0.06*	-0.09
	-0.04	-0.07	-0.06	-0.08	-0.16	-0.01	0.08
Cr_risk	0.17***	0.16***	0.15**	0.15***	0.14**	0.15***	0.16***
	-0.04	-0.04	-0.04	-0.08	-0.05	-0.05	0.04
Costs	-2.7***	-2.8***	-2.6***	-2.9***	-2.4***	-2.8**	-2.7***
	-0.92	-0.91	-0.86	-0.07	-0.9	-0.84	0.89
Size	10.7**	10.14*	10.93*	8.21*	6.02**	2.3***	10.5**
	-4.8	-4.9	-5.05	-3.21	-2.9	-1.6	4.7
Size2	-0.30*	-0.29*	-0.33	-0.33*	-0.33*	-0.28	-0.29
	-0.23	-0.24	-0.21	-0.2	-0.21	-0.2	0.23
Gdpg	0.13**	0.11**	0.12*	0.11**	0.11***	0.10***	0.11***
	-0.05	-0.04	-0.04	-0.04	-0.03	-0.06	0.04
Infn	0.34**	0.03***	0.02**	0.01**	0.03**	0.03**	0.02
	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01
Conc	-0.11	-6.7	-3.7	-1.6	-5.6	-0.85	-7.06
	-0.87	-3.84	-3.3	-0.57	-2.8	-0.58	5.4
Fown	0.11	-0.05	-0.04	-0.05	-0.05*	-0.07	-0.05
	-0.08	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
lgdpp c	0.97**	0.67**	0.74**	0.38*	0.36*	0.63*	0.71*
	-0.33	-1.02	-0.4	-0.2	-0.22	-0.25	-0.31
Pressf	0.11	-0.09	-0.26	0.9	-0.72	-1.26*	1.38*
	-0.87	-1.01	-0.95	-0.96	-1.3	-0.4	-0.55
cr/ir/ent/sup erv/pvt/intk/secmkt	-0.19	-0.75*	-2.99*	1.83**	0.65*	-0.4	-0.16*
	-0.41	-1.4	-1.2	-0.85	-0.15	-1	-1.06
Wald Chi ² (¹)	132***	189***	105***	119***	101***	124***	201***
AR(1) ²	-1.57**	-1.69***	-2.1***	-1.62**	-2.0***	-1.5***	-1.32***
AR(2) ³	0.39	0.4	0.9	-0.36	0.36	0.4	-0.9
Sargan Test ⁴	100	104	102	105	112	104	103
Windmeijer (2005)-corrected robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1							
Columns 1 to 7 correspond to liberalisation of credit controls, interest rates, entry restrictions, bank supervision, privatisation, international capital flows, and security market policies respectively							
1 Wald statistic: H0 All coefficients are zero.							
2; 3 AR(1) and AR(2) tests for 1st and 2nd -order autocorrelation, H0 No autocorrelation of residuals.							
4 Sargan Test of overidentifying restrictions: H0 Overidentifying restrictions are valid.							

Table A 5. Financial Liberalization and Bank Net Interest Margins: 2-Step GMM Results

Variable	(1)	(2)	(3)	(4)	(5)	(6)
NIM_1	0.53***	0.46**	0.38***	0.46**	0.25**	0.34**
	-0.21	-0.17	-0.14	-0.2	-0.11	-0.03
Capital	0.04*	0.03	0.11**	0.16***	0.19***	0.14***
	-0.03	-0.03	-0.06	-0.04	-0.04	-0.04
Cr_risk	0.21***	0.16***	0.25**	0.03*	0.19***	0.02*
	-0.08	-0.05	-0.07	-0.03	-0.08	-0.01
Costs	2.36*	2.8**	2.58**	3.06**	3.94**	2.81**
	-1.12	-1.5	-1.64	-1.47	-2.24	-1.27
Size	3.1**	2.54**	2.4**	2.6*	0.17*	2.16*
	-1.16	-0.91	-0.89	-1.3	-0.12	-1.1
Size2	-0.17*	-0.18*	-0.14**	-0.04	-0.09*	-0.06*
	-0.05	-0.06	-0.05	-0.14	-0.11	-0.03
gdpg	0.09**	0.08**	0.12**	0.08**	0.10**	0.07**
	-0.04	-0.04	-0.05	-0.04	-0.05	-0.03
Infn	0.04**	0.03***	0.01**	0.03**	0.01**	0.02**
	-0.02	-0.02	-0.03	-0.02	-0.03	-0.01
Conc	-0.74	0.7	-0.4	-0.62	-0.39	-4.3
	-0.62	-0.9	-0.36	-0.57	-0.59	-2.2
fown	-0.03	-0.06	-0.04	0.01	-0.02	-0.01
	-0.04	-0.04	-0.05	-0.04	-0.03	-0.05
lgdpp c	0.17**	0.21**	0.14**	1.64*	0.23**	2.4**
	-0.05	-0.07	-0.08	-0.42	-0.09	-0.5
pressf	-0.31	-0.09	-0.26	0.29	0.71	0.62
	-0.17	-1.01	-0.95	-2.11	-0.51	-2.5
gov	0.15	0.26	0.36	-0.09	0.9	-1.6
	-0.38	-0.04	-0.12	-1.2	-0.74	-1.9
finref	0.05			0.01		
	-0.36			-0.35		
complib		-0.12**			-0.25***	
		-0.04			-0.07	
crgdp			-0.24***			-0.29***
			-0.08			-0.08
cir				-0.04***	-0.02**	-0.03***
				-0.01	-0.01	-0.01
AR(1) ²	-2.14**	-2.05***	-2.01***	-1.78**	-2.6**	-2.61***
AR(2) ³	-0.27	-0.84	1.2	-0.21	0.92	0.14
Sargan Test ⁴	89	80	101	97	93	94
W indmeijer (2005)-corrected robust standard errors in parentheses. ***=p<0.01, **= p<0.05, *= p<0.1						
2,3 AR(1) and AR(2) tests for 1 st and 2 nd -order autocorrelation, H0 No autocorrelation of residuals						
4 Sargan Test of overidentifying restrictions: H0 Overidentifying restrictions are valid						

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