

Financial Liberalisation Policies and Economic Growth: Panel Data Evidence from Sub-Saharan Africa

By

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Abstract

The paper conducts an empirical investigation into the effects of financial liberalisation policies on the growth of 19 countries in Sub-Saharan Africa (SSA). 2 indexes are constructed which measure the gradual progression and institutional changes involved in financial liberalisation. Because these indexes track specific financial liberalisation policies, they provide better measures of financial liberalisation than the indicators of financial development often used in literature. Panel data estimates show a significant positive relationship between economic growth and financial liberalisation policies. Our results are robust to alternative specifications of the model, and also across slow and fast-growing countries.

JEL Classification:G10, E44, O16

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1. Introduction

The economic performances of Sub-Saharan African (SSA) countries have attracted considerable attention in recent years with superlative terms such as ‘tragedy’, ‘mediocre’, and ‘dismal’ used to describe the low rates of economic growth experienced in these countries from the 1980’s to date. SSA has been the only region in the developing world to ‘stagnate’, and growth rates have been, by and large, poor. The average GDP per capita growth rate from 1961 to 2000 was 0.45% for SSA while it was 1.6% for Latin America and the Caribbean (LAC), 2.3% for South Asia (SA), and 4.9% for East Asia and the Pacific (EAP).

The seminal works of McKinnon (1973) and Shaw (1973) attributed financial repression as the cause of the unsatisfactory growth performance of developing countries. Both McKinnon and Shaw advocated that financial liberalisation was needed to remedy the problems caused by the financial repressive policies of developing countries. Broadly speaking financial liberalisation is used to mean

all those policies aimed at freeing "repressed" economies from the effects of such growth-retarding policies as low and often negative real interest rates and directed credit policies. Such financial liberalisation policies include interest rate liberalisation, abolition of directed credit allocation, bank denationalisation, liberalising entry into the banking sector, and strengthening of prudential regulation.

According to the financial liberalisation theory, financial repression through interest rate ceilings keeps interest rates low and this discourages savings with the consequence that the quantity of investment is stifled. Thus investment is constrained by savings. The quality of investment is also low because the projects that will be undertaken under a regime of repression will have a low rate of return. With financial liberalisation, interest rate deregulation means that the interest rate will rise, thereby increasing savings and also investment. The increased investment results in the rationing out of low-yielding projects and the subsequent undertaking of high-yielding projects. The quality of investment rises and this will ultimately increase economic growth. McKinnon and Shaw therefore advocated the liberalisation of such repressed financial systems so as to promote economic growth.

This paper is aimed at conducting an empirical investigation of the effect of financial liberalisation policies on the economic growth of selected countries in Sub-Saharan Africa (SSA). Many SSA countries have embarked at various times in the past 3 decades on financial liberalisation policies. Existing empirical studies (Ogun, 1986; Oshikoya, 1992; Seck and El Nil, 1993; Matsheka, 1998; Allen and Ndikumana, 2000) have not adequately measured the gradual institutional changes that financial liberalisation entails. Some studies such as Allen and Ndikumana (2000) and Aziakpono (2004) have employed the ratio of liquid liabilities to GDP as a measure of financial intermediation, but this variable does not give any indication of the specific financial liberalisation policies embarked upon by various countries. Other studies such as Seck and El Nil (1993), Oshikoya (1992), and Matsheka (1998) used the real rate of interest as a measure of financial liberalisation but this variable captures only one component of financial liberalisation - interest rate deregulation. Financial

liberalisation does not consist solely of interest rate deregulation but involves other policies and Gibson and Tsakalatos (1994, p.596) and Demetriades and Luintel (1996, p.366) note that studies that rely only on the real interest rate will suffer from the problem of omitted variable bias.

The objective of this paper is to improve on previous empirical research by developing variables that adequately measure the progress made with financial reforms. We have constructed two indexes to take account of the gradual progression of liberalisation policies. We identified five major moves towards liberalisation and principal components analysis is used to derive the first financial liberalisation index. The second index involves assigning a numerical value to progress with each of the five moves towards liberalisation. This is the first study we are aware of that has constructed such indexes for financial liberalisation in SSA.

The structure of the paper is as follows. The second section provides a review of empirical literature while the third section presents the empirical framework. We highlight the methodology and data in section four and discuss the results in section five and the final section concludes.

2 Review of Empirical Literature

A number of studies have been carried out on empirically testing the finance-growth nexus for countries in SSA. These studies can be broadly classified based on the econometric procedures employed which could be single-period cross-section analysis, time series, or panel data econometrics. The results they obtain are not conclusive and they are generally not robust. We provide a brief review of such studies below.

Bhatia and Khatkhate (1975) used correlation graphs to examine the relationship between economic growth and financial intermediation for eleven African countries. Financial intermediation is measured by the ratio of currency, demand deposits, and time and savings deposits to GDP. The authors find no definite relationship between growth and financial intermediation for the countries either individually, or for the whole group. Splitting the financial intermediation measure into two -

the ratio of money to GDP and the ratio of quasi-money to GDP – still does not reveal any definite relationship between growth and financial intermediation.

Ogun (1986) used cross-section analysis to estimate the correlation between financial deepening and economic growth by using data for 20 countries in Africa from 1969 - 1983. The degree of financial intermediation is measured using the ratios of monetary liabilities (M1, M2, and M3) to GDP. For the full sample, all the monetary liabilities are negative and only the ratio of M3 to GDP is statistically significant. When the countries are split into high and low income countries, some of the coefficients of the monetary liabilities are positive while some are negative. However, they are all insignificant and offer no support to the growth enhancing capabilities of financial intermediation.

Oshikoya (1992) used time series econometrics to see how interest rate liberalisation has affected economic growth in Kenya. The author used data from 1970 to 1989 and the results showed a negative and insignificant coefficient for the real interest rate. The sample was then split into two sub-periods: 1970-1979 and 1980-1989. The real interest rate had a negative and significant coefficient for the 1970-1979 period, but was positive and significant for the 1980-1989 period; thus offering no robust result of the effect of interest rate liberalisation on growth.

Panel data have been used by some authors (Seck and El Nil, 1993; Charlier and Oguie, 2002; Allen and Ndikumana, 2000; Aziakpono, 2004) to examine the relationship between finance and growth in SSA. Seck and El Nil (1993) and Charlier and Oguie (2002) find a significantly positive relationship between economic growth and the real interest rate. Allen and Ndikumana (2000) used the ratio of liquid liabilities, ratio of banks' private sector credit, ratio of banks' total credit, and an index to include all three measures as proxies for financial intermediation. The authors find that only the ratio of liquid liabilities is positive and significant, and even this variable is insignificant in the fixed effects estimation and when annual data are used. The other financial intermediation variables take on different signs but are all insignificant. Aziakpono (2004) used the ratio of liquid liabilities and the ratio of banks' private credit as measures of financial intermediation and found mixed results. They

found that growth was negatively related to financial intermediation in Botswana and Swaziland while the relationship was positive in Lesotho and South Africa.

The above discussion highlights the fact that there is no consensus in existing empirical studies for SSA countries on the relationship between economic growth and financial development. The results seem to be sensitive to the different time periods, countries, and the specifications of the models; and are not robust enough for definite inferences to be made from them.

Furthermore, we cannot ascertain the effect of financial liberalisation policies on economic growth from these studies because none of them explicitly measures the different stages involved in financial liberalisation. Although some of them (Seck and El Nil, 1993; Oshikoya, 1992) try to model liberalisation by including the real rate of interest as an explanatory variable, liberalisation involves more than just interest rate liberalisation. It includes an array of measures such as directed credit abolition, bank denationalisation, and the removal of restrictions of entry into banking. Measuring financial liberalisation through the real interest rate thus negates the impact of the other liberalisation policy moves and implies that estimates derived suffer from omitted variable bias (Gibson and Tsakalatos, 1994, p.596; Demetriades and Luintel, 1996, p.366). The main contribution of this paper is that we improve on previous work by constructing two indexes that take into account the gradual nature that financial liberalisation involves. These two indexes together with a dummy variable for financial liberalisation are included in growth equations. Our study will therefore provide a more insightful analysis of the relationship between growth and specific financial liberalisation policies in SSA, and such an analysis is missing from current empirical work.

3 Empirical Framework

The empirical framework draws from the recent literature on the impact of financial development on economic growth such as Beck et al. (2000) where the growth rate of per capita income is regressed on financial development and a conditioning information set. In line with this literature the general specification of the growth equation is given in equation (1) below:

$$Y_{it} = \Phi_0 + \Phi_1 FL_{it} + \Phi_n X_{nit} + \varepsilon \quad (1)$$

where Y = growth rate of per capita income

FL = measure of financial liberalisation

X_n = a conditioning information set.

FL represents the primary variables of interest in this study. It comprises three measures of financial liberalisation which will be included separately in growth equations to measure the impact of financial liberalisation on growth. These are 2 financial liberalisation indexes (FINDEX1 and FINDEX2) and a dummy for financial liberalisation (FINDUMMY). From the financial liberalisation theory it is expected that these variables will exert a positive impact on economic growth.

In line with the economic growth literature, the control variables are initial income per capita to measure convergence, investment, life expectancy to measure human capital, the ratio of exports and imports to GDP to measure the degree of openness, and the debt service ratio to measure macroeconomic uncertainty.

Based on the above discussion we will estimate three separate equations as follows:

$$Y_{it} = \alpha_1 + \alpha_2 FINDEX1_{it} + \alpha_3 INIPCY_{it} + \alpha_4 INV_{it} + \alpha_5 OPEN_{it} + \alpha_6 LIFEEXPECT_{it} + \alpha_7 DEBT_{it} + \varepsilon \quad (2)$$

$$Y_{it} = \beta_1 + \beta_2 FINDEX2_{it} + \beta_3 INIPCY_{it} + \beta_4 INV_{it} + \beta_5 OPEN_{it} + \beta_6 LIFEEXPECT_{it} + \beta_7 DEBT_{it} + \nu \quad (3)$$

$$Y_{it} = \gamma_1 + \gamma_2 FINDUMMY_{it} + \gamma_3 INIPCY_{it} + \gamma_4 INV_{it} + \gamma_5 OPEN_{it} + \gamma_6 LIFEEXPECT_{it} + \gamma_7 DEBT_{it} + \xi \quad (4)$$

where Y = growth rate of real per capita GDP

FINDEX1 = the first index of financial liberalisation

FINDEX2 = the second index of financial liberalisation

FINDUMMY = dummy variable for financial liberalisation

INPCY = initial real per capita GDP

INV = ratio of gross domestic investment to GDP

OPEN = ratio of exports plus imports to GDP

LIFEEXPECT = life expectancy

DEBT = ratio of debt service to exports of goods and services

4. Data and Methodology

4.1 Data

The first liberalisation index (FINDEX1) is derived from the method of principal components. Principal component analysis is useful for reducing the dimension of a data set and extracting the main relations from it. This method has been used in the financial liberalisation literature to obtain an index which measures the different phases of the deregulatory and institution-building process.ⁱ What we do is to identify five major indicators of moves towards liberalisation which are: bank denationalisation and restructuring, interest rate liberalisation, prudential regulation, directed credit abolition, and free entry into bankingⁱⁱ. We then allocate to each of these variables a value of 0 prior to liberalisation. After liberalisation, the indicators take on values from 1 and this increases depending on the progress made for each specific liberalisation policy. We get a matrix of 5 variables for each country and then apply principal components analysis. We use the first principal component for each country as our index of liberalisation, and for all countries except Nigeria (58.8%) and Mauritius (56.9%) this first component accounts for at least 65% of the total variation. The second liberalisation index (FINDEX2) also measures the progressive nature of financial liberalisation. The same five major indicators of liberalisation used for the first index are used but in this case each of these measures is assigned a value of zero prior to liberalisation and it becomes one after liberalisation. This gives a matrix of five dummy variables and the index is the addition of the variables for each

year.ⁱⁱⁱ FINDUMMY, the dummy variable for financial liberalisation, captures the starting date of major financial liberalisation in the countries. The dummy takes a value of 0 prior to liberalisation and 1 after liberalisation.

Tables 3 and 4 give an indication of the two financial liberalisation indexes. Table 3 summarises the second index FINDEX2 and each cell shows how many financial liberalisation measures were in existence in the particular year. We can observe some interesting features of the financial liberalisation for different countries. Firstly, we see that some countries such as Botswana, Kenya, Malawi, and Zambia progressed gradually with financial liberalisation as different measures were executed in different years. On the other hand, some other countries such as Cote d'Ivoire, The Gambia, Mali, Uganda, and Zimbabwe were less gradual in their approach and embarked on multiple liberalisation measures in the same year. Secondly, we see from this table that by 2000 most countries had undergone substantial financial reforms as evident from the fact that they had at least 4 financial liberalisation measures in place. Another observation from Table 3 is that some countries such as South Africa, Mauritius, and Senegal embraced financial liberalisation quite early (as early as 1980), whereas some other countries were quite late in embarking on financial liberalisation with Zambia and Zimbabwe starting in 1991 and Sierra Leone and Uganda starting in 1992.

Table 4 shows the starting dates of specific liberalisation measures and we see that all countries liberalised interest rates, and this, coupled with the fact that this was one of the first measures by many countries supports the wide held belief that interest rate liberalisation is one of the bedrocks of financial liberalisation. We also see from Table 4 that relaxing restrictions on entry into banking was not a very popular policy in many countries as this policy was not carried out in about half of the countries in the study.

Our analysis covers the period 1978 – 2000. This was dictated by the availability of data on the financial liberalisation measures that were used in constructing the indexes as we were unable to

obtain such data after 2000 for most countries. The data for the macroeconomic time-series are from the World Development Indicators (WDI) CD-ROM 2005.

4.2 Methodology

We will exploit the cross section and time series dimension of our data by using panel data estimation techniques. We have employed both the fixed effects and dynamic panel estimator. Fixed effects estimates have been used to correct for the problems such as omitted variable bias that may arise from pure cross section regressions (Islam, 1995; Caselli et al., 1997; Baltagi, 2001). The fixed effects model takes account of the unobservable country specific effects which are assumed to be fixed parameters to be estimated.

To control for the potential endogeneity of financial liberalisation we have also applied the dynamic panel estimator of Arellano and Bover (1995) and Blundell and Bond (1998). Although we could use an instrumental variable estimator for this purpose, this dynamic panel estimator also allows us to control for the endogeneity of all the other regressors in the model and at the same time control for the econometric problems that arise from the inclusion of the initial per capita income as an explanatory variable. This estimator involves estimating the equations in levels and in differences. For the levels equations lagged values of all explanatory variables are used as instruments while for the differenced equation we use the lagged values in levels of all explanatory variables as instruments. The two equations –levels and differenced – are then combined to give the GMM system estimators. These instrumental variables are called internal instruments because they rely on previous realisations of the explanatory variables and we test their validity using the Sargan test and their consistency using the second-order serial correlation test.

5. Discussion of Results

5.1 Fixed Effects

The results of the fixed effects estimates of equations 2 to 4 are reported in Table 5 and there is evidence of a positive and statistically significant effect of financial liberalisation on economic growth. All the three proxies for financial liberalisation are positive, and the two indexes are statistically significant. The coefficient on the second index (FINDEX2) which is significant at the 5 percent significance level implies that financial liberalisation has improved economic growth by about 0.7 percentage points. Thus, after controlling for country specific effects, we find evidence of a positive effect of financial liberalisation on economic growth.

For the other variables in the model investment is positive and significant in all equations and this is in consonance with earlier studies that have found investment to be an important determinant of economic growth (Levine and Renelt, 1992). The investment coefficient is 0.19 which implies that an increase in the investment ratio by 10 percentage points is on the average associated with an increase of 1.9 percentage points in the growth rate of real per capita GDP. This means that the investment rate for an average economy would have to increase from 19 percent to 29 percent to achieve a 2 percentage point increase in the growth rate of real per capita GDP. It would be difficult to achieve such increases in investment for many SSA countries. This is in view of the fact that investment rates have been very volatile and steadily declining in these countries from the 1980s. The debt service ratio as expected is significantly negative implying that increased debt service payments shift resources away from economically productive uses.

5.2 System GMM

The system GMM estimates are presented in Table 6 and after controlling for the endogeneity of all explanatory variables, we find that financial liberalisation has still had a significant positive effect on economic growth. All the liberalisation proxies are significantly positive thereby supporting the

earlier results from the fixed effects estimates of a significant positive effect of financial liberalisation on economic growth. The implication of these results is that liberalising the financial systems of these SSA countries has increased the efficiency of investment and this has been channelled into growth in real per capita GDP. These results highlight the importance of a well developed financial sector in stimulating economic growth through their effects on pooling and hedging risk, reducing transactions costs, creating liquidity, and channelling capital to the most productive sectors of the economy (Gibson and Tsakalatos, 1994).

From the diagnostic statistics, we see that the system GMM estimators are valid and consistent because the Sargan test supports the validity of the instruments and from the second-order serial correlation test we cannot reject the hypothesis of the absence of second-order serial correlation.

The results for the other variables are largely unchanged from those in Table 5. Investment and debt have significant positive and negative coefficients respectively, and the life expectancy ratio is significantly positive in equation 2.

5.3 Robustness of Results

We conducted a number of changes to the model specification and employed other estimators to check the robustness of our results. Firstly, we changed the dependent variable from the growth rate of real per capita GDP to the growth rate of real GDP and the results of the estimations are presented in Table 7. The results are supportive of our earlier findings that financial liberalisation has had a significant positive effect on economic growth. All the three liberalisation proxies in both fixed effects and system GMM estimations are positive and statistically significant. Thus, irrespective of the dependent variable used, financial liberalisation has exerted a positive effect on economic growth.

Secondly, we assess the sensitivity of our results to the estimation technique employed. Table 8 presents the results of OLS and random effects estimations. The results are similar to those from

Tables 5 and 6. The coefficients on all liberalisation proxies are significant positive and the same conclusion can be drawn – that financial liberalisation has had a positive effect on economic growth.

Finally, to test the stability of the results across countries, we split the sample into 2: slow and fast growers. Slow growing countries are countries whose average growth rate is lower than the sample average, while fast growing countries are countries with average growth rates higher than the sample average. The results for fast growers are reported in Panel A of Table 9 while those for the slow growers are in Panel B. For the fast growers all liberalisation proxies are positive and the liberalisation dummy is significant in both fixed effects and system GMM estimations. We find similar results for the slow growers where all proxies are positive and the two indexes are significant in the system GMM estimations. The earlier results are therefore stable across the countries and we still find that economic growth is positively related to financial liberalisation irrespective of whether we are considering slow or fast growing countries.

6 Conclusion

This paper has examined the relationship between economic growth and financial liberalisation policies in selected Sub-Saharan African countries. Two indexes were developed which track the specific measures and institutional changes involved in financial liberalisation. We used two estimators: a fixed effects estimator to control for unobservable country specific effects and a dynamic panel estimator to control for the potential endogeneity of financial liberalisation and other regressors.

The results of the estimations show that financial liberalisation has had a positive effect on economic growth. Specifically, the two indexes of financial liberalisation and a dummy variable to capture major moves towards liberalisation show a significant positive relationship between economic growth and financial liberalisation. The results are robust when we use different estimators, when we use a different dependent variable, and when the sample is split between fast and slow growing countries.

The results support the view that liberalising financial markets to eliminate financial repression and develop better functioning financial markets promotes economic growth.

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Appendix

Table 1 Summary Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
PCYGROW	0.32	4.93	-15.8	20.15
FINDEX1	0.29	1.88	-3.31	3.94
FINDEX2	2.18	1.94	0	5
INV	18.56	7.4	3.38	59.73
OPEN	66.9	28.94	6.32	153.95
LIFEEXPECT	51.28	7.63	37.71	71.66
DEBT	22.61	15.67	0.81	181.6

Table 2 Starting Dates of Major Moves Towards Financial Liberalisation

Country	Date	Source
Botswana	1989	Bank of Botswana (2001)
Burundi	1986	Hussain & Faruqee(1994)
Cameroon	1990	Galbis (1993)
Congo, Rep.	1990	Reinhart & Tokatlidis (2003)
Cote d'Ivoire	1989	Galbis (1993)
Gambia, The	1986	Moreira (1999)
Ghana	1987	Honohan (2000)
Kenya	1991	Demirguc-Kunt & Detragiache (1998)
Madagascar	1994	Reinhart & Tokatlidis (2003)
Malawi	1992	Honohan (2000)
Mali	1989	Reinhart & Tokatlidis (2003)
Mauritius	1981	Galbis (1993)
Nigeria	1987	Galbis (1993)
Senegal	1989	Reinhart & Tokatlidis (2003)
Sierra Leone	1991	Honohan (2000)
South Africa	1980	Williamson & Mahar (1998)
Uganda	1988	Galbis (1993)
Zambia	1992	Demirguc-Kunt & Detragiache (1998)
Zimbabwe	1993	Naude (1995)

Table 3 Financial Liberalisation Index 2 by Year and Country

Country	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Botswana	0	0	0	0	0	0	0	0	1	1	1	1	3	4	4	4	4	4	4	4	4	4	4
Burundi	0	0	0	0	0	0	0	0	1	1	2	2	2	2	3	3	3	3	3	3	3	3	3
Cameroon	0	0	0	0	0	0	0	0	0	0	0	0	2	4	4	4	4	4	4	4	4	4	4
Congo Republic	0	0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	4	4	4	4	4	4	4
Cote d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	3	4	4	4	4	4	4	4	4	4	4	4
The Gambia	0	0	0	0	0	0	0	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4
Ghana	0	0	0	0	0	0	0	0	0	2	3	5	5	5	5	5	5	5	5	5	5	5	5
Kenya	0	0	0	0	0	0	0	1	1	1	2	2	3	4	4	4	5	5	5	5	5	5	5
Madagascar	0	0	0	0	0	0	0	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4
Malawi	0	0	0	0	0	0	0	0	0	0	1	2	3	4	4	4	4	4	4	4	4	4	4
Mali	0	0	0	0	0	0	0	0	0	0	0	3	4	4	4	4	4	4	4	4	4	4	4
Mauritius	0	0	0	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	5	5
Nigeria	0	0	0	0	0	0	0	1	1	3	5	5	5	5	5	5	5	3	3	3	5	5	5
Senegal	0	0	0	1	1	1	1	1	1	1	1	3	4	4	4	4	4	4	4	4	4	4	4
Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3
South Africa	0	0	2	2	2	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
Uganda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4	4	4	4	4	4	4
Zambia	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	4	4	4	4	4	4
Zimbabwe	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	5	5	5	5	5

Notes:

The table shows a summary of the second financial liberalisation index (FINDEX2). Each cell gives the number of financial liberalisation measures that have been embarked on out of a total of 5 liberalisation measures. The financial liberalisation measures are: bank denationalisation and restructuring, interest rate liberalisation, prudential regulation, abolishing directed credit, and free entry into banking. The index ranges from 0-5, with 0 indicating no financial liberalisation and 5 indicating all liberalisation measures.

Table 4 Starting Years of Financial Liberalisation

Country	Bank de-nationalisation & restructuring	Interest rate liberalisation	Prudential regulation	Free entry into banking	Removal of directed credit
Botswana	1990	1986	1991	1990	no
Burundi	no	1988	1992	no	1986
Cameroon	1991	1990	1990	no	1991
Congo Republic	1991	1990	1991	no	1991
Cote d'Ivoire	1989	1989	1990	no	1989
The Gambia	1985	1985	1985	no	1990
Ghana	1989	1987	1989	1987	1988
Kenya	1988	1990	1985	1994	1991
Madagascar	1988	1985	1988	1988	no
Malawi	no	1988	1989	1990	1991
Mali	1989	1989	1990	no	1989
Mauritius	1995	1981	1988	1999	1981
Nigeria	1988	1987	1988	1987	1985
Senegal	1981	1989	1990	no	1989
Sierra Leone	1992	1992	no	no	1992
South Africa	1989	1980	1983	1983	1980
Uganda	1992	1992	1993	no	1992
Zambia	1995	1992	1994	1991	no
Zimbabwe	1996	1991	1996	1991	1991

Notes:

No indicates that there was no major incident in that particular liberalisation measure. There were no major moves towards bank denationalisation and restructuring in Burundi and Malawi. Also, Sierra Leone did not witness significant measures to strengthen prudential regulation. In Botswana, Madagascar, and Zambia, the removal of directed credit was not a visible component of financial liberalisation.

Table 5 Fixed Effects Estimates of Economic Growth Equation

Variable	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects
findex1	0.69 (1.88)***		
findex2		0.73 (2.33)**	
findummy			1.45 (1.57)
inipcy	-1.54 (-0.63)	-2.18 (-0.82)	-1.51 (-0.64)
inv	0.19 (3.45)*	0.19 (3.5)*	0.19 (3.77)*
open	0.03 (1.23)	0.03 (1.2)	0.03 (1.15)
lifeexpect	2.64 (0.61)	3.49 (0.76)	2.18 (0.54)
debt	-0.05 (-2.32)**	-0.05 (-2.41)**	-0.05 (-2.33)**
Diagnostic Tests			
R ²	0.27	0.27	0.27
Wald test of joint significance	[0.000]	[0.000]	[0.000]
Second-order serial correlation			
Sargan test			
Number of countries	19	19	19
Number of observations	384	384	384

Notes:

Dependent variable is real GDP per capita growth. All models include time dummies that are not reported. Figures in parenthesis () are t-ratios and figures in [] are p-values. t-ratios are computed using heteroscedastic consistent standard errors. inipcy is the log of real per capita GDP in the first year and lifeexpect is the log of life expectancy. All coefficients have been rounded to 2 decimal places. * indicates that a coefficient is significant the 1 percent level, ** significant at the 5 percent level, and *** significant at the 10 percent level. The null hypothesis of the

Table 6 System GMM Estimates of Economic Growth Equation

Variable	(2) GMM-SYS	(3) GMM-SYS	(4) GMM-SYS
Constant	-15.06 (-1.87)***	-10.58 (-1.2)	
findex1	0.66 (1.85)***		
findex2		0.58 (2.24)**	
findummy			1.47 (1.95)***
inipcy	-0.38 (-0.57)	-0.41 (-0.69)	-0.42 (-0.68)
inv	0.18 (2.76)*	0.18 (2.71)*	0.19 (2.85)*
open	0.02 (0.75)	0.01 (0.67)	0.01 (0.54)
lifeexpect	4.06 (1.99)**	2.71 (1.22)	2.76 (1.29)
debt	-0.03 (-2.01)**	-0.04 (-2.19)**	-0.04 (-2.41)**
Diagnostic Tests			
R ²			
Wald test of joint significance	[0.000]	[0.000]	[0.000]
Second-order serial correlation	[0.334]	[0.335]	[0.395]
Sargan test	[0.686]	[0.913]	[0.952]
Number of countries	19	19	19
Number of observations	384	384	384

Notes:

Dependent variable is real GDP per capita growth. All models include time dummies that are not reported. Figures in parenthesis () are t-ratios and figures in [] are p-values. t-ratios are computed using heteroscedastic consistent standard errors. inipcy is the log of real per capita GDP in the first year and lifeexpect is the log of life expectancy. All coefficients have been rounded to 2 decimal places. * indicates that a coefficient is significant the 1 percent level, ** significant at the 5 percent level, and *** significant at the 10 percent level. The null hypothesis of the Sargan test is that the instruments are valid. The null hypothesis of the serial correlation test is the absence of second-order serial correlation.

Table 7 Fixed Effects and System GMM Estimates of Economic Growth Equation

Variable	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(2) GMM-SYS	(3) GMM-SYS	(4) GMM-SYS
Constant				-12.65 (-1.37)	-6.45 (-0.64)	-10.11 (-0.96)
findex1	0.67 (1.87)***			0.64 (1.9)***		
findex2		0.7 (2.32)**			0.53 (1.94)***	
findummy			1.67 (1.87)***			1.37 (1.88)***
iniy	-0.84 (-0.88)	-1.06 (-1.04)	-0.84 (-0.92)	0.09 (0.35)	-0.03 (-0.13)	0.08 (0.33)
inv	0.19 (3.49)*	0.19 (3.54)*	0.21 (3.78)*	0.19 (3.03)*	0.19 (2.98)*	0.2 (2.92)**
open	0.03 (1.12)	0.03 (1.08)	0.03 (1.01)	0.01 (0.54)	0.01 (0.49)	0.01 (0.43)
lifeexpect	4.95 (1.02)	5.77 (1.12)	4.55 (1)	3.03 (1.41)	1.92 (0.81)	2.17 (0.87)
debt	-0.05 (-2.11)**	-0.05 (-2.2)**	-0.05 (-2.16)**	-0.03 (-1.94)***	-0.03 (-2.09)**	-0.04 (-2.32)**
Diagnostic Tests						
R ²	0.27	0.27	0.27			
Wald test of joint significance	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Second-order serial correlation				[0.274]	[0.274]	[0.324]
Sargan test				[0.691]	[0.914]	[0.966]
Number of countries	19	19	19	19	19	19
Number of observations	384	384	384	384	384	384

Notes:

Dependent variable is real GDP growth. All models include time dummies that are not reported. Figures in parenthesis () are t-ratios and figures in [] are p-values. t-ratios are computed using heteroscedastic consistent standard errors. iniy is the log of real GDP in the first year and lifeexpect is the log of life expectancy. All coefficients have been rounded to 2 decimal places. * indicates that a coefficient is significant the 1 percent level, ** significant at the 5 percent level, and *** significant at the 10 percent level. The null hypothesis of the Sargan test is that the instruments are valid. The null hypothesis of the serial correlation test is the absence of second-order serial correlation.

Table 8 OLS and Random Effects Estimates of Economic Growth Equation

Variable	(2) OLS	(3) OLS	(4) OLS	(2) Random Effects	(3) Random Effects	(4) Random Effects
Constant	-20.19 (-3.45)*	-19.01 (-2.88)*	-20.45 (-3.32)*	-18.37 (-2.24)**	-16.76 (-1.99)***	-19.05 (-2.38)**
findex1	0.69 (1.88)***			0.7 (1.82)***		
findex2		0.45 (1.89)***			0.53 (1.90)***	
findummy			1.64 (1.95)***			1.62 (1.83)***
inipcy	-0.26 (-1.01)	-0.3 (-1.15)	-0.37 (-1.49)	-0.25 (-0.51)	-0.34 (-0.68)	-0.37 (-0.78)
inv	0.21 (5.7)*	0.21 (6.1)*	0.22 (5.89)*	0.21 (4.37)*	0.21 (4.45)*	0.22 (4.62)*
open	-0.01 (-1.06)	-0.01 (-1.02)	-0.01 (-1.03)	-0.01 (-0.69)	-0.01 (-0.61)	-0.01 (-0.86)
lifeexpect	5.51 (3.9)*	4.92 (3.09)*	5.41 (3.77)*	5.01 (2.03)**	4.38 (1.74)***	5.03 (2.09)**
debt	-0.04 (-1.85)***	-0.04 (-1.79)***	-0.04 (-2.03)**	-0.04 (-2.47)**	-0.04 (-2.36)**	-0.04 (-2.49)**
Diagnostic Tests						
R ²	0.21	0.21	0.21	0.19	0.19	0.19
Wald test of joint significance	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Second-order serial correlation						
Sargan test						
Number of countries	19	19	19	19	19	19
Number of observations	384	384	384	384	384	384

Notes:

Dependent variable is real GDP per capita growth. All models include time dummies that are not reported. Figures in parenthesis () are t-ratios and figures in [] are p-values. t-ratios are computed using heteroscedastic consistent standard errors. inipcy is the log of real per capita GDP in the first year and lifeexpect is the log of life expectancy. All coefficients have been rounded to 2 decimal places. * indicates that a coefficient is significant the 1 percent level, ** significant at the 5 percent level, and *** significant at the 10 percent level. The null hypothesis of the Sargan test is that the instruments are valid. The null hypothesis of the serial correlation test is the absence of second-order serial correlation.

Table 9 Fixed Effects and System GMM Estimates of Fast and Slow Growing Countries**A: Fast Growers**

Variable	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(2) GMM-SYS	(3) GMM-SYS	(4) GMM-SYS
Constant				-15.59 (-1.02)	-16.39 (-1.08)	-14.71 (-0.83)
findex1	0.23 (0.54)			0.51 (1.42)		
findex2		0.47 (1.41)			0.47 (1.32)	
findummy			2.66 (1.87)***			3.48 (2.71)*
inipcy	-1.24 (-0.41)	-1.91 (-0.59)	-2.76 (-0.76)	-2.11 (-1.67)***	-1.91 (-1.57)	-2.46 (-1.91)***
inv	0.23 (3.74)*	0.23 (3.75)*	0.26 (3.75)*	0.23 (4.48)*	0.25 (3.89)*	0.28 (3.79)*
open	0.04 (1.43)	0.03 (1.25)	0.03 (0.93)	0.01 (0.37)	0.002 (0.07)	-0.01 (-0.15)
lifeexpect	1.95 (0.39)	3.13 (0.58)	4.52 (0.75)	7.56 (1.42)	7.23 (1.39)	7.62 (1.33)
debt	-0.07 (-1.45)	-0.07 (-1.41)	-0.09 (-1.97)**	-0.05 (-0.83)	-0.05 (-0.86)	-0.08 (-1.44)
Number of countries	8	8	8	8	8	8
Number of observations	175	175	175	175	175	175

B: Slow Growers

Variable	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(2) GMM-SYS	(3) GMM-SYS	(4) GMM-SYS
Constant				-14.61 (-1.27)	-10.74 (-0.99)	-15.79 (-1.31)
findex1	0.76 (1.56)			0.81 (1.66)***		
findex2		0.69 (1.72)***			0.65 (1.89)***	
findummy			0.39 (0.34)			0.22 (0.19)
inipcy	-1.47 (-0.55)	-1.88 (-0.66)	-1.5 (-0.56)	0.34 (0.96)	-0.03 (-0.08)	0.13 (0.49)
inv	0.12 (1.52)	0.13 (1.73)***	0.13 (1.8)***	0.05 (0.82)	0.07 (1.06)	0.09 (1.25)
open	0.03 (1.69)***	0.03 (1.93)***	0.03 (1.77)***	0.02 (1.91)***	0.02 (1.52)	0.02 (1.7)***
lifeexpect	1.17 (0.32)	1.42 (0.36)	0.67 (0.19)	2.69 (1.04)	1.76 (0.69)	2.73 (0.99)
debt	-0.03 (-1.46)	-0.03 (-1.54)	-0.02 (-1.03)	-0.03 (-1.83)***	-0.03 (-1.76)***	-0.03 (-1.61)
Number of countries	11	11	11	11	11	11
Number of observations	209	209	209	209	209	209

Endnotes

ⁱ See Bandiera et al. (2000).

ⁱⁱ Due to lack of sufficient data, only domestic liberalisation has been considered. Unlike Latin America and East Asia, liberalisation of the capital account in SSA was not very extensive and information on countries that embarked on them has proved difficult to come by. Our discussion is therefore more in the ‘spirit’ of Gibson and Tsakalatos (1994) and Reinhart and Tokatlidis (2003) who focus exclusively on domestic financial liberalisation. Reinhart and Tokatlidis (2003) note that the external liberalisation dating offers few observations for any statistically meaningful testing.

ⁱⁱⁱ Laeven (2000) has used such methods to construct a financial liberalisation index.