

Financial Development and Economic Growth: Evidence from South Africa: 1970-1999

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ABSTRACT

We examine the impact financial development has on economic performance of the South African economy from 1970 to 1999. The evidence is based on a time series empirical growth model, using instrumental variables with robust standard errors. The paper introduces an index of political and economic polarisation as well as the inflation tax, as the identifying instruments, to compensate for simultaneity bias in the financial development regressors. The results show that credit extension to the private sector and stock market liquidity have a complementary and statistically progressive impact on economic performance over the period, whilst, in the short-run at least, liquid liabilities exerts a negative impact on economic growth. We also find that institutions and the regulatory environment matter for both economic growth and financial development. Increasing access to credit and indexed securities, is a beneficial policy proposition to reduce inequality and protect the earnings of the poor, in particular, whilst increasing productivity. Therefore a more active stock market and banking sector drives economic growth in South Africa

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1 Introduction

1.1 Motivation

A well functioning financial system mobilizes savings from depositors and then selects investment opportunities through credit lines to entrepreneurs. In developed countries, a well functioning system has been shown to be growth promoting as it spurs on entrepreneurial innovation, technological progress and rapidly increases human and physical capital accumulation. Financial intermediaries function in order to reduce information, monitoring and transaction costs. With less information asymmetry, banks and stock markets can better monitor managers, reduce risk through portfolio diversification and hedging opportunities, increase liquidity in productive assets, and facilitate the trading and exchange of real goods and services.

South Africa developed a sophisticated financial system, borne out of the mining boom of the late 1800s. As such, one would expect to find South Africa to exhibit robust economic growth, not unlike other middle income nations that have similar financial systems and economic histories. South Africa's economic performance is crucial for the development of the Sub-Saharan African region as it is by far the largest economy on the continent with a the second oldest stock exchange on the continent behind Egypt. (Fourie et al., 1992)

This paper sets out to examine the finance-growth link and hypothesises that financial development has a positive impact on economic performance in South Africa. The paper particularly investigates the period 1970 to 2000, a period of dynamic change in the economic and political environment of the country. The country experienced political change to democracy; the financial sector underwent liberalisation to adopt free-market principles and the economy was under recessionary pressure with increasing inflation, unemployment and disinvestment in the economy by foreign investors.

This paper contributes to the empirical growth literature, firstly, by examining the finance-growth nexus for the country-specific case of South Africa and secondly, employing an instrumental variable approach to compensate for simultaneity bias in the financial development measures. The study also allows for the opportunity to investigate the importance of policy and institutional factors on the financial system and economic growth.

1.2 Literature Overview

The works of Schumpeter (1912), Goldsmith (1969), McKinnon (1973) and Shaw (1973) were pioneering contributions in the debate surrounding the relationship between financial development and economic growth. This debate has since, continued to be a critical part of the discourse on economic development and especially so for developing nations because there's an impetus for more country specific analysis. The cross-country evidence is not sufficient to account for the permutations from theoretical predictions, especially when one considers the impact of institutional, policy and regulatory changes at a disaggregated, country-specific level (Levine, 2004).

Since these seminal works, the theoretical disagreement centred on the role of the financial system in economic growth, whereby prominent economists such as Robert Lucas (1988) downplayed the relevance of the finance-growth relationship in growth theory; whilst Merton Miller (1998) held the view that it was too obvious and not worth serious discussion that financial markets do contribute to growth, (Levine, 2004). For example, to crystallize the essence of the disagreement, Goldsmith (1969) sought to detail the evolution of financial structures as economies grow and develop and also to establish the impact financial development has on growth. Although Goldsmith managed to establish a positive correlation between finance and growth, he could not establish a causal relationship. In contrast to this, Robinson (1952) argued that, "by and large, it seems to be the case that where enterprise leads finance follows." inferring that the financial system does not cause growth, but merely responds to events stemming from the real sector.

More recently, a critical mass of literature has emerged with eminent contributions by economists such as Levine, King, Demirgüç-Kunt, Beck, Loayza amongst others. They have all made great strides in advancing the application of endogenous growth theory, with the view that financial systems affect long-run economic growth. On that basis therefore, the debate continues to focus on, but not limited to, the determinants of financial development, models of financial systems and other interesting new theoretical models that link finance to aggregate growth, income distribution and poverty alleviation (Levine, 2004).

Country-specific studies are also receiving greater amounts of attention because researchers can model specific structural changes that occur in an economy and assess the individual causes of growth and level of financial development in that economy. This has important implications on policy and regulatory strategies employed by countries and economic/geographical regions on issues such as business development, industry competition and regulation and financial market liberalization. For example, Acemoglu et al. (2004) promotes the economic institutions hypothesis.

Political institutions play an important role in income distribution, social

conflict, corruption and political stability as they respond to special electoral interests. Thus, the institutional quality of a country has an important impact as a determinant of financial development on long-run economic growth. For example, Levine (2004) cites Haber's (1991,1997) example of Brazil's revolution from monarchy in the late 1800's to a republic that was characterized by subsequent liberalization policies in financial markets that increased industrial production and opened the financial system to external sources of finance for businesses. The Mexican experience of liberalization was slower during their Diaz dictatorship which "...relied on the financial and political support of a small in-group of powerful financial capitalists."

Demirgüç-Kunt and Levine (1999) found that countries with higher incomes per capita tend to exhibit large, active and efficient financial systems and that in developing economies, development of their financial structure can be determined by the legal, regulatory, tax and macroeconomic environment. The study by La Porta et al. (1998) and corroborated by Beck, Levine, Loayza (2000) contend that the origins of the legal system in a country is an important indicator in determining the financial structure to be bank or market based. For example, under-developed financial systems were likely to have French Civil law legal systems that do not focus on minority shareholder rights. They have relatively inefficient contract enforcement and tend to have higher levels of corruption and could thus have adverse effects on the market-based system performance. On the other hand, countries with Common Law legal systems were likely to have relatively stronger market-based financial systems. Although, there exists a sharp debate between market-based versus bank-based financial systems being better for economic development, microeconomic literature points towards the complementarities of the two systems whereby stock-market development tends to increase the use of bank intermediaries in developing countries (Demirgüç-Kunt and Maksimovic, 1996)

1.3 Financial Structure and Intermediaries

A well functioning financial system is one that exhibits allocative efficiency of the system by mobilizing savings from depositors and selecting investment opportunities through credit lines to entrepreneurs. The Schumpeterian view of a financial system is one that influences and can in fact; accelerate economic growth through the savings-investment channel by influencing savings rates, investment decisions and technological innovations. De Gregorio (1996) argues that the volume of savings however, may not be as important to growth so much as the impact that borrowing constraints have on the marginal productivity of capital. Countries that relax borrowing constraints can induce higher human capital accumulation rates, technological progress and higher output growth, despite reduced savings rates. Hence, the focus should remain on the role of

financial intermediaries have in productivity growth as opposed to merely improving aggregate savings as the first-generation growth theory would suggest.

Financial intermediaries therefore function in order to reduce information, monitoring and transaction costs. With less information asymmetry, banks and stock markets can better monitor managers, reduce risk through portfolio diversification and hedging opportunities, increase liquidity in productive assets, and facilitate the trading and exchange of real goods and services. Such a system can then spur on productivity growth by facilitating entrepreneurial innovation, technological progress and rapidly increase human and physical capital accumulation.

The richness in this debate, evidently, is in the different econometric techniques proposed in order to promote and express a specific argument where the financial development is concerned, for example, country specific studies use time-series data and it is with these dynamic datasets that causality in the relationship between financial development and growth can be established using econometric techniques such as Granger-type causality tests and vector autoregressive procedures. (Levine, 2004)

Evidence from cross-sectional studies propose a positive statistical relationship between financial development and output growth and that finance leads growth, but the robustness of these studies are compromised by issues of simultaneity bias or reverse causality effects. So, in the Demetriades and Hussein (1996 cited in Khan et al. 2005), there's evidence of bi-directional causality between financial development and output growth for a majority of countries in their sample.

That said, we alternatively consider the dynamic panel analysis by Rioja and Valev (2004a, 2004b) which produces interesting results, in that, their evidence shows that in rich economies, finance increases the rate of productivity growth and accelerates economic growth in relatively poorer economies by increasing capital accumulation. These relationships are non-linear because marginal increases in financial development have greater impacts on growth acceleration for rich and middle-income countries, whilst it is very low for poor countries with low levels of financial development. Again, the causality of the non-linearity was not established.

Levine (1993b, 1997, 2004) in his many examinations on the topic, finds compelling statistical evidence that financial development, is positively related with the rate of physical capital accumulation and measures of efficiency of resource allocation or economic performance. The findings infer that finance does indeed lead growth, a view that sharply contrasts that of Robinson (1952). It is important, however, to be mindful that accounting for growth through capital accumulation does not necessarily translate into long-run economic growth.

King and Levine (1993a) conducted a cross-country panel study that ana-

lyzed whether the level of financial development in a country predicts long-run economic growth, capital accumulation and productivity growth. Apart from financial development proxies, other control variables related to economic growth and that can improve the robustness of the economic model include, for example: income per capita, education, political stability, indicators of exchange rate, trade, fiscal, and monetary policy, inequality and inflation. The evidence from this study noted a positive relationship between real interest rates, real income and financial depth. It is important to note that this model does not establish causality and inherits the ambiguities found in Goldsmith (1969). Other research has developed from this basis to include the stock market ratios to improve upon the definition of financial development. The results also significantly promote the finance-growth relationship (Levine and Zervos 1998a).

The spectrum of international evidence is indeed wide, and draws upon many important economic and political factors that affect the case of South Africa, as a middle-income economy, such as income inequality, political stability and the institutions and regulatory environment that govern financial services.

The rest of the paper proceeds with a description of the dataset used. We also analyse the initial statistics and comment on the behaviour of the key relationships using a correlation matrix and univariate regressions of financial development on per capita GDP growth. Section 3 explains the empirical strategy employed to make statistical inferences and reports the ordinary least squares and instrumental variable regression results. Section 4 concludes with a summary of the salient findings and asserts some policy remarks.

2 The Data

The dataset comprises annual time-series data spanning the period 1970 to 1999. The financial development indicators were sourced from the South African Reserve Bank (*SARB*) Quarterly Bulletin and also from two World Bank databases: The Financial Structure Database compiled by Beck et al. (2000) and the World Development Indicators (*WDI*) database.

Drawing from the spectrum of empirical literature that model the finance development and output growth relationship, we begin by using financial depth as a proxy for financial development. Financial development refers to the aggregate supply of financial assets by bank and non-bank intermediaries in the financial system. Theoretically, financial depth is necessarily defined by the size of financial intermediaries. Size is captured as the ratio of liquid liabilities to nominal gross domestic product (*LLY*). Liquid liabilities consist of currency plus demand and interest-bearing liabilities of banks and other financial intermediaries and it is the broadest measure of financial deepening (Beck et al., 2000).

Additionally, the ratio of credit extended to private enterprises divided by nominal gross domestic product (*CREDIT*) sufficiently proxies financial depth (Beck et al., 2000). These claims on the private sector indicate the level of activity in the savings-investment channel performed by the banking-sector and other financial intermediaries. This infers that financial development increases access to credit by the private sector rather than to government; which, at times, focuses on investing non-profit seeking activities. Access to credit, in turn, stimulates private investment and increases the levels and growth rates in economic development (King and Levine 1993c; Shaw, 1973).

The last proxy (*SML*) is the ratio of stock market total value traded to GDP and measures the liquidity of the stock market or the ability for firms to issue equity (Dimitriades et al., 2007). The securities market also has the ability to mobilise the savings of short-term investors, who prefer to keep their savings in a more liquid form, and channel these funds to finance longer-term investments in capital goods (Fourie et al., 1992).

From these three financial development indicators we create an aggregate measure (*FD*) which is derived from the principal components analysis (PCA). PCA is a method of data reduction that takes orthogonal linear combinations of the original financial development measures that contain most of the variance (Jackson, 2004).

The real GDP growth (*GRGDP*) data and the set of macroeconomic control variables for growth were sourced from the Penn World Table (*PWT*) Version 6.2, compiled by the Centre for International Comparisons of Production, Income and Prices at the University of Pennsylvania.

The three principle control variables used are those commonly used in endogenous growth literature and in cross-country empirical analysis as determinants of economic growth². In this study, we include trade openness (*OPEN*), which is measured as total trade over real GDP; investment share of real GDP (*INVY*) and government share of real GDP (*GOVY*).

GOVY, in Mariotti (2001), is introduced as a proxy for fiscal policy. The fiscal policy paradigm in post-apartheid South Africa is strongly influenced by the labour unions which emphasise the need for the state to play a greater role in reducing inequality in South Africa through fiscal policy, whilst funding it by increasing taxation on the rich (Nattrass, 1996).

In addition to the principle macroeconomic controls mentioned above, we include the inflation rate and an index of political and economic polarisation which are assumed to be exogenous and have been shown to have an impact on per capita GDP growth in South Africa (Mariotti, 2001; Fedderke, 1999).

²See Barro (1991 and 1997) and Levine and Renelt (1991) for theoretical analysis and a review of empirical growth literature and international evidence. See Mariotti (2001) for South African evidence.

Firstly, we consider inflation. Mariotti (2001) also introduces the inflation rate to proxy monetary policy as the South African Reserve Bank is mandated primarily to fight inflation and maintain price stability, with a view to achieve a stable macroeconomic environment ³. We obtain data on inflation from the International Monetary Fund’s International Financial Statistics (*IFS*) Yearbook. Following Erosa and Ventura (2002), we then transform the inflation rate to reflect the inflation tax (*INFLTAX*), as inflation operates as a regressive consumption tax.

$$INFLTAX_t = \frac{\pi_t}{1 + \pi_t} \quad (1)$$

De Gregorio (1993) examines the impact inflation has on investment and economic growth. The paper reports evidence from Latin America, citing that real money balances of firms begin to decline as a result of high rates of inflation. Furthermore, the value of existing capital increases, along with the cost of holding cash to purchase new capital goods. Therefore, private investment by firms is depressed as resources tend to be diverted away from productive processes and channelled into working capital, and ultimately, lower rates of investment and economic growth are the outcomes. Inflation, therefore, is a tax on firms’ money balances and erodes the contribution investment has to additional capacity and to firm profits (Mariotti, 2001).

Acemoglu et al. (2003) and La Porta et al (1998) find that better institutions and increased political and civil rights, that derive from the onset of democratisation, also matter for economic development. Therefore, to proxy for political stability, we construct an index of polarisation (*POLAR*) which is comprised of interacted data series from the Centre for Systemic Peace’s Polity IV Project’s Polity index⁴ and The University of Texas Inequality Project’s (*UTIP*) annual Household Income Inequality index⁵.

$$POLAR_t = 1 - \left[\frac{(Polity_t \times Inequality_t)}{10} \right] \quad (2)$$

The *POLAR* index attempts to capture South Africa’s historical political and economic polarisation from an oppressive apartheid regime, characterized by low levels of democracy and high income inequality. These conditions were

³See www.reservebank.co.za

⁴According to the Polity IV Dataset, the *POLITY*_{*t*} score/index computed by subtracting the institutionalised autocracy score (*AUTOCT*) from the institutionalised democracy score (*DEMOC*_{*t*}) and the resulting unified polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic).

⁵*UTIP* uses the Theil *t* – *statistic* as the measure of inequality

a source of great civil unrest and uncertainty which was shown in Fedderke (1999; 2000) to adversely affect the investment rate and in so doing, adversely affecting GDP growth. Investment is one of the most robust determinants of growth. (Levine and Renelt, 1992)

Lastly, we include an indicator variable to control for periods of direct intervention and regulation in the banking sector and securities market by monetary authorities.

The indicator variable, *DUMV*, takes a value of one in the years 1970-1972 and 1976-1980 and zero otherwise. During these years, monetary authorities made use of credit ceilings and high liquid asset requirements in the banking sector to try and curtail overspending and to dampen the increasingly high levels of inflation. Meanwhile, the Exchange Control Regulations Act imposed capital restrictions, exchange controls, direct investment controls and off-shore borrowing and lending restrictions on the capital markets to prevent deterioration of the capital account. These policies affected banks' intermediation activities so much so, that banking sector disintermediation began to occur. This was characterised by the development of "grey markets", whereby firms began to bypass the banking system in favour of firm-to-firm lending (Fourie et al., 1992).

2.1 Behaviour of the Data

According to the descriptive statistics in *Table 1*, South Africa's growth has been poor over the period of study, ranging from -3.8% to 4.5%, which suggests the economy suffered recessionary pressure borne out of a combination of factors, principally, poor macroeconomic stability and high levels of political instability over the period of study.

The measure of financial deepening (*LLY*) shows a mean ratio of 50% ranging from a minimum of 38% to a maximum of 60% of GDP; which shows the relative size of the financial sector in South Africa to be large as cross-country evidence shows other middle income nations' ratios ranging between 30% to 40% (Beck et al., 2000).

The mean ratio for *CREDIT* is 74% and this ratio of banking sector activity shows large variability of up to 21 standard deviations over time. *CREDIT* reaches a maximum ratio of 121% of GDP, which reflects South Africa's level of private sector indebtedness and is also indicative of a consumer-driven economy.

The ratio of stock market total value traded to GDP (*SML*) has a lower than expected mean value of 10%, considering the bourse is well established; over 100 years old. It is, by far, the largest stock market on the African continent and ranks among the top 20 exchanges globally. The proxy also exhibits wide variation ranging from a low of 2% of GDP to a high of 56% of GDP, suggesting

that the securities market was under a period of considerable repression, but showed significant recovery.

Table 1. Summary Statistics and Correlation Matrix, South Africa 1970-1999.

Variable	Obs	Mean	Std. Dev.	Min	Max
GRGDP	30	0.008	0.020	-0.038	0.045
LLY	30	0.495	0.069	0.384	0.600
CREDIT	30	0.737	0.215	0.488	1.211
SML	30	0.101	0.122	0.022	0.559

Correlations	GRGDP	LLY	CREDIT	SML	FD	INFLTAX	POLAR	OPEN	INVY	GOVY
GRGDP	1									
LLY	0.272	1								
CREDIT	0.078	-0.642***	1							
SML	0.161	-0.375***	0.795***	1						
FD	0.001	0.763***	0.955***	0.854***	1					
INFLTAX	-0.417**	-0.163	-0.525***	-0.470***	-0.350*	1				
POLAR	-0.039	0.672***	-0.967***	-0.751***	-0.935***	0.483***	1			
OPEN	0.337*	0.521***	0.150	0.196	-0.039	-0.754***	-0.129	1		
INVY	0.354*	0.771***	-0.505***	-0.333*	-0.609***	-0.198	0.488***	0.639***	1	
GOVY	-0.422**	-0.822***	0.256	-0.017	0.385**	0.536***	-0.312*	-0.744***	-0.741***	1

Source: PWT Version 6.2, World Bank Financial Structure Database, WDI, SARB Quarterly Bulletin, IFS, UTIP and author's own calculations. *** p<0.01, ** p<0.05, * p<0.1

Consider the correlation matrix in the second panel of *Table 1*. The matrix reports, as we expect, that all the measures of financial development exhibit a positive correlation with per capita GDP growth. *SML* and *CREDIT* are positively correlated, however, *LLY* is negatively correlated with the other two financial depth measures, which suggests the possibility of substitution effects away from savings and deposit accounts towards credit channels and equity markets. The correlations between each financial development measure with the composite measure of financial development, *FD*, shows that *CREDIT* explains the greatest portion of the *FD* measure; closely followed by the *SML* variable and *LLY* explains the least.

The control variables *OPEN* and *INVY* are positively and significantly correlated with per capita GDP growth at the 10% level. The policy variables *INFLTAX* and *GOVY* are both significant at the 5% level and are negatively correlated with growth. The correlation signs of these policy control variables are consistent with the South African evidence found by Mariotti (2001), which suggests that *GOVY* and *INFLTAX* exert a negative impact on economic growth at higher levels of inflation and government consumption⁶.

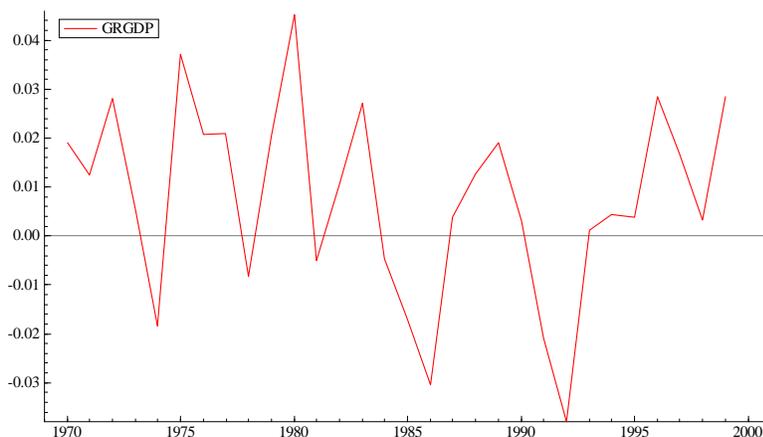
The polarisation index is negatively correlated with GDP growth, *CREDIT*, *SML* and *FD*, but positively correlated with *LLY*. This is suggestive of the

⁶Mariotti (2001) also found the presence of non-linearity in the impact of government consumption of growth in South Africa

impact political instability had on the financial system, particularly through capital flight and disinvestment, and also, that inequality in South Africa may preclude certain sectors of society, particularly the poor, from access to credit and other financial securities (Fourie et al., 1992). These observations merely reflect statistical associations which may not be empirically conclusive.

To further our insight into the behaviour of the data, we consider the following diagrams. *Figure1* exhibits real per capita GDP in South Africa which has been poor and erratic over time. Even the gold boom of the early 1980s could not break the cycle of low growth and sustain higher levels of growth. South Africa experienced its longest recessionary period in its history between 1988 and 1993, due to low investment and high political instability or uncertainty (Fedderke, 2005; 2001a).

Figure 1. Real per Capita GDP growth (GRGDP), South Africa 1970-1999.



Source: PWT Version 6.2

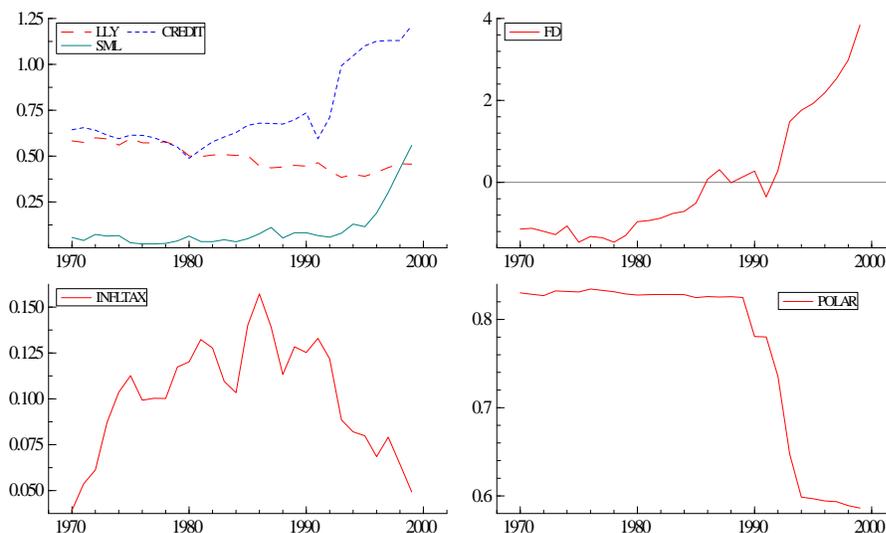
The top two panels of *Figure2* below provide a graphical interpretation of the financial development series. From the 1970's to the early 1990's South Africa experienced high rates of inflation. Monetary authorities then employed interventionist policies in the banking sector, which were characterised by high cash reserves, high liquid asset requirements and credit ceilings aimed at moderating the increasingly high levels of inflation. As a result, we observe that over the same period, liquid liabilities as a proportion of GDP declined as savers began to shift their deposits from banking and contractual savings institutions into other, often less-liquid, savings instruments that they considered to be more inflation-proof and often had attractive "tax-breaks" attached to them (Fourie et al., 1992). Banking sector de-regulation consolidation began in the early 1980's and the process of disintermediation in the credit sector began to be reversed as credit extension to the private sector began to improve. *LLY* began

to improve in the early 1990s and *CREDIT* significantly accelerated as sanctions were lifted and political instability gave way to democratic institutions, inflation began to decline and free market policies were pursued by monetary authorities.

The stock market liquidity ratio remained low primarily due to the exchange controls. Furthermore the exchange experienced capital flight and disinvestment due to the sanctions imposed on the country (Fourie et al., 1992). However, the dual effect of the advent of democracy and the liberalisation of the exchange controls in 1995 saw *SML* accelerate. The *FD* measure shows a trend that closely characterises that of the *CREDIT* variable, inferring that credit extension is a lead indicator for financial development in South Africa.

When we consider index of polarisation in *Figure2*, we observe that South Africa is a polarised society that experienced high levels of political oppression and then transitioned to high levels of democracy in a relatively short period between 1989 and 1994. According to the inequality data, over the sample period, inequality in South Africa remained relatively high and marginally increased; therefore the variation in the index is primarily due to the advent of democracy in South Africa. Having a high inflation environment and high levels of economic inequality has implications on the poor as they have limited access to indexed financial products. Bittencourt (2007) mentions that in developed countries, inflation is progressive through the debtor and creditor channel and that the rich have access to credit and sophisticated indexed assets, whilst the poor, who mainly fund their consumption of goods using cash, as opposed to credit, are impacted disproportionately by the inflation tax.

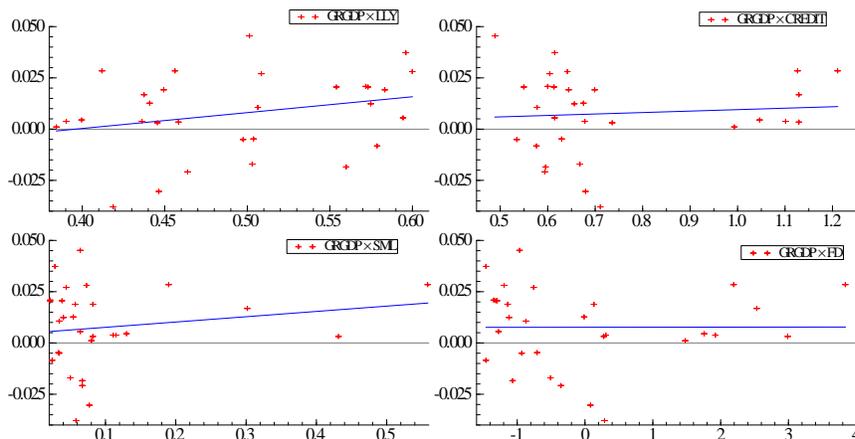
Figure 2. Measures of Financial Depth (*LLY*, *CREDIT*, *SML* and *FD*), Inflation Tax (*INFLTAX*) and Index of Political and Economic Polarisation (*POLAR*), South Africa, 1970-1999.



Source: PWT Version 6.2, World Bank Financial Structure Database, WDI, SARB Quarterly Bulletin, IFS, UTIP, Polity IV Project and author's own calculations.

Figure 3 depicts univariate ordinary least square regression estimates where we impose a linear regression line for each financial development proxy on per capita GDP growth. The evidence affirms what was exhibited in the correlation matrix, that *LLY*, *CREDIT*, *SML* and *FD* are positively related to per capita GDP growth; however, we acknowledge that the distribution of *CREDIT*, *FD* and to a lesser extent, *SML* about their regression lines appear to be non-linear.

Figure 3. Univariate OLS Regressions Lines: Financial Development on per capita GDP growth (GRGDP). LLY is Liquid Liabilities over GDP; CREDIT is private credit by Deposit Banks and other Financial Institutions over GDP; SML is Stock Market total value traded over GDP and FD is the Principal Components Score.



Source: PWT Version 6.2, The World Bank's Financial Structure Database, WDI, the SARB Quarterly Bulletin and author's own calculations.

All in all, the initial statistics show that there is a positive association between financial development and per capita GDP growth, without considering the possible feedback effects from per capita GDP growth back to financial development. We also observe that although per capita GDP growth has been poor and low over the sample period, we need to control for the impact certain policies have had on growth and the financial sector. This suggests that financial development may not be exogenous and in section 3, we attempt to isolate and then explain the role financial development has had in promoting economic growth.

3 Empirical Strategy and Results Strategy

Demetriades and Hussein (1996) suggest that simultaneity bias in the finance-growth relationship may be a problem, particularly in developing countries. To explore this possibility in this dataset, we follow instrumental variable evidence by Levine, Loayza and Beck (2000) and Bittencourt (2008) to assess the strength of the linkage between financial development and economic performance in South Africa.

Instrumental variable (IV) methods are used to obtain consistent parameter estimates in regressions where endogeneity of regressors is suspected or where $E[u|x] \neq 0$. Statistical endogeneity is therefore a problem caused by measurement error and possible reverse causality, which renders all specified ordinary

least squares (OLS) parameter estimators to be biased and inconsistent (Baum, 2007).

Firstly, we estimate two benchmark regressions. The first is a simple Ordinary Least Squares (OLS) regression and the second, an instrumental variable (IV) regression with robust standard errors. *Equation3* below illustrates baseline model estimated by the OLS and IV estimators⁷; where Y_t is real per capita GDP growth, α_t is the constant term, FIN_DEV_t is the financial development estimator, $CONTROLS_t$ is the set of macroeconomic control variables, $DUMV_t$ represents the time indicator variable that captures the presence of financial repression policies and ϵ_t is the error term.

$$Y_t = \alpha_t + \beta FIN_DEV_t + \gamma CONTROLS_t + \eta DUMV_t + \epsilon_t \quad (3)$$

Secondly, we abstract from the benchmark IV regression and introduce the index of political and economic polarisation (*POLAR*) and the inflation tax (*INFLTAX*) as possible identifying instruments. The rationale is based on the evidence above which suggests that financial development may be endogenously determined by the high inflation and political instability apparent over the period of study. The Hausman test is used to test for endogeneity in all the instrumental variable specifications.

3.1 Results

Table2 reports the main findings from the benchmark OLS estimates in the first panel, followed by the baseline instrumental variable case in the second panel. Initially, the sequence of benchmark OLS regressions report statistically significant estimates for *CREDIT*, *SML* and *FD*, which carry positive signs. This indicates that financial development, in general, has a progressive impact on per capita GDP growth and more specifically; credit extension and stock market liquidity also have a positive impact on growth. On the other hand, *LLY* is not reported as having a statistically significant impact on per capita GDP growth; however, its negative sign suggests that growth in money supply, as a proportion of GDP, has had a diminishing impact on economic growth. We suspected that endogeneity in the financial deepening variable may be a problem, and this OLS result is suggestive of this.

Assessing the control variables, across all specifications, *GOVY* is not statistically significant. The negative sign for *GOVY* is consistent with the Mariotti (2001) findings that high levels of government expenditure and inflation are deleterious to GDP growth, whilst at lower levels; the variables would exhibit

⁷The data is assumed a priori to be stationary and results are available upon request.

a positive sign. Trade openness is also negative in all specifications and is statistically significant in the second model. The investment share of real GDP (*INVY*) is positive in all specifications and reported as significant in the second model and interestingly; the dummy variable is reported with a positive sign in all the models and has a statistically significant impact on growth where *CREDIT*, *SML* and *FD* are specified as the financial depth measures. This indicates that the regulations imposed by monetary authorities to protect the economy from external shocks and capital flight had a growth promoting effect in the short-run. The *F test* for overall significance of regressors rejects the null that all the regressors are jointly equal to zero and the R^2 values are sound.

When we examine the baseline IV regression evidence, all the financial development estimates are statistically significant and the signs of the coefficients remain the same as they were in the OLS models. The Hausman regression test rejects the null of no endogeneity when liquid liabilities is specified as a regressor and as expected- the second lag of *LLY* is reported as a valid instrument in the first-stage regression. What this infers is that the measurement error problem may be caused by feedback effects from output growth to financial deepening. Therefore the IV regression approach is justified in this specification. When *CREDIT*, *SML* and *FD* are specified, the Hausman test reports that we can also reject the null of no endogeneity.

Before we interpret the changes in the control variables, it is important to note the Levine and Renelt (1992) suggestion that the macroeconomic variables are sensitive to small changes in the other control variables in the conditioning set. As a result of this, it is possible that changes in signs and levels of significance are due to this fragility; hence, these results must be interpreted with care.

GOVY is statistically significant and has a negative sign in the first two models. The fact that *GOVY* is positive in the third model is probably due to the sensitivity of the conditioning set mentioned above. *OPEN* and *INVY* report a similar result to the OLS specifications and the dummy variable is statistically significant in all the models. The instrumental variable method reports robust standard errors, hence we consider the Wald Chi-squared test for overall significance of the models, which reports that all model specifications are valid and the R^2 statistics are reasonable.

Table 2: Baseline Ordinary Least Squares and Instrumental Variable Regressions of Financial Development on Economic Growth. South Africa 1970-99

	OLS (GRGDP)				IV(1) (GRGDP)			
	Baseline Ordinary Least Squares Regressions				2nd Lag of each financial development measure serves as an identifying instrument			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
LLY	-0.194 (0.114)				-0.409** (0.208)			
CREDIT		0.086*** (0.027)				0.089*** (0.029)		
SML			0.078* (0.039)				0.093*** (0.027)	
FD				0.010*** (0.004)				0.012*** (0.04)
OPEN	-0.033 (0.061)	-0.183** (0.078)	-0.052 (0.063)	-0.119 (0.069)	-0.054 (0.083)	-0.179** (0.087)	-0.055 (0.063)	-0.128 (0.087)
GOVY	-0.688 (0.424)	-0.387 (0.302)	-0.030 (0.348)	-0.338 (0.311)	-1.152* (0.686)	-0.372* (0.220)	0.0356 (291)	-0.332 (0.295)
INVY	0.264 (0.242)	0.696** (0.272)	0.378 (0.260)	0.588** (0.269)	0.501* (0.275)	0.722** (0.298)	0.450* (0.257)	0.680** (0.302)
DUMV	0.017 (0.010)	0.023** (0.009)	0.0173* (0.010)	0.023** (0.009)	0.029** (0.013)	0.024*** (0.009)	0.020*** (0.007)	0.026*** (0.009)
CONSTANT	0.266 (0.164)	0.057 (0.099)	-0.008 (0.115)	0.088 (0.103)	0.477 (0.304)	0.047 (0.083)	-0.033 (0.106)	0.082 (0.112)
Obs.	30	30	30	30	28	28	28	28
R ²	0.299	0.451	0.327	0.410	0.231	0.449	0.320	0.405
F	2.051	3.935	2.330	3.330	Wald Chi ² 4.31	4.89	4.56	5.43
					Hausman test 0.752*** (0.157)	0.986*** (0.112)	0.960*** (0.075)	0.939*** (0.119)

***p<0.01, **p<0.05, *p<0.1
Source: author's own calculations

For IV Regression Robust standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1

Table3 presents the alternative instrumental variable cases with robust standard errors. All the models in both instrumental variable cases report statistically significant Wald Chi-squared test values, meaning we can reject the null that regressors are all jointly equal to zero and infer that the overall model specifications are valid. The Hausman test results presented in both panels indicate that endogeneity is a problem. The change in the endogeneity of the stock market liquidity measure when we use the *INFLTAX* as an instrument suggests the possibility that it may be a weak instrument. The macroeconomic control variable reports generally similar results to those presented in the baseline IV regression in Table2.

The financial development measures keep the same signs in all the specifications as we observed in the baseline IV regression above; with *CREDIT*, *SML* and *FD* exhibiting positive signs and the *LLY* ratio remaining negative. The stock market liquidity proxy is not statistically significant when the

inflation tax is introduced as an identifying instrument. The first-stage least squares regression reports that *INFLTAX* is not an efficient instrument for *SML*, presumably because investors were still able to be compensated for high levels of inflation through stock market returns, hence the inflation tax would not explain the variation in the stock market liquidity ratio. Bruno and Easterly (1998) cite that at inflation rates exceeding 40%, one would then witness significantly lower levels of investment and real activity. Cross-country evidence by Khan and Senhadji (2000) offers no conclusive evidence of threshold effects for South Africa and therefore, inflation in South Africa, albeit high, has not been high enough to have a significant impact on this particular aspect of the financial system and depress real returns to negative values, as it did in Brazil in the late 1980's (Bittencourt, 2008).

On the other hand, the index of polarisation would be an important instrument to explain poor macroeconomic performance because the political instability and increasing inequality, emphasised by declining real incomes and increasing unemployment, characterised the recessionary economic environment of the time and where the stock market witnessed capital flight and disinvestment by foreign banks.

That said, *CREDIT* robustly promotes per capita GDP growth, despite the financial repression policies that resulted in disintermediation. Fedderke (2005) finds that deepening credit extension and improving stock-market liquidity has a complementary and progressive impact on economic growth in South Africa.

The persistence of the negative signs for the liquid liabilities ratio may have a number of explanations. Firstly, Beck et al. (2000) remark that a positive long-run relationship may co-exist with a generally negative short-run link⁸. Secondly, Benhabib and Spiegel (2000) make an important qualifying statement as to why permutations from theoretical evidence exist, mentioning that measures of financial development are linked to different components of economic growth such human capital, physical capital accumulations and total factor productivity, which is suggestive of the findings by Kularatne (2002) and Fedderke (2005), that financial deepening has indirect effects on growth through the investment channel. Thirdly, it is also a possibility that in the short-run, liquid liabilities (consisting mainly of short-term deposits) may not be utilised in longer gestation-period and productivity enhancing investment projects.

We have evidence to suggest that the *FD* measure captures the important components of financial development for South Africa. We can therefore, generalise our findings to infer that when we consider financial development, particularly instrumented by the polarisation index, one may remark that South Africa's financial structure over the period of study reflects one that is biased to cater to an elite, and thus, deepening financial development by increasing

⁸Results for dynamic equations using instrumental variables showed *LLY* change sign to positive, but the result was not statistically significant. Available upon request.

access to credit and indexed securities would disproportionately benefit the rich compared to the poor (Beck et al., 2004b).

Table 3: Instrumental Variable Regressions of Financial Development on Economic Growth, with robust standard errors. South Africa 1970-99

IV(2) (GRGDP)					IV(3) (GRGDP)				
The Polarisation index (POLAR) serves as the identifying instrument					The inflation tax (INFLTAX) serves as the identifying instrument				
	(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)
LLY	-0.397** (0.165)				LLY	-0.510** (0.224)			
CREDIT		0.077*** (0.027)			CREDIT		0.103*** (0.038)		
SML			0.143** (0.061)		SML			0.329 (0.212)	
FD				0.011*** (0.004)	FD				0.017** (0.008)
OPEN	-0.076 (0.069)	-0.161** (0.077)	-0.104 (0.073)	-0.123 (0.079)	OPEN	-0.100 (0.079)	-0.219** (0.096)	-0.248 (0.173)	-0.196* (0.108)
GOVY	-1.146** (0.583)	-0.372 (0.228)	0.155 (0.290)	-0.341 (0.287)	GOVY	-1.402* (0.727)	-0.414* (0.234)	0.680 (0.690)	-0.392 (0.344)
INVY	0.485* (0.293)	0.623** (0.278)	0.654** (0.299)	0.606** (0.303)	INVY	0.609* (0.311)	0.820** (0.326)	1.435* (0.786)	0.919** (0.403)
DUMV	0.025** (0.012)	0.021** (0.009)	0.024** (0.009)	0.023** (0.010)	DUMV	0.030* (0.016)	0.025*** (0.010)	0.044* (0.023)	0.031** (0.014)
CONSTANT	0.481* (0.251)	0.058 (0.081)	-0.066 (0.101)	0.089 (0.105)	CONSTANT	0.601* (0.318)	0.057 (0.080)	-0.231 (0.215)	0.106 (0.122)
Obs.	30	30	30	30	Obs.	30	30	30	30
R ²	0.206	0.447	0.246	0.409	R ²	0.073	0.442	.	0.336
Wald Chi ²	3.35	3.30	3.22	3.41	Wald Chi ²	2.85	3.84	2.07	3.97
Hausman test	0.770*** (0.158)	1.043*** (0.101)	0.767** (0.146)	0.989*** (0.109)	Hausman test	0.606*** (0.140)	0.903*** (0.112)	0.166 (0.165)	0.708*** (0.153)

***p<0.01,**p<0.05,*p<0.1, Robust standard errors in parentheses :

Source: author's own calculations

4 Concluding Remarks

The objective of this paper was to examine the finance-growth link for South Africa from 1970 – 1999; sourcing data from a number of international databases to build an endogenous growth model that would isolate the impact financial development has on economic performance, in the presence of macroeconomic controls for economic growth.

Initial statistical evidence showed that per capita GDP growth in South Africa has been poor and that financial development is expected to be progressive for economic growth. The evidence also suggests that the economic

environment in South Africa was unstable, characterised by increasing rates of inflation and inequality, international sanctions and civil unrest. These conditions gave way to a new democratic system from 1994. The financial system also underwent significant reform from financial repression and market protection policies towards adopting free-market principles. In light of these, isolating the impact financial development had on economic growth would not be simple because one would expect to find evidence of bi-directional causality in the finance-growth relationship.

Therefore, learning from international evidence, we applied the instrument variable with robust standard errors to compensate for the possibility of simultaneity bias in the measures of financial development.

The regression results report that deepening credit extension and improving stock-market liquidity has a complementary and progressive impact on economic growth in South Africa. In the short-run, the evidenced showed that banking sector deepening was regressive to economic growth. The reason is not entirely clear, but intuitively, one would conclude that liquid liabilities, in the short-run, would not be invested by holders of deposits in long-term growth enhancing capital projects and that increasing liquidity would be inflationary and hence growth retarding over time.

By using the inflation tax and index of polarisation as instruments; the results emphasise the findings by Choi, Smith et al. (1996) and Acemoglu, Johnson et al. (2003) that inflation levels and the institutional framework matter for growth and financial development, particularly by enhancing the efficient allocation of resources through the investment channel.

These findings therefore have important policy implications for the South African economy. The result is that the investment climate has not always been conducive to broad-based financial development and economic growth evidenced by the levels of instability and resultant capital flight from the stock market. Furthermore, the onset of financial liberalisation in the 1980's led to banking sector consolidation as the economic environment led to decreased levels of profitability, and thus, the competitive structure of commercial banks became more oligopolistic. This allowed the financial sector to develop in a direction that supported and benefited the rich and the poor disproportionately. Less competition would dampen the incentives for the banks to access the lower end of the market. Although the fiscal policy position was motivated by the need to reduce inequality, expansive fiscal policy was shown to be growth retarding and would crowd-out private investment. Therefore, if pro-poor growth is the objective, then the financial sector has an important and dual role to play to promote growth and reduce inequality. This is achieved by expanding access to credit and access to indexed securities, particularly for the poor. In so doing, this would increase the size and efficiency of private sector productivity in the long-run.

Therefore, the policy imperative remains to continue to strengthen institutions to ensure that insiders (the rich) do not benefit from a more active financial sector at the expense of outsiders (the poor). The evidence presented implies that financial deepening is growth promoting if policy and regulation allow for easing of credit constraints and access to indexed securities, conditioned upon macroeconomic and political stability for the case of South Africa.

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