



# Financial Development and Economic Growth

## Evidence from South Africa: 1970-2007

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# Presentation Outline

1. Introduction
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# Introduction

## Finance-Growth Link

An unresolved debate?

- o *Services provided by financial intermediaries – mobilizing savings, evaluating projects, managing risk, monitoring managers and facilitating transactions- are essential for technological innovation and economic development.* (Schumpeter, 1911)
- o *By and large, it seems to be the case that where enterprise leads finance follows.* (Robinson, 1952)

# Pioneering Contributions

- o Bagehot (1873)
- o Schumpeter (1912)
- o Gurley & Shaw (1955)
- o Goldsmith (1969)
- o McKinnon (1973)

THEORETICAL	
Boyd & Prescott (1986)	Information efficiency & resource allocation
Greenwood & Jovanovic (1990)	Efficient capital allocation
King & Levine (1993b)	Technological innovation & entrepreneur selection
Bencivenga & Smith (1993)	Corporate governance and growth
Acemoglu & Zilibotti (1997)	Trading, hedging & risk-pooling
Banerjee & Newman (1993); Galor & Zeira (1993); Aghion & Bolton (1997); Piketty (1997)	Accumulation of physical & human capital, inequality & credit constraints
Greenwood & Smith (1996)	Transaction costs, specialization & innovation

Source: Aghion and Howitt (2009), "The Economics of Growth", MIT Press

EMPIRICAL	
Goldsmith (1969)	Finance on growth
King & Levine (1993a)	Cross-country - finance on L-R growth, capital accumulation and productivity growth
Rajan & Zingales (1998)	Cross-country sector level – external finance in US & endogeneity of FD
Demirgüç-Kunt & Maksimovic (1998)	Cross-country firm level-growth & finance
Levine & Zervos (1998)	Add stock market development on growth
Levine, Loayza & Beck (2000); Rousseau & Wachtel (1998, 2000); Aretis, Demitriades & Luintel (2001)	Apply panel and time series econometric techniques to test specific results

Source: Aghion and Howitt (2009), "The Economics of Growth", MIT Press

## Notable Contributions

Team Schumpeter		Team Robinson	
Author	Argument	Author	Argument
Goldsmith (1969)	Finds a positive correlation between Finance and growth, but not a causal one	Lucas(1988)	Finance is an "overstressed" determinant of economic growth
Miller (1998)	<i>That financial markets contributes to economic growth is a proposition far too obvious for serious discussion</i>	Keynes(1936)	When Capital Development of a country becomes the by-product of the activities of a casino, the job is likely to be ill done
McKinnon (1973), Gurley & Shaw(1955)	Find empirical evidence suggesting that the nexus can't be ignored without limiting our understanding of economic growth		

## Motivation

- In developed countries a well-functioning financial system has been shown:
  - ❖ To spur on entrepreneurial innovation and technological progress
  - ❖ To be growth promoting
  - ❖ To rapidly increase human and physical capital accumulation
- The role-players:
  - ❖ Stock Markets
  - ❖ Banks: Central Banks and Deposit Money Banks
  - ❖ Other Financial Institutions:
    - Bank-like Institutions: Savings and Cooperative Banks, Mortgage Banks, Building Societies, etc.
    - Insurance Companies , Pension and Provident Funds
    - Pooled Investment Schemes: Eg: Real Estate Investment Schemes or Mutual Funds
    - Development Banks

- The role of financial intermediaries is to:
  - ❖ Reduce information, monitoring and transaction costs
  - ❖ Exhibit allocative efficiency by Mobilizing savings from depositors and selecting investment opportunities through credit lines to entrepreneurs
- How do they achieve this?
  - ❖ Less information asymmetry allows banks and stock markets to:
    - Monitor managers better
    - Reduce risk through portfolio diversification and hedging opportunities
    - Increase liquidity in productive assets
    - Facilitate the trading and exchange of real goods and services.

## About the South African Financial System

### Context

- South Africa has by far the largest and most sophisticated financial system in Africa
- 1793 Dutch East India Company established first commercial bank "Bank van Leening"
- Stock exchange was borne out of the mining boom of the late 1800's
- It is the second oldest stock exchange after Egypt
- We would expect this system to support robust economic growth similar to other middle-income countries with similar financial systems and economic history

### Over the sample period

- Economy experienced poor growth averaging 0.5% due to macroeconomic and political instability.
- Monetary authorities imposed a regime of repressive policies:
  - ❖ Credit ceilings and high liquid asset requirements in order to curtail spending and dampen increasingly high levels of inflation
  - ❖ Exchange Controls Act: Exchange and direct investment controls, Capital and off-shore borrowing and lending restrictions to prevent further deterioration in the capital account.
- Implication of such policies was the development of "grey markets" or disintermediation

### My Contribution

- Main Hypothesis is that financial development has a positive impact on economic performance over the period 1970-2007
- Contribute to Empirical Growth literature:
  1. Examine the finance growth nexus for the country –specific case of South Africa
  2. Employ an instrumental variable approach to compensate for simultaneity bias in the financial development measures
- The paper provides for the opportunity to investigate the importance of institutional factors to the financial system and to economic growth in general.



Variables	Description	Source	Use
GRGDP	Growth of real per capita GDP	SARB Quarterly Bulletin	Dependent variable
GDP	Log level of real per capita GDP	SARB Quarterly Bulletin	Log control variable
OPEN	Total trade share of GDP	SARB Quarterly Bulletin	Control variable
INV	Total investment share of GDP	SARB Quarterly Bulletin	Control variable
GOV	Government share of GDP	SARB Quarterly Bulletin	Control variable & proxy for fiscal policy
LLY	Financial depth	World Bank Financial Structure Database	Size of financial intermediaries
CREDIT	Credit Extension to private sector	SARB Quarterly Bulletin	Level of activity in savings-investment channel
SML	Stock market liquidity	SARB Quarterly Bulletin	Ability of firms to issue equity
FD	Financial development index	PCA	Orthogonal scores from each FD measure
INFLTAX	Inflation Tax	SARB Quarterly Bulletin	Instrumental variable
POLAR	Index of political and economic polarization	Polity IV & UTIP	Instrumental variable
DUMV	Indicator variable	Fourie et al. (1992) & Exchange Control Act	DUMV=1 in years of financial repression

## Data

### Variable Transformations

- $INFLTAX_t = \frac{\pi_t}{1 + \pi_t}$
- Dummy Variable:  $DUMV = 1$  {1970-1972; 1976-1980; 2000; 2006}  
 $= 0$  {otherwise}
- $POLAR_t = 1 - \frac{(POLITY_t \times INEQUALITY_t)}{10}$
- Financial Development Index (FD) is an uncorrelated linear combination of LLY, CREDIT and SML.

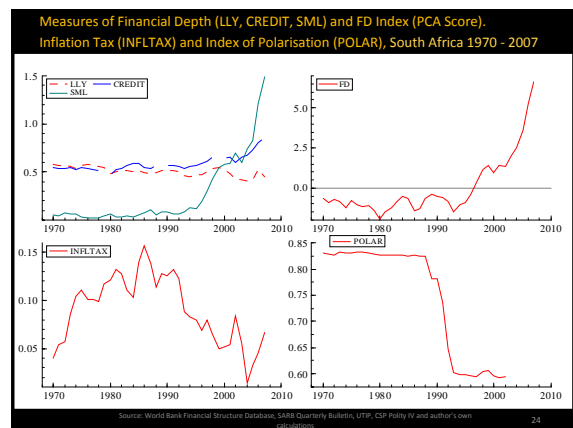
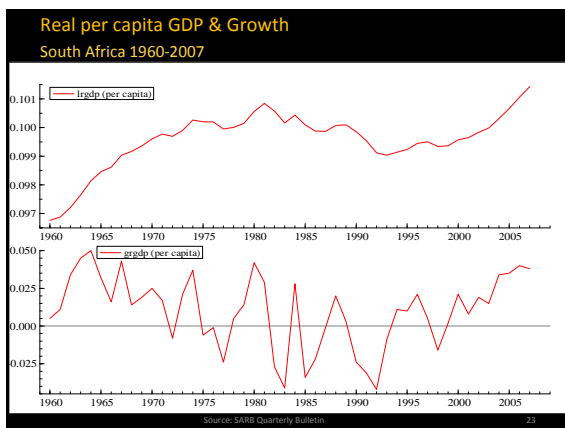
**About the Polity Variable:**  
According to the Polity IV Dataset, the POLITY score/index is computed by subtracting the institutionalised autocracy score (AUTOC) from the institutionalised democracy score (DEMOC) and the resulting unified polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic).

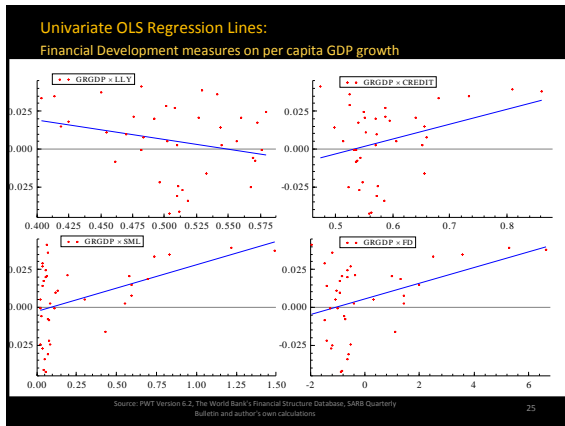
**About Principal Component Analysis:**  
Principal component analysis (PCA) is a statistical technique used for data reduction. The PCA Score describes a series of uncorrelated linear combinations of the variables that contain most of the variance (Jackson, 2004).

### Correlation Matrix, South Africa 1970-1999.

Correlations	GRGDP	LLY	CREDIT	SML	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					
INFLTAX	-0.417**	-0.163	-0.525***	-0.470***	1				
POLAR	-0.039	0.672***	-0.967***	-0.751***	0.483***	1			
OPEN	0.337*	0.521***	0.15	0.196	-0.754***	-0.129	1		
INVY	0.354*	0.771***	-0.505***	-0.333*	-0.198	0.488***	0.639***	1	
GOVY	-0.422**	-0.822***	0.256	-0.017	0.536***	-0.312*	-0.744***	-0.741***	1

Source: World Bank Financial Structure Database, SARB Quarterly Bulletin, UTIP, CSP Polity IV and author's own calculations. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1





## Empirical Strategy

**Stationarity: Unit Root Tests**

- o ADF (1979)
- o Perron (1989) – Structural Breaks
- o Ng-Perron (2001) – Demeaned series
  - o Finite Samples
  - o Truncated lag selection

**Diagnosing problems of endogeneity:**

- o To compensate for simultaneity bias we follow Levine, Loayza and Beck (2000) and Bittencourt (2008) method of Instrumental Variables in Regression.
  - ❖ Instrumental variables are used to obtain consistent parameter estimates in regressions where endogeneity is expected.  $E[u|x] \neq 0$
  - ❖ Endogeneity Bias is usually due to measurement error and reverse causality problems

## Empirical Strategy

$$\Delta Y_t = \alpha_t + \beta FIN\_DEV_t + \delta Y_{t-1} + \gamma CONTROLS_t + \varphi DUMV_t + \epsilon_t$$

Regressions:

1. Benchmark regressions:
  - I. Autotgressive Ordinary Least Squares
  - II. Instrumental Variable case with the 2<sup>nd</sup> lag of each financial development measure as the identifying instrument.
2. Instrumental Variable cases:
  - I. Inflation Tax (INFLTAX) as the identifying instrument
  - II. The index of economic and political polarisation (POLAR) as the identifying instrument

## Results

	OLS (GRGDP)				IV(1) (GRGDP)				
	(1)	(2)	(3)	(4)	The lag of financial development serves as the identifying instrument				
LLY	-0.182*				-0.467**				
CREDIT		0.115*				0.043			
SML			0.027				0.025**		
FD				0.005*				0.003	
GDP <sub>t-1</sub>	-0.202**	-0.277**	-0.250**	-0.270**	-0.290***	-0.195**	-0.243***	-0.228**	
OPEN	0.227***	0.222***	0.187***	0.205***	0.190***	0.340***	0.192***	0.220***	
INV	-0.011	0.014	0.036	0.017	0.234*	-0.100	0.022	-0.045	
GOV	-0.293	-0.349*	-0.298	-0.332*	-0.223	-0.342**	-0.301**	-0.334**	
DUMV	0.006	0.001	-0.001	-0.001	0.011	0.002	-0.001	0.001	
CONSTANT	2.076**	2.671**	2.465**	2.679**	3.045***	1.908**	2.396**	2.266**	
Obs.	37	37	37	37	37	37	37	37	
Adj. R <sup>2</sup>	0.448	0.453	0.437	0.453	0.413	0.522	0.531	0.538	
F-stat	5.86***	5.96***	5.66***	5.96***	35.04***	40.05***	50.62***	45.43***	

	IV(2) (GRGDP)				IV(3) (GRGDP)				
	The lag of the inflation tax (INFLTAX) serves as the identifying instrument.				The lag of the polarisation index (POLAR) serves as the identifying instrument.				
LLY	0.028								
CREDIT		0.117*							
SML			0.033*						
FD				0.005**					
GDP <sub>t-1</sub>	-0.127	-0.278**	-0.271***	-0.269***	-0.430***	-0.468***	-0.461***		
OPEN	0.265***	0.222***	0.174**	0.205***	0.083	0.072	0.081		
INV	-0.203	0.016	0.078	0.015	0.234***	0.319***	0.277***		
GOV	-0.324**	-0.349**	-0.290*	-0.332**	-0.446***	-0.568***	-0.487***		
DUMV	0.001	0.001	-0.001	-0.001	-0.070	-0.141	-0.062		
Constant	1.249	2.682***	2.673***	2.667***	4.478***	4.701***	4.594***		
Obs.	36	37	37	37	32	32	32		
R <sup>2</sup>	0.486	0.544	0.529	0.544	0.522	0.656	0.579		
Wald chi <sup>2</sup>	34.77***	51.50***	46.20***	47.75***	76.70***	106.36***	85.89***		

## Concluding Remarks

- Initial statistics suggested that Financial Development is progressive for economic performance.
- Over the period of examination, South Africa exhibited macroeconomic and political instability.
  - ❖ Increasingly high inflation & inequality
  - ❖ Sanctions and red-tape in financial sector and later; de-regulation
- Endogeneity is a problem – Cause to use Instrumental Variables.

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- Results confirm that financial development is generally progressive on economic growth and that more stock market liquidity and credit extension are important channels for financial development.
  - ❖ Credit channel and Stock Market have a complementary and progressive impact.
  - ❖ Bank-sector deepening not growth promoting – but an important channel to access financial products.
  - ❖ Financial deepening likely to benefit the rich more than the poor.
- Institutions Matter.
- Financial Development has a role to play in pro-poor growth by broadening access to micro-credit and providing access to indexed securities.

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## Questions

THANK YOU

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