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UNIVERSITY OF CAPE TOWN

SCHOOL OF ECONOMICS

**FINANCIAL DEVELOPMENT, CREDIT RATIONING
AND THE DISTRIBUTION OF INCOME: SOUTH
AFRICA 1913-2008**

Dissertation presented in partial fulfilment of the requirements for the

Degree of

**MASTERS IN ECONOMICS – APPLICATIONS IN
DEVELOPMENT**

by

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Abstract

South Africa is a major developing country known for its wide income inequality inherited from the apartheid years. This paper provides a theoretical examination of the impact of financial development and credit constraints on earnings inequality in the country between 1923 and 2008. The time-span is particularly interesting, as it includes three distinct political regimes: colonialism, apartheid and democracy. We draw on the microeconomic models of credit-rationing to understand the relationship between interest rates and inequality and reconcile these findings with the macroeconomic literature on the role of financial market development. Although the correlations for the entire sample were significantly low, the within-period correlations revealed interesting trends. From a theoretical point of view, lower interest rates during the colonial period could be said to have contributed to lowering credit constraints on middle-class Afrikaner landowners, contributing to a decline in inequality. During the apartheid era, higher demand for investment put pressure on interest rates; declines in inequality during the period were attributed to a great extent to government interventions. Thereafter, upon the implementation of the democratic regime, despite the noteworthy developments in the country's financial markets, the increase in interest rates constituted a considerable barrier to capital accumulation and wealth remained highly concentrated at the top.

Keywords: Apartheid, colonialism, democracy, financial development, inequality, interest rates.

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Remaining errors are my own responsibility.

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Dedication

To my parents, Abílio Santos Jnr and Maria António.

Thank you for your infallible support.

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Plagiarism Declaration

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Table of Contents

ABSTRACT	I
ACKNOWLEDGEMENTS	II
DEDICATION	III
PLAGIARISM DECLARATION	IV
TABLE OF CONTENTS	V
1. MOTIVATION AND OVERVIEW	1
2. LITERATURE REVIEW	3
2.1 ESTABLISHING THE LINK BETWEEN FINANCIAL DEVELOPMENT, CREDIT RATIONING AND INEQUALITY	3
2.2 MODELS OF OCCUPATIONAL CHOICE AND INEQUALITY	5
2.2.1 <i>The credit market - Financial development, imperfect information and credit rationing</i>	6
2.2.2 <i>Capital market imperfections, the market for skills and the labour market</i>	8
3. FINANCIAL SECTOR DEVELOPMENT IN SOUTH AFRICA	10
3.1 HISTORICAL BACKGROUND OF THE FINANCIAL SECTOR AND THE ECONOMY	10
3.2 MONETARY POLICY	14
3.3 STOCK MARKET DEVELOPMENT – THE JOHANNESBURG STOCK EXCHANGE	16
3.4 THE SOUTH AFRICAN BANKING SECTOR.....	17
4. DATA AND MEASUREMENT	20
4.1 INCOME INEQUALITY, 1913-1993.....	20
4.2 INCOME INEQUALITY, 1993-2008	22
4.3 INTEREST RATES, 1913-2008.....	24
4.4 INTEREST RATES AND INEQUALITY	25

5. THEORETICAL UNDERSTANDING OF THE RELATIONSHIP BETWEEN INEQUALITY AND FINANCIAL AND CREDIT MARKETS.....	26
5.1 INEQUALITY AND INTEREST RATE, 1923-1948.....	26
5.2. INEQUALITY AND INTEREST RATE, 1948-1993.....	30
5.3 INEQUALITY AND INTEREST RATES, 1994-2008.....	34
6. CONCLUDING REMARKS	36
REFERENCES.....	40

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List of Figures

FIGURE 1: INCOME SHARES OF THE TOP 1 PERCENT WEALTH HOLDERS. SOURCE: ALVAREDO AND ATKINSON (2010).	20
FIGURE 2: INCOME SHARES OF THE TOP 1 PERCENT INCOME EARNERS, 1993-2008. SOURCE: WORLD BANK DEVELOPMENT INDICATORS (2010).	22
FIGURE 3: REAL INTEREST RATE, 1913-2008. SOURCE: FIRER AND MCLEOD (1999) AND FIRER AND STAUNTON (2002).	24
FIGURE 4: INEQUALITY AND INTEREST RATE, 1923-1948. SOURCE: ALVAREDO AND ATKINSON (2010), FIRER AND MCLEOD (1999) AND FIRER AND STAUNTON (2002).	29
FIGURE 5: INEQUALITY AND INTEREST RATE, 1948-1993. SOURCES: ALVAREDO AND ATKINSON (2010), FIRER AND MCLEOD (1999) AND FIRER AND STAUNTON (2002).	30
FIGURE 6: INEQUALITY AND INTEREST RATE, 1994-2008. SOURCE: WORLD BANK DEVELOPMENT INDICATORS (2010) FIRER AND MCLEOD (1999) AND FIRER AND STAUNTON (2002).	34

1. Motivation and Overview

South Africa is a developing country that has experienced positive growth since the implementation of democracy in 1994. However, poverty and high income inequality remain a concern. While the formal economy has prospered, becoming more technologically advanced, competitive and providing viable opportunities for skilled workers, the informal sector populated mostly by the unskilled and unemployable poor has not been as prosperous.

Financial and credit market imperfections and their effects on income inequality have been a prolific topic of debate in the growth literature. Despite these developments, there has been little work on the links between financial intermediation and credit rationing and their impact on income inequality, especially in the context of South Africa. Related empirical evidence establishes that credit markets play a role in speeding up job creation and poverty alleviation, thereby reducing inequality. The importance of financial markets in such instances is twofold. Firstly, well developed financial markets benefit the poor by allowing them to invest in education and other profitable ventures and secondly, it gives the poor some form of insurance in times of macroeconomic volatility (Bittencourt, 2006).

However, it is not always the case that financial development leads to reductions in income inequality. Asymmetrically distributed information in credit markets drives a wedge between the interests of borrowers and lenders. Investment projects with the same return are then faced with different costs of capital depending on the borrowers' initial wealth. Lenders will offer credit only to those who can offer some security in the event of default. The poor lack collateral assets (be it in form of immovable property or valuable movables) and are thus denied access to credit. Even when the poor are allowed to borrow, their incentive to exert effort and make their enterprise viable declines the more they have to pay back. Therefore, the lower the entrepreneur's wealth and the higher the interest rate, the higher the incentive to shirk. Lenders take this into account when allocating their funds and choose to not lend to the poor. Credit rationing implies that the gains from better financial intermediation are more likely to accrue to those at the top, while the poor lag behind.

The objective of this paper is twofold: firstly, it provides a theoretical overview of the macroeconomic evidence on the links between financial development and inequality on one

hand and the microeconomic models of credit-rationing on the other. Secondly, it relates the literature to the South African context using the interest rate mechanism.

Existing studies on the role of credit market imperfections, emphasise two relatively opposing views, one in which the poor are net borrowers and another in which the poor are net lenders. As discussed by Piketty (1997), in an economy in which the poor are net borrowers, higher interest rates are associated with a higher proportion of credit constrained individuals, lower capital accumulation and higher inequality. Therefore, it is possible that an economy reaches a long-run steady-state with persistent inequality. Aghion and Bolton (1997) extend the analysis and describe the mechanism of trickle-down growth when the poor are net borrowers. Sufficiently high levels of capital accumulation by the rich allow more funds to become available to the poor who are then able to invest and escape poverty. In a relatively similar work, Matsuyama (2000) looks at the role of incomplete credit markets in which the rich are allowed to borrow, while the poor are net lenders. Inequality persists in the long run because the scarcity of rich individuals implies lower demand for credit and lower interest rates, which hurt the poor. When there are a large proportion of rich individuals in the economy, higher demand for loanable funds pushes up the interest rate to the benefit of the poor and inequality decreases.

In order to investigate which of these views is consistent with the South African evidence we look at the correlations between the interest rate and inequality from 1913 to 2008. This time span is particularly interesting because it covers three distinct periods in the South African history: colonialism, Apartheid and democracy. For the colonial and apartheid periods (1913-1993), we use a measure of inequality recently published by Alvaredo and Atkinson (2010), calculated as the income shares of the top 1 percent wealth holders, and estimated using income tax data. Given the data limitations, for the post-apartheid period (1994-2008) we use the World Bank Development Indicators to determine the top 10 percent income shares. The interest rate data is obtained from Firer and McLeod (1999) and Firer and Staunton (2002), updated to 2008. For the colonial era, the evidence is in line with the predictions of Piketty (1997) and Aghion and Bolton (1997), where lower interest rates permit the diversification of economic activity and as growth trickles down to the poor inequality falls. During the apartheid period, the implementation of measures to reduce the income gap between the English capitalists and the Afrikaner landowners led to the formation of a new class of financial, industrial and commercial Afrikaner capitalist. The results substantiate the model

proposed by Matsuyama (2000) in which a larger number of rich individuals, increases demand for credit, pushes up the interest rate and reduces inequality. For the democratic period, a somewhat surprising finding was the increase in inequality despite government policy to deal with the issue. The trend was explained in terms of the Piketty (1997) framework, where higher interest rates deter investment and capital accumulation, thus contributing to the persistence of income inequality. Furthermore, the concentration of wealth at the top among very few individuals limits the supply of credit, raising interest rates, lowering capital accumulation and increasing inequality.

The remainder of this paper has the following structure: the next section reviews the existing literature. Section 3 provides the historical background of the South African financial sector. Section 4 looks at the empirical evidence and finally Section 5 concludes the paper, summarises the main findings, discusses the limitations of the results and provides some of the policy implications of increasing the access to financial and credit markets.

2. Literature review

In this section we will draw on the existing literature to reconcile the macroeconomic models of financial development and the micro-economic models of credit rationing. More recently, interest in financial markets and institutions has developed as economists have realised their relevance for and impact on growth and output fluctuations. These in turn affect the distribution of wealth through their influence on the allocation of credit and investment opportunities.

2.1 Establishing the link between financial development, credit rationing and inequality

The growth and development literature provides a substantial body of evidence that predicts a positive impact of financial development on inequality and poverty. If financial markets are complete, investment opportunities with the same return face the same market price of capital, regardless of the borrower's initial wealth. Claessens and Perotti (2005) show that by minimising credit constraints on the poor, financial development contributes to reducing inequality.

Demirgüç-Kunt and Levine (2009) complement to the findings of Claessens and Perotti (2005) and provide a body of evidence which shows that beyond providing equal opportunities to the rich and the poor, financial development reduces the income distribution gap by expanding the pool of investment opportunities in an economy. A well-developed financial system improves the allocation of resources, fosters growth and demand for labour and affects wages thereby promoting equity. Extending their argument, the authors explain that wealth constraints on the poor are exacerbated if financial markets are weak, since moral hazard and adverse selection have a stronger impact on credit allocation. The authors also predict that if entrants are faced with fixed costs when starting a project as well as when joining financial intermediaries, at the initial stages of development inequality will increase. As the economy progresses, more people join financial intermediaries, more resources are made available, incomes rise and development in the sector helps bridge the gap between rich and poor. In this scenario, financial development ensures that wealth trickles down to the poor and incomes converge.

In an empirical study, Beck, Demirgüç-Kunt and Levine (2004) use a regression-based model to estimate the relationship between finance and changes in income distribution and poverty. The paper determines that financial market frictions may be specially binding on the poor who lack collateral, as such, any relaxation on credit constraints will have a disproportionately positive effect on the poor, is strongly associated with poverty alleviation and will improve efficiency and resource allocation.

However, it is not always the case that a more dynamic financial environment benefits the poor. Demirgüç-Kunt and Levine (2009) recognise that financial development could have a negative impact on inequality if it leads to increases in the returns to skills and entrepreneurial ability. In this case, it is possible that individuals with high ability are compensated without any significant impact on the incomes of the poor, widening the income gap.

Beyond the credit market constraints, the political system and macroeconomic stability are important determinants of the relationship between finance and inequality. Li, Squire and Zou (1998) draw on the political economy literature to explain to that the extent to which the rich can lobby for policies – either through bribes or through direct political control – in a way that the political system is beneficial to them, can exacerbate credit constraints on the poor.

Then, developments in the financial markets will be captured by the rich, perpetuating inequality. Macroeconomic stability also plays an important role in ensuring that the poor benefit from financial development, as postulated by Clarke, Xu and Zou (2003) monetary instability has a disproportionately negative impact on the poor and middle-class when compared to the rich, since the latter have better access to financial intermediation which protects them in periods of high inflation. When considering the political economy arguments, they conclude that diversity exacerbates inequalities as different political structures lobby for redistribution policies that benefit their own ethnic group. Furthermore, legal origins appear significantly related to financial development, since some legal systems have a higher regard for property rights and are more adaptable to exogenous changes.

A further topic, widely debated in the financial development literature is the role of technological diffusion in reducing cross-country inequalities. Theories predict that countries growth rates should converge as those lagging behind take advantage of their backwardness adopt and adapt the technologies developed elsewhere and catch-up. However, cross-country differences in growth rates exist and persist. Aghion, Howitt and Mayer-Foulkes (2004) present a cross country study in which they show that financial constraints are what prevents poor countries from taking full advantage of technological transfer and what makes their growth rates diverge from the world technological frontier. Convergence is clubby in the sense that countries that have reached a certain level of development will converge to the same growth rate, while the others fall behind. Financial development could work as a mechanism that facilitates technological diffusion and ensure that laggard countries catch up.

2.2 Models of occupational choice and inequality

In attempting to understand the relationship between occupational choices and inequality, Pellicer *et al.* (2011) identify three economic mechanisms of inequality persistence relevant to our analysis: the credit market, the market for skills and the labour market. The focus of this paper is on the credit market; however, the relevance of the other realms of interaction between economic agents is also briefly considered. Financial markets are relevant in this context in the sense that, as explained before, they expand the pool of available opportunities, enhance the poor's ability to invest in human capital, acquire skills and influence the choices between becoming an entrepreneur and selecting an alternative occupation. Thus, financial development has the potential to boost human capital accumulation in an economy and foster

growth. In perfectly competitive financial markets, the decision to invest – including that relating to human capital accumulation – depends solely on the expected return. However, when such markets are less than perfect, borrowing constraints and non-convex investment opportunities imply that cross-dynasty inequalities can persist.

2.2.1 The credit market - Financial development, imperfect information and credit rationing

The bulk of the above-mentioned evidence establishes that financial development can have a significant impact in reducing inequality. However, the relationship is not as straightforward as it sounds - the presence of moral hazard and adverse selection implies that financial markets are imperfectly accessed by the poor. On one hand, if markets are perfectly competitive, investment decisions can be modelled as being independent of income or wealth. The relevant determinants of investment then become the expected returns and the market price of capital. Entrepreneurs with good investment opportunities are able to borrow and finance their investments. People with the same returns on their investments will invest exactly the same amounts; in periods when interest rates are high agents will prefer to lend and when they are low, agents will prefer to become borrowers. On the other hand, as discussed by the World Development Report (2006), credit markets are far from the ideal described above. When lenders have imperfect information about borrowers and agency costs are high, there will be a gap between borrowing and lending rates. Borrowers who are easier to monitor are likely to enjoy better rates. If markets are less than perfect and borrowers can wilfully default on their loans, lenders will prefer to provide loans to borrowers who can provide collateral assets, i.e. the rich. Those unable to provide collateral will have no access to credit. Efficient allocation of loanable funds becomes problematic when there is underinvestment by the poor with good growth opportunities.

General equilibrium models present an important theoretical argument for the relationship between financial development and inequality. Piketty (1997), Aghion and Bolton (1997) and Matsuyama (2000) develop models of occupational choice by analysing the borrowing and lending mechanism in capital markets with imperfect information. In their study, lenders know that the more an agent needs to borrow and the higher the interest rate, the higher is the incentive to shirk. Lenders will choose not to lend, or at least limit lending to the poor. Only agents with wealth above a certain level will find it profitable or be allowed to become investors (or entrepreneurs) while the poor are credit-rationed.

Piketty (1997) presents a model in which, because there are fixed costs associated with becoming an entrepreneur and diminishing returns to investment, the rich are net lenders while the poor are net borrowers. Lower interest rates benefit the poor as borrowers. Higher interest rates on the other hand, induce a higher steady state fraction of credit-constrained individuals and lower long-run capital accumulation. There are two possible steady states in this framework, one with low interest rates and no credit rationing and one where interest rates are high, it takes longer for credit-constrained agents to rebuild their capital and there is separation between the rich and the poor. Poverty traps are thus more likely when interest rates are high and inequality can persist even in the long-run. On aggregate, the model predicts that countries with higher interest rates and low wealth mobility will have lower investment levels, be more unequal and grow more slowly than countries with lower interest rates.

Aghion and Bolton (1997) complement the argument presented by Piketty (1997) and show the mechanism through which the accumulation of wealth by the rich trickles down to the poor. Capital accumulation by the rich implies that more funds are made available to the poor for investment purposes and lending terms are shifted in favour of borrowers. The middle-class agents are able to catch up with the rich and borrow and invest in their own individual projects to escape poverty.

Matsuyama (2000), on the other hand, assumes that investment opportunities are profitable and face increasing returns, implying that it is optimal to borrow and invest as much as possible (Pellicer *et al.*, 2011). Imperfect information in capital markets implies that lenders choose to assign loans only to agents who can provide collateral assets, i.e. the rich. The rich then become borrowers and the poor, lenders. Because of the gap between borrowing and lending rates, the poor accumulate less wealth than the rich and lag behind. Therefore in this model inequality is endogenous and the rich accumulate wealth partly because of the poor. Convergence in income distribution would occur in this scenario if demand for capital by the rich pulled up the interest rate to the benefit of the poor as lenders. They would thus be able to catch up with the rich in a trickle-down mechanism that is clearly different from the one discussed by Aghion and Bolton (1997). Therefore there are two possible long-run outcomes, one in which there is convergence in income distribution to a unique steady state and another where the economy remains polarised. In this model, contrary to the models above, low interest rates lead to higher inequality.

Brückner, Gerling and Grüner (2010) attempt to bridge the gap between these general equilibrium models and empirical evidence using a regression-based model. Their work evaluates the relationship between real interest rates and income inequality in the US, UK and Sweden from the early 1920s to 1992. The results show a positive relationship between inequality and the interest rate; more equality being associated with lower interest rates, as hypothesised by Piketty (1997). The model shows a significant cointegration relationship between the interest rate and wealth inequality for the US and Sweden, but not for the UK. Also, they find no evidence of a statistically significant relationship between wealth inequality and growth, which the authors interpret as refuting the trickle-down mechanism presented by Aghion and Bolton (1997). When using a Vector Error Correction Model (VECM), inequality and the interest rate remain significantly related, even after additional controls (such as trade openness, human capital formation and alternative measures of the interest rate) are introduced. The authors take their analysis one step further and apply it to a panel of 16 OECD countries over the period 1960-2008 and are able to supplement their evidence (at the conventional significant levels) of a positive relationship between wealth inequality and the interest rate.

2.2.2 Capital market imperfections, the market for skills and the labour market

In analysing the mechanisms for inequality persistence in the market for skills, the literature provides us with models of occupational choice in which the faith of an economy, convergence of income across agents or persistence of inequality, are somewhat dependent on initial conditions. Becker and Tomes (1986) analyse parents' decisions to invest in their children's education and its impact on intergenerational mobility, what the authors call "the rise and fall of families" when individuals differ in their abilities. They work on the assumption that parents' utility increases with consumption and investments in their children's education, thus consumption and human capital investment are indivisible and increased investment in education implies lower consumption. If capital markets work perfectly, high-ability individuals are able to borrow against their ability and invest in schooling irrespective of their parents' wealth. On the condition that ability endowments are mean-reverting, initial differences in wealth across generations do not persist. However, if capital markets are imperfect, poor families will find it difficult to finance the investment in their children's education since loans to supplement their limited resources are difficult to obtain when human capital is the collateral. Consequently, children from rich parents with

comparatively lower ability will receive more schooling than the higher ability children from poor families; that is, the wealth effect dominates the ability effect. Another relevant finding, especially in the context of developing economies, is the negative relationship between household size and investment in human capital: the larger the household, the lower the investment per child. Jacoby and Skoufias (2000) extend this study and show that when financial markets are imperfect and households suffer an *unexpected* income shock they will tend to reduce their investment in their children's human capital or use their labour in low-wage jobs at the expense of higher-return education. This happens because of borrowing constraints which do not allow poor households access to insurance against income shocks.

Galor and Zeira (1993) also explore the relationship between the distribution of wealth and investments in human capital in the context of imperfect capital markets. However, contrary to Becker and Tomes (1986), they assume that individuals are identical in their *abilities* or *potential skills* and differ only in terms of inherited wealth. Imperfect information and high monitoring costs drive a wedge between borrowing and lending interest rates. Poor individuals face borrowing constraints and invest less in education than the wealthy. In the long-run, the level of investment in human capital determines the distribution of income. The future of each dynasty is then determined by initial wealth; rich dynasties invest in education, work in the skilled sector, accumulate wealth and leave large bequests. Poor dynasties, on the other hand, inherit less, do not invest in education, and leave less to future generations. It is the initial wealth distribution that determines educational choices and the long-run equilibrium in the economy. Poverty traps arise when there is credit rationing, poor agents cannot invest in education, do not accumulate enough wealth and remain poor. In this model, some dynasties never become wealthy.

The study by Mookherjee and Ray (2003) also looks at the relationship between occupational choice and inequality. Their model assumes that skilled and unskilled labour are not perfect substitutes and, given the costs of acquiring skills and capital market imperfections, it is possible that the economy reaches a unique steady state in which individuals are locked in a specific occupation, with a particular wage and level of consumption. Thus, there is persistence of inequality in steady state. This result contrasts with others discussed above, where given some pre-specified conditions perfect equality is not ruled out as a possible steady-state.

The interactions between rich and poor individuals in the context of the labour market as presented by Banerjee and Newman (1993) show that, given capital market imperfections and borrowing constraints, the poor will prefer occupations that do not require high levels of investment. Wage contracts then become substitutes for financial contracts and the wage is determined in such a way that the labour market clears. Economic development is thus determined by the initial distribution of wealth – where the rich are few, the economy will be characterised by high inequality and poverty. That is, when there are a large number of poor individuals in an economy of relatively poor people, the economy will converge to a steady state where wage employment and large-scale production prevail, while an economy with few very poor people is more likely to converge to a steady state dominated by self-employment in small-scale production.

3. Financial sector development in South Africa

This section will document the development of the financial sector in South Africa from the early 1900s to 2008. By reviewing the history we expect to gain a better understanding of the extent to which financial intermediary development has contributed to broadening the access of these services. We do so by looking at the role of monetary policy, the Stock Market and the banking system.

3.1 Historical background of the financial sector and the economy

From the 1880s mining played a major role in the in the South African economic system, and as speculation in the sector increased, banks expanded their operations. During the 1910s growing mining houses and imperial banks, under the control of London banks, were at the centre of the economy (Bond, 2003).

From a historical point of view, the late 1880s and early 1900s were a period of significant income inequality and important developments in the financial sector. The English elite controlled most of the capital in the country, while the Afrikaners were mainly landowners and the black population, labourers. The substantial start-up costs to mining contributed to this separation of wealth between the English and Afrikaner population. Fedderke (2010) explains that there were substantial obstacles associated with deep-level mining, such as

raising the required financing (mostly from abroad) and obtaining the appropriate level of expertise. This implied that only certain groups, mostly foreign, participated in the activity. Compounded with this was the considerable risk associated with investing in a country where mining firms had a difficult relationship with the government.

Towards the end of the First World War, the weakening control of the City of London over the banking sector on South Africa became evident. This happened as a result of the increasing pressures caused by the war, the uncertainties on the gold standard as base for the currency, the devaluation of the pound and the rise of New York as a competitor. By 1918 the gap between the value of gold and the declining South African currency led to massive gold smuggling. To prevent further losses, gold was formally delinked from currency in 1920. In 1925, when conditions improved, South Africa returned to the gold standard (Bond, 2003; Rossouw and Padayachee, 2008).

In 1920, to deal with the financial uncertainty, the Union of South Africa authorities decided to create a local Reserve Bank to act as a grantor for banks and the South African currency. Disputes over the banking regulation meant the Reserve Bank had to be placed under the direct control and ownership of bankers (the mining elites) rather than being state owned. The developments in the world economy and the changes in the domestic banking system helped strengthen the power of the English elite while agricultural production fell behind. In rural areas, farmers accumulated large amounts of debt. This, compounded with the low agricultural productivity led to a state of dependence for landowners (Bond, 2003). There was a need to transform the economy, and policies implemented at the time allowed the expansion of credit concessions to landowners and the growth of manufacturing and commercial agriculture.

The 1929 crash brought back pessimism to the economy and banks began to cut back on lending. Agricultural profits declined as foreign demand fell and land became overpriced. Foreign investment decreased, as did exports excluding gold. During the 1930s many countries could not afford to back their currency in gold. In 1932 Britain (still at the centre of international finance) abandoned the gold standard and many countries followed. Without a way to root the value of currencies, international trade stagnated and protectionist currency blocks developed. South Africa was still part of the British sterling area. As the world's leading gold producer, the country could remain on the gold standard. However, because the value of the currency was much higher relative to other currencies, exports dwindled. By the

end of 1932, the overwhelming pressures on the economy led to the abandonment of the gold standard and the devaluation of the currency (Bond, 2003). All in all, the wealth holdings of both farmers and mining capitalists suffered as a result of the volatility in the world economy.

Early in 1933, banks began to restructure their interest rates (going from 6 percent for loans and 3.5 percent for savers, to 5 and 0.5 percent respectively). Where demand for loans existed, enormous financial profits could be made from the interest rate spread. Gold and agricultural exports picked up after the currency devaluation and the rest of the economy followed. From 1933 to the 1940s, as South Africa became relatively isolated from the international arena, the economy grew significantly (with an average GDP increase of 8% per annum), more evenly across sectors and with larger relative wage increases for blacks than in any other time in the twentieth century (Bond, 2003). The proportion of wealth of those at the top during the 1930s and early 1940s declined, bringing more equality in incomes.

While the country prospered, tensions between the English-speaking financial elites and Afrikaner farmers remained. By the mid-1940s, the benefits of the financial elites outweighed those of the Afrikaners, especially because of the former's influence over gold mining (and the 1944 Breton Woods agreement regulating international finance through semi-gold standard) and the expansion of the Johannesburg Stock Exchange in 1946. The political arena went through substantial restructuring in 1948, when the National Party came into power. It focused on institutionalising existing racial practices through apartheid and also overcoming the ethnic imbalances in the financial system. This facilitated the emergence of a new class of Afrikaner financial, industrial and commercial capitalist. Financial capital diversified into commerce and industry, the Afrikaner financial capital became less dependent on agriculture and the cooperation between Afrikaner and the non-Afrikaner elites helped reduce struggles between the two classes (Bond, 2003).

The pace of innovation in the South African financial sector began to accelerate in the late 1950s. Before this period, banking was mainly controlled by English-owned commercial banks. Thereafter, banking began to diversify its operations into insurance, and investment in manufacturing and commercial enterprise (Ndako, 2010). The first merchant bank (Union Acceptances) and the first discount house (Discount House of South Africa) emerged, and the number of Afrikaner-owned banks grew (Jones, 1992).

Also in the 1950s, production strengthened and higher capital intensity in mining, agriculture and the production of middle-class goods all contributed to economic growth. The financial sector also deepened its contribution to growth as demand for more diversified sources of financing increased. These developments allowed the Johannesburg Stock Exchange (JSE) to broaden its base and sound monetary policy became an evident priority (Jones, 1992; Bond, 2003).

Financial sector growth was interrupted in the 1960s by the political uncertainty surrounding the withdrawal of South Africa from the Commonwealth and the implementation of apartheid. Only in the 1980s, at a time of sanctions, inflation, the *debt crisis*, deregulation and increased competition did the financial sector begin to recover. This was as a result of the collapse in the growth of the economy combined with the mobilisation of funds by the financial sector (Jones, 1992).

From 1970s to the 1980s, growth rates fell, the country experienced losses in agriculture, manufacturing, mining and exports declined. The economy moved from a position of low growth to one of no growth. The main causes of such a negative trend were the decline in the price of gold, high and volatile inflation and the excesses in government spending (on armaments manufacturing, the anti-terrorist campaigns in Namibia and the Angolan war of 1975-1978) and the sanctions imposed on the country's government. The subsidising of corrupt and inefficient government practices which went unpunished and high taxation which crippled private enterprise were also at the root of the problem. By 1990, economic imperatives brought a halt to these disruptive policies. The ending of economic growth was further accompanied by the continued rapid growth of the population, which had the effect of converting the very modest rates of real growth into an absolute decline expressed in real terms. The serious decline in savings followed from the decline in per capita disposable incomes. Investment prospects under such a scenario were worrying. Given high inflation, there was little incentive to save and private investment fell. In turn, the relative importance of the government's share of gross domestic fixed investment increased (Jones and Inggs, 1994; 2003).

President De Klerk's speech of 2 February 1990 signalled the beginning of major changes in the South African political and economic arena. Initially, there was a great uncertainty regarding the policies that would be followed by the African National Congress (ANC) once

it came into power. While the integration of South Africa into global markets represented new opportunities for domestic businesses, it also made the economy more vulnerable to external shocks. Real GDP declined from 1990 to 1992, mainly because of the uncertainties surrounding the new government. It improved notably after the 1994 democratic elections. However, growth was substantially lower in the 1990s than in previous decades (even the 1980s). Inflation was high at the beginning of the decade, but declined from 1993. The balance of payments position also improved significantly after the elections. Although inequality remained high, important changes took place: the gap between different racial groups became smaller while the distribution among the Black population became more unequal (Mohr, 2003). Despite expectations that the changes in the political system would result in a reduction in inequality in South Africa, inequality increased from 1994. Moreover, even though the country's financial sector grew substantially; there were no signs of any substantial benefits accruing to the poor.

According to Jones and Inggs (2003), private enterprise was the main driver of growth in the 1980s and 1990s. The financial sector was the largest contributor to growth, with its contribution increasing from 14.4 percent in 1990 to 20.3 percent in 2000. The authors establish that private enterprise was the driving force behind the expansion of the banking sector as new financial institutions were formed in the country.

3.2 Monetary policy

Both fiscal and monetary policy prior to the 1980s were characterised by extensive use of direct controls such as import controls, credit ceilings and the imposition of a maximum interest rates (Jones, 1992). As explained by Addelson (1992), monetary policy in this period had no clearly defined framework. Central bank independence was not regarded as a priority and the execution of monetary policy was the responsibility of both fiscal authorities and the Reserve Bank (Wessels 2004). In the 1960s and 1970s, inflation was high, and the developments in the financial markets were suppressed by the direct controls imposed over banks and other financial institutions. (Gidlow, 1999)

During the 1980s, monetary policy was strongly influenced by monetarism. It emphasised monetary targeting, whereby the level of interest rates and the external value of the currency should be determined by market forces and policies which involved too much intervention on

part of the authorities should be avoided (Jones, 1992). The banks also began to change their mechanisms of controlling money supply, there was a phasing out of the liquid asset requirement on commercial banks and a more indirect channel was used, namely the Bank rate (Hodge, 2001). Although initially the authorities intended to implement Central Bank independence, such intentions never fully materialised, monetary policy remained strongly influenced by political matter and inflation remained high and volatile (Wessels, 2004).

Although great attempts were made to stabilise the interest rate and inflation between the 1970s and the 1980s, monetary policy failed to achieve these objectives. Dr. C.L. Stals became governor of the Reserve Bank after Dr. M. H. de Kock's death in 1989. Monetary policy became tighter, less erratic and took a clear stance against inflation as well as the ending of negative real interest rates. This was also a time when Central Bank independence was accentuated and the developments contributed to containing inflationary expectation in the country (Wessels, 2004).

The 1990s imposed a challenge on the implementation of monetary policy. There were fears that the newly elected ANC government would embark on a populist spending programme to achieve the objectives of the party's Reconstruction and Development Programme (RDP). The fears never materialised and the RDP objectives were constrained by the implementation of the conservative macroeconomic policy framework of GEAR (Growth Employment and Redistribution), announced in 1996. This helped ease the pressure on monetary policy to contain the rates of growth on monetary aggregates (Hodge, 2001).

The 1994 elections came, the political instability dissipated and South Africa became an integrant member of the global economy. Net capital inflows increased, as did the country's foreign exchange reserves. Given the positive response of financial markets, authorities began the systematic removal of exchange controls. The financial rand system was ended in March 1995 (Hodge, 2001).

Schoombee (2003) explains that the reintegration of South Africa into the global financial system and the increased volatility in financial markets in the late 1990s demanded flexibility in short-term interest rates and in the monetary authorities' ability to respond promptly to changes in market conditions. This was the motivation behind the implementation of the repurchase (or repo) rate system in 1998. The result of the adjustments in monetary policy

was that it became more aligned with what was generally the policy stance in industrialised countries. The manner in which monetary control was conducted in South Africa made an important contribution to the substantial decrease in inflation in the 1990s.

During Dr Stals' term the Reserve Bank chose to avoid setting an official inflation target, announcing that the objective was to bring inflation in line with the rates of inflation of the country's major trading partners, between 1 and 5 percent (Schoombee, 2003). In February 2000, Trevor Manuel, the then Minister of Finance, announced the adoption of inflation targeting as monetary policy framework for South Africa. The target was specified in terms of changes in consumer price inflation (CPIX), and it was set for achievement in 2002 as it took 18 to 24 months for the country's interest rates to influence inflation. The specification of a range rather than a specific point was determined as being more appropriate for South Africa, as it would improve the probability of achievement by the Reserve Bank and thus guarantee the credibility of the system. In 2001, the range was specified as being between 3 and 6 percent. Although actual inflation has at times deviated from the targets, the latter have remained unchanged (Rossouw and Padayachee, 2008).

3.3 Stock Market Development – The Johannesburg Stock Exchange

At the centre of the market level of the financial sector is the Johannesburg Stock Exchange. It was founded in 1887, initially to fund the development of mining companies in the wake of the discovery of gold (Akinboade and Makina, 2006).

The main functions of the Johannesburg Stock Exchange (JSE) are threefold: to channel savings into investments, to provide liquidity for investments, and to provide some form of evaluation of securities and of management of companies whose shares are quoted on the Exchange (Jones, 1992).

Before the 1960s, the Exchange was mainly a market for highly volatile mining shares, somewhat removed from the country's leading financial institutions. However, rapid economic growth, and the exchange rate control, drew the attention of business. The stock market had become very profitable, as the return on equity investment was considerably higher than the inflation rate and gave investors the prospect of capital gains as well as

income. Between the 1960s and early 1980s, the substantial rise in dividends and returns provided a strong incentive for investing (Jones, 1992).

From the 1980s, as pressures for the end of the apartheid regime intensified, foreign multinationals faced increasing pressures to withdraw their investments in the country. The rationale for the disinvestment campaigns was that it would cripple the government's ability to sustain the apartheid regime. This panic of capital flight gave a boost to the Exchange and provided bargains for local capitalists. Government legislation as well as disinvestment by large foreign-owned firms worked to reinforce the trend towards capital concentration. (Jones, 1992)

A number of initiatives were introduced in the late 1990s to improve the efficient functioning of the Exchange. In 1995 the JSE was restructured and liberalised; trading was then opened to non-South Africans, allowing brokers to buy and sell stock for their own account (Yartey, 2008). Since then, continuous innovation has allowed trading to become more efficient, more transparent and in line with international standards, increasing investor confidence and raising the profile of the JSE among the international investor community. Some of the measures implemented include the replacement of the 'open cry' system (where deals were conducted on telephones) by the automated trading system; the introduction of the Shares Transactions Totally Electronic (STRATE); the separation of the stock exchange and the bond market; the merger of the JSE with the South African Futures Exchange (SAFEX); the replacement of trading and information with that of the London Stock Exchange (LSE); and the adoption of the free-floating indexing system to improve the comparability of the South African Stocks worldwide (JSE; Ndako, 2010; Yartey, 2008).

3.4 The South African Banking Sector

Ever since the late 1800s, concentration has been a dominant feature of the South African banking environment. In 1910, the sector was controlled by four foreign banking corporations: Standard Bank, the Bank of Africa, the African Banking Corporation and the Netherlands Bank. The Volkskas Group was formed in 1934 and represented the introduction of Afrikaner capital into the banking sector (Verhoef, 2009; Jones, 1992).

In 1942 was the promulgation of the first comprehensive Banks Act. It classified banks institutions according to functions (commercial banks, deposit-taking institutions, people's banks and loan banks) and allowed monetary authorities a greater control over money supply. From then on, amendments to the Act gave the Reserve Bank more influence over the competitive environment in which banks operated. Although these measures did restrict credit concessions (thus curbing increases in money supply), they had the adverse effect of increasing concentration and reducing competition between banks, this way threatening efficiency.

Commercial banks began to introduce measures to protect their dominant position. In the mid-1960s, they entered into an agreement with the smaller banks to collude on and extended maximum/minimum fees, tariffs, rates and commissions charged. This agreement was the Register of Cooperation among commercial banks (Rocco). The agreement guaranteed order and discipline among commercial banks that and reduced risk for smaller participants, it also induced them to implement more advanced equipment and technology, and improve service delivery. However, Rocco also limited competition and the ability of banks to innovate outside the agreement (Verhoef, 2009).

At a time of political unrest, as the international opposition to the apartheid regime was gaining ground, the banking sector was becoming less and less competitive. This was reason for concern, given that the sector was dominated by foreign institutions. Under the recommendation of the Franszen Commission, in 1973 a ceiling of 50 percent foreign ownership was declared. Thereafter, Standard Bank and Barclays were listed on the JSE and the controlling shareholding of these groups was passed to South African hands (Verhoef, 2009).

The 1970s were a time of evident contradictions in the regulatory framework for banks. While the monetary authorities attempted to move away from direct control measures in the sector, they continued to restrict international capital flows from participation in the South African banking sector. Although the banking legislation did follow the international trends towards market-oriented regulation, it diverged from the trend towards openness (Verhoef, 2009).

In the late 1970s, high liquidity and inflation, growing international pressure against apartheid and the depreciation of the South African currency led to substantial changes to the monetary environment. Competition among banks was once again encouraged through the removal of barriers to foreign capital. The measures led to increased competition, put pressure on interest margins and led to rapid product innovation. But the banking sector continued to be highly concentrated, mainly because of the high capital requirements imposed on banks. Foreign banks were still not allowed to conduct business in the country. This restriction was lifted only in 1990 (Verhoef, 2009).

In the 1980s, increased competition motivated computerisation and further diversification of banking services. Concentration remained high. Only in the 1990s did it begin to decrease marginally and a more competitive environment arose (Verhoef, 2009).

The 1990s marked the first decade of the increased competition among the four big banks – First Rand Group, ABSA (Amalgamate Bank of South Africa), Standard Bank Investment Corporation, the Nedcor Group – and new entrants. Nevertheless the role of foreign banks remained limited (Verhoef, 2009).

The participation of South African banks in foreign market increased after 1997, when permission was granted in that year. The ability of domestic banks to extend operations overseas worked to prove their management capabilities, the strength of their capital base and the confidence of both national and foreign clients. Globalisation of bank operations was as much a function of the size and level of experience and expertise of the banks as of the soundness of domestic central bank regulation (Verhoef, 2009).

Between 2001 and 2002, the banking sector in South Africa became more concentrated, this was due to weak economic conditions and tough competition from large sophisticated capital

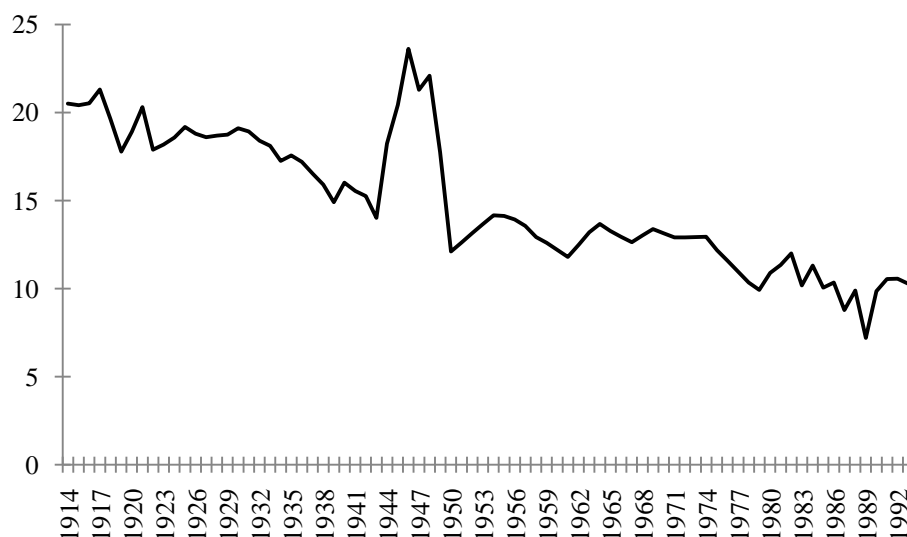


Figure 1: Income shares of the top 1 percent wealth holders. Source: Alvaredo and Atkinson (2010).

rich banks. The banking sector remains more competitive than it was in the 1990s. However, the increase in competition, especially between 1994 and 2001 did not lead to improvements in efficiency (Verhoef, 2009).

The penetration of foreign banks was reconfigured in 2005 when ABSA became a subsidiary of Barclays Bank. The return of Barclays after its withdrawal in 1987 was interpreted as confirmation of the attractiveness of investing in South Africa (Verhoef, 2009).

4. Data and Measurement

We now turn to the empirical analysis of the relationship between the interest rate and inequality, using annual data for South Africa between 1913 and 2008. The inequality data used for the colonial and apartheid periods, and the one used for the post-apartheid democratic regime differ due to data availability.

4.1 Income inequality, 1913-1993

This study uses wealth inequality data, estimated using income shares of the top 1 percent wealth holders covering, with gaps, the period from 1913 to 1993. The annual time series was obtained from Alvaredo and Atkinson (2010) and is represented in Figure 1.

Estimates of top income shares were acquired using income tax returns data. The challenge of using the inequality time series lies in the fact that there are missing observations. The relevance of the period for which we have missing data should not be understated, however, according to the authors; the unavailability of statistics was confirmed by the Treasury of South Africa as well as by the South African Revenue Services¹. Despite the likely underestimation of the level of income inequality at the top, the data is still a valuable source of understanding of the degree of inequality in the country.

For the period 1914 to 1953, estimates for the top income shares are obtained excluding dividend income. For the period 1953 to 1993, dividend income is included. Inspection of the trends suggests very little difference between the two series.

Figure 1 plots the evolution of our inequality indicator for the period 1914 to 1993. The figure shows that there was a general decline in inequality. However, the distribution did not remain steady. Inequality was particularly high during the First and Second World Wars. In 1914, the top 1 percent wealth holders' share of the country's income was around 20 percent, meaning that this group had on average 20 times their proportionate share. The share fell to about 10 percent in the early 1990s.

Capital income inequality at the beginning of the sample was high, with most of the country's wealth concentrated at the top and among the white population. In the early 1900s, the high dependence of the economy on the extraction of diamonds and gold implied that only a selected few benefited from the economy's development and growth. The high levels of concentration, fixed costs and expertise required posed as strong barriers to new entrants. It is not surprising that top incomes responded notably to changes to gold production and prices. The impact of such changes declined around the 1950s and 1960s as the country diversified into manufacturing.

The tensions surrounding the apartheid government and the adoption of sanctions by the international community are translated in the data. Top incomes did not rise between the 1980s and the early 1990s.

¹ We interpolate inequality linearly for missing years.

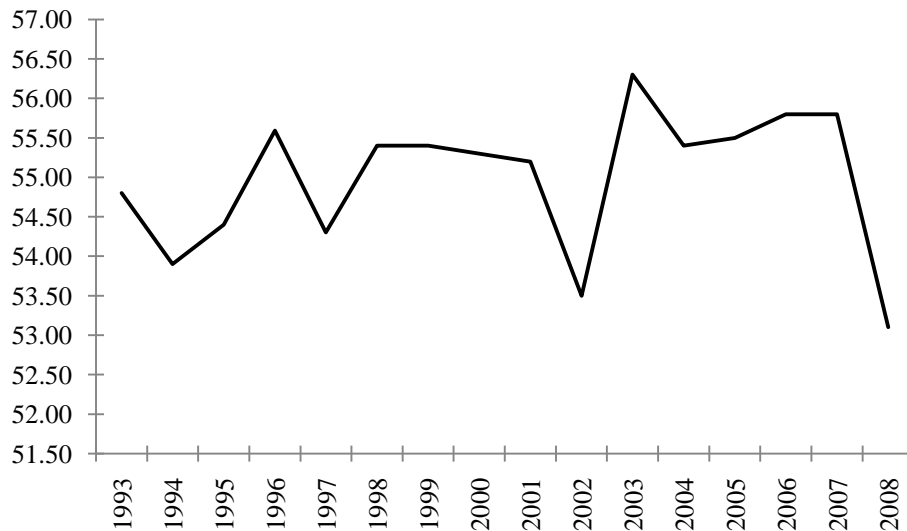


Figure 2: Income shares of the top 1 percent income earners, 1993-2008. Source: World Bank Development Indicators (2010).

4.2 Income Inequality, 1993-2008

In order to obtain results that are more accurate for the post-apartheid period, a second dataset was used. Inequality is defined as the percentage of the country's total income held by the top 10 percent income earners and was obtained using the World Bank Development Indicators (2010), calculated at 2008 constant prices. Figure 2 displays South Africa as a very unequal country, with the highest 10 percent earners holding more than 50 percent of the country's income.

Figure 2 above shows the trends in income inequality. Although the Apartheid regime came to an end in 1994, it left behind substantial challenges for the new democratic government - poverty and inequality being the most pervasive. More than a decade after Apartheid, studies have shown that inequality has either increased or remained stagnant, especially because of the increase in inequality among the black population. Although the country has seen satisfactory levels of economic growth, it has not been pro-poor.

Granting that the democratic government's policies - from Reconstruction and Development Programme (RDP) to the Growth Employment and Redistribution (GEAR), to the Accelerated and Shared Growth Initiative for South Africa (ASGISA) - over the years emphasised the importance of job creation and pro-poor economic growth, little progress has

been made in these fields. Most of the employment created in the country has been in the skilled labour sector, while unskilled labour demand has either fallen or remained stagnant. The contribution of investment to these goals has also been disappointing (Bhorat, Van der Westhuizen and Jacobs, 2009; Fedderke, 2010; Hoogeveen and Özler, 2005).

Moreover, as explained by Bhorat, Van der Westhuizen and Jacobs (2009), capital income inequality in South Africa is high. However, because capital income is a very small contributor to total income in South Africa, this source of inequality has not been a major topic of research and studies have focused rather on wage inequality.

When exposing the argument that growth has not been pro-poor in South Africa, consensus exists that the growth trajectory of the country has been mainly beneficial to the formal economy, characterised by high concentration and high barriers to entry. Additionally, the growing sectors in the country are mostly capital intensive and/or demanding of skilled labour. In general, the informal sector has not been able to take advantage of the country's economic growth. Some of the identified entry barriers to the formal economy have been the lack of collateral assets by poor agents, which restricts access to financial intermediation, low skills and concentration of the formal economy in urban areas when the poor are mostly located in rural areas.

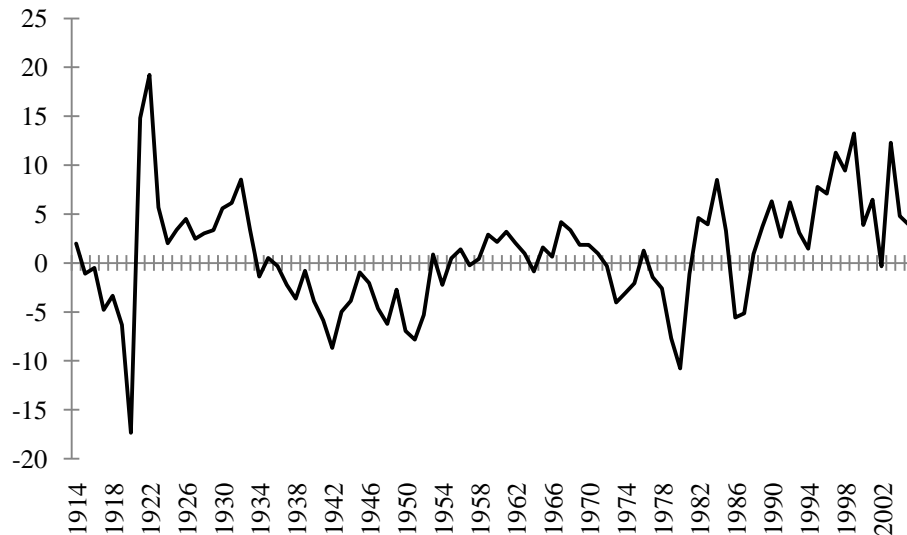


Figure 3: Real interest rate, 1913-2008. Source: Firer and McLeod (1999) and Firer and Staunton (2002).

4.3 Interest rates, 1913-2008

In order to analyse the hypothesis put forth by Piketty (1997), Aghion and Bolton (1997), and Matsuyama (2000), we will firstly look at the patterns of interest rates between 1900 and 2008. Thereafter we will attempt to establish whether higher inequality increases the equilibrium risk-free rate or whether it decreases it.

The real interest rate r_t is computed using the Fisher equation

$$(1 + r_t) = (1 + i_t) / (1 + \Pi_t^e)$$

where i_t denotes the nominal risk-free rate and Π_t the expected inflation rate. Assuming that individuals are perfectly rational, the expected and the actual inflation rate will be equal ($\Pi_t^e = \Pi_t$). The interest rate data and inflation data are obtained from Firer and McLeod (1999) and Firer and Staunton (2002). The Treasury bill (T-bill) returns (measured based on Negotiable Certificate of Deposits and T-bills data) are used as a proxy nominal risk-free interest rate and inflation is measured using the Consumer Price Index (CPI).

The time series graph in Figure 3 shows that during World War 1 and 2 and for the period between 1970 and 1980s, there was a substantial decline in the interest rate. In 1920 interest

Table 1: Correlations between Inequality and Interest Rates

Period	1923-1993	1923-1947	1948-1993	1994-2008
Correlation: Inequality and Interest Rate	0.0150	0.22787	-0.2148	0.3546

Source: Alvaredo and Atkinson (2010), World Bank Development Indicators (2010) Firer and McLeod (1999) and Firer and Staunton (2002).

rates reached a record low of -17.3 percent, then dipped again, reaching -8.7 percent in 1942 and in 1980 the rates were as low as -10.8 percent.²

4.4 Interest rates and inequality

As shown in Table 1, there is only a weak correlation between inequality and the interest rates between 1923 and 1993 – when colonialism and apartheid are considered simultaneously; the data shows that the financial system contributed very little to changes in inequality. The result could be attributed to the extensive macroeconomic and policy changes that occurred from one period to the next which introduce a great amount of variability in the model, masking important underlying trends. On one hand, during the colonial years capital ownership was concentrated among the English population, while the National Party focused on overcoming the ethnic imbalances in the financial system by uplifting the position of the Afrikaner population. The National Party was responsible for extensive credit concessions once it came into power, allowing farmers to invest in the financial sector. The changes in monetary policy, as documented in Section 3 also had an influence on interest rates. It is reasonable to expect that the changes from one period to the next could disguise important trends in the data. Thus, taking the South African political context into account, we divide the sample into three periods: colonialism (1923-1947), apartheid (1948-1993) and democracy (1994-2008).

In a similar analysis Brückner, Gerling and Grüner (2010) use a VECM to establish whether there is a positive relationship between the real interest rate and income inequality as

² Because the changes during the First World War contaminate the results to a great extent, we will exclude the period 1913-1922 from our analysis.

hypothesised by Piketty (1997). When applying the Augmented Dickey-Fuller (ADF) test to the South African data to investigate the stationarity of our series we find that the real interest rate data is stationary³. Hence, there is no cointegration relationship between the interest rate and inequality, that is, there is no long-run association between the variables. This being the case, we use a simple correlation analysis to draw our conclusions.

While for the apartheid years inequality and the interest rate display a negative relationship, we see inequality increasing with interest rate for both the colonial period and after the implementation of democracy. In the next section we will attempt to understand the within period correlations over the various political regimes in the context of the credit-rationing models developed by Piketty (1997), Aghion and Bolton (1997) and Matsuyama (2000).

5. Theoretical Understanding of the Relationship Between Inequality and Financial and Credit Markets

To further explore the relationship between inequality, credit rationing and financial development we will draw on the within-period correlation results obtained in Table 1 as well as the theoretical models of Piketty (1997), Aghion and Bolton (1997) and Matsuyama (2000). We will complement this analysis by drawing on the historical background of the South African economy and financial sector development. The goal is to use the existing data and literature to establish a link between the macro models of financial development and the microeconomic models of credit rationing to the evolution of inequality in South African.

5.1 Inequality and interest rate, 1923-1948

Between 1923 and 1947, the South African data appears to give some evidence relating to the theoretical predictions of Piketty (1997), who predicts that inequality should be increasing with interest rates. Moreover, the evidence also supplements the findings of Aghion and Bolton (1997), whereby the benefits of capital accumulation should trickle down to the poor and inequality should fall for high enough levels of accumulation by the rich.

³ Using the ADF test, the t-statistic on the real interest rate (1923-2008) is -3.913 with critical values -3.531 (1%); -2.902 (5%); -2.586 (10%). Hence we can reject the hypothesis of a unit root.

Piketty (1997) and Aghion and Bolton (1997) build models in which the entrepreneurs incur a fixed cost when investing in a profitable venture with diminishing returns. What this implies is that, beyond a certain point, investors will have exhausted all available profitable opportunities and will lend to the poor. Thus, in their formulations the poor are net borrowers.

In the framework outlined by Piketty (1997) inequality can persist even in the long run. Higher interest rates are associated with higher steady state fraction of credit constrained individuals and lower long-run capital accumulation. This happens because credit constraints are so tight that it takes a long time for credit-constrained individuals to rebuild their capital. In a scenario where there is no credit rationing, borrowers do not shirk and supply high effort. Equilibrium interest rate and allocation of capital are independent of initial wealth. Therefore, optimum level of investment is determined where the interest rate and the marginal product of capital are equal. In this model, the rich lend to the poor. With no credit rationing all dynasties converge to the average wealth level, inequality uncorrelated with the interest rate and there is no poverty trap.

Introducing credit rationing to the model, changes the conclusions. Assume effort supply is not observable and it is costly to monitor borrowers, then the interest rate will be set high enough to induce high effort on the part of borrowers and to take into consideration the risk of the project failing, in which case no repayment is made to the lender. The higher the initial investment, the higher the repayable amount and the lower the incentive to exert effort. Lenders then set the interest rates high enough to induce high effort.

In this scenario, credit rationing will occur when interest rates are high. With low interest rates credit rationing disappears because the net returns become sufficiently high to give proper incentives to agents with no collateral. Multiple steady states could then arise in the long-run. If the interest rate is sufficiently low so that no credit constraint appears, then inequality decreases since credit is better allocated. When long-run steady interest rates are high, both upward and downward mobility are less likely. A high initial wealth requirement implies that credit-constrained individuals as net borrowers do not accumulate enough wealth. The wealthy, on the other hand, have high interest rate incomes even if their investment project fails. Therefore, high interest rates are associated with high inequality.

Aghion and Bolton (1997) provides an understanding as to the mechanisms that permit the evolution of inequality to a unique steady state. Growth trickles down to the poor because given high interest rates the rich continue to invest, while the poor prefer to become lenders and inequality increases. As the rich accumulate more wealth, the pool of profitable opportunities is exhausted, additional funds become available for the poor to invest and lending terms are shifted in favour of borrowers. The middle-class agents are able to catch up with the rich and the poor are also able to borrow and invest in their own individual projects.

At least theoretically, the data seems to fit well with the models proposed by Piketty (1997) and Aghion and Bolton (1997). During the 1920s and 1930s the more profitable investment opportunities were associated with gold mining. Those investors able to enter the sector made large profits; this was the mineral on which the world economy depended. Profits were determined by supply, those who adopted best practices and the most advanced technology, were more efficient and earned greater returns. However, only a selected few were able to enter the mining sector. The substantial fixed costs and expertise required in extracting the mineral and the uncertainties of the gold-pegged exchange rate system (which introduced a serious element of volatility to the sector) and the shocks in foreign demand (especially for the domestic agricultural products) served as a deterrent to investment for the middle-class agents such as the Afrikaner landowners. The constraints were even more severe to the black population for whom racial and other restrictions, such as land ownership, implied that they owned no collateral assets and therefore could not enter the credit market and invest.

One would then expect that, during the colonial period, the entrepreneurial power to be concentrated among the English population, while the Afrikaner middle-class and the black population lagged behind. Taking a closer look at Figure 4, we see no major changes on top income inequality between the 1920s and early 1930s.

History reminds us that in 1932 the country abandoned the gold standard; the benefits to the economy were almost immediately felt. In 1933 banks began to restructure interest rates following the exchange rate shocks and the changes in monetary policy of the late 1920s. As in the framework discussed above, this gave the poor, as net borrowers, the chance to invest and benefit from the lower interest rates; contributing to some extent to the reduction of inequality.



Figure 4: Inequality and interest rate, 1923-1948. Source: Alvaredo and Atkinson (2010), Firer and McLeod (1999) and Firer and Staunton (2002).

Moreover, as the mining sector's earnings grew, the economy diversified into other relatively more accessible opportunities, such as manufacturing. State intervention was also a major contributor to the diversification of the economy, as shown by Fedderke and Simkins (2009). The state intervened both indirectly, by implementing import tariffs to protect local production as well as directly by implementing governmental bodies to help capitalise local businesses which faced substantial barriers in raising capital themselves. Both diversification and state intervention could have contributed to the downward trend in wealth inequality we see from the 1930s onwards.

Although there was a trend decline in inequality, as is evident in Figure 4, the literature emphasises two probable deterrents to further reductions on the income gap, one being the racial divide and the other, the level of progress in the financial market. Racial segregation prevented the black population from sharing the benefits of economic prosperity, thus captured by the English capitalists and Afrikaner middle-class. Changes to labour policy and attempts to increase human capital benefited the white population, leaving the black population to become labourers or self-employed in low return activities (Fedderke and Simkins, 2009). The clubby financial sector, developed to serve the interest of big mining houses, English elites and the Afrikaner landowners worked less than efficiently in allocating savings to investors. Also in the 1920s the local Reserve Bank was created and placed under the control and ownership of bankers. This strengthened the power of mining houses and

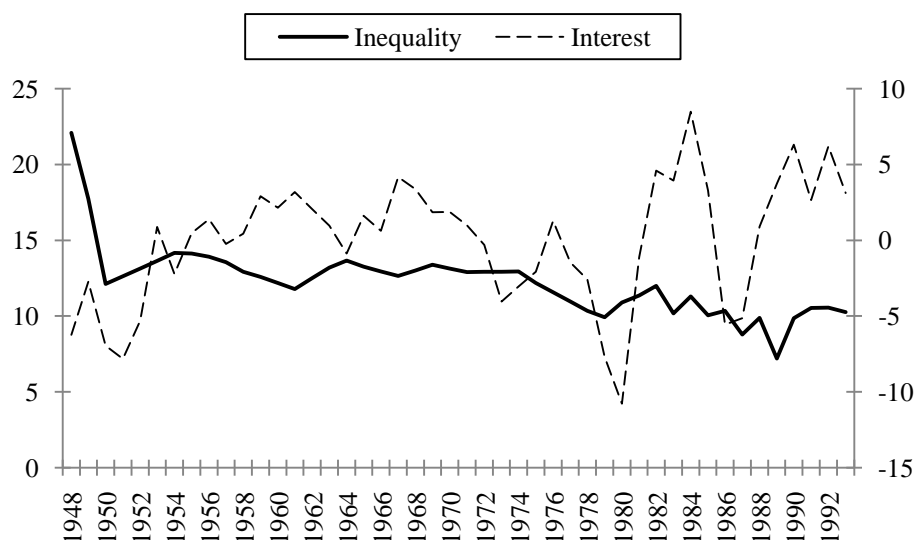


Figure 5: Inequality and interest rate, 1948-1993. Sources: Alvaredo and Atkinson (2010), Firer and McLeod (1999) and Firer and Staunton (2002).

English elites, while undermining income equality in the country. Thus, although low interest rates would benefit those at the bottom, or at least the middle-class, one would not expect the gains to be very significant.

Despite the progress made two decades earlier, in the 1940s money supply and interest rates began to increase, as did inequality. The gold mining boom and the expansion of the Johannesburg Stock Exchange, controlled mainly by the English elite could be at the centre of these developments.

5.2. Inequality and interest rate, 1948-1993

The negative association between inequality and the interest rate between 1948 and 1993 is evidenced in Table 1 and (to a lesser extent) in Figure 5. We make use of the general equilibrium framework developed by Matsuyama (2000) to examine this relationship. The author presents a scenario in which inequality decreases with interest rates. Investment opportunities require an initial capital investment and face increasing returns. Therefore, it is optimal to borrow and invest as much as possible. Given that the poor lack collateral assets, the rich end up as net borrowers and the poor as net lenders (Pellicer *et al*, 2011). In the model, there are three types of agents, the rich acting as entrepreneurs, and borrowing to invest in their projects; the middle-class who need to borrow to complement their initial

wealth and invest and the poor as lenders. Inequality can persist in the long-run when the poor, acting as lenders face a lower interest rate than the rich's return to investment. Another possible steady state occurs when the income gap disappears as the rich increased demand for credit pushes up the interest rates, allowing the poor to catch up.

In the model borrowing is limited; individuals wishing to invest at a scale greater than their inherited wealth will have to enter the competitive credit market and borrow at an interest rate determined to equate the supply and demand for loanable funds. Borrowing is limited because it is costly for lenders to monitor borrowers' effort. As the scale of investment increases, the borrower's end-of-period wealth (his/her private return) declines. Moreover, since investors are allowed to borrow only a limited amount, as the loan amount increases so does the interest rate, to keep the borrowing limit unchanged. Therefore, it is the borrowing constraint that determines investment demand, which falls with the interest rate.

The higher interest rate is, in this framework, favourable to the poor lender and less beneficial to the rich. At a higher interest rate the poor accumulate more wealth, while the rich's accumulation is slower. The high interest rate also increases the credit rationing threshold. Consequently, while the high interest rate is good for the poor, it is not so for the middle-class, which could borrow and become entrepreneurs at a lower interest rate.

Wealth trickles down to the poor, allowing them to escape poverty, as the rich accumulate more wealth and push the interest rate up. Hence, the rich accumulate wealth because of the poor. A large pool of poor lenders is able to meet the large demands for credit of the few rich, the latter facing a higher return in their projects than the borrowing rate. So, the poor are never able to accumulate enough wealth to become entrepreneurs as the rich do not accumulate enough wealth to pool the poor out of poverty. In this case, the long-run steady state will be one with endogenous inequality.

An alternative scenario would occur when the interest rate is high enough that the rich actually manage to accumulate enough wealth to allow the poor to escape poverty and the economy ends up in a steady state with lower inequality

The predictions of Aghion and Bolton (1997) would not be applicable in this case since their model assumes that the decision to borrow and lend (identity of agents) depends not only on

their initial wealth endowment, but also on the interest rate and as the interest rate falls there is a greater preference for borrowing. Although credit is rationed at this low interest rate, those able to invest will face an increasingly higher private return, especially those borrowing large amounts. Eventually, as the investment opportunities become scarcer, a larger pool of borrowers will be able to benefit from the lower interest rate. A lower interest rate will be associated with a lower level of inequality in this model, contrary to the evidence and the predictions of Matsuyama (2000).

Piketty (1997) on the other hand, explains that if we assume that the poor are net lenders, then a higher interest rate would imply that the interest rate effect dominates the credit-rationing effect, allowing the poor to accumulate wealth and escape poverty and the middle-class to become entrepreneurs.

The models proposed by Matsuyama (2000) and Piketty (1997) (assuming the poor as net lenders) would be applicable to the South African evidence for Apartheid era; whereby declining interest rates would benefit the rich, allowing them to increase their investments (especially given the high capital requirements of mining and manufacturing at the time), and their private returns. The lower interest rates would not favour lenders, i.e. the poor. As the wealth of those at the top increased, we would expect the poor not to benefit as much, increasing the income gap.

The 1950s were a period of significant growth as the economy diversified into commerce and industry. It is reasonable to expect that the English capitalists had enough opportunities available to them so that they would indeed borrow to invest. Evidence can be found that the apartheid government's increased credit extensions to the Afrikaner landowners gave way to the creation of a new Afrikaner elite more engaged in the financial market than before (Bond, 2003). As per Matsuyama (2000) a larger pool of "rich" borrowers implies higher interest rates, which then benefit the poor as lenders reducing inequality. The new Afrikaner government also worked to institutionalise existing racial practices. So, while the income gap between the English and the Afrikaner population declined, the black South Africans lagged behind. The financial development literature borrowing the political economy arguments, makes the valid proposition that although financial development helps reduce inequality it can have a disproportionately negative impact on the poor if it different political structures lobby for redistribution policies that benefit their own ethnic group, in this case the Afrikaner

population (Clarke, Xu and Zou, 2003). Given the fact that we are using the top income shares as our definition of inequality, we might not be able to capture accurately certain changes at the bottom, meaning that although the middle-class benefited and concentration of income at the top declined, the data could be masking changes in income among the poor.

The financial sector suffered major alterations after the 1950s as banks began to innovate and diversify their activities and the sector in general took advantage of technological innovation. Increased financial activity and intermediation allowed the Afrikaner middle-class investors to accumulate more capital and catch up with the wealthy English capitalists.

In the 1960s the withdrawal of South Africa from the Commonwealth, the political unrest and high inflation had dire consequences on the country's economy. The changes to banking legislation and the imposition of capital controls added to investors' uncertainty, creating incentives for capital flight. Mergers and acquisitions on one side and capital flight on the other further reduced competition and efficiency in the financial sector. As pointed out by the financial development literature, the negative developments in financial markets affect its ability to channel savings to investors, exacerbating credit constraints on the poor, thereby increasing the income gap. History describes the 1960s as being a period of declines in investment, accompanied by a declining (and volatile) interest rate and increasing inequality.

Financial markets began to recover in the 1980s, after the implementation of some of the recommendations of the De Cock Commission of enquiry into the monetary system and monetary policy. The removal of barriers on capital markets and the adoption of a clearly defined monetary policy stance worked to increase capital flows, reduce inflation and incentivise competition and diversification of banking operations which then put pressure on interest rates. Top income inequality continued to decrease and a hypothesis could be made that it was either due to the positive effects it had on lenders – the poor, as specified by Matsuyama (2000) – or a reflection of losses suffered by investors during that period. The financial development literature also provides us with evidence that increased competition in financial markets, banks included, leads to innovation in the sector and better allocation of financial instruments.

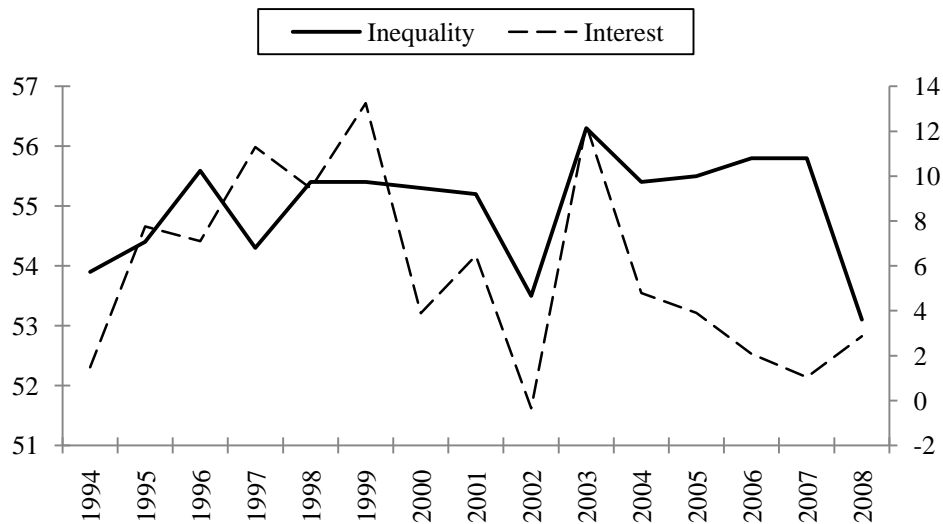


Figure 6: Inequality and interest rate, 1994-2008. Source: World Bank Development Indicators (2010) Firer and McLeod (1999) and Firer and Staunton (2002).

5.3 Inequality and interest rates, 1994-2008

The upward trends in both interest rates and inequality after 1994 can be contextualised in terms of the framework developed by Piketty (1997) in which the scarcity of rich individuals in an economy implies that there is an excess demand for credit. The upward pressure of interest rates limits borrowing and investing for the poor and widens the income gap. Thus, in a society such as South Africa where wealth is concentrated among a small minority, we would expect such scarcity to be associated with high interest rates and high inequality as shown by the positive within period correlation in Table 1.

Figure 6 above, displays a picture of South Africa as a very unequal economy with the highest 10 percent of wealth holders holding more than 50 percent of the country's income. This is a somewhat unexpected finding, given that government's policy post-apartheid took a clear stance to reduce poverty and income inequality. Empirical evidence shows that despite these efforts the development trajectory of the country has not been pro-poor, with the faster-growing sectors of the sector demanding skilled labour, and capital markets remaining highly concentrated, demanding of skills and collateral assets that the poor lack.

In theory, the greater focus of monetary policy in stabilising interest rates and inflation, the development of a more dynamic financial sector from lending institutions, to the Stock

Market, the liberalisation of these markets, and the restructuring and globalisation of domestic banking operation should have resulted in a decline in inequality as investment opportunities became more diversified and competition among lenders drove down interest rates. However, once Dr. M. H. De Kock became governor of the Reserve Bank in 1989, his commitment to monetary stability translated into rather higher interest rates, which remained high for the majority of the period ending in 2008. Small business owners have identified these high interest rates as a relevant restriction to entrepreneurship.

The financial sector remains very concentrated and with substantial entry barriers. . The fixed costs associated with joining financial intermediaries have been identified as a deterrent to investment. These costs imply that the wealthy are more likely to access financial markets and will therefore accumulate more capital (or at least at a faster rate) than the poor, increasing the income gap. As postulated Demirgüç-Kunt and Levine (2009) although a well-developed financial system in theory should reduce income gap between the rich and the poor, by increasing the availability of financial services, it can also happen that financial development exacerbates the gap by increasing availability of such services to those who already have access to financial intermediaries, usually the wealthy. Therefore, the benefits of improvements in the financial system could fall disproportionately on the rich, widening the inequality gap and propagating the differences in economic opportunity across income groups.

More recent studies have shown that many of the country's poor have remained unbanked, despite extensive institutional measures implemented to remedy this outcome. Both the cost and the concentration of financial institutions in urban areas have been identified as the causes of such exclusion (Pellicer *et al.*, 2011). Furthermore, a large proportion of South Africa's poor population lack documented credit histories; this makes their insertion into the formal economy even harder. The lack of experience and adequate managerial skills to ensure the viability of the enterprise are also an obstacle (Bamu, Schuckman and Godfrey, 2007).

On the supply side, the high costs of servicing loans to small businesses relative to the size of the loan imply that lenders are less likely to extend credit to such businesses. In general, there is a fixed administrative cost associated with servicing loans, regardless of their size. Thus, the unit administrative costs are much higher for smaller loans than for larger loans, making

smaller loans less profitable. This creates a gap in credit provision for smaller loans (Bamu, Schuckman and Godfrey, 2007).

Given all the above-mentioned factors, it comes as no surprise that, as hypothesised by Piketty (1997), the high fixed costs associated with profitable investment opportunities and high interest rates have been accompanied by high inequality. Imperfect information has kept lenders away from the poorer borrowers, trusting only the rich. The poor are thus credit-rationed. Also, the rich constitute a small minority in the country, their being the net lenders, pushes up the interest rate and constricts capital accumulation, hurting the trickle-down process to the poor, who never accumulate enough capital to escape poverty. The data provides no evidence of a unique steady state with incomes converging as specified by Aghion and Bolton (1997).

6. Concluding Remarks

Economic theory based on the relationship between financial markets and inequality in the presence of imperfect information provides ambiguous predictions as to the impact of interest rates and inequality. If markets are complete, then investment will be determined by the expected return and the cost of capital. People with the same returns on their investment will be able to invest the same amount irrespective of their initial wealth. However, imperfections in the credit market mean that lenders cannot observe borrowers' efforts and availability of collateral assets will be a significant determinant of lending decisions. The rich have the option of financing their own investments, while the poor or middle-class agents will need to borrow to complement their own investment. However, because the poor lack collateral assets their borrowing will be limited.

Two possible situations may arise as a result of imperfect information in credit markets: one in which the poor are net borrowers and higher interest rates prevent them from accumulating enough wealth to escape the credit-rationing interval as specified by Piketty (1997). In this case, inequality may persist even in the long-run. Aghion and Bolton (1997) show the mechanism through which wealth can trickle down to the poor. Capital accumulation by the rich makes more funds available in the economy, driving down the interest rate, allowing the poor to invest and escape poverty. Another scenario arises when the poor are net lenders, in

which case, increasing demand for investment by the rich pushes up the interest rate thus benefiting the poor as lenders as postulated by Matsuyama (2000).

We analyse these two possible outcomes in the context of the South African economy over three distinct periods: colonialism, apartheid and democracy. The conclusions are drawn based on the correlations between interest rates and inequality. For the colonial and apartheid years (1923-1993) we use a measure inequality recently published by Alvaredo and Atkinson (2010) calculated as the income shares of the top 1 percent wealth holders, estimated using income tax data. Given the data limitations, for the years following the implementation of the democratic regime (1994-2008), we use the World Bank Development Indicators to determine the top 10 percent income shares. The interest rate data is obtained from Firer and McLeod (1999) and Firer and Staunton (2002) updated to 2008. The evidence shows that credit markets were not the sole determinants of inequality for any of the periods; however, they did play a role in widening or reducing inequality, depending on the epoch analysed.

During the colonial period, the economy was heavily reliant on gold and diamond mining, London Banks had control over the financial market and the owners of capital were mostly the English elite. We find, for this period, a positive relationship between interest rates and inequality. We attempt to understand the trend in the context of Aghion and Bolton (1997) and Piketty (1997) and conclude that high interest rates could have worked as a deterrent to investment. However, the accumulation of wealth by the rich did to some extent trickle down to the middle-class insofar as it gave way to the diversification of economic activity into other less capital intensive activities such as manufacturing and commercial agriculture.

For the duration of the apartheid regime, the data shows a negative association between interest rates and inequality. While, mining continued to dominate the country's national accounts, the financial market gained an increased role as did government spending. We analyse the evidence in accordance to the framework provided by Matsuyama (2000), whereby increasing returns to investment implies that the poor are net lenders, higher interest rates thus benefit the poor and not the rich. The historical analysis shows that after 1948, accumulation of wealth by the English elites implied increased demand for funds pushing interest rates up and benefiting those at the bottom. As the financial market developed, the Afrikaner landowners were able to participate more in the economy. However, one cannot ignore the fact that government policy at the time played a significant role in reducing the income gap at least among the white population.

Following the implementation of the multi-racial democracy in 1994, the relationship reverted back to the colonial period estimates whereby higher interest rates were associated with higher inequality. Many economists have been puzzled by this result to the extent that the substantial changes to monetary policy and the institutional environment, the technological advances experienced in the financial markets and the ending of the racial divide were all expected to contribute to the reduction of inequality. In such an environment and in particular with more efficient financial markets, higher interest rates should have an effect in lowering inequality as capital accumulation by the rich and growth trickled-down to the poor; however this has not been the case. In trying to understand this outcome, one needs to account for the fact that many of the country's poor remain unbanked and live in rural areas while financial markets are concentrated in urban areas. Moreover, capital income is highly concentrated at the top, meaning that the rich are the most likely to benefit from any improvements to financial intermediation.

Although this analysis reveals interesting trends it is not without limitations. Firstly, the theoretical models employed are not able to capture the full complexity of the South African economy. Secondly, given the data limitations, one can only attempt to understand these trends; more in depth analysis would require more detailed data, especially for the colonial and apartheid periods. Also, our measure of income inequality, although it captures the changes in inequality at the top, it does not necessarily capture the changes at the bottom. Lastly, there is very little research examining the particular mechanism through which financial development impacts inequality, part of the problem again being data availability and this paper provides only a theoretical overview of the role of interest rates.

Our results point to the important role credit markets and financial intermediation could have in reducing income inequality. Given the size of the second economy and the contribution it has in absorbing the unskilled and unemployed labour in the country, credit constraints on the poor could well translate into constraints to small business development in the formal economy. In this regard, government policies that give incentives to the private sector to evaluate and provide credit to small business owners, policies that augment entrepreneurial activity by increasing secondary as well as high school enrolment, especially among the black population, could in the long run contribute to the reduction of inequality. The role of policy also extends to the development and implementation of measures to boost private sector participation in programmes geared towards small business development.

Moreover, the Reserve Bank's focus on inflation targeting has translated into what some economists, entrepreneurs and labour organisations identify as a high interest rate, which deters small business development in the country. Establishing a balance between the goal of containing inflationary expectation on one hand and ensuring an interest rate that does not hurt borrowers on the other is an ongoing challenge for monetary authorities. However, further research has to be done that will clarify the exact path for government policy in terms of counteracting the impacts of high interest rates on small scale investors and ensuring pro-poor financial intermediation.

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