

# INCLUSIVE FINANCE FOR SMEs IN SOUTH AFRICA AND ITS IMPACT ON GROWTH AND INEQUALITY

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## Abstract

This paper analyses the impact of inclusive financial policies for SMEs on macro-economic variables like GDP, TFP and inequality. Using a micro-founded general equilibrium model and firm-level data from the World Bank Enterprise Surveys, we focus on three dimensions of financial inclusion: access, depth and intermediation efficiency to calibrate the model to South Africa. We find that relaxing participation and collateral constraints increases GDP by up to 3 percentage points and TFP by up to 2 percent. Inequality declines by 1 – 3 percentage points, driven by both the extensive and intensive margins. In a regime of initially low intermediation costs, this policy stance might lead to an increase in monitoring costs due an influx of high risk talented but constrained entrepreneurs. Conversely, constrained entrepreneurs might refrain from borrowing and maintain a low leverage ratio to void being monitored, if intermediation costs are initially high. Overall welfare gains are attributed to the proportion of talented but constrained entrepreneurs and the degree of awareness of credit opportunities.

JEL Classification: E13; L26; O12; O16; O55

Key words: Financial Inclusion; SMEs; Growth; Inequality; South Africa

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## 1. Introduction

Lack of sufficient finance is often cited as a major constraint for the growth of small and medium enterprises (SMEs) especially in developing countries. Yet these businesses play a pivotal role in the social and economic development of a country (Beck and Cull, 2014; Aterido et al., 2009; Beck, Demirgüç-Kunt and Levine, 2007). For instance, more than 50% of global employment happens in businesses that employ less than 100 people (Ayyagari et al., 2011). With as many as 95% of global businesses falling in the category of SMEs (Beck and Cull, 2014), their operations and growth warrant attention. Indeed, the global financial inclusion drive aims at ensuring that constraints related to access to finance for individuals and businesses are addressed. Despite its multidimensional nature, financial inclusion often relates to the availability of affordable finance to those who wish to use it through bank accounts, credit extension and sufficient intermediation (Chakravarty and Pal, 2013; Sarma, 2015). According to the Global Financial Inclusion Report, great strides have been made regarding access to finance at individual level (World Bank, 2013a). However, firm-level studies show that access to finance has not spread especially to small businesses as shown in Figure 1. For instance, in Columbia, only 40% of small firms have access to a bank loan compared to 72% of the large firms (Karpowicz, 2014). Similarly, private sector lending in Zambia is as low as 12% of gross domestic product (GDP), yet the country boasts a large number of formal financial institutions (Jang, Banicio and Chiyaba, 2014). Research findings show that financial inclusion exhibits both participation barriers as well as financial frictions which are also country-specific (see Demirgüç-Kunt et al., 2015; Dabla-Norris et al., 2015). Subsequently policy interventions regarding financial inclusion are likely to vary from country to country.

This paper investigates the effect of relaxing financial constraints for South Africa's SMEs on the country's growth and inequality. The financial constraints considered relate to financial access (proxied by access to a line of credit), financial depth (determined by size of collateral constraints) and intermediation efficiency which is determined by the interest rate spread and the size of the number of non-performing loans as a percentage of total loans. We use a micro-founded general equilibrium and overlapping generations model from Dabla-Norris et al. (2015) to investigate how relaxing these three dimensions of financial inclusion affects growth and income inequality in the country. In this model, financial inclusion is assumed to affect growth and inequality by first, channelling more financial resources to entrepreneurs, which increases their output. Second, by ensuring efficient allocation of funds which increases total factor productivity and finally, by ensuring efficient contracting which minimises wastage of financial resources.

Results show that there are both positive and negative outcomes to implementing financial inclusion policies and as such, trade-offs have to be made. Relaxing participation or collateral constraints for instance, can boost GDP by over 3 percentage points and TFP by up to 2 percent. Inequality declines by between 1 and 3 percentage points. But greatly relaxing these constraints is likely to be counterproductive if financiers have to increase monitoring of NPLs due to the high number of high risk entrepreneurs attracted to the credit regime. This would lead to an increase in intermediation costs. On the other hand, if intermediation costs are already high, constrained entrepreneurs will not demand credit. They will instead maintain a low leverage ratio to avoid being monitored. Moreover, fewer talented but constrained entrepreneurs appear to take advantage of the favourable conditions in the credit regime, which could be due to lack of awareness of credit opportunities. Thus, financial inclusion policies would benefit from increasing awareness of credit facilities to minimise the negative effects of information asymmetry. Increasing intermediation efficiency, while it increases GDP, reduces TFP by 3.5% and increases inequality by 1 percentage point.

This is because intermediation efficiency benefits incumbent entrepreneurs who are already wealthy, thus driving relative incomes further apart.

The rest of the paper is organised as follows: Section 2 provides an overview of financial inclusion in South Africa. This is followed by the theoretical underpinnings in Section 3 and related literature in reviewed in Section 4. The empirical strategy is discussed in Section 5 and the results discussed in Section 6. Section 7 concludes.

## **2. Overview of financial inclusion, growth and inequality in South Africa**

### **2.1. Access**

Access refers to removing barriers to accessing financial services. Barriers include costs and documents for opening and operating bank accounts, or for obtaining credit. Access to financial services in South Africa is high both in the Southern Africa Development Cooperation (SADC) region and on the continent, as shown in Figure 1. This follows the Broad Based Black Economic Empowerment (B-BBEE) Act of 2003, part of the Reconstruction and Development Programme (RDP) put in place to transform the post-apartheid economy from one that served the wealthy and excluded the poor, to one that harnessed the full potential of the country's people and resources (African National Congress, 1994). As part of the RDP, the Financial Sector Charter of 2003 was developed, committing its participants (who include banks and insurance companies) to 'actively promote a transformed, vibrant, and globally competitive financial sector that reflected the demographics of South Africa, and to contribute to the establishment of an equitable society. This was to be achieved by effectively providing accessible financial services to black people and by directing investment into targeted sectors of the economy'.<sup>1</sup> As a result, affordable financial services and products were extended to the previously excluded notably, the low cost transactional/Mzansi account.<sup>2</sup> This boosted inclusion between 2003 (49%) and 2009 (62%) by six million bank account holders, many of whom were first time users (see FinScope Surveys SA).

The National Small Business Act of South Africa (NSBSA) was also established in 1996 (later amended in 2003) to offer the financial and regulatory guidelines for the business sector. These factors were crucial as reported in the following extract:

*"South Africa can benefit from removal of obstacles to small business lending. These include the Usury Act, opening of legislation to enable a wide variety of financial institutions, and increasing transparency of bank reporting on their lending to SMMEs. An assessment of the legal requirements for opening up a window in the JSE for penny stocks may be useful. Work on collateral legislation and related registry services will be important and should proceed soon. Finally, laws governing debt recovery and administration of justice can be made simpler. (Wilkinson, 2000).*

To address constraints related to access to credit, the Usury Act of 1968 was repealed. This Act had the effect of financial exclusion by capping interest rates for borrowers of small amounts.<sup>3</sup> The NSBSA defined SMEs in the context of the country, to guide financiers who include banks and non-bank lenders. This categorisation is provided in Appendix A1. Banks created business finance units to specifically attend to the financial needs of businesses for instance, the ABSA small enterprise unit in one of the largest banks of the country. But by 2010, up to 90% of micro and small enterprises did not

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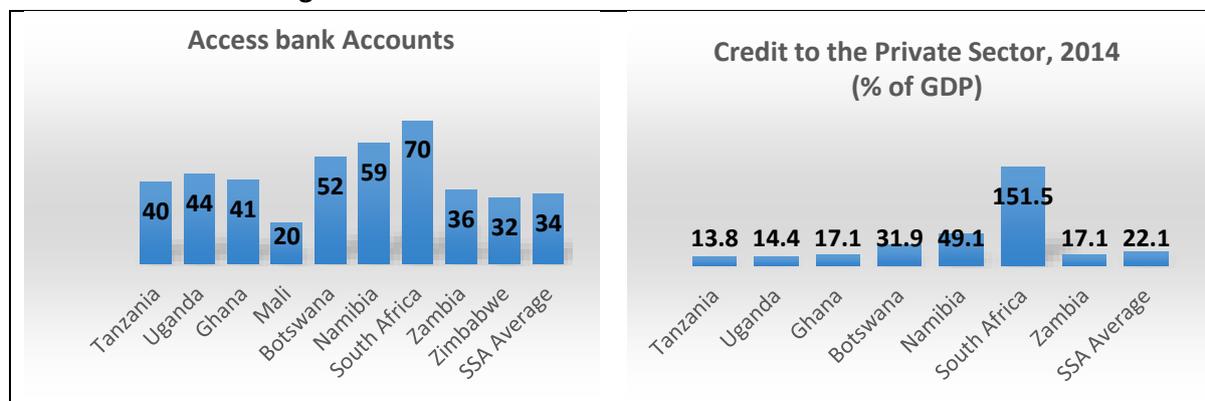
<sup>1</sup> For the full content of the Financial Sector Charter see [www.banking.org.za](http://www.banking.org.za)

<sup>2</sup> This account was offered by all deposit taking banks as a low-income transactions banking account. Required minimum balance was R325 by 2005 (\$30).

<sup>3</sup> See Usury Act, 1968 (Act No. 73), <https://www.acts.co.za/usury/index.html>

have access to formal finance (World Bank, 2013b; FinScope SME Survey, 2010). Nonetheless, the country's private credit-to-GDP ratio remains the highest in Sub-Saharan Africa and the Southern Africa region as shown in Figure 1.

**Figure 1: Access to Finance in selected African Countries**



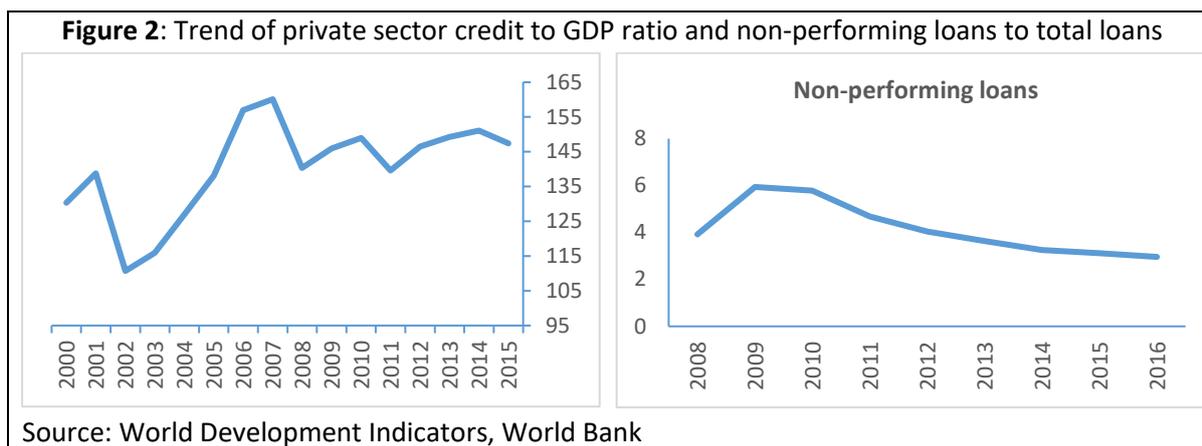
**Source:** Author's compilation from the World Bank Global Financial Database (2014) and World Development Indicators

## 2.2. Depth

Depth is captured by the extent of collateral requirements to secure credit, or by the ratio of private sector credit to GDP. Given the historical exclusion of the majority of South Africans alluded to in the preceding section, it is highly unlikely that new entrants into the private sector would have sufficient assets to use as collateral. To circumvent the possibility of further exclusion due to lack of collateral, the Government of South Africa introduced the National Credit Act of 2005 along with credit bureaus, at the time when financial access was instituted as a policy. The idea was to create a credit history for an individual, and perhaps use this credit information to secure more credit. There are currently 14 registered credit bureaus in South Africa under the watch of the National Credit Regulator, with credit information on approximately 24 million borrowers as at December 2016 (CBM, 2016). Up until 2015, lenders used the credit bureau information to extend new or more credit to borrowers based on the willingness-to-pay criteria, which was derived from the repayment history of the borrower. But this approach came under review by the Regulator arguing that the criterion was vague, and that lenders were extending credit to borrowers who could not afford, leading to a debt-trap for many individuals and businesses, with negative effect on welfare.<sup>4</sup>

According to the World Bank's *Doing Business* Report (2016), which measures and compares regulations relevant to the life cycle of a small- to medium-sized domestic business, South Africa has no official collateral registry and as such, information cannot be shared about the assets of the reported 1 million firms in the country. However, Figure 2 shows that credit to private sector has steadily increased for the past two decades while non-performing loans as a percentage of gross loans have been on a decline since the global financial crisis. This trend is nonetheless vague, given that the distribution of private credit is not clear.

<sup>4</sup> Regulation 23 of the National Credit Act was amended to standardize credit affordability assessment to ensure that whoever receives credit has sufficient proof to repay it without compromising their welfare.



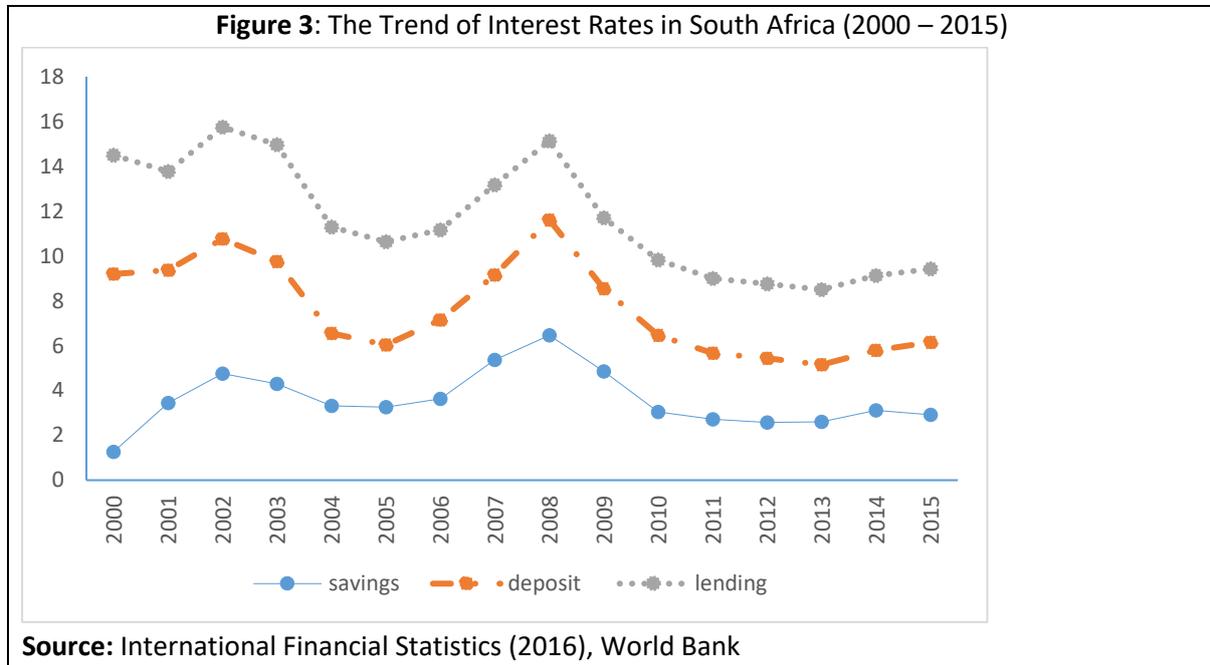
### 2.3. Intermediation Efficiency

Intermediation efficiency relates to the degree of competition in the financial sector. The South African banking system is comprised of 31 domestic and foreign bank branches. Five large banks—ABSA Bank, FirstRand Bank, Nedbank, Standard Bank of South Africa, and Investec Bank—dominate the sector, which together account for more than 90 percent of total banking assets. With financial assets of about 298 percent of GDP, this value is posited to be larger than in many emerging markets. Four of the five large banks are providing full-scale banking services nationwide, while Investec’s operation is focused on corporate and private banking businesses. The rest of the sector consists of 7 locally owned banks, 5 subsidiaries of foreign banks, and 14 branches of foreign banks (as at the end of 2013). Except for two relatively large local banks focusing on retail banking, other banks, both locally controlled and foreign controlled, have limited operations, and not systemically important even regionally (IMF, 2015). This scenario has caused concern with arguments that the concentrated ownership structure of the banking sector might pose a challenge to financial inclusion, whereby financial access is likely to be concentrated among high income individuals or large firms (see World Bank, 2013b). In terms of finance from the public sector, a dedicated financing unit for small and medium enterprises was set up under the Industrial Development Corporation (IDC) – the Small Enterprise Financing Agency (SEFA).<sup>5</sup> Also known as the Enterprise Finance Agency (SOC) Ltd, SEFA was established on 1st April 2012 as a result of the merger of South African Micro Apex Fund, Khula Enterprise Finance Ltd and the small business activities of IDC. SEFA’s mandate is to foster the establishment, survival and growth of SMMEs and contribute towards poverty alleviation and job creation. These financial sector reforms serve to address two components of financial inclusion: access and intermediation. For instance, Khula Finance Ltd was established to support retail financial intermediaries by assuring guarantees of loan repayment (Berry et al, 2002).

Efficiency is captured by the interest rate spread. Lending rates have averaged 11.74% between 2000 and 2015 as shown in Figure 3 (IFS, 2016 ), and only 34% of firms had formal bank loans by 2006 (WBES, 2007). This interest rate is comparatively high if firms are to engage in external borrowing. Firms can access finance through three channels: internal finance, debt and equity (Mullineaux & Murinde, 2014). Advocating for inclusive finance for firms implies that entrepreneurs should either be able to save and finance their projects (internal financing), or have sufficient collateral and credibility

<sup>5</sup> The IDC is one of government’s development finance institutions, operating in a semi-autonomous manner to extend finance to businesses according to government’s development priorities. See [www.idc.co.za](http://www.idc.co.za) . See also [www.sefa.org.za](http://www.sefa.org.za)

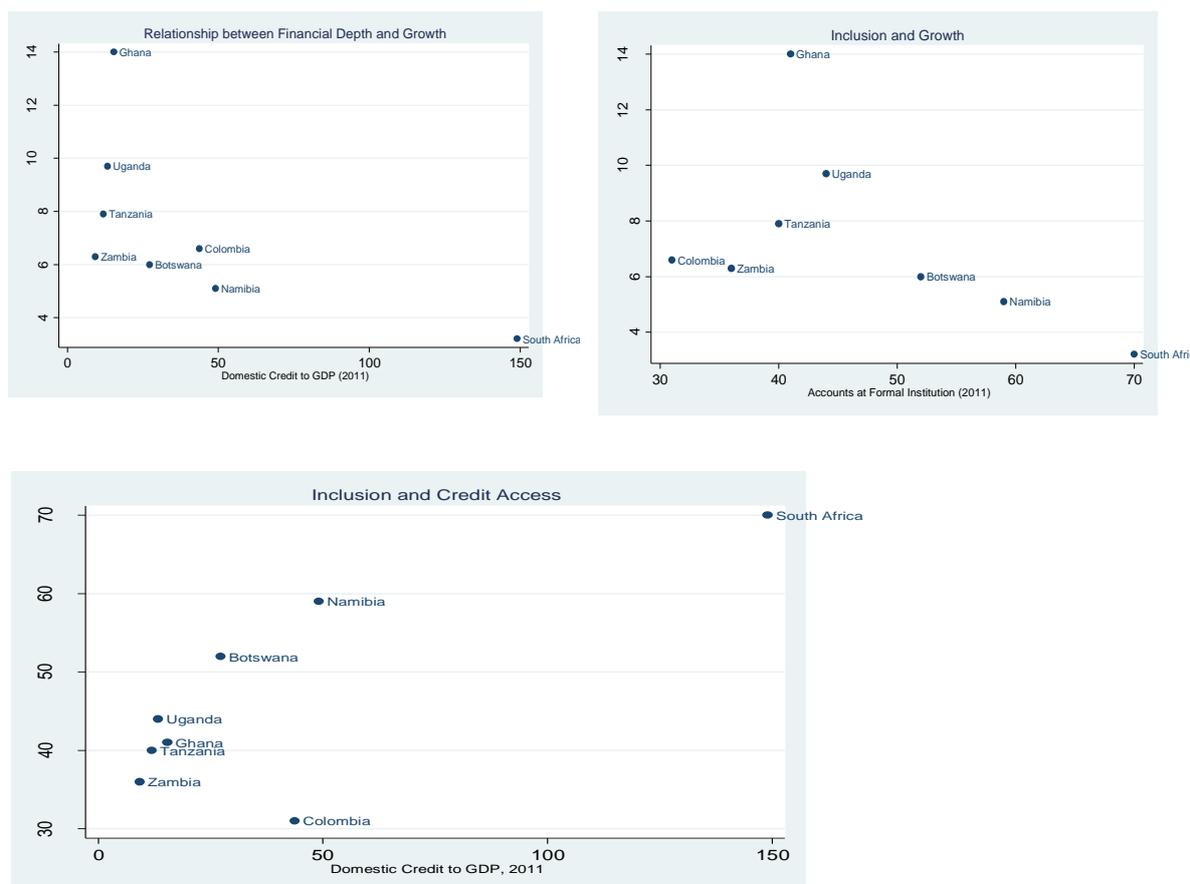
to access external finance to grow their businesses and /or improve productivity. But as shown in Figure 3, savings rates in South Africa are way below lending and deposit rates to encourage savers, contributing to the low average savings rate of 3.6 % of GDP over the past decade, of which the household savings account for only 0.2% (SARB).



#### 2.4. Inclusion, Growth and Inequality

Figure 4 shows that there is an inverse relationship between financial access (proxied by credit extension and formal account holding) and the GDP rate. The lower panel of the figure shows that there is positive relationship between account holding and credit access in most Sub-Saharan countries. However, for South Africa and Colombia, both which are emerging countries, there is a higher private sector credit-to-GDP ratio compared to the percentage of account holding. This would imply either that each account has at least two credit contracts or that too much credit is concentrated in too few accounts. The relationship between inclusion and inequality is inconsistent as shown in Table 1. It is even more perplexing for South Africa which reports the highest financial inclusion compared to its peers. Moreover, the country's Gini coefficient remains one of the highest globally, reaching a high of 0.70 in 2012.

**Figure 4: The relationship between financial inclusion and growth**



**Source:** Author's compilation from the World Bank Findex database and the World Development Indicators

**Table 1: An Overview of the Relationship between Inclusion, Growth and Inequality**

	Domestic Credit to GDP (%)	Accounts at Formal Institutions	Gini Coefficient
Botswana	6.0	52	60.46*
Colombia	6.6	31	54.18
Namibia	5.1	59	90.97*
South Africa	3.2	70	63.38
Uganda	9.7	44	44.2*
Zambia	6.3	36	55.62

**Note:** All data is for the year 2011. \*Data is for the year 2009. The choice of the years was to facilitate comparison as some countries do not have recent statistics.

**Source:** Author's compilation from the World Development Indicators, World Bank.

## 2.5. Challenges for SMEs in South Africa

Challenges exist relating to lack of awareness of loan facilities especially for micro-enterprises (information asymmetry) and the limited understanding of the role of finance for SMEs and SMEs'

contribution to growth and development (Berry et al., 2002). This is made even more challenging given the duality of the economy. For example, informal activities can be viewed as 'small enterprises' which may eventually generate tax revenues through a gradual process of formalization. Alternatively, there are views that informal activities are low productivity employment ventures or 'survivalist' strategies for poor households. From this perspective, the informal sector plays a passive role in development and acts as a temporary substitute for social protection during the formal-sector-led growth process (Davies & Thurlow, 2009). Berry et al. (2002) argue that there is room for both perspectives. For instance, in the presence of capital and technological spin-offs, both the productive sector (larger enterprises) and the less productive sector (the small and micro-enterprises) can contribute to an increase in labour demand and subsequently productivity. According to the Department of National Treasury, South Africa had an estimated 1 - 3 million small and medium enterprises by 2010, representing a contribution of up to 50% to the country's GDP and an even greater contribution to employment. Thus, financial frictions towards South African SMEs warrant attention given the potential positive spill-overs the sector has for the economy. A colloquium was hosted in October 2014 to debate and interrogate policies that hamper the growth and sustainability of SMEs in South Africa. Some inhibitive issues identified include access to credit and project finance. Yet thus far, there has not been any explicit evaluation of the potential benefits of relaxing especially the financial inhibitors to SMME performance.

This study attempts to close this gap by investigating the impact of relaxing financial inclusion constraints for SMEs on growth and inequality in South Africa. In achieving this objective, the study makes the following contribution: i) apply a micro-founded general equilibrium framework to throw light on the interactions between financial variables and macro variables; ii) contribute to the policy debate of the role of SMEs in the country; iii) subsequently, guide financial support strategies for the sector from financiers.

### **3. Finance, Growth and Inequality: The Theory**

#### **3.1. Finance and Growth**

The relationship between finance and growth is an ongoing debate. Traditional development economists like McKinnon (1973) and Shaw (1973) argue that financial markets have an important role in the economic growth of a country. But the neo-classical view based on Solow (1957) is that financial systems have a small effect on the rate of investment in physical capital, and that these small changes have a minor effect on economic growth. In thinking about financial support for firms, King and Levine (1993) develop an endogenous growth model in which they argue that a financial system is a lubricant for the main engine of growth. Better financial services expand the scope and improve the efficiency of innovative activity, thereby accelerating economic growth. This happens through evaluation of prospective entrepreneurs and funding the most promising ones. That financial institutions can provide the research, evaluative, and monitoring services more effectively and less expensively than individual investors; they are also better at mobilizing and providing appropriate financing to entrepreneurs than individuals. Thus, the evaluation and sorting of entrepreneurs lowers the cost of investing in productivity enhancement and stimulates economic growth (King and Levine, 1993).

According to the theory of financial intermediation, firms in need of finance must pay a price to the financiers. *Ceteris paribus*, all demand can be met by the available funds, otherwise, in low savings regime, demand exceeds supply, whereas in a low entrepreneurial environment, demand falls short of supply. In a framework of imperfect markets common in developing countries, credit worthiness of

firms becomes crucial, wherein firms that are not creditworthy or can't pay the price are excluded from the financial markets through interest rates and collateral requirements. This situation is exacerbated by information asymmetry or transaction costs, the former of which is the reason why financial institutions exist (Mullineux & Murinde, 2014; Diamond, 1991). Thus, the concern is the amount of finance available, the modalities of access (which types of firms are likely to be excluded) and the cost of finance - related to interest rates (Berry et al., 2002).

But firms can also finance internally through savings or retained earnings depending on the stage of development of the enterprise. However, savings require that the interest rates are conducive to reward such efforts and hence accumulate the desired capital for especially business start-ups. The effect of these frictions is to impact total factor productivity (TFP) and ultimately incomes or wages. Overall, financial inclusion enables small savers to pool funds, then efficiently allocates finances among entrepreneurs and investments with high return use, and minimises monitoring and participation costs which often lead to contract enforcement, thus increasing aggregate demand.

### 3.2. Finance and Inequality

The effect of finance on inequality is debateable in part due to the definition of inequality. The concept can refer to equality of opportunities or differences in the intergenerational persistence of dynasty relative income or simply income distribution (Demirgüç-Kunt & Levine, 2009). Subsequently, finance can impact inequality through the extensive margin or through the intensive margin channels. In the case of the extensive margin, financial inclusion ensures that services are available and used by individuals and entrepreneurs who were previously not using them due to some constraints, thereby reducing the intergenerational income differences (Greenwood and Jovanovic, 1990). Thus, inclusion that lowers the cost of credit for instance, could potentially attract smaller firms and the less wealthy entrepreneurs, and ultimately reduce inequality. On the other hand, the intensive margin effect occurs when financial inclusion benefits those already in the financial system. In this case, financial resources would be given to already large firms and wealthy entrepreneurs which would most likely widen the income inequality gap and widen the intergenerational income differences. Townsend and Ueda (2010) identify an indirect mechanism whereby financial inclusion that influences aggregate production and allocation of credit, could also alter the demand for low and high skilled workers in a manner that affects the distribution income.

Given the above arguments, Demirgüç-Kunt & Levine (2009) provide a framework to illustrate how financial inclusion can impact inequality. They assume that total income  $y_t$  of an individual ( $i$ ) in generation ( $t$ ) is a composed of wage earnings  $h_t w_t$  - return to human capital, and returns on physical capital  $a_t r_t$ , summarised in the expression below:

$$y_{i,t} = h_{i,t} w_{i,t} + a_{i,t} r_{i,t} \quad (1)$$

where:  $h_{i,t}$  is the level of human capital for an individual in generation ( $t$ ) which varies among individuals within a given generation,  $w_{i,t}$  is the wage rate per unit of human capital,  $a_{i,t}$  is the wealth of an individual in generation ( $t$ ) and  $r_{i,t}$  is the return on assets both of which may also vary among individuals within a generation.

Inclusive finance would ensure that individuals with high ability (or talented entrepreneurs) but without financial resources can access funds to enable them to invest in education  $h_t$  (or in businesses) and earn high wages  $w_t$  (or profits) regardless of whether their parents were wealthy or not. Financial inclusion can also reduce the wage gap that arises from discrimination. According to

Gary Becker (1957), discrimination is cheaper when there is little competition. Thus, a financial system that funds new entrepreneurs than already established firms causes competition for labour in the process of production, thus reducing discrimination of the disadvantaged groups in society.

Liquidity constraints can impede business opportunities for the poor (Demirgüç-Kunt & Levine, 2009). Financial inclusion can reduce moral hazard and adverse selection problems, both of which have a tendency of aligning returns  $r_t$  to assets with the initial stock of assets  $a_t$  available for individuals in generation ( $t$ ). Thus, financial inclusion opens up investment opportunities irrespective of parental wealth. Suffice to say that intergeneration income is a function of savings, where rich parents are likely to bequeath more assets to their children than do poor parents. The possible role of financial inclusion on savings is (1) to provide more services to be used by the wealthy to expand their financial portfolios (intensive margin) or (2) through the extensive margin by enabling the poor to reduce liquidity constraints, mitigate risks and expand business opportunities (Demirgüç-Kunt & Levine, 2009).

#### 4. Review of related literature

There is vast literature on the finance - growth nexus (Levine, 2005; King and Levine, 1993) and finance, inequality and welfare (Honohan, 2008, Burgess and Pande, 2005; Greenwood and Jovanovic, 1990). More recently, there has been an increase in emphasis on financial inclusion owing to the role of finance in consumption smoothing of economic agents.<sup>6</sup> This inclusion is often achieved through financial innovation or financial intermediation/deepening. According to Levine (2005), one of the mechanisms of tracing the impact of financial deepening on growth and poverty is through SME financing. Several studies find a positive relationship between access to external finance and firm growth, expansion and efficient productive asset allocation (Beck and Cull, 2014; Ayyagari et al., 2011). Although causality is difficult to pin down, there is evidence from cross-sectional studies that financial access is associated with general equilibrium increase in wages (Lloyd-Ellis and Bernhardt, 2000), poverty reduction and income inequality (Beck et al., 2007; Clarke et al., 2006). This paper contributes to this literature by looking at the impact of access to finance by firms on inequality and economic growth in a country that still faces financial access constraints and inequality.

This paper is related to studies on finance for SMEs which build on the seminal work by Fazzari et al. (1988). These authors, and subsequent empirical work such as Beck and Cull (2014), Dabla-Norris et al. (2015, Jang et al. (2014) and Karpowicz (2014) find that there are financing obstacles especially for firms in Africa and developing economies. Using standardised World Bank Enterprise Surveys as well as privately conducted surveys, these studies find that while firm characteristics are significant determinants of access to finance, there are also supply-side constraints such lending techniques. Indeed, seminal work by Townsend (1979) and follow-up empirical work show that credit history and collateral requirements by banks imply that entrepreneurs face different contracts and this is a potential barrier to access to finance.<sup>7</sup> But if entrepreneurs are risk-averse and without a credit history, then they would most likely be excluded from the financial sector because they lack a basis for being assessed for credit worthiness. This study therefore examines whether relaxing collateral requirements can attract such constrained entrepreneurs to the financial sector in a country where the majority of the population were financially excluded and with minimal or no credit history nor asset possession.

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<sup>6</sup> See Alliance for Financial Inclusion (AFI), [www.afi.org](http://www.afi.org)

<sup>7</sup> See also Amaral and Quintin (2010), Paulson, Townsend and Kairanov (2006)

This study also contributes to empirical work on the evaluation of access to finance for firms on overall economic growth and inequality. Recent work by Dabla-Norris et al. (2015), Jang et al. (2014) and Karpowicz (2014) provides an approach that can be used to evaluate the impact of micro-level strategies on macro-economic variables. This approach allows for disentanglement of institutional level factors that can have an impact on the outcomes of financial access, which are often masked by conventional analytical methods such as regression analysis. For instance, several studies find a positive relationship between financial sector and growth and poverty reduction (see Beck et al. 2007; Clark et al., 2006). Yet there are inequalities in access to this credit at firm level (Beck and Cull, 2014). Dabla-Norris et al. (2015) argue that causal relationships and policy evaluation can also be challenging when using these static frameworks for analysis. Hence using a general equilibrium and dynamic framework can overcome these challenges. This approach ties in well with arguments by Greenwood and Jovanovic (1990) that benefits of finance are not necessarily linear. Different economic agents benefit differently depending on their initial position.

## 5. Empirical approach

### 5.1. Model presentation

The paper utilises a micro-founded general equilibrium model by Dabla-Norris et al. (2015). The model features heterogenous agents who differ in wealth ( $w$ ) and talent ( $z$ ) endowments. These individuals are faced with decisions related to financial sector participation, occupation choice (supply labour or become entrepreneurs) or investment. The financial sector has two regimes: a savings regime and a credit regime. Only individuals with a certain level of wealth and talent become entrepreneurs. These individuals can participate in both the savings and the credit regimes. On the other hand, wealth-constrained individuals or those without entrepreneurial talent only supply labour and they do not participate in the credit regime.

Participation in the savings regime has costs, which are also the determinants of financial inclusion. These include: transactions costs, documentation requirements, periodical fees and other financial inclusion constraints. In the credit regime, the size of collateral and information asymmetry determine the extent of financial inclusion of the agent. The latter is captured as differentials in the lending rate. These interest rate differentials are the result of monitoring costs for highly leveraged firms of individuals with talent but with less wealth. According to Dabla-Norris et al. (2015) this can be a source of financial exclusion even in the presence of availability of credit. Thus, the size of collateral and interest rate differentials can distort capital allocation and entrepreneurial talent in a manner that affects aggregate total factor productivity and therefore GDP.

The model also assumes two periods. In the first period, financial sector participation, occupation choice and investment decisions are made. While in the second period agents earn wages or profit and they maximise utility by either consuming or bequeathing to their off-springs. The utility function is assumed to be Cobb-Douglas as shown in expression (2), which agents maximize in the second period subject to a budget constraint.

$$u(c, b') = c^{1-\omega} b'^{\omega} \quad (2)$$

where  $c$  is consumption and  $b'$  is bequest. The bequest is the basis of the economy's wealth distribution which is determined endogenously across periods.  $\omega$  is the optimal bequest rate. The budget constraint  $c + b' = W$  shows that wealth  $W$  in the second period is a composite of initial wealth as well as the first-period income.

Firm productivity depends on the entrepreneur's talent in combination with capital and labour employed. This relationship is shown as in expression (3).

$$f(k, l) = z(k^\alpha l^{1-\alpha})^{1-\nu} \quad (3)$$

where the Lucas span-of-control parameter  $1 - \nu$  represents the share of output that comes from the variable factors. Of this,  $\alpha$  comes from capital while  $1 - \alpha$  comes from labour,  $\nu > 0$  and capital depreciates at a rate of  $\delta$ . There is a probability  $p$  of project failure and hence zero output. In this case, the entrepreneur can only recover a portion of his capital investment equal to  $\eta < 1$ , net of depreciation. Thus, the probability of earning a wage income is  $1 - p$ .

Agents' choice to participate in the savings or credit regimes depends on their expected income, which is equivalent to them maximising expected end-of-first-period wealth. This relationship is given by expression (4). Entrepreneurs who participate in this regime rely on their savings to finance their business undertakings.

$$W^s = \begin{cases} (1 + r^d)b + (1 - p)\omega & \text{for workers} \\ \pi^s(b, z) & \text{for entrepreneurs} \end{cases} \quad (4)$$

where,  $W^s$  is wealth in the savings regime,  $r^d$  is the deposit interest rate,  $\pi^s$  is the profits for entrepreneurs operating in the savings regime. Thus agents chose to work if their earnings are greater than the profit they would make if they invested their wealth and talent into business projects.

In the credit regime, the emphasis is on the implied lending rate  $r^l = \frac{\Omega}{\Phi} - 1$  (where  $\Omega$  is the face value of the loan contract and  $\Phi$  is the total amount), and the leverage ratio  $\tilde{\lambda} = \frac{\Phi}{\Delta}$  (where denominator represents the collateral). The end-of-period wealth in this regime is thus given by  $W^c = \pi^c(b, z)$  such that the agent will pay the participation costs in the credit regime if his wealth from participation in the credit regime is greater than that from his participation in the savings regime, that is,  $W^c > W^s$ . Entrepreneurs then chose capital and labour to maximise (5) subject to  $k \leq \lambda(b - \Psi)$

$$\pi^c(b, z) = \max_{k, l} \{ (1 - p)[z(k^\alpha l^{1-\alpha})^{1-\nu}wl + (1 - \delta)k - \Omega + (1 + r^d)(b - \Psi)] + p \max(0, \eta(1 - \delta)k + (1 + r^d)(b - \Psi) - \Omega) \} \quad (5)$$

Assuming initial wealth and talent  $H_0(b, z)$ , a competitive equilibrium has allocations  $\{c_t(b, z), k_t(b, z), l_t(b, z)\}_{t=0}^\infty$ , sequences of wealth and talent  $\{H_t(b, z)\}_{t=0}^\infty$  and prices  $\{r^d(t), w(t)\}_t$ , such that;

- i. Agents maximize utility at time  $t \geq 0$  by choosing either the savings or the credit regime, occupation (entrepreneur or worker),  $c_t(b, z), k_t(b, z), l_t(b, z)$
- ii. Capital market clears at all  $t \geq 0$

$$\iint_{(b, z) \in E(t)} k_t(b, z) H_t(b, z) db dz = \iint_{(b, z)} b H_t(b, z) db dz - \Psi \iint_{(b, z) \in Fin(t)} H_t(b, z) db dz$$

where  $E(t)$  is a set of all type  $(b, z)$ , who choose to be entrepreneurs at time  $t$ ;  $Fin(t)$  is the set of all  $(b, z)$  agents who are in the credit regime.

- iii. Labour market clears at all  $t \geq 0$

$$\iint_{(b,z) \in E(t)} l_t(b,z) H_t(b,z) db dz = \iint_{(b,z) \notin Fin(t)} H_t(b,z) db dz$$

iv.  $\{H_t(b,z)\}_{t=0}^{\infty}$  evolves according to the equilibrium mapping below:

$$H_{t+1}(\bar{b}, \bar{z}) db = \gamma \mu(\bar{z}) \int_z \mathbb{1}_{\{b'=\bar{b}\}} H_t(b,z) db dz + (1-\gamma) \int_b \mathbb{1}_{\{b'=\bar{b}\}} H_t(b, \bar{z}) db$$

where  $b'$  is the bequest for an agent of type  $(b,z)$ , and  $\mathbb{1}_{\{b'=\bar{b}\}}$  an indicator function which equals 1 if  $b' = \bar{b}$ , and equals zero otherwise. According to Dabla-Norris et al. (2015), the steady state of the economy is defined as the invariant joint distribution of wealth and talent  $H(b,z)$ , such that  $H(b,z) = \lim_{t \rightarrow \infty} H_t(b,z)$

### *Limitations of the model*

The above model focusses only on the formal financial sector and assumes that credit extension is made possible by savings. But it is possible for bankers to have alternative sources of funds such as from the money markets as is the case in South Africa. The model does not allow us to estimate the effect of the informal SMEs as these are most likely to be considered as workers. It has been argued that both the formal and informal enterprise sectors have a potential role to play in closing the unemployment gap for instance. Berry et al. (2002) argues that growth in South Africa's medium enterprises has minimal spin-offs to the small and micro enterprises and is likely to increase wages in the high-productive or large enterprises and possibly reduce wages in the small and micro enterprises. If indeed access to finance is a constraint for the latter to grow into large businesses, the model does not allow us to estimate absolute changes in employment.

## **5.2. Data and calibration**

For the calibration exercise, we use data from the World Bank Enterprise Surveys, the World Development Indicators and International Financial Statistics database. The Enterprise surveys provide firm-level cross-section data with a range of variables including: access to finance, business environment, firm and owner characteristics. For South Africa, data is available only for one period – 2007. The World Development Indicators from the World Bank database provide macro-level gross-savings, the interest rate spread and the non-performing loans. To calibrate the model, standard values are used from the literature as used in the original exercise by Dabla-Norris et al. (2015) for countries that are like South Africa. For instance, the one-year depreciation rate of 0.06 is used and the share of output earned by capital is 0.33. Other parameters are estimated by matching the simulated moments to actual data. For example, the savings rate is matched to estimate the bequest rate,  $\omega$ , and the average value of collateral is used to calibrate the degree of financial friction stemming from limited commitment,  $\lambda$ , which coincides directly with the maximum leverage ratio in the model. The financial participation cost,  $\psi$ , intermediation cost,  $\chi$ , recovery rate,  $\eta$  and probability of failure,  $p$ , are jointly calibrated to match the moments of the percent of firms with credit, NPLs as a percentage of total loans, interest rate spread, and the employment share distribution as in Jang et al. (2014). Each of these moments is affected by some parameters of the model.

The model assumes that the share of firms with credit is endogenous and is affected by  $\psi$ ,  $\lambda$ , and  $\chi$ . Therefore, three policy experiments are conducted to identify key constraints to financial sector inclusion in South Africa and to study the macro effects of their removal. The first experiment consists

of reducing financial participation costs ( $\psi$ ). The second experiment consists of relaxing borrowing constraints in the form of collateral requirements ( $\lambda$ ). The third experiment assumes an increase in intermediation efficiency ( $\chi$ ). Table 2 presents an overview of the data.

**Table 2:** Overview of the data

Gross savings (% of GDP)	19.7
Collateral (% of loan)	103.6
Firms with a bank loan or line of credit (%)	30.1
Non-performing loans (% of total loans)	3.2
Proportion of credit requiring collateral (%)	71.2
Percentage of firms using banks to finance investments	34.8
Percentage of firms that need a loan	50
Percentage of firms using banks to finance working capital	21.1
Proportion of investment financed internally (%)	68.5
Percentage of firms with a checking or savings account	97.9
Interest rate spread	4.01
Average age of the establishment (years)	15
Average number of permanent skilled production workers	25.7
Average number of permanent unskilled production workers	17.2
Percentage of firms identifying access to finance as a major obstacle	15.5
Percentage of firms formally registered	91
Total number of firms	1 045

**Source:** World Bank Enterprise Surveys, World Development Indicators. All data for 2007

The table shows evidence of financial stress given by the high percentage of collateral requirements. 50% of the firms indicated that they need a loan and up to 30% of firms' working capital is financed through credit. Even though 98% of firms have a bank account, still up to 16% identify access to finance as an obstacle. This is plausible given the high collateral requirements, subsequently not surprising that the rate of internal financing is as high as 68.5%. The interest rate spread is comparable to that of emerging economies (3.3 for Malaysia, 4.3 for the Philippines and 6.1 for Egypt) for the same period.<sup>8</sup> Given that the average number of employees in the data is almost 50, it is safe to say that this study is conducted on small to medium enterprises as per South Africa's definition provided in appendix Table A1.

As mentioned earlier, financial inclusion is captured by three dimensions: access or reach (which is measured by the size of participation costs), depth (determined by the size of collateral constraints), and efficiency (determined by the size of interest rate spreads). Finally, welfare analysis is conducted by estimating the change in income of the different agents (with varying initial wealth and talent) when one of the parameters  $\psi$ ,  $\lambda$ , and  $\chi$  changes. Wealth is captured by the share of income accruing to various quintiles. The direction of this change is not known *a priori* as discussed in Section 3.2.

Table 3 presents the parameter calibrations and compares the computed moments with the summary statistics from the data. The moments from actual data suggests that South Africa has a lower savings rate compared to emerging countries, despite favourable interest rates for savers. The low levels of savings can stifle financial intermediation since lenders would not have sufficient deposits to extend to SMEs as credit. This might account for the small number of firms that have access to credit (just 30%). The moments computed from the model are close to the actual moments with

<sup>8</sup> Figures for Malaysia, Philippines and Egypt were obtained from Dabla-Norris et al. (2015)

respect to savings rate, interest rate spread and non-performing loans. This indicates that the model fits the actual data fairly. The parameters, as noted before, are calibrated based on the data and some are based on Dabla-Norris et al. (2015).

**Table 3:** Data, model and estimated parameters

Target moments	Data	Model	Parameters
Savings (% of GDP)	19.7	20.1	$\omega = 0.2$
Collateral (% of loan)	103.6	109.6	$\lambda = 2.52$
Firms with credit (%)	30.1	---	$\psi = 0.03$
Non-performing loans (%)	4.9	8.1	$\chi = 0.85$
Interest rate spread	3.9	3.1	$\rho = 0.15$
Top 40% employment share	91.6	62.1	$\eta = 0.3$
			$v = 0.7$
			$\rho = 0.03$
			$\alpha = 0.33$
			$\delta = 0.1$

**Note:**  $\lambda$  = degree of financial friction resulting from limited collateral ( $\lambda \geq 1, \lambda=1$  implies that entrepreneur cannot borrow)

## 6. Results

Figures 5 - 7 show the results of the comparative statics resulting from relaxing the financial inclusion constraints in this study. Three scenarios are investigated. In the first scenario, we consider reducing the participation costs,  $\psi$ . The second scenario involves reducing the borrowing constraints equivalent to reducing collateral requirements thus changing the ratio of collateral as a proportion of total loans,  $\lambda$ . Finally, we consider an increase in the intermediation efficiency,  $\chi$ .

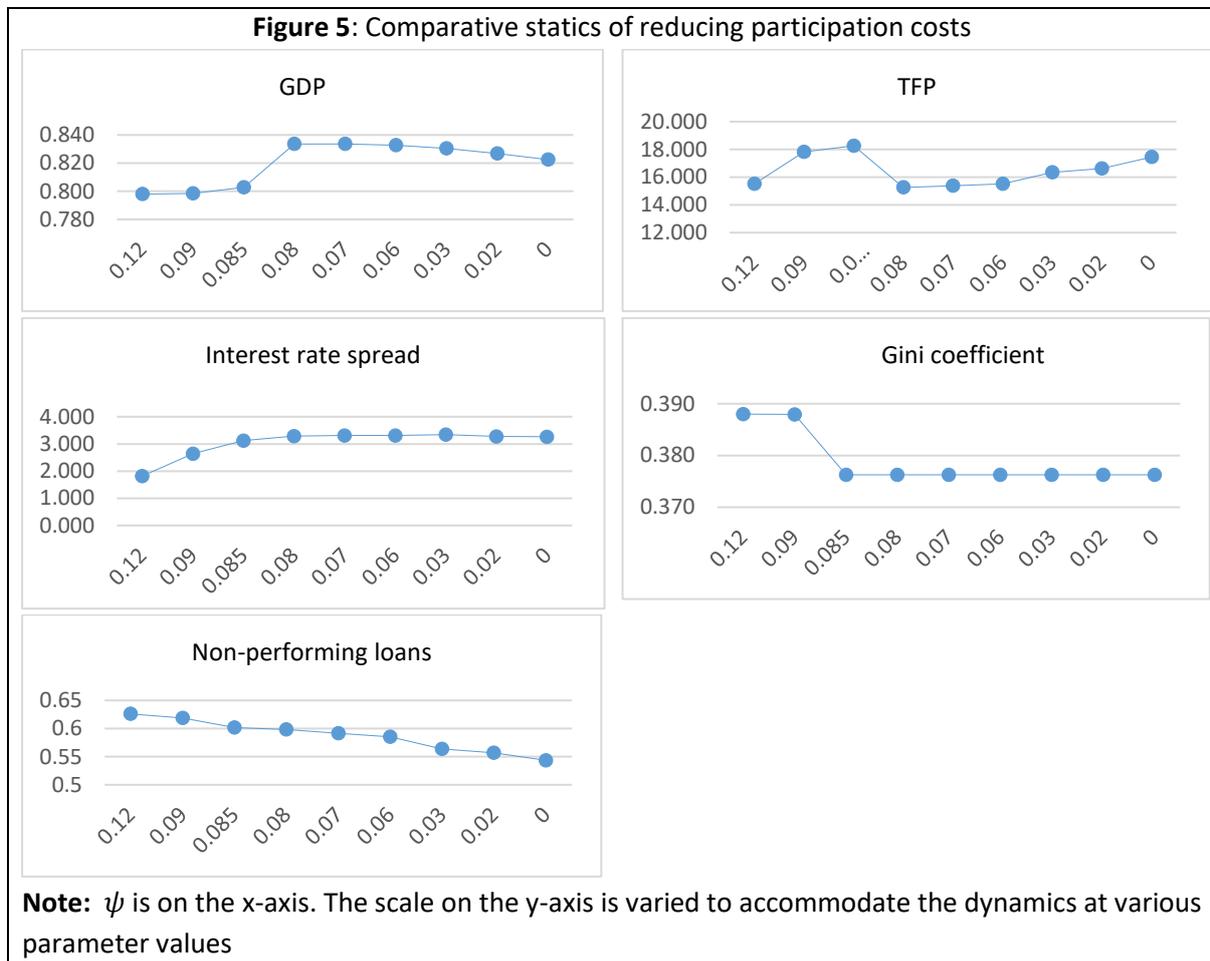
### 6.1. Relaxing participation costs

Figure 5 shows the effect of reducing participation costs from 0.12 to 0. This decline causes a slight increase in GDP through two channels. First, a reduction in participation costs allows more firms to access credit from the extensive margin perspective. This increases investment and subsequently GDP. Second, this scenario leads to less wastage as firms invest more capital in production – the intensive margin. Subsequently, TFP increases due to the efficient allocation of capital among entrepreneurs.

Interest rate spread rises monotonically driven by two forces. First, the low participation costs imply that the cost of capital is low, which encourages entrepreneurs to acquire more and hence become wealthier. These entrepreneurs then deleverage, which pushes the average interest rate spread down. Secondly, talented but constrained workers can join the credit market and borrow to become entrepreneurs. Since these workers are wealth constrained, they chose a high leverage ratio driving up the average interest rate spread. The second effect becomes more dominant as  $\psi$  tends towards zero.

The effect on inequality, captured by the Gini coefficient, is to decrease. This is because a reduction in participation costs disproportionately benefits both constrained workers and talented but constrained entrepreneurs. Constrained entrepreneurs access more credit and inject capital into production which boosts their profits as NPLS drop. Constrained workers on the other hand receive higher wage incomes which improves their welfare. The combined effect is a sharp decline in inequality until such a point when all firms that need credit have received it, at which point the Gini

coefficient flattens as  $\psi$  approaches zero. Further decline in inequality is curtailed because of other constraints that could be prevalent or that arise as a result of these dynamics. This result is similar to that obtained for Colombia by Karpowicz (2014).

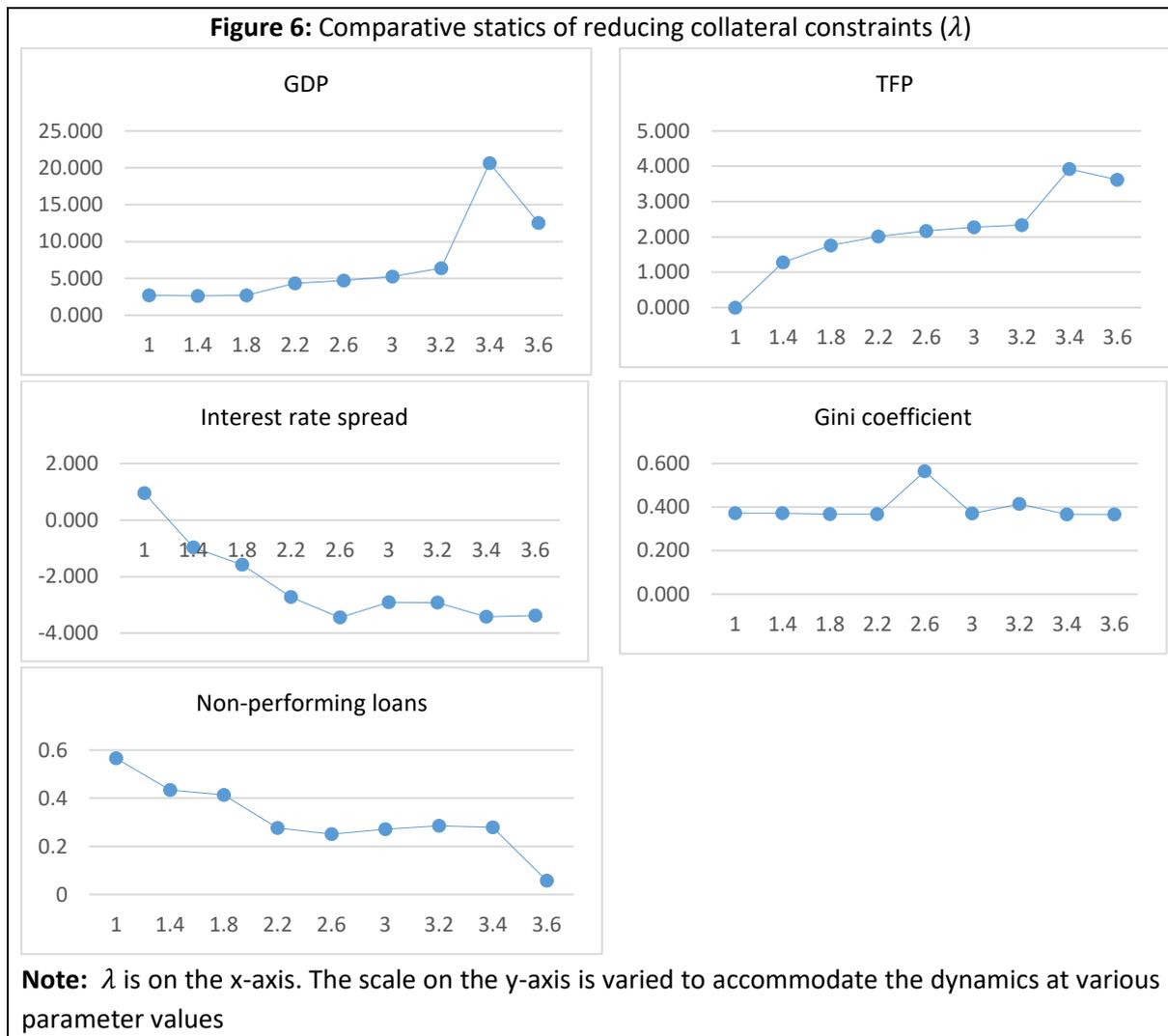


## 6.2. Relaxing borrowing or collateral constraints

Figure 6 shows the effect of varying the collateral requirements,  $\lambda$ , from 1.0 to 3.4. Aggregate GDP rises sharply, greater than levels observed in the low participation costs regime. This is due to high deposit rates and very low average interest rate spread, which free up financial resources for investment, leading to an increase in GDP. This result is similar to results obtained for other emerging economies like Philippines by Dabla-Norris et al. (2015) and Colombia by Karpowicz (2014). This large increase in GDP would suggest that relaxing collateral constraints has great promise for increasing growth in South Africa. TFP also improves considerably. A possible reason is that relaxing borrowing constraints enables firm to acquire more efficient technology and factor inputs.

The interest rate spread is very low, going below zero when  $\lambda$  increases slightly from one, as the ratio of non-performing loans also declines sharply. In the first instance, a relaxation of the borrowing costs pushes the default rate down and firms leverage more. However, as  $\lambda$  increases, the interest rate spread continues to decline due to a declining trend in the lending rate amidst a rising trend in deposit rate. This result is slightly different from what is observed in other emerging economies where the spread rises after an initial fall in response to a relaxation of borrowing constraints (Dabla-Norris

et al., 2015; Karpowicz, 2014). A possible explanation is perhaps that relaxing borrowing constraints might only affect the incumbent and larger firms which have almost achieved optimal production. Moreover, South Africa has an initially low rate of non-performing loans. Further reduction in the borrowing constraints drives the interest rate spread down, but does not attract many newer firms to borrow thus keeping TFP relatively low. Earlier work by Berry et al (2002) identified information asymmetry as a setback for South Africa's SMEs in that they have limited awareness of loan facilities. This means that even when collateral constraints are relaxed and interest rates drop to their lowest, fewer firms will demand loans but they would quickly take advantage of a rising deposit rate to build up own capital, which impacts productivity. It should also be noted that from a practitioner's perspective, interest rates cannot go below zero without causing some financial instability.

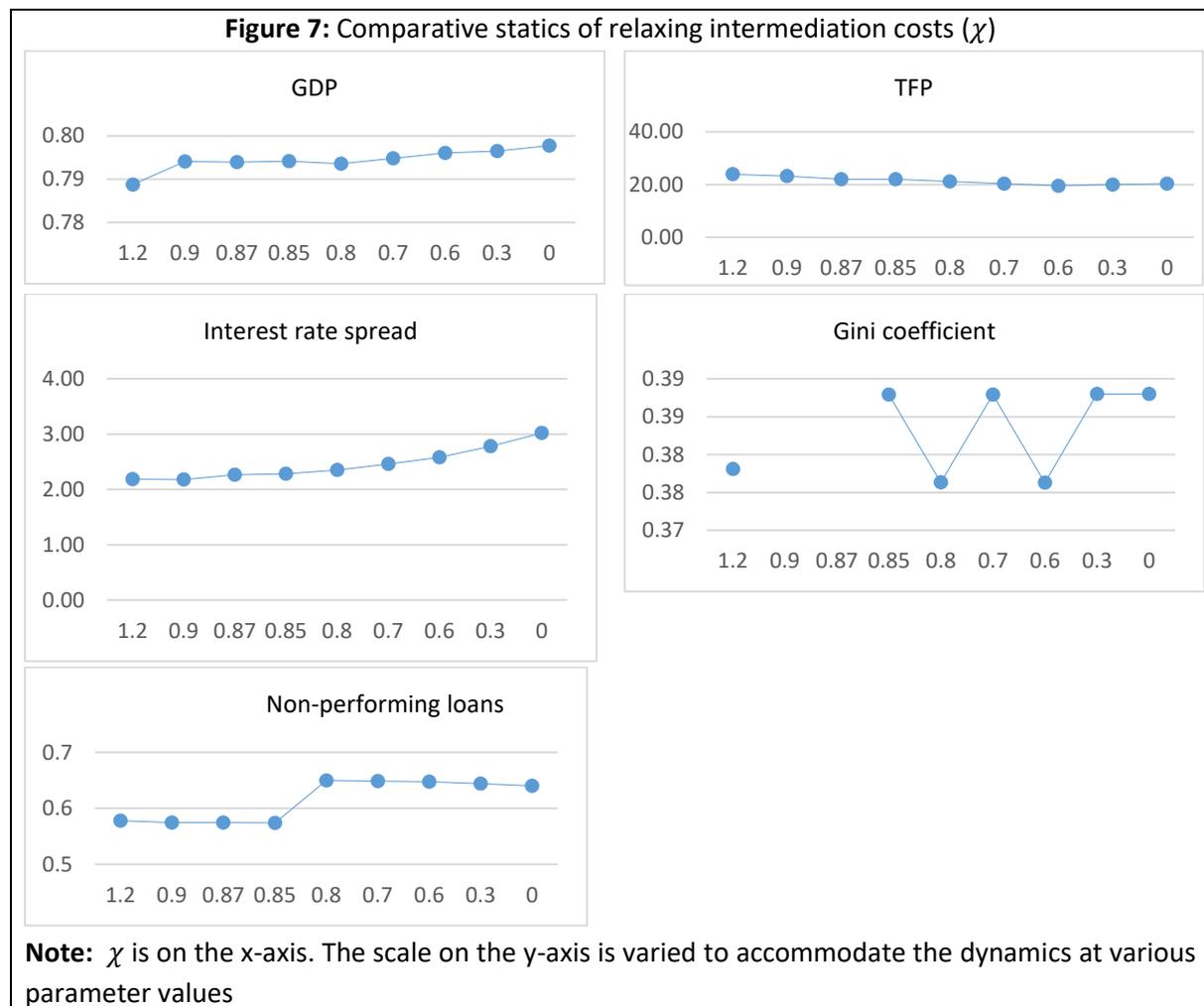


In terms of inequality, there is on average, no effect. Initially, we would expect constrained entrepreneurs to take advantage of the availability of credit, which in turn would improve their incomes. But this does not seem to happen. As interest rates decline further and collateral constraints relaxed further, incumbent entrepreneurs take advantage and borrow more, invest in their production which increases their profits even further, and subsequently inequality shoots up before returning to the original levels. This drop could be attributed to two effects: 1) the incumbent entrepreneurs cannot make more profits as they have to pay higher wages. This takes up some of their profits while

raising the welfare of the constrained workers, leading to a decline in inequality. 2) Further relaxation of the collateral constraints could attract a few constrained entrepreneurs, who make profits by investing in production. But they too now face the high wages that have to be paid to workers. The failure of constrained entrepreneurs to take advantage of low collateral constraints might reflect lack of awareness of credit opportunities, i.e. information asymmetry.

### 6.3.Reducing intermediation costs

We now reduce parameter  $\chi$  from 1.2 to 0, which is part of the total intermediation cost  $p\chi$  reflecting intermediation efficiency. Figure 7 shows that with a reduction in  $\chi$ , GDP increases minimally. This is because the initial beneficiaries of this reduction are incumbent and large firms which are already few and they are highly leveraged. TFP also declines as  $\chi$  declines further, while the interest rate spread initially declines before increasing monotonically. The initial decline in the interest rate spread is the direct effect of intermediation costs. But as the intermediation costs decline further, this attracts risky firms given the low cost of capital, which increase the share of non-performing loans. This latter effect dominates the more intermediation efficiency increases.



The effect on inequality is non-monotonic. We expect that large firms benefit from the decline in intermediation costs such that they make profits and consolidate their wealth even further, thus driving up the Gini coefficient. But the increase in equilibrium wages reduces their profit levels, while

at the same time increasing incomes for workers. The combined effect is to reduce inequality. As intermediation efficiency improves further, the cycle is repeated until the intermediation costs are zero, at which point inequality levels off but at almost the initial level, with rising NPLs as well.

#### 6.4. Interaction between the parameters $\psi, \lambda, \chi$

Thus far, we have analysed the effect of changes in these parameters separately on macroeconomic variables. Yet in practice they are interrelated and as such, a policy mix might yield better results. Say for instance the financial sector is mandated to reduce the collateral requirements which is equivalent to increasing  $\lambda$ . This would have the effect of increasing the number of firms with a line of credit, which is synonymous to reducing participation costs  $\psi$ . This would increase GDP because the cost of capital becomes cheaper for both talented-wealthy and talented but constrained entrepreneurs, enabling them to invest in production. But if monitoring costs are already high, i.e. intermediation costs, then entrepreneurs might avoid acquiring cost even at low interest rates, keeping a low leverage ratio to avoid being monitored. The effect of this behaviour is to dampen the GDP gains that would have been realised by reducing participation costs. From the financial authorities' perspective, it might not be plausible to reduce the borrowing costs below a certain threshold without raising monitoring (contract enforcement) as the former would attract high risk entrepreneurs. Thus, greatly relaxing participation and borrowing constraints is likely to be counterproductive if it leads to an increase in the intermediation costs to closely monitor NPLs (Karpowicz, 2014).

Table 4 shows a comparison of the outcomes and it provides guidance of where financial inclusion should be targeted for optimal results. The largest effect on GDP results from relaxing collateral constraints ( $\lambda$ ) which leads to an increase in GDP by almost 18% (but GDP doubles if the increase in  $\lambda$  is capped at 3 as in Dabla-Norris et al., 2015; Karpowicz, 2014; Jang et al., 2014). On the other hand, the highest gains of 1.94% in TFP are realised by reducing participation costs. The effect on inequality is the same whether we are in a region of a Gini coefficient of above or below 0.60, with a decrease in inequality by 1 - 3 percentage points. An increase in the intermediation efficiency reduces inequality marginally (if the Gini coefficient was below 0.60 initially), but its effect on TFP is negative amidst a marginal increase in GDP of 1 percentage point. These results suggest that a reduction in the participation costs coupled with a decrease in the collateral constraints would offer relatively better results for the South African macro economy.

**Table 4:** Comparative statics of relaxing financial constraints on growth and inequality

	Reduction in $\psi$ ( $\psi = 0.12$ to $\psi = 0$ )	Increase in $\lambda$ ( $\lambda = 1.4$ to $\lambda = 3.4$ )	Reduction in $\chi$ ( $\chi = 1.2$ to $\chi = 0$ )
GDP	0.034	18.01	0.009
TFP	1.940	1.280	-3.530
Gini (< 0.60)	-0.010	-0.021	-0.002
Gini (> 0.60)	-0.012	-0.026	0.010

**Note:** Two scenarios of inequality are considered –Gini coefficients of above and below 0.60, given that South Africa's Gini has often been above 0.50.

## 7. Conclusion

This paper has used a micro-founded general equilibrium model to examine the implications of financial inclusion policies on macroeconomic variables such as GDP, TFP and inequality in a dual

economy like South Africa. Three financial inclusion dimensions were considered: access- measured by the degree of financial participation, depth – measured by the extent of collateral constraints, and intermediation efficiency – measured by the interest rate spread. We used the World Bank Enterprise Surveys and standard parameters from the literature to calibrate the model for South Africa and then undertook three simulation experiments by relaxing the constraints related to each of the financial inclusion dimensions.

Our results showed that relaxing financial sector constraints has positive and negative effects on macroeconomic variables, and hence trade-offs have to be made. For instance, relaxing participation or collateral constraints can boost GDP by over 3 percentage points and TFP by up to 2 percent, while reducing inequality by up to 3 percentage points. On the other hand, increasing intermediation efficiency increases GDP marginally, has a negative effect on TFP and it increases inequality. Since the dimensions of financial inclusion are interrelated, however, these results suggest that reducing participation and collateral costs offers relatively better gains on several fronts, with inequality reducing by 1 – 3 percentage points. But the attraction of more agents into the credit regime need not translate into higher intermediation costs if the financiers can work-out an optimal interest rate that would prevent intermediation costs from rising while maintaining a positive TFP position.

The results also suggested possible restraint by talented but constrained entrepreneurs from taking up credit when collateral constraints are greatly relaxed. Two explanations are advanced such as lack of awareness of credit opportunities or, if intermediation costs remain high, constrained entrepreneurs might choose to remain low leverage to avoid expansion and being monitored. At the same time, constrained workers might choose to save if the deposit rates are favourable, instead of joining the credit regime.

Overall, there is evident that relaxing financial constraints for SMEs can lead to positive spill-overs to South Africa's economic growth and inequality reduction prospects. However, policies that advocate for financial inclusion for firms should also create more awareness about the availability of credit, as well as develop entrepreneurial skills to grow the entrepreneurial base in South Africa. The lack of awareness or asymmetrical information was identified as a challenge for South African SMEs by Berry et al. (2002). The results of this study present further evidence that this challenge could impede the achievement of benefits of financial inclusion policies in the country.

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## Appendix

**Table A1: Definitions of SMMEs given in the National Small Business Act of South Africa**

Enterprise Size	Number of employees	Annual turnover	Gross assets, excluding fixed property
Medium	Fewer than 100 to 200, depending on industry	Less than R4 million to R50 million, depending upon industry	Less than R2 million to R18 million, depending on industry
Small	Fewer than 50	Less than R2 million to R25 million, depending on industry	Less than R2 million to R4,5 million depending on industry
Very small	Fewer than 10 to 20, depending on industry	Less than R200 000 to R500 000, depending on Industry	Less than R150 000 to R500 000, depending on industry
Micro	Fewer than 5	Less than R150 000	Less than R100 000

**Source:** National Treasury of South Africa (2010) - unpublished