



Impact of finance on entrepreneurship: a South African case study

By

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Abstract

This study investigates the relationship between entrepreneurship and access to finance in South Africa. Entrepreneurship is currently a buzz topic around the world as policy makers and private sector business influencers realise that this disused area is a catalyst for economic growth. Because of the assortment of theoretical and empirical evidence on entrepreneurial finance at the microeconomic level, we decide to tackle the gap from a macroeconomics point of view. We employ time series data and proxy entrepreneurship activity using self-employment. Furthermore, we employ unit root and cointegration tests to investigate the long run relationship between access to finance and entrepreneurship activity. The results of the empirical analysis indicate access to finance has a significant and positive impact on entrepreneurship activity in the long run. Furthermore, the causality test reveals that the relationship between access to finance and entrepreneurship is bi-directional.

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Declaration

I, Lesego N. Maseko declare that the research work contained in this thesis is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Master of Management in Finance and Investment in the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or part, been submitted for a degree or diploma to any other universities.

Signed

A handwritten signature in black ink, appearing to read 'Lesego N. Maseko', written in a cursive style.

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Chapter 1. Introduction

1.0 Background of the study

Entrepreneurship is currently a buzz topic around the world as policy makers and private sector business influencers realise that this disused area is a catalyst for economic growth. Various authors across various studies have defined entrepreneurship differently. The concept of entrepreneurship can be described as multifaceted at best, with different measures reflecting different aspects of entrepreneurship. It can be described as a resource, a process or a state of being. Entrepreneurship is a critical component in the process of economic growth (Nyström, 2008). Several conclusions over the past have reinforced the idea that entrepreneurship is an essential tool for job creation and accelerating economic growth (Van Hemert, 2008; Nyström, 2008). The importance of entrepreneurship in an economy usually manifests itself in its contribution to economic development and reduced unemployment.

Several papers advocate for the link between unemployment and entrepreneurship (Audretsch et al., 2007) however, it is alarming that the rate of entrepreneurial activity as measured by the Global Entrepreneurship Monitor (GEM) for South Africa (2017/2018) is currently fluctuating around 11% despite the high level of adult unemployment which sits at around 30%. One could argue that the population of unemployed individuals may not necessarily have the skills to enterprise or innovate but empirical evidence proves that the threat of unemployment offers a stronger pull towards necessity based entrepreneurship (Cowling and Bygrave, 2003).

There are a myriad of factors that impact the aptitude to start or grow businesses and these factors vary across different economies and countries. A recent study conducted by the GEM highlighted that many entrepreneurs cite lack of access to capital as the major constraint. Access to finance has been an important factor in the growth trajectory of small and medium enterprises (SMEs). The strengthening of access to finance for ground-breaking entrepreneurs clearly requires the pro-active participation of government, financial intermediaries and institutions.

Traditionally the primary sources of financing for entrepreneurs over the years have consisted of their personal funds and loans from friends or family members. A study conducted on Malaysian SMEs by Aris (2007), pointed out that lack of collateral and financial history is still a major inhibitor to bank loan approvals for SMEs. This situation presents a challenge because an entrepreneur's internally generated funds only represent a fraction of the potential capital accessible if financial intermediaries and government were to become active contributors of entrepreneurial finance.

Research has shown that SMEs play an important role in the industrial development of any economy (Aris, 2007). The South African Government established the Ministry of Small Business Development in 2014 as a response to the growing need to support the development of SMEs in the country. According to Romer (2017) A major key to achieving this objective would be to create an environment that is conducive to doing business and promoting alternative sources of funding in addition to encouraging banking institutions to apportion credit towards SMEs as a way of addressing the finance gap.

To this end we know that the success of many economies can be largely attributed to their entrepreneurial culture and a strong empirical case supports the positive effect that entrepreneurship has on regional economic development (De Groot et al., 2004, p10). Therefore, this study seeks to examine the influence of access to finance on entrepreneurship growth in South Africa by taking a fresh look at past trends and shining a light on the critical topics that should be taking centre stage in public policy and big business platforms.

1.1 Problem statement

The issue of access to finance for entrepreneurial activity is one that evokes many sentiments and discussions around the topic often lead to heated debates. The level of financial intermediation for entrepreneurs is relatively low in South Africa when compared to the rest of the international economies (GEM, 2016). This comes as an alarming surprise since South Africa has one of the strongest financial market developments in Africa. It appears that the capital being held by financial intermediaries is not being channelled into areas such as entrepreneurship thus limiting the increase in entrepreneurial growth and its contribution to economic development. However, there remains a sceptical response to entrepreneurial finance in South Africa.

Studies have been conducted in numerous countries and the microeconomic theory of access to finance has been established. Understanding the importance of the link between finance and entrepreneurship from an aggregate level in South Africa will

create awareness and provide guidance to government and the private sector on how to support the entrepreneurial industry through credit facilitation and by doing so, stimulate economic growth and tackle the challenging rate of unemployment.

1.2 Research question and hypothesis

It has been established that entrepreneurs require funding in order to launch and scale their businesses, thereby enabling them to contribute to economic development. The defining research question is: *Does having access to finance have a significant influence on the level of entrepreneurial activity in South Africa?*

This is conducted at the macro-level rather than the microeconomic level of access to finance. In other words, does credit extension on aggregate level tell us anything about entrepreneurship development in South Africa?

The following hypothesis is formulated and is tested using time series modelling, which we present in the methodology chapter.

H_0 = *Finance has no significant impact on Entrepreneurship*

H_1 = *Finance has a significant impact on Entrepreneurship*

1.3 Purpose of the study

The study examines the empirical effect that access to finance has on entrepreneurship growth in South Africa. This will be done by assessing the level of credit supplied by the financial services sector to the private sector. That is, the

financial indicator in terms of access to finance is proxied using credit extension by financial institutions in South Africa. De Meza and Southey (1996) report that external finance secured for new businesses is mostly comprised of bank loans with equity finance only making up a small portion. The Task Group of the Policy Board for Financial Services and Regulation further validates that “a crucial thrust of this association is the recognition that, for SMEs, access to debt cannot be separated from the broader topic of access to banking services”, (National Treasury Task Force, 2011).

Government in particular has an important role to play in policy development and facilitating the process of eliminating restrictions to the expansion of entrepreneurship and SME businesses. For example as compared to other newly industrialised countries such as India, Malaysia and others, South Africa has no proper state-owned bank to facilitate the access of finance to entrepreneurs. The results of this study may be used to inform the development of an effective entrepreneurial financing framework and the formation of a macroeconomic policy aimed at targeting entrepreneurship financing resulting in an enhanced level of entrepreneurial activity in the country. It will also provide the relevant stakeholders in the private sector with insight as to where there is an opportunity to collaborate with government in the neglected segment of entrepreneurial finance by offering products that will increase access to finance for entrepreneurs.

1.4 Outline of the study

The preceding chapter has covered the introduction and purpose of the study as it

relates to the topic of finance and entrepreneurship in South Africa. The rest of the research paper will be structured and the study conducted in the following manner:

The introduction will be followed by a literature review in Chapter 2. This involves the review of publications including relevant journals, theses and papers which reflect the work already done in the area of entrepreneurship growth and finance in South Africa and the rest of the world. The literature review will assist in shedding some light on the identified areas that need further research work or any gaps that exist in this area of research.

Chapter 3 of this paper presents the research methodology employed, specifying the data and its sources as well as the model specification. This section includes commentary on the choice of variables and justification thereof. Chapter 4 covers the data analysis and empirical results of the study. The implications derived from the results will be discussed in this chapter as well. Lastly, conclusions with respect to the objectives of this study will be drawn from the empirical results. This will be covered in Chapter 5 of this paper.

Chapter 2. Literature review

2.0 Introduction

The first part of this chapter covers the theoretical and empirical foundation of entrepreneurship with further evidence on the cyclical change in access to finance. The second part explains the issue of access to finance and its relevance to entrepreneurship while the third part examines the impact of entrepreneurial finance and its impact at an international level. Lastly, the topic of finance and entrepreneurship as it relates to South Africa during the last few years is reviewed.

2.1 Theoretical foundation

Who is the entrepreneur and what is entrepreneurship?

“In the absence of a universally accepted scientific definition of an entrepreneur”, (Bygrave & Hower, 1991, p13), it is imperative for a researcher to define the term being used. The definition of entrepreneurship differs across countries and continents and depends on the scope and resources related to the entrepreneurial activity.

The term entrepreneur has French roots, emanating from the term *entreprendre* which clearly denotes an individual who undertakes a business project. Despite the direct meaning of the root term, there have been variations in what economists and business people view to be the correct meaning of the term entrepreneurship. According to the Schumpeterian perspective, entrepreneurship can be equated with business innovation which encompasses the ability to identify opportunities in

various markets and exploiting them (Schumpeter, 1934). A further addition to this is that entrepreneurship is the ability to enterprise and channel financial resources to more beneficial industries and creating sustainable economic growth as a result. Gottlieb (2014) views an entrepreneur as an individual who is able to take any idea, be it a product or service, equipped with the skillset, courage and will to assume extreme uncertainty in the form of risk to do whatever it takes to turn that idea into reality through a viable product that people want or need. Gartner (1990) centres the debate about what constitutes the nature of entrepreneurship around some eight themes: the individual, innovation, value creation, organisation creation, owner management, making profit, uniqueness and growth.

An interesting point to note is that all definitions cited above from different authors are related to one important aspect – the mobilisation of resources which requires financing to make it possible. This suggests an important ingredient in the entrepreneurial dish, the individual's ability to acquire and mobilise financing resources. Schumpeter (1934) defines the ease of acquiring finance as access to finance, a subject which some authors think is an impediment to entrepreneurship, see Cole (1949); Low and MacMillan (1988); Lumpkin and Dess (1996). Claessens and Tzioumis (2006) argue that access to finance varies across countries and depends on the different financing structures prevalent in these respective countries, for example, countries differ in degrees of financial development. They also suggest that access to finance can also be theoretically pinned down to demand and supply market dynamics. We expect credit markets to be sluggish in periods of economic recession, where interest rates tend to be higher than normal, preventing or limiting the number of people or organisations who can access funding at such rates. In such

an economic environment, supply of loanable funds increases while demand decreases as the cost of borrowing increases.

From the supply side, there may be structural problems that hinder the availability of loanable funds to entrepreneurs. One example to note is that the returns to innovation are highly uncertain and thus increases the risk attached to financing the innovation see for example the work of Hall (2002), Coad and Rao (2008) and Mazzucato (2013). Very few firms experience success in the form of growth after investment in entrepreneurial innovation. Most products fail with only a small fraction being commercialised. No guarantee exists that products incubated through research and development will succeed.

This uncertainty problem can be massive for small firms who lack the investment scale to diversify into other businesses. This leaves them at the risk of 'putting all their eggs on one basket', as expressed by Freel (2007). Previous research (Coad and Rao, 2008), shows that the returns from innovation are not normally distributed. There is a huge skew in the distribution of returns from innovation with only a few projects giving significant gains with the rest yielding modest gains. This is different with large corporations who are able to diversify their portfolio which cushions them if a failure occurs.

Another structural problem on the supply of finance is that of information asymmetries. In most cases, the entrepreneur knows and understands their innovation better than the lending institution. This results in banks and other credit providers failing to assign a fair value to the innovation investment (O'Sullivan,

2005). In a way, this follows from the uncertainty problem above, but it may also be because of the complexities that follow the ideas behind an innovation – it may require specialist valuation. The skills and tools required to value some innovations are sector specific and may be difficult to apply to other firms. These special valuations may be provided by Venture capitalists which are not found in banks. For example, a bank's valuation of Facebook Inc might not have been feasible when Mark Zuckerberg started the firm because of the complexities of the business itself in terms of how it would generate cashflows at the time. Venture capitalists' skills were the right skill set to be used to value the firm. Banks are mainly interested in the serviceability of their loan facility defined as the ability of the investment to generate cashflows enough to repay the principal amount plus interest accrued and therefore will not finance a project beyond their understanding of this end (Mina et al., 2013). Another view on information asymmetry is that because the entrepreneur knows the potential and probability of his innovation succeeding more than the financier, the financier may increase the cost of finance which then decreases the probability of the firm actually succeeding. This can resemble Arkelof's (1970) market for lemons.

Another structural problem that follows from the two already explained is the specificity of certain innovations. According to Mina et al. (2013)'s notes, some intangible capital produced as a result of research may not be marketable outside the firm itself and therefore may not be usable as collateral. These findings individually and in combination may make it more difficult for banks to provide financing to start-up firms or may imply that they provide it at higher costs (Nightingale, 2011). Many research findings present evidence supporting the presence of structural problems in the supply of loanable funds to innovative firms.

For example, small firms whose innovations are in the high technology sectors are hampered mainly by limitations in their ability to acquire finance (Canepa and Stoneman, 2007 and Czarnitzki, 2006). Another study by Freel (2007), shows that it is difficult for research and development intensive small firms to successfully secure funding than other firms.

2.2 Empirical evidence

Mina et al. (2013) studied the UK and the United States firms during the period before the global economic recession. Results from their study show a considerably subtle difference depending on the metrics used to measure innovation. For example, innovative firms have lower chances of securing finance than other firms when research and development intensity is used as a measure. Using other measures such as product innovation, process or organisation innovation, the results show that the United States is more rewarding to innovative firms as more innovative firms are more likely to secure funding. However, the opposite holds for the UK. In addition, Revest and Sapio (2010) find that new technology-based firms find it more difficult to acquire funding than firms with less innovation.

Seminal work on firm capital structure by Modigliani and Miller (1958) suggests that in perfectly competitive financial markets where information is costless, whether a firm favours debt financing over equity financing or vice versa has a zero effect on the firm's investment decisions. However, practically these assumptions fail due to market imperfections and information asymmetries. These financing constraints will reflect on the firm's investment decisions. The basic premise that follows from this

theoretical design is that – due to information asymmetries - external funds are more costly than internal funds. Now from an entrepreneurial viewpoint, lending institutions are aware of such asymmetries and are reluctant to lend based on the information sets presented to them by the entrepreneur. From the lending institution's viewpoint, entrepreneurs know what banks and other lending institutions want to know before they can give out funding and they tend to hide the true facts and give an impressive picture. Levine (1993) notes that banks are better informed about this through continuous learning from past experiences with other entrepreneurs. This point is strengthened by firstly Adam Smith's 'Wealth of Nations', then de Meza & Southey (1996) who are of the belief that entrepreneurs are optimistic individuals who in most cases are overly optimistic causing them to trivialise key facts. An extract from their study says, "It is not just that banks are better informed, but that borrowers actually have biased expectations. Our general perspective is that it is the unrealistically optimistic who, through self-selection, will dominate the entrepreneurial class and from this follows many of the features associated with small businesses and their access to credit."

Empirical research by Hussain et al. (2006) on China and the UK find that start-up funding is difficult to source from credit markets. Most of the entrepreneurs rely exclusively on funds acquired from their immediate family or close friends. It is only after about two years in business that individuals start to place higher reliance on their own savings and financing from banks and other credit institutions. Their study also finds that in the UK, after five years, business owners and managers prefer borrowed funds to their own savings with the borrowed funds coming mainly from banks. The trend is different in China. Business owners and managers still heavily

depend on financial support from immediate family and friends.

An analysis of the access to finance channel in Indonesia shows capital market imperfections in developing and less developed countries impinges the growth of start-up businesses. However et al. (1980) argue that such claims are subjective observations of the Indonesian markets. They claim that no substantive evidence exists to show that the markets are imperfect and that the barriers of access to finance for small businesses are exaggerated. Instead they attribute these constraints to the lack of entrepreneurial ability of the individuals managing the business. They however acknowledge the need for government to formulate policies that support entrepreneurial activities through low cost funding and availability of grants.

Lee et al. (2015) investigate the ease of accessing finance for small business post the financial crisis for firms in the UK. They use a dataset of more than ten thousand SME employers and find that firms that are innovative are less likely to acquire funding than other firms. They suggest that this trend is due structural problems in the UK financial systems as explained in Freel (2007) that make it harder for innovative firms to access finance. A different perspective to the trend says this could be caused by the credit crunch during the global economic recession of 2008 which may have had a cyclical effect on the markets. Limitations in credit may have intensified the shortage of credit for all firms and may have also worsened problems for smaller firms and start-ups.

2.3 Cyclical change in access to finance

A different view points to cyclical changes in access to finance as another reason why entrepreneurial activities have limited access to funding. According to Lee et al. (2015), not much evidence supports the existence of such cyclical effects. Theoretically however, we can dissect the Schumpeterian process of creative destruction to explain the cyclical effect. This follows previous work by Archibugi et al. (2013a) who are the contenders of such an analysis. In the first phase, firms get rid of old products which they replace with newer products, newer services and newer processes. As such, firms that are weak and those with less efficient processes and obsolete business models will be forced to shut down. This process can be viewed as cyclical in nature, where recessions can contribute to increased research to find better technologies and better business processes. That is firms invest more in innovative products and services which they expect to be more commercially successful as the economy makes its recovery. As a result of the process, there is a cyclical increase in the demand for funding. Due to this, Schumpeter (1939) proposed a counter-cyclical argument for investment in innovation.

Evidence however shows that innovation investment is pro-cyclical (Kleinknecht and Verspagen, 1990; Filippetti and Archibugi, 2011). This view is contrary to the Schumpeterian one, in the sense that firms fund new innovations using internal funds as opposed to external finance. However, during recessions when there is less demand, a reduction in demand of their products affects the balance sheet, which also affects the availability of internal funds forcing firms to look for external finance

to ensure they can bring more products that are marketable.

Other empirical research such as Cowling et al.(2012) ; Armstrong et al. (2013); Mason (2013) argue that lending to small firms decreased after the financial crisis of 2008. This was a result of fewer lenders remaining in the market after foreign banks left the market while risk aversion dominated the environment of existing banks. Cowling et al. (2012) also notes that the criteria used for lending changed too during this period. Firm size and track record became particularly important determinants for lending, in other words, small firms became restricted in their access to capital. Fraser (2009) also notes that during this period risk assessment firms downgraded small to medium firms making them more risky at an index assessment level.

For empirical evidence, North et al. (2013) studied finance gaps for technology based small firms before and after the financial crisis. They found that the availability of funding for these small firms worsened during the crisis. Their study is however undermined by the very small sample of innovative firms they use because they cannot compare their finding with the business population at large, (Lee et al., 2015). No further studies have considered the general case of this effect that is, whether it applies in the general sense and whether the innovative firms have been impacted by the cyclical effect.

2.4 Other rigidities

Following Schumpeter's idea of creative destruction, it is important to note that economic development in terms of productivity growth in any economy can emanate from the extensive rather than the intensive margin of growth. Productivity growth

from the extensive margin refers to growth that comes from the birth of new firms and organisations while unproductive firms close down versus growth that comes from existing firms becoming more productive, which is the intensive margin of economic development (Kerr and Nanda, 2009). Now, most firms need to raise capital at start-up in order to put into action their business ideas but fail because of cross-sectional frictions and rigidities present in capital markets. Greenwood and Jovanovic (1990); Guiso et al. (2004) believe that these rigidities undermine the potential for capital markets to extract and select the best entrepreneurial ideas leading to the misallocation of the limited financial resources in terms of capital finance. Hence, the failure for good projects to access finance is due to limited cognition by capital market participants.

Proponents of this line of thought continue their analysis of the topic by examining the sources of friction that may lead to this misallocation of financial resources. The first factor, probably the most important is financial market depth, Kerr and Nanda (2009). Financial market depth refers to the complexity an economy's capital markets. Naturally, this complexity provides a firm initial point for measuring the extent of capital market development for the financing of new projects, through different metrics for example ratio of bank loans to GDP per year. Empirical research finds that economies with deeper capital markets support the development of industries that have large needs for external finance, Rajan and Zingales (1998). According to Fisman and Love (2003), even in countries where large firms are able to access finance through other less formal channels like trade credit, small firms and start-ups still find it difficult to overcome weaknesses that hinder financial market development. Comin and Nanda (2009) reiterate that commercialisation of new

technologies is mostly affected negatively by the challenges faced by start-ups in securing capital.

Differences in financial depth between countries can be attributed to financial and security laws prevalent in these jurisdictions. La Porta et al. (1997) establish that there exists a solid relationship between the degree of investor protection and the constitutional origins of financial market laws in different countries. This relation translates to the ability of financial service providers to raise capital, hence their willingness and ability to lend, or put oppositely, the willingness of depositors to save. This is called financial market liquidity and depends hugely on the laws and regulations governing a country. In a study on Argentina, Paravisini (2008) finds that the law hinders banks' ability to access external finance as well as limiting them from seizing positive net present value projects in the real economy. Another study on the direct lending program in India finds similar results (Nanerjee and Duflo, 2008).

These issues seem prevalent in emerging markets, but also affect advanced economies. For example, in the United States (US) where the laws around bankruptcy protection for individuals are more binding, Berkowitz and White (2004) show that it is still difficult for entrepreneurs to secure funding for their start-ups. A study of the Italian supply of loanable funds finds that the formation of new firms and the propensity to possess entrepreneurial abilities is promoted more when capital markets have more depth (Guiso et al., 2004).

Institutional make up in different countries is also affected by financial laws. Specialist firms such as venture capitalists who are more likely to provide funding for start-ups than formal channels such as banks are also affected. For example, in

Germany where the economy is more bank led or bank oriented when compared to the US, which is market led, financing start-ups is hindered by the limitations they face to access liquidity events like stock listings (Kerr and Nanda,2009). As a result, Germany's venture capital sector suffers development and the flow of risk capital is reduced.

Another frictional factor cited by many authors on the subject is the degree of competitiveness between financial service providers. According to Levine (1997), the degree of capital allocation to the positive net present value projects with the highest quality can be affected by the level of competition between financial service providers. This issue is more prevalent in emerging than advanced economies. For example, Banerjee et al. (2003) and Cole (2009) find that in some economies, the banking systems are subject to political capture.

Cetorelli and Strahan (2006) and Black and Strahan (2002) find that start-up activity increased rapidly after the deregulation of inter-state bank branches in the US. This supports theories that suggest that increasing the competition between banks possesses the potential to impede the propensity to start new firms. This idea can be viewed in an economy where the banks are monopolistic such that the banks can cross-subsidize loans. In such a market, Petersen and Rajan (1995) argue that start-ups can gain substantially by charging higher rates to bigger firms and relatively lower rates to start-ups. Increased competition erodes this possibility as banks will no longer be able to charge higher market rates to mature firms.

The final hindrance in this pool of research is the arrangement of financial intermediaries and their prior relationships with existing firms. Banks play a pivotal role in making a choice on which projects to finance and go a long way in monitoring these after funding them. However, as the implied costs of learning and gathering all information relevant to the borrower increase, it undermines the profitability of funding the project in the first place. In this regard, mature organisations enjoy economies to scope due to their size and track record. They can pledge greater collateral in addition to their huge histories of audited financial statements and their ability to support external finance through their retained earnings.

Theoretically one would suggest that banks raise their interest rates to counter the information costs, but practically speaking the costs are not directly transferable as noted by Stiglitz and Weiss (1981). They find that raising the interest charged will lead to a more complicated problem of adverse selection where none but the most ambitious entrepreneurs with very risky projects will meet the banks' loan requests. This poses the banks with greater default probabilities leaving them with a high probability of incurring losses. When this happens, Stiglitz and Weiss (1981) show that theoretically banks may be forced to ration credit as opposed to raising interest rates. However, credit rationing poses more financial constraints on entrepreneurs.

At this point, we turn to another stream of financing that affects entrepreneurship, personal wealth. In many nations, entrepreneurship tends to reward the business owner with wealth that is significantly higher than what formal employment offers. Only 9% of households in the US are entrepreneurs while 39% of total wealth is distributed among these 9%, Gentry & Hubbard (2004). As a result, we find that

more personal wealth increases the propensity for one to become an entrepreneur. This finding is supported by the canonical model developed by Evans and Jovanovic (1989) who investigate the relationship between individual wealth and entrepreneurship. They find that returns to projects are positively related to the amount of capital invested. Now wealthy individuals are expected to supplement borrowed funds with personal funds leaving them with more capital to invest as compared to less wealthy entrepreneurs. This implies that some projects become only profitable to the ones who possess personal wealth as they have more capital to invest (Kerr and Nanda, 2009).

2.4 Entrepreneurship and economic growth

Gartner (1990) centres the debate about what constitutes the nature of entrepreneurship around some eight themes: the individual, innovation, value creation, organisation creation, owner management, making profit, uniqueness and growth. There is ample proof in various academic studies that suggest that economic growth can be attributed an increase in the level of entrepreneurship (Davidsson et al., 2006; Popescu, 2014) and that the two macroeconomic concepts are strongly interconnected. One theoretical model proved that the “emergence of a critical mass of viable ventures may lead to economic development”, (Toma et al. 2014). Economic growth is encouraged by entrepreneurship mainly through an increase in competition as a result of an increase in the number and variety of businesses in an economy. However, since growth in entrepreneurship is strongly influenced by access to suitable and sustainable funding (Somoye, 2013), a link is formed between GDP growth and entrepreneurial growth. The probability of increased economic

development is likely to be accelerated if distortions relating to resource allocation towards SMEs in the financial systems are improved. SMEs have been long identified as an important vehicle through which job creation and accelerated employment can be achieved. Thus SMEs that wish to grow must overcome their unique impediments in order to contribute to society.

2.5 The problems faced by SMEs

The main problems for SMEs as reported by Prelipcean & Boscoianu (2014), are their inability to access funding and their “fragility in a macroeconomic environment dominated by volatility”. According to Aris (2007), these challenges can be largely categorised as lack of adequate finance, proper infrastructure and technology and lack of managerial skills or formal education just to name a few. By their nature, SMEs are not able to provide the necessary collateral that larger businesses have when accessing loans from the banking sector, thus making them the least preferred clients for a majority of banking institutions. Also important to note is that some SMEs are unable to present succinct and convincing business plans required by banks for feasibility assessment.

Peripheral issues such as social perceptions and the attitude towards entrepreneurship also play a role in influencing the sentiment of banks and other intuitions that play a role in apportioning funding resources for new businesses. Policy makers need to double up on their efforts to eradicate the factors that inhibit starting new businesses if they are to succeed in inspiring new generations of entrepreneurs.

The role of finance in promoting the growth in entrepreneurship and SMEs has been the subject of much literature over the past. A broad battery of evidence in the literature suggest that that finance is very essential in entrepreneurship and that entrepreneurial firms are the pillars of many economies and the drivers of economic development and employment (Moreira, 2016; Bellavitis et al., 2017).

Entrepreneurs can finance their business ventures through various avenues namely; personal savings, loans from friends or family, loans from banking institutions, equity finance from angel investors, funding from venture capitalists or grant funding from government support programs. New businesses often experience difficulty in improving their level of productivity, financing their expansion as well as creating innovative projects without the proper access to finance. Access to financing can be considered as a means for the creation of innovative businesses and the sustainability and growth of existing enterprises. However, the problem of lack of access to finance is still pervasive and requires further scrutiny.

Evidence can be found in literature (Rupeika-Apoga, 2014; Bhattacharya and Londhe, 2014) that bank loans are the main source of finance in general for SMEs. Abe, Troilo and Batsaikhan (2015) found that lack of finance is a severe barrier for SME sustainability and expansion and those information asymmetries impede loan applications. Another study done by Fowowe (2017) lends credence to the notion that access to finance is a crucial factor for business growth as demonstrated by data from African countries. The empirical insights provided by these researchers

confirm that finance is a barrier to entry for many an aspiring entrepreneur.

A recent study done on SMEs in Ghana established that access to requisite banking finance increased the likelihood of firms exporting and the contribution of the SMEs to economic growth (Abor et al.,2014). It can be put forward that access to finance can be a significant force that drives entrepreneurship expansion which in turn drives economic growth. According to Fry (1997), the performance of the entrepreneurial sector can be measured by commercial banks as these dominate the financial structures of most developing countries. This therefore cements the view that access to finance for an entrepreneurial firm can be measured by access to bank loans. Ease of access to finance for businesses is of vital importance because the current limited scope of entrepreneurial finance in South Africa will deprive us of the positive effect that it may have on the economy. Thus, focus must be drawn to how these problems can be reduced for sustainable growth of entrepreneurship.

2.6 Finance and entrepreneurship in the South African ecosystem

South Africa has been an entrepreneurial success in sub Saharan Africa and SMEs are an important contributor to its national economy. The government has made headway in overcoming some of the structural and constraints to SMEs through the establishment of various funding programs such as the National Empowerment Fund (NEF) Small Enterprise Finance Agency (SEFA), Industrial Development Corporation (IDC), National Youth Development Agency (NYDA) just to name a few. Further support and ad-hoc funding is also available from various ministries in the local government. Although these initiatives are an improvement, placing South

Africa in 19th place (out of 66 economies) for government policies that offer strong support and priority to entrepreneurship (GEM SA report, 2016/2017), further reforms need to be made to address the persistently low level of total entrepreneurial activity. The latest World Economic Forum's Global Competitiveness Indicator shows that South Africa has regressed 14 positions to 61st place out of 137 economies. Some of the problematic factors for doing business highlighted in the Global Competitiveness Report were corruption, high crime rates and government instability. The GEM provides a more thorough analysis by highlighting some major points such as the level of education, bureaucracy and red tape, dominance of large firms and access to markets. The level of education is especially very poor for black learners and the structure of higher learning institutions is such that it hinders innovation and creativity, resulting in low levels of entrepreneurship activity. In Toma et al., (2014), it is highlighted that certain countries (ie. USA, Israel and UK) that have successfully integrated formal entrepreneurial syllabuses in their schools and universities have reached their entrepreneurial potential.

Elements such as restrictive labour laws make it very difficult for SMEs to thrive bearing in mind that SMEs have to source labour at rates similar to those of large businesses. Aspiring entrepreneurs have to overcome arduous legislation and compliance requirements as well as face the possibility of high tax rates from their revenues once their businesses are operational. Established businesses and even state owned enterprises (SOEs) prefer doing business with suppliers that they have a long history with. Certain sectors such as mining and banking have high barriers to entry leading to concentrated sectors with few dominant firms.

New focus is needed to increase South Africa's global competitiveness and drawing from the above discussions, my research seeks to develop on the above literature by examining the impact that domestic finance has on entrepreneurship in South Africa. This will be useful in assessing where the opportunity gap is in South Africa that can be filled by alternative offerings to stimulate the creation of new businesses. The topic of how this objective was achieved is the subject of the next section.

2.7 Gaps identified in the literature reviewed

In summary, this chapter lays out the main theoretical and empirical findings on the subject. We begin by giving a background on entrepreneurship, which is a word that was borrowed from French to mean the art of mobilising resources to undertake a business project. From this definition follows the need to acquire finance so that the mobilization of resources is possible, which we term 'access to finance' in this research. Different authors such as Cole (1949), Low & MacMillan (1988) and Lumpkin & Dess (1996) all agree that finance is an important ingredient for entrepreneurship to manifest but also argue that it is not easy for entrepreneurs to fund their projects using formal channels such as bank loans. They further argue that this is due to different financial rigidities prevalent across countries.

Another set of authors make similar conclusions but differ in opinion with regards to the sources of the rigidities. Hall (2002); Coad and Rao (2008) and Mazzucato (2013) pin down the problem to the supply of loanable funds. They find that the supply of finance faces structural and cyclical problems. Structural problems are those that are inbuilt in the structure of the financial system of an economy, for

example the presence of information asymmetries. O'Sullivan (2005) supports this finding, particularly the presence of information asymmetries and how they hinder banks' willingness to provide funding for entrepreneurs. Mina et al. (2013) also find that the structural setup of banks do not allow them to willingly fund complex business ventures due to the way their business models are set-up.

On the cyclical side, Archibugi et al. (2013) believe that the process of creative destruction in itself creates cycles in which demand for loanable funds increases and decreases depending on which part of the cycle the economic wheel turns on. For example, periods of new technological findings will result in firms with old or obsolete production methods shutting down or rather updating their machinery which may require huge capital investments. As such, new market entrants will need to raise capital to fund their projects so as to seize the newly created economic business opportunities.

The final set of authors' findings are in line with their colleagues' findings but differ slightly in thought. According to Kerr and Nanda (2009) and Greenwood & Jovanovic (1990), there are rigidities present in capital markets, but however, these rigidities are macroeconomic rather than microeconomic in nature. For example, proponents of structural rigidities believe that the structure of the bank itself hinders access to finance for entrepreneurs while this new set of authors believes issues such as the financial development of the banking sector as a whole is what affects access to finance. They also find empirical evidence that laws governing the securities and financial services of any country also play an important part in the accessibility of finance through their effect on liquidity.

Chapter 3: Research methodology

This chapter presents the methodology we employ to investigate the impact of access to finance on entrepreneurship activities. We ought to say this is a macro-level analysis, in other words historical analysis of access to finance on entrepreneurship activities. The first section of this chapter presents the model and further explains other independent variables that enter the model beside the access to finance variable. The second and the last section of this chapter present the data and sources of the data that we employ for the empirical analysis.

3.1 Empirical model

Before moving to the presentation of the empirical model that we utilise, we first present an overview of how entrepreneurship activity is proxy in the empirical research world. An increasing literature on the impact of access to finance on entrepreneurship activities has suggested that the most used proxy for entrepreneurship activities is self-employment. For instance, Bjuggren et al. (2012) examine self-employment data in the Swedish economy. They argue that entrepreneurship can be measured using many other quantitative proxies rather than self-employment because of its narrow definition. Berthold and Grundler (2012) have also used self-employment to measure entrepreneurship activity. They investigated the relationship between entrepreneurship and GDP growth establishes that self-employment stands as a good proxy for entrepreneurship activity.

Faggio and Silva (2014) investigated self-employment and entrepreneurship in rural and urban areas in UK. Their study establishes a high correlation between self-employment and entrepreneurship. In this study and as commonly used in the

literature, we proxy entrepreneurship activity using self-employment. We follow Somoye (2013) and write the following long run relationship between entrepreneurship activity and a number of macroeconomic variables. The variables that enter the model are log of access to finance $lAFin_t$, real interest rate r_t , log of manufacturing production index $lmpi_t$, the unemployment rate un_t and the log of real gross domestic product $lrgdp_t$. The relationship is illustrated in equation (1) below.

$$En_t = \alpha_0 + \alpha_1 lAFin_t + \alpha_2 r_t + \alpha_3 lmpi_t + \alpha_4 un_t + \alpha_5 lrgdp_t + \mu_t \quad (1)$$

In the empirical literature, all the above variables are justified and constitute majors factors that influence entrepreneurship activity. Access to finance $lAFin_t$ is the major independent variable in the long-run relationship specified in equation (1). At the micro level, the entrepreneurship finance has been extensively investigated and scholars have documented on the relationship between these two variables. Starting from the endogenous growth model of King and Levine (1993), where they provided the theoretical connection between finance, entrepreneurship and economic growth. In their analysis, they argue that financial systems particularly influence entrepreneurs' decisions in productivity enhancing activities. This is because financial institutions play an active and significant role in funding entrepreneurial activities that are productivity enhancing activities.

King and Levine (2013) believe that is the channel by which finance has its dominant effect on entrepreneurship and productivity. Other scholars, especially at the micro-level often argue that, because entrepreneurship at the beginning only concentrate on growth and the fact that they do not have access to capital markets as

established firms do, they are therefore forced to use bank credits which represents a constraint for their growth otherwise. For example Beck & Demirgu-Kunt (2006) investigate how access to finance by SMEs represents a constraint for their growth. They argue that, in the absence of bank credit, firms use leasing and factoring as alternative source of finance. The presence of access to finance in the above long-run relationship is therefore self-justifying. Furthermore, we expect financial deepening to have positive impact on entrepreneurship activity (Bettignies and Brander, 2007). In their study, Bettignies and Brander (2007) analyse data from both developed and developing countries while Berger, Hassan and Klapper (2004) established that an increased overall outflow of bank credit or improved financing to SMEs has a positive effect on economic development.

Audretsch et al. (2001) found that there is a strong link between unemployment and self-employment which indicates that a rise in the level of entrepreneurial activity will result in a reduction of unemployment rate in subsequent periods. According to King and Levine (1993), there is ample proof that links financial systems to growth in the economy. Audretsch and Keilbach (2004) concluded in a study done using data from Germany that there is a positive link between entrepreneurial capital and economic development. An extension of Schumpeter's groundwork suggests that increased entrepreneurship leads to increased productivity of labour and capital as innovators direct resources to high value areas thereby improving industries and lowering prices (De Groot et al., 2004).

Another discouraging factor even though when firms have the possibility to access finance, is the cost of finance, which is the interest payment. Georgiou (2009)

established that higher interest rates are an indirect obstacle to entrepreneurial activity and consequently hamper economic development. Higher cost of capital created by the higher interest rates can discourage financial institutions from extending credit. This exacerbates the problem of access to finance further since most entrepreneurs are credit rationed or denied access to bank credit although they are prepared to pay a premium on credit rates (De Meza & Southey, 1996).

From the economic theory, higher interest rate is negatively associated with the amount of loan taken by an individual, thus in this model, it represents an important factor amongst others. Other macroeconomic variables such as manufacturing production, real gross domestic product and unemployment are encouraging factors as explained by Somoye (2013) and Wennekers and Thurik (1999). Increasing economic activities such as increasing manufacturing production and real domestic product are expected to have positive effect on entrepreneurship; the effect of real domestic product may be ambiguous due the services component of GDP. The following table presents the expected sign of the independent variables.

Table 3 1: Independent variables and their expected signs

Variables	Expected sign
Access to Finance	+
Interest rates	-
Manufacturing Production	+
Real Gross Domestic Product	+/-
Unemployment	+/-

Source: Based on literature

We expect that the deepening of intermediation in the financial sector to improve the level of finance available to entrepreneurs in the market. Greater saturation will

certainly give rise to affordable and competitive product offerings to new businesses. The fiscal effect of low interest rates (and consequently prime rates) will lead to increased borrowing capacity due to lower costs of capital. Unemployment is expected to have an ambiguous effect on the level of entrepreneurial activity. This is due to the refuge effect and entrepreneurial effect presented by Thurik et al. (2008).

The purpose of this study is to investigate the impact of access to finance on entrepreneurship activity in South Africa using time series data. The data we use in this study is time series and requires time series properties investigation. Further down, we presents unit root test model, cointegration model and define the appropriate time series model after unit root and cointegration tests.

3.1.1 Time series properties and the time series model

This subsection presents the time series properties models. First we present how the unit root test is modelled and second the cointegration model. The unit root test allows checking whether the variables in the regression model are stationary. The cointegration test allows us to know whether there is a long-run relationship between the variables. If there is a long run relationship, we therefore employ a vector error correction model to see how adjustment happens in the short run. If no long run relationship is found, we then employ a vector autoregressive model to pine down the short run relationship.

3.1.1.2 Unit root test

Unit root tests go back to Dickey and Fuller (1976), Phillips and Peron (1988). These tests have become an obligation in empirical studies especially in time series data

and panel data with long time component. In testing for unit root in the data, often three different specifications are required. The unit root test without an intercept, with an intercept and with an intercept and a trend. The following equation illustrates the mathematical form of the unit root test.

$$\Delta x_t = \alpha_0 + \gamma x_{t-1} + \beta t + \sum_{j=1}^k \alpha_j \Delta x_{t-j} + \epsilon_t \quad (2)$$

In equation (2) x_t is any of the variables in equation (1) including the dependent variable, but expressed in difference form. The parameter α_0 is the intercept. To perform the unit root test, the null hypothesis is formulated assuming that variable is non-stationary. The alternative hypothesis is to assume that the variable is stationary at level. We reject the null hypothesis when γ is statistically significantly different from zero.

3.1.1.3 Cointegration test and time series model

If the null hypothesis as formulated for the unit root test is rejected, we say that the variable may be integrated of order I (1), in order words, taking the first difference of the level variable should give a stationary series at difference level. There are different methods for testing the existence of cointegration relationship between variables. Granger (1980) cointegration approach is more applicable in two variables model. When the variables in the model are more than two, the Johansen (1988) cointegration model becomes the more appropriate. In our case, the number of variable in our model is more than two and we follow the Johansen cointegration approach. We follow Johansen (1988) and Zou and Wang (2016) and write the cointegration model as follows:

$$\Delta z_t = \mu + \sum_{j=1}^L \Gamma_j \Delta z_{t-j} + \Pi z_{t-j} + \epsilon_t \quad (3)$$

In equation (3) z_t is a L vector of non-stationary variables $I(1)$ while Γ_j and Π are coefficient matrices, but Π contain the statistic of the long-run relationship. The cointegration rank in the Johansen cointegration test is tested using trace statistics and maximum Eigenvalue statistics. As mentioned above, if long run relationship is observed between the variables, we employ error correction model, otherwise we employ vector autoregressive. The model specification is presented in the following equation.

$$\begin{aligned} \Delta En_t = \theta_0 + \sum_{j=1}^n \theta_{1j} \Delta En_{t-j} + \sum_{j=1}^n \theta_{2j} \Delta AFin_{t-j} + \sum_{j=1}^n \theta_{3j} \Delta r_{t-j} + \sum_{j=1}^n \theta_{4j} \Delta mpi_{t-j} \\ + \sum_{j=1}^n \theta_{5j} \Delta un_{t-j} + \sum_{j=1}^n \theta_{6j} \Delta rgdp_{t-j} + \psi ECM_{t-j} + \epsilon_t \end{aligned} \quad (4)$$

Equation (4) is an error correction model because the last term ECM_{t-j} which is an error correction term. It may become a vector autoregressive model depending on the results of the cointegration test. If it turns out that there is no cointegration, then the last term in equation (4) falls off and (4) become an autoregressive model.

3.2 Data

We have explained in section 3.1, what we intend to use as proxy for entrepreneurship activity. Sanyang and Huang (2010) argue that entrepreneurship can be measured in terms of the relative portion of economic activity by small businesses while Carree and Thurik (2002) pointed to self-employment as a proxy. In the literature, self-employment is often used. Studies such as Bjuggren et al. (2012), Berthold and Grundler (2012), Faggio and Silva (2014) have also employed self-employment as a proxy for entrepreneurship activity.

We follow these studies and also proxy entrepreneurship activity using self-employment. Data on self-employment is obtained from the International Labour Organisation database. We proxy the variable access to finance using credit extension. Credit extension is obtained from the South African Reserve Bank (SARB) database. Other macroeconomic variables such as unemployment, real interest rate and real gross domestic product are also obtained from the SARB database. The data is quarterly time series and ranges from 1991Q1 to 2017Q3.

Before presenting the empirical results in the following chapter, we first present the descriptive statistics of the data with graphical illustration. The following chapter therefore presents the empirical results together with the results discussion.

Chapter 4: Empirical results

4.0 Introduction

The structure of this chapter is as follows: the first section presents the descriptive statistics; the second section presents the unit root test and the cointegration tests. The third section presents the parameters estimated while the last section discusses the results.

4.1 Descriptive statistics

Table 4.1 below presents the descriptive statistics of the variables included in equation (1). The variables that compose our model are entrepreneurship activity, interest rate, manufacturing industrial production, unemployment rates and the real gross domestic product. In order to smooth volatility in manufacturing production and the real domestic product and credit extension, we apply log to those three variables.

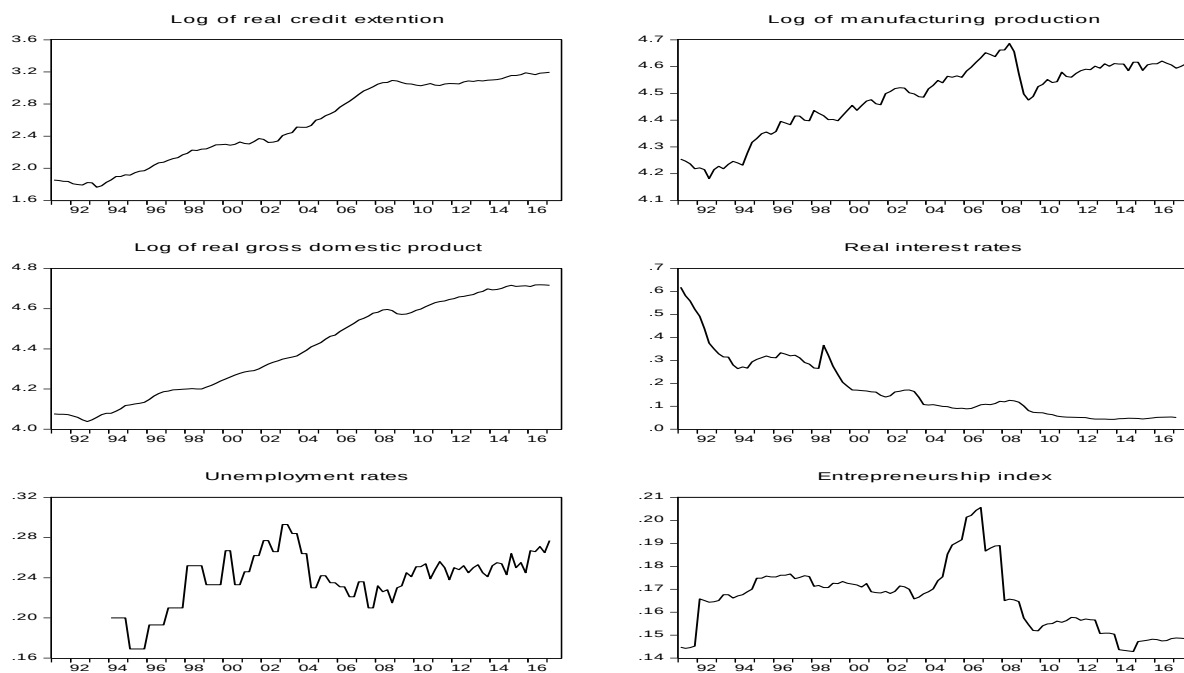


Figure 4.1: Trends of dependent and independent variables

Figure 4.1 shows that the credit extension in South Africa in real term has been growing since 1991. The same upward trending is observed in the manufacturing industries, but the manufacturing production is only growing at a decreasing rate. The real domestic product also shows an upward trend between 1991 and 2017. The real interest rate has been falling since its highest level in 1991. Unemployment has sharply risen between 1998 and 2004 but fell during 2005 and 2007. It has changed direction since the financial crisis of 2008 and still increasing. When we look at the entrepreneurship index, it increases slightly between 1992 and 2004 and rises sharply between 2004 and 2007. But the financial crisis changed the direction of the entrepreneurship index and only now, after 2014 that entrepreneurship has started increasing. Table 4.1 below presents the descriptive statistic while 4.2 presents the correlation between the variables.

Table 4 1: Descriptive statistics

	$lAFin_t$	$lmpi_t$	$lrgdp_t$	r_t	un_t	En_t
Mean	2.65	4.51	4.44	0.14	0.24	0.17
Median	2.68	4.53	4.46	0.11	0.24	0.17
Max	3.20	4.69	4.72	0.37	0.29	0.21
Min	1.85	4.23	4.08	0.04	0.17	0.14
Std	0.44	0.10	0.21	0.10	0.03	0.01
Skew	-0.25	-0.65	-0.15	0.78	-0.63	0.45
Kurt	1.53	2.75	1.55	2.24	3.29	3.04
JB	9.28	6.83	8.52	11.66	6.53	3.18
Obs	93	93	93	93	93	93

In table 4.1 and 4.2, $lAFin_t$ is the log of real credit extension, $lmpi_t$ is the log of manufacturing production, r_t is the real Treasury bill rate, which we use to proxy interest rate, and un_t is unemployment rate while En_t is entrepreneurship index. In table 4.1, the log of access to finance as proxy by credit extension has a minimum of 1.85 billion while the maximum was 3.20 billion. The real interest rate for the period

of study fluctuated for a minimum of 4% and a maximum of 37%. The standard deviation of interest rate is 0.10 for the period of study. Unemployment reach a minimum of 17% while a maximum of 29% was recoded. When it comes to entrepreneurship index, the minimum of the index was 0.14 while the maximum entrepreneurship index was 0.21. The standard deviation of the index was 0.01 while skewness as third moment and kurtosis as fourth moment were 0.45 and 3.04 respectively.

In table 4.2 the values that are not in bracket are the correlation coefficients while the values in bracket are the t-statistic of the coefficients. Table 4.2 shows a high and significant positive correlation between credit extension and manufacturing production, the real gross domestic product and unemployment. Credit extension is however, negatively related to entrepreneurship index and the real interest rate.

Table 4 2: Correlation matrices

Correlation						
	$lAFin_t$	$lmpi_t$	$lrgdp_t$	r_t	un_t	En_t
$AFin_t$	1					
$lmpi_t$	0.89 (-18.83)	1				
$lrgdp_t$	0.99 (68.05)	0.89 (18.86)	1			
r_t	-0.91 (-20.37)	-0.84 (-14.95)	-0.92 (-22.26)	1		
un_t	0.44 (4.68)	0.48 (5.22)	0.46 (4.90)	-0.58 (-6.77)	1	
En_t	-0.49 (-5.31)	-0.20 (-1.99)	-0.52 (-5.88)	0.43 (4.54)	-0.40 (-4.13)	1

Entrepreneurship index is negatively and significantly correlated with manufacturing production, real gross domestic product and unemployment. However it is positively

correlated with the real interest rate. The correlation results as presented in table 4.2 is similar to the one presented in Somoye (2013), except that he finds negative relationship between entrepreneurship index and interest rate while our data depict a positive correlation between these two variables.

4.2 Unit root test

In testing the unit root of the variables as presented in table 4.3 below, we report only the Augmented Dickey-Fuller test. We run the unit root test with intercept, with intercept and trend, and without intercept and trend. We also run the unit root at level and first difference.

Table 4 3: Unit root test results

Variables	Intercept		Intercept & Trend		None	
	Level	1 st Diff	Level	1 st Diff	Level	1 st Diff
<i>lAFin_t</i>	0.70	7.16***	1.13	7.14***	3.49	2.16**
<i>lmpi_t</i>	1.62	8.01***	2.12	8.03***	1.31	7.87***
<i>lrgdp_t</i>	0.64	4.97***	1.75	4.95***	3.35	2.75***
<i>r_t</i>	4.73***	-	4.22***	-	4.47***	-
<i>un_t</i>	2.26	10.63***	2.62	10.57***	0.38	10.63***
<i>En_t</i>	1.52	4.03***	2.48	4.22***	0.24	4.05***

*** 1% significance ** 5% significance, * 10% significance

The results show that the variables except the real interest rate are stationary after the first difference is taken. The real interest rate on the other hand is stationary at level and significant at 1% level of significance. The next section now presents the Johansen cointegration as defined in equation (3) in the methodology section.

4.3 Cointegration test and vec model

Two different cointegration results are presented in table 4.4 and table 4.5. The results in table 4.4 are trace statistics cointegration results and table 4.4 shows cointegration results based on maximum eigenvalue statistics. Table 4.4 indicates six cointegration equations while the eigenvalue indicates only two cointegration relationship. In table 4.4, we see that the computed trace statistics at each cointegration rank level is greater than the critical statistics, which indicates the presence of six cointegration relationship.

Table 4 4: Unrestricted cointegration rank test (trace)

Cointegration equations	Eigenvalue	Trace Statistic	Critical Value	Prob.**
0	0.376165	131.7572	95.75366	0.0000
1	0.294152	90.23268	69.81889	0.0005
2	0.254469	59.57737	47.85613	0.0027
3	0.169309	33.73547	29.79707	0.0167
4	0.119115	17.41173	15.49471	0.0254
5	0.068568	6.250805	3.841466	0.0124

Table 4 5: Unrestricted cointegration test (Maximum Eigenvalue)

Cointegration equations	Eigenvalue	Statistic	Critical Value	Prob.**
0	0.376165	41.52455	40.07757	0.0341
1	0.294152	30.65531	33.87687	0.1156
2	0.254469	25.8419	27.58434	0.0821
3	0.169309	16.32374	21.13162	0.2065
4	0.119115	11.16092	14.2646	0.1463
5	0.068568	6.250805	3.841466	0.0124

In table 4.5, the result is different and only two maximum eigenvalue statistics are greater than the critical statistics, which indicate two cointegration relationships. In order to confirm the number of cointegration equation, we estimate the vector error

correction which is presented in table 4.6 below.

Table 4 6: Error correction results

Error correction	$d(En_t)$	$d(lAFin_t)$	$d(lmpi_t)$	$d(lrgdp_t)$	$d(r_t)$	(un_t)
Coefficients	-0.02	-0.14	0.14	-0.02	-0.01	0.06
Standard errors	0.01	0.04	0.04	0.01	0.03	0.03
t-statistics	[-2.62]	[-3.48]	[3.87]	[-1.85]	[-0.18]	[2.31]

In table 4.6 above, we notice that the coefficients under entrepreneurship index and access to finance are negative and significant at 5% and 1% respectively. This implies that the maximum eigenvalue result of two cointegration relationship is confirmed. Further, we may say with certainty that there is a long run relationship between entrepreneurship activity and other variables or access to finance and other variables. The causal relationship runs from manufacturing production, real gross domestic product, real interest rate and unemployment rate to entrepreneurship or access to finance.

4.4 Regression estimates

The major focus of this study is to investigate whether access to finance by entrepreneurs has or has no impact on entrepreneurship activity. In order to test that, the long run regression estimates are presented in table 4.7

Table 4 7: Long run regression estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$lmpi_t$	0.19	0.02	11.12***	0.0000
$lrgdp_t$	-0.21	0.03	-7.51***	0.0000
$lAFin_t$	0.03	0.01	2.62**	0.0103
un_t	-0.23	0.04	-6.36***	0.0000
r_t	-0.09	0.02	-4.05***	0.0001
R-squared	0.759609			
Adjusted R-squared	0.745794			
Prob (F-statistic)	0.0000			

Table 4.7 above shows the long run results estimates. It shows that log of manufacturing production is positive and significant at 1% level while the real gross domestic product is negative and significant at 1% level of significance. The real interest rate and unemployment rate are both negative and significant at 1%. Access to finance variable is positive and significant at 1%. In order to confirm the long run relationship between access and entrepreneurship index as the focus variables in our model, we perform a granger causality test to check whether the relationship between access to finance and entrepreneurship activity is bi-directional. The result for the granger causality test is presented in table 4.8 below.

Table 4 8: Granger causality test

Null Hypothesis	F-Statistic	Prob.
Access to finance does not cause entrepreneurship	3.67295	0.0290
Entrepreneurship does not cause access to finance	9.47311	0.0002

Table 4.8 shows that, the probabilities associated with each null hypotheses are both less than 5%. This implies that we can reject the null hypotheses and conclude that the relationship between access to finance and entrepreneurship activity is bi-directional.

4.5 Results discussion

The objective as set in the first chapter of this paper is to investigate the impact of access to finance on entrepreneurship at a macro level. The topic has been extensively investigated at the micro level while macro level analysis is still limited. This paper explores this gap by providing empirical evidence on the topic using times series macroeconomics model. The first part of the empirical results presents the cointegration relationship between entrepreneurship activity and access to finance.

The Johansen (1988) cointegration test based on trace statistics reveals 6 cointegration relationships. On the other hand, the maximum eigenvalue result shows two cointegration relationships. In order to confirm the cointegration relationship, we run the error correction model, which reveals two cointegration equations.

The first cointegration is between entrepreneurship activity and the dependent variables. The second cointegration relationship is between access to finance and the independent variables including entrepreneurship activity. The speed of short run adjustment when entrepreneurship is considered is -0.02 with t-statistics equal to -2.62 while the speed of short run adjustment when access to finance is considered is -0.14. We can see that disequilibrium in the short run when access to finance is considered is 7 times faster than when entrepreneurship is considered. In order to confirm the direction of causality between entrepreneurship activity and access to finance, we perform the granger causality test between entrepreneurship activity and access to finance. The results indicate a two-way relationship between entrepreneurship and access to finance.

We further present the long run regression estimate in table 4.6. The results show that all the variables included in the model are statistically significantly different from zero. Access to finance is positive and significant at 1%. This implies that, in the long run, a well-established financing system that channels funds from surplus units to the deficit units will enhance entrepreneurial development in South Africa. This result is confirmed by Somoye (2013) in Nigeria but South Africa is a multiracial country and an aggregate impact may not be the true reflection of the microeconomic impact. At

the micro level one may find that credit extension play no significant role due to wealth concentration. Given this, a good future study would be to investigate whether the macroeconomic effect of access to finance reflects the microeconomic impact on entrepreneurship.

This empirical analysis also reveals that industrial production has a positive and significant effect on entrepreneurial activities while the gross domestic product is negative but significant. The sign of the real GDP is in line with our predicted sign. The industrial production is the reflection of the productive sector. The increase in industrial production from economics theory may be analysed from two angles. It is whether the increase in production is generated by old firms or new firms that enter the market because of profitability opportunities. If new firms enter the market because of new profitability opportunities, this therefore is an event that emanates from entrepreneurial actions. If the increase in industrial production comes from the existing firms, entrepreneurial activities will increase because the existing may be forced to require new services such as inventories management. The impact of the real domestic product was predicted to be positive or negative. This is because the gross domestic product account for the productive sector output (manufacturing and machinery) and services sector such as banks. On the other hand, increase in the real domestic product may signals job opportunities than entrepreneurial opportunities. If the later happens, the gross domestic product will therefore have a negative impact on entrepreneurial activities. The impact of unemployment on entrepreneurship is well documented in the literature. In this study, we found a significant but negative relationship between entrepreneurship activities and unemployment.

For example, Baptista and Preto (2007) study the dynamics and the causal relationship that exists between entrepreneurship and unemployment. They argue that, higher unemployment is a source of motivation for new business start-up and higher start-up rate and self-employment contribute to economic restructuring. They use vector autoregressive model (which is similar to the one we adopted in this paper) and find an ambiguous relationship between entrepreneurship and unemployment. The ambiguity implies that unemployment may be positive or negatively related to entrepreneurship. They further pointed out that, the results is robust to proxies of entrepreneurship. The work of Thurik et al. (2008) reveals that the impact of unemployment on self-employment is deemed to be “refugee effect” or entrepreneurial effect. According to Thurik et al. (2008), refugee effect reflects a positive relationship between unemployment and entrepreneurship while entrepreneurial effect reflects a negative relationship. Our finding in this paper is more in support of the entrepreneurial effect. Finally, interest rate in our model is negative and significant, but this, from theoretical relationship between economic activities and interest rates, is consistent.

Chapter 5: Summary, conclusions and recommendations

5.0 Introduction

This chapter summarises the findings in this paper and gives suggestions for future works. The first part of the concluding chapter presents the objective and the research problem, the second part summarises the findings in the literature reviews and the third part conclude by pointing at some limitations and recommendations.

5.1 Summary of findings

The objective as set in the introductory chapter was to investigate the impact of access to finance on entrepreneurship activity. South Africa as one the countries with the strongest financial system in Africa has been experiencing serious problems with adequate policies to finance entrepreneurship in order to reduce the high level of unemployment. In order to address the problem of entrepreneurship finance in South Africa, this paper looks at the issue from a macroeconomics point of view. Further, the hypothesis we formulated to address entrepreneurship finance is stated as follows: "Access to finance has no significant impact on entrepreneurship activity". Because the literature from the microeconomic point of view has provided empirical evidence, we tackle entrepreneurship finance in this paper from a macroeconomics perspective.

From theoretical and empirical points of view, different authors such as Cole (1949), Low and MacMillan (1988) and Lumpkin and Dess (1996) all agree that finance is an important ingredient for entrepreneurship to manifest but also argue that it is not

easy for entrepreneurs to fund their projects using formal channels such as bank loans. They further argue that this is due to different financial rigidities prevalent across countries. Another set of authors make similar conclusions but differ in opinion with regards to the sources of the rigidities. Mazzucato (2013), Hall (2002) and Coad and Rao (2008) pin down the problem to the supply of loanable funds. They find that the supply of finance faces structural and cyclical problems. Structural problems are those that are inbuilt in the structure of the financial system of an economy, for example the presence of information asymmetries.

In order to empirically test the effect of access to finance using macroeconomics data in South Africa, we utilize time series regression model to investigate the long run relationship and the causal effect of access to finance on entrepreneurship activity. We find that in the long run, access to finance has a positive and significant effect on entrepreneurship while the causal relationship between entrepreneurship and access to finance is bi-directional. That is a well established finance system that favors access to finance by entrepreneurs will have a positive impact on entrepreneurship in the long run. On the other hand, when entrepreneurship is motivated by government policies and external factors such as unemployment, this will in the long run create businesses and make it easy for the financial system to adapt and provide finances to the deficit units. The others macroeconomics variables in our model are all significant. Similarly to Thurik et al. (2008), we find that the relationship between unemployment and entrepreneurship is of an entrepreneurial effect type, which implies that there is a negative relationship between unemployment and entrepreneurship in South Africa for the period we considered.

5.2 Recommendations

This study has come to the conclusion that access to finance in the long run has a positive and a significant impact on entrepreneurship activity. However, given the aggregate nature of the evidence that we provided and given the fact that credit extension to the private sector is used as a proxy for access to finance, we advise that readers be critical and take the results in this study as a basis for future research and for more disaggregated empirical investigation.

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