Analysis of the Relationship between Business Cycles and Bank Credit Extension:

Evidence from South Africa

By

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ABSTRACT

This study provides evidence of the relationship between bank-granted credit and business cycles in South Africa. The study is conducted in three phases, namely qualitative research (Phase I), quantitative research (Phase II) and econometric analysis (Phase III). A sequential (connected data) mixed methodology (Phase I and II) is used to collect and analyze primary data from market participants. The qualitative research (Phase I) involves structured interviews with influential or well informed people on the subject matter. Phase I of the study is used to understand the key determinants of bank credit in South Africa and to appreciate how each of the credit aggregates behaves during alternate business cycles. Qualitative survey results suggest key determinants of commercial bank credit in South Africa as economic growth, collateral value, bank competition, money supply, deposit liabilities, capital requirements, bank lending rates and inflation. The qualitative results are used to formulate questions of the structured survey questionnaire (Quantitative research- Phase II). The ANOVA and Pearman's product correlation analysis techniques are used to assess relationship between variables. The quantitative results show that there is direct and positive relationship between bank lending behavior and credit aggregates namely economic growth, collateral value, bank competition and money supply. On the other hand, the results show that there is a negative relationship between credit growth and bank capital and lending rates. Overall, the quantitative findings show that bank lending in South Africa is procyclical. The survey results indicate that the case for demand-following hypothesis is stronger than supply-leading hypothesis in South Africa.

The econometric methodology is used to augment results of the survey study. Phase III of the study re-examines econometric relationship between bank lending and business cycles. The study employs cointegration and vector error correction model (VECM) techniques in order to test for existence of long-run relationship between the selected variables. Granger causality test technique is applied to the variables of interest to test for direction of causation between variables. The study uses quarterly data for the period of 1980:Q1 to 2013:Q4. Business cycles are determined and measured by Gross Domestic

Product at market prices while bank-granted credit is proxied by credit extension to the private sector. The econometric test results show that there is a significant long-run relationship between economic growth and bank credit extension. The Granger causality test provides evidence of unidirectional causal relationship with direction from economic growth to credit extension for South Africa. The study results indicate that the case for demand-following hypothesis is stronger than supply-leading hypothesis in South Africa. Economic growth spurs credit market development in South Africa.

Overall, the results show that there is a stable long-run relationship between macro-economic business cycles and real credit growth in South Africa. The results show that economic growth significantly causes and stimulates bank credit. The study, therefore, recommends that South Africa needs to give policy priority to promotion and development of the real sector of the economy to propel and accelerate credit extension. Economic growth is considered as the significant policy variable to stimulate credit extension. The findings therefore hold important implications for both theory and policy.

Key words: *Bank Credit, Business Cycles, Credit Extension, Cointegration, Correlation, Economic Growth, Granger Causality, Procyclicality, Vector Error Correction Model.*

DECLARATION

I declare that ***"Analysis of the Relationship between Business Cycles and Bank Credit Extension: Evidence from South Africa"*** is my own work and that all sources that I used or quoted have been indicated and acknowledged by means of complete references. This thesis has not been submitted in part or full for any degree or for any other qualification at another university.

   Goodman Chakanyuka   30 June 2015

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ACRONYMS

ADF:	Augmented Dickey-Fuller
AIC:	Akaike Information Criteria
ANOVA:	Analysis of Variance
ARDL:	Autoregressive Distributed Lags
BCI:	Business Cycle Indicator
BIS:	Bank of International Settlement
CADQAS:	Computer-Assisted Data Qualitative Analysis Software
CPI:	Consumer Price Index
DEP:	Deposit Liabilities
ECM:	Error Correction Model
FAVAR:	Factor-Augmented VAR
GDP:	Gross Domestic Product
IMF:	International Monetary Fund
M3:	Broad Money Supply
NEER:	Nominal Effective Exchange Rate
OECD:	Organization of Economic Cooperation and Development
PP:	Phillips Perron
PSCR:	Private Sector Credit
SARB:	South African Reserve Bank
SIC:	Schwartz Information Criteria
SPSS:	Statistical Package for Social Sciences
SVAR:	Structural VAR
VAR:	Vector Auto-regression
VECM:	Vector Error Correction Model

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CHAPTER ONE
INTRODUCTION

1.1 Orientation

Almost all major landmark events in modern history have been associated with a financial crisis (Jorda, Schularich & Taylor, 2011). Since the beginning of the global financial crisis in 2007-2009, there has been a renewed interest on the linkage of financial markets and real economy as well as its implications towards the design of monetary and fiscal policies. In particular, there is a surge in macroeconomic literature relating to business cycles and the role of credit shocks on economic dynamics, both theoretical and empirical (Ramirez, 2013; Rannenberg, 2012). In its Global Financial Stability report, IMF (2010) argues that losses incurred by banks caused a contraction in credit supply which in turn contributed to the economic downturn in the United States and beyond. Economic boom and bust cycles are interestingly familiar to countries across the world and likely to persist into the foreseeable future (IMF, 2010). What happens to bank lending behavior over these cycles? This study analyzed business cycle episodes in South Africa and attempted to establish the link between economic growth patterns and changes in bank lending behavior.

The lending activity of commercial banks has long received considerable attention as an important contributor to the performance of the economy. This attention has perhaps, become sharper in the wake of the difficulties experienced by the banking industry in the 1980s and since 2008 (Berlin, 2009). According to Weinberg (1995), the public perception of bank lending seems to continuously have changed from one extreme to the other, that is, the credit markets either experiencing a credit boom or credit crunch. In the early 1990s, the predominant and prevailing view was that the bank loan market was 'short' experiencing a credit crunch in which banks set '*unreasonably*' high credit standards denying credit to qualified borrowers (Owens & Schreff, 1995). With growth in bank loans picking up geometrically by late 2008, some expressed concerns that banks were possibly becoming '*too loose*' in their standards for acceptable credit risk (The American Banker, 2009; SARB, 2010, FinWeek, 2008). Is there any good reason why

"banks are at times *too stringent* and at other times *too lax* in their lending" asked Berlin (2009: 1)?

There is vast and wide literature on the relationship between credit and economic growth. However, although many studies have found an association between both variables, "the direction of causality remains an issue of debate" (Gantman & Dabos, 2012: 1). As cited in Calderon and Liu (2003), the theoretical foundation of this relationship can be traced as far back to the work of Schumpeter (1911) and later McKinnon (1973) and Shaw (1973). Does financial development promote economic growth, or does economic growth propel financial development? Patrick (1966) labelled the possible directions of causality between economic growth and financial development as the supply-leading and demand-following hypotheses.

The '*supply-leading*' hypothesis posits a causal relationship from financial development to economic growth, through efficient allocation of financial resources to more productive sectors. Cited in Unalmis (2002: 2), Patrick explains the functions of the supply-leading phenomenon as follows: "to transfer resources from the traditional, low-growth sectors to the modern, and high- growth sectors and stimulates an entrepreneurial response in these modern sectors." Many recent research works support the view that credit spurs economic growth (Evans, 2013; Lahura, 2011; Odhiambo, 2007; Habibullah & Eng, 2006; Ghirmay, 2004). In the second pattern suggested by Patrick (1966), called '*demand-following*' hypothesis, economic growth creates demand for financial institutions and services and the financial system simply responds to these demands. According to this strand of literature, financial development follows economic growth or "where enterprise leads, finance follows" (Esso, 2010: 36). In other words, the demand for financial services increases in tandem with the expansion of the real sector of the economy. Empirical support for this view can also be found in recent studies (Murty, Sailaja & Demissie, 2012; Pradhan, 2009; Sindano, 2009). According to this view, the lack of financial institutions in some less developed countries is simply a testimony of the lack of demand for their products and financial services, in particular credit demand (Calderon & Liu, 2003).

In between the supply-leading and demand-following continuum, there are other frequently mentioned views. Apergis, Filippidis and Economidou (2007), for example, argue that there is a mutual impact between bank credit and economic growth. The second view postulates that there is no relationship between bank credit and economic growth. Lucas (1998) in Esso (2010) dismisses finance as an 'over-stressed' determinant of economic growth, or in other words, credit availability and real economic activity are not causally related.

Policymakers and academics closely follow and monitor developments on the credit markets because of the adverse economic effects that often follow episodes of credit booms (Mendoza & Terrones, 2008). To guarantee macro and financial stability, it is imperative to understand whether, and to what extent, banks are affected by the fluctuations of the macro-economic environment. Quagliariello (2007) argues that on the one hand, if the business cycle does influence banks, financial surveillance may need to be strengthened during recessionary phases, when banks are likely to be more fragile. On other hand, if the response of banks to macro-economic shocks exacerbates the effects of the downturn, it would be appropriate to establish rules aimed at reducing the pro-cyclicality of bank operations (Quagliariello, 2007). The cause-and-effect equation of bank-granted credit needs to be understood by policymakers because the pattern of lending may impact the business cycle and therefore the economic growth of the country (Fourie, Botha & Mears, 2011). The main question that this research sought to answer was what is the causal relationship between business cycles and bank credit extension?

This study investigates and quantifies the causal relationship between business cycles and bank lending in South Africa for the period 1980 to 2013. As argued by Akinboade and Makina (2009), this issue is important because there are variations in bank lending patterns which may coincide with particular business episodes with attendant effect on economic growth of the country. South Africa might offer an ideal case study for an investigation of this nature because of its volatile history both politically and economically (Akinboade & Makina, 2009). The country has gone through many

structural changes since the 1970s. Unlike other countries, it has a fairly developed banking sector that is comparable to the developed countries. This is the rationale of giving an overview on the business cycle episodes and cyclical movements in the banking industry in South Africa in section 1.2 below.

The purpose of this study was to provide further evidence of the relationship between bank lending and macroeconomic business cycles in South Africa. To analyze this relationship, this study used both primary data and secondary data. Both qualitative and quantitative methods were used to analyze survey data. In addition, econometric methods were used to analyze time series data. These models will assist key stakeholders and market participants to understand the nature of the relationship and the direction of causality between business cycles and bank-granted credit. The Augmented Dickey-Fuller (ADF) and Phillips- Perron (PP) models were used to test for stationarity while the long-run relationship was examined through the cointegration test. Finally the direction of causality was examined using the Error Correction Model (ECM) and the Granger Causality test. This study covered the period 1980: QI to 2013: QIV for South Africa.

In literature, there have been three approaches in testing the causal relationship between bank-granted credit and macroeconomic business cycles and these approaches were summarized in Unalmis (2002). One approach is to test the hypothesis on a group of countries using either cross-section or panel data techniques (King & Levine, 1993; Levine, 2002). Another approach is to present industry-level or firm level evidence that measures this correlation (Demirguc-Kunt & Maksimovic, 1998). The third approach is to test the hypothesis for a particular country using time series techniques (Kar & Pentecost, 2000), which is also the approach used in this study.

1.2 Overview: Business Cycle and Credit Cycle Episodes in South Africa
This section of the study presents an overview of the business cycle and banking cycle episodes in South Africa since 1980.

1.2.1 Business Cycle Episodes in South Africa

a) Upward and Downward Business Cycles

As documented in Bosch and Ruch (2012), since 1946, the South African Reserve Bank (SARB) has used various methods to determine the upper and lower turning points of South Africa's business cycles. Venter (2011) explains that the first method involves the calculation of the composite leading and coincident business cycle indicators. According to Venter and Pretorious (2001), leading indicators change direction ahead of business cycle turning points while coincident indicators move more or less in conjunction with the business cycle. The second set of calculations involves a composite index commonly known as the current diffusion index. The third method, known as the historical diffusion index, is defined as a measure of dispersion of the changes in a number of time series during any particular period (Venter, 2011; Akinboade & Makina, 2009).

Table 1.1: Business Cycle Phases of South Africa Since 1981

Business Cycle	Downward Phase	Length (Months)		Upward Phase	Length Months
1	1981:09-1983:03	19		1983:04-1984:06	15
2	1984:07-1986:03	21		1986:04-1989:02	35
3	1989:03-1993:05	51		1993:06-1996:11	42
4	1996:12-1999:08	33		1999:09-2007:11	99
5	2007:12-2009:08	21		2009:09-2013:12	52 *plus**

Source: SARB Quarterly Bulletins and Author's own calculations.

* Since upward phase did not end in December 2013, this figure may not fully explain the situation.

South Africa experienced 15 business cycles between World War II and December 2014 and measuring the business cycle from peak to peak, the country is in the upward phase of the fifth business cycle since the early 1980s (SARB, 2014). Table 1.1 presents business cycle phases of South Africa as categorized by SARB for the period 1980 to 2013.

As noted by Akinboade and Makina (2009), since the end of the Second World War, downward and upward phases averaged 20.4 months and 25.6 months in duration respectively. Table 1.1 above shows that during 62.6% of the period, South Africa mostly experienced economic upswings, the rest being economic downturns. Laubscher (2004) observes that in this era of globalization, South African economy is not decoupled from the developments in the rest of the world. The domestic business cycle is synchronized with international business cycles. Laubscher (2004: 26), in Khomo and Aziakpono (2007), argues "as a supplier of commodity inputs to the major industrial countries, business cycles developments in those countries were rapidly transmitted to South Africa."

In the early 1990s, South Africa's business cycle was characterized by a protracted economic downturn of 51 months in length. This was followed by an upturn that commenced ahead of the historical April 1994 general elections (Khomo & Aziakpono, 2007). It lasted a total of 42 months. The recession which followed was equally long and lasted 33 months. According to Venter (2011), the most recently identified peak in the business cycle occurred in November 2007, ending a 99 months upswing; the longest upward phase of the South African business cycle on record. Throughout 2006 and 2007, domestic price pressures steadily mounted as energy and food prices increase were exacerbated by the exchange rate depreciation that occurred from April 2006. Against the backdrop of these developments, the upward phase came to an end and South African economy eventually entered a downward phase of business cycle in December 2007. This particular downturn lasted 21 months. The current upward phase in the South African business cycles started in September 2009 (SARB, 2012).

b) Trends in Domestic Output

Having recorded a peak growth rate of about 5% in the second quarter of 2002, real output growth in South Africa decelerated progressively in the subsequent quarters of 2003, bringing growth rate in the second quarter to a mere half a percent. Year on year growth averaged 3.1% in 2003. Economic growth trend between 2000 and 2012 is depicted in Figure 1.1 below.

Figure 1.1: Real Gross Domestic Product Change: Percentage Change from quarter to quarter (%)
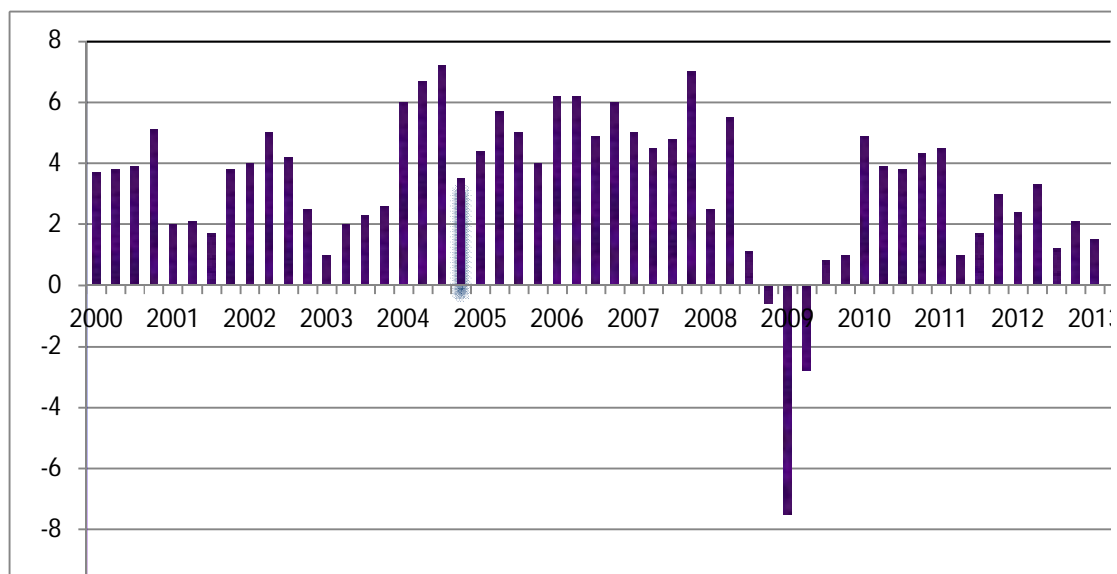
Source: Derived SARB (Quarterly Bulletins, Several Years)

The sluggish performance of the economy in 2003 reflected still subdued conditions in many parts of the economy. Although world growth had started to pick up, the recovery was not evenly distributed. While growth figures from the US were high, signs of recovery in the Euro area, which is South Africa's major trading partner, remained tentative (SARB, 2004). This contributed to the weakness evident in South Africa's exports and the lack of buoyancy in the domestic production side of the economy.

Economic growth was on an upward trend from 2004 to 2006. Real economic growth for 2006 was revised upwards to 5.4%, a rate previously encountered in 1981 (IMF, 2008).

Growth in the first three quarters of 2007 fell marginally below that rate. Growth in real GDP accelerated to 5.0% in the third quarter of 2007 from an annualized rate of 4.5% in the second quarter. This was the result of stronger growth in the real output of both the primary and tertiary sectors. Third quarter growth in the secondary sectors was substantially slower compared with growth recorded in the second quarter of 2007.

Following four years of robust economic growth fluctuating around 5% per annum, real economic activity expanded at a notable slower pace in the first half of 2008. The moderation in growth to below the country's estimated potential value of output growth could mainly be attributed to severe electricity supply constraints in an environment of softening global and domestic demand (SARB, 2012). A slowdown in consumer demand was registered in 2007 and in the first half of 2008, but output nevertheless kept growing at a fairly brisk pace throughout this period. This performance was in part due to robust demand for South African exports towards the end of 2007 and in the first half of 2008.

According to Venter (2011), the global recession that originated in the developed economies in the second half of 2008, amplified by the failure of Lehman Brothers in September of that year, spread rapidly to emerging market economies. The global recession was transmitted to developing countries, mainly through plummeting demand for their exports. This resulted in sharp output contractions, falling commodity prices and confidence levels and in employment losses. As a commodity exporting country South Africa was no exception (SARB, 2011).

The South African economy recorded another negative real growth rate in the second quarter of 2009; the third successive quarterly contraction (SARB, 2009). However, the pace of contraction in the first quarter of 2009 had been worse than in the second quarter, suggesting a moderation overtime of the recessionary forces in the economy. Real output growth remained weak in the second quarter of 2009. Having declined at annualized rate of 1.8% and 6.4% in the preceding quarter, real GDP contracted at a rate of 3% in the second quarter of 2009. Stimulus monetary and fiscal policies were pursued by the South African authorities in an attempt to support domestic demand. These efforts were

reinforced by similar policies elsewhere in the world, which indirectly started to stabilize demand for South African exports (1MF, 2010).

During 2009, the world economy began to emerge from the widespread recession that began in the later part of 2008. Notwithstanding the acceleration in quarter-to-quarter growth in the fourth quarter of 2009, real GDP in South Africa still shrank by 1.8% in 2009 as a whole, compared with a growth of 3.7% in 2008. This was the first contraction in real gross domestic product on an annual basis to be recorded since 1992 (IMF, 2010).

The global economic recovery continued in 2010, characterized by a considerable degree of divergence in economic performance and policy direction between countries and country groupings. Emerging market economies continued to record stronger economic growth than developed countries (World Bank, 2012). The South African economy expanded robustly in the fourth quarter of 2010 as real GDP accelerated from an annualized rate of 2.7% in the third quarter to 4.4% in the fourth quarter. However, for 2010 as a whole, real output increased at a rate of 2.8% following a decline of 1.8% in 2009 (SARB, 2011). The stronger growth in the fourth quarter mainly reflected a rebound in the real value added by the secondary sector alongside stronger growth in the real value added by the tertiary sector.

 The pace of economic recovery in the advanced economies slowed considerably in 2011 as confidence was impaired by the intensification of the fiscal credibility crisis in the Euro area and uncertainty about the raising of the debt ceiling in the US (The Economist, 2012). Following fairly sluggish growth in the middle quarter of 2011, economic activity in South Africa picked up pace in the fourth quarter of 2011-real GDP nearly doubled from annualized rate of 1.7% in the third quarter of 2011 to 3.2% in the final quarter. The buoyancy of real output in the fourth quarter of 2011 largely reflected the normalization of production in mining and manufacturing following the disruptive impact of industrial action in the preceding quarter. Underpinned by a steady expansion in activity in the services sector of the economy throughout 2011, real GDP increased by 3.1% in the year as a whole (SARB, 2012).

Domestic growth prospects remained subdued notwithstanding a better-than-expected fourth quarter GDP growth outcome and positive developments in the mining and manufacturing sectors in January 2013. The economy grew by 2.5% in 2012, having recorded an annualized growth of 2.1% in the fourth quarter despite a 9.3% contraction in the mining sector (SARB, 2013). Despite the improved performance in the fourth quarter of 2013, aggregate domestic product for the year as a whole increased by a paltry 1.9%, reflecting among other factors the adverse impact of sporadic labor disruptions in several sectors of the economy, subdued business and consumer confidence levels, structural impediments hampering production and ongoing subdued global economic conditions (SARB, 2014). Growth in real GDP in 2013 was, with the exception of 2009 when GDP contracted, the lowest in 15 years.

1.2.2 Banking Cycle Episodes in South Africa

Akinboade and Makina (2009), note that as a result of successful liberalization of the financial markets, the South African banking industry went through major structural changes. As outlined in Figure 1.2 overleaf, the South African banking sector went through eight stages between 1999 and 2013.

From late 1999 to 2002, the banking sector went through very challenging times and the country experienced a severe banking crisis. During this period, South Africa experienced Stage 1 of the cycle, that is, a banking crisis stage. To ameliorate the severity of the crisis, regulators implemented several remedial actions, and the end result was restoration of stability in the banking sector, a typical feature of Stage 2 of the cycle. Naturally, during Stage 3, many banks became more prudent and extra cautious. Banks introduced different measures to respond to the challenging environment. Some of the survival strategies implemented by banks include rightsizing of businesses, cost cutting and cost containment, and review and strengthening of risk-management practices among other things (SARB, 2005). The country experienced a severe credit crunch during that period.

Figure 1.2: Banking Cycle Episodes in South Africa

Source: Derived from Akinboade and Makina (2009) and SARB (Several Years)

The economy started improving from 2004 and a significant growth in stock market was recorded. This is clear evidence that the banking sector was going through Stage 4 of this cycle during that period. Improvement in the macro-state incentivized banks to liberalize their risk management policies. The trend in loan growth was upward from 2004 onward, which is characteristic of Stage 5. In fact, South Africa experienced a credit boom during that period as banks increased their lending volumes.

Improved operating environment, excess liquidity and investment optimism attracted some local and international players to participate in the vibrant sector. This is typical of Stages 6 and 7 of the banking cycle. However, increased competition meant squeezed margins and deterioration in quality of the loan book. Not surprisingly, South Africa experienced Stage 8 of the banking cycle, which is, overheating of the economy. Growth in money supply and credit extension by banks moderated somewhat in 2007 before slowing more meaningfully in 2008 and 2009. Impaired advances increased notably and domestic bank profits came under pressure (SARB, 2011).

Fluctuations in the banks' ability or willingness to extend credit may lead to some swings in bank lending behavior. Such type of lending, however, may not be in line with financing needs of the real sector of the economy. If not properly managed, the volatility in lending patterns may even aggravate the cyclical nature of the economy, leading to a pro-cyclical lending practice. According to Akinboade and Makina (2009) a major concern of policymakers is to understand the ways that changes in the banking industry, such as those depicted in Figure 1.2 and in the patterns of firm finance may alter their ability to control or even predict business cycle fluctuations. From the point of view of macro-economic stability, it is important to prevent the two extreme cases of pro-cyclicality; 'credit crunch' and 'lending boom' (Fourie *et al*., 2011).

1.3 Background and Problem Statement

The speed, severity and geographic reach of the credit crisis of 2007-2009 have renewed the prominence of credit in the rhythm of business cycles (BIS, 2011; Fourie *et al*., 2011; Rose & Spiegel, 2009). Before the credit crisis, the role of credit had largely been neglected in monetary policy making (Xu, 2012; Rannenberg, 2012). But crises also offer opportunities. According to Rannenberg (2012), it is now well understood that the interactions between the financial system and the real economy are a weak spot of modern macroeconomics. The ultimate outcome from empirical literature on bank credit channel is clearly articulated in a recent study of the Basel Committee on Bank Supervision. After reviewing the literature, the Committee concluded as follows:

".... A key gap in our knowledge is on the influence of lending on real economic activity [and vice versa]. Specifically, while there is a sizeable body of research on the question of how bank balance sheet positions influence lending, there is significantly less research on the question of how lending affects real activity....." (BIS, 2011: 39).

Researchers and policymakers alike have been left searching for clearer insights (Jorda *et al.,* 2011). In its Global Financial Stability Report, the International Monetary Fund (IMF) argues that the losses incurred by banks caused a contraction in credit supply which in turn contributed to the economic downturn in the United States and beyond

(IMF, 2010). These developments have revitalized investigations into the possibility that changes in the supply of credit can amplify the macroeconomic cycle and potentially increases systemic risk. In response to the global crisis, there have been worldwide calls for appropriate policy interventions (Aikman, Haldane & Nelson, 2011). Evaluating advantages and justifications of these proposals requires full comprehension of causes of and the link between business cycles and credit cycles, which as yet, appear not to having been thoroughly investigated, especially in the developing world.

The question of the direction of causality between economic growth and credit extension "has not been adequately addressed" (Basurto, Goodhurt & Hofman, 2006: 476). Several studies have examined the linkages between bank credit and economic growth (for example Rannenberg, 2012; Fourie et *al.,* 2011; Armistead, 2009; Dell' Ariccia, Igan & Laeven, 2009, Bordo & Haubrich, 2009; Kiyotaki & Moore, 1997 and Bernanke & Lown, 1991). The results have been mixed and conflicting. Moreover, most of these studies have been done in developed countries such as the United States, Canada and Australia. Studies on developing countries like South Africa are limited and fragmented (Fourie *et al.,* 2011; Akinboade & Makina, 2009; Dlamini, 2008; Khomo & Aziakpono, 2007). Researches carried out by Fourie e*t al.,* (2011) and Odhiambo (2004) suggest further research is required on this topical issue and further to compare South African situation to global business cycles.

Clearly, there is theoretical and empirical curiosity in terms of finding the exact nature of the relationship between the financial sector and real economy. Based on the abovementioned, the problem statement of this study was given in the form of a research question as follows: "What is the nature and causal relationship between business cycles and bank credit extension?" In other words, the crucial question, therefore, is whether bank credit market development precedes or follows economic growth in both good and crisis times?

In order to answer this question, responses to the following sub-questions were required:

i. What are the key determinants of bank credit growth in South Africa and how do the different credit aggregates behave during alternate business cycles?

ii. Is there a long-run relationship between economic growth and bank credit availability in South Africa?

iii. What is the direction of causality between economic growth and bank credit growth in South Africa?

1.4 Objectives and Hypotheses of the Research

The main objective of this study was to determine the causal relationship between business cycles and bank credit extension in South Africa. Assuming the relationship is established, the study also sought to establish the nature and extent of that relationship. The specific objectives of the study included the following:

i. To determine the key credit extension drivers in South Africa.

ii. To determine the long-term relationship between business cycles and bank credit extension in South Africa.

iii. To determine the direction of causality between business cycles and bank credit extension in South Africa.

iv. To verify the extent to which prior research findings on the influence of business cycles (and vice-versa) is applicable in the South African business context.

v. To recommend to policymakers and banks as to how they can mitigate the risks associated with the different stages of credit and business cycles.

This study also made and an attempt to test the following hypotheses:

i. HI: There is no long-term relationship between economic growth and bank credit extension

ii. H2: Economic growth does not cause credit growth.

iii. H3: Credit growth does not cause economic growth.

1.5 Rationale of the Study

It is widely agreed that credit markets appear to have played a significant role in the context of events which led to the severe recession experienced during 2008 and 2009 worldwide. These episodes represent clear indications that credit markets may play a non-negligible role over the business cycle on a recurrent basis (IMF, 2012). In fact, the recession was a clear testimony that the relationship between the financial sector and the real economy has not been well understood and incorporated in macroeconomic models (Gambetti & Muso, 2012).

In the context of understanding the role of credit markets over business cycles, from a policy perspective, it is important to assess the relative role of supply and demand forces in driving credit and output, as these factors may call for different response of monetary and fiscal policy. For example, an insufficient provision of loans to the private sector by banks caused by balance sheet constraints affecting financial intermediaries may require a different policy response compared to the case of declining loan growth due to declining demand from households and enterprises. In the former case, measures to directly support the banking system may be needed, while in the latter case, measures directly to support the real economy are likely to have priority (Fourie *et al.,* 2011).

According to Quagliariello (2007), the nature and form of policy intervention is determined by the causal nature of the relationship between economic growth and financial development. If the business cycle impacts on bank lending behavior and performance, financial surveillance and bank supervision may need to be strengthened during economic downturns when banks are likely to be more fragile and delicate. On the other hand, if banks' reaction to macro-economic shocks worsens the effects of the recessionary phase, it would be appropriate to establish rules aimed at reducing the pro-cyclicality of banking sector (Quagliariello, 2007). Evidence that the banking sector will affect the real sector in the long run might lead to policies that would support the banking sector in a period of falling GDP (Sendeniz-Yuncu, Akdeniz & Aydogan, 2006). According to Dlamini (2008), policy makers always seek to avoid recessions and steer

the economy on a steady non-inflationary growth path and are therefore always on the lookout for information that indicates the likelihood of recessions.

A recent focus of attention for a number of central banks and other authorities responsible for stability of the financial and macroeconomic environments has been reduction and management of pro-cyclicality of bank lending (IMF, 2012). However, despite active debate on this subject in the media, to-date, there is no universal conclusion but clarity on this important issue is very crucial because it has significantly different implications for policy development (Gantman & Dabos, 2012, Fourie *et al*., 2011). Moreover, there is little and limited research focused on developing and emerging countries like South Africa (Fourie, *et al.,* 2011; Akinboade & Makina, 2009; Dlamini, 2008). Hence, an investigation of the relationship between economic growth and bank-granted credit in South Africa will help to identify the extent to which prior research findings are applicable and can be generalized to emerging markets like South Africa.

As highlighted above, crises also offer lessons. It is now well understood that the interactions between the financial system and the real economy were a weak spot of modern macroeconomics. Thus researchers and policymakers alike have been left searching for insights, and the work in this study presents a sharper picture using the lens of macroeconomic history.

1.6 Significance of the Study

The researcher's attempt in this study was to contribute to the existing empirical literature on financial development and economic growth by testing the causality between bank credit extension and macroeconomic business cycles in South Africa, using the recent data. The importance of the investigation is relevant for theory, practice and future research. Among the beneficiaries of this study are the following:

i. *Policymakers*- from a policy perspective, the results of the study are relevant for the ongoing debate on the inter-linkages between the financial sector and the rest of the economy (Dell'Ariccia, Igan & Laeven, 2009). The study results may also assist in deciding on how resource allocation should be achieved between

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financial development and real sector development. Moreover, understanding the relationship between macro-economic fluctuations and bank lending behavior helps policymakers on the most appropriate policies to ameliorate the severity of risks associated with different stages of credit and business cycles. This contribution provides new insights that may permit policymakers to offset the negative impact of the pro-cyclicality effects and avoid them altogether where necessary.

The global economy is on the path to recovery but there is "not a great deal for maneuver and no room for policy mistakes" (IMF, 2012: 3). The results of the study would therefore assist authorities to make informed decisions in this unforgiving environment. A better understanding of significance and relevance of credit is important for SARB's monetary policy. According to Sindano (2009), cross-country studies do not properly account for time dimension. Such studies can give lead to misleading conclusions on the possible impact of economic growth on bank-granted credit (and vice-versa) since they assume that "the different countries in the model are homogeneous entities" (Sindano, 2009: 8). Moreover, since countries may differ greatly with respect to size, economic structure, legal frameworks, and economic policies used, results may be country-specific. Thus, an analysis of the causal relationship between real economic activity and bank-granted credit in South Africa is essential for policymakers.

ii. *Banking Community*- changes in credit risk associated with economic cycle tend to be misplaced and miscalculated. In particular, banks often underestimate risks in booms and overestimate risks in recessions (Boris, Furfine & Lowe, 2001). The calculation errors will definitely affect bank performance. The results of the study provide new insights that may permit bankers to minimize 'risk of calculation errors' and offset possible negative effects of bank pro-cyclicality.

iii. *Academics and Researchers*- The recent crisis has renewed the focus on the relationship between credit growth and business cycles. As a result, further

studies comparing South Africa to global business cycles are likely (Fourie *et al.,* 2011). This study will benefit and help future researchers as their guide, providing data and information necessary on this topical issue. Besides, it would also help researchers in the field of banking and economics in further understanding the nuances in making use of the VAR framework in finding the causality dimensions so as to point the direction of movement to the policymakers with concrete evidence. The study also contributes to the literature by establishing causal relationship between macroeconomic business cycles and bank credit extension in South Africa.

iv. *Other Economies*- Although levels of sophistications are different, the banking structure and system in South Africa is almost similar to what is available in most African countries especially Namibia, Swaziland, Lesotho, Botswana, Malawi, Zambia and Zimbabwe. The results of this study therefore could easily be applied to other such countries.

The contribution of this study is different from previous studies in several ways. Firstly, the study used both survey data (primary data) and time series data (secondary data). Secondly it used a longer time series of data covering periods before, during and after the most recent (2007-2009) global financial crisis. The study also used different proxies for business cycles and credit extension. Lastly, the study used both descriptive statistics approach and econometric techniques (for example, Cointegration and Granger causality methods) to test the causal relationship between bank-granted credit and economic growth. Thus this study makes a significant contribution towards filling the identified void in literature.

1.7 Delimitation and Scope

The business cycle and credit extension indicators used in this research simply provide a working estimate used for purposes of this research and to compare results with other similar studies done elsewhere. They may not be accurate measures of business and credit cycles in South Africa. Therefore, the results of this research should not be used as a

simple basis of lending and policy decisions. The study does not cover all aspects of economic activity and credit cycles but rather aligns itself with a few selected variables due to access to bank data, time and opportunity constraints. It is also imperative to mention that the lending behavior of banks is complex and cannot be adequately explained by analyzing few constructs with a simple formula regardless of activities of competitors, micro and macro business environment (Oluitan, 2009).

1.8 Outline of the Research Report

The remainder of the thesis is organized as follows. Chapter 2 reviews the recent literature on the relationship between business cycles and bank credit extension. Chapter 3 discusses the research methods used in this study. Chapter 4 presents the empirical results. This particular chapter also gives detailed discussion of the results, making comparison with previous research findings. The last chapter (5) draws conclusions, provides recommendations and gives guidance for future research.

1.9 Chapter Summary

This chapter has hinted that there is renewed interest on the linkage between financial markets and real economy. An overview of the business cycle and credit cycle episodes in South Africa has been presented. The problem statement has been clearly defined and the objectives of the study clearly articulated. This chapter has also highlighted the rationale and significance of the study. The chapter then has presented the structure of the whole research and has provided a guide on what literature to review and the selection of methodology and design of the study. This chapter therefore has set the ground for the remaining chapters.

CHAPTER TWO
THEORETICAL FOUNDATION AND LITERATURE REVIEW

2.1 Introduction

The nature of the relationship between economic growth and financial development has been one of the most debated in the recent past, yet with little consensus. Central to this debate is the question of whether strong economic performance is finance-led or growth driven. However, there is little consensus about the nature of the relationship between these variables, the causal direction and its theoretical underpinnings.

In view of this, an attempt is made in this chapter to review both theoretical and empirical literature. This chapter is organized into three sections as follows: Section 2.2 summarizes sources the research consulted in the course of literature review. Section 2.3 reviews theoretical literature on the link between business cycles and bank lending patterns and standards. Section 2.4 presents results of previous researches on the impact that credit has on economic growth, and vice-versa. The last section (2.5) provides highlights of the chapter and draws conclusions by highlighting the gap in literature, that is, what is not yet done or found.

2.2 Literature Sources

There are three types of sources the research consulted in the course of the literature review. These are primary, secondary and tertiary literature sources.

2.2.1 Primary Literature Sources

These are the first occurrence of a piece of work (Cooper & Schindler, 2006). Examples of such reports are conference reports, market research reports and unpublished dissertations and theses. List of reports and magazines consulted include the following: Bank of International Settlement (BIS) Papers, International Monetary Fund (IMF) Papers, World Bank Papers, SARB Papers and Organization of Economic Cooperation and Development (OECD) Papers. Other sources consulted include Business Day,

Business Report, The Economist, News Week, Fin Week, Financial Mail and The Financial Times.

2.2.2 Secondary Literature Sources

Secondary literature source are those that provide the researcher with scholarly summaries of the research that have been done in the field of interest (Saunders, Lewis & Thornhil, 2003). Important academic journals reviewed include the following: Business Review, Journal of Applied Finance, The Review of Economic Studies, American Bankers Association Journal, Applied Financial Economics, Journal of Applied Econometrics and The Quarterly Journal of Economics. Other journals consulted include: Journal of Financial Services Research, Journal of Money, Credit and Banking, Journal of Credit Risk, South African Journal of Business and South African Journal of Economics. Subject librarians were also consulted to access computerized databases and information stored on CD-ROM.

2.2.3 Tertiary Literature Sources

Tertiary literature sources are also called search tools, which are designed to help the researcher in locating primary and secondary sources. These include encyclopedias, CD-ROM and computer databases ((Cooper & Schindler, 2006).

2.3 Theoretical Foundation

This section presents theoretical literature on the link between business cycles and changes in bank credit extension. However, it is imperative to start with outlining the business cycle framework and the credit cycle. A number of researchers including Rajan (1994), Laubscher (2004) and Akinboade and Makina (2009) have similar models to establish the link between business cycles and bank lending patterns.

2.3.1 Business Cycle Framework

Generally, business cycle has come to be understood as a sequence of economic activity and is typically characterized by the following patterns; recession, fiscal recovery, growth and finally fiscal decline (Khomo & Aziakpono, 2007). Akinboade and Makina (2009:

478) define business cycles as "recurring patterns of recession (economic decline) and recovery (economic growth)." According to Negro (2001: 18), "the business cycle consists of expansion occurring at about the same time in many economic activities followed by a similar general contraction.

Claessens, Kose and Terrones (2011) argue that a complete business cycle has two phases; the *recession phase* (from peak to trough) and the *expansion phase* (from trough to the next peak). In addition to these two phases, recoveries from recession have also been widely studied. As shown in Figure 2.1 below, the *recovery phase* is the early part of the expansion phase and is usually defined as the time it takes output to return from its low point to the level it reached just before the decline began. *Decline phase* is the late part of the recession phase (Claessens *et al.,* 2011). According to SARB (2012: 18), the recoveries, expansions and contractions of the national economy are usually measured by real Gross Domestic Product.

Figure 2.1 A Typical Business Cycle
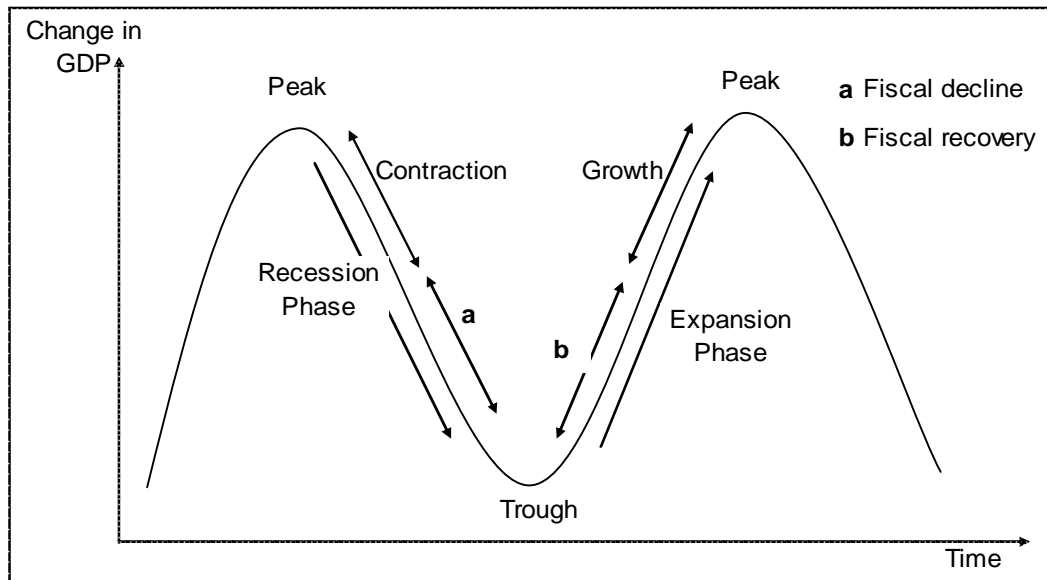
Source: Khomo & Aziakpono (2007) and Author's own contribution

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Nouriel Roubini, cited in Monro (2010), argues that the recession phase can take the following forms: U-shaped, V-shaped, W-shaped, or L-shaped. These forms of recession and recovery are depicted in Figure 2.2 below.

Figure 2.2: Forms of Recession Phase
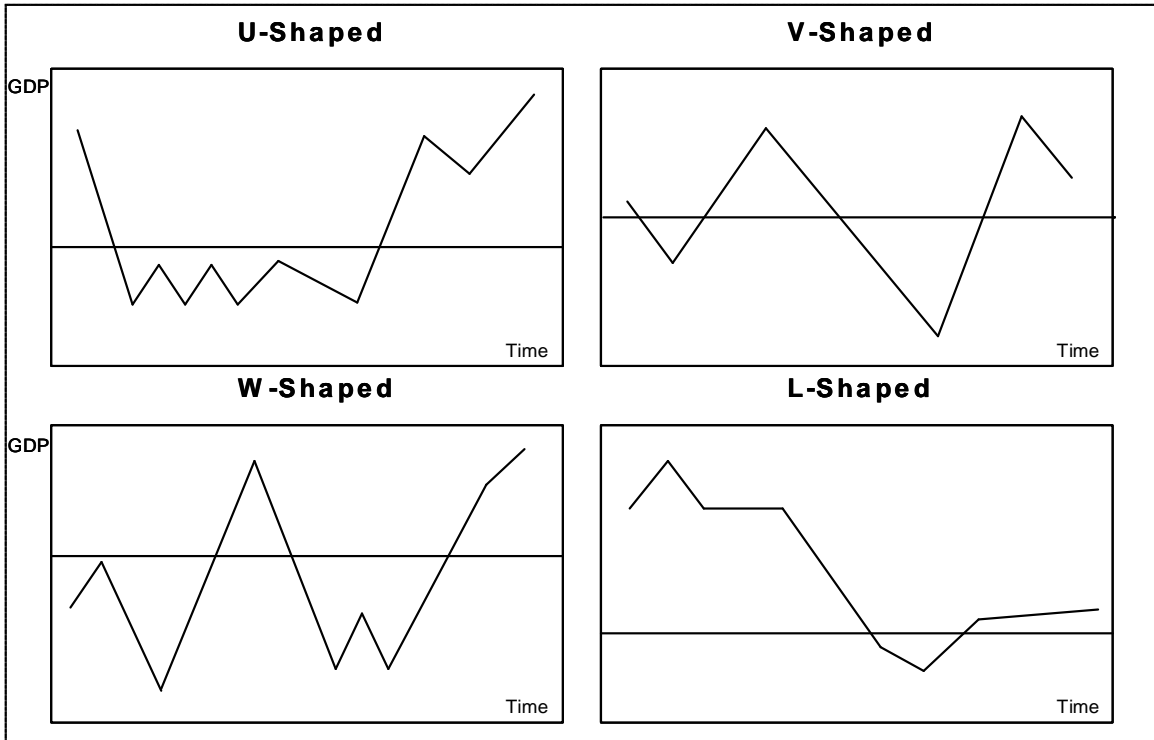
Source: Monro (2010) and Author's own contribution

Specifically, a *U-shaped* recovery represents the shape of the chart of certain economic measures, such as GDP and employment. A U-shaped recovery involves a gradual decline in these metrics followed by a gradual rise back to its previous peak (NBER, 2012). On the contrary, the *V-shaped* recovery involves a sharp decline in economic metrics and is followed by a sharp rise to its previous peak. Roubini notes that compared to the V-shaped recovery, the U-shaped recovery takes longer to reach levels seen prior to the recession.

According to NBER (2012), a *W-shaped* recession occurs when the recovery has a recession, emerges from recession with short period of growth, but quickly falls back into

recession. The early 1980s recession in the US is cited as an example of a W-shaped recession (The Economist, 2009). Lastly, an *L-shaped* recession occurs when an economy has a severe recession and does not return to trend-line growth for many years, if ever. Many refer to the 1990s –era in Japan as an example of an L-shaped recession, where there was an economy that essentially flat lined for a decade (The Economist, 2009).

The literature on business cycle distinguishes between "classical business cycle" and "growth cycle" (Laubscher, 2004: 22). The classical business cycle refers to cycles in which many aggregate activities, almost at the same time, experience expansion, followed by a similar downturn and subsequent recovery into another expansion phase. Such changes on economic activity are "recurrent but non-periodic and vary from one to twelve (12) years in duration" (Smith 1982: 49). On the other hand, a growth cycle can be defined as the fluctuation of the general economic growth rate around the long-term potential rate of growth, with such fluctuations being "recurrent, but not periodic" (Laubscher, 2004: 22). For the purpose of this study, cyclical movements in economic activity in South Africa will refer to the business cycle in between classical and growth cycle terms.

There is general consensus on the definition of business cycle. However, there are several competing theories on the causes of the macroeconomic cycles. According to the business cycle theory the cyclical fluctuations in an economy are believed to be caused by factors inherent in the economic system (Khomo & Aziakpono, 2007). Chatterjee (2000: 1) believes that "each cyclical phase of the economy carries with it the seed that generate the next phase – a boom generates the next recession that recession generates the next boom; and the economy is forever caught in a self-sustaining cycle." Based on this view, many analysts conclude that the economy is not in a position to ensure a stable and sustainable economic performance and as a result it is essential that an aggressive counter cyclical policies aimed at smoothing out the business cycles be pursued (Khomo & Aziakpono, 2007; Chatterjee, 2000).

Romer (1993: 3), a proponent of the shock-based theory of the business cycle, proclaims that "there always exits a full employment level of economic activity which the economy could theoretically always achieve." This full employment level of output as continues to grow with increase in population as well as with the advancement and discovery of technologies. Romer further argues that it nothing disturbs the economy then this output level can be maintained forever. Fuhrer (1998: 10) argues that "business cycles occur because the economy is occasionally disrupted by large shocks that force it to move temporarily away from the point of equilibrium."

Various structural disruptions have evolved over the eras, all of which have a role to play in the cause, nature and amplitude of cyclical variation (Fourie *et al.*, 2011; Bordo, 2006). The analysis and comparison of macro-economic fault-lines of the past provides a useful basis to compare cyclical patterns across countries and monetary regimes (Schularick & Taylor, 2009). According to Stock and Watson (1998), cited in Fourie *et al.,* (2011: 13076), various signal events across the history of the world are "connected to the start and end points of the business cycle." Cited events range from the first and second world wars to the Great Depression of the 1930s and the inflation volatility caused by the OPEC price spikes of the 1970s. The uninterrupted period of growth in the early 2000s and the "globally contagious credit crisis" of 2008 are still fresh in the minds of monetary authorities and contemporary economists (Fourie *et al.,* 2011: 13076). These events have created a platform for economists to investigate the role of financial intermediation and its effect on business cycle (Schularick & Taylor, 2009).

2.3.2 Identifying Credit Cycle

The business cycle definition can be used to interpret alternate phases of cyclical fluctuations in the credit markets in an effort to define credit cycles. Claessens *et al.,* (2011) use a similar methodology to business cycle to define a credit cycle. The recovery phase of the credit cycle is called "the *upturn* and the contraction phase, the *downturn" (*Claessens *et al.,* 2011: 8*)*. The recovery phase covers the time it takes from the trough to return to the previous peak and the contraction phase covers the time it takes from the

peak to return to the previous trough. The credit cycle phases are shown in Figure 2.3 below.

Figure 2.3: Credit Cycle Phases
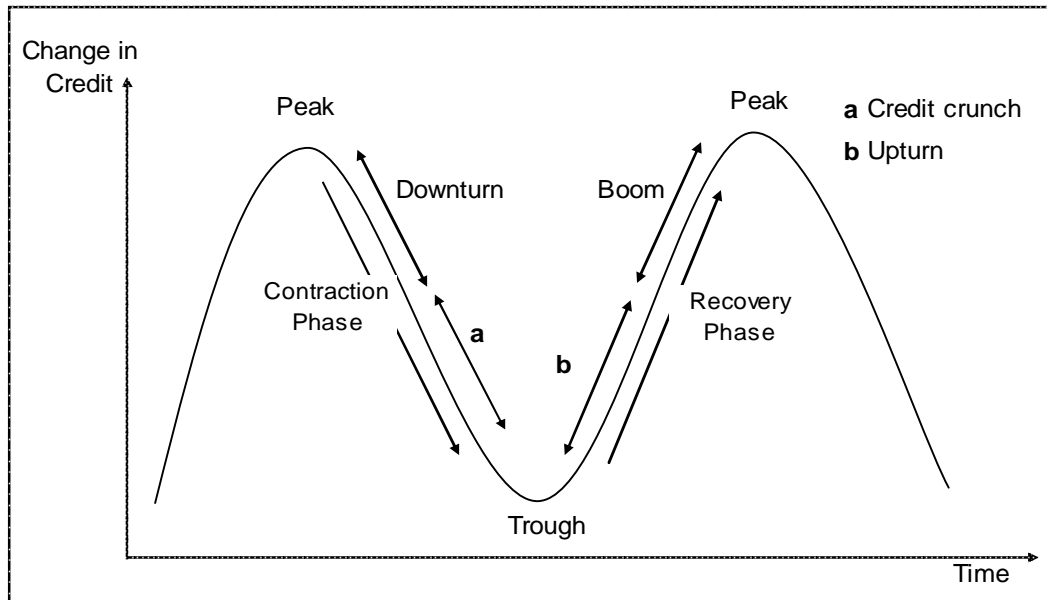
Source: Claessens, Kose and Terrones (2011) and Author's own contribution

In discussions of bank lending activity, the notion of cycles in lending standards typically begins with expansion; standards fall with heightening competition in expansions and rise in contractions as banking respond to their own capital shortfalls or constraints of regulators (Weinberg, 1995). Large movements in financial variables are often associated with highly volatile fluctuations in economic activity (Bliss & Kaufman, 2003). An episode is classified as a financial *disruption* if the change in the available credit during the downturn falls in the bottom quartile of all changes. These disruptions are called either *credit crunches* or *credit busts*. If the change in the credit available during the upturn falls in the upper quartile, then the movement is classified as a credit *boom* (Bliss & Kaufman, 2003).

Claessens *et al.,* (2011) found that there were nearly 500 episodes of financial cycles between first quarter of 1960 and the final quarter of 2007 across 23 countries and three variables. They identified 114 downturns in credit, 114 in house prices, and 245 in equity

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price. Correspondingly, the sample included 115 upturns in credit, 114 in house prices and 251 in equity prices.

Naturally people enjoy booms. Walter Bagehot, an editor of The Economist in the 19th century (cited in Car (2009: 5)) observes that "all people are most credulous when they are most happy." Car (2009) argues that it is hard to stop booms once they are in full swing; however, it is easier to prevent them from starting in the first place. According to Hayman Minsky, an unconventional economist who made it his life's work study crisis was concerned that "booms arose spontaneously. Financial stability itself creates confidence and risk taking eventually leading to recklessness and instability. After the bust, stability will return and the cycle will begin again" (The Economist, 2009: 12).

According to Fourie *et al.,* (2011), from the early 1900s, credit has been a powerful propagation mechanism which has systematically affected the timing, duration and amplitude of cycles in money, credit and output in the macro-economy. This view is widely supported in literature (Akinboade & Makina, 2009; Bordo & Halbrich, 2009; Asea & Bloomberg, 1997). Borio *et al.,* (2001) argue that credit sustains and directs the development and momentum of the financial and economic cycle.

Sub-Sections 2.3.1 and 2.3.2 have provided detailed descriptions of business cycles and credit cycles. But the following important questions have not yet been adequately addressed: To what extent are the different phases of the credit cycle influenced by fluctuations in economic activity (and vice-versa)? Is credit availability demand driven or supply driven? Sections 2.3.3-2.3.8 present theoretical foundation and section 2.4 summarizes empirical evidence on this topical issue.

2.3.3 Underpinning Theories and Conceptual Framework
 The previous section attempted to clear the definitions and provide more details on the forms of business and credit cycles. The focus in this section is on examining theoretical background of these two types of cycles. Many authors have presented competing and at times opposing theories on this topic. As a result, only a few selected theories will be

covered in detail otherwise the text would deviate substantially from its original topic. Frequently cited vital strands of economic theory include Marshall Model, Austrian Business Cycle and Post-Keynesian concept (Semerak, 2001).

a) Pre-Keynesian Approach

In the works of pre-Keynesian economists, examination of money and credit was predominant. During this era, the analysis emphasized on monetary and business cycle theories. Typical examples of this approach include the Marshall's Model and the Austrian Business Cycle Theory.

a(i) Marshall's Model

According to Semerak (2001), Marshall's model is based on *psychology*. Fluctuations in economic activity and changes in bank lending behavior are driven by psychology. Occurrence of positive impulse is related to the seed stage of a business cycle. For example, discovery of new minerals and resources creates new business opportunities and contributes to increase of general *confidence* and also set in motion increased demand for credit facilities by both households and businesses. This will be followed by execution of new contracts and issuance of new orders in response to increased business opportunities for mining companies and downstream industries. The production and manufacturing industries will start hiring labor force and increase wages in response to the increase of demand of their goods. Marshall's model assumes that confidence levels will remain at elevated levels and spreading throughout the society. If not interrupted due to unforeseen circumstances, the process will continue to cover significant portion of the society. Semerak (2001) brand this attractive and conducive business environment as 'growth phase of the cycle.'

Like any other bubble, the growth of economy based on confidence alone will not continue forever. Lenders and creditors will at some time identify new emerging risks and will naturally reduce supply of credit as a way of mitigating the risks. Credit supply will contract in an era of increased credit demand. In an efficient market, interest rates will increase significantly. General confidence will be replaced by skepticism and

wariness. Prudent lenders will respond by curtailing and rationing credit. Borrowers and debtors will be faced with no option but to sell their properties to raise money to repay their debts. This development will result in undesired outcome, that is, the flooding of property market will push property prices further down. Poor performance of the property market will make creditors and lenders even more circumspect and unwilling to take further risks. Some of the creditors will go bankrupt and borrowers falling in debt trap in the process. In the end, some of the otherwise 'healthy' creditors may go out of business and close shop. This is characteristic of the contraction phase of the business cycle. Again, this continuous and gradual decline will not continue forever as ground will be prepared for a kick-start of a new cycle (Semerak, 2001).

a (ii) Austrian Business Cycle Theory

Hayek (1999) asserts that disequilibrium development in the economy is caused by money in general and bank credit in specific. In addition, Tempelman (2010) stresses that for an economic expansion to be sustainable, it has to be supported by savings, and since economic boom driven credit alone is considered short-term. When credit creation by monetary authorities exceeds a society's structural saving rate, financial intermediaries end up lending money at interest rates that are below the rate where supply and demand clears in the market for loanable funds (Hayek, 1999). It common for market participants, in particular entrepreneurs and businessmen, to miscalculate this trend and judge the decline in interest rate as a relative decrease in dearth of capital.

However, Templeman (2010) argues that such improvement in scarcity of capital is unsustainable since the improvement is not supported by economic fundamentals such as increased savings but by 'false' moderation and easing of interest rates. The disharmony between development of wages and growth of prices of consumption goods will evidently result in forced savings. Relative to the ultimate consumer tastes and liking, the market end up producing excessive capital goods and inadequate consumer goods. Eventually as the lack of underlying demand for these capital goods becomes apparent, production capacity is idled and the boom that was fed by credit expansion turns to bust (Tempelman, 2010).

Hayek (1999) claims that changes in the temporal structure of production, if not controlled, will result in the growth of prices of consumption goods. The resultant disequilibrium structure of capital can only be corrected during economic downturns. Consequently, credit expansion during recession will not help bring about a sustainable economic growth. This will merely postpone it, as it causes a delay in the structural adjustments such as business closures and other eliminations of unproductive use of capital, that need to be made to bring about a sustainable economic expansion (Templeman, 2010; Hayek, 1999).

b) Hyman Minsky Theory: Post- Keynesian Perspective

The connection between credit and money is the linchpin and center of Post-Keynesian economic thought. Economists sharing this stance strongly believe that money comes into existence at the same time as debt (Seremak, 2001). Post-Keynesian economists also believe that credit and money adapt to economic conditions. According to Banerjee (2011), of all the popularized post-Keynesian analysis of financial crises, Minsky's theory of financial instability of capitalist economy ranks among the best in terms of contribution to economic theory. Higher leverage can lead to more pronounced confidence shocks and exceptional swings as conjectured by Minsky (1992).

According to Cassidy (2008), there are basically five stages in Minsky's model of credit cycles: displacement, boom, euphoria, profit taking and panic. A displacement occurs when investors get excited about something, for example, an invention such as internet or an abrupt change in economic policy. With the cost of borrowing (mortgage rate in particular) at historic lows, a speculative real estate boom quickly developed in the United States. The boom was reportedly bigger, in terms of valuation, than the previous bubble in technology stock (Cassidy, 2008). As boom leads to euphoria, Minsky claims that financial institutions extend credit to borrowers of questionable integrity. Recently, securitization of mortgages enabled banks to provide home loans without satisfying themselves on the creditworthiness of borrowers. Then at the top of the market (in this case mid 2006), some smart traders started to cash in their profits. The onset of panic is

usually heralded by a dramatic effect (Cassidy, 2008). As was widely expected, the mortgage market collapsed like a deck of cards.

c) Modern Theories

As stated by Xu (2012), modern theories that attempt to describe and give account of linkages between economic growth patterns and credit cycles share three points in common: they are built on optimization, on explicit microeconomic modeling of behavior of economic agents, and they are formalized. Seremak (2001) divided the modern approaches and resulting contributions into two main groups. The first group of models centered on difficulties of loan market under asymmetric information and selected aspects of intermediation. Little consideration is given to macroeconomic aspects and a classic case of this approach may be Holmstrom- Trirole (1997). The second group of models describes correlations of economic variations with specific features of credit markets. Typical examples of this second approach include Bernanke, Gertler and Gilchrist (BCG) Model, Kiyotaki-Moore Model and Monetary Transmission Mechanism.

c(i) Holmstrom- Trirole Model

Xu (2012) summarizes the main features of the Holmstrom-Trirole Model. In this model, the maximum debt a firm can incur is determined by its networth. It therefore follows that companies with insufficient networth heavily rely on bank credit since they are unable to use direct financing (Holmstrom- Trirole, 1997). Of paramount importance is that financial intermediaries must enhance their project monitoring and supervision activities to mitigate the inherently high risk.

The model then analyzes some of the factors that influence supply and demand for credit. Credit supply is influenced by the strength of banks' balance sheet positions, capital adequacy levels as well as levels and composition of bank deposit liabilities. On the other hand, the net worth of the borrowing firms and collateral offered by existing and potential borrowers influence demand for credit. These scenarios were categorized by Holmstrom and Trirole (1997) as credit squeeze, collateral squeeze and savings squeeze. Seremak (2001) argues that this class of models emphasizes more on credit markets and gives little

attention on macroeconomic consequences; consequently, this will not be dealt with extensively here.

c(ii) Bernanke, Gertler and Gilchrist (BGG) Model

The framework is part of the new Keynesian model, and it exhibits a 'financial accelerator' in that endogenous developments in credit markets work to propagate and amplify shocks to the macro-economy (Bernanke & Gertler, 1999). The key mechanism involves the link between 'external finance premium' (the difference between the cost of funds raised externally and the opportunity cost of funds internal to the firm) and net worth of potential borrowers (defined as the borrower's liquid assets less outstanding obligations). To the extent that borrower's net worth is pro-cyclical (because of the pro-cyclicality of profits and asset prices for example), the external finance premium will be countercyclical (Bernanke *et al.,* 1998). Internally generated funds are therefore cheaper than unsecured external borrowings. Moreover, the risk premium is determined by the creditworthiness of the borrower. This particular outcome amplifies the variability of output and investment (Barnejee, 2011).

The other important feature of this model is possibility of exogenous asset price bubbles that can arise because asset prices may be influenced by non-fundamental matters. These non-fundamental factors include pessimism and optimism (Seremak, 2001).

c(iii) Kiyotaki-Moore Model

In the Kiyotaki-Moore Model, imperfection of credit markets lead to imposition of credit limits determined by the value of assets offered as collateral. Lenders have limited power to make borrowers service their loans, unless their borrowings are tangibly secured (Kiyotaki & Moore, 1997). A theoretical study by Kiyotaki and Moore (1997), cited in Barnejee (2011), showed how credit constraints interact with growth and fluctuations of output over the business cycle. In particular, the dynamic interaction between credit limits and asset prices as collateral for loans is a powerful transmission mechanism by which effects of shocks persist, amplify and spill over to other sectors.

Borrowers' credit limits are determined by value of property offered as security, which affects investment and demand for assets in the economy. Bankers therefore try to align and match maximum credit exposure with intrinsic value of collateral held. This view was also echoed by Xu (2012). In addition to the demand for credit from firms, Meh and Moran (2004) argue that banks themselves are also subject to frictions in raising loanable funds and show that the *supply* side of the credit market equation also contributes to shock propagation, affecting output dynamics in the economy.

In a nutshell, Kiyotaki and Moore (1997) observed that lending decisions by financial institutions are largely informed by fluctuation in asset prices, which are offered as collateral by the borrowers. Prices of assets move in tandem with developments in the macroeconomic environment and demand conditions. This collateral requirement magnifies the business cycle. Banerjee (2011) adds that credit rationing can potentially intensify small shocks to the economy, giving rise to large swings in output and can be highly pro-cyclical.

c(iv) Monetary Policy Transmission Mechanism

Bernanke (2006) defines monetary policy as the process by which the government, central bank or monetary authority of a country controls (i) the supply of money, (ii) availability of money, and (iii) cost of money or rate of interest, to attain a set of objectives towards the growth and stability of the economy. According to Paligorova and Jimenez (2012), monetary policy is referred to as either being expansionary or contractionary, where an expansionary policy increases the total supply of money in the economy more rapidly than usual, and contractionary policy expands the money supply more slowly than usual or even shrinks it. Expansionary policy is traditionally used to combat unemployment and recession by lowering interest rates in the hope that easy credit will entice businesses into expanding. Contractionary policy is intended to slow inflation in order to avoid the resulting distortion and deterioration of asset values (Dlamini, 2008). Furthermore, monetary policies are discussed as follows: 'accommodative' if the interest rate set by the central monetary authority is intended to

create growth; 'neutral' if it is intended neither to create growth nor combat inflation; or 'tight' if intended to reduce inflation (Kimani, 2013; Paligorova & Jimenez, 2012) .

As stated by Fuare (2007), central banks use various monetary instruments, which differ from one country to another, to achieve desired stabilization in an economy. The nature and form of instruments used depend among others, economic structures as well as level of sophistication of capital and money markets. Loaya and Schmidt-Hebbel (2002) categorize frequently adopted monetary policy instruments as open market operations, changes in discount rate, changes in the legal reserve ratio and moral suasion.

Kimani (2013) proclaims that there is a general agreement among academics and policymakers that monetary policy works effectively largely through interest rate. An approach used by most central banks is setting a target for a specific short-term interest rate. Adjustment of short-term policy interest rate, *ceteris paribus*, prompts changes in medium- and long-term interest rates (Pligorova & Jimenez, 2012). According to Macklem (2002), these rates, in turn, will affect economic activity by decreasing the cost of mortgages when reference rate (for example Prime or Libor) falls, by making it cheaper for firms to borrow when yields on corporate bonds go down or by increasing exports when the exchange rate depreciates. Changes in interest rates can therefore, ultimately lead to changes in economic activity, because they influence the spending and investment decisions of consumers and firms (Macklem, 2002).

Paligorova and Jimenez (2012) contend that a key characteristic feature of the most recent global crisis was historically low real interest rates in a number of countries. These developments have revived the question of whether economic agents are willing to take more risk when interest rates remain low for a prolonged time period. Extended spells of low interest rates regime may prompt financial institutions to increase the supply of credit to obligors with poor credit history, resulting in an overall increase in the riskiness of bank loan portfolio. According to Gambacorta (2009), the impact of extended low interest rates may be intensified because of an imprudent tolerance for risk. The risk-taking channel implies an increase in the risk tolerance of banks in 'good times' when

interest rates remain persistently low. Rajan (2006) cited in Pligorova and Jimenez (2012), concludes that this behavior can present itself as a switch in a portfolio composition of the bank from low-risky to high-risky investments, known as 'search for yield.

Dlamini (2008) indicates that increasing short-term interest has its own challenges and complications. Such policy move escalates the cost of capital to firms through the *balance sheet channel*. The consequence of this is the amplification and continuation of the initial decline in employment and output. The financial position of borrowers and debtors is affected by adjustments in the policy rate through the balance sheet channel. For instance, *ceteris paribus*, accommodative monetary policy strengthens balance sheets of firms because lower interest rates decrease the interest expenses on their short-term debt, which increases net cash flows and improves their financial positions. Moreover, declining interest rates, typically associated with asset prices, may increase the value of borrower's collateral, hence enhancing borrower' access to credit (Bernanke & Gertler, 1995; Mishkin, 1995). Therefore, in a high interest regime, the cost of credit sometimes becomes exorbitant and excessive, dampening demand for credit.

Keeton (2001) and Stiglitz and Weiss (2001) are among economists and authors who have argued that an additional policy channel works through the bank credit. In this perspective, the ability of financial institutions to avail new credit facilities is directly constrained by monetary policy. Consequently, less credit is made available to borrowing entities that depend on external financing. It therefore follows that accommodative monetary policy promotes economic growth by increasing credit extended to both households and businesses. Hence, policy measures such as reserve requirements are also used to limit credit in a contractionary monetary policy regime, in addition to the use of interest rates. Tighter monetary policy saps reserves from the banking system, curtailing the ability and capacity of banks to extend credit (Dlamini, 2008).

By changing the level of deposit liabilities available for banks to make loans, the required reserve ratio is sometimes used as a tool in monetary policy, influencing the country's

borrowing and interest rates. Ituwe (1983), cited in Kimani (2013: 24), asserts that "a bank's ability to grant further advances is checked by the available cash in the vault." In cases where a bank extends credit beyond it cashing ability, the bank will unavoidably find itself in serious liquidity problems. In banking literature, bank deposits are cited as the predominant source of funds for lending especially for entities that rely on external financing (De Angelis *et al.,* 2005). In this case, an expansionary policy (for example, decrease in reserve requirements) that increases bank deposit liabilities available for credit stimulates financial institutions to enhance their lending activities, and firms that are dependent on external financing respond by increasing investments. However, the opposite is true. A restrictive monetary policy which results in decrease in funds available for lending compels banks to curtail lending.

The other monetary policy tool is *Open market operation (OMO).* This entails managing the quantity of money in circulation through buying and selling of various instruments, such as treasury bills and government bonds. All these purchases or sales result in more or less base currency entering or leaving market circulation (Kimani, 2013). Achieving a specific short term interest rate target is a primary goal of OMO. In addition, OMO also seeks to indirectly control the level of money supply in the economy (Madura, 2003). In other cases, monetary policy might instead entail targeting of a specific exchange rate relative to some currency.

According to Dlamini (2008), in South Africa, the credit and interest rate channels are more important and renowned in the transmission of monetary policy. Faure (2006) claims that the repo rate not only influences activities on the interbank market, but shapes the yield curve of interest rate as well. In this regard, a change in the repo rate signals the beginning of sequence of economic activities.

In summary, a growing academic literature has shown that the prevalence of non-contingent bank debt has the potential of interacting with binding collateral constraints in order to magnify the effects of shocks to the economy. The mechanism is based on different versions of the collateral amplification argument popularized by Bernanke and

Gertler (1989), Kiyotaki and Moore (1997) and Bernanke et al., (1999). Post-Keynesian models of credit rationing used to be good at explaining how asymmetric information can distort market results and thus, financial markets to be inefficient. However, Hahn (2008) argues that classical Keynesian theories are not good at explaining the occurrence of a credit crunch as an equilibrium result of a market clearing process. This class of models has also been criticized for emphasizing more on credit markets and gives little attention on macroeconomic consequences, hence they will not be used in this study.

The new generation of models (modern theories), aimed at tackling financial system fragility, is primarily built on the theoretical work closely related to Bernanke-Gertler (1989), Bernanke *et al.,* (1999) and Kiyotaki-Moore (1997). The former two analyze shocks to the net worth of borrowers due to the financial accelerator effect on investment. The latter investigates the occurrence of credit cycles induced by credit-constrained firms that use their productive assets as collateral. The new generation models of credit-induced economic growth go a step further by endogenizing both financial constraints and asset prices (Hahn, 2008).

Studies by Miller and Stigliz (2010), Kocherlakota (2009), Akinboade and Makina (2009) are closely related to the current study, in the sense that they examine the effects of the boom-bust cycles in the Kiyotaki-Moore model. For purposes of this study, the framework employed is based on the Kiyotaki-Moore Model. In addition to offering instinctive and elementary explanation between economic growth and bank credit extension, the model is quite fascinating. As outlined above, the framework provides a conceptual framework drawn from observation that was intuitively appealing and provides a basis for empirically testable hypotheses. In addition, the framework is augmented and enriched by the monetary policy transmission underpinning theory. To come up with meaningful hypotheses, it is essential to review the relevant literature in the area and present a discussion of previous studies undertaken on the relationship between business cycles and bank credit extension.

2.3.4 The Link between Business Cycles and Changes in Bank Credit

The existence of a connection between business cycles and bank-granted credit seems indisputable judging by the numerous researchers who have positively proved and validated the relationship. What is arguable is the direction of causality between economic growth and credit extension (Oluitan, 2009). As discussed in literature, the relationship between these variables may be unidirectional, the reverse or bi-directional (Ramirez, 2013; Manikandan, Manivel & Vettriselvan, 2012; Patrick, 1966).

Patrick (1966) describes the causality direction as *demand-following* and *supply-leading* hypotheses. When the relationship is from financial development to economic growth then this relationship is termed as supply-leading since it is believed that the financial institution's activities increases the supply of credit which as a result creates economic growth. Similarly, when growth within the economy results in increase in the demand for credit then this subsequently motivates financial development, which is then styled as demand-following hypothesis (Manikandan, *et al.,* 2012; Oluitan, 2009; Patrick, 1966). Other scholars believe that this causality runs in both directions. This third postulate is related to *bi-directional* causality (Ramirez, 2013; Manikandan, *et al.,* 2012). It means causality is mutual and reciprocal, that is, bank-granted credit to economic growth and economic growth to bank-granted credit.

a) Supply-Leading View

The supporters of the supply-leading hypothesis claim that the activities of lending banks stimulate productive capacity of the economy. They suggest that the pace of economic development in any economy is determined by the degree and extent of access to credit facilities. Various economists have argued that the financial markets and specifically credit and money play a central role in the depth, breadth and duration of business cycles (Apergis *et al.,* 2007; Calderon & Liu, 2003; Kiyotaki, 1999; King & Levine, 1993; Keynes, 1930; Schumpeter, 1911). According to Fourie *et al.* (2011), economists that support the central, unifying role of money in business cycle date back to the beginning of 20th century with Hawtrey, followed by Fisher (1933), Schumpeter (1934), Minsky (1978), Bernanke (1983), Gertler (1988) and Schularick and Taylor (2009).

Schumpeter (1934), cited in Murty *et al.,* (2012), emphasized the importance of banks and credit in economic development as early as 1911. According to Schumpeter, banks channel savings to firms and entrepreneurs who offer feasible and profitable investment projects. By doing so, banks and financial institutions may affect economic growth and development. Gurley and Shaw (1967), as the initial supporters of the supply-leading view underline the effects of financial system on economic growth. Monetary cycle theory is built on Hawtrey's model that bank granted credit is the cause of the fluctuation of the business cycle (Cloete, 1990). The leading idea of the Hawtrey's theory is that banks exacerbate the cycle as they grant "too much credit during the upturn and excessively contract access to credit during the downturn" (Cloete, 1990: 64).

Much concern has been expressed that both large procyclical changes in bank assets and 'credit crunch' caused by banks' reluctance to expand loans during recessions contribute to economic instability (Bliss & Kaufman, 2003). As an economist at the Bank for International Settlements (BIS) noted:

"…financial developments have reinforced the momentum of underlying economic cycles and in some cases have led to extreme swings in economic activity …….. These experiences have led to concerns that financial system is excessively procyclical, unnecessarily amplifying swings in the real economy" (Borio, Furfine & Lowe 2001: 19).

Keynes (1930), cited in Murty *et al.,* (2012: 50), in *'A Treatise on Money',* argued for the importance of the banking sector in economic growth. He suggested that

"credit is a pavement along which production travels, and the banks, if they knew their duty, would provide the transport facilities to just the extent that is required in order that the productive powers of the community can be employed at their full capacity" (50).

A long tradition, going back as far as Fischer (1933), points out the importance of finance in the propagation (and perhaps as the starting point) of the business cycle. The idea is called the *credit channel* of the business cycle (see Schularick & Taylor, 2009; Claus, 2007; Braum & Larrain, 2005; Kiyotaki & Moore, 1997; Bernanke & Gertler, 1990). The

leading idea of this 'credit view' is that bank lending plays an instrumental role in the volatility of business cycles (Schularick & Taylor, 2009). Former SARB Governor Dr. Chris Stals noted "there is a definite relationship between developments in the real economic activity (business cycle) and in the financial aggregates relevant to monetary policy" (Stals, 1997: 1). Central banks in their pursuit of long-run price stability have played a significant role in causing many recessions (Fuhrer, 1998).

Since restrictive monetary policy is associated with downswings in economic activity and accommodative monetary policy with sustainable economic growth, MacFarlane (1993) deduces that inconsistent monetary policy could cause swings in economic activity. In this case, a negative shock (typically associated with monetary tightening) affects ability of banks to provide funds and therefore reduces real activity (Bernanke & Blinder, 1998; Braum & Larrain, 2005).

Changes in inducements from a bank perspective also contribute to the adjustments in the risk profile of financial institutions. A downswing economic environment is 'forgiving' to all market participants and such an environment may incentivize financial institutions to be less conservative and imprudent in their lending practices, hence increasing their riskiness. As stressed by Rajan (1994), myopic bankers will draft and implement credit policies that are driven by demand side conditions which could intensify the fluctuations. Akinboade and Makina (2009) discerned that these risk stimulants may originate and amplify credit cycles and associated volatility in the riskiness of banks.

If indeed, there is a natural tendency for expansion of credit to push down credit standards, it would naturally follow that expansions would lead at least sometimes, to significant loan losses (Weinberg, 1995). Under this view, primary driving force in cycles in the credit markets is the propensity of lenders, to succumb to an unrealistic optimism in good times, creating lending booms that sow the seeds of their own demise. John G Medlin, the then Chairman of Wachonia Corp in (cited in Matthews, 1994; 86) state that,

*"the seeds of future problems are sown in the liberal lending going on today………
Another (downturn) probably will come within the next two or three years."*

It is acknowledged that such a rendition of the cycle also appears in some discussions by economist, policymakers and academics. In this sort of description, the expansion of the lending could in itself, be the impulse that drives the cycle, as a spontaneous wave of optimism with the lending community. Alternatively, the expansion could be an overreaction to the other shocks to the economy that 'legitimately' shifts the supply or demand of credit (Akinboade & Makina, 2009; Weinberg, 1995).

Fourie *et al.,* (2011) argue that the availability and cost of credit is determined by the interplay of credit supply and demand and the moderating factor is interest rate. According to Botha (2004), customers deposit excess money with banks in the form of credit balances during the expansion. As a result of the surplus liquidity, banks increase lending. As customers have increasing access to cheaper credit, capital investment and consumption increase, thus fuelling demand for credit (Botha 2004). This culminates in the peak of a cycle, whereby bank funds begin to become scarce and the demand by banks for deposits increases. The increased demand for deposits drives interest rates higher which, in turn, places pressure on banks to increase the cost and availability of credit. The rising interest rates and contracting credit granted by banks result in a decrease in consumption and investment, culminating in the reduction of aggregate economic activity (Fourie *et al.,* 2011; Botha, 2004).

b) Demand-Following Hypothesis

Contrary to the claims of the supply-leading proponents, the supporters of the demand-following view postulate that economic growth is a causal factor for credit market development (Lucas, 1998; Ireland, 1994; Junga, 1986; Demetriades & Hussein, 1969; Gurley & Shaw, 1967; Patrick, 1966; Robinson, 1952). In their views, the increasing demand for credit, created by the growth of the real sector of the economy, stimulates credit extension (Gurley & Shaw, 1967, cited in Oluitan, 2009). Robinson (1952), for instance, opined that economic growth spurs financial institutions to finance enterprises,

implying that bank-granted credit responds to economic growth. Thus, where *'enterprises lead, finance follows'* (Oluitan, 2009).

Economists have expressed a spectrum of opposing viewpoints on why banks change their lending policies. One extreme is that bank credit policy changes are correlated with changes in fundamental business conditions (Rajan 1994). A change in the level of bank credit should be a consequence only of a change in the quality of borrowers. Similarly, Akinboade and Makina (2009) argue that bank lending to enterprises tend to move in the same direction as the overall state of an economy and as a result of corresponding credit demand created during alternate business cycles. Bank performance as measured by liquidity, asset quality and profitability is impacted by business cycles through decreased credit demand. Business cycle impacts on bank profitability through decreased demand for credit. The value of an enterprise's collateral declines during economic downswings and in most cases this makes them ineligible for any meaningful credit facilities. Quality of the underlying business loans would be compromised and this trend would be expected to continue into recovery. This weak demand affects quality of bank loans to business and would be expected to persist into a recovery. The reverse trend occurs during economic upswings as businesses qualify for substantial loans availed under reasonable and less stringent terms and conditions. As proclaimed by Bernanke and Gertler (1989), this kind of causal relationship suggests that bank lending is highly pro-cyclical. Berger and Udell (1992) endorse this claim and add that the availability of bank loans to enterprises magnifies the amplitude and duration of business cycles.

Bernanke (1983), building on Fisher (1933), emphasized the transmission of monetary shocks via their effects on the balance sheets of borrowers and on the supply of credit by banks. Borrowers' balance sheets weakened during the Great Depression. Borrowers with positive net present value (NPV) projects, but weak balance sheets had less internally generated retained earnings to invest and could not qualify for credit. Bernanke termed the combined weakening of borrowers' balance sheets and the contraction in bank credit supply a rise in the 'cost of credit intermediation'. What began as a contraction in aggregate demand became a contraction in aggregate supply, which exacerbated adverse

economic shocks and elongated the Great Depression (Calomiris & Mason, 2003). The financial distress of firms and banks and the decline in bank lending were not only symptoms of the Depression, but means of magnifying the shocks that caused the Great Depression (Calomiris & Mason, 2003).

Cole and Ohanian (2001) have challenged Bernanke's view, arguing that the existence of macro-economic time series evidence does not necessarily mean that borrower credit worthiness and bank credit supply were important channels for magnifying shocks. It is argued that it is very difficult to separate credit supply shocks from endogenous declines in the demand for credit. Proponents of the loan demand critique argue that an aggregate decline in bank credit does not necessarily imply a decline in bank credit supply due to weak bank balance sheets. Instead, it may simply indicate a lack of viable projects for firms to pursue in a depressed economy (Cole & Ohanian, 2001). According to Calomiris and Mason (2003), a decline in bank lending may reflect a contraction in loan demand in anticipation of contraction in output. Thus the fact that loan contraction accompanies or precedes output contraction does not necessarily imply a causal connection running from financial distress and loan supply to output.

As articulated in Smullen and Hand (2005), credit is a product of moderating factors, whereby risk appetite and behavioral elements determine bank lending across phases of the business cycle. A bank's appetite for risk is calculated by trading-off risk with return (Fourie *et al.,* 2011; Van Zyl *et al.,* 2003). According to Akerlof and Shiller (2009), cited in Fourie *et al.,* (2011:13075), behavioral factors that affect the decision to grant or accept credit are "based on emotion and spontaneous urge to action." In addition to the factors noted above, there are other supply- and demand-side factors at play through the cycle. Bank credit determinants include, *inter-arlia*, the following: value of collateral, intensity of competition, expectations from stakeholders, capital and deposits levels and regulatory requirements (Fourie *et al*., 2011; Akinboade & Makina, 2009; Kiyotaki & Moore, 1997). These credit aggregates behave differently during alternate business cycles.

b(i) Value of Collateral and Bank Lending

Bernanke and Gertler (1989) hold that asymmetric information and agents' costs are typically high during economic downswings and low during upswings. Lenders find it very difficult to establish the exact risk profile of borrowers during recession times. The cash flows of borrowing entities are severely affected when the macroeconomic environment is unfavorable. Consequently, banks suffer huge losses because of high levels on non-performing loans (Akinboade & Makina, 2009). To mitigate this risk banks demand collateral to cover existing and potential exposure.

In endorsing Bernanke and Gertler's assertion, Lown and Morgan (2006) claim that asymmetric information is comparatively high during recessionary phase of the economy and low during expansionary phase. The implication of this is that lenders will be more vulnerable in business cycle downturns through diminution on the intrinsic value of assets pledged as security. This implies that bank intermediation becomes riskier during downturns through a reduction in the value of collateral assets attached to the outstanding loans and an increase in the degree of asymmetric information. Prudent banks always endeavor to mitigate risk in a hostile environment by tightening lending standards. Lenders have other alternatives available, including but not limited to, enhancement of screening process of applicants at entry level, demanding more securities and hiking interest rate changed on credit facilities (Lown & Morgan, 2006).

Aikman, Haldane and Welson (2011) argue that movements in prices of collateral have the potential to aggravate cycles in leverage and credit. These cycles in turn act as *'financial accelerator'* for business cycles (Geanakoplos, 2010). Igan *et al.,* (2009) documents the overlap between house prices and credit cycles. An increase in house price driven by demand momentum has a collateral feedback effect. Once collateral value increases, lenders are willing to lend even more to households, feeding the house price boom.

The supporters of the demand-following view also argue that property prices may affect bank lending in various wealth effects. Due to financial market imperfections, household

and firms may be borrowing constrained. As a result, households and firms can only borrow when they offer collateral, so that their borrowing capacity is a function of their collateralizable networth (Kiyotaki & Moore, 1997; Bernanke *et al.*, 1998). An initial positive shock to an asset such as land-say an increase in the price of crops grown on that land – raises a borrowers net worth, which enhances the land-owners ability to borrow and amplifies the demand for land. On the way, perhaps because of a drop in commodity prices, lower land prices mean lower net worth, less collateral, a reduced ability to borrow and significant contraction in demand for land. According to Rajan and Ramcharan (2011), the price decline is further amplified by fire sales (forced sales), which depress prices.

Moreover, a change in property prices may have a significant effect on consumers' *lifetime wealth,* inducing them to change their spending and borrowing plans and thus, their credit demand in order to smooth consumption over life cycles (Hoffman, 2010). Data on the consumption of household's wealth reported in OECD (2014) show that households hold a large share of their wealth in property. The key message here is that asset values tend to rise during an upswing and decline during a downswing or contraction, thereby reducing collateral values and accelerating the amplitude of the cycle (Bernanke & Gertler, 1989).

b(ii) Competition and Lending Standards

Improved macro-state attracts many players to participate in the banking sector. However, increase in number will unavoidably result is competition stiffening. Theoretical models focusing on adverse selections (Riodan, 1933, cited on Guzman, 2000) envisage that contrary outcomes of enlarging the number of players in the lending market include hiking interest rates and banks adopting conservative lending approaches. However, Dell'Ariccia *et al.,* (2009) presents a different argument. Threat of new players in a competitive lending market, in an environment where information asymmetry is skewed in favor of borrowers, will prompt existing lenders to be more liberal and relax their lending standards. It is common to see banks facing this kind of dilemma trading loan quality for market shares.

Randall (1994) endorses this competition-lending standards argument and adds that competition drives lenders to ease their lending standards. However, in some discussions of cycles in lending standards, the supposed market imperfections simply seem to be a general failure by lenders to make good credit decisions. Sometimes this failure takes the form of basing decisions on other lenders rather than an independent evaluation of market conditions. In Weiberg (1995) this kind of imperfection is branded as the *herd mentality problem*

Economists also argue that bank competition for borrowers lead to periodic swings between high and low credit allocations. The reason is that bank lending standards vary through time due to strategic interaction between competing banks. It has also been argued in literature that loan losses are more likely in bad times and credit worth opportunities are more limited (Rannenberg, 2012). In this tough operating environment, investors are demanding above market returns, forcing banks to match or exceed returns offered by their rivals. Such demanding expectation, in an era where 'failure is not an option' induces banks to increase their risk appetite in various ways (Alessandri & Haldane, 2009). All banks have an incentive to take advantage of this more forgiving environment to cut back on credit, blaming losses on economic conditions rather than their inadequate assessment ability. Thus, expanded credit may follow cycles that amplify real shocks, both positive and negative, especially in areas where banks are more competitive (Rajan & Ramcharan, 2011).

b(iii) Market Share, Reputation and Stakeholder Expectations

As argued in Gorton and He (2008), failure in coordination among lenders is one of the frequently cited reasons behind credit market frictions. The argument is that financial institutions are heterogeneous; the actions of the individual banks can generate collectively sub-optional credit provisions in both periods of boom and recession. In times of prosperity, the risk of default looks low and borrowing expands. This means more borrowing for cars, houses, credit cards and for student loans. The environment is also conducive for business and firms to increase their borrowing. The greater borrowing pushes up the economy for a time, but borrowing cannot stay on a rising trend forever.

When the bubble busts, those who have over-borrowed still need to make their interest payments.

Economists have indicated that the *incentives* for banks to lend or not also affect the boom-bust cycle. When credit is expanding, banks may be unwilling either to stop renewing bad loans (often called *ever- greening*) or to hold back on new lending for fear of realizing losses or signaling a lack of lending opportunities which would also reveal their earlier failure to assess properly the quality of loans they are booking (Rajan, 1994). Improvements in the macro-state increase the incentives for banks to liberalize their risk management policies. As the economy performs better, banks with greater capacity and potential are more likely to outperform low-ability banks. The market can forgive banks for posting sub-optimal returns when the economy is in recession, but such poor returns will not be well received during the expansionary phase of the economy, since this constitutes a clear signal of lack of capacity and ability (Aikman *et al.,* 2011). So it can safely be concluded that in a world where lenders and borrowers have incomplete information, risk taking is driven by *reputational concerns.* Bankers can be selfish at times and are only interested in their job security and future job prospects, which depend in part on their current reputations as perceived by the market. In the absence of complete information on bankers' ability and capability, the market has no other credible source but to *infer* ability through announcements. Morris and Shin (2003) claim that this dynamism sows the seeds of pro-cyclical bank lending behavior and is largely accountable for generation and amplification of credit cycles.

Coordination failures in the economy in general and credit markets in specific have been observed since immemorial time. Keynes (in Rajan, 1994) memorably noted ;

> *"A sound banker, alas, is not one who foresees danger and avoids it, but one who, when he is ruined, is ruined in a conventional and not orthodox way with his fellows, so that no one can really blame him."*

This is popularly known as the 'Keynes Constraint'. It is better for your reputation to fail "conventionally" than to succeed "unconventionally" (Rajan, 1994: 403). In August

2007, just before the credit markets seized up Chuck Prince, the then head of Citigroup captured the collective action problem thus;

"As long as the music is playing you have to get up and dance. We are still dancing" (Financial Times, August 2007; 14).

As Prince's quote attests, these incentives were a key driver of risk taking behavior in the run-up to the crisis. A bank of Citi's size could not sit out the boom without attracting the attention of commentators and investors alike. According to Car (2009:5), the winner is more likely to be the "bank that dances in hope that it can scramble to a seat when the music stops (even if, as in this crisis, there are virtually no seats)." Before the year was out, Mr. Prince resigned over Citi's huge losses.

Alan Greenspan, former Federal Reserve Bank Chairman, cogently summarizes why the financial crisis problem became so widespread;

"One difficult problem is that much of the dubious financial market behavior
  that chronically emerges during the expansion phase is the result not of
 ignorance but of concern that unless firms participate in a current euphoria,
 they will irretrievably lose market share" (Financial Times, March 2008; 57).

A bank, for instance, may attempt to convince the market of its abilities by concealing the extent of bad loans originated. It can do this by maintaining a liberal credit policy, extending the term of the loans, lending new money so that insolvent borrowers can keep up the pretense of being current on their loan repayments. Other tactics include weakening covenants so as to avoid recognizing default. Isomorphically, the bank may attempt to convince the market of the quality and profitability of its lending. As interpreted by Rajan (1994), the bank is trapped in this 'second-best' credit policy because the market expects it.

Pro-cyclicality in bank lending may also stem from inappropriate responses by financial system participants. Borio *et al.,* (2001) argue that bank lending behavior can be explained using *theories of behavioral finance*. Bank lending behavior may be based on

the euphoric expectations associated with an investment boom driven by the business cycle (Minsky, 1977) or disaster myopia.

b(iv) Deposits, Capital and Regulatory Requirements

In developing and emerging markets where stock exchange is a relatively an insubstantial source of financing to the private sector, domestic credit is crucial depending on the *lending capacity* of the banking system (Catao, 1997). Bank's lending capacity is defined as the sum total of deposits and bank's own capital less the cash in vaults required to meet daily obligations and the legal reserve or liquidity requirements (SARB, 2010).

Due to the key role of domestic banks in intermediating credit flows, banks have witnessed sharp fluctuations in their lending capacity over the business cycle. In 'good' times, when banking liquidity is abundant and external interest rates lower, banks tend to embark upon a lending euphoria. According to Catao and Rodriguez (2000), lending euphoria practices include lowering spreads and raising ratio of loans to deposit, thus magnifying the impact of favorable external conditions and domestic output and employment. During 'bad' times, when liquidity dries up, banks have had to raise their lending spreads and cut down on loans, leading to market contraction in overall credit supply.

Akinboade and Makina (2009) insist that bank capital is one of the key determinants of bank lending. In fact, the maximum loan size per borrower and aggregate of loan facilities is restricted by bank's capital position. During periods of economic decline, bank reserves are quickly depleted as number of loans in default increases and loan-loss reserves replenished. Capital limitations will compel banks to reduce their risk appetite levels and cut their lending further (Catao & Rodriquez, 2000). Quagliariello (2007) adds that as regulated entities, banks have to maintain minimum capital levels in line with prudential guidelines. As capital buffers are squeezed further in recessionary periods, lending institutions may react by curtailing lending, thus aggravate the effects of economic downturn.

George and Kaufman (2003) argue that during 'bad times', not only do number of irregular loans increase, but the rate of migration of loans from performing status to non-performing status also increases at a drastic pace, as does the loss given default. In economic downturn, it is likely that regulatory capital will increase in response to deteriorating loan quality. According to Akinboade and Makina (2009), this increases the risk-weighted value of existing assets, which in turn translates into an increase in the associated regulatory capital that must be held against those assets. As a result, in recessions, the level of loan assets that the banking system can support on the existing capital base is further reduced giving rise to the perceived credit crunches (Wagster, 1999).

The efforts to discipline depository institutions through regulations lead to reduction of bank loans popularly known as the credit crunch. The new capital adequacy demand, commonly known as the Risk Based Capital requirements (RBC), often squeeze part of banks equity. The credit crunch becomes synonymous with capital crunch (Gosh, 2010). Under Basel III, a global set of banking rules being implemented between 2012 and 2018, the Registrar of Banks can apply what is known as *counter-cyclical buffer* which means lenders would have to hold additional capital when credit growth is deemed excessive (Business Day, 2012). While academics and practitioners grapple to understand the reasons behind slow credit growth, skeptics argue that the newly introduced RBC requirement caused a reduction in commercial lending where a significant number of borrowers who otherwise would have been funded were denied credit or priced out (Gosh, 2010). The term *'priced out'* means that loan prices were set high so that loan customers elected not to obtain such loans.

Bank risk capital is a scarce and costly resource and follows the cycle pro-cyclicality (Masschelein, 2007). According to Fourie *et al.,* (2011), economists at Bank for International Settlement are working to devise a counter-cyclical algorithm that increases capital during growth cycles and decreases it during a downswing or contraction. The idea behind is to "fuel the economy during a slump and avoid overheating during growth trajectories" (Masschelein, 2007: 3).

c) Other Causality Views

The proponents and supporters of bi-directional hypothesis propound that there is *mutual relationship* between bank-granted credit and economic growth (Demetriades & Andrianova, 2004; Demetriades & Hussein, 1996). Causation is reciprocal, that is, economic growth spurs credit extension and bank-credit prompts economic growth. Manikanda *et al*., (2012), in a different approach, also reported this situation. They narrate that the impact of economic growth on bank credit is not the same throughout the different phases of the business cycle. The impact on credit volumes is substantial and remarkable up to a certain period and after that, there is reversal of roles, that is, credit volumes start to cause economic growth to increase. However, some economists still would argue that bank credit and economic growth are unrelated. A good example of this view is Lucas (1998) who argues that economists 'badly over-stress' the role of financial system, thereby reinforcing the difficulties of agreeing on the link and its direction between credit and growth.

Apart from the competing supply-leading, demand-following and bi-directional hypotheses, Patrick (1966) proposes the *stage of development hypothesis*. According to this view, the stage of economic development actually determines and influences the nature of the causal relationship between economic growth and bank credit extension. In the early stages of economic development, the supply-leading view occupies the driving seat. Availability and access to bank credit facilities as well as saving and investment opportunities stimulate economic growth (Calderon & Liu, 2003; Eita & Jordan, 2007). As financial and economic development progresses, the impact of the supply-leading view become insignificant allowing the demand following view to takeover and start dominating (Calderon & Liu, 2003). Patrick, in Eita & Jordan (2007), argues that the availability and ease access to credit can prompt a firm to adopt an aggressive expansionary strategy, and when it reaches a certain level of growth, it's financing shifts to demand-leading. It is also a fact that other industries remain in supply-leading phase as long as their status in terms of growth has not changed.

2.4 Review of Literature: Empirical Evidence

Results of studies on the causal relationship between macro-economic business cycles and bank-granted credit have been mixed and the subject remains a matter of debate. Evidence in support of both the supply-leading view and the demand-following view has been widely documented. Empirical studies in support of the bi-directional causality view have also been extensively published.

2.4.1 Evidence of Supply-Leading View

Various studies support the supply leading view, confirming a positive relationship between economic growth and bank credit extension while direction of causality flows from bank credit to economic growth (Akpansung & Babalola, 2012; Claessense *et al.,* 2011; Iqbal *et al.,* 2012; Murty *et al.,* 2012; Lahura, 2011; King & Levine, 2008). Murty *et al.,* (2012) examined the long-run relationship between business cycles and bank credit extension in Ethiopia for the period 1971-2010 applying the Johansen Cointegration analysis. In the Vector Autoregressive Regression (VAR) framework, the application of Granger causality tests provided evidence that there is unidirectional causal relationship from bank credit to economic growth in Ethiopia. The study recommended that for Ethiopia to achieve sustainable economic growth, the country needs to prioritize development of the financial sector with ultimate objective of increasing availability and allowing easy access to credit by the private sector. In a similar study, Akpansung and Babalola (2012) found evidence of positive and unidirectional relationship from credit to economic growth in Nigeria. The study also recommended that to promote economic growth, Nigeria needed to prioritize policies that liberalize and deepen the financial sector with special focus on access to credit by enterprises in the private sector. Comparably, Oluitan (2009) found that credit positively impacts on output in Nigeria.

A study by Mishra *et al.,* (2009) used a VAR framework to investigate the nature of the causal relationship between economic growth and bank credit in India for the period 1980 to 2008. The Granger causality test provided evidence in support of the supply-leading view, that is, bank credit extension propels economic growth. A Granger causality test

designed by Eita and Jordan (2007) to test financial development and economic development revealed that the direction of causality runs from finance to growth in Botswana for the period 1977 to 2008. These specific results indicate that the direction and speed of economic development of Botswana is heavily influenced by the availability and suitability of financial services offered by the banking sector. Employing Autoregressive Distributed Lags (ARDL) techniques, Iqbal *et al.,* (2012), found that Pakistan's economic growth is strongly impacted by credit to the private sector and national savings. The results of the study suggest that economic development in Pakistan is very sensitive to credit extension with sensitivity ratio estimated at 5.59: 1, that is, for every one percentage increase in credit to the private sector, real GDP increases by 5.59 percent. Iqbal *et al.,* (2012) concluded that not only in the long run, but also in the short-run, the credit to the private sector has significant ramifications on business cycles.

Similarly, Cappiello *et al.,* (2010), cited in Evans (2013), in their study of European Area, found that economic growth respond positively to the supply of credit to the private sector. Hebling *et al.,* (2010), using a VAR methodology, examined the impact of credit shocks on aggregate fluctuation in economic activities for the G-7 countries. The study provides evidence that in business cycle frequencies, credit has significant positive effect on economic activities in this specific dominant group of economies. In Ramirez (2013), Claessense *et al.,* (2011), itemized some significant findings about economic downturns. In the first instance, financial disruptions have a propensity to deepen and prolong recessions. Secondly, recessions with credit crunches and house price busts result in significantly larger drops in output and correspondingly greater cumulative output losses relative to those without such episodes.

In a similar study, Jorda *et al.*, (2011) investigated the role of leverage in the business cycle. They found that more credit intensive booms tend to be followed by deeper recessions and slower recoveries. They found a close relationship between the rate of credit growth relative to GDP in the expansion phase and the severity of subsequent recessions. They also found that the effects of leverage are particularly pronounced in recessions that coincide with financial crises, but also distinctly present in normal cycles.

Taylor (2012) also found that when an expansion has been driven by a credit boom, the recession that follows is more likely to involve a severe drop in lending which in turn is felt, most greatly in a decline in investment.

In Weinberg (1995), Schreft and Owens (1991) found that loan officers' self-professed tendency to tighten lending standards follows a cyclical pattern that tends to peak (attains the greatest tightening of lending standards) just prior to or during general economic downturn. Further, they found that peaks in high loan growth rates are recorded in periods when lending standards are at their lowest, and this is common in economic upswings. As argued by Peak and Rosengreen (1995), banks' disinclination to grant credit exacerbated the recession of 1990-1 in New England. Also in the second most recent business cycle downturn (2000-3), banks were accused of being excessively restrictive, both in the US and in Europe (The Economist, 2012). Bordo and Haubrich (2009) provided evidence indicating both that more severe financial events are associated with more severe recessions and that a confluence of such events also indicates increased severity. The empirical results complement the cross country evidence by Claessens *et al.,* (2011) and Reinhart and Rogoff (2009). Causality is of course always hard to determine, but the narrative evidence strongly suggest, and empirical work is at least consistent, with the claim that credit turmoil worsens recessions (Bordo & Haubrich, 2009).

Gambetti and Musso (2012) provided evidence on the role played by loan supply shocks over the business cycle in the Euro Area, the United Kingdom and the United States from 1980 to 2010. The evidence suggests that loan supply shocks appear to have a significant effect on economic activity and credit market variables in all three areas. Moreover, they reported evidence that short-term impact of these shocks on real GDP and loan volumes appears to have increased in all three economic areas over the past few years. The results of the analysis also suggest that the impact of the loan supply shocks seems to be particularly important during slowdowns in economic activity. As regards to the 2008/09 recession, they found that the contribution of these shocks can explain about one-half of

the decline in annual real GDP growth in the Euro and the United States and possibly about three-fourths of that observed in the United Kingdom.

Using the GMM methodology, a study by Habibullah and Eng (2006) provided evidence that bank credit stimulates economic growth. There results of the study also confirmed and supported the 'Schumpeterian Hypothesis.' The results are consistency with those of other similar studies, for example, study by Calderon and Liu (2003). King and Levine (1993), cited in Oluitan (2009), conducted a study on 77 countries made up of developed and developing economies. The aim of the research was to find out whether higher levels of credit market development are significantly robustly correlated with faster current and future economic growth. The results show that finance is one of the key determinates and cause of economic growth (Oluitan, 2009). The results further reinforce the protestation that bank credit availability stimulates economic growth. The work by Demirguc-Kunt and Levine (2008) found strong evidence that there is positive relationship between economic growth and bank credit with causality emanating from credit to economic development. The study recommended that the financial sector should be developed and prioritized in order to sustain economic growth.

In advancement of the cited studies, literature is rich with recent studies is support of the causal relationship between economic growth and bank credit extension. Lahura (2011) examined the empirical relationship between credit and output in Peru. The study provides evidence that real credit growth contains useful information to understand the evolution of non-deterministic component of real output. In particular, the study provides evidence that there exist strong positive relationship between the variables with causality emanating from credit to output. Using the ARDL technique, Disbudak (2010), investigated the linkage between bank-granted credit and economic growth in Turkey. The results of the study are mixed. For the period 1961 to 2002, the results suggest that credit causes economic growth, but it inversely worked between 2003 and 2008. The results by Ghirmay (2004) provide evidence in support of finance-led growth in eight (8) out of 13 Sub-Saharan countries investigated. Abu-Bader and Abu-Quarn (2008) equally provide evidence in support for the supply-leading hypothesis in Egypt, Morocco and

Tunisia. This particular study concludes that African countries can accelerate their economic growth by improving their financial systems and making credit easily accessible.

Ansea and Bloomberg (1998) examined a large panel data set of bank loan terms over the period 1993-1997 and "demonstrate that banks change their lending standards – from tightness to laxity- systematically over the business cycle" (p89). They conclude that cycles in bank lending standards are important in explaining aggregate economic activity. Bordo and Haubrich (2009) found evidence that financial distress events exacerbate business cycle downturns both in the nineteenth and twentieth centuries and that a confluence of such events makes recessions even worse. In a comparable study, Fourie *et al.,* (2011) investigated and quantified the nature and direction of causality between the economic growth and credit cycles in South Africa for the period 1985 to 2009. The study results confirm a significant relationship between credit extension and business cycles. They conclude that bank credit plays a unifying role in the expansion and contraction of the business cycle and it is positively associated to a number of associated variables.

From what has been presented so far, one can easily be tempted to conclude that the supply-leading view dominates the demand-following view, insinuating that credit positively impacts on business cycles. The overall conclusion of this strand of empirical literature is that financial markets and institutions have a positive and significant effect on the long-run economic growth. However, empirical work buttressing the demand-following and bi-directional views has also been widely documented.

2.4.2 Evidence of Demand-Following View

There is substantial literature supporting the demand-following view, that is, *'where enterprise leads, finance follows'* (Kelly, McQuinn & Stuart, 2013; Akpansung & Babalola, 2012; Akinboade & Makina, 2010; Sindano, 2009; Vazakidis & Adampoulos, 2009; Odhiambo, 2004). Akinboade and Makina (2010) examined econometric

relationship between bank lending and business cycles in South Africa. They found that bank lending is significantly dependent on demand as indicated by cyclical factors such as business cycle coincident indicators and real money supply. Their results suggest that during business cycle upswing, bank credit tends to increase followed by the opposite dynamics in downswing. Evidence provided by Muhsin and Eric (2000) on Turkey further support this proclamation, and confirms that causality runs from economic growth to bank credit extension. They therefore concluded that credit extension follows economic growth.

In furtherance to the above studies, Ibrahim (2009) provide evidence that there is a positive causal connection between economic growth and bank activity because increase in GDP will raise both supply and demand for bank credit. As GDP increases, banks will have more funds to make loans due to increase in deposits. Dell'Ariccia and Marques (2006), as cited in Kelly *et al.,* (2013), predicted that the default cases increase after credit has been expanded rapidly. They found that rapid credit growth is more likely to occur in the upswing of a business cycle due to over-exuberant lending. In a similar study, Sindano (2009) employing the Cointegration and VECM techniques, examined the causal link between economic growth and credit cycles. The study provides evidence that causality flows from economic growth to bank credit. The study recommended that the real sector of the economy should be developed further in order to stimulate further development in the economy through appropriate policy interventions. The study by Odhiambo (2004) on South Africa further lends credence on the demand-following argument. The investigation revealed strong evidence in support of the demand following view for South Africa.

There is huge empirical literature studying the linkages between value of collateral and bank credit extension. Mendoza and Terrones (2008) found that credit booms are associated with periods of economic expansion, rising equities and house prices followed by the opposite dynamics in contraction phase. Dell'Ariccia *et al.,* (2009) found that in the United States, relaxation in lending standards was higher in areas with faster rates of house appreciation. This suggests that lenders were gambling that higher house prices

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would enable borrowers in default to liquidate the collateral and repay the loan. Several other studies including Mian and Sufi (2009) and Car (2009) also provide empirical illustrations of such amplification. Car (2009) found that when markets have turned down, forced asset sales (fire sales) weaken price of properties further. Borrowing becomes even harder and more expensive during business cycle downswing.

Empirical evidence by Car (2009) also confirmed that in the booming American housing market, mortgage originators were happy to accept no additional security at all lending 100% of the value of the house. This was partly because they thought house prices would continue to rise and partly because they assumed the market would be liquid enough for them to off-load the mortgages to other investors. As it happened, the mortgage originators were wrong and the loans that were stuck on their books helped destroy their business (Car 2009). Salas and Saurina (2002) found that during booms riskier borrowers obtain credit and collateral requirements decrease.

In a comparable study, Dell'Ariccia *et al.,* (2009) found that the decrease in collateral requirements in subprime mortgage market was associated with rapid house appreciation. The results are consistent with the conviction that in good times, bankers relax lending standards and lend exuberantly at the peak of a business cycle. Likewise, Gerlach and Peng (2003) studied the nexus between output, property price and bank lending in Hong Kong. They found that bank lending appears to be demand –driven and that the direction of influence goes from property price to bank lending rather than conversely.

Evidence to show that bank competition for borrowers' leads to periodic swings between high and low credit allocations has also been uncovered. Dell' Ariccia *et al.,* (2009) found that an increase in the number of competing lending institutions increases demand rates of present banks in the overall mortgage market. The findings are consistent with the asymmetric information theories of competition in credit markets implying that an increase in the number of competing institutions increases adverse selection (Murty *et al.,* 2012). The interpretation of the mortgage market by Dell'Ariccia *et al.,* (2009) is that local lenders were 'forced' to cut lending standards when facing competition from new

entrants. This piece of empirical evidence supports the view that strategic interaction among asymmetrically informed banks leads to banks to behave more aggressively and lend exuberantly during economic upswings than in downswings (Ruckes, 2004; Gorton & Herbert, 2008).

In furtherance to the above cited studies, Salas and Saurina (2002) analyzed the relationship between bad loans and economic cycle in Spain over the period 1985-1997. They observed that during economic booms, banks tend to expand lending activity to increase their market share; this result is often reached by lending to borrowers of lower credit quality. They report that bad loans increase in recessionary phases and that the contemporary impact is much higher than the delayed impact. Quagliariello (2007) concluded that macro-economic shocks are quickly transmitted to bank's balance sheets. Banks adopt aggressive provisioning methodologies during economic downswing. This is important because loan losses provisions should reflect changes in 'borrowers' credit worthiness and banks sentiments concerning the health of the economy. The study provides evidence showing a negative relationship between provisions and loan and GDP growth. The study concluded that aggressive provisioning during recessions actually exacerbates the effects of negative phase of the business cycle.

Evidence suggesting a positive correlation between bank credit extension and levels of bank deposits and capital held has also been documented (Catao & Rodriguez, 2000). Banks world-over have internal benchmarks on the loan-to-deposit ratio (LDR). As large devaluations and interest rate shocks of 1994/95 in Latin America and of 1997/98 in Asia eroded banks deposit base and led to a sharp rise in non-performing loans, domestic credit came to a halt. This helped intensify and prolong the recession well beyond what appeared to be warranted by the initial monetary tightening (Catao & Rodriguez, 2000).

Akinboade and Makina (2009) observed that bank lending capacity is determined by the institution's capital position. For example empirical evidence suggests that credit rationing played a significant role in limiting the expansion of bank loans to businesses during the 1991-1992 recessions in the United State of America, after the introduction of

new restrictive and tighter capital requirements measures (Akinboade & Makina, 2009; Berger & Udell, 2000). Bliss and Kaufman (2003) observed that capital requirements are more binding at the bottom of a business cycle.

Investors and lenders to banks registered alarm after Lehman Brothers collapsed in September 2009. So worried were they about the risk of being wiped out in a bankruptcy or a state rescue that they suddenly started to demand that banks hold more capital against their risk-weighted assets. For decades, this ratio had been stable, below 10% of book assets. Nobody can be sure how much capital shareholders now want to hold, but Alan Greenspan (in Car, 2009), thinks the figure could have grown to 15% of their assets. If so, banks will have to raise money and sell loans and securities. Investor's desire for extra protection has exacerbated the contraction of credit.

Overall, the presented evidence in this sub-section supports Robinson's argument that 'where enterprise leads, finance follows', but not the Schumpeterian view that credit impacts positively on business cycles. However, it is imperative to mention that there is also evidence suggesting a mutual relationship between business cycles and bank credit. Interestingly, there is also evidence suggesting non-existence of any form of relationship between economic growth and bank credit.

2.4.3 Evidence of Bi-directional View

The champions of the mutual causation argument posit that there is feedback response or reciprocal relationship between bank-granted credit and economic growth. Several research works on business cycles and credit extension support a mutual relationship between the variables (Evans, 2013; Mishra, Das & Pradhan, 2009; Pradhan, 2009; Shan & Jianhong, 2006; Odhiambo, 2005; Ghirmay, 2004; Demetriades & Hussien, 1996).

Mishra *et al.,* (2009), using VAR, found that economic growth promotes bank credit in India. In addition, Granger causality tests indicated that credit market development spurs economic growth in India. In Murty *et al.,* (2012), the findings of Pradhan (2009) also provide evidence for bidirectional causality between economic growth and credit in India

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using monthly data set for the period 1993-2008. What is not mentioned is whether bank credit represents total credit or bank credit to private sector only. Similarly, using a VAR approach, Shan and Jianhong (2006), investigated the relationship between economic growth and financial development in China. The study provide strong evidence is support of the postulation in the literature that financial development and economic growth exhibit a two-way causality and hence is against the so-called 'finance-led' or 'growth-led' hypotheses (Akpansung & Babalola, 2012).

In furtherance to the above studies, Abu-Bader and Abu-Quarn (2007) examined the relationship between financial development and economic growth in Egypt during the period 1960-2001 within a trivariate VAR framework (investment being the additional variable). The study applied Granger causality tests using the VECM methodology. The study results strongly support the view that financial development and economic growth are mutually causal, that is, causality is bi-directional. Using a multivariate VAR for 10 countries, Luintel and Khan (1999), investigated the causal link between bank credit and economic growth. The study provides evidence that there is a mutual relationship between bank credit and economic growth for all the sampled countries.

In a comparable study, Demetriades and Hussein (1996) conducted causality tests between financial development and real GDP using time series data. The study concluded that finance is a leading sector for economic development and there are different causality patterns across countries. In some cases, the study found that economic development systematically causes financial development. The study showed the bi-directional relationship between financial development and economic growth. In a similar study, Evans (2013), using the VAR technique, empirically investigated the relationship between domestic credit and economic growth in Nigeria, using time series data from 1970 to 2012. The study results suggest that there is a two-way relationship between bank credit and economic growth in Nigeria.

2.4.4 Evidence of Other Causality Patterns

As discussed in section 2.3.4 above, Patrick (1966) proposed the *stage of development hypothesis*. This view propounds that the causal relationship between bank credit and economic growth depends on the stage of economic development. A couple of research works on business cycles and bank credit extension support this hypothesis (Odhiambo, 2007; Calderon & Liu, 2003; Gregorio & Guidotti, 1994; Jung, 1986). Gregorio and Guidotti (1993) examined the empirical relationship between long-run growth and financial development, measured by the ratio of bank credit to the private sector to GDP. They found that this proxy is positively correlated with growth in a large-cross-country sample, but that its impact changes across countries. The positive effect is particularly strong in middle and low income countries and also in the 1960s than in the 1970s and 1980s. As shown in their findings, the main channel of transmission from credit market development to economic growth is the efficiency, rather than the volume, of investment. They however, also found a robust and significant negative correlation between financial intermediation and economic growth in Latin America. The findings support the stage of development hypothesis.

In furtherance of the above studies, Jung (1986) investigated the causal connection credit and economic growth for 56 countries (19 developed and 37 developing). The study provides evidence to show that in developing countries, supply-leading view is more dominant than demand-following view and the opposite is true for developed countries. In a similar study, Calderon and Liu (2003) concluded bank credit contributes more to economic growth in developing countries than developed countries. Again, the results provide support for Patrick's hypothesis of stage of development.

Odhiambo (2007) revealed evidence suggesting that demand-following view reigns in South Africa. It therefore follows that in South Africa, it is the real sector of the economy that creates and promotes demand for credit. The same study found contradicting evidence in Tanzania where it is the availability and growth of bank credit that propel economic growth. The findings of this study are consistent with the stage of development

view. This is evident by the fact that there is strong evidence is support of supply-leading response in Tanzania- a country with a comparatively less developed real sector and support for demand-following response in South Africa- a country with a relatively developed real sector.

Whilst it is acknowledged that there is overwhelming evidence in support of both the supply-leading or demand following views, it is imperative to mention that some areas of controversy have been reported in literature. Some research works suggest that there is no relationship between business cycles and bank credit extension. Gorton and Herbert (2008) argued that bank credit can occur without any change in the macro-economic environment. They provide empirical evidence that bank credit cycles are an autonomous part of business cycle dynamics. This lends credence to the argument that economic growth and credit growth are unrelated (Lucas, 1998). In furtherance of these studies, Mukhopadhyay and Pradhan (2010) examined the causal relationship between financial development and economic growth of 7 Asian developing countries (Thailand, Indonesia, Malaysia, the Philippines, China, India and Singapore) during over a period of 30 years using the multivariate VAR model. The study concluded that no general consensus can be made about finance-growth nexus in the context of developing countries.

2.5 Chapter Summary

The existence of causality between business cycles and bank credit extension seems indisputable as many researchers have worked on the issue and positively confirmed it. What is contestable is the direction of causality between credit and economic growth. As discussed in literature, the relationship between these variables may be unidirectional, the reverse or bi-directional. The direction of causality has been described as supply-leading, demand-following and bi-directional hypotheses. The causality question is germane because the determination of the causal pattern between credit and growth has important policy implications.

The purpose of the research was to establish the link between business cycles and changes in bank credit. Based on the contrasting arguments and empirical evidence

presented in section 2.3 and 2.4 above, it is clear that the results are inconclusive, mixed and in some instances conflicting. Most of these studies have been done on developed countries such as the United States, Canada and Australia. Studies on developing and emerging economies like South Africa are limited and fragmented. In South Africa, the most recent and relevant studies on the subject include Fourie *et al., (*2011), Akinboade and Makina (2010), Dlamini (2008) and Odhiambo (2004). As it is elsewhere, there is no consensus on the direction of causality between business cycles and bank credit extension. Moreover, most of the widely cited studies on South Africa use data up to 2007, just before the start of the global crisis- the studies do not cover the historical downward phase that started in December 2007 and the recovery that started in third quarter of 2009 and this weakens the empirical literature. This study endeavored to fill such gaps.

Although the positive role of finance on economic growth, and vice-versa, has become a stylized fact, there are some methodological reservations for the results of the previous empirical studies. Accordingly, the heart of this study is to link the business cycles and bank credit extension in the South African economy by using a two-pronged approach: (i) descriptive approach and inferential statistics to analyze survey data and (ii) using the cointegration and causality approach to analyze time series data. The details of these techniques are comprehensively explained in Chapter 3.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

After identifying the initial gaps in the literature on the causal link between business cycles and bank credit extension, a qualitative study was conducted to explore key determinants of bank-granted credit. The behavior of credit aggregates during alternate business cycles was also assessed. Particular attention was given to reasons why banks change lending policies over time. The results of this leg of the research (Phase I) led to a quantitative study (Phase II) that sought to understand the nature of the relationship between economic growth and bank credit extension. To augment the results of the survey approach, the study also adopted an econometric methodology to estimate the direction of causality between business cycle and credit extension in South Africa using time series data.

The research, as earlier mentioned in Chapter 1, sought to answer the following question: What is the nature and causal relationship between business cycles and bank credit extension? After considering relevant theory and reviewing literature, it is time to give empirical evidence to test the consistency of theories with the real world. This chapter discusses research methodology, evaluating possible methods used by similar studies, and describing and justifying the selected method of sampling, method of data collection, capture and analysis. It also covers the issues of reliability, validity and ethical considerations.

A two-pronged approach was taken in this study. Firstly, a content analysis and descriptive analysis were employed on survey data (primary data). Secondly, a Vector Autoregressive Model (VAR) was adopted in the study in order to estimate the direction of causality between business cycle and credit extension in South Africa using time series data.

This chapter is arranged as follows: section 3.2 describes the research paradigm adopted and section 3.3 describes the research approach used to collect primary data. Sections 3.4 to 3.8 describe the sample characteristics and data collection methods used on primary data. Section 3.9 presents data analysis methods and techniques used. Validity and reliability concerns are addressed in section 3.10 while section 3.11 summarizes ethical considerations. Section 3.12 presents the econometric methodology employed to analyze time series data. The last section (13) provides highlights of the chapter.

3.2 Research Paradigm

Academic researchers have traditionally been confronted with the choice of two distinct paradigms by which to conduct their research: positivistic and phenomenological (Collins & Hussey, 2003). They hold diametrically different views about research process and research design (Creswell, 2007).

The proponents of positivism argue that reality is independent from the researcher (Morcoil, 2001). Positivistic paradigm is applied to social sciences and business research. However, positivism may not always be appropriate as all social sciences cannot be accurately and reliably measured, thus reducing the *validity* of the findings (Creswell, 2007). On the other hand, proponents of the phenomenological approach argue that objectivity is an impossible aim and reality is subjective as the researcher interacts with what is researched. This approach is undermined by the subjectivity of the research and poor reliability of the findings in that two researchers may arrive at different conclusions based on their observations of the same phenomenon at the same time (Creswell, 2007).

As suggested by Yin (1994), the choice of the research paradigm employed in the current study was influenced by the nature of the research questions. In addition, O'Donnell *et al.*, (2006: 6) argue that the choice of the research paradigm should not be considered an either/or decision as research based on a critical perspective is not a "fixed homogeneous approach." The theoretical framework presented in Chapter 2 and the research questions that this study sought to address suggested the most appropriate research paradigms to be used.

Table 3.1 Research Questions and Research Paradigms adopted in the Study

Research Question	Research Paradigm	Data Collection Method
In your opinion what do you consider to be the key drivers of credit extension?	Positivism (Quantitative) and phenomenological (Qualitative)	Interviews and structured survey questionnaire
What is the relationship between economic activity and bank credit availability?	Positivism (Quantitative) and phenomenological (Qualitative)	Document analysis, interviews and structured survey questionnaire
What is the direction of causality between business cycles and bank credit extension?	Positivism (Quantitative)	Document analysis and survey structured questionnaire
Why are changes in bank credit policy seemingly correlated with changes in condition of those demanding credit?	Phenomenological (Qualitative)	Semi-structured interviews and structured survey questionnaire

Source: Developed on the basis of the research problem outlined in Chapter 1

Table 3.1 above illustrates that the research questions that were addressed in this study required both positivistic and phenomenological paradigms. The quantitative research leg of the study described, tested and examined cause and effect relationships (Burns & Grove, 1987), using a deductive process of knowledge attainment (Dufy, 1985). The study also utilized qualitative research methods including document analysis and, open-ended survey questions. The documents reviewed include SARB Quarterly Bulletins, SARB Annual Reports, Monetary Policy Statements, South Africa Budget Speeches, Bank BA returns to SARB, Bank Annual Reports and Reuter's websites as well as newspaper and magazine articles (Business Day, Business Report, The Economist).

3.3 Research Approaches: Primary Data

In this study, a mixed research design was used to answer the research question and is defined by Creswell *et al.,* (2003: 212) as "the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given priority, and involve the integration of the data at one or more stages in the process of research." The mixed research method was considered to be very efficient in answering the research questions compared to the qualitative and quantitative approaches when used in isolation (Johl, Bruce & Bikins, 2012; Creswell *et al*., 2003). Since the mixed methods research design comprises both qualitative and quantitative research methods, these concepts will be discussed first.

3.3.1 Quantitative versus Qualitative Approaches

Leedy and Ormord (2005), state that research literature has identified two silent features of both qualitative and quantitative approaches. At the most basic level, data are considered quantitative if they are numbers and qualitative if they are words. Qualitative data may also include photos, videos, audio recordings and other non-text data.

Researchers who use logical positivism or quantitative research employ experimental methods and quantitative measures to test hypothetical generalizations (Hoepfl, 1997), and they also emphasize the measurement and analysis of causal relationships between variables (Denzin & Lincoln, 1994). In this approach the researcher's emphasis was on facts and causes of behavior and the information was in the form of numbers that could be quantified and summarized. Moreover, the mathematical process was the norm for analyzing the numeric data, and the final result was expressed in statistical terminologies as guided by Golafshani (2003).

Generally, quantitative research "… supported by positivist or scientific paradigm, leads us to regard the world as made up of observable and measurable facts" (Glesne & Peshkin, 1992: 6) though the assumption that "social facts have an objective reality" and "variables can….be identified and relationships measured" (p7) is problematic. The disadvantage of using solely quantitative approach is that it would "idolize numbers and

emphasize precision but it is not particularly useful in revealing the meanings that people ascribe to particular events or activities and not well suited to understand complicated organizational processes in context" (Creswell *et al.,* 2003: 15). Also it is unable to reveal the underlying details and depth in the area researched (Miles & Huberman, 1994). Often, the quantitative research approach has been criticized for failing to incorporate a broad range of information, such as unstructured responses in the analysis (Creswell *et al.,* 2003; Miles & Huberman, 1994). Even when data is collected, it is often reduced to simple categories through quantification.

As stated above, the researcher also used the qualitative method to answer the 'why' and 'how' questions. Qualitative research is a study in a natural setting and involves a process of building a complex and holistic picture of the phenomenon of interest (Maree, 2010). Qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as "real world setting [where] the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 2001: 39). Qualitative research, broadly defined, means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss & Corbin, 1990: 17) and instead, the kind of research that produces findings arrived from real-world settings where the "phenomenon of interest unfolds naturally" (Patton, 2001: 39).

Nevertheless, the qualitative approach has also often been criticized as it tends to be stronger on long descriptive narratives rather than on statistical categorizing events or activities and this has raised the problem of reliability (Creswell *et al.,* 2003; Silverman, 2000). In addition, qualitative researchers are criticized for their selectivity in reporting the results and not providing alternative perspectives on how to increase the credibility of findings. Silverman (2000) criticized qualitative research as it tends to express personal opinions instead of accurately reflecting perspectives of the informants. All these create doubts on the reliability and validity of qualitative research that has led many quantitative researchers to underestimate its value.

In addition to the qualitative and quantitative research methods, Johnson, Onwuegbuzie and Turner (2007) argue that there is a third method called mixed methods research. This third methodology has been given many names. Here are a few: blended research (Thomas, 2003), integrative research (Johnson & Onwuegbuzie, 2004), multi-method research (Morse, 2003) and mixed research (Johnson, 2006). An advantage of the broader term *mixed research*, as well as *integrative research*, is that it does not suggest a limitation of mixing to methods only (*Johnson et al.*, 2007).

3.3.2 Rationale for Mixed Methods Approach

Looking at the qualitative-quantitative continuum in Figure 3.1 below, mixed research can be viewed as incorporating several overlapping groups of mixed method researches or types of mixed methods research. The area in the center of the figure, moving outwards in both directions (and excluding the area near poles), is where mixed research, broadly speaking, falls, with the center representing the strongest or 'pure' form (Johnson *et al.,* 2007). It makes sense that a researcher might have one primary home (out of the three major homes: qualitative research, mixed research and quantitative research). Johnson and Onwuegbuzie (2004) argue that it makes sense for the researcher to visit other homes when his/her research can benefit from such a visit.

Figure 3.1 Graphic of the Three Major Research Approaches, Including Subtypes of Mixed Methods Research
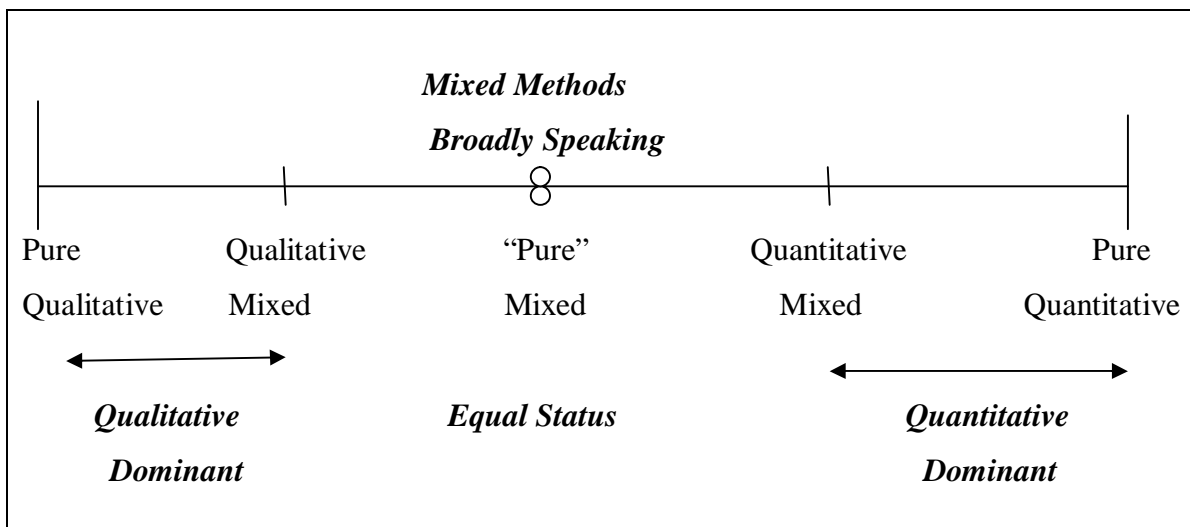
Source: Johnson, Onwuegbuzie, & Turner (2007)

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The area around the center of the continuum, *equal status*, is the home for the person that self-identifies as a mixed researcher. These mixed method researchers are likely to believe that qualitative and quantitative data and approaches will add insights as one considers most, if not all, research questions as illuminated in Table 3.1. As shown in Figure 3.1 there is also another type of mixed methods research that results from the continuum, labeled *qualitative dominant* mixed methods. This type of research is symbolized as QUAL +quan research (Johnson *et al.,* 2007). This area on the continuum would fit qualitative or mixed researchers who believe it is important to include quantitative data and approaches in their otherwise qualitative projects. Here is a good definition of qualitative dominant mixed method research:

"Qualitative dominant mixed methods research is the type of mixed research in which one relies on a qualitative, constructivist-poststructuralist- critical view of the research process, while concurrently recognizing that the addition of quantitative data and approaches are likely to benefit most research projects" (Johnson et al., 2007: 124).

As shown in Figure 3.1 there is another type of mixed methods research that results from the continuum and is labeled *quantitative dominant* mixed methods research. This type of research is symbolized as QUAN+qual research. This area on the continuum would fit quantitative or mixed method researchers who believe it is important to include qualitative data and approaches into their otherwise quantitative research projects. Here is a potential definition:

"Quantitative dominant mixed methods research is the type of mixed research in which one relies on a quantitative, postpositivist view of the research process, while concurrently recognizing that the addition of qualitative data and approaches are likely to benefit most research projects" (Johnson et al.,2007: 124).

The mixing of data is a unique aspect of the definitions. By mixing the data, the researcher provides a better understanding of the problem than if either dataset had been

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used alone. According to Creswell (2003), there are three ways in which mixing occurs: merging or converging the two datasets by actually bringing them together, connecting the two datasets by having one build on the other, or embedding one dataset within the other so that one type of data provides a supportive role for the other dataset.

Figure 3.2 Three Ways of Mixing Quantitative and Qualitative Data

Merge the data:

Qualitative data → Results ← Quantitative Data

Connect the data:

Qualitative data → Quantitative data → Results

Embed the data:

Quantitative data [Qualitative data] → Results
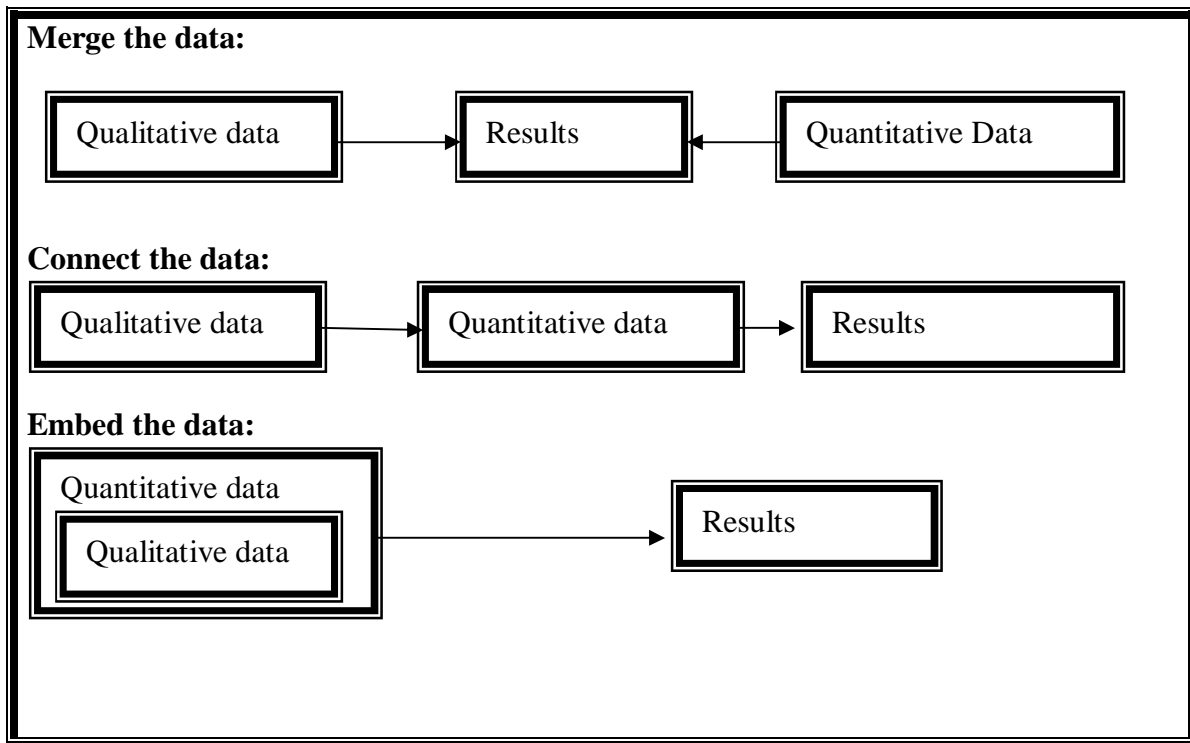
Source: Creswell (2003)

The different ways of mixing data are depicted in Figure 3.2 above. In short, it is not enough to simply collect and analyze quantitative and qualitative data in isolation: they need to be 'mixed' in some way so that together they form a more complete picture.

The basic premise behind using a mixed methods research design is that the combination of both approaches provides a better understanding of a research problem than either approach could alone. Creswell and Clark (2011) argue that integrating methodological approaches strengthens the overall research design, as the strength of one approach offsets the weaknesses of the other, and can provide more comprehensive and convincing evidence than mono-method studies. Another practical benefit is that mixed method

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research can encourage interdisciplinary collaboration and the use of multiple paradigms (Creswell & Clark, 2011). Also the results from one method can help develop or inform the other method (Greene *et al.,* 1989). Furthermore, by using a mixed method approach at different stages of the research, any bias that exists in any single method can neutralize or remove the biases of other methods (Creswell, 2003). Therefore, in this particular study the advantages of collecting closed-ended quantitative data through survey questionnaires and open-ended qualitative data by conducting interviews proved to be advantageous to better understand the research question (Creswell *et al.,* 2003).

The benefits and advantages of mixed method research are many. The researcher would be remiss and irresponsible, however, if he/she does not also discuss some of the weaknesses and disadvantages associated with integrated methodology. Creswell (2003) summarizes the potential limitations. Conducting mixed method is not ease. It takes time and resources to collect and analyze both quantitative and qualitative data. Brannen (1992), cited in Creswell *et al.,* (2003), argues that research strategy that combines two approaches is not necessarily superior at all times. It is important for the researcher to judge whether any important aspect of the research problem would be ignored if there is a total reliance on one research approach. It is important to ensure that the use of the additional research approach is there much more than a cosmetic purpose (Creswell *et al.,* 2003).

As guided by (Creswell & Clark, 2011), the researcher's decision of whether or not to integrate multiple approaches depended on a combination of factors, including but not limited to the following: research objectives, research questions, availability of resources and participants and the audience for the study findings. Noting the strengths and weaknesses that flow from purely quantitative and qualitative bias in research, the researcher decided to use a *sequential (connected data) mixed approach* that draws on both positivism and phenomenology. The use of the multiple research method enabled the researcher to increase the reliability and validity of findings (Johl, Bruce & Binks, 2012). The weaknesses of one method were balanced by the strengths of the other methods incorporated in the same study.

For this study, two research strategies were combined into a single research design. Text information was obtained through interviews and numeric data was collected through the survey instrument. Information received from the participants or the findings were connected at various points within the study (Maree, 2010). Maree suggests there are three mixed method designs of research, namely explanatory mixed method design, exploratory mixed method design and the triangulation mixed method design. The present study used an exploratory mixed method design as depicted in Figure 3.3 below.

Figure 3.3: Exploratory Mixed Method Design

Qualitative data collection and analysis	Quantitative data collection and analysis	Qualitative →Quantitative
(Interviews and focus groups)	*(Survey on business cycles and credit extension)*	*(Interpret how Quantitative results build on Qualitative results)*
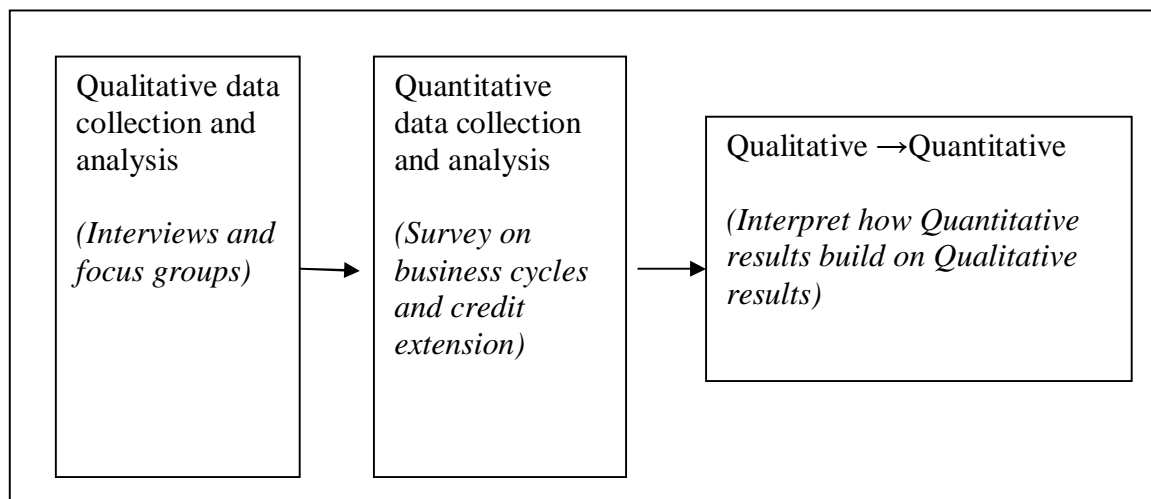
Source: Adapted from Maree (2010: 267)

As shown in Figure 3.4 overleaf the study had three phases. The first phase was to explore factors that determine credit growth through a qualitative methodology through interviews. Phase I of the research used an exploratory approach to unravel and deepen the understanding of the business cycle-credit extension connection. The variables and relationships identified in this phase informed the formulation of questions of the survey instrument used to collect quantitative survey data in Phase II of the research. Phase III of the study examined the econometric relationship between bank lending and business cycles in South Africa. Decision on time series data collected was influenced by literature on the subject as well as by results of Phase I and Phase II of the research.

Figure 3.4: Research Design
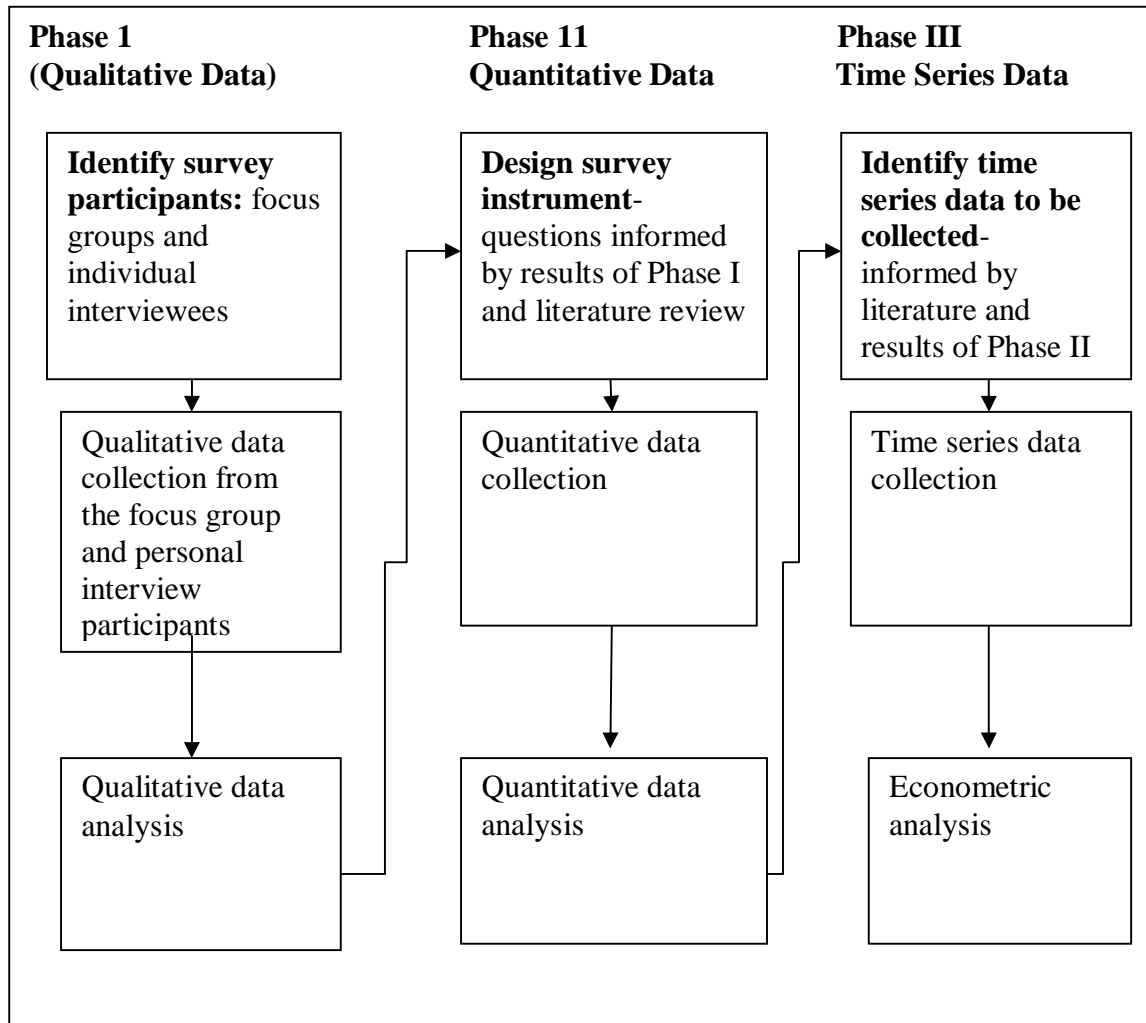
Source: Singh (2012) and Author's Own Contribution

As indicated above, the study adopted a sequential approach which involved two phases (Creswell, 2003). This procedure sought to elaborate the findings of one method with another method for exploratory purposes. This began with a qualitative method for exploratory purposes which was then followed by a quantitative method with a larger sample for the researcher to generalize the results to a population. Phase I began with an exploratory study using a qualitative method at the first stage of the research in order to determine the gap of knowledge that needed to be addressed. The main objective of this exploratory study was to obtain participants' views and perception on the key drivers of credit extension and on the behavior of different credit aggregates during alternate

business cycles. This leg of the study also sought opinion of respondents on reasons why banks change credit policies over time. This exploratory study compared the findings within the existing literature on business cycles-credit growth relationship and analyzed whether there existed a gap in knowledge that needed to be explored. In addition, this phase was used to reshape the research questions and to crystallize the scope for the next phase.

To explore further, a quantitative approach (Phase II) was then used to determine the key credit extension divers as well as determine the nature of long-run relationship between business cycles and bank credit in South Africa. Also, reference was made to the researches of Fourie *et al.,* (2011) and Akinboade and Makina (2010) to include additional questions on the direction of causality between economic growth and bank credit extension with the intention of ensuring that there would be a comprehensive coverage in this aspect. After seeking opinions of research experts, these questions were further improved before distributing to respondents. The survey method was then used to distribute the questionnaires which provided breadth to the results compared to the qualitative study which provided depth to the study (Creswell *et al.,* 2003).

For completeness and to further augment results of the survey approach, an econometric methodology (VAR) was used to re-examine the econometric relationship between bank lending and business cycles in South Africa using selected time series data. Literature and results of Phase II of the study informed the time series data selected.

3.4 Study Population and Unit of Analysis
3.4.1 Study Population
A study population refers to the *entire* group of individuals or objects or alternatively a full set of cases from which the researchers are interested in generalizing conclusions (Lewis & Thornhill, 2009; Mungenda & Mungenda, 2003). In this study all banks registered with the SARB for the period between 1980 and 2013- inclusive were included in the study. Inspired by the Senior Loans Officers Opinion Survey (Lown & Morgan, 2006), the study was limited to senior loan officers in commercial, merchant and

investment banks only. The target population therefore was all commercial, merchant and investment banks registered with the SARB between 1980 and 2013.

According to the SARB (2013), as at end of June 2013, the SA Banking industry was made up of 17 registered banks, two mutual banks, 12 local branches of foreign banks, and 41 foreign banks with approved local representative offices. The banks are listed in Table 3.2 below.

Table 3.2:   List of Banks in South Africa

Category	Bank
Registered banks- locally controlled	ABSA Bank Limited; African Bank Limited; Bidvest Bank Limited; Capitec Bank Limited; FirstRand Bank Limited; Grindrod Bank Limited; Investec Bank Limited; Nedbank Limited; Regal Treasury Private Bank Limited (in liquidation); Sasfin Bank Limited; Ubank Limited; The Standard Bank of South Arica Limited.
Registered banks- foreign controlled	Albaraka Bank Limited; Habib Overseas Bank Limited; HBZ Bank Limited; Islamic Bank Limited (in Final Liquidation); Mercantile Bank Limited; The South African Bank of Athens Limited.
Mutual banks	GBS Mutual Bank; VBS Mutual Bank
Local branches of foreign banks	Bank of Baroda; Bank of China Limited Johannesburg Branch (trading as Bank of China Johannesburg Branch); Bank of Taiwan South Africa Branch; China Construction Bank Corporation-Johannesburg Branch; Citibank N.A; Deutsche Bank AG; JP Morgan Chase Bank N.A. (Johannesburg Branch); Societe Generale; Standard Chartered Bank-Johannesburg Branch; State Bank of India; The Hongkong and Shanghai Banking Corporation.

Source: SARB (2013)

As at December 31st 2013, total loans and advances in South Africa stood at R3.8 trillion (SARB, 2014). Figure 3.5 illustrates the asset market share as at end of December 2013. The four major banks represented about 84 percent of total banking assets. Standard

Bank, the largest bank in terms of assets had a market share of 26 percent, followed by ABSA with 21 percent. FirstRand and Nedbank had a market share of 18 percent and 19 percent respectively. The other banks contributed 16 percent to the asset pool.

Figure 3.5 Bank Asset Market Share
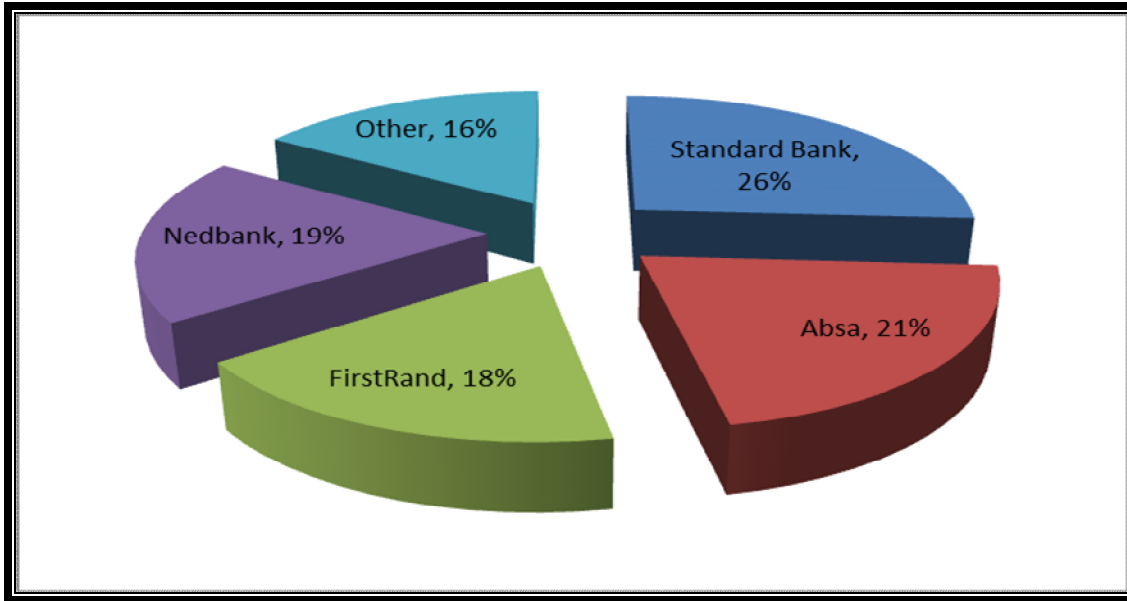
Source: SARB (2014)

The number of loan officers in all registered banks is unknown. For this research, the survey used various sources such as banks' annual reports, banks' websites and SARB various bulletins to estimate the population of interest (total bank employees) and target population (number of loan officers). Specific details of population and sample of study are provided in Table 3.4.

3.4.2 Unit of Analysis

One of the biggest challenges in conducting qualitative data analysis is deciding on what piece of data constitutes a meaningful unit to analyze. In qualitative data analysis a unit would be a single undivided entity upon which you direct your analysis and express the qualities you perceive in that element (Chenail, 2012). It is the 'what' and 'who' that is being studied (Mugenda & Mugenda, 2003). Neumann (2006: 58) defines unit of analysis as "the unit, case, or part of social life that is under consideration. Unit of analysis is key

in concept development, empirically measuring or observing concept, and in data analysis." According to Cooper and Schindler (2008), the unit of analysis describes the level at which the research is performed and which objects are researched.

In social science research, there are several units of analyses that are commonly used, including an individual, a group, an organization, a division, a department and at a 'lower' level, a management decision, a transaction or a contract (Babbie, 2001). As highlighted by Mugenda and Mugenda (2003), there can be more than one unit of analysis in research study. It is imperative to mention that the unit of analysis and the kind of respondents may not be same thing. As guided by Neumann (2006), the researcher's choice of unit of analysis was related to the following three questions: (i) what is your research problem and what do you really want to answer? (ii) What do you need to measure to answer your research question? (iii) What do you want to do with the results of the study or whom do you address in conclusion?

In this research, the 'bank' was the primary unit of analysis and 'senior loans officer' was the secondary unit of analysis. The credit decisions they make and the actions they take were analyzed thoroughly during the research to determine their impact on bank credit extension. In this research, 'the management decision' of credit extension was the tertiary unit of analysis. The respondents were loan officers and banks, and these are the things that were sampled. The focus of the analysis was at the loans officer level.

3.5 Study Sample: Sampling Issues

As indicated above, the targeted respondents in this research were senior loans officers within respective banks. The sample was therefore randomly selected (Denscombe, 2008). Non-probability samples are samples where members of population do not have an equal chance of being selected (Denzin & Lincoln, 1994). Non-probability samples include nomination, snowballs, volunteers, and theoretical (purposive/judgmental) samples. These sample types are relatively small and are used for qualitative research (Denzin & Lincoln, 1994).

Nomination is the most widely-used form of recruiting a non-probability sample. Essentially the researcher will ask a local *social gatekeeper* or *intermediary* to nominate a group of people who meet requirements for a research study. A social gatekeeper exercises control over who enters a community. Essentially the researcher searches them out, writes to them explaining the nature of the research, and asks them to nominate a cross-section of local people to interview. Often, they will offer to arrange the meetings. But this offer of assistance is incompatible with the ethical ideal of voluntary consent (Denzin & Lincoln, 1994). This sampling approach was therefore considered inappropriate for this study.

Snowballs grow larger as they are rolled across snowfields. The snowball sample is therefore used to describe samples which become larger as each contact suggests more people to contact (Cooper & Schindler, 2006). Snowball sampling is conducted in stages. In the first stage, a few people with requisite characteristics are chosen and interviews conducted. These people in turn identify others who qualify for inclusion in the initial interview stage or for the formal survey stage. The additional contacts will also be interviewed, or the formal survey questionnaire will be sent to them. This approach was considered suitable because "respondents are difficult to identify and are best located and motivated to participate through referral networks" (Saunders *et al*., 2003: 484).

A *volunteer sample* is one where members of the research population volunteer in your research. You are most likely to seek volunteers where your sample is likely to undergo a period of discomfort, pain or financial cost. The greatest advantage of seeking volunteer samples is that they can be relied upon to cooperate fully. Conversely, because the volunteers are self-electing, they are more likely to be especially interested in the topic and therefore may be less likely to be representative of the population as a whole. This sampling approach was therefore considered inappropriate for this study.

Purposive sampling is a deliberate choice by the researcher, selection being judged by the researcher having field experience (Saunders *et al.,* 2003). Under this approach, the researcher picks only those who best meet the purpose of the study. Saunders *et al.,*

(2003: 486) define purposive sampling as "a non-probabilistic sampling procedure in which the judgment of the researcher is used to select cases that make up the sample." For this specific study, purposive sampling was selected as the preferred method because this sampling technique met all the requirements which were prescribed by Saunders *et al.,* (2003). A researcher may have a specific group in mind such as high level executives, in this case, senior loans officers within commercial banks. It may not be possible to sample the entire population and attempts are made to zero in on the target group, interviewing whoever is possible. Denzin and Lincoln (1994) elucidate that the logic and power behind purposeful selection of informants is that the sample should be information rich.

Because of cut-throat competition, need to protect proprietary information and emphasis on bank-customer confidentiality, respondents are difficulty to get in the banking field. Therefore, two appealing and considered sampling approaches were the snowball sampling and the purposive sampling techniques. Noting the strengths and weaknesses that flow from purely judgmental and snowball sampling approaches, the researcher opted to use a hybrid of the two approaches. The purposive sampling assisted in identifying respondents with the right profiles that meet the requirements of the study and through referrals, the snowball approach assisted in increasing the sample size. While purposive and snowball sampling methods were used on the qualitative methods, a probability sampling method (random sampling method) was be used on the side of quantitative method.

3.6 Sample Size

Salkind (2000: 96) suggests that researchers keep the following in mind, when determining the size of their samples.

i. In general, the larger the sample (within the research), the smaller the sampling error and the higher the representation of the sample.

ii. While a big sample is good, an appropriate sized sample is better as it is cost efficient in terms of time and money.

iii. The sample must be large enough to represent salient characteristics of the accessible population and hence the target population, assuming of course, that the population validity does exist (Mungenda & Mungenda, 2003).

3.6.1 Sample Size Criteria

In addition to the purpose of the study and population size, the researcher considered three criteria in determining the appropriate sample size as guided by Miaoulis and Michnener (1976): the level of precision, the level of confidence or risk, and degree of variability in the attributes being measured. The *level of precision,* sometimes called *sampling error*, is the range in which the true value of the population is estimated to be (Israel, 2013). This range is often expressed in percentage points (for example +/-5 percent) in the same way that results for political campaign polls are reported by the media. A margin of 5% is common among researchers (Bartlett, Kotrlink & Higgins, 2001). Lower margin of error requires a larger sample. For the purposes of this study and as recommended by Bartlett *et al.,* (2001), a 5% margin of error was used.

The *confidence* or *risk level* is the amount of uncertainty the researcher can tolerate (Bartlett *et al.,* 2001). The risk level is based on ideas encompassed under the Central Limit Theorem. The key idea encompassed in the Central Limit Theorem is that when a population is repeatedly sampled, the average value of the attribute obtained by those samples is equal to the true population value (Israel, 2013). *Higher* confidence level requires a *larger* sample. Typical choices are 90%, 95% or 99%. According to Israel (2013), most researchers use the 95% confidence level. This study therefore used a 95% confidence level.

The third criterion considered by the researcher, the *degree of variability* in the attributes being measured, refers to the distribution of attributes in the population. The more heterogeneous a population, the larger the sample size required to obtain a given level of precision. The less variable (more homogeneous) a population, the smaller the sample size (Mungenda & Mungenda, 2003). Because a proportion of 0.5 indicates the maximum variability in population, it is often used in determining a more conservative sample size,

that is, the sample size may be larger than if the true variability of the population attribute were used (Israel, 2013). Banking is highly regulated and policy driven environment. The banking skills are easily transferrable; hence the research opted for a relatively small sample (Mungenda & Mungenda, 2003).

3.6.2 Determining Sample Size

Determining sample size is a very important issue because samples that are too large may waste money, time and other resources, while samples that are too small may lead to inaccurate results (Bartlett *et al.,* 2001). There are several approaches to determining the sample size. These include using a census for small populations, imitating a sample size of similar studies, using published tables, and applying formulas to calculate sample size (Israel, 2013).

One approach is to use the entire population *(census)* as the sample. A census eliminates sampling error and provides data on all the individuals in the population (Cochran, 1963). In addition, some costs such as questionnaire design and developing the sampling frame are 'fixed', that is, they will be the same for samples of 80 or 280 (Cochran, 1963).. However, resource constraints (money, time and other resources) make this impossible for large populations. Bankers are known to be 'always busy' and geographically scattered; hence covering the entire population is almost an impossible mission. The census approach was considered unsuitable and inappropriate for this research.

Another approach is to use the same sample size as those of studies similar *(imitations)* to the one you plan. Without reviewing the procedures employed in these studies one may run the risk of repeating errors that were made in determining the sample size for another study (Bartlett *et al.,* 2001). However, a review of literature in one's discipline can provide guidance about 'typical' sample sizes that are used. Similar studies by, Fourie et *al.,* (2011), Akinboade and Makina (2009) and Ludi and Ground (2006) focus on secondary data only and this study sought to use both primary and secondary data. Hence, the imitation approach was also not considered suitable for this particular study.

A third way to determine sample sizes is to rely on *published tables*, which provide the sample size for a given set of criteria. Table 3.3 below has been developed which relates to sample size to the degrees of acceptable error and levels of confidence. Most social research adopts levels of confidence of 95% (Israel, 2013; Holtzhausen, 2001). This means that you are confident that, in 95 out of 100 cases, the characteristic (for example risk appetite) shown by the sample will be shared by the research population. The sampling error is the inaccuracy arising from the use of a sample (De Vaus, 2001).

Table 3.3: Sampling Errors/Sample Size of Random Samples at 95% Confidence Levels.

Sampling Error (%)	Sample Size
1	10,000
2	2,500
3	1,100
4	625
5	**400**
6	277
7	204
8	156
9	123

Source: Abstracted from De Vaus, (2001)

As shown in Table 3.3 above, if the researcher is willing to accept a sampling error of 5% either way, you can use a sample of 400. But if one insists on a sample error as low as 1% either ways, then you must use a sample of 10,000 (De Vaus, 2001). Again, the researcher considered sample size of this magnitude to be practically impossible because of cost reasons. Moreover, bankers are not easily accessible and their availability is very limited. Although tables can provide a useful guide for determining the sample size, the researcher may need to calculate the sample size for a different combination of levels of precision, confidence and variability (Israel, 2001).

Lastly, sample size can also be determined through application of one of several *formulas*. Cochrain's (1977) formula uses two key factors: (i) the risk the researcher is willing to accept in the study, commonly called the margin of error, or the error the researcher is willing to accept and (ii) the alpha level, the level of acceptable risk the researcher is willing to accept that the true margin of error exceeds the acceptable margin of error, that is, the probability that differences revealed by statistical analysis really do not exists (also known as Type I error). The alpha level used in determining sample size in most studies is either 0.05 or 0.01 (Ary, Jacobs & Razavieh, 1996). In Cochran's formula, the alpha level is incorporated into the formula by utilizing the t-value for the alpha level selected (for example, t-value for alpha level of 0.05 is 1.96 for samples above 120).

Cochrain (1963) developed the Equation 3.1 to yield a representative sample

n= Z^2pq/e^2   **Equation (3.1)**

n= required sample size

Z = confidence level at 95% (t-value of 1.96)

p= is the estimated proportion of the attribute that is present in the population (assume maximum variability of p=0.5)

e= margin of error at 5%

q= 1-p

n= $(1.96)^2(0.5) (0.5)/ (0.05)^2$

n=385

For practical reasons (access challenges as well as resources and time constraints), a sample size of 300 was used for primary quantitative data in this research. A calculated sample figure of 385 was only used as a guide in this research.

As mentioned above, the target respondents of interest in this study were senior credit officers in the Big Four Banks in South Africa (Standard Bank, Absa, FirstRand and Nedbank). This particular group of employees was selected since they are the main drivers of lending policies and practices in commercial banks (Kimani, 2013). Purposive

and snowball sampling techniques were used to select the 300 respondents who participated in the study. As shown Table 3.4 below the asset market share was used as criteria to determine the number of respondents per each qualifying bank. In other words, sample size per bank is in proportion to the respective bank's market share as measure by total value of loans to the private sector.

Table 3.4: Population and Sample of Study

Bank	Total No. of Employees (Est)	Credit & Risk Headcount (Est)	Asset Market Share	Sample Size	Sample Percentage
Standard Bank	53,000	3,500	26%	93	31%
Absa Bank	34,000	3,100	21%	75	25%
Nedbank	29,000	2,200	19%	68	23%
FirstRand	38,000	2,400	18%	64	21%
Others	26,000	1,800	16%	0	0%
TOTAL	**180,000**	**13,000**	**100%**	**300**	**100%**

Source: Bank Annual Reports, Websites and Author's own calculations

As argued by Israel (2013), the reliability of the data obtained from a sample will increase as the sample size increases in size towards that of the whole population. But is it the size of the sample which determines its accuracy? The size of the sample is *less* relevant in accuracy determination, argued De Vaus (2001). Bartlett *et al.,* (2001) argue that doubling the size of the sample will not guarantee you the reliability of information. Accuracy is proportional to the square root of the sample size. So to double the accuracy, the sample size must be increased fourfold- which will generally increase the cost of the sample survey. There is therefore a trade-off between cost and reliability. There are trade-offs between *depth* and *breadth,* between doing fewer cases in greater depth, or more cases in less depth, given the limitation of resources. This is an example of the so called *diminishing returns (or diminishing marginal utility).* It explains why most samples are relatively small (Patton, 2003).

Often the researchers are faced with various constraints that may force them to use inadequate sample sizes because of practical versus statistical reasons (Bartlett, *et al.,* 2001). These constraints may include budget, time, personnel, and other resource limitations. In these cases researchers should report both the appropriate sizes along with the sample sizes actually used in the study, the reasons for using inadequate sample sizes, and a discussion of the effect the inadequate sample sizes may have on the results of the study. The good news is that in most cases, large samples are not needed for qualitative data. In fact, carrying out large number of data collection events is "often an exercise in diminishing returns" (Patton, 2003: 25). And not all qualitative analyses need to be rigorously executed. In some cases, a 'quick and targeted' analysis (Guest, MacQueen & Namey, 2012) is all that is warranted or possible within exigent time constraints.

According to Saunders *et al.,* (2003), there is 'no rule' that determines the sample size. The sample built and evolved as data gathered, and as guided by Guest *et al.,* (2012), the researcher's prime concern was the quality rather than the quantity of the sample. Experience and expertise are normally the best to be used to determine the correct size (Patton, 2003; Guest *et al.,* 2012).

In view of arguments presented above and recommendations by Bartlett *et al.,* (2001), as well as for practical reasons, the researcher used a sample of 20 (three respondents from each of the top four banks in South Africa) for qualitative research. As argued in section 3.5, the purposive sampling technique was used to select respondents for the qualitative study. Soliciting information from bankers about their institutions is particularly challenging. As advised by De Vos, *et al.,* (2001) purposive sampling was used in order to ensure that specific elements were included in the study. It is acknowledged that this approach employs a considerable degree of selectivity. A sample of 300 was used for the quantitative research. Details of sample size per bank are provided in Table 3.4. Again as argued in section 3.5, the respondents for the quantitative research were selected using a combination of the purposive and snowball approaches. The purposive sampling assisted

in identifying respondents with the right profiles that met the requirements of the study and through referrals, the snowball approach assisted in increasing the sample size.

3.7 Data Collection and variable measurement

The research used two sources of data namely primary data and secondary data (time-series data). Primary data is data that was collected by the researcher, or team of researchers (for example, population census), for the specific purpose or analysis under consideration (Saunders *et al.,* 2003). Here a research team conceives of and develops a research project, collect data designed to address specific questions and performs their own analyses of the data they collect. The people involved in the data analysis therefore are familiar with the research design and data collection process (Mueller & Hart, 2010). On the other hand, secondary data analysis is the use of data that was collected by someone else for some other purpose (Tasic & Feruh, 2012). Secondary data are from secondary sources, that is, they are not directly compiled by the researcher. They may include published or unpublished work based on research that relies on primary sources of any material other than primary sources used to prepare a written work. Secondary data are collected by persons or agencies for purposes other than solving the problem at hand. This type of data is often available from both the original sources (for example loans data from banks) and from secondary sources which collect and organizes data (for example loans data by SARB) as well as from sources that simply summarize data collected by others and market the information (for example loans data published by IMF).

There are important properties that all secondary data should have if researchers tend to have reliable results. Secondary data should be "accurate, reliable, precise, unbiased, appropriate and timely" (Tasic & Feruh, 2012: 328). Accurate data must accurately reflect what is being studied. Accurate data reflects the true population parameters. Reliable data refers to this: if the same variable is measured several times, the data is reliable if the estimates are approximately the same. Bias is the deviation of a statistical estimate from the true parameter which is estimated by the selected statistical procedure (Kimani, 2013; Tasic & Feruh, 2012). It is systematic error introduced into an analysis by

the failure to follow proper procedures or by errors in the database. Validation is the process of checking to make sure the proper procedures were followed in collecting, organizing and analyzing data. Data that has been validated is considered more accurate because more is known about its origin and characteristics (Tasic & Feruh, 2012). The researcher was concerned that the data are appropriate. They measured what they were supposed to measure; the sample must be taken from correct population. The researcher ensured that the data reflected the true time period that governed the analysis.

Primary data was used to augment time series secondary data. According to Mathers, Fox and Hunn (2009), surveys are particularly useful for non-experimental descriptive designs that seek to describe reality. So, for, instance, a survey approach may be used to establish the prevalence or incidence of a particular condition. It is also possible for surveys to take an exploratory or correlational approach. This means that by using survey data the researcher would try to explore causal relationships between two or more variables. There is a wide range of methods available for collecting survey data covering human participants, but Mathers *et al.,* (2009) recommend the following: face-to-face interviews, telephone interviews and questionnaires. The primary data collection techniques/approaches applied by the researcher consist of:

   i.   Semi-structured interviews with influential or well-informed people on the subject matter, described as elite interviewing by Cooper and Schindler (1998: 23).
   ii. Structured survey questionnaire.

In addition to guidelines provided by Mathers *et al.,* (2009), the researcher's choice of the appropriate methods was also influenced by a number of factors, including: access to potential participants, the literacy level of respondents, and the subject matter, the motivation of the respondents and availability of resources.

3.7.1 Semi-Structured Interviews
In general, there are three types of interviews: structured, semi-structured and unstructured. According to Johl *et al.,* (2012), structured interviews are mostly used for survey research, telephone interviews, market research and political polling. It employs a

sequence of questions and the pace of the interview tends to be pre-established. Bechhofer (1994) found that structured interviews define situations in advance and do not allow the researcher to follow up further on any interesting ideas (Burgess, 1982). The strength of the structured interviews is that it allows the researcher to gain a great deal of control over the interview process. However, qualitative scholars find that "this can be a drawback because structured interviews grant too much control to the interviewee and issues that might be considered important to the interviewer may be overlooked" (Johl *et al.,* 2012: 6373). Also, criticisms have been made on structured interviews where interviewees tend to give responses that they thought the interviewer would want to hear which is known as 'social desirability bias' (Esterberg, 2002).

On the other extreme end, unstructured interviews are often conducted in a field setting and the questions posed to interviewees tend to be more spontaneous and free flowing with topics arising from the situation or behavior at hand (Esterberg, 2002). The interviewer does not have a set of questions prepared in advance, instead, the questions arise more naturally (Johl et *al.,* 2012). The main advantage of conducting unstructured interviews is that it provides greater breadth when compared with other types of interviews. However, this approach is often criticized because if not properly managed, the interviewer might not be able to get out of the interviewee what he or she is looking for.

In view of the above, this study used semi-structured interviews, also known as in-depth interviews, as the primary qualitative data collection instrument. Semi-structured interviews are considered less rigid than structured interviews. Qualitative researchers prefer to use semi-structured interviews to obtain greater insight into the lives of their research participants. The main objective of semi-structured interviews is to explore a particular topic more openly by allowing interviewees to express their own ideas in their own words (Patton, 1990; Esterberg, 2002). Patton (1990), cited in Johl et *al.,* (2012: 6373), argued that "it is not possible to observe everything we wish to know, therefore, by interviewing people, it is possible to understand what life is like from the perspective

of another." According to Esterberg (2002), this approach is particularly useful for exploring a topic in detail or in constructing a theory.

The structure of interviews employed allowed for the discussion of a broad range of issues on business cycle-credit cycle relationship and the extraction of detail from respondents' comments (Hansen *et al.,* 1998). A semi-structured process using a few central questions was used by the researcher to explore the nexus between business cycle and bank-credit extension. The process provided flexibility to the researcher "to probe and delve deeper to excavate meaning into issues" (Singh, 2012: 171). For consistency reasons, the researcher managed the process and ensured that each interview covered the same core issues. Open ended questions were used to ensure respondents could provide their opinions as precisely as possible. The key question asked was: *Is there a long-run relationship between business cycle and bank credit extension in South Africa?* Other questions asked include the following:

    i. In your opinion, what are the key credit determinants?

    ii. How do the different credit aggregates respond to changes in the macroeconomic environment?

    iii. Explain why banks change lending policies over time,

    iv. Does availability of bank loans to fund activities of businesses exacerbate the magnitude of business cycles?

    v. To what extent is credit in South Africa pro-cyclical (that is, does it move in tandem with business cycles)?

For interviews to deliver desired results and be beneficial, handling of interviews need to follow certain rules and procedures. In conducting these interviews, the researcher strictly followed interview guidelines as offered by Nuemann (2006) and Perry (2001). This research synthesized and customized the guidelines which it then religiously followed. The guidelines used in these interviews include, *inter-arlia,* the following:

    i. Identify some questions in advance: the questions must be related to the research questions and the overall research problem. Limit the number of questions to

between five and seven. The questions must encourage people to talk about the topic without the research suggesting at the direction that the answer should take.

ii. Make sure the interviewees are representatives of the population but in some cases you can pick 'extremists' but should identify them as such in notes.

iii. Find a suitable location. You will have more success in a quiet place where the interview process will not be interrupted.

iv. Get written permission. Explain the nature of the study and your plans for using the results. Ask the participant to sign a consent form. Offer to provide a copy of the research document when the research has been completed.

v. Establish and maintain rapport. Begin the interview with a small talk to break the ice. Be courteous and respectful at all times. Show genuine interest in what the person has to say. The interviewer must not disclose his own thoughts, beliefs and feelings but should use body language and neutral encouragements like "Go on" and "can you elaborate" to maintain closeness and trust.

vi. Focus on the actual rather than on the abstract or hypothetical. Ask what a person does or would do in a specific situation.

vii. Do not put words in the interviewee's mouth. Let interviewees express their own views and thoughts. A good interviewer is a good listener.

viii. Record responses verbatim.

ix. Keep your reactions to yourself.

x. Remember that that you are not necessarily getting facts

xi. When conducting a focus group discussion, take group dynamics into account.

These guidelines were followed closely in the execution of field research. This was very useful and valuable advice that the researcher followed in pursuit of a quality qualitative research.

The interviews were conducted with 20 representatives from the top four (by market share and profitability) banks in South Africa. The interviews were conducted between September 2013 and February 2014. Following guidelines by Miles and Huberman, (1994: 26), the research findings were in addition confirmed and extended with

interviews with, two economists and a focus group brought together for respondent validation.

The interview sessions typically lasted between 45 and 60 minutes as recommended by De Vos *et al.,* (2001). Data was collected until data saturation was attained; when it was established that there was no new information or themes were not repeated (Poggenpoel, 2000). Other than the focus group, all interviews were taped and transcribed and transcripts were sent to interviewees for confirmation. In addition to the transcripts, extensive notes were taken. To supplement the interviews, documentary sources were also used. These included the banks' financial statements for the period 1980 to 2013, analysts' reports on the banks and SARB Quarterly Bulletins.

3.7.2 Structured Survey Questionnaire

In order to support the interviews, a survey instrument, capturing the variables of interest, was developed using "a mix of semi-structured and open-minded questions" (Van der Berge & Levrau, 2004: 467). McNeil (1985) defines a questionnaire as a list of present questions used to measure attitudes, opinions and behavior of respondents. Questionnaires are just one of a range of ways of getting information from people, or answers to research questions. Incidentally, one of the weaknesses of questionnaires is they seek answers just by asking questions (Gillham, 2000). Saunders *et al.,* (2003) maintain that it is generally good practice not to rely on questionnaire data but to use questionnaire in conjunction with at least one data collection instrument (observation and semi-structured interviews).

The questionnaire types were determined by the format of questions which were restricted to two basic types: closed-ended and open-ended questions. In a closed-ended question, the researcher provided an appropriate list of answers or responses, such as yes/no from which the respondent made choices. In open-ended questions, the researcher did not provide the respondent with any predetermined list of possible answers to select from and the respondents were expected to answer in their own words. The use of open-

ended questions allowed going beyond the "box ticking" approach (Van der Berge & Levrau, 2004: 467).This produced mainly qualitative data.

These two types of questionnaires were adopted in this study to satisfy the mixed method approach. The questionnaire basically consisted of two main components. The first component contained questions requiring: (i) Choose from a range of options, (ii) Yes/no answers, (iii) Open-ended questions, and (iv) Perception questions. The second component of the questionnaire used the *Likert scale* to rate the independent variables as set out in the hypotheses. A five-point Likert scale was used ranging from strongly agree to strongly disagree. Kumar (2005: 146) defines the Likert or summation scale as a scale that is used upon the assumption that each statement on the scale has equal attitudinal value, importance or weight in terms of reflecting an attitude toward the issue in the question." Each level was given a numerical score and each questionnaire represented a tally. The questions used in this section of the questionnaire were derived from two sources: (i) from literature reviewed and (ii) on the basis of business cycle- credit cycle relationships identified during focus group and individual interviews. A copy of the survey questionnaire is attached as Appendix A1.

The combination of document analysis and in-depth interviews allowed for the placing of respondents' comments within a broad credit and business cycle context. This combination provided quantitative data from the questionnaire for "*breadth* and qualitative data from interviews for *depth*" (Kumar, 2005: 148). The embraced *modus operandi* is considered robust enough to give indications of the behavior of bank lending during economic upswings and downswings. In any case, the interpretation of descriptive data forms an important precursor for any further complex analysis in empirical studies (Akinboade & Makina, 2009).

3.8 Pilot Testing the Questionnaire

Before administering the questionnaire to the participants in the study, the researcher tested it on a small sample of eight participants which was similar to the actual sample planned in the study. Lowies and Somera (2012: 123), define a pilot test as a small scale

study used to test a questionnaire to "minimize the likelihood of respondents encountering problems as well as data recording problems." Pilot survey is "in fact the replica and rehearsal of the main survey" (Kothari, 2004: 101). A pilot study involving even a few respondents is better than no pilot study at all. Subjects in the actual sample were not used in the pretest. The analysis of the pilot test revealed flaws in some questions, and suggested possible improvements and applied a range of possible answers to open-ended questions. The exercise revealed some questions which were vague in the sense that the respondents would interpret them differently. The researcher took the opportunity to rephrase such questions until they conveyed the same meaning to all subjects. According to Mungenda and Mungenda (2003), this enhances the validity of the instrument. Pretesting also enhances the reliability of the instrument, that is, as a consistent measure of the concept being studied (Mungenda & Mungenda, 2003).

In addition, the pilot survey enabled the researcher to:
  i.   Make amendments necessary to maximize returns and minimize the error rate on answers.
 ii.   Categorize the open-ended questions.
iii.   Perform the analysis on the pilot sample and test out all the computational procedures and produce initial hypothesis
 iv.   Evaluate the adequacy of data for the research questions.

3.9 Data Analysis Methods & Techniques: Survey Data

Both qualitative and quantitative analysis techniques were used to analyze survey data. Specifically, the survey data was analyzed using descriptive statistics and content analysis. The regression models were also used to study the relationship between fluctuations in economic activity and bank lending behavior.

3.9.1 Qualitative Data Analysis
A challenge or possibly a nightmare is proper analysis of qualitative data. As eloquently stated by Hatch (2002):

"[Qualitative] data analysis is a systematic search for meaning. It is a way to process qualitative data so that what has been learned can be communicated to others. Analysis means organizing and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques, or generate theories. It involves synthesis, evaluation, categorization, hypothesizing, comparison, and pattern finding. It always involves what Wolcott call 'mindwork'......Researchers always engage their own intellectual capacities to make sense of the qualitative data" (148).

A crucial phrase in the above quotation is 'data analysis is a systematic search for meaning.' Data analysis is the search for patterns in data- recurrent behaviors, objects, phases or ideas. It allowed the researcher to move from "the description of events and social setting to a more general interpretation of data" (Neumann, 2005: 467). It involved examining, sorting, categorizing, evaluating, comparing, synthesizing, and contemplating the coded data and reviewing the raw data and recorded data.

Leech and Onwuegbuzie (2007) identify 21 qualitative data analysis techniques. However, the following techniques are commonly used: (i) method of constant comparison, (ii) domain analysis, (iii) taxonomic analysis, (iv) word count, (v) classical content analysis, (vi) key-words-in-context, and (vii) componential analysis. These techniques are selected because they represent the earliest formalized data analysis techniques and they also represent the most commonly used techniques (Leech & Onwuegbuzie, 2007).

Constant comparison analysis is the most commonly used type of data analysis for qualitative data. Glaser and Straus (1967), the fathers of Grounded Theory, created the method of constant comparison. Some authors use the term 'coding' when referring to this type of analysis (Miles & Huberman, 1994; Ryan & Bernard, 2000). In the coding exercise, the researcher made efforts to observe three rules stated by Kothari (2004). Firstly, the researcher ensured that the categories were appropriate to the research problem under consideration. Secondly, the classes possessed the characteristics of

exhaustiveness (that is, there must be a class for every data item) and that of mutual exclusivity which means that a "specific answer can be placed in one and only one cell in a given category set" (Kothari, 2004: 123). The last rule to be observed was that of unidimensionality by which is meant that every class is defined in terms of only one concept. When a researcher is interested in utilizing an entire data set, to identify underlying themes presented through the data, a constant comparison can be helpful (Leech & Onwuegbuzie, 2007). Constant comparison can be undertaken deductively (for example, codes are identified prior to analysis and then looked for in the data), inductively (codes emerge from the data) or abductively (codes emerge iteratively).

Classical content analysis is similar to constant comparison analysis and is also used frequently in qualitative research. The main difference is that instead of creating themes, the researcher counts the number of times each code is utilized (Leech and Onwuegbuzie, 2007). This type of analysis is helpful to use when there are many codes, it can identify which codes are most used and which might be the most important concepts for the interviewee (Miles & Huberman, 1994). Typically, the codes are produced deductively, and then can be either included as descriptive information about the data, can be analyzed using quantitative procedures or both (Onwuegbuzie & Teddlie, 2003). Classical content analysis can be used through the research process. The main advantage of the content analysis tool is that it is a comfortable self-taught analysis technique and can be completed quickly. However, the major limitation of this technique is that it does not yield complex themes, inter-relationships or in-depth insights (Miles & Huberman, 1994). This method was therefore considered inappropriate for this research.

Denzin and Lincoln (1994: 429) set out three steps to qualitative data analysis, namely, data reduction, data display and conclusion drawing and verification. The three steps were followed in the data analysis in this study. In concurrence with the approach to data analysis that this study followed as set out above, Denzin and Lincoln (1994: 216) in Singh (2012) observe that, "the qualitative researcher uses inductive analysis, which means that categories, themes, and patterns come from the data. The categories that emerge from the field notes, documents, and interviews are not imposed prior to data

collection. Early on, the researcher will develop a system of coding and categorization. There is no best system for analysis".

Taylor-Powell and Renner (2003) argue that there are two ways to categorize narrative data- using present or emergent categories. With present categories, you start with a list of themes or categories in advance, and then search the data for these topics. For example, you start with concepts that you really want to know about, or you might start with topics from research literature. These themes provide direction for what you look for in the data. You identify these before you categorize data, and search the data for text that matches these themes. However, with emergent categories, rather than using preconceived themes or categories, you read through the text and find themes or issues that recur in the data. These become your categories. They may be ideas or concepts that you had not thought about. This approach allows categories to emerge from the data. Categories are defined after you have worked with the data or as a result of working with the data (Denzin & Lincoln, 1994). Following recommendation by Taylor-Powell and Renner (2003), the researcher combined these two approaches in this study- starting with some present categories and adding others as they became apparent.

In agreement with Denzin and Lincoln (1994), Leedy and Ormond (2005: 150) state that, "there is no single right way to analyze data in qualitative research". In fact, not only is there no one right way to analyze qualitative data, "the actual process of qualitative data analysis is not well articulated" (Collins & Hussey, 2003: 252). As outlined by Collins and Hussey, (2003), data analysis in qualitative research has four major problems, namely: (i) reducing the data, (ii) structuring the data, (iii) anticipatory data reduction and (iv) detextualising data.

(i) **Reducing the data:** Phenomenological research generates a lot of data through field notes, documents, and transcripts of interviews. The challenge is how to condense it into meaningful information. One solution can be to use codes to summarize the data. This study used the codes to reduce the data into manageable information.

(ii) **Structuring data**: The manner in which data is collected may not be suitable for analysis. To address this challenge, this study used the theoretical framework developed

in literature review section, and then the collected data was fitted into the theoretical framework (Singh, 2012). The frameworks gave a structure and give a prior specification of the categories into which the data can be fitted. The existing structure was however continued to be tested against the emerging trends from the data collection with a view to enhance and adapt it.

(iii) **Anticipatory data reduction:** This can happen when the researcher has developed a theoretical framework or structure through which some data can be ignored. However, anticipatory data reduction is not encouraged in phenomenological research as it restricts a deep understanding of the phenomenon and limits the collection of rich data. In this study, anticipatory data reduction was not used.

(iv) **Detextualizing the data**: Most data in phenomenological research is collected in the form of extended text. This makes its analysis and presentation to different audiences difficult. To address this challenge in this study, the data was converted into diagrams and illustrations for analysis and presentation purposes.

The data analysis for this research took into cognizance the challenges and utilized the practical solutions proposed for each of them as outlined above. These solutions follow the recommendations provided for each of the challenges by Singh (2012) and Collins and Hussey (2003).

Text and narrative data came from the following sources: (i) open-ended questions and written comments on questionnaires may generate single words, brief phrases, or full paragraphs of text, and (ii) individual /focus group interviews can produce data in the form of notes, a summary of individual interview, or word -for -word transcript. The researcher reviewed the information provided, and probed, summarized and paraphrased the main themes that were emerging (Singh, 2012; Burns & Grove, 2005). The data from interviews were analyzed using content analysis guidelines (Terre-Blanche, Durrheim & Painter, 2006; Leech & Onwuegbuzie, 2007). The procedure used entailed reading the full raw narrative data, and then categorize as much as possible for the narrative according to coding guidelines. The coding was thus done deductively, starting with predefined themes and matching the collected data with themes (Singh, 2012; Terre

Blanche *et al*., 2009). Data was collected until saturation was attained, established when there were no new information and themes are not repeated (Poggenpoel, 2000).

Recorded in-depth-interviews and focus group interviews were transcribed verbatim and analyzed using a descriptive analysis technique Tesch's coding (Creswell, 2007). The transcribed interviews were read to gain a sense of the whole. Following study by Singh (2012), the data analysis process described by Maritz, Poggenpoel and Myburgh (2009) was used as a framework for analyzing qualitative data. The process followed includes reading through the entire transcript and identify the main topics underlying the discussion and to record these ideas in the margins. After all the ideas were identified, the ideas were clustered into topics reflecting their meaning. The ideas were sorted into main topics, unique topics and unassigned topics. Through a process of verifying the topics it was compared to the data and the topics were abbreviated by code and written next to the appropriate segments of the text. The most descriptive wording was chosen to represent the cluster of topics. The procedure was to identify an overarching terms that represent the cluster of topics. The topics were defined and categorized.

To ensure validity and data integrity, a set of clean data was provided to an independent coder who has experience in qualitative data analysis. A consensus discussion was held between the researcher and the independent coder to verify and agree on the findings.

Thus the data analysis for the qualitative aspects of the study followed the general procedures outlined by Singh (2012), Denzin and Lincoln (1994) and Maritz *et al.,* 2009). Emphasis in the data analysis was on: creating categories, groups, clusters and themes deriving from the data and then identifying the patterns and relationships between them. The overall theoretical framework from the literature review also assisted in guiding the data analysis.

Qualitative social research relies on various methods of systematizing, organizing and analyzing data. Today, researchers increasingly make use of computer software for qualitative data analysis (QDA). Computer –assisted data qualitative data analysis

software (CADQAS) programs (for example, Nvivo, SAS, NUD*IST, ATLAS.ti) are available that can be used to undertake each of the qualitative data analysis outlined above (Leech & Onwuegbuzie, 2007). They systematize and facilitate all the steps in qualitative analysis. SAS software can manipulate pre-categorized responses to summarize open-ended survey questions (Santos, Mitchel & Pope, 1999).

CADQAS offers an efficient means through which to manage and organize data while supporting rigorous data analysis (Banner & Albarran, 2009). The advantages of using this software include being freed from manual and clerical tasks, saving precious time, managing huge amounts of qualitative data, having increased flexibility and having improved validity and auditability of qualitative research (Bazeley, 2006). In particular, CADQAS programs provide an excellent tool for recording, storing, indexing and sorting voluminous data that are the hallmark of many qualitative research studies (Morse & Richards, 2002).

At this point, caution is needed about using computer software: CADQAS programs can help researchers to analyze their data, but they cannot analyze the data for the researchers (Bazeley, 2006). Further, in using CADQAS programs, flexibility, creativity, insight and intuition should never be replaced by systematic and mechanical analysis of qualitative data (Dey, 1993). As recommended by (Denzin & Lincoln, 2005), in this study, the researcher remained the main tool of the analysis, regardless of whether a computer program is used to assist in the analysis (Denzin & Lincoln, 2005). The researcher used NVIVO in this study since the program is widely used and is very user friendly ((Leech & Onwuegbuzie, 2007; Jones, 2007). The researcher also predominantly used the manual approach to complement computer software.

3.9.2 Quantitative Analysis

Quantitative data analysis is defined by Saunders *et al.,* (2003: 472) as "the ability to break down numerical data to clarify the nature and relationship of the data with the numerical data's component parts." For this research, the questionnaire had each section representing a defined objective. The 'unitizing' of data involves the arrangement of data

by a selective process based on research outcomes. This enables data to be "better mined, directed, managed and comprehended" (Lowies & Somera, 2012). Data contained in questionnaires, checklists and interview schedules was captured using *Statistical Package for Social Sciences (SPSS)*. The field notes from focus group discussions, key informant interviews were processed by transcription.

The study used the Analysis of Variance (ANOVA) and Pearson's product moment correlation to test relationship between variables. The ANOVA technique was used because the sample size was considered small. According to Kimani (2013), ANOVA removes some of the random variability so that significant differences can be found more easily and also helps to look at interactions between factors. As recommended by Cooper and Schindler (2006), this study used linear additive model for ANOVA called the Effects Model:

$$Yij = U + \Gamma i + \xi ij$$ ………………………………. *Equation (3.2)*

Where U is the grand mean, Γi are deviations from the grand mean due to treatment levels and ξij are the error terms. The error terms show the amount of 'left over' after considering the grand mean and the effect of being in a particular level. Like any other statistical test, the ANOVA has assumptions that must be met. Failure to meet these assumptions means that the conclusions drawn from the model may not be trusted (Khotari, 2004). The populations from which the samples are obtained must be normally or approximately normally distributed. In addition, the sample must be independent and the variances of the populations must be equal (Cooper & Schindler, 2006). To evaluate the model fit and these assumptions, the study employed the 'plot the residuals' diagnostic test (Cooper and Schindler, 2006) using the SAS software. The researcher also used a certain amount of common sense and visual inspection of the plots to determine any obvious problems. To deal with violations to the constant and/or normality assumptions, the researcher sought a transformation of the response variable that would yield a data set for which the assumptions were nearly satisfied. As recommended by

Kimani (2013), the study used the natural log transformation to address any inherent model violations.

The researcher further employed the Pearson product moment correlation multivariate model to study the relationship between the dependent and explanatory variables.

3.10 Validity and Reliability

According to Handley (2012), validity entails the question, 'does your measurement process, assessment or project actually measures what you intend to measure?' In qualitative research, this refers to truthfulness. 'True' in the sense of your findings accurately reflecting the situation and 'certain' in the sense your findings being backed by evidence (Guion, 2002). It refers to how well an idea fits with actual reliability. Qualitative researchers pursue authenticity rather than absolute truth. Neumann (2006: 196) defines authenticity as "giving a fair, honest, and balanced account of social life from the view point of someone who lives it."

Internal validity encompasses whether the results of the study are legitimate because of the way the sample was selected, data was recorded or analysis performed (Neumann, 2006). It refers to the absence of the errors in the design of the research. While it is a concept from quantitative research, it still has relevance in qualitative research, which is why guidelines, procedures and protocols have been developed to assist in the execution of qualitative research (Singh, 2012). External validity, often called 'generalizability' involves whether the results of the study are transferable to other groups, that is, how generalizable the study's inferences are to the general population (Handley, 2012). This measure is generally seen as more relevant to quantitative than to qualitative research (Perry, 2001).

The researcher sought to achieve high levels of both internal and external validity through proper design and strict protocol execution. Denzin and Lincoln (1994) claims that there are two crucial tools in qualitative research to safeguard and improve validity namely the use of member checks and audit trails. Member checks are when the

researcher enlists the services of a knowledgeable and experienced outsider to review the field notes and interview scripts and then data analysis and findings. This enables the independent reviewer to check if the explanation is in harmony with the description, and if the description is plausible (Hirschman, 1986). This study used the member check method. The researcher enlisted the services of a statistician and experienced scholar in the field of finance and economics to review the final thesis to check that the explanation fits the description. This outsider was one of the interviewees.

This research operationalized the strategies of credibility, applicability, dependability and conformability as described by Lincoln and Guba (1985). Credibility was ensured through prolonged engagement, triangulation, peer debriefing and member checking. A dense description of the background information and purposeful sampling ensured transferability of this research. Dependability was maintained through code-recode procedures. Conformability was established through triangulation and reflectivity.

The audit trail is when there is comprehensive documentation of the conceptual development of the project which leaves an adequate amount of evidence which interested parties reconstruct the process with aim to reach the research's conclusion (Hirschman, 1986). Denzin and Lincoln (1994) in Singh (2012), state that the audit trail has six types of documentation; raw data, data reduction and analysis products, data reconstruction and synthesis products, process notes, materials relating to intentions and dispositions, and instrument development. The researcher ensured that there was careful documentation of all steps in the development of this thesis to allow for a reconstruction should the need arise. An adequate amount of evidence was provided for all steps.

The main element in the study design that also addressed internal validity for the quantitative research is random sampling. By randomly assigning participants you can be sure that any difference between the treatment group and control group is due to chance alone and not selection bias (Handley, 2012). In order to control external validity, the study focused on specific population being registered banks operating in South Africa.

A common threat to internal validity is *reliability*. According to Saunders *et al.*, (2003: 96) reliability is the "degree of stability exhibited when a measurement is repeated under identical conditions." Reliable data is dependable, trustworthy, unfailing, sure, authentic and reputable (Holtzhausen, 2001). The researcher depended heavily on consistency as the main measure of reliability. This means that the same study procedure on a particular phenomenon can be repeated under the same conditions and produce the same results (Neumann, 2006). Lack of reliability may arise from divergences between observers or instruments of measurement or stability of the attribute being measured (Kumar, 2005). Measurement validity and reliability were boosted by piloting the questionnaire. Before administering the questionnaire to the participants in the study, the researcher tested it on a small sample. Such a survey, being conducted by experts, brought to light weaknesses of the questionnaire and also of the survey techniques.

Triangulation is an approach to research that uses a combination of more than one research strategy in a single investigation to check and establish validity and reliability in findings. Triangulation involves the consensus combination of qualitative and quantitative methodologies as a powerful solution to strengthen a research design (Holtzhausen 2001). The goal in choosing different strategies in the same study is to balance them so each counterbalances the margin of error in the other. In this study, five types of triangulation were examined: (i) data triangulation, (ii) investigator triangulation, (iii) theory triangulation, (iv) methodological triangulation and (v) environmental triangulation (Guion, 2002).

Data triangulation involves the use of different sources of data/information. It implies collection of accounts from "different participants from different sites of the setting" (Banister *et al.,* 146). It entails the cross-checking of consistency of specific and factual data items from different sources via multiple methods at different times (Guba & Lincholn, 1989). This type of study being perhaps the most popular and easiest to use (Guion, 2002) was adopted in this study. The study used both primary data and secondary data.

Investigator triangulation involves using several different investigators/evaluators in a research project (Guion, 2002). While this is an effective method of establishing validity, in this instance, it was considered not practical to assemble different investigators given time constraints and individual schedules. *Theory triangulation* involves the use of multiple professional perspectives to interpret a single set of data/information. Unlike investigator triangulation, this method typically entails using professionals outside your field of study. In theory, it is believed that individuals from different disciplines or positions bring different perspectives. Therefore, if each evaluator from the different disciplines interprets the information in the same way (draw same conclusions), then validity is established (Thurmoud, 2001). As with investigator triangulation, this method was considered not be feasible in all situations. Also it may be more time consuming to try involving individuals from other disciplines (Guion, 2002; Thurmoud, 2001).

Methodological triangulation involves the use of multiple qualitative and/or quantitative methods to study the program. If conclusions from each of the methods are the same or similar, then validity is established (Guion, 2002). This is also a popular method of triangulation that is widely used. However, in practice, this method may require more resources in order to evaluate the study using different methods. Likewise, it will require more time to analyze the data/information yielded by different methods (Thurmoud, 2001). This study used this method to check and establish reliability and validity in the findings. *Environmental triangulation* involves the use of different locations, settings and other key factors related to the environment in which the study took place, such as the time of the day, day of the week or season of the year. Unlike other types of triangulation, environmental triangulation cannot be used in every case. It is only used when it is likely that the findings may be influenced by some environmental factors (Guion, 2002; Thurmoud, 2001).

The researcher used different sources of primary data/information including, but not limited to, loan officers from several banks registered with SARB as well as selected SARB officials in the SARB Bank Supervision Division. In this study, data triangulation also entailed the comparison of qualitative data received from structured interviews with

respondents with quantitative data from Bank Lending Questionnaire of participants. The use of interviews as well as questionnaires would add depth to the results that would not have been possible using a single data collection technique (Thurmoud, 2001). So by not relying on a single research approach and methodology, the validity and reliability of the research findings were improved (Denzin, 1978; Patton, 2002; De Vos, 1998).

3.11 Ethical Considerations

Neumann (2006: 129) elucidates ethical challenges as "concerns, dilemmas and conflicts that arise over the proper way to conduct a research. Ethics define what is legitimate and what is not legitimate to do, or what moral research procedure involves…" The researcher was cognizant of the fact that ethics has become a cornerstone for conducting effective research. The ethical behavior of individual researchers is under unprecedented scrutiny (Best & Kahn, 2006; Trimble & Fisher, 2006; Field & Behrman, 2004). The researcher therefore ensured that participants had complete understanding of purpose and methods to be used in the study, and the demands placed upon them as participants (Jones & Kottler, 2006).

As guided by (Fritz, 2008), the researcher considered six broad ethical areas in the research. These include voluntary participation, informed consent, confidentiality and anonymity, the potential for harm, communication of results and more specific ethical issues. To comply with the principle of informed consent, the research participants were informed of the nature of the research and had to provide explicit consent for participating in the research study (Collins & Hussey, 2003). The guidelines provided by Neumann (2006) were followed to draft a letter of informed consent (copy of draft letter attached as Appendix I). Basically, the letter of informed consent had an outline of the research, the duration, the procedure for the research, the risk of participating in the study, a guarantee of anonymity, the researcher's details, voluntary participation, benefits or rewards of the study and feedback of the results. Providing feedback to those who have participated in an engagement process, allows them to see whether their views have been accurately represented when decisions are being made. Participants are often interested in receiving a summary of the range of information generated via an

engagement process and how this is being considered, not simply a summary of their own ideas.

In Singh (2012), Neumann (2006: 139) discerns that "the ethical researcher violates privacy only to a minimum degree necessary and only for legitimate research purposes. In addition, he or she protects the information on research participants from public disclosure." The conditions of confidentiality were adhered to in the research process. Cooper and Schindler (2006) argue that the confidentiality pledge ensures that most research respondents' answer the research questions honestly. The information attained from the respondents was used for the research and not for any other purposes. Where possible, the researcher used codes to protect identity of the respondents (Cooper & Chindler, 2006). The respondents may refuse to participate in the research or can decide to withdraw from the research at any point. This thesis respected the privacy of all the respondents. All findings were reported in a complete and honest fashion, without misrepresenting what had been done or intentionally misleading others about the nature of the findings.

The researcher endeavored to avoid malpractices and stayed away from unethical behavior. Neumann (2006) grouped unethical behaviors into three categories namely, scientific misconduct, research fraud and plagiarism. Scientific behavior is when a researcher "falsifies or distorts the data or the methods of data collection or plagiarizes the work of others" (Neumann, 2006: 130). Like most universities, UNISA SBL has also policies and procedures to detect misconduct, report it and penalize researchers who engage in misconduct. The researcher religiously followed guidelines for ethical conduct contained in the Doctor of Business Leadership Degree Rules and Procedures, the Masters and Doctor Degree general information and the Master's Dissertation and Doctoral Thesis: A Guide to Research and the Organization of Material.

As stated in section 3.7, in addition to the primary data collected through interviews and survey questionnaires, the research also used secondary data (time series data)

extensively. An econometric methodology (Phase III of the study) was used to analyze time series data.

3.12 Econometric Methodology

Applied economic research is pervaded by questions about causes and effects. For example, what is the effect of a monetary policy intervention? Is energy consumption causing growth or the other way round? Or does causality run in both directions? Are economic fluctuations mainly caused by monetary productivity or demand shocks? According to Banerjee (2011), econometric methods to analyze the inter-relationship between any two variables generally range from simple univariate time series analysis to leading indicators, co-integration, vector auto-regression (VAR), panel data analysis and Granger causality tests. However, lead-lag correlations studies generally depend on peak-and- trough analysis, Granger causality tests and cross-correlations of which the latter of the two tests are more objective in nature. Lead-lag analysis is best done on the cyclical components extracted from the time series (Banerjee, 2011).

According to Cooley and Dwyer (1998), beginning in the early 1980s, the VAR technique emerged as an important vehicle for empirical analysis of macroeconomic time series. In a VAR model, each of a set of variables is regressed on past values of itself and past values of every other variable in the system. Cross variable linkages are incorporated because lags of all variables in each equation are included and also because of the existence of correlation among the disturbances of various equations (Hoover & Demralp, 2003). Cooley and Dwyer (1998) guide that VARs have been attractive research tools for at least three reasons. First, they offer a simple way to characterize data without having to invoke economic theory to restrict the dynamic relations among variables. Second, many completely specified economic models give rise to VAR representations of variables in the model. As a result, VAR models have been widely exploited for both data description and model characterization. Third, VARs can be readily transformed to interpret the evolution of the system's variables as a function of *orthogonalised* innovation.

Ordinary VARs have the drawback that the impulse responses they generate cannot be given any structural interpretation because their innovations are not identified with structural errors (Hoover & Demralp, 2003). Another common problem of VAR models is often the large number of parameters to estimate, preventing analysis of large data sets. The VAR approach was also criticized by Cooley and Leroy (1985) as *atheoretical,* which eventually led to the development of the so called structural VARS (hereafter SVARs) which have proliferated in the past few years. Sharifi- Renani (2010) defines SVARs as multivariate, linear representation of a vector of variables on its own lags. These models are economically interpretable simplifications of VAR models where the identification restrictions are used according to some economic theory. SVARs solve the problem of interpreting VARs by introducing restrictions sufficient to identify the underlying shocks.

The SVAR methodology provides a valuable tool for macroeconomic analysis but the SVAR models are also subject to vulnerabilities as every model is (Banerjee, 2011). First, it has been argued that the economic shocks recovered from the SVAR do not resemble the shocks measured by other mechanisms such as market expectations embodied in future prices. Second, the shocks recovered from a SVAR may reflect variables omitted from the model. If these omitted variables correlate with the included variables, the estimated shocks will be biased. Third, the results of many SVARs are sensitive to the identification restrictions (Blanchard & Quah, 1989). The lack of robustness of results with respect to model specification is an issue that is sometimes raised in the literature (Barnejee, 2011). It should be noted that this critique is not specific to SVARs alone but applies to all empirical models. The researcher provided robustness analysis in this study whenever conclusions were sensitive to model specifications.

Emerging interest is shown by many studies that have used the Structural Vector Autoregression (SVAR) to understand various aspects of the business cycle. SVARs have been used to document the effects of money on output (Sims & Zha, 2005) and the relative importance of supply and demand shocks on business cycles (Blanchard & Quah, 1989). Akinboade and Makina (2010) apply SVAR to investigate the econometric

relationship between bank lending and business cycles in South Africa. Stock and Watson (2003) use VAR to understand changes in international business cycle dynamics. Lown and Morgan (2004) in their paper on commercial bank lending standards and output use VAR to demonstrate how credit standards explain the variation in the business cycle. Fourie *et al.,* (2011) use SVAR to prove the relationship between credit and underlying business cycle in South Africa for the period 1985 to 2009. Siklos and Lavender (2011) estimate the VAR for Canada and the United States and factor-augmented VARs (FAVAR) for Canada to investigate the relationship between changes in non-price lending standards, business loans and output.

Since the seminal work of Engle and Granger (1987) *co-integration* has become a prevalent tool of time series econometrics. Cointegration has emerged as a powerful technique for investigating common trends in multivariate time series, and provides a sound methodology for modeling both long-run and short-run dynamics in a system (Schmith & Johansen, 2010; Cortes, 2007). This is a means for testing hypotheses concerning the relationship between two variables having unit roots (that is, integrated of at least order one). A series is said to be 'integrated of order d' if one can obtain a stationary series by 'differencing' the series *d* times. Co integration analysis provides a technique to establish long-term and short-term dynamics in non-stationary series processes, which are found to be integrated in the same order (Cortes, 2007). The series are co integrated if a linear combination of the two exists, which is itself stationary (Engle & Granger, 1987).

According to Schmith and Johansen (2010), co integration test generally takes two steps:
  i. The first step is to conduct a unit root test on each variable to find the order of integration,
  ii. If all variables are integrated of the same order, the second step is to estimate the model, called a 'co-integration equation,' and test whether the residual of the model is stationary.

These tests for co integration assume that the co integration vector is constant during the period of study. In reality, it is possible that the long-run relationship between the underlying variables change (shift in the cointegrating vector can occur). The reason for this might be technological progress, economic crises, changes in people's preferences and behavior. This is especially likely to be the case if the sample period is long. To take this into account, Gregory and Hansen (1996) introduced tests for co integration with one unknown structural break and Hatemi (2007) introduced tests for co integration with two unknown breaks. According to Sanso and Montanes (2002) co-integration has two improvements as compared to other methods such as differentiated demand for imports, market share, propensity to imports and trade flow matrices. The first improvement refers to the inclusion of the stochastic properties of the time series accounting for estimation and testing. The second improvement deals with long-term and short-term impacts.

Engle and Granger (1987) were the first to formalize the idea of integrated variables sharing an equilibrium relation which turned out to be either stationary or have a lower degree of integration than the original series. They *denote* this property by co integration, signifying co-movements among trending variables which could be exploited to test for the existence of equilibrium relationships within which a fully dynamic specification framework. In this sense, the basic concept of co integration applies in a variety of economic models including relationships between capital and output, real wages and labor productivity, normal exchange rates and relative prices consumption and disposable income and short-term interest rates, price of shares and dividends (Dolado, Gonzalo, Marmol, 1999). In particular, Campbell and Shiller (1987) point out that a pair of integrated variables that are related through Present Value Model, as it is often the case in macroeconomics and finance, must be co integrated.

The generic existence of long-term relationships should be tested using techniques like co- integration analysis "to reduce the risk of finding spurious conclusions" (Dolado *et al.,* 1999: 23). Granger and Newbold (1974) alert many to the econometric implications of non-stationarity and the dangers of running *nonsense* or *spurious* regressions. An example of a spurious regression is as follows: if two independent

integrated series were used in a regression, one chosen as the 'dependent variable' and the other as the 'explanatory variable', the standard regression computer package would often 'find' a relationship whereas in fact there is none. That is standard statistical methods would find a spurious regression (Dolado *et al.,* 1990).

Cortes (2007) used multivariate co integration techniques and error correction models along with time series data (1960-2003) to examine whether there is a long-term relationship between Australia and Columbia imports by using macroeconomic fundamentals such as the real exchange rate, income, population and openness. Sahan and Bektasoglu (2010) used a panel cointegration analysis technique to analyze the empirical relationship between budget deficit and inflation for Turkey and European countries. Schmith and Johansen (2010) used cointegration analysis technique to examine the relationship between global surface air temperatures and see level.

Although Aburachis (2010) used cointegration test on quarterly US data over the period 1952:Q2 to 2007:Q2 (on total credit growth and the ratio of GDP growth to the output gap), to understand the long-run relationship , he relied on the *Granger Causality* test to ascertain the lead-lag relationship on shorter periods based on business cycle turning points. Granger's (1980's) work aims at inferring causal relations directly from statistical properties of the data relying only to a minimal extent on background knowledge. In Siklos and Lavender (2011), Granger (1980) proposes a probabilistic concept of causality. Granger defines causality in terms of the incremental predictability (at horizon one) of a time series variable $\{Y_t\}$ (given the present and past values of $\{Y_t\}$ and of a set $\{Z_t\}$ of possible variables) when another time series variable $\{X_t\}$ (in its present and past values) is not omitted. More formally
$\{X_t\}$ Granger-causes $\{Y_t\}$ if
$P(Y_{t+1}/X_t, X_{t-1}\ldots Y_t, Y_{t-1}\ldots Z_t, Z_{t-1},..) \neq P(Y_{t+1}/Y_t, Y_{t-1}, \ldots Z_t, Z_{t-1})$ ….. (3.3)

The concept of Granger causality has been criticized for failing to capture 'structural causality' (Hoover, 2008). Suppose one finds that a variable A Ganger-causes another variable B. This does not necessarily imply that an economic mechanism exists by which

A can be manipulated to affect B. The existence of such mechanism does not necessarily imply Granger causality (Hoover, 2008).

The SVAR technique was used in this study. According to Akinboade and Makina (2010) this methodology allows all variables to be endogenously determined and has the advantage of fully capturing the interactions between banking sector specific and macroeconomic variables. The model uses shocks to shed light on the variables that display a strong relationship with the underlying amplitude of the cycle (Sims, 2002). SVAR's ability to capture interactions between variables was a key factor in the selection of this technique. Moreover, the simplicity of modeling procedure of the SVAR model made it a good candidate describing the relationship between the variables and for forecasting business cycle (Eklund, 2007). The cointegration technique was used to test existence of long run relationship between economic growth and credit extension. Granger causality tests and cross correlation coefficients represents the methodology that was used to see whether credit leads or lags economic growth.

In essence, time series is more applicable for single country analysis, hence this study used time series methods of estimation following methods used by Fourie *et al.,* (2011), Akinboade and Makina (2010), Oluitan (2009), Dlamini (2008) and Ghirmay (2004). This, according to Demetriades and Adrianova (2003), allow the use of appropriate statistical procedures, such as co-integration to test for long-run relationship; they allow the use of statistical procedures that can shed light on the causality between two or more variables in both the short run and the long run. Though often without its limitations, it is often considered "an appropriate tool in single country analysis" (Oluitan, 2009: 15).

3.12.1 Formulation of Empirical Model

It could be speculated from the works reviewed in the previous sections that the lending of commercial banks is determined by some factors at both micro and macro levels. According to the bank lending channel theory, the pro-cyclical behavior of bank lending must pass through the macroeconomic sphere (Bikker & Hu, 2002). Thus, in respect of

hypotheses stated below, the main issue was an investigation of the relationship between bank credit and each of the variables that have been identified through interviews, surveys and literature; money supply, deposit liabilities, bank lending rate, inflation, exchange rate, cash reserve requirement, liquidity ratio, and gross domestic product (Olokoyo.Felicia, 2011; Fourie *et al.,* 2011; Akinboade & Makina, 2010). Other factors not explicitly included in the model are policy instruments for regulation of banks like government control and monetary authorities' guidelines and past relation with customers. These are captured by the error term in the model (Olokoyo.Felicia, 2011).

The model adopted for the study assumed an underlying relationship between the variables expressed in functional form and bank loans and advances. The belief was informed by Usman (1999) that bank lending vary from time to time with variables expressed although with addition of two macroeconomic variables, that is, economic growth (GDP) and foreign exchange (NEER).

The model is specified implicitly below.

Credit = f(Gross Domestic Product, Deposits Liabilities, Money Supply, Prime Lending Rate, Inflation, Exchange Rate).

In the SVAR, each of the seven variables is linked. Following study by Akpansung and Babalola (2012), the researcher proposed a simultaneous equation model for this study, since bank credit and business cycles are jointly determined. The neglect of reverse causality in either cross-sectional or time series modeling framework might introduce simultaneity bias (Akpansung & Babalola, 2012; Gujarati & Sabgeetha, 2007).

   i.   **Bank Credit Equation**

$PSCR_t = \beta_o + \beta_1 GDP_{t-i} + \beta_2 DEP_{t-i} + \beta_3 M3_{t-i} + \beta_4 LR_{t-i} + \beta_5 CPI_{t-i} + \beta_6 NEER_{t-i} + \xi_{1t} \ldots (3.4a)$

   ii.   **Business Cycle Equation**

$GDP_t = \alpha_o + \alpha_1 PSCR_{t-i} + \alpha_2 DEP_{t-i} + \alpha_3 M3_{t-i} + \alpha_4 LR_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6 NEER_{t-i} + \xi_{2t} \ldots (3.4b)$

Where PSCR is credit extended to the private sector, GDP is Gross Domestic Product growth (business cycle proxy), LR is the prime lending rate of commercial banks, DEP are the deposit liabilities of commercial banks, M3 is the broad money supply, CPI is the consumer price index and NEER is the nominal effective exchange rate. βo and αo are constant terms or intercept terms, $\xi 1t$ and $\xi 2t$ are the disturbances terms and $\beta 1$, $\beta 2$,$\beta 3$, $\beta 4$, $\beta 5$, $\beta 6$, $\alpha 1$, $\alpha 2$, $\alpha 3$, $\alpha 4$,$\alpha 5$,$\alpha 6$ are the estimated coefficients, t is the time period, i is the number of lags, and t-i are the time lags. The optimal lag (i) was chosen based on Akaike Information Criterion (AIC) (Akpansung & Babalola, 2012).

The *a priori* expectations are $\beta 1$, $\beta 2$, $\beta 3$, $\alpha 1$, $\alpha 2$, $\alpha 3 > 0$ and $\beta 4$, $\beta 5$, $\beta 6$, $\alpha 3$, $\alpha 4$, $\alpha 5$, $\alpha 6 < 0$

In using the Multiple Regression Model, the following assumptions were made:
   i. There is a linear relationship between the dependent variable Bank Lending and Economic Growth, Deposit Liabilities, Money Supply, Prime Lending Rate, Inflation and Exchange Rate, hence the functional relationship: PSCR= f(GDP,DEP,M3,LR,CPI,NEER).
   ii. Both dependent and independent variables are continuous random variables which are normally distributed.
   iii. The random terms of different observations are (ξi, ξj) are independent. This means that all the co-variances of any ξi, with any other ξj, are equal to zero. The value which the random term assumes in one period does not depend on the value which it assumed in any other period.
   iv. The explanatory variables are not perfectly linearly correlated. If there is more than one explanatory variable in the relationship it is assumed that they are not perfectly correlated with each other. Indeed the regressions should not be highly multi-collinear (Evans, 2013).

The data set used in this study covers selected macroeconomic indicators and bank loans to the private (non-bank) sector (businesses and households) in South Africa for time period ranging from 1980:QI to 2013:Q4. Credit is therefore seen as a unifying variable in this analysis. Bank lending was represented with credit extension to the private sector

(businesses and households) while Gross Domestic Product was used as a proxy for business cycles. The justification for including each of the above-mentioned variables is made in section 3.12.2 below.

3.12.2 Time Series Data Description

In line with recommendations by Leedy and Ormrod (2005), the researcher used both primary data and secondary data to provide adequate information and the comparability required. As indicated above, semi-structured interviews and structured survey questionnaires were used to source primary data. Secondary data on bank credit was available from both the original sources (example: details of bank loans directly from banks) and secondary sources which collect and organizes data (for example consolidated loans data by SARB) as well from sources that simply summarize data collected by others and market the information (loans data published by the International Monetary Fund).

On the basis of the variables identified in literature and during interview sessions, the researcher collected time series data on the following bank credit drivers: Gross Domestic Product, bank deposit liabilities, money supply, prime lending rate, inflation and exchange rate (Akpansung & Babalola, 2012; Fourie *et al.,* 2011; Banerjee, 2011; Akinboade & Makina, 2009; Bordo & Haubrich, 2009; Rajan, 2005). The justification of including each of the above-mentioned key variables is made below:

i. Bank Credit Extension (PSCR): In line with financial and economic theory, Fourie *et al.,* (2011) note that Sprague, in 1910, debated the extent to which credit expands and contracts systematically through phases of the business cycle. The expansion and contraction of credit have macroeconomic consequences that range from contracting GDP to rising unemployment, a decrease in business and consumer confidence and an increase in credit costs (Bordo & Haubrich, 2009; Rajan, 2004). Credit is therefore seen as a unifying variable in this analysis.

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The choice of credit measure used in this study 'bank credit (loans and advances) to the private sector' was guided by existing literature and data availability. In South Africa, the aggregate credit is always allocated to between public sector and private sector of the economy (SARB, 2013). But studies (for example, Akpansung & Babalola, 2012; Crowley 2008, Beck *et al.*, 2005) have revealed that when compared to credit to the public sector, the impact of private sector credit on economic growth is significant and more pronounced. Credit to the public sector is feeble and frail in accelerating economic growth because they are susceptible to misuse and politically motivated programs which may not deliver the best result to the community (Beck *et al.*, 2005). Demirguc-Kunt and Levine (1998) emphasize the importance of focusing on allocation of credit to the private sector as opposed to all bank intermediation. Similarly, Beck *et al.,* (2005) also observe private sector credit as a good predictor of economic growth while study by Akpansung & Babalola, (2012) also supported this position.

In this study, therefore, credit extension to the private sector (PSCR) was taken as an appropriate measure of bank lending. The researcher's main sources of credit data were SARB Quarterly Bulletins and BA returns to SARB.

 ii. Gross Domestic Product (GDP): Given the emphasis of the study on business cycles and as recommended by Banerjee (2011), Gross Domestic Product (GDP) at market prices was used to determine business cycles. GDP is the "most preferred choice especially to investigate cycles at quarterly or annual frequencies" (Banerjee, 2011: 17). The SARB quarterly bulletin publishes the GDP figures. In this study, economic growth, as measured by GDP growth, was taken as an appropriate proxy for business cycles.

iii. Bank deposit liabilities (DEP): There is a premise that the banking system extends credit on the basis of deposit liabilities and that bank reserves are needed to make loans (Brink & Kock, 2010). One would expect that higher deposit growth rates would lead to more credit growth as banks would have more loanable funds (Guo & Stepanyan, 2011). According to De Angelis (2005), deposits represent the principal source of funds for lending especially for small firms who require bank loans for expansion purposes and

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investment. In this case, a contractionary policy that reduces bank deposits compels banks to cut back on their lending and firms that are dependent on bank loans respond by refraining from investment. However, Brink and Kock, (2010: 19) argue that the level of deposits and reserves "does not directly influence lending by private sector banks." Credit extension is a function of banks' willingness to lend based on their credit demand (Boro, 2009; Brink & Kock, 2010). Banks can extend credit without the necessary deposit funding. In which case, they borrow the shortfall from the monetary authority which supplies it on demand. The borrowing by private sector banks is reflected in the net liquidity requirement (Brink & Kock, 2010).

Otto (2007) is of the view that bank lending is largely funded by a mix of deposits made by depositors and wholesale funding. During the credit crunch, when funds become scarce and more expensive, banks reacted by shrinking the amount of credit that they extend or by increasing the cost of credit (Fourie *et al.,* 2011). A decline in credit extension reduces consumption and creates a feedback loop that ultimately affects production and causes GDP to contract the macro economy (Akinboade & Makina, 2009). The total deposit liabilities are used as a proxy for bank funding.

Schematically, the impact of deposit liabilities on bank lending and economic activity is as follows:

Bank Deposits↓ → Bank Loans↓ → I↓ → Y↓   Schematic Diagram {1.1}

iv. **Real money supply or growth (M3):** This defines the sum of cash and noncash balances held by the public, other demand, short-term and medium term deposits and long-term savings. The M3 definition comprises money defined in its broad sense and is the measure used to assess the relationship between money supply and other macroeconomic aggregates, such as inflation and the structure of interest rates. Growth of money supply makes real growth possible, and is also an indicator of future growth potential (Akinboade & Makina, 2010). According to Brink and Kock (2010), the expansion of broad M3 is also directly related to credit extension as credit in banking system creates its own deposits. In the first instance, it reflects the availability of money,

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which is strongly linked to the creation of money by banks through lending. Excessive growth of money also implies a risk of the economy overheating and concomitant increase in inflation. Schematically, the effect of monetary policy in this credit view channel is as follows:

$\downarrow M3 \rightarrow$ **Bank Deposits**$\downarrow \rightarrow$ **Bank Loans**$\downarrow \rightarrow I\downarrow \rightarrow Y\downarrow$ Schematic Diagram {1.2}

In this study broad money (M3) is used as a measure of money supply. A higher M3/GDP ratio implies a larger financial sector and therefore greater financial intermediary (Calderon & Liu, 2003). SARB quarterly bulletin publishes money supply levels and trends.

v. Prime Lending Rate: The prime lending interest rate (LR) is the benchmark rate that banks quote when they extend credit (Fourie *et al.,* 2011; Chetty, Schoeman & Wentzel, 2008). According to Chetty *et al* (2008: 260) the SARB will increase the Repo rate (interest rate at which banks borrow from the Reserve Bank) "if it anticipates inflation is on the rise". This will cause an increase in the cost and reduction in the availability of credit. A negative relationship between credit and interest rate is expected.

vi. Inflation: The Consumer Price Index (CPI) and the Producer Price Index (PPI) are the two primary measures of inflation in South Africa (SARB, 2014). Both indicators are published monthly. The CPI tracks the rate of change in the price of goods and services purchased by consumers. The headline CPI is used as the inflation target measure which guides the South African Reserve Bank on setting of interest rates (Stats SA, 2014). The PPI tracks the rate of change in prices charged by producers. The PPI is widely used by businesses as a contract escalator and as a general indicator of inflationary pressures in the economy.

As nominal credit growth will in general be affected by inflation, in this study, inflation was used as a control variable. In addition, it could inform whether inflation is detrimental to real private credit growth or not. Stepanyan and Guo (2011) find that high inflation, while increasing nominal credit, is detrimental to real credit growth.

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Pazarbasioglu (1991), cited in Dlamini (2008), found that inflation had a strong negative effect on credit demand in Finland during the period 1981-1986 and 1987-1997. The Moore and Threshgold (1985) study also provide relationship between bank credit and inflation. If the inflation coefficient is less than one (1), then inflation will in fact decrease real private credit. Following study by Stepanyan and Guo (2011), CPI was used as proxy for inflation in this study.

vii. Exchange rate: The real exchange rate is an important relative price signaling inter-sectorial growth in the long run. The level of the real exchange rate (relative to the equilibrium real exchange rate level) and its stability have been shown importantly to influence exports and private investment (Aron, Elbadawi & Kahn, 1997). Exchange movements would have a material impact on the availability of credit if banks were to be dependent on foreign financing as a source of capital. However, the significance of foreign inflows in enhancing credit growth has also been widely discussed in literature, but there seems to be no consensus opinion about the effect so far. The study by Crowley (2007) found that foreign inflows are significant for growth of credit in Slovakia Republic. This was also clearly illustrated by the Asian Financial Crisis in 1997/98 when banks in Thailand, for example, were unable to repay their foreign loans (denominated in dollars) owing to sharp depreciation of the baht (Aron *et al*., 1997). Several other studies support this assertion (Arvai, 2005; Duenwald *et al.,* 2005). However, Cottarelli *et al.,(*2003) posited that domestic savings flows is the main factor responsible for the growth of credit in Eastern Europe, and as such there was no evidence that foreign inflows was significant in stimulating credit growth.

Following the empirical studies of Aron *et al.,* (1997), this paper used nominal effective exchange rate (NEER) as a proxy for exchange rate. The nominal effective exchange rate is a weighted exchange rate of the rand against basket of currencies of South Africa's major trading partners, where an increase in the index denotes appreciation (SARB, 2013).

The sample analyzed in this study consists of quarterly time series secondary data collected from various SARB Quarterly Bulletins, Stats SA and International Financial Statistics online data for the period 1980Q1-2013Q4.

3.12.3 Econometric Analysis Techniques

Following studies by Tawose (2012), Fourie *et al*., (2011), Akinboade and Makina (2010) and Dlamini (2008), the techniques adopted in this study include unit roots for stationarity of data, co-integration for co-movement of variables, selection of a vector correction model and causality tests for predictive ability. The study adopted the Granger Causality Test in the Vector Auto Regressive (VAR) model to examine the direction of causality between business cycles and bank credit extension. VAR was adopted because with VAR, once variables are cointegrated, "it becomes easy to distinguish between the short-run dynamics and long-run stability" (Manikandan *et al*., 2012: 249). Sims (1980), cited in (Manikandan *et al*., 2012), adds that the VAR framework also eliminates the problems of endogeneity by treating all variables as potentially endogenous.

Many studies have used the VAR framework and steps outlined above in their attempts to examine the causal relationship between two variables, especially between finance and growth ((Tawose, 2012; Manikandan *et al*., 2012; Fourie *et al*., 2011; Addamopoulos, 2010; Akinboade & Makina, 2010; Oluitan, 2009). The present study followed the same methods and procedures adopted by different authors as described below. The study used E-View software to analyze the data.

3.12.4 Properties of Data
a) Graphical Analysis
The first step in data analysis was to plot all variables to be used in the model. A time series plot shed light of the properties of data and identifies whether or not it is stationary (Dlamini, 2008). A graphical plot is also used in selecting the correct assumptions when estimating the vector correction model. Graphical analysis does not, however, provide an accurate presentation of the data to achieve information on the unit root and stationarity

(Dlamini, 2008). Hence, the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests were used to test for unit root. Another test that was important before the unit root/stationarity test is the test for multi-collinearity.

b) Diagnostic Checks

This involved testing for multicollinearity, autocorrelation, heteroscedasticity and the normality test. The diagnostic checks are important to ensure that the VAR is correctly specified.

b (i) Residual Normality Test

A common assumption of time series models is a Gaussian innovation distribution. After fitting a model, one can infer residuals and check them for normality. If the Gaussian innovation assumption holds, the residuals should look approximately normal (*MathWorks*, 2014). According to El-Fallah and El-Salam (2013), significant deviations from normality of the regression residuals substantially affect performance of the usual inference techniques. Thus diagnostic tests for normality are important for validating inferences made from regressions.

One of the most famous tests for normality of regression residuals is the test of Jarque and Bera (1980; 1987), which has gained great acceptance amongst econometricians (El-Fallah & El-Salam, 2013). The test statistic *JB* is a function of the measures of Skewness *S* and Kurtosis *K* computed from the sample. In other words, the JB determines whether the data have the skew and kurtosis matching a normal distribution. Under normality, theoretical values of S and K are 0 and 3 respectively. The JB statistic has an asymptotic chi-square distribution with two degrees of freedom and can be used to test the null hypothesis that the sample data is from a normal distribution. This is a one-side (one tail) test, so the computed *p*-value should be compared with the whole significance level (α). A significant p-value for the Jarque-Bera test indicates that one can reject the null hypothesis of normality. The null hypothesis is of normality, and rejection of the hypothesis leads to the conclusion that the distribution from which the data came is non-normal. Other goodness-of-fit tests discussed in econometric literature include the

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Shapiro-Wilk test, the Kuiper test as well as the Kolmogorov-Smirnov test (Urzua, 1996). As pointed out by several authors, the Jarque-Bera test behaves well in comparison with some other tests for normality if the alternatives to the normal distribution belong to the Pearson family (El-Fallah & El-Salam, 2013; Urzua, 1996; Jarque & Bera, 1987; Kuiper, 1960). This study used the Jarque-Bera (JB) residual normality test.

b(ii) Multicollinearity Test

Multicollinearity, where more than two independent variables are highly correlated- can have damaging effects on multiple regressions. When this condition exists, the estimated regression coefficients can fluctuate widely from sample to sample, making it risky to interpret the coefficients as an indicator of the relative importance of predictor variable (Cooper & Schindler, 2006). The primary concern is that as the degree of multi-collinearity increases, the regression model estimates of the coefficients become unstable and the standard errors of the coefficients can get widely inflated (IDRE, 2014). Just how high can acceptable correlations be between independent variables? There is no definitive answer but correlations at a 0.80 or greater level should be dealt with (Cooper & Schindler, 2006).

The study used a correlation matrix which displays multiple combinations of two variable relationships to identify highly correlated predictor variables. The study considered the following two ways to address inherent multicollinearity problem: (i) Choosing one of the variables and deleting the other, or (ii) Creating a new variable that is a composite of the highly intercorrelated variables and use this new variable in place of its components. The current study used the first option to mitigate the multicollinearity problem.

b(iii) Serial Correlation Test

In the case of serial correlation the Lagrange Multiplier (LM) test was used. As noted in Harris (1995), the lag order when testing for serial correlation should correspond to the VAR lag length. The null hypothesis for this test was no serial correlation as opposed to auto- correlated residuals.

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b(iv) Heteroscedasticity Test

One of the main assumptions of the ordinary least squares regression is homogeneity of variance of residuals. If the model is well-fitted, there should be no pattern to the residuals plotted against fitted values. If the variance of residuals is non-constant then the residual variance is said to be 'heteroscedastic' (IDRE, 2014). The first test of heteroscedasticity is the White's test and the second one is the Breusch-Pagan test (MathWork, 2014). The heteroscedasticity test helps to ascertain if the variance of the error term is constant. In this study an extension of White's (1980) test was used, as suggested by Doornik (1995, in Dlamini, 2008). The null hypothesis is that residuals have a constant variance, that is, the variance of the residuals is homogenous. Therefore, if the p-value is very small, one would have to reject the null hypothesis and accept the hypothesis that the variance of the residuals in not homogenous. The standard estimation techniques become inefficient if the error term varies. The presence of heteroscedasticity in a model may be the result of omitting important variables that explain the dependent variable. To rectify the problem of heteroscedasticity, software E-Views 5 provides a *White* option which is capable of eliminating it.

3.12.5 Unit Roots Test

The pre-requisite of cointegration test is the stationarity of each individual time series over the sample period (Sindano, 2009). A time series is said to be stationary if the mean and variance are constant through time and the value of the covariance between the two time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2003). However, if the mean and variance change in samples for different time spans, then, this type of variable is known as non-stationary variable (Sindano, 2009). Regression equations with non-stationary variables have serious limitations. Among other problems, "their *t*-ratios and adjusted R-square will be overestimated by large magnitude" (Sindano, 2009: 29). Therefore, all tests become invalid. This is known as the spurious regression problem. In order to avoid the problem of spurious regression, trended data was differenced a minimum of time to generate a stationary time series (Olumuyiwa et al., 2012; Banerjee, 2011; Sindano, 2009).

To determine the stationarity of the series, Augmented Dickey-Fuller (ADF: Dickey and Fuller, 1981) and Phillips –Perron (PP: Phillips & Perron, 1988) tests were used. The modelling procedure of these two tests is described as follows:

$$\Delta Y_t = \alpha_1 + \alpha_2 Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-i} + \S_t \qquad \text{------------------------ (3.5)}$$

where **Y** is the variable of choice and Δ is the first difference operator, **α1** is the intercept, **α2** is the coefficient of the lagged term, **βi** (for i=1,2,…p) are constant parameters, *p* is the number of lagged terms chosen by Akaike Information Criterion (AIC) and Schwartz Information Criterion (SIC) and to ensure that **§t** (the stationary stochastic process) is white noise error term. $\Delta Y_{t-I}=(\Delta Y_{t-I}-\Delta Y_{t-2})$; $\Delta Y_{t-2}=(\Delta Y_{t-2}-\Delta Y_{t-3})$ e.t.c

To determine the order of integration of a particular time series variable, the equation has to be modified by including second differences on lagged first and p lags of second differences. This is as follows:

$$\Delta^2 Y_t = \eta_2 \Delta Y_{t-1} + \sum_{i=1}^{p} \mu_i \Delta^2 Y_{t-i} + \S_t \qquad \text{--------------------------------------- (3.6)}$$

The stationarity of ADF test and PP test were applied to equations 3.5 and 3.6 respectively. The null hypotheses are as follows:

Ho: **α2**=0 (that is, there is a unit root- the time series is non-stationary) against Ha: **α2** <0 (significantly negative- that is, there is no unit root- the time series is stationary) for equation (3.5) and Ho: **η2**=0 (that is, there is a unit root- the time series is non-stationary) against Ha: **η2** <0 (significantly negative- that is, there is no unit root- the time series is stationary) for equation (3.6).

If the calculated ADF test statistic is higher than McKinnon's critical values, then the null hypothesis (Ho) is not rejected- this means that a unit root exist between Y_{t-1} and ΔY_{t-1}, implying that the series are non-stationary or not integrated of order zero I(0).

Alternatively, the rejection of the null hypothesis implies stationarity of the underlying series (Murty *et al.,* 2012; Manikandan *et al.,* 2012; Banerjee, 2011; Adamopoulos, 2010). Failure to reject the null hypothesis leads to conducting the test on the difference of the time series, so further differencing was conducted until stationarity was achieved and the null hypothesis is rejected (Murty *et al.*, 2012; Harris, 1995). If the time series are stationary in their first difference (that is, **η2** <0), then they can be said integrated of order one, that is, I(1); if stationary in their second differences, then they are integrated of order two, that is, I(2) (Murty, *et al*., 2012).

 Alternatively, one can look at the *p*-value, that is, the probability for rejection of the null hypothesis when it is true. The critical region of the rejection of the null hypothesis is so determined that *p*-values do not exceed the level of significance, that is, the maximum allowable probability with which a true null hypothesis is rejected (Banerjee, 2011). For example, for a 5 percent level of significance, if the p-value is less than 0.05 then one can reject the null of root and say that the series is stationary.

The E-View 5 software package was used to conduct the ADF and PP tests.

3.12.6 Cointegration Test

Once the tests of integration (that is unit roots tests) are achieved, then it is possible to implement tests of cointegration to check the existence of a stable long-run relationship between business cycle and bank credit extension (Perera & Paudel, 2009). Sindano (2009) defines cointegration as a long run relationship of variables that are linked to form an equilibrium relationship when the individual time series themselves are non-stationary in their levels, but become stationary when differenced. Thus, it can be stated that cointegration highlights the existence of a long run equilibrium to which the system converges over time. According to Olumuyiwa *et al.,* (2012), the cointegration technique allows for the estimation of a long-run equilibrium relationship. Simply put, one can argue that various non-stationary time series are cointegrated when their linear combination is stationary. Stationary deviations from the long run are allowable in the short run. Economically speaking, two variables can only be cointegrated if they have

long-run or equilibrium relationship between them. The cointegration technique was pioneered by Engle and Granger (1897) and extended by Johansen (1990). In Olumuyiwa *et al*., (2012: 76), Granger notes, "A test for cointegration can be thought of as a pre-test to avoid 'spurious regression' situation."

According to Sindano (2009), two of the widely used tests in modern research for cointegration are the Engle-Granger and Johansen procedures. The Engle-Granger procedures investigate the possibility of cointegration in bi-variate models. One of the limitations of the Engle-Granger approach is that it assumes uniqueness of the cointegrating vector. For more than two variables, the approach does not provide sufficient framework (Sindano, 2009: 31). In this study, estimation of cointegrating vectors and testing for long-run causal relationships in the context of error correction representation of cointegrated variables was conducted using the Johansen maximum likelihood procedure (Johansen & Juselius, 1990). Ghirmay (2004) notes that Toda and Phillips (1993) and Hall and Milne (1994) have shown that the Johansen procedure is an "efficient method of testing cointegration and causality" (427). The Johansen procedure, a p-dimensional VAR of order p can be specified as follows:

$$\Delta Y_t = \alpha_o + \Pi Y_{t-1} + \sum_{i=1}^{p+1} r_i \Delta Y_{t-1} + \beta\emptyset + \S_t \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. \qquad (3.7)$$

Here **Yt** is an nx1 vector composed of non-stationary variables, **Π** and **r** are nxn matrices of coefficients and **ø** is a set of deterministic variables such as constant, trend, and dummy variables and $\S_t$ is a vector of normally and independently distributed error terms.

Johansen and Juselius (1990), cited in Perara and Paudel (2009), developed two likelihood ratio tests: the *Maximum Eigenvalue* test, which evaluates the null hypothesis of r cointegrating vectors against the alternative of (r+1) cointegrating vectors and the *Trace* test, which evaluates the null hypothesis of, at most, r cointegrating vectors. In the case of bivariate VAR, the null hypothesis is that there is no cointegration between the variables and the alternative one is the existence of only one cointegrating vector.

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Cointegration exists if the trace statistic is greater than the critical values (Thaker, Sin & Man, 2014). In some cases, Trace and Maximum Eigenvalue statistics may yield different results. In such cases, "the results of the trace test should be preferred" (Evans, 2013: 10).

According to Odhiambo (2007), if cointegration is detected between two variables, then the existence of Granger causality cannot in either way be ruled out. As long as the relevant variables have a common trend, Granger causality must exist in at least one direction (Abu-Bader & Abu-Qarn, 2007; Granger, 1988). However, although cointegration indicates the presence of Granger causality, it does not indicate direction of causality between variables, which can be detected using the vector error-correction model (VECM) which is derived from the vectors of cointegration (Abu-Bader & Abu-Qarn, 2007).

After identification of the number of cointegrating equations, the reseracher proceeded to the Vector Error Correction Model analysis.

3.12.7 Vector Error Correction Model

If the variables included in the VAR model are found to be cointegrated, the next step is to specify and estimate a vector error correction model (VECM) including the error correction term to investigate dynamic behavior of the model (Adamopoulos, 2010). Once the equilibrium is achieved, the VECM model describes how the examined model is adjusting in each time period towards its equilibrium. According to Perera and Paudel (2009), the dynamic specification of the model allows the deletion of the insignificant variables, while the error correction term is retained. Engle and Granger (1987), cited in Vazakidis and Adamopoulos (2009), posit that the size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long run equilibrium state.

If variables are cointegrated we can use an error correction model to test causality between business cycles and bank credit extension since cointegration implies the existence of an error correction model (Perera & Paudel, 2009; Sindano, 2009; Vazakidis

& Adamopoulos, 2009; Odhiambo, 2007). The final form of the Error Correction Model (ECM) was selected according the *general* to *specific* methodology suggested by Maddala (1992). The ECM corresponding to our situation is:

$$\Delta PSCRt = \alpha 0 \quad + \sum_{i=1}^{n} \alpha 1 \Delta PSCRt\text{-}i + \sum_{i=1}^{n} \alpha 2 \Delta GDPt\text{-}i + \sum_{i=1}^{n} \alpha 3 \Delta DEPt\text{-}i + \sum_{i=1}^{n} \alpha 4 \Delta M3t\text{-}i + \sum_{i=1}^{n} \alpha 5 \Delta LRt\text{-}i$$

$$+ \sum_{i=1}^{n} \alpha 6 \Delta CPIt\text{-}i + \sum_{i=1}^{n} \alpha 7 \Delta NEERt\text{-}i + \lambda 1 EC1t\text{-}1 + \mu t \qquad \text{---------------------------- (3.8a)}$$

$$\Delta GDPt = \beta 0 + \sum_{i=1}^{n} \beta 1 \Delta PSCRt\text{-}i + \sum_{i=1}^{n} \beta 2 \Delta GDPt\text{--}i + \sum_{i=1}^{n} \beta 3 \Delta DEPt\text{-}i + \sum_{i=1}^{n} \beta 4 \Delta M3t\text{-}i + \sum_{i=1}^{n} \beta 5 \Delta LRt\text{-}i$$

$$+ \sum_{i=1}^{n} \beta 6 \Delta CPIt\text{-}I + \sum_{i=1}^{n} \beta 7 \Delta NEERt\text{-}i + \lambda 2 EC2t\text{-}1 + vt \qquad \text{----------------------- (3.8b)}$$

where Δ = the first difference operator

ECt-1 = the error term lagged one period, captured from the cointegration equation

λ = the short run coefficient of the error term ($-1 < \lambda < 0$). The causal inference is obtained through the influence of λ1 and λ2

μt, vt = the white noise terms

3.12.8 Granger Causality Test

Following the empirical studies of Murty *et al.,* (2012) and Adamopoulos (2010), this study used Granger causality test for testing the causality between bank credit extension and economic growth in South Africa in the long run. As cited by Murty *et al.,* (2012),

the Granger procedure is selected because it consists of "more powerful and simpler way of testing causal relationship" (53). The Granger causality test is also preferred to other alternative techniques because of its "favorable response to both large and small samples" (Sindano, 2009: 26). The test in the VAR framework formulates the null hypotheses as follows:

Ho: No causal relationship between business cycles and bank credit extension

H1: There is causal relationship between business cycles and bank credit extension

The above hypotheses are tested in the context of the VAR of the form:

$$LnPSCRt= \alpha 1 + \sum_{i=1}^{p} \beta ilnPSCRt\text{-}i + \sum_{i=1}^{p} \lambda ilnGDPt\text{-}i + \xi t \qquad \text{----------- } (3.9a)$$

$$LnGDPt= \alpha 2 + \sum_{i=1}^{p} \psi ilnGDPt\text{-}i + \sum_{i=1}^{p} Yiln PSCRt\text{-}i + \mu t \qquad \text{------------- } (3.9b)$$

Where PSCR (bank credit extended to the private sector) is the dependent and GDP (business cycle indicator) is the explanatory variable in log form and ξt is the white noise error term (equation 3.9a) while GDP is the dependent and PSCR is the explanatory variable in equation 3.9b. Moreover, t is the sample size and p is the lag lengthy of unrestricted VAR model. According to Katos (2004) and Seddighi *et al*., (2000), there exists a unidirectional causality if only $\{\lambda 11, \lambda 12, ...\lambda 1k) \neq 0$ and $\{Y21,Y22,......Y2k) \neq 0$ (*Fc > critical value of F)* in equation (3.9a) and equation (3.9b) and bi-directional causality if both $\{\lambda 11, \lambda 12, ...\lambda 1k)$ and $\{Y21,Y22,......Y2k) \neq 0$ in the two equations respectively.

According to Sindano (2009), the use of the traditional Granger causality tests has its limitations since it suffers from the following methodological deficiencies. First, these standard tests do not examine the basic time series properties of the variables. Granger,

cited in Odhiambo (2007), argues that if the variables are cointegrated, then these tests incorporating differenced variables will be miss-specified unless the lagged error correction term is included. Second, the majority of these tests turn the time series stationary "mechanically by differencing the variables and consequently eliminate the long run information embodied in the original form of variables" (Sindano, 2009: 27).

Given the two methodological deficiencies in the traditional Granger causality method, proper statistical inference can be obtained by analyzing the causality relationship on the basis of error correction model (ECM) as argued above. The ECM allows for the inclusion of the lagged error correction term derived from the cointegration equation (Perera & Paudel, 2009; Vazakidis & Adamopoulos, 2009; Odhiambo, 2007). By including the lagged error correction term "the long run information lost through differencing is reintroduced in a statistically acceptable way" (Sindano. 2009: 30).

3.12.9 Statements of Hypotheses

Following on the aforementioned, it may be apt to re-state the research questions as follows:

   i.   Is there a long run relationship between business cycles and bank credit extension in South Africa?

   ii.   What is the direction of causality between business cycles and bank credit extension in South Africa?

The null hypotheses this section of the study tested are as follows:

   iii.   Change in economic growth (GDP- business cycle indicator) does not Granger-cause change in credit (PSCR- private sector credit).

   iv.   Change in credit (PSCR- private sector credit) does not Granger-cause change in economic growth (GDP- business cycle indicator).

3.13 Chapter Summary

The theoretical framework presented in Chapter 2 and the research questions that this study sought to address suggest that the study is both quantitative and qualitative in nature. Accordingly, a sequential (connected data) mixed approach that draws on both positivism and phenomenology was used. Results of Phase I questions (qualitative survey) shaped the research agenda for Phase II (quantitative survey). Purposive sampling method was used on the qualitative research and a combination of purposive sampling and snowball sampling methods was used on the side of quantitative leg of the research. Primary data collection techniques consisted of semi-structured interviews and structured survey questionnaires. Descriptive and inferential statistics were used to analyze survey data.

Results of the survey study and literature review determined credit extension variables and time series data to be considered for the econometric research. Time series data was sourced from registered commercial banks and SARB various bulletins. To establish the long-run and short-run dynamics, the Johansen cointegration approach and the vector error correction model (VECM) were used in the following chapter (4). The former provides a unified framework for the estimation and testing of cointegration relations in the context of vector auto regressions (VARs) (Fourie *et al.*, 2011; Akinboade & Makina, 2010; Dlamini, 2008; Brooks & Tsolacos, 1999). Granger causality tests represented the methodology used to see whether credit leads or lags economic growth.

The research attempted to follow the directives of 'good research.' The research was rigorous and adhered to a strong ethical foundation. To this end, the research participants signed informed consents and also a privacy, anonymity and confidentiality pledge, was respected through all stages of the research.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Introduction

This study investigated and quantified the relationship between the macroeconomic business cycle and bank-granted credit in South Africa for the period 1980:Q1 to 2013:Q4. The main question that this research sought to answer was what is the nature and causal relationship between economic growth and bank credit extension? Empirical evidence "justifies a belief in the truth or falsity of an empirical claim" (Evans, 2013: 11). This study required empirical evidence for the following hypotheses not to be rejected:

i.   Credit extension has significant impact on economic growth in South Africa, and

ii. Economic growth has significant impact on bank credit extension in South Africa.

Therefore, this chapter aims at validating the *a priori* expectations of the variables by determining the relationship between the dependent and independent variables.

This chapter is presented as follows: section 4.2 presents results of qualitative results of interviews with senior loans officers and section 4.3 presents results obtained through quantitative study. Econometric test results are presented in section 4.4 and section 4.5 presents discussion and interpretation of the findings. Section 4.6 provides a summary of all tests performed in this study.

4.2 Presentation of Qualitative Findings

The findings of the qualitative side of the survey are presented below. The main research question was:

"Is there any relationship between business cycles and bank credit extension?"

The sub-questions included the following:

i.   In your opinion, what factors are significant in determining the growth of credit in South Africa?

ii. How do the different credit aggregates behave during alternate business cycles?

iii. Why do banks change lending policies overtime?

iv. To what extent is credit procyclical in South Africa?

4.2.1 Factors determining credit growth in South Africa

Respondents were asked to indicate their opinion on factors significant in determining credit growth in South Africa. A majority (95%) of the participants stated that the performance of the economy in general influences credit growth. The value of collateral offered by loan applicants was singled out to be the largest contributor. The key message from the participants was that asset values tend to rise during economic upswing and decline during a downswing or contraction. In the words of one participant "bank intermediation becomes riskier during downturns" through a reduction in the value of collateral assets attached to the outstanding loan. About 70% of the respondents observed that competition among banks drives lenders to cut lending standards and this is common during economic downswings. A respondent stated that business and consumer confidence levels are maintained at high levels when the economy is doing well and this creates sufficient demand for credit.

There was also consensus (100%) among participants that credit growth is affected by a number of macroeconomic variables. Common variables mentioned during the discussions include money supply growth (95%), deposit liabilities (80%), lending rates (85%) and inflation (65%). A respondent commented that "bank deposits are the lifeblood of banking ….. and they represent the principal source of funds for lending." Some participants (80%) claimed that the expansion of money supply signify the availability of money and is also directly related to credit extension. Overall there was an agreement that low interest regime stimulates credit demand. A further observation was that inflation is detrimental to credit growth. A few respondents (35%) commented on bank capital positions and regulatory requirements as some possible key drivers of credit growth.

4.2.2 Relationship between economic activity and bank credit availability

The respondents were asked to give their opinion on the relationship between economic growth and bank credit availability. Respondents were unanimous (100%) that there is a positive and significant relationship between economic activity and bank credit

availability. They explained that improvement in macroeconomic environment will result in consumer and business confidence being elevated to high levels. The resultant increase in credit appetite will be matched by banks' liberalization of risk management policies. A couple of respondents (55%) stated that during a recession, business activity goes down and demand for credit slows down and the reverse is true. A respondent commented that "a link between credit booms and financial crisis has been established, with excessive credit growth now generally considered a reliable early warning indicator."

4.2.3 Equilibrium loan amount and supply side effects

The respondents were asked to explain whether equilibrium loan amount result from supply side effects. They gave various responses which include; (i) equilibrium loan amount is a function of both the capability of the bank to lend (cash reserves, liquidity, appetite to lend) as well as the demand for credit by customers (95%); (ii) mostly to do with availability of loanable funds (70%); (iii) it is a combination of both supply and demand (85%); (iv) it is driven by bank capacity to lend, businesses and personal sector have unlimited demand for loans while demand for credit is restricted by other factors such as ability to service loans, lack of security and capital (15%).

4.2.4 Correlation of changes in credit policy and changes in conditions of those demanding credit

The respondents were asked to explain why changes in credit policy were seemingly correlated with changes in conditions of those demanding credit and they gave various responses. Most respondents (85%) indicated that banks need to align their credit policies in line with changes in the macroeconomic environment in order to remain relevant in the market place. They added that macroeconomic shocks are quickly transmitted to borrowers' balance sheets. Banks experience a sharp rise in non-performing loans during economic downturns. Not only do more loans default, but the default risk of performing loans in the aggregate tends to increase, as does the expected loss when default occurs. In this regard, respondents argued that loan loss provisions should reflect changes in borrowers' creditworthiness and banks' sentiments concerning the health of the economy.

A few respondents (35%) indicated that there is need to strike a balance between risk and profitability. In a boom, there is less risk perceived and high certainty of rewards hence the liberal credit policies and vice versa is true. The key message from participants here was that improvements in the macro-state increase the incentives for banks to liberalize their risk management policies.

4.2.5 Extent of pro-cyclicality of credit in South Africa

The respondents were asked to tell to what extent is credit pro-cyclical in South Africa. In their response majority of the respondents (85%) said that to a large extent, credit extension in South Africa moves in tandem with development in the macro-state characterized by high credit growth rates during economic upswing and contraction in credit during downswing. Some respondents (60%) also stated that South African economy is very vulnerable to international shocks to such an extent that the local business cycle follows international business cycle. The credit cycle in South Africa follows both the domestic and international business cycles. Majority of respondents (80%) argued that in this era of globalization, South African economy is not decoupled from the developments in the rest of the world, contrary to the general belief. The domestic business cycle is synchronized with international business cycles.

In addition, some respondents (75%) indicated that during economic downturn, many banks in South Africa become more prudent and extra cautious. Fluctuations in the banks' ability and willingness to extend loans may lead to a predominantly cyclical lending practice. In the words of one respondent, "…. Banks are not all-weather friends. They give you an umbrella when you do not need it and take it away when you need it most [raining]…."

4.2.6 Other issues of importance to bank lending behavior in South Africa.

The respondents were asked whether there were other issues of importance to bank lending behavior in South Africa. Most of the responses (85%) were on quality of loans and funding issues. They stated that quality of the lending book to Black Economic Empowerment (BEE) clients has largely been very poor and disappointing. This is a big

problem in the financial sector as a whole and banks have been compelled to raise huge provisions and ultimately recording significant write-offs in the few past years. Not surprisingly, most banks have tightened their lending criteria to this sub-category of borrowers. The impact of the Basel III on banks' liquidity and capital holdings reserves was also singled out as one of the major constraints on banks' capacity to lend. A few respondents (35%) also indicated that there is enormous pressure from regulators to reduce the average loan tenor (duration) with the ultimate objective of matching loan book to funding.

Interview results suggest that bank credit extension is determined by factors at both micro and macro levels. The results of the survey also suggest that credit extension in South Africa is procyclical. However, the results were not very clear on the direction of causality between economic growth and credit extension. These qualitative results (Phase I of the survey) were used to formulate questions for the survey instrument used to collect quantitative data in the second phase of the research process. Quantitative findings are therefore presented in section 4.3.

4.3 Presentation of Quantitative Findings

4.3.1 Response Rate

The targeted sample was 300 in size. However, due to accessibility challenges as well as resource and time constraints, questionnaires were successfully circulated to 240 respondents. The respondents were drawn from top four banks in terms of loan market share (with total market share of 84 %%). Out of the 240 respondents who were sampled and the questionnaires administered, only 81 (about 34%) responded by the initially stipulated expiry date. The researcher followed up by reminding non-respondents about the questionnaire. The researcher used all means available to increase the response rate in order to have a representative sample for meaningful generalizations. Phone calls were made and emails and/or letters with some encouragement were sent to non-respondents. The follow-up messages reiterated the importance of the study. The communication assumed that the individuals wished to respond "but due to unforeseen circumstances, it was not possible" (Mungenda & Mungenda, 2003: 82).

Another technique used was that of sending a new copy of the questionnaire plus a follow-up letter. The researcher assumed that most questionnaires which were not returned were 'misplaced.' These interventions proved to be very effective as the number of returned survey instruments increased from 81 to 179. However, sixteen (16) of the returned questionnaires were considered not useable. The unusable questionnaires were either blank with a note attached which explained why respondents would not be able to complete the survey, or only partially complete with major portions of the survey blank. Because the study used a sample that was smaller than the adequate sample size of 300, this might have caused a bias which might have affected the sample representation and hence, validity and reliability of the study. As shown in Table 4.1, with 163 returned and usable questionnaires out of 240, the effective response rate increased from the initial 33.75% to 67.92%. This response rate was considered adequate and conforms to Mungenda and Mungenda (2003) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of at least 70% is excellent.

Table 4.1: Response Rate

	Frequency	**Percentage**
Response	163	67.92
Non Response	77	32.08
Total	**240**	**100**

4.3.2 Demographic Information of the Respondents

The study sought to establish the respondents' experience in the credit and risk management field. Figure 4.1 overleaf shows that 7% of the respondents indicated that they had less than 3 years' experience in the credit and risk management field, 19% indicated that they had 3 to 5 years relevant experience, 46% for 6 to 10 years while 28% stated they had worked in the credit and risk space for more than 10 years. This illustrates that majority of the respondents (74%) had worked in the credit and risk management field for more than 5 years which suggests that they had been in the field long enough and could therefore offer reliable information as sought by the study.

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Figure 4.1: Years of Experience in Credit and Risk Field
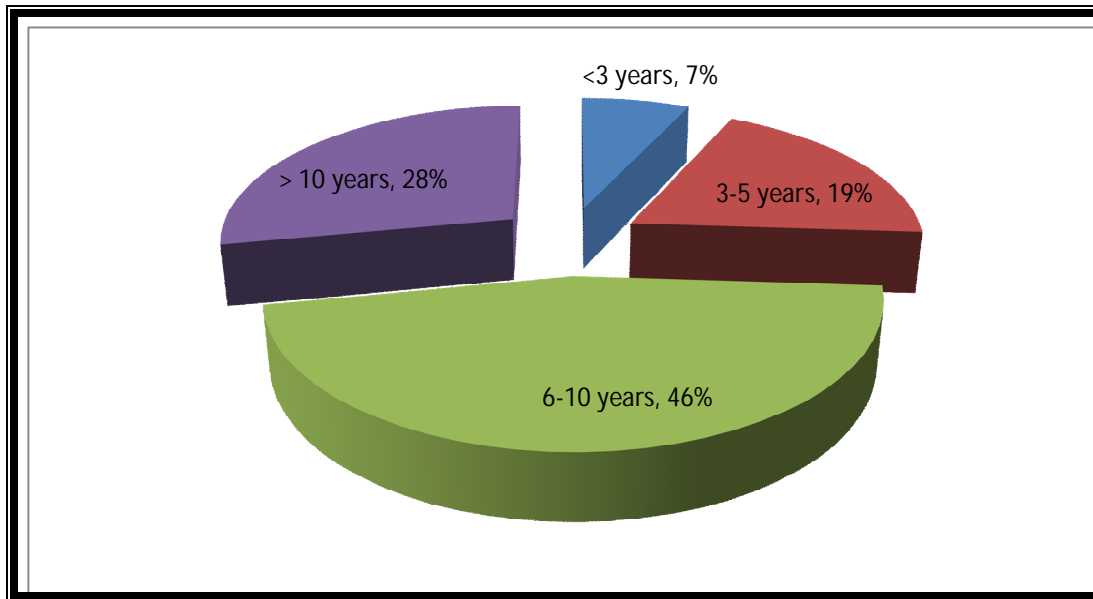
4.3.3 Changes in bank lending policies

Respondents were requested to state whether their banks change lending policies in line with developments in the macro-state environment. Results in Table 4.2 below revealed that a majority (80%) agreed with the statement. Majority of those who disagreed with the statement commented that whilst their bank polices do not change, their underwriting criteria and standards change over alternate business cycles.

Table 4.2 Changes in lending policies

Statement	Frequency	Percent
No	33	20
Yes	130	80
Total	163	100

The findings imply that banks in South Africa conduct environmental scanning and are therefore in a position to know what changes are taking place and how to strategically alter or change their lending policies and/or their underwriting standards in light of the macro-state environment.

4.3.4 Effect of Macroeconomic Environment on Credit Extension Drivers

The study sought to establish the extent of effect of fluctuations in economic environment on bank credit extension drivers. The results are indicated in Figure 4.2 below.

Figure 4.2: Effect of Macroeconomic Environment on Credit Extension Drivers
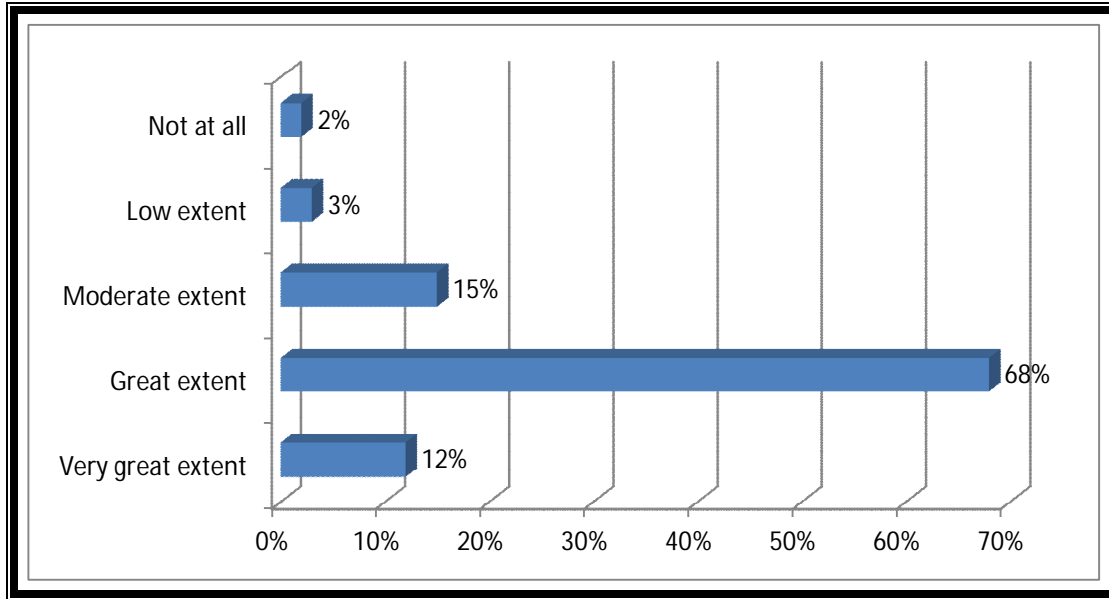
Results above shows that majority of the respondents (68%) indicated that credit extension are influenced by fluctuations in the economic environment to a great extent. About 5% of the respondents were of the view that the impact of macro-state on credit aggregates was very minimal, if any. The results show that economic conditions influence lending behavior of commercial banks to a large extent.

4.3.5 Reasons for change in bank lending policies

The study sought respondents' agreement, on a Likert scale of 1 to 5 (where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree) with statements related to reasons for changes in bank lending policies. Majority of the respondents strongly agreed that banks change lending policies due to changes in the fundamental business conditions as indicated by a mean score of 4.62. The standard deviation ("σ") was 0.68 (below 1) indicating that answers received were closer to the mean thus they were similar. The respondents also agreed that banks change lending policies due to changes in the quality of borrowers as indicated by a mean score of 4.15

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(σ<1) . Respondents strongly agreed with the statement that banks change lending policies when the business cycle impacts the bank's profitability through decreased demand for credit (mean score = 4.66 ; σ<1)) and banks change lending policies when the economy goes into recession and the value of firms' collateral decreases making them ineligible for credit (mean score = 4.15; σ<1). However, majority of the respondents neither agreed or disagreed with the statement that banks change lending policies due to other factors (mean score = 3.0). The standard deviation of 1.31 (greater than 1) indicates that responses on this particular statement were not closer to the mean thus they were dissimilar.

Table 4.3 Reason for changes in lending policies

Statement	Mean	Std Dev
My bank changes lending policies due to changes in the fundamental business conditions.	4.62	0.68
My bank changes lending policies due to changes in the quality of borrowers.	4.15	0.66
My bank changes lending policies when the business cycle impacts the bank's profitability through decreased demand for credit.	4.66	0.66
My bank changes lending policies when the economy goes into recession and the value of firms' collateral decreases making them ineligible for credit.	4.15	0.44
My bank changes lending policies due to other factors	3.0	1.31

4.3.6 Credit Rationing in the bank

Respondents were asked to give reasons as to why their banks rationed credit in the previous business cycle (2007-2009 global financial crisis). Results in the table 4.4 reveal that majority of the respondents disagreed (mean score = 2.15) with the statement that banks rationed credit due to weak collateral value. They also strongly disagreed (mean score = 1.09) with the statement that banks rationed credit due to increased competition. Most respondents were indifferent on statements that banks rationed credit due erosion of

deposits (mean score = 2.55) and weak capital position (mean score = 2.55). Respondents also agreed (mean score = 3.45) with the statement that banks rationed credit due to poor loan performance. They were further in disagreement (mean score = 1.45) with statement that tighter regulatory oversight adversely impact on bank lending. The standard deviations of responses on all statements were below one (1) indicating that the answers received were closer to the respective means thus they were similar.

Table 4.4 attributes of credit rationing

Statement	Mean	Std Dev
Credit rationing attributed to weak collateral in my bank.	2.15	0.49
Credit rationing attributed to increased competition in my bank	1.09	0.39
Credit rationing attributed to erosion of deposit base in my bank.	2.55	0.50
Credit rationing attributed to weak capital position in my bank.	2.55	0.50
Credit rationing attributed to poor loan performance in my bank.	3.45	0.47
Credit rationing attributed to tighter regulatory oversight in my bank.	1.55	0.47
Credit rationing attributed to other factors in my bank.	1.0	0.40

4.3.7 Statements with regard to bank lending

a) Collateral value and bank lending

The study also sought respondents' agreement, on a Likert scale of 1 to 5 (where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree) with the following statements related to relationship between collateral value and bank lending. Respondents were asked to indicate whether the prices of assets used as collateral are directly linked to the state of the economy. A mean of 4.42 suggests that most respondents agreed on the statement while the standard deviation was 0.66 indicating that the answers received were closer to the mean thus they were similar. In

addition, with regard to whether borrowers' credit limits are determined by the value of property offered as security, which affects investment and demand for assets in the economy, majority of the respondents neither agreed nor disagreed with the statement (mean score = 2.71). As depicted in Table 4.5 below, standard deviation was 1.18 indicating that the answers received were not closer to the mean thus they were dissimilar.

Table 4.5 Collateral value and bank lending

Statement	Mean	Std. Dev
Prices of assets are directly linked to the state of the economy, leading to pro-cyclicality in lending.	4.42	0.66
Borrowers credit limits are determined by the value of property offered as security, which affects investment and demand for assets in the economy.	2.71	1.18

b) Competition and bank lending

Respondents were asked to give the extent to which they agree with the statement that banks are supposed to keep pace with the returns on equity offered by their rivals in the face of stiffening competition. As shown in Table 4.6 a mean of 3.93 suggests that most respondents just agreed on the statement while standard deviation of 1.02 indicates that answers received were not closer to the mean thus they were dissimilar. In addition, respondents were asked to indicate whether competition drives lenders to cut their lending standards. A mean of 2.4 suggests that respondents disagreed on this particular statement while standard deviation of 1.37 ($\sigma>1$) indicates that answers received were not closer to the mean thus they were dissimilar.

Table 4.6 Competition and bank lending

Statement	Mean	St. Dev
In the face of stiffening competition, banks are supposed to keep pace with the returns on equity offered by their rivals.	3.93	1.02
Competition drives lenders to cut lending standards	2.40	1.37

c) Market share, reputation, shareholders expectation and bank lending

On a Likert scale of 1 to 5 (where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree), respondents were asked to give the extent to which improvement in the macro-state increases the incentives for banks to liberalize their risk management policies. As indicated by a mean score of 3.71 majority of the respondents agreed with the statement. In addition, with regard to whether posting low returns in a boom is particularly damaging to the bank reputation as this constitutes a clear signal of low ability to lend, a majority of respondents agreed with the statement (mean score = 3.62). As depicted in Table 4.7 below the standard deviation was 1.42 (σ>1) which indicates that the answers received were not closer to the mean thus they were dissimilar.

Table 4.7: Market share, reputation, shareholders expectation and bank lending

Statement	Mean	Std.Dev
Improvement in the macro-state increases the incentives for banks to liberalize their risk management policies.	3.71	1.01
Posting low returns in a boom is particularly damaging the bank reputation as this constitutes a clear signal of low ability to lend.	3.62	1.42

d) Liquidity, capital, regulatory requirements and bank lending

On a Likert scale of 1 to 5 (where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree), respondents were asked to give the extent to which in economic downturn, required regulatory capital is likely to increase as the credit risk of the loan portfolio increases. As shown in Table 4.8, a majority of the

respondents agreed with the statement (mean score =4.42) while the standard deviation was 0.66 indicating that the answers received were closer to the mean thus they were similar. In addition, with regard to whether credit rationing may also result from banks weak balance sheet position (in terms of liquidity, capital and regulatory requirements), the mean of the responses indicated from the results was 3.98 which suggests that most of the respondents were agreeing with the statement while the standard deviation was 1.22 which indicates that the answers received were not closer to the mean thus they were dissimilar.

Table 4.8: Liquidity, capital, regulatory requirements and bank lending

Statement	Mean	Std.Dev
In economic downturn, required regulatory capital is likely to increase as the credit risk of the loan portfolio increases	4.42	0.66
Credit rationing may also result from banks weak balance sheet position.	3.98	1.22

e) Causality runs from business cycles to bank credit extension

Table 4.9 presents data on the level of agreement from respondents on statements suggesting that causality runs from business cycle to bank credit extension. Firstly, respondents were asked to give the extent to which lending standards change in response to variations in the quality of the borrowers over the business cycle. As indicated by a mean score of 4.09, a majority of the respondents agreed with the statement, while a standard deviation of 0.97 indicates that the responses were closer to the mean thus they were similar. In addition, most of the respondents agreed that bank lending is procyclical, that is, it moves in tandem with business cycles as indicated by a mean score of 3.78. The standard deviation of 1.12 ($\sigma>1$) indicates that the answers received were not closer to the mean thus they were dissimilar.

Table 4.9: Causality from business cycles to bank credit extension

Statement	Mean	Std.Dev
Lending standards change in response to variations in the quality of the borrowers in the business cycle.	4.09	0.97
Bank lending is pro-cyclical i.e. it moves in tandem with business cycle.	3.78	1.12

f) Causality runs from bank credit extension to business cycles

On a Likert scale of 1 to 5 (where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree), respondents were also asked to give the extent to which they agreed with the statement that causality runs from bank credit extension to business cycles. Most of the respondents agreed that availability of bank credit to fund activities of businesses exacerbate the magnitude of business cycles as shown by a mean score of 3.93. Further, respondents strongly agreed with the statement that fluctuations in bank credit may have significant, indeed critical, effects on macro-economic activity and may amplify swings in the macro-economy as shown by a mean score of 4.51. As shown in Table 4.10 the standard deviations of the responses on both statements were below 1 ($\sigma < 1$) indicating that the answers received were closer to the respective means thus they were similar.

Table 4.10: Causality from bank credit extension to business cycles

Statement	Mean	Std.Dev
Availability of bank funds to fund activities of business exacerbates the magnitude of business cycle.	3.93	0.69
Fluctuations in bank credit may have significant, indeed critical, effects on macro-economic activity and may amplify swings in the macro-economy.	4.51	0.50

g) Changes of credit standards as applied to approval of loans and advances

Respondents were asked to give the extent to which bank credit standards as applied to approval of household and business loans changed during the peak of the 2007-2009 financial crisis. The study sought respondents' agreement with the statement, on a Likert scale of 1 to 5 (where 1= Tightened Considerably; 2= Tightened Somewhat; 3= Remained Basically Unchanged; 4= Eased Somewhat and 5= Eased Considerably). To start with, in the case of households a majority of the respondents indicated that bank standards were tightened somewhat as indicated by a mean score of 2.39. Secondly, in the case of businesses, a majority of the respondents also indicated that bank standards were tightened somewhat as indicated by a mean score of 2.30. Thirdly, majority of the respondents indicated that overall, banks somewhat tightened credit standards in regard to approval of loans and advances to households and businesses. The standard deviations of the responses on the three statements were 1.46, 1.02 and 1.46 respectively (σ>1), indicating that that the answers received were not closer to the respective means thus they were dissimilar. The data findings are presented in Table 4.11 below.

Table 4.11: Changes of Bank Credit Standards

Statement	Mean	Std.Dev
My bank changed credit standards in regard to approval of loans and advances to households	2.39	1.46
My bank changed credit standards in regard to approval of loans and advances to businesses	2.30	1.02
Overall, my bank changed credit standards in regard to approval of loans and advances to households and businesses	2.42	1.46

h) Demand for loans during bottom of business cycle

Respondents were asked to give the extent to which demand for bank credit changed during the peak of the 2007-2009 financial crisis. The study sought respondents'

agreement with the statement, on a Likert scale of 1 to 5 (where 1= Decreased Considerably; 2= Decreased Somewhat; 3= Remained Basically Unchanged: 4= Increased Somewhat and 5= Increased Considerably). Respondents were asked to give the extent to which demand for loans and advances have changed in both households and businesses. To start with, in the case of households, a majority of the respondents indicated that household demand for loans and advances decreased somewhat (mean score =2.10). Secondly, in the case of businesses, majority of respondents indicated that demand for loans and advances decreased somewhat (mean score =2.41). Thirdly, in the case of the overall change in credit demand, majority of respondents indicated that demand for loans and advances decreased somewhat (mean score =2.36). As shown in Table 4.12 below the standard deviations were 1.05, 1.37, 1.17 levels respectively, indicating that the answers received on the three statements were not closer to the respective means thus they were dissimilar.

Table 4.12 Change in demand for loans and advances during the financial crisis

Statement	Mean	Standard Deviation
Households demand for loans and advances changed in my bank	2.10	1.05
Businesses demand for loans and advances changed in my bank	2.41	1.37
Overall, the demand for loans and advances changed in my bank	2.36	1.17

4.3.8 Reliability Test Results

A pilot study was carried out to determine reliability of the questionnaire. The pilot study involved 10 respondents. Reliability analysis was subsequently done using Cronbach's Alpha which measures the internal consistency by establishing if certain items within a scale measure the same construct (Kimani, 2013). According to Saunders (2003), alpha

values greater than 0.70 are an indication of acceptable internal reliability. Nunnaly (1978) recommends that instruments used in research should have reliability of 0.70 and above, thus forming the study's benchmark. Cronbach Alpha was established for every objective which formed a scale.

Table 4.13: Reliability Statistics

Item	Cronbach's Alpha
Economic Growth	0.963
Collateral value	0.812
Competition level	0.943
Business and consumer confidence	0.958
Real Money Supply (M3)	0.913
Lending rates	0.803
Capital requirements	0.786
Stakeholder expectations	0.753

Table 4.13 above shows that economic growth had the highest reliability ($\alpha= 0.963$) followed by business and consumer confidence ($\alpha= 0.958$). Stakeholder expectations had the lowest reliability ($\alpha=0.753$) followed by capital requirements ($\alpha=0.786$). This illustrates that all the eight scales were reliable as their reliability values exceeded the prescribed threshold of 0.70. These results establish a good justification for using these instruments for collecting data for the study.

4.3.9 Inferential Statistics

The study used the Analysis of Variance (ANOVA) and Pearson's product moment correlation to test the relationship between variables of interest.

a) ANOVA Analysis

The study used ANOVA to test the relationships since the sample size was small, and the variables were few. Further ANOVA removes some of the random variability so that significant differences can be found more easily and also helps look at interactions

between factors (Kimani, 2013). ANOVA statistics indicate that the overall model was significant. This was supported by an F statistic of 98.79 and *p-value* of 0.000, as shown in Table 4.14. The reported probability was less than the conventional probability of 0.05 (5%) significance level. The ANOVA results imply that the independent variables are good joint predictors of credit extension. The ANOVA results also indicate that predicting credit extension through independent variables yields better results than predicting credit extension through the mean.

Table 4.14: Analysis of Variance (ANOVA)

Indicator	Sum of Squares	Df	Mean Square	F	p-value
Regression	12.842	6	2.14	98.79	0.000
Residual	1.04	236	0.022		
Total	13.882	240			

b) Results of Correlation Analysis

The study also estimated the relationship between variables in the following multivariate correlation equation:

Credit Extension=b1Economic Growth+b2Collateral Value+ b3Competition+b4Real Money supply+b5 capital requirements +b6Lending Rates+ W1

The results of the correlation analysis are presented in Table 4.15.

Table 4.15: Pearson Correlation

(p) 2-tailed	Credit Extension	Economic Growth	Collateral Value	Comp.	Money Supply	Capital Req.	Lending Rates
Credit Ext	1.000						
Eco. Growth	0.732 (0.000)	1.000					
Coll. Value	0.921 (0.000)	0.801 (0.000)	1.000				
Comp.	0.922 (0.000)	0.789 (0.000)	0.968 (0.000)	1.000			
Money Supply	0.879 (0.000)	0.824 (0.000)	0.935 (0.000)	0.896 (0.000)	1.000		
Cap. Req	-0.926 (0.000)	-0.649 (0.000)	0.893 (0.000)	0.932 (0.000)	0.837 (0.000)	1.000 (0.000)	
Lending Rates	-0.873 (0.000)	-0.806 (0.000)	0.920 (0.000)	0.930 (0.000)	0.953 (0.000)	0.902 (0.000)	1.000

The data presented above reflect the effects of economic growth, collateral value, bank competition, money supply, bank capital requirements and bank lending rates on bank lending behavior in South Africa. Pearson analysis was then conducted at 95% confidence interval and 5% confidence 2-tailed. Table 4.15 above indicates the correlation matrix between the selected determinants of credit extension and commercial banks' lending behavior in South Africa. The results indicate that there is a positive relationship between lending by commercial banks and economic growth, collateral value, competition and money supply of magnitude 0.732, 0.921, 0.922 and 0.879 respectively. On the other hand, the results show a negative relationship between bank lending and bank capital requirements (-0.926) as well as bank lending rates (-0.873).

The positive correlations mean that a unit change in the predictor variable is associated with a positive change in credit extension and the reverse is true for negative correlations.

This notwithstanding, all the factors had a significant p-value (p <0.05) at 95% confidence level. This indicated that all the factors were significant with bank capital requirements being the most significant factor followed by bank competition and then collateral value. Surprisingly, fluctuation in economic activity was the least significant. On an overall basis it can be concluded that the variables of the study had strong correlations.

4.4 Econometric Test Results

As previously stated in Chapter One, the purpose of this study was to establish the nature and causal relationship between business cycles and bank credit extension. In this study, a change in Gross Domestic Product (GDP) at current market rate was used as a proxy for business cycle indicator. The credit extended to the Private (PSCR) in South Africa was modelled against several variables namely; Gross Domestic Product (GDP), Deposit Liabilities (DEP), Money supply (M3), Prime Lending Rate (LR), Inflation (CPI) and Nominal Effective Exchange Rate (NEER).

4.4.1 Preliminary Analysis
a) Descriptive Analysis
Table 4.16 Descriptive Statistics

	GDP	CPI	DEP	LR	M3	NEER	PSCR
Mean	12.92	9.63	15.44	15.41	15.04	216.70	14.96
Median	15.43	9.25	12.13	15.38	12.45	136.10	15.40
Maximum	22.60	19.70	37.14	25.50	39.90	747.58	34.60
Minimum	(3.74)	0.30	1.79	8.50	1.55	52.74	(0.60)
Std. Dev.	4.23	4.69	7.64	4.32	7.17	198.21	6.97
Observations	136	136	136	136	136	136	136

Table 4.16 provides the descriptive statistics of the variables namely, Gross Domestic Product (GDP), Inflation (CPI), Deposits (DEP), Prime lending Rate (LR), Money supply (M3), Nominal Effective Exchange Rate (NEER) and Credit extended to the private sector (PSCR) for the period 1980:Q1 to 2013:Q4. During the period under review, GDP growth averaged 12.92% with a low of -3.74% and a high of 22.60%. Bank credit extended to the private sector averaged 14.96% recording a maximum of 34.60% and minimum of -0.60% during the same period.

b) Trend Analysis

This section provides graphical representation of the movement and changes of the variables under study over the years 1980:Q1 to 2013:Q4.

Figure 4.3: Trend of PSCR, GDP and NEER
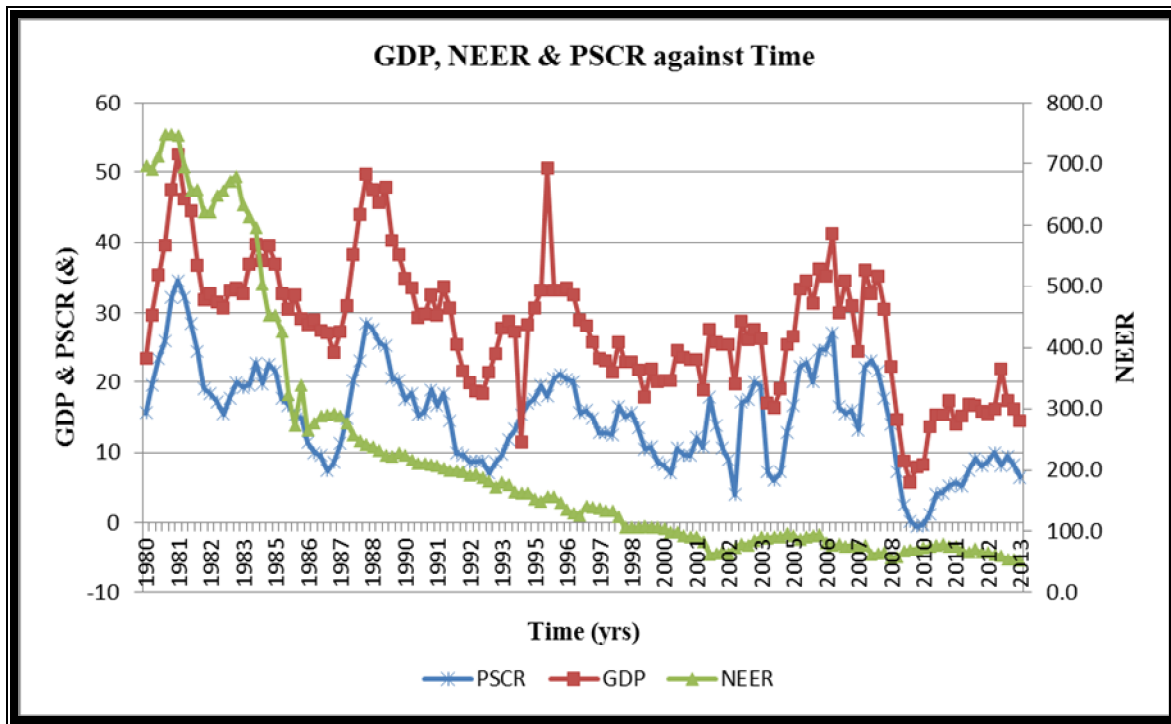
A trend analysis of credit to the private sector (PSCR), business cycle indicator (GDP) and exchange rate (NEER) was conducted and results shown in Figure 4.3. The graph shows an insightful trend between business cycle indicator and the supply of bank credit extended to the private sector over the years. The trend indicates that for the period of

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study the nominal effective exchange rate was generally downward trending whereas GDP and PSCR were cyclical in nature. When the GDP rose there was a rise in credit to the private sector also implying that there was a positive and pronounced association between the two variables.

Figure 4.4 depicts the trend analysis of prime lending rate, inflation and credit to the private sector over the period of study. This trend shows that when inflation rose then there was an accompanying rise in the prime lending rate so was the credit to the private sector. However, from about 2003 to 2010, the pattern changed. Low levels of interest rate and inflation were associated with high increases in credit extended to the private sector. In this case an increase in CPI or prime lending rate also led to the decrease of credit to the private sector and a decline in them led to an increase in the credit to the private sector.

Figure 4.4 Trend of PSCR, LR and CPI over years
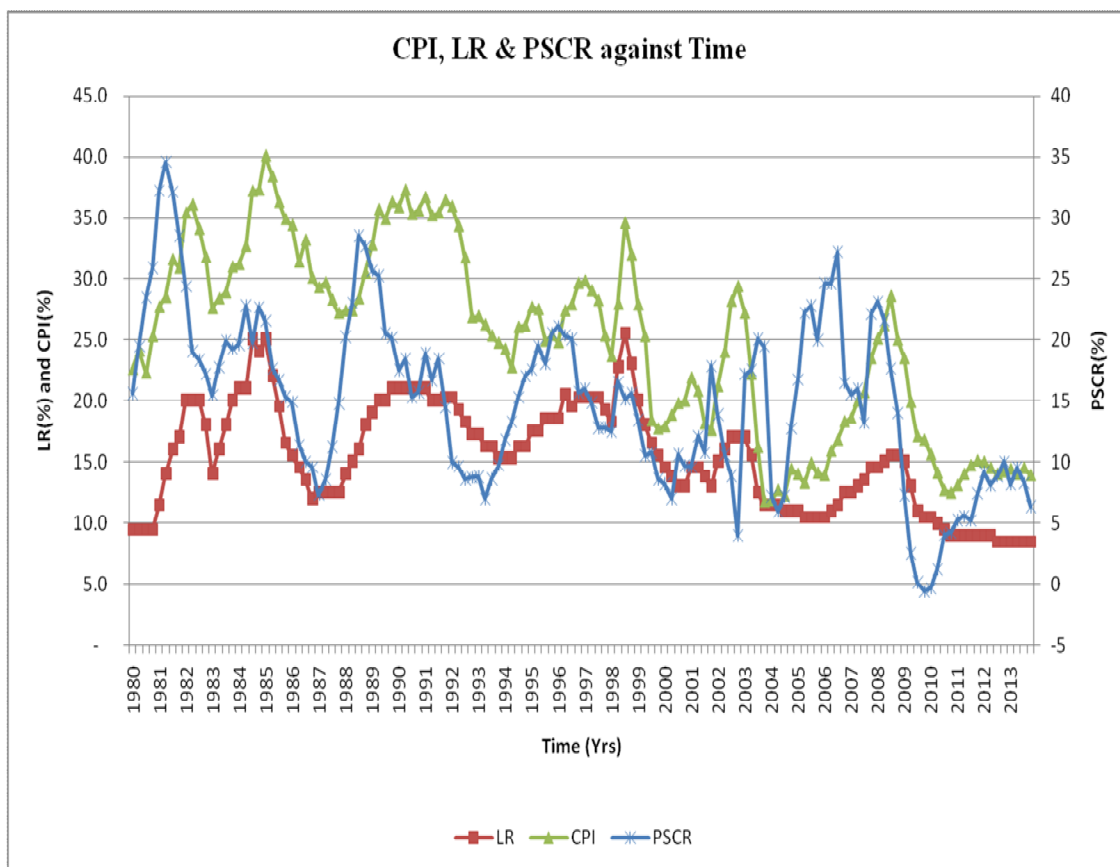
The figure 4.5 below shows the trend analysis of Money Supply (M3) and PSCR over the entire period of study (1980:Q1- 2013:Q4). From the graphical presentation, the money supply (M3) and PSCR have been fluctuating in tandem since 1980. The rate of growth in money supply however, has been much greater than the change in credit to the private sector. Nonetheless, there is a positive correlation between the two variables. A positive relation is also observed between deposit liabilities (DEP) and credit extended to the private sector.

Figure 4.5: Trend of PSCR, DEP and M3
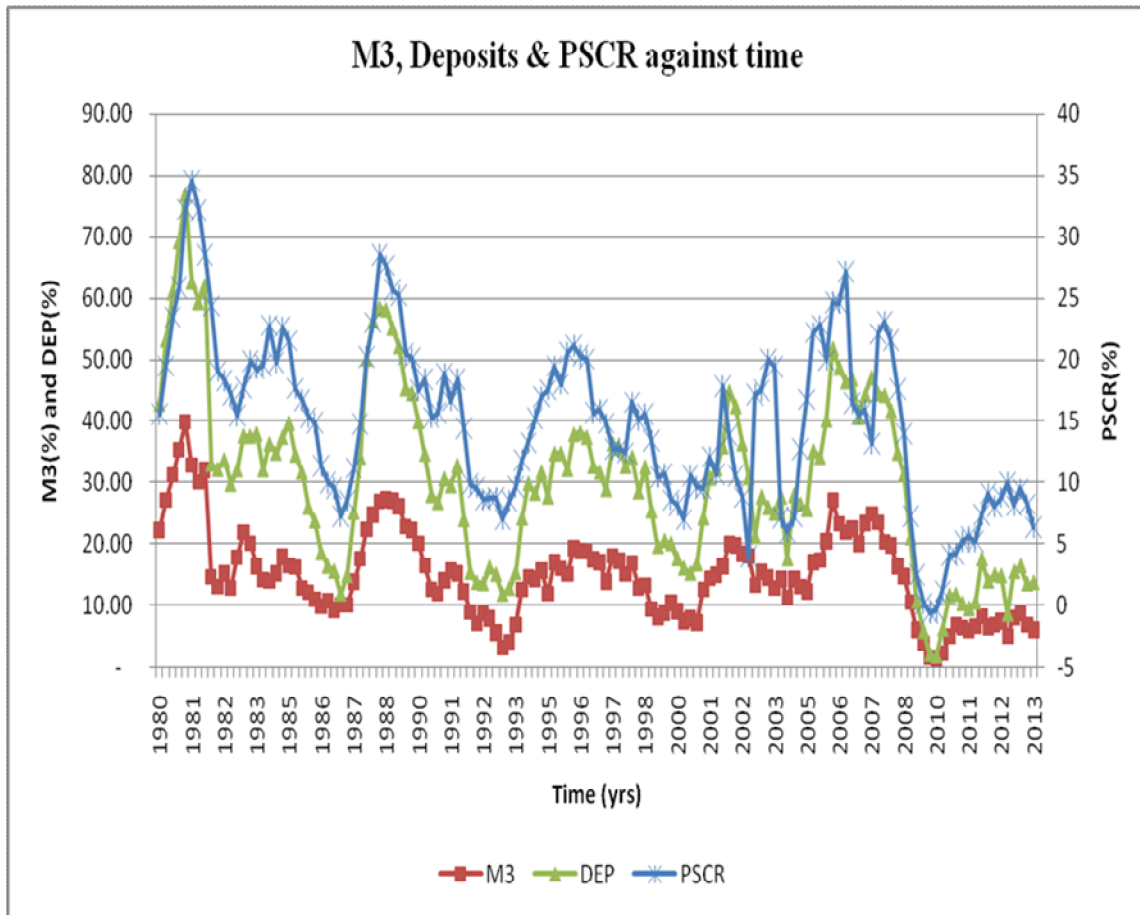
c) Diagnostic Checks

This involved testing for multicollinearity, autocorrelation, heteroscedasticity and the Jarque-Bera normality test. The diagnostic checks are important to ensure that the VAR is correctly specified.

c (i) Normality Test

Table 4.17: Normality Test Results

	GDP	PSCR	LR	CPI	NEER	M3	DEP
Skewness	0.41	0.19	0.14	0.12	**1.59**	0.70	0.29
Kurtosis	**3.81**	-0.09	-0.85	-1.03	1.25	0.72	-0.19
Jarque-Bera	20.16	24.83	4.94	6.73	60.80	28.43	27.04
Probability	0.0000	0.00004	0.800	0.0300	0.0000	0.000001	0.00001
Observations	136	136	136	136	136	136	136

The skewness coefficients displayed in Table 4.17 above reveal that all the variables except NEER are normally distributed since their coefficients are within acceptable range. In practice, the value of this coefficient lies between ±1 (Saleemi, 2012). Nominal effective exchange rate (NEER) is not normally distributed as its coefficient of 1.59 is slightly outside the acceptable range. However, the kurtosis coefficients indicate that all the variables are normally distributed except Gross Domestic Product (GDP) since the reported kurtosis of 3.81 was outside the rule of thumb range of ±3 (Cooper & Schindler, 2006; Mungenda & Mungenda, 2003).

Since Skewness and Kurtosis were not conclusive on whether the data was normal or not, the Jargue-Bera test offered a more conclusive test on normality. The Jarque-Bera test statistic tested the null hypothesis that the distribution of the variables was not significantly different from a normal distribution. The test revealed that only lending rate (LR) was normally distributed at 5% level. This called for conversion of variables into their natural logarithm in order to improve their normality. The second reason for conversion was to enhance interpretation of the results in terms of sensitivities.

Results in Table A2.1 in the appendix imply that taking natural logarithms of the data does improve the normality. In this case all variables are normally distributed except LNCPI since its skewness (-1.80528) and kurtosis (8.368121) exceed the rule of thumb. The most conclusive test of normality is the testing of the normality of the residuals. The residuals were obtained from running the following equation.

$$PSCR_t = \beta_o + \beta_1 BCI_{t-i} + \beta_2 DEP_{t-i} + \beta_3 M3_{t-i} + \beta_4 LR_{t-i} + \beta_5 CPI_{t-i} + \beta_6 NEER_{t-i} + \xi_{1t}$$

The error term, ξ_{1t} was tested for normality and the results are shown in Figure A2.1 in the appendix. The error term is therefore normally distributed.

However, it was still considered reasonable and acceptable to work with the data in their log form for purposes of statistical interpretation. Normality was further improved by use of lags. At this stage, it is imperative to mention that in a research study that uses inferential statistics to test hypotheses, the assumption of normality may be violated to a certain extent "without serious implications on the accuracy of generalization of findings" (Mungenda & Mungenda, 2003: 55). According to Islam and Ahmed (1999), cited in Dlamini (2008: 41), "non-normality is not a problem if some of the variables are weakly exogenous."

c(ii) Multicollinearity Test Results

As explained in section 3.12.4 (b) above, highly correlated independent variables have damaging effects on multiple regressions. Multicollinearity is a problem when the correlation coefficients in the correlation matrix are greater than 0.80 (Cooper & Schindler). In Table 4.18 overleaf, it is noted that the correlation coefficients between M3 and DEP and between GDP and DEP are 0.999728 (~1.00) and 0.954331 respectively, indicating high correlation between the identified sets of variables.

Table 4.18: Correlation Matrix

Correlation							
Probability	PSCR	GDP	CPI	DEP	LR	M3	NEER
PSCR	1.000000						
GDP	-0.267721	1.000000					
CPI	0.360287	-0.562230	1.000000				
DEP	-0.461745	*0.954331*	-0.596244	1.000000			
LR	0.338019	-0.573290	0.456887	-0.644356	1.000000		
M3	-0.462614	0.745978	-0.591962	*0.999728*	-0.64528	1.000000	
NEER	0.514553	-0.585018	0.607293	-0.581565	0.234285	-0.577219	1.000000

As shown in Table A2.2.2 in the Appendix, when variable M3 is dropped, DEP is still found to be highly correlated with GDP (correlation coefficient =0.954331). Table A2.2.3 shows correlation matrix results after dropping DEP. Under this scenario, all correlation coefficients are below 0.8 and thus the remaining variables PSCR, GDP, CPI, M3, LR and NEER were used to run a regression model.

c(iii) *Heteroscedasticity and Serial Correlation Test*

The long run model was run before carrying out Heteroscedasticity and serial correlation tests. The error term of this model was used in these tests. Heteroscedasticity test was run in order to test whether the error terms are correlated across the observations in the time series. The test for heteroscedasticity was conducted using the *Whites Test* where the F-statistic and its associated p-value was reported as well as the Obs*R Squared and its associated p-value. The null hypothesis was that the data does not suffer from heteroscedasticity, that is, residuals have a constant variance (homoscedasticity). The test results are shown in Table 4.19 overleaf.

Table 4.19: Heteroscedasticity and Serial Correlation Test Results

White Heteroskedasticity Test:			
F- Statistic	3.849043	Probability	0.000146
Obs*R-squared	32.01838	Probability	0.000398
Breusch-Godfrey Serial Correlation LM Test:			
F- Statistic	49.77362	Probability	0.000000
Obs*R-squared	37.86471	Probability	0.000000

Source: Eviews Computations

As depicted in Table 4.19 above, both the p-value associated with F-Statistic (p-value =0.000146) and p-value associated with Obs*R-square (p-value =0.000398) are less than the critical p-value of 0.05. It is therefore concluded that the null hypothesis of homoscedasticity is rejected and thus there is heteroscedasticity. Given that there is heteroscedasticity this implies that the t-statistics and the standard errors from regression are biased and therefore this was corrected for by using the White's standard error correction in E-views such that in the model after adjusting for heteroscedasticity the model indicates that the model has been estimated with "White Heteroscedasticity-Consistent Standard Errors & Covariance" and this addresses for heteroscedasticity (see Table 4.22).

Serial correlation tests were run in order to check for autocorrelation of error terms across time periods. Serial/autocorrelation was tested using the *Breusch-Godfrey* serial correlation LM test where also F-statistic and its associated p-value as well as the Obs*R- Squared and its associated p-value were reported. The null hypothesis was that no first order serial/auto correlation exists. As shown in Table 4.19 above, both the p-value associated with F-Statistic (p-value =0.000000) and p-value associated with Obs*R-square (p-value =0.000000) are less than the critical p-value of 0.05. It is therefore concluded that the null hypothesis of no serial correlation is rejected and thus serial correlation exists.

Autocorrelation was corrected by including the lags of the dependent and independent variables. In order to correct for the presence of serial correlation, the following equation was therefore estimated.

$PSCRt = \beta o + \beta_1 lnGDP + \beta_2 lnDEP + \beta_3 lnM3 + \beta_4 lnLR + \beta_5 lnCPI + \beta_6 lnNEER + \beta_7 lnPSCR_{t-i} + \beta 8 lnGDP_{t-i} + \beta 9 lnDEP_{t-i} + \beta 10 lnM3_{t-i} + \beta 11 lnLR_{t-i} + \beta 12 lnCPI_{t-i} + \beta 13 lnNEER_{t-i} + \xi 1t.$

Normality, multicollinearity, heteroskedasticity and serial correlation statuses have been established when performing diagnostic checks. The researcher thus proceeded to test for unit root/stationarity of all selected variables in the model.

4.4.2 Unit root test

Before applying the unit root tests, the logarithms of the variables were taken because log variables give us elasticities and reduce the impact of outliers and smoothies out time series" (Murty, 2012: 53). A necessary but not sufficient condition for cointegration is a test for unit root. Hence, prior to testing for a causal relationship and cointegration between the time series, the first step is to check the stationarity of the variables used in the model. The aim is to verify whether the series have a stationary trend, and, if non-stationary, to establish orders of integration. The study used both Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests to test for stationarity. The ADF and PP test the null hypothesis that the series have a unit root. If the null hypothesis of the two tests is rejected that would imply that the series does not have a unit root.

The results in Table 4.20 (intercept only) show that all variables except GDP are non-stationary in levels (that is, presence of unit roots) since the level values are smaller than the corresponding critical values at 1%, 5% and 10% levels. However, when the first difference condition of all variables are conducted using the same ADF and PP tests, these variables fulfill the requirement of stationarity since the first differenced series are greater than the corresponding critical values. It is, therefore, worth concluding that all variables used in this study are integrated of order one, that is, I(1). Thus, if the variables are I(1), then the Johansen cointegration test is used to find out whether there exist a

long-run relationship between the variables or not. The linear combination of I(1) variables will be stationary if variables are cointegrated (Murty *et al.,* 2012).

Table 4.20: Unit root tests Results

Variable	Level			1st Difference		
	ADF Statistics	PP Statistics	Inference	ADF Statistics	PP Statistics	Inference
LNGDP	-7.294122	-7.291243	Stationary	-16.28243	-16.28336	Stationary
LNPSCR	-3.314563	-3.316541	Non Stationary	-10.00751	-10.07051	Stationary
LNNEER	-1.488544	-1.489681	Non Stationary	-10.13262	-10.11467	Stationary
LNM3	-2.715161	-2.710613	Non Stationary	-10.34537	-10.43887	Stationary
LNLR	-2.921890	-2.907764	Non Stationary	-7.742058	-7.748952	Stationary
LNCPI	-2.977763	-2.918836	Non Stationary	-9.794646	-9.798563	Stationary
Critical Values						
1%	-4.0283	-4.0318		-4.0288	-4.0237	
5%	-3.4435	-3.4547		-3.4437	-3.4564	
10%	-3.3614	-3.3516		-3.3146	-3.3168	

Source: Eviews computation

Since the variables under the study are integrated of order one, that is, I(1), the next step is to test for cointegration using the Johansen's full information maximum likelihood to know whether there exists a long-run equilibrium in the relationship or not. The optimal lag length is chosen automatically by the econometric package E-views.

4.4.3 Cointegration Test Results

When a linear combination of variables that are I(1), produces stationary series, then the variables may need to be cointegrated. This means that a long run relationship may exist among them, which connotes that they may wonder from one another in the short run but in the long run they will move together. Having confirmed that all variables included in the causality test were integrated of order one as presented in Table 4.20, the next step was to independently test the existence of the cointegration relationship between each of the explanatory variables and the dependent variable.

Table 4.21: Results of Cointegration Test

Sample: 1980:1- 2013:4   Included Observations : 134

Test Assumption: Linear Deterministic Trend in Data

Series: LNPSCR; LNGDP; LNM3; LNLR; LNCPI; LNNEER

Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No. of CE(s)
0.323927	149.3848	94.15	103.18	None **
0.273010	96.92988	68.52	76.07	At most 1 **
0.139902	54.20494	47.21	54.46	At most 2 *
0.103166	34.00994	29.68	35.65	At most 3 *
0.079243	19.41935	15.41	20.04	At most 4 *
0.060457	8.356464	3.76	6.65	At most 5 **
0.047785	3.189545	3.21	5.68	At most 6

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

 L.R. test indicates 6 cointegrating equation(s) at 5% significance level

Source: Eviews computation

To establish whether long run relationship exists among the variables or not, cointegration test using Johansen and Juselius (1992) cointegration test was carried out

and reported in Table 4.21 as shown. The testing hypothesis is the null of non-cointegration against the alternative that is the existence of cointegration.

Table 4.21 shows that at none, at most 1,2,3,4 and at most 5, the null hypothesis of no cointegrating vector is rejected because the trace likelihood ratio statistic values are greater than the critical values at 5% level (149.3848 > 94.15; 96.92988 > 68.52; 54.20494 > 47.21; 34.00994 > 29.68; 19.41935 > 15.41; 8.356464 > 3.76). The trace statistic for at most 6 cointegrating vectors is 3.189545, which is less than the critical value at the 5% level (3.21); hence the null hypothesis cannot be rejected. This means that there are at least 6 integrating equations, which implies that a unique long run stable relationship exists among the variables and the coefficients of the estimated regression can be taken as equilibrium values.

a) Long-run Results

This section presents the results of the long run model after adjusting for heteroscedasticity and serial correlation.

Table 4.22 presents the long run results. The R- squared of the model 0.92 indicated that the overall goodness of fit was satisfactory. This implies that 92% of the variances in PSCR are explained by the variances in independent variables. The F-statistic of 65.238175 (p value =0.0000) indicated that the independent variables have good joint explanatory power.

The business cycle indicator (LNGDP) is positively associated with credit to the private sector in South Africa (coefficient= 0.0407920). At p-value of 0.0428 the impact of economic growth on bank credit extension is considered significant. This implies that a unitary increase in LNGDP will lead to a 0.040792 increase in LNPSCR all things being equal. The coefficient of LNLAGGDP is also positive and significant (p-value < 0.5). This implies that a unitary increase in business cycle indicator (economic growth measured by GDP percentage change) in the prior period will lead to 0.09185 increase in the credit to the private sector *ceteris paribus*. This means that current credit cycle is

largely explained by both the current and previous business cycles and the association is positive. In this case, the null hypothesis of no long-run relationship between the two variables private sector credit and economic growth is rejected given that the reported p-value in the long-run model is below the 5% critical value thus leading to the adoption of the alternative hypothesis of existence a long-run relationship.

Table 4.22: Long-run Relationship

Dependent Variable: **LNPSCR**				
Method: Least Squares				
Sample(adjusted): 1980:2 2013:4				
Included observations: 135 after adjusting endpoints				
White Heteroskedasticity-Consistent Standard Errors & Covariance				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.040792	0.051302	-0.795132	0.0428
LNCPI	-0.168603	0.160521	-1.050345	0.2956
LNLR	-0.103495	0.171094	-3.178566	0.0019
LNM3	0.351519	0.072219	4.86741	0.0000
LNNEER	-0.004913	0.0009340	-0.525980	0.5715
LNLAGGDP	0.09185	0.080357	1.247500	0.02146
LNLAGCPI	0.097862	0.174128	0.562011	0.5751
LNLAGLR	-0.064766	0.170752	-379300	0.007051
LNLAGM3	0.148727	0.085251	1.744582	0.0383
LNLAGNEER	0.007955	0.009309	0.854526	0.3279
LNLAGPSCR	0.564006	0.127978	4.407069	0.0000
C	-0.059767	1.070972	-0.055806	0.9556

R-squared	0.919873	Mean dependent var	12.74464
Adjusted R-squared	0.919864	S.D. dependent var	1.322388
S.E. of regression	0.0121468	Akaike info criterion	-4.979928
Sum squared resid	0.015456	Schwarz criterion	-5.238175
Log likelihood	417.6171	F-statistic	65.238175

| Durbin-Watson stat | 2.201159 | Prob(F-statistic) | 0.000000 |

LNNEER and its lag (LNLAGNEER) are insignificant determinants of private sector credit (LNPSCR) since their p-values of 0.5715 and 0.3279 respectively are greater than 0.05. Money supply (LNM3) and its lag (LNLAGM3) are significant determinants of private sector credit. Their *p*-values are 0.0000 and 0.0383 respectively. This implies that a unit increase in LNM3 and LNLAGM3 led to an increase of 0.351519 and 0.148727 increase in credit to the private sector, respectively.

It was also observed that the lending rate (LNLR) and its lag (LNLAGLR) are significant in determining the credit to the private sector given that their *p*- values are less than the critical value (0.05). The coefficient of lending rate is negative and a unit increase in lending rate is associated with a 0.103495 decrease in credit to the private sector. Similarly, the coefficient of its lag is negative and a unit increase in the lag of lending rate implies that the credit to the private sector decreases by increases by 0.064766. The other variable considered in this study was inflation (LNCPI), which was also found to be an insignificant determinant of credit to the private sector given that its p-value (0.2956) was greater than the critical value (0.05). The lag of inflation however was found to be positive but also insignificant; its p-value reported was 0.5751. It was also observed that credit extended to the private sector in the previous quarter (LNLAGPSCR) is significant (p-value < 0.5) in determining credit extension in the current quarter (LNPSCR). A one unit increase in prior quarter credit extended is associated with a 0.564006 increase in credit extended in the current quarter.

In summary, the model results suggest that the following variables are significant: LNGDP, LNLAGGDP, LNLR, LNLAGLR, LNM3, LNLAGM3 and LNLAGPSCR. The remaining variables: LNCPI, LNLAGCPI, LNNEER and LNLAGNEER were considered insignificant.

The existence of a cointegration relationship among the variables suggests that there must be causality among the variables in at least one direction in the long run. However, although cointegration suggests the presence of causality of some form between the variables, "it does not provide information on the direction of the causal relationship" (Ghirmay, 2004: 424). The next task was, therefore, to identify the direction of the causality using the Vector Error Correction Model (VECM) from the long run cointegrating vectors. Moreover, to see the speed of adjustments of the variables to deviations from their common stochastic trend, the error correction model was used. ECM corrects deviations from the long run equilibrium by short run adjustments

4.4.4 Vector Error Correction Model Test Results

a) Short Run Results

The researcher proceeded to estimate the short run error correction model after having reached conclusion regarding the inherent long run relationships. The estimates of the error-correction model are given in table 4.23.

As shown in Table 4.23, in the short run, the impact of economic growth on credit extended to the private sector is mixed. The current (DLNGDP) impacts positively while the first lag (DLNLAGGDP) impacts negatively. From the short-supply elasticity of DLNGDP, a short-run increase in economic growth by 1% induces an increase in credit extended by about 0.11% in South Africa. However, in the long-run, the magnitude of GDP coefficient is quite small and insignificant (p-value > 0.5) indicating that business cycles partially determine the magnitude of bank credit extended in the short run. In this case, the null hypothesis of no short-run relationship between the two variables DLNPSCR and DLNGDP is not rejected given that the reported p-value (p=0.1192) in the short run model is above the 5% critical value thus leading to the adoption of the null hypothesis of non-existence a short-run relationship.

Table 4.23: Short-run Relationship

Dependent Variable: **DLNPSCR**				
Method: Least Squares				
Sample(adjusted): 1980:3 2013:4				
Included observations: 133 after adjusting endpoints				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DLNCPI	-0.116015	0.218212	-0.531663	0.0276
DLNGDP	0.106130	0.067620	1.569520	0.1192
DLNLR	-0.074561	0.016197	-4.603528	0.0000
DLNM3	0.275292	0.08815	3.124247	0.0022
DLNNEER	0.005472	0.011003	0.497263	0.6199
DLNLAGCPI	0.012335	0.003398	3.630207	0.0004
DLNLAGGDP	-0.072628	0.130048	-0.450622	0.0065
DLNLAGLR	0.050877	0.016589	3.066906	0.0027
DLNLAGM3	0.171539	0.078770	2.177714	0.0314
DLNLAGNEER	0.017750	0.014714	1.206325	0.2301
DLNLAGPSCR	0.011688	0.086710	0.134797	0.00894
LAGRESID	-0.105563	0.188433	0.560215	0.00576
C	-0.004369	0.002735	-1.597456	0.1128
R-squared	0.785547	Mean dependent var		0.033946
Adjusted R-squared	0.760317	S.D. dependent var		0.022754
S.E. of regression	0.011140	Akaike info criterion		5.200182
Sum squared resid	0.014768	Schwarz criterion		5.482697
Log likelihood	420.4436	F-statistic		2.048523
Durbin-Watson stat	2.044543	Prob(F-statistic)		0.00000

Source: Eviews Computations

Similarly, the impact of changes of the current and first lag of inflation (CPI) and prime lending rate (LR), on credit extended to the private sector (PSCR) is mixed. Current lending rates (DLNLR) impact negatively while first lag (DLNLAGLR) impacts

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positively. Both results are highly significant (p<0.05). The impact of DLNCPI (negative) and DLNLAGCPI (positive) is significant (p-value = 0.0276 and 0.004 respectively). Money supply variables DLNM3 and DLNLAGM3 have positive coefficients and both are considered significant (p-values <0.5). This suggests that bank lending is strongly dependent on demand as indicated by cyclical factors such as economic growth and money supply.

Going through the results in Table 4.23 as shown, the variables appeared with the expected signs except for exchange rate (DLNNEER) which was expected to be negative. The result is contrary to major beliefs that exchange rate impacts negatively on the amount of loans that can be extended by commercial banks in South Africa. However, it is important to note that the results of the model suggest that the impact of both DLNNEER and DLNLAGNEER is minimal and insignificant as confirmed by p-values of more than 0.05. By and large, the results indicate that the economic criterion for the model estimation was satisfactory

The coefficient of determination (R-squared) which gives 0.785547 indicates that the model explains 79% of the variations in the dependent variable DLNPSCR. This result remains robust even after adjusting for degrees of freedom (df) as indicated by the value of adjusted R-squared, which is 0.760317. Thus the regression has a good fit as only 24% variation in credit extended to the private sector is left unaccounted for by the model. The F-statistic, a measure of overall significance of the regression is 2.048523. This value is significant at 1%, 5% and 10% because the calculated Prob (F-statistic) is equal to zero. This is supported by low standard error of regression equation signifying minimized sum of squared error. With this, the hypothesis that all the explanatory variables introduced in the model are not jointly significant in explaining the variations in DLNPSCR was rejected and concluded that they are simultaneously significant, that is, the independent variables have good explanatory power.

The most important parameter when estimating the VECM is the speed of adjustment. The results in Table 4.23 reveal that the error correction term (ECM-1) is negative and

statistically significant at 5% (p-value = 0.00576), which implies that DLNPSCR and measures of DLNPSCR are adjusting to their long run relationship. In other words, this confirms that there is not any problem in the long run equilibrium relationship between the independent and dependent variables at 5% level of significance. The error correction term relative value (-0.105563) for South Africa shows a satisfactory rate of convergence to the equilibrium state per period. This result implies that there is a negative gradual adjustment (convergence) to the long run equilibrium. The coefficient of (0.105563) indicates that 10.56% of the disequilibria in the short run PSCR achieved in one period are corrected in the subsequent period. This was buttressed by the first differenced lagged values of the dependent variable DLNLAGPSCR (-1) that is significant at 5% level. This implies that bank's lending performance of the previous quarter significantly and positively affects the current quarter's performance. The Durbin-Watson statistic of 2.044543 shows that the autocorrelation is inconclusive.

The results of the vector error correction model (VECM) indicate how long it will take for a variable to return to equilibrium in the short run when confronted with a shock. The VECM results indicate a significant short-run equilibrium relationship in the cointegrating equation between credit and the variables in the model. This supports the theory of pro-cyclicality that credit is a "unifying variable which will respond to shocks emanating from the dynamic interaction between macroeconomic variables" (Fourie *et al.,* 2011: 13079).

4.4.5 Pairwise Granger Causality Tests Results

Correlation does not tell us anything about the causal relationship between business cycles and bank credit extension. Thus, the Granger causality test was used to examine the direction of the relationship that exists between the variables. In order to proceed to Granger causality test and find direction of causation between the key variables of interest (PSCR and GDP) in the environment of VAR, the researcher used the lag length of 5 as determined by Akaike Information Criterion (AIC). The results of the Granger causality test are presented in Table 4.24.

Table 4.24: Granger Causality Test Results

Null Hypothesis	Lags	F-Statistic	Prob.
DLNGDP does not Granger cause DLNPSCR	5	0.37509	0.04541
DLNPSCR does not Granger cause DLNGDP	5	5.65441	0.18853
DLNCPI does not Granger cause DLNPSCR	5	6.15315	0.01438
DLNPSCR does not Granger cause DLNCPI	5	0.16674	0.68369
DLNLR does not Granger cause DLNPSCR	5	4.29667	0.04013
DLNPSCR does not Granger cause DLNLR	5	11.2340	0.00105
DLNNEER does not Granger cause DLNPSCR	5	4.33099	0.03936
DLNPSCR does not Granger cause DLNNEER	5	3.07777	0.08169
DLNM3 does not Granger cause DLNPSCR	5	9.65166	0.00232
DLNPSCR does not Granger cause DLNM3	5	7.91018	0.00567
DLNCPI does not Granger cause DLNGDP	5	11.6700	0.00084
DLNGDP does not Granger cause DLNCPI	5	0.48382	0.48792
DLNLR does not Granger cause DLNGDP	5	76.1105	1.0E-14
DLNGDP does not Granger cause DLNLR	5	0.75803	0.38553
DLNNEER does not Granger cause DLNGDP	5	0.00356	0.95254
DLNGDP does not Granger cause DLNNEER	5	1.10101	0.29596
DLNM3 does not Granger cause DLNGDP	5	0.46050	0.49858
DLNGDP does not Granger cause DLNM3	5	5.51689	0.02032

The results show that the null hypothesis that business cycle (GDP) does not Granger cause bank credit extension (PSCR) is rejected at 5% level (p-value < 0.05). However, the null hypothesis that bank credit extension does not Granger cause business cycles cannot be rejected at 5% level since p-value >0.5. The implication is that there is a unidirectional causal relationship from economic growth to bank credit in South Africa. Therefore, the increase in bank granted credit is a cause of economic growth in South Africa.

The results further provide evidence of unidirectional causalities running from inflation (CPI) to PSCR, from CPI to GDP, from prime lending rate (LR) to GDP, from GDP to

money supply (M3) and from exchange rate (NEER) to credit extension (PSCR). Table 4.24 also shows evidence of bi-directional causality between LR and PSCR as well as between M3 and PSCR. However, there is no evidence to support the existence of causality between the remaining pair of variables.

4.4.6 Comparing Results of the two Quantitative Approaches

The quantitative leg of the primary survey and the econometric approach (for the time series data) seek to achieve almost similar objectives. It will be interesting to compare the findings from both quantitative approaches. Common variables of interest are bank credit (PSCR), economic growth (GDP), money supply (M3) and bank lending rates (LR). A comparison of the two sets of results reveals the following:

i. The primary data results (The Pearson Correlation Matrix) indicate that there is a positive relationship between bank credit and economic growth (correlation= 0.732). A positive relationship between bank credit and money supply is also noted (correlation=0.879). The results further show that there is a negative relationship between bank credit and bank lending rates (correlation= -0.873). On the other hand, *Cointegration Test results* show that economic growth is positively associated with bank credit (for both current and prior period). The coefficients of both LNGDP (0.4079) and LNLAGGDP (0.09185) are positive and significant (p-value>0.5). Both LNM3 (0.3515) and LNLAGM3 (0.1487) are significant determinants of PSCR, indicating positive association between the variables. The cointegration test results also show that there is a negative relationship between credit growth and bank lending rates for both current and prior periods (LNLR= -0.103495 and LNLAGLR= -0.0648).

ii. *VECM Test Results*- In the short run, the impact of economic growth is mixed. The current (DLNGDP=0.10613) impacts positively while first lag (DLNLAGGDP=-0.07262) impacts negatively.DLNM3 (0.2752) and DLNLAGM3 (0.1715) have positive coefficients and both are considered

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significant. Current lending rates impact negatively (DLNLR= -0.07456) while first lag (DLNLAGLR= 0.0508).

iii. *Granger Causality Test Results*- The null hypothesis that economic growth does not Granger cause bank credit extension is rejected at 5% (p-value<0.5). However, the null hypothesis that bank credit extension does not Granger cause economic growth cannot be rejected at 5% since p-value>0.5.

Whilst both approaches show that there is a positive relationship between bank credit and economic growth, the extent of the relationships as measured by the corresponding coefficients is at different levels. The impact is more significant more pronounced on primary data results than on time series data. The Granger Causality test goes a step further to suggest that there is unidirectional causal relationship from economic growth to bank credit in South Africa.

4.5 Discussion of Findings

This section of the study discusses in depth the qualitative findings, quantitative findings, and econometric test results presented in Sections 4.2-4.4.

4.5.2 Interpretation of Qualitative Findings

Based on the results of the qualitative survey it could be concluded that bank credit extension is determined by factors at both micro and macro levels. Key credit extension aggregates were given as level of economic activity, value of collateral, intensity of bank competition, money supply, deposit liabilities, capital requirements, lending rates and inflation.

Results of the qualitative study suggest that there is a positive and strong relationship between economic activity and bank credit availability with high credit growth rates during upswing and contraction in credit during downswings. The key message from respondents was that improvement in macro-state boost consumer and business confidence and this result in increased demand for bank credit. Banks respond by

relaxing and liberalizing their lending policies. Among others, the results are consistent with evidence provided by Fourie *et al.,* (2011), Akinboade and Makina (2010) and Sales and Saurina (2002).

The results also suggest that changes in bank credit policies were seemingly related to changes in conditions of those demanding credit. Majority of the respondents indicated that banks need to align their credit polices with changes in the macroeconomic environment in order to remain relevant and competitive. In other words, the development of the real sector in South Africa precedes and induces growth in credit market, by creating greater demand for funds by enterprises, which eventually leads to further financial intermediation. This outcome corroborates the findings by Akinboade and Makina (2009) who demonstrate that the procyclical feature of bank lending to business cycle is partly driven by credit demand.

Overall, results of the qualitative study suggest that growth within the economy results in increase in the demand for bank credit. This further buttresses the assertion that real activity stimulates bank credit availability. This is consistent with the growth-led hypothesis as coined by Robinson (1952) and supported by Patrick (1966). The results compliment evidence by Akinboade and Makina (2010), Ibrahim (2009) and Muhsin and Eric (2000). The case for supply-leading hypothesis was weak and was not strongly supported.

4.5.2 Interpretation of Quantitative Findings

This sub-section discusses quantitative results of the survey data obtained through questionnaires. As earlier indicated, a sequential (connected data) mixed methodology was used in this study. Results of the qualitative survey (Interviews- Phase I) were used to formulate the survey questionnaire (Phase II).

Majority of the respondents indicated that their banks change lending policies in line with changes in the macro-state. The findings imply that banks in South Africa regularly conduct environmental scanning and therefore in a position to know what changes are

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taking place and how to strategically alter their lending policies and/or underwriting standards in light of the macroeconomic environment.

The findings also shed light into specific reasons why banks change their lending policies. The majority of the respondents indicated that the reason for change was due to changes in the fundamental business conditions. It was made clear that bank credit determinants behave differently under alternate business cycles. In particular, quality of borrowers deteriorates during economic downswing and value of firms' collateral decrease making them ineligible for credit. Since the value of collateral is proven to be procyclical, asymmetric information will be relatively high in business cycle downturns and relatively low in booms (Lown & Morgan, 2001). The results seem to imply that bank intermediation becomes riskier during downturns through reduction in the value of collateral assets attached to outstanding loans and an increase in the degree of information asymmetry. The study findings that the prices of assets used as collateral are directly linked to the state of the economy leading to pro-cyclicality in lending conforms to other similar studies by Saurina (2010), Car (2009), Mendoza and Terrones (2009) and Gerlach and Peng (2003).

The study also found that level of competition among commercial banks intensifies with improvement in the macroeconomic environment. Moreover, competition drives lenders to cut their lending standards. This piece of empirical evidence is consistent with theories suggesting that strategic interaction among asymmetrically informed banks lead to banks to behave more aggressively and take on more risks during booms than in tranquil (Ruckes, 2004; Gorton & Herbert, 2008).The result support views by Weinberg (1995) that lending standards fall with heightened competition in expansion and rise in contraction as banks respond to their own capital shortfalls or constraints of regulators. In this case, our results echo the views recently expressed by Murty *et al*., (2012) and Dell'Ariccia *et al.,* (2009) that bank competition for borrowers lead to periodic swings between high and low credit allocations.

Results of the quantitative study also show that improvement in macro-state increases the incentives for banks to liberalize their risk management policies. In addition, the results suggest that posting low returns in a boom is particularly damaging to the bank reputation as this constitutes a clear signal of low ability to lend. The results supports the view by Aikman *et al.*, (2001) that risk taking is driven by reputational concerns in a world of imperfect information. The results also conform to study by Sales and Saurina (2002).

The study findings also show that in economic downturn, required regulatory capital is likely to increase as the credit risk of the loan portfolio increases. Credit rationing may also result from banks' weak balance sheet positions. Among others, the results are consistent with those obtained by Catao and Rodriguez (2000) who found evidence that as large devaluations and interest rate shocks of 1994/95 in Latin America and of 1997/98 in Asia eroded bank capital bases, domestic credit came to a standstill. This helped to intensify and prolong the recession well beyond what appeared to be warranted by the initial monetary tightening. In furtherance to the above, Akinboade and Makina (2009) observed that bank's capacity to lend is determined by its capital base, which base fluctuates during alternate business cycles. Bliss and Kaufman (2002) also observed fluctuations in the level of bank capital through the business cycle- higher ratios during expansions and lower rations during recessions. Quagliariello (2007) provide evidence that financial intermediaries react by reducing lending if they have their capital buffers below the minimum required, thus exacerbating the effects of economic downturn (pro-cyclicality).

The study also used the ANOVA Analysis technique to further test the relationships since the sample size was small. ANOVA statistics indicated that the overall model was significant (F-statistic = 98.79 and p-value < 0.05). The results imply that the independent variables are a good joint predictor of credit extension in South Africa. The ANOVA results also indicate that predicting credit extension through independent variables yields better results than predicting credit extension through the mean.

The Pearman's product moment correlation analysis was used to assess relationship between variables. The results show that there is a positive relationship between credit and economic growth, collateral value, competition and money supply of magnitude 0.732; 0.921; 0.922 and 0.879 respectively. As empirical evidence has suggested, the use of real estate as collateral provides a channel through which property price movements can positively feed into the credit market (Gerlach and Peng 2003). On the other hand, there is a negative relationship between bank lending and bank capital requirements (-0.929) as well as bank lending rates (0.873). The positive correlation mean that a unit changes in the independent value is associated with a positive change in bank-granted credit and the reverse is true for negative correlation.

Overall, the quantitative findings show that the different credit aggregates behave differently during alternate business cycles. Moreover, the results show that bank lending in South Africa is procyclical, that is, it moves in tandem with business cycles. To some extent, the results of the quantitative study suggest that there is feedback response or bidirectional relationship between business cycles and credit extension, supporting mutual relationship between the variables. This piece of evidence is in agreement with other causality studies by Evans (2013), Mishra *et al.,* (2009) and Odhiambo (2005). However, the case for supply leading argument was not strongly supported. There was overwhelming support for the demand-following response. It can therefore be concluded that it is the growth of the real sector which drives the development of the credit market in South Africa.

At this stage it is imperative to point out that because the study used a sample that was smaller than the adequate sample size of 300, this might have caused a bias which might have affected the sample representation and hence, validity and reliability of the study. Therefore, results of this study should be used with caution and treated as guidelines.

Correlation analysis helped us in determining the degree of the relationship between dependent and independent variables. However, it did not tell us anything about cause-effect relationship. Even a high degree of correlation does not necessarily mean that a

relation of cause-and-effect exist between the variables or, simply stated, correlation does not necessarily imply causation or functional relationship though the existence of causation always implies correlation (Saleemi, 2012). By itself, correlation establishes only covariation. The results of the econometric model, interpreted in section 4.5.3, augments the results of the survey study.

4.5.3 Interpretation of Econometric Test Results

The Johansen cointegration test indicates that cointegration was present. The results support the hypothesis that several long-run equilibrium relationships exist between variables. According to the Granger causality tests, a one-way relationship exists between credit and business cycles. This relationship is significant and supports the hypothesis that a relationship between credit and economic growth exists. This is congruent with the long-run cointegrating relationship displayed by the Johansen test results. The results of the vector error correction model (VECM) indicate how long it will take for a variable to return to equilibrium in the short-run when confronted with a shock (Fourie *et al.,* 2011). The VECM results indicate a significant short-run equilibrium relationship in the cointegrating equations. This supports the theory of procyclicality that credit is a unifying variable which will rapidly respond to shocks emanating from the dynamic interaction between variables macro-economy (Akinboade & Makina, 2009; Bordo & Haubrich, 2009; Borio *et al.,* 2001).   .

Overall, the results of the econometric model provide evidence that the relationship between business cycles and bank granted credit in South Africa follows a demand-leading view. Our findings on the causal relationship from real activity to private sector credit support the economic theory that economic activity propels banks to finance enterprises. However, the reverse is not necessarily true. In other words, we can argue that improvement in the credit market development is caused by economic growth in South Africa in the long run. Hence the result that real activity 'leads' bank credit in South Africa is consistent with the growth-led (demand-following) hypothesis as postulated by Robinson (1952) and subsequently popularized by Ranneberg (2012),

Rajan (1994), Demetriades and Hussien (1969) and Patrick (1966) among others. These results corroborate and substantiate the findings by Kelly *et al*., (2013), Akinboade and Makina (2009), Sindano (2009) and Odhiambo (2004) that demonstrate how alternate business cycles explain variations in credit standards. According to Akinboade and Makina (2009), the procyclical feature of bank lending is driven by credit demand.

It is imperative to mention that Fourie *et al.,* (2011) conducted a similar study on South Africa and the current study benefited immensely from their work. However, the outcomes of the two seemingly similar studies are different. Whereas Fourie *et al.,* (2011) found a two-way relationship (bi-directional) between credit extension and business cycles, current study found a one-way relationship (uni-directional) with causality from business cycles to credit extension. The question is why different results? Differences may be due to several reasons. Firstly, the VAR model used by Fourie *et al.,* (2011) tested the hypothesis that "credit has a relationship with coincident indicator, insolvencies, debt to disposable income, cost of funds, prime, money supply and business and consumer confidence indices" (13077). This current study used a VAR model to test the hypothesis that credit has a relationship with Gross Domestic Product, money supply, deposit liabilities, lending rates, inflation and exchange rate. Not only are the credit aggregates different, the proxies used for credit and business cycles are also different. Fourie *et al.,* (2011) used total domestic credit and coincident indicator while the current study used bank credit to the private sector and Gross Domestic Product at current cost at market prices (as recommended by Banerjee, 2011) as proxies for credit extension and business cycles respectively. Secondly, the current study used a longer time series of data (1980:01 to 2013:04) compared to period of 1985:01 to 2009:04 used by Fourie et al. (2011).

4.6 Chapter Summary

This study used both the sequential mixed methodology and econometric methodology to answer the research questions. The qualitative leg of the survey (Phase I) identified the key determinants of bank lending as economic activity, collateral values, competition, money supply, lending rate, bank capital requirements and stakeholder expectations. The

results of the study suggested that these different credit aggregates behave differently during alternate business cycles. The qualitative results also indicated bank lending in South Africa is procyclical. The qualitative results were used to formulate questions of the structured survey questionnaire (Phase II). Results of the quantitative leg of the research (Phase II) suggest that there is a positive relationship between lending by commercial banks and economic activity, collateral value, competition and money supply. On the other hand, there is evidence to show that there is a negative relationship between bank lending and bank capital requirements as well as lending rates. Although results of the survey study suggest that there is a relationship between business cycles and credit extension, the researcher hesitated to interpret these correlations as evidence of a causal connection between bank lending and real activity. Correlation does not necessarily imply causation or functional relationship.

Phase III of the study was used to resolve the causation leg of the study equation. This phase of the study examined econometric relationship between bank lending and business cycles in South Africa, with a view to confirm the direction of causality between the variables of interest. The choice of time series data collected was heavily influenced by results of the survey leg of the study and literature source. Long-run economic relationships were hypothesized between credit and independent variables namely Gross Domestic Product, money supply, deposit liabilities, lending rate, inflation and exchange rate. Stationarity test of all variables in levels showed that the time series was non-stationary, that is, it contained unit roots. However, the test for stationarity in first difference showed the time series was stationary. Cointegration test showed that there was a cointegration relationship between business cycles and bank credit extension. This supports the hypothesis that several long-run relationships exist between the variables. The VECM results indicated a significant short-run equilibrium relationship in the cointegrating equation between credit and the variables in the model. The granger causality test revealed that there was a unidirectional long-run relationship with causality running from business cycles to bank granted credit in South Africa.

Overall, the findings suggest that bank lending is significantly dependent on demand as indicated by cyclical factors such as economic growth, money supply and collateral values. The results suggest that during business cycle upswing, bank credit tends to increase followed by the opposite in downswing. There was overwhelming evidence suggesting that economic growth precedes credit at business cycle frequencies in South Africa. Although there was some evidence suggesting a bidirectional relationship, the case for supply leading argument was not strongly supported. In other words evidence presented strongly support the growth-led argument that 'where enterprise leads, finance follows,' but weakly supports the finance- led argument that 'financial activity spurs economic growth.' It can therefore be safely concluded that the South African case supports the case of demand following both in the short-run and long-run. The results support the demand following view that postulates that economic growth is a causal factor for credit market developments (Lucas, 1998; Demetriades & Hussein, 1969; Gurley & Shaw, 1967). The results also support postulation by Robinson (1952) that economic activity spurs banks to finance enterprises. The study findings on real activity propelling banks to extend credit to enterprises conform to other studies by Kelly *et al.,* (2013), Akinboade and Makina (2010), Sindano (2009) and Odhiambo (2004). The case for supply-leading was considered very weak.

CHAPTER FIVE
CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter provides a summary of the findings of the research and it also draws conclusions based on the objectives of the study. Section 5.2 draws conclusions and indicates the extent to which each specific objective was achieved. Section 5.3 covers policy implications of the study in detail. Section 5.4 clearly highlights the study's original contribution to knowledge while section 5.5 discusses limitations of the study. The last section of the chapter (5.6) discusses recommendations for future research.

5.2 Conclusions

The study re-examined the relationship between business cycles and bank credit extension in South Africa by attempting to answer whether banking sector, through lending activities, affects real sector, or the real sector affects the banking sector, or both affect each other. More specifically, the study tested whether a decline in bank loan volume causes a reduction of aggregate output, or whether banking sector shrinks loans to private sector due to an economic downturn.

The study was conducted in three phases, namely qualitative research (Phase I), quantitative research (Phase II) and econometric analysis (Phase III). A sequential (connected data) mixed methodology (Phase I and II) was used to collect and analyze primary data from market participants. The qualitative research (Phase I) involved structured interviews with influential or well informed people on the subject matter, described as elite interviewing by Cooper and Schindler (2006). Phase I of the study was used to understand the key determinants of bank credit in South Africa and to appreciate how each of the credit aggregates behaves during alternate business cycles. The qualitative results were used to formulate questions of the structured survey questionnaire (Quantitative research- Phase II). The ANOVA technique and Pearman's product correlation analysis were used to assess relationship between variables. However, it is important to reiterate that because the quantitative research used a sample that was

smaller than the adequate sample size of 300, this might have caused a bias which might have affected the sample representation and hence, validity and reliability of the study. Therefore, results of this study should be used with caution and treated as guidelines.

Although results of the survey study suggest that there is a relationship between business cycles and credit extension, the researcher hesitated to interpret these correlations as evidence of a causal connection between bank lending and real activity. It is acknowledged that correlation does not necessarily imply causation or functional relationship. The econometric methodology was therefore used to augment results of the survey study. Phase III of the study re-examined econometric relationship between bank lending and business cycles using quarterly time series data over the period 1980:Q1-2013Q:4. The estimation process started with examining stationarity property of underlying time series data. The unit root test was applied for the same. The dynamic interactions between variables were investigated using the concept of Granger causality after testing for cointegration using the Johansen techniques to detect whether there is long run relationship between business cycles and bank credit extension or not. This study indicates that this outcome has been successfully achieved.

5.2.1 Objective One: To determine key credit extension drivers in South Africa.

Based on the study results, the researcher safely concluded that the major determinants of commercial bank credit in South Africa are economic growth, collateral value, bank competition, money supply, deposit liabilities, capital requirements, inflation, exchange rate and bank lending rates. However, the impact of inflation and exchange rate on credit to the private sector was considered minimal and insignificant. Therefore monetary authorities are advised to be sensitive to the behavior of the aforementioned significant credit aggregates during alternate business cycles so as to ensure sustainable credit growth and economic development.

5.2.2 Objective Two: To determine the long-term relationship between business cycles and bank credit extension in South Africa.

The results of the qualitative research suggest that there is a direct positive relationship between economic growth and credit extension in South Africa. The quantitative results showed that there is direct and positive relationship between credit and credit aggregates namely economic growth, collateral value, bank completion and money supply. On the other hand, the results show that there is a negative relationship between credit and bank capital and lending rates. The quantitative findings show that the selected credit aggregates behave differently during alternate business cycles. The empirical results from the Johansen cointegration test suggest the existence of a stable long-run relationship between bank-granted credit and business cycles. Moreover, economic growth has a significant positive impact on credit growth in the long-run. However, the estimated coefficients are small in magnitude in the short-run, suggesting that the relationship between bank credit and business cycles is rather weak in the short run.

Overall, the results of the study provide evidence that there is long-term positive relationship between business cycles and bank credit extension in South Africa.

5.2.3 Objective Three: To determine the direction of causality between business cycles and bank credit extension in South Africa

Majority of the respondents claimed that direction of causality is from economic growth to credit extension and argument for reverse causality was considered weak. The Granger causality analysis in the VAR framework suggests that there is unidirectional causal relationship between business cycles and bank credit extension with direction running from economic growth to bank credit in South Africa. Overall, the study provides evidence to show that there is a long-run relationship between business cycles and bank credit extension. In addition, it is shown that economic growth significantly causes bank credit. There is strong evidence suggesting that economic growth precedes credit extension. There is little and weak evidence of statistical precedence of credit to business

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cycle frequencies in South Africa. The results lend some support to the demand-following view initially postulated by Robinson (1952) and confirmed by Demetriades and Hussien (1996).

5.2.4 Objective Four: To verify the extent to which prior research findings on the influence of business cycles (and vice-versa) is applicable in the South African business context.

Overall, the results of the study provide evidence that the relationship between business cycles and bank granted credit in South Africa follows a demand-following view. The results corroborate and substantiate the findings by, among others, Kelly, *et al.,* (2013), Akinboade and Makina (2010), Sindano (2009) and Odhiambo (2004). However, the results of the study are inconsistent with recent empirical studies in support of the supply-leading view (Evans, 2013; Lahura, 2011; Odhiambo, 2007). Patrick's stage of development hypothesis can be used to explain the difference in views and conclusions between these two strands of empirical literature. Financial development contributes more to economic growth in developing countries than developed countries. South Africa is a country with a relatively more developed real sector, hence support for an overwhelming demand following response. The study, therefore, recommends that for South Africa, the real sector of the economy should be developed further in order to sustain the development of the credit market.

5.2.5 Objective Five: To recommend to policymakers and banks as to how they can mitigate the risks associated with the different stages of credit and business cycles.

The results of the study suggest that, for South Africa, the real sector of the economy should be developed further in order to stimulate further development in the economy through appropriate policy interventions. Since it has been proven that business cycles do influence banks, financial surveillance may need to be strengthened during recessionary phases, when banks are likely to be more fragile. For sustainable growth and continued survival, banks need to align their credit policies in line with changes in the

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macroeconomic environment. Prudent banks always strike a balance between risk and profitability. Section 5.3 covers policy implications of the study in detail.

5.3 Policy Implications

The direction between economic growth and bank-granted credit is crucial because it has different implications for development policies. The contentious question has been whether policymakers should first pursue financial development in order to induce higher levels of economic growth or whether they should first concentrate on the development of the real sector in order to stimulate financial development. One could argue that in the case of supply-leading, polices should aim at financial intermediation, financial liberalization and financial deepening. However, the case of demand-following requires more emphasis to be placed on other growth-enhancing policies.

From the foregoing results, it is clear that the demand-following response seems to be stronger than the supply leading hypothesis in South Africa. This implies that for South Africa, it is the real sector which leads in the process of economic development. In other words, the development of the real sector creates further demand for bank credit, which is met passively from the financial side of the economy. The more rapid the growth rate of the real sector, the greater the demand for external funds by enterprises, which eventually leads to further financial intermediation.

The expansion of the real sector can significantly influence development of the credit market in South Africa. In other words, strategies that promote development in the real sector should be emphasized. Strong economic growth and low inflation are conducive for economic development and credit growth. Therefore, policies that improve economic fundamentals are not only beneficial on their own right; they also boost credit growth and hence further strengthen economic activity.

Policies should be designed to take advantage of South Africa's comparative advantage in the production of agriculture, mining and manufacturing of products related to these

industries. Efforts should also be made to resolve structural impediments that have generally limited economic growth to below potential rates. These constraints include protracted and at times violent strikes in the mining industry, lack of skilled labor, high unemployment, infrastructure bottle-necks and disruptions to power supply. On the macroeconomic front, the government of South Africa is urged to pursue policies that can restore and maintain macroeconomic stability in the context of a difficulty global market. Since it has been proven that business cycles do influence banks, financial surveillance may need to be strengthened during recessionary phases, when banks are likely to be shaky and frail.

5.4 Original Contribution to Knowledge.

This study benefited from previous similar studies by Kelly *et al.,* (2013), Fourie *et al.,* (2011), Akinboade and Makina (2010) and Odhiambo (2004). However, the contribution of this study is different from previous studies in several ways: methodology used, theories and frameworks adopted, business cycle and credit proxies used, policy prescriptions, longer time series and it opened up avenues for further research.

Whereas previous studies adopted either a purely qualitative approach or quantitative approach, this study used a sequential (connected data) mixed approach, although with a bias towards quantitative approach (QUANT + qual research). Acknowledging that correlation does not necessarily imply causation or functional relationship, the study used the econometric methodology in addition to augment results of the survey study. The study used both descriptive statistics approach and advanced econometric techniques (for example, Granger causality through cointegrated vector auto regression method) to test the causal relationship between bank-granted credit and economic growth. Moreover, the study used a longer time series of data covering periods before, during and after the most recent (2007-2009) global financial crisis. The study also used different proxies for business cycles and credit extension. The current study proposes practical policy prescriptions to address challenges currently facing South Africa. Last but not least, the other major contribution of this study is that it shall open new avenues for further

research on finding causality of the relationship between various proxies of economic growth and financial development adopting the VAR framework. Thus this study attempted to fill the identified void in literature.

5.5 Limitations of the Research

The primary limitation of this study was the sample size. Structured survey questionnaires were used to collect primary data. The researcher had planned to work with a sample of 300, but a practical sample of only 179 was achieved. Moreover, due to time and resource constraints, the participants were drawn from five major banks (contributing about 92% of total bank credit) out of a total of 17 registered banks. A couple of targeted respondents refused to participate in the survey citing either their 'busy schedules' or they considered the requested information to be 'proprietary information.' Therefore, it is difficult to generalize the findings within the financial services industry.

Another limitation is that time series is more applicable for single country analysis. Hence, it becomes difficult to generalize findings in South Africa to other countries. Caution in using the results is thus advised.

5.6 Areas of further Research

In this study, the Granger causality test was considered appropriate because it does not involve complex statistical procedures and saves time. Further research in this area may use a different econometric model, such as the Sim's test, and compare the results with the current study. Moreover, to test robustness of the study's findings, future research may employ variance decomposition for relative importance of explanatory variables and impulse-response function for impact analysis.

This study also used bank credit to the private sector as a whole without making a distinction between loans afforded to firms and households. To augment this study, further research in line with this study should also consider separating the two, in order to get the impact of each sub-sector on economic growth.

The present study also confines itself to the relationship between bank-granted credit and business cycles. However, literature indicates that financial development can affect economic growth either through bank sector channel (that is, bank-based system) or via capital markets (that is, market-based system). Hence more studies can be attempted to find the causality between financial development and economic development. Financial development measures to include both banking activity proxies and stock market development proxies.

5.7 Chapter Summary

In this chapter, the results of the study were summarized and conclusions drawn. Some important recommendations were also presented. The chapter also clearly highlighted the study's original contribution to knowledge. Finally, the limitations of the study and areas of future research were dealt with. As all the research objectives were achieved, this concludes the study. In the following pages, the references and annexures are presented.

APPENDICES

Appendix A1: Survey Questionnaire

Dear Sir/Madam

I am a Doctoral student at the Graduate School of Business Leadership (SBL), University of South Africa (Unisa). I am conducting a study on the relationship between business cycles and credit cycles. The aim of this study is partly to establish the nature and causal link between economic fluctuations and changes in bank credit extension in South Africa. Among potential beneficiaries of this study will be policymakers, banking community, academics and researchers.

I am interested in your knowledge and experiences in bank lending behavior during alternate business cycles of boom and bust, so I have enclosed a questionnaire which asks you kindly to respond to a series of statements and questions.

Your participation in this study is voluntary. You may refuse to participate in the entire study or in any part of the study. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with University of South Africa. Nothing in this questionnaire will in any way influence your present or future employment with your company.

Although results of this study may be published, no information that could identify you will be concluded. All efforts to protect your identity and keep the information strictly confidential will be taken.

I have enclosed a consent form for your review. Please read the form and feel free to contact me or my promoter, Prof. Philip Serumaga-Zake if you have any questions about the study. If you choose to participate, please sign, initial and date the consent information form and return it along with the completed questionnaire in the self addressed envelope or email me on: c.goodman@yahoo.com.
Your participation will be greatly appreciated.

Sincerely,

Goodman Chakanyuka
Phone: 00254733444744
Prof. Philip Serumaga-Zake: +27 11 6520318

………………………………………………………………………………....

CONSENT

I hereby agree to participate in the research on the relationship between business cycles and bank credit extension. I understand that my participation is voluntary. I also understand that I can stop participating at any point in time should I not want to continue and that the decision will not in any way affect me personally or my organization negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term.

I understand my participation will remain confidential.

……………………………………………….   ……………………..

Signature of participant   **Date`**

SURVEY QUESTIONNAIRE: BANK LENDING AND ECONOMIC ACTIVITY IN SOUTH AFRICA

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CROSSING (X) THE RELEVANT BLOCK OR WRITING YOUR ANSWER IN THE SPACE PROVIDED

Section 1: General Information

1. What is your highest level of education? (Tick where appropriate)

Diploma   [ ]   Bachelors [ ]

Masters   [ ]   Doctorate [ ]

2. Please indicate your total number of years of experience in the credit and risk management field

Less than 3 years [ ]   3-5 years   [ ]

6-10 years   [ ]   More than 10 years [ ]

Section II: Awareness of changes in lending policies and behavior

3. In your view, indicate the extent of effects of fluctuations in the macroeconomic environment on bank credit extension drivers.

Very great extent   [ ]   Great extent   [ ]

Moderate extent   [ ]   Low extent   [ ]

Nil extent   [ ]

4. Does your bank change lending policies in line with developments in the macro-state environment?

   Yes   [ ]   No   [ ]

5. If the answer to Question 4 is Yes, please indicate why your bank changes lending policies? (Tick all *applicable* to you)

[   ] Bank credit policy changes are correlated with changes in fundamental business conditions

[ ] A change in the level of bank credit should be a consequence only of a change in the quality of the borrowers

[ ] Business cycle impacts on the bank profitability through decreased demand for credit

[ ] When the economy goes into recession, the value of firms collateral or networth at risk declines enough to make them ineligible for loans

[   ]   Other,   please   specify

……………………………………………………………………………………………

………………………………………………

6. Credit rationing in your bank over the previous business cycles is attributed to the following:

[ ] Weak collateral value

[ ] Increased competition

[ ] Erosion of deposit base

[ ] Weak capital position

[ ] Poor loan performance

[ ] Tighter regulatory oversight

[ ] Other, please specify

……………………………………………………………………………………………

………………………………………………

……………………………………………………………………………………………

………………………………………………

7. What is your level of agreement with the following statements? Use a scale of 1 to 5 where, 1=Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree and 5= Strongly Agree. Tick in the appropriate box

Statement	1	2	3	4	5
Collateral value and Bank lending					
Prices of assets are directly linked to the state of the economy					
Borrowers credit limits are determined by the value of property offered as security , which affects investment and demand for assets in the economy					
Competition and Bank Lending					
In the face of stiffening competition, banks are increasingly required to keep pace with returns on equity offered by their rivals					
Competition drives lenders to cut their lending standards					
Market Share, Reputation, Stakeholder expectation and Bank Lending					
Improvements in the macro-state increase the incentives for banks to liberalize their risk management policies					
Posting low returns in a boom is particularly damaging to bank reputation as this constitutes a clear signal of low ability to lend					

Liquidity, Capital & Regulatory requirements and Bank Lending					
In economic downturn, required regulatory capital is likely to increase as the credit risk of the loan portfolio increases					
Credit rationing may also result from bank's weak balance sheet position					
Causal relationship from business cycle to bank credit extension					
Lending standards change in response to variation in the quality of borrowers over the business cycle					
Bank lending is pro-cyclical i.e it moves in tandem with business cycle					
Causal relationship from credit extension to business cycle					
Availability of bank loans to fund activities of businesses exacerbate the magnitude of business cycles					
Fluctuations in bank credit may have a significant, indeed critical, effects on macro-economic activity and may amplify swings in the macro-economy					

Section III: Loans and advances to businesses and households

In South Africa, the most recently identified peak in business cycle occurred in November 2007 and current upward phase started in September 2009.

8. Over the past three years, how have your bank's credit standards as applied to approval of *loans and advances* changed? Use a scale of 1 to 5 as follows: 1= Tightened

considerably, 2= Tightened somewhat, 3= Remained basically unchanged, 4= Eased somewhat and 5= Eased considerably

	1	2	3	4	5
Households					
Businesses					
Overall					

9. Over the past three years, how have the following factors affected your bank's credit standards as applied to approval of **_loans and advances_** (as described in question 8 in the row headed **_"Overall")?_** Please rate the contribution of the following factors to the tightening or easing of credit standards using the following scale:

1= contributed considerably to tightening of credit standards; 2= contributed somewhat to the tightening of credit standards; 3= contributed to basically unchanged credit standards; 4= contributed somewhat to easing credit standards; 5= contributed considerably to easing of standards; 6= not applicable

A) *Cost of funds and balance sheet constraints*	1	2	3	4	5	6
• Costs related to your bank's capital position						
• Your bank's ability to access market financing (e.g money or bond market financing)						
• Your bank's liquidity position						
B) *Pressure from Competition*						
• Competition from other banks						
• Competition from non-banks						
• Competition from market financing						
C) *Perception of Risk*						
• Expectation regarding general economic activity						
• Industry or firm-specific outlook						
• Product performance/portfolio quality						
• Risk on the collateral demanded						

• House market prospects					
• Change is risk appetite					
D) Regulatory changes and pressures					
E) Other factors , please specify					

10. Over the past three years, how have your bank's terms and conditions for approving _**loans and advances (overall)**_ changed? Please rate each factor using a scale of 1 to 6 as follows: 1= Tightened considerably, 2= Tightened somewhat, 3= Remained basically unchanged, 4= Eased somewhat, 5= Eased considerably and 6= non-applicable

A) Price	1	2	3	4	5	6
• Your bank's margins on average loans (wider margin= tightened, narrower margin= eased)						
• Your bank's margin on riskier loans						
B) Other conditions and terms						
• Non-interest rate charges						
• Size of the loan						
• 'Loan-to-Value" ratio						
• Collateral requirements						
• Loan covenants						
• Maturity (Loan tenor/duration)						
C) Other factors, please specify						

11. Over the past three years how has the _**demand for loans and advances**_ changed at your bank, apart from normal seasonal fluctuations? Use a scale of 1 to 5 as follows: 1= Decreased considerably, 2= Decreased somewhat, 3= Remained basically unchanged, 4= Increased somewhat and 5= Increased considerably

	1	2	3	4	5

Households				
Businesses				
Overall				

12. Please indicate how you expect your _bank's credit standards as applied to approval of loans and advances_ to change over the next three years (_credit supply_). 1= Tighten considerably, 2= Tighten somewhat, 3= Remain basically unchanged, 4= Ease somewhat and 5= Ease considerably

	1	2	3	4	5
Households					
Businesses					
Overall					

13. Please indicate how you expect _demand for loans and advances_ to change at your bank over the next three years (apart from normal seasonal fluctuations). Use a scale of 1 to 5 as follows: 1= Decrease considerably, 2= Decrease somewhat, 3= Remain basically unchanged, 4= Increase somewhat and 5= Increase considerably

	1	2	3	4	5
Households					
Businesses					
Overall					

Section IV: Open-ended questions

14. What is the relationship between economic activity and bank credit availability?

15. Does equilibrium loan amount result from supply side effects (i.e bank capacity to lend) or driven by weak credit demand?

16. Why are changes in credit policy seemingly correlated with changes in conditions of those demanding credit?

17. How does the cost of credit (lending rates) respond to fluctuations in the economy?

18. To what extent is credit pro-cyclical in South Africa?

19. Over the past three years, have there been any other issues of importance for bank lending behavior in South Africa which are not covered by this survey?

Thank you for your cooperation in completing this questionnaire. Kindly return the questionnaire to the following email address: c.goodman@yahoo.com

Glossary

	Meaning
Capital	Regulatory capital in accordance with the capital regulations under the legislation currently in effect
Credit standards	The internal criteria or procedures that reflect a bank's lending policy. They are written and unwritten criteria, or procedures reflecting this policy, which define, for example, the types of a loan a bank considers desirable/undesirable , its designated geographical priorities, collateral deemed acceptable, e.t.c.
Credit terms and conditions	Obligations agreed upon by the lender and borrower. For purposes of this survey, these obligations consist of the interest rate, the maximum size of the loan and the access conditions, and other terms and conditions in the form o charges, collateral, loan covenants and maturities
Collateral	The security given by a borrower to a lender as pledge for repayment of the loan. Collateral may include financial assets, such as equity , debt instrument or real estate.
Enterprises	Non financial corporation irrespective of size or legal form, which are not primarily engaged in financial intermediation but rather in production of goods and non-financial services
Households	Individuals or groups of individuals who share same living accommodation, pool some or all of their income and wealth, and consume certain goods and services collectively
Procyclicality	Bank lending moving in tandem with business cycles

Appendix A2: Econometric Test Results

Table A2.1: Normality Tests after taking Natural Logarithm

	LNGDP	LNCPI	LNDEP	LNLR	LNM3	LNNEER	LNPSCR
Skewness	0.687	-1.805	-0.121	-0.305	-0.084	0.631	-0.191
Kurtosis	2.239	8.368	1.823	2.056	1.834	2.277	1.863
Jarque-Bera	13.99	237.165	8.178	7.161	7.866	11.987	8.148
Probability	0.000915	0.000	0.0167	0.0278	0.0195	0.0024	0.017
Observations	136	136	136	136	136	136	136

Figure A2.1: Error Term Normality Test Results
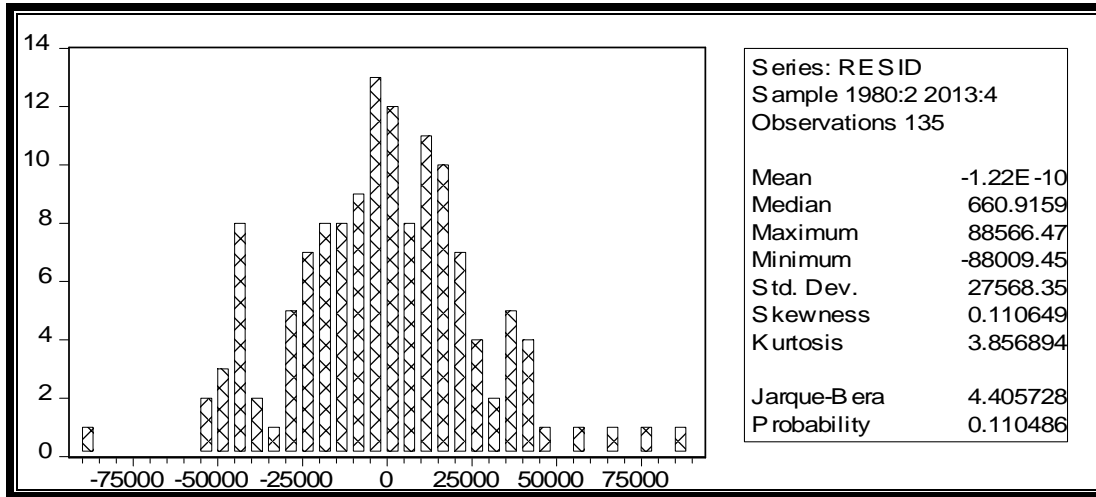
Table A2.2.1: Correlation Matrix: All Variables Included

Correlation							
Probability	PSCR	GDP	CPI	DEP	LR	M3	NEER
PSCR	1.000000						
GDP	-0.267721	1.000000					
CPI	0.360287	-0.562230	1.000000				
DEP	-0.461745	0.954331	-0.596244	1.000000			

LR	0.338019	-0.573290	0.456887	-0.644356	1.000000	
M3	-0.462614	0.745978	-0.591962	0.999728	-0.645287	1.000000
NEER	0.514553	-0.585018	0.607293	-0.581565	0.234285	-0.577219 1.000000

Table A2.2.2: Correlation Matrix- M3 Dropped

Correlation						
Probability	PSCR	GDP	CPI	DEP	LR	NEER
PSCR	1.000000					
GDP	-0.267721	1.000000				
CPI	0.360287	-0.562230	1.000000			
DEP	-0.461745	0.954331	-0.596244	1.000000		
LR	0.338019	-0.573290	0.456887	-0.644356	1.000000	
NEER	0.514553	-0.585018	0.607293	-0.581565	0.234285	1.000000

Table A2.2.3: Correlation Matrix- DEP Dropped

Correlation						
Probability	PSCR	GDP	CPI	LR	NEER	M3
PSCR	1.000000					
GDP	-0.267721	1.000000				
CPI	0.360287	-0.562230	1.000000			
LR	0.338019	-0.573290	0.456887	1.000000		
NEER	0.514553	-0.585018	0.607293	0.234285	1.000000	
M3	-0.462614	0.7459783	-0.591962	-0.645287	-0.577219	1.00000

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