The relationship between financial crises and South African bank lending activities

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ABSTRACT

Financial assets, and particularly fiat money, play a critical role in the prosperity of an economy. Its health therefore becomes the cornerstone of an economy, as asserted by modern financial intermediation theory. Fundamentally, as established by literature, crises affect bank balance sheets and subsequently banks' ability to provide credit, thereby restricting investment, capital and asset growth, aggregate output, and eventually national income. This study conclusively establishes the relationship between financial crises and the South African bank lending activities. It describes this relationship, concluding that crises and bank lending have a negative short run relationship and positive long run relationship. The study gives a brief background of recent crises that were experienced by different economies in the world. The study uses South African quarterly data for the period 1996 to 2015, where it employs a VECM model that gives empirics to the effect that lending is indeed negatively affected by financial crises, but only in the short run. This is due to the South African Reserve Bank, through its monetary policy, cushioning the banking sector against the detrimental effects of economic distress. The study recommends that given the indebtedness of South Africa relative to GDP growth, to avoid credit downgrades and disinvestment in the long run, government should focus on improving GDP growth rather than debt; and should establish a policy framework that centralises operational transactions in order to reduce the effect of crises on real output.

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CHAPTER ONE
Introduction of the study

1.1 Introduction

Financial Crises cause stress to many economies around the globe, more especially market based economies, Hardie et al (2010). The most recent crisis that South Africa has suffered from is the global financial crisis, which caused turmoil in both financial asset markets and real asset markets in the global economy and left the South African economy affected in various capacities (Word Bank, 2012; Padayachee, 2012). It was triggered by the housing bubble in 2006 which, in fact, was caused by the new policies that encouraged homeownership and easier access to loans. This resulted in a non-fundamental increase in the prices of property markets in the US where property prices increased more than could be explained by market developments (Holtz-Eakin, et al., 2010). This bubble busted in 2007, causing massive financial turmoil and eventually a global recession.

According to Ivashina et al (2009), bank credit availability was affected substantially by the global financial crisis of 2008. Hardie et al (2010) say that the financial crisis has revealed that increasingly it is the market that determines both banks' capacity to lend and the particular decision to lend. Ivashina et al (2009) further say "new loans to large borrowers fell by 47% during the peak period of the financial crisis (fourth quarter of 2008) relative to the prior quarter and by 79% relative to the peak of the credit boom (second quarter of 2007). New lending for real investment (such as working capital and capital expenditures) fell by only 14% in the last quarter of 2008, but contracted nearly as much as new lending for restructuring (leveraged buyouts, mergers and acquisitions, share repurchases) relative to the peak of the credit boom."

The South African economy has also suffered from the Rand Crisis which had two episodes, one in 1998 and another in 2001. Bhundai et al (2005) say "between end-April and end-August in 1998, the rand depreciated by 28 percent in nominal terms against the U.S. dollar. This was accompanied by increases of around 700 basis points in short-term interest rates and long-term bond yields, while sovereign U.S. dollar-denominated bond spreads increased by about 400 basis points. At the same time share prices fell by 40 percent and output contracted during the third quarter of 1998 (quarter on- quarter). In 2001, the rand depreciated by 26

percent in nominal terms against the U.S. dollar between end-September and end-December, but short-term interest rates remained stable, long-term bond yields increased by less than 100 basis points and sovereign U.S. dollar-denominated bond spreads narrowed by about 40 basis points. Share prices rose by 28 percent and real GDP increased" (Bhundia & Ricci, 2005).

Banks had to revisit their lending patterns and models, before, during, and after financial crises; learning to recognise risky borrowers and practicing risk-mitigating lending activities (South African Reserve Bank, 2009). They had to implement lending policies that facilitated a positive equity balance for banks' capital. However, it is no secret that the banking sector has always been affected by the financial crises and thus had secondary effects on other sectors of the real world economy.

This paper seeks to investigate the relationship between financial crises within the South African banking sector, specifically how it affects lending. It will attempt to answer questions like how financial crises affected the South African economy, specifically the banking sector; what measures the Central Bank, the National Treasury, and (or) the Finance Ministry took to influence the activities of banks, empirically speaking, pre, during and post financial crises; and how the structure of the South African economy facilitated the impact of the financial crises on lending activities.

1.2. Statement of the problem

The financial crisis of 2008 was one of the worst crises since the great depression of the 1930s, at least in so far as putting economic stress on industrialised economies. This particular crisis has provoked South African economists to study its causes and real effects on the economy. Notably, South Africa being the second largest economy in Africa has a well-developed and integrated financial system, thus the most important destination for portfolio inflows and the largest borrower from the European banks in the region. This makes sure that South African banks have large supply of credit and liquidity to both private and public sectors. However, South Africa experienced reduction in portfolio inflows in the late 2011 in spite of capital inflows from Europe; and was expected to balance this reduction by other international banks and investors but did not.

South African banks protected themselves against the direct effects of the financial crisis by not investing as much in high-risk securities and by maintaining a traditional and

conservative banking model which required high standards for loans (South African Reserve Bank, 2009). They tightened their lending practice even before the onset of the financial crisis of 2008. They did this in reaction to the new Consumer Credit Act of 2007, the transition to Basel II and III accounting standards, and capital requirements during 2008 (van Rensburg et al, 2012). Moreover, lending contracted even further during the crisis as banks were more risk-averse in their approach to lending (South African Reserve Bank, 2011). This amplified the decline in house prices, cut down in consumer spending, and reduction in investment loans. Without sound bank management, the South African economy would have been subject to a banking crisis, as most countries were, during the financial crisis of 2008 (Kershoff, 2009). South African banks remained profitable during the crisis; however their profitability was reduced due to the economic stress they were operating within (IMF, 2010).

Banks' financial positions were affected by this phenomenon, thus affecting their ability to create liquidity. As stated above, this leads to secondary effects on the economy as a whole and increases financial risk due to the financial positions of economic units during the crisis. Economists have studied the causes, effects, and solutions to financial crises and produced inconclusive evidence. These causes, effects, and solutions varied with each economy as economies are different; moreover, fewer studies have been done on the South African economy.

1.3. Objectives
General Objective:

To determine the relationship between financial crises and banks' lending patterns in the South African banking sector

Specific Objectives:

1. To provide an overview of financial crises and bank lending practices in South Africa.
2. To empirically explore the relationship between financial crises and bank lending in South Africa, and policy intervention and their implication by policy makers.
3. To provide policy recommendations based on the findings.

1.4. Hypothesis
The hypothesis which this study seeks to test is:

H_0: The South African bank lending activities have no relationship with financial crises

H_1: The South African bank lending activities have a relationship with financial crises.

1.5. Significance of the Study

Financial intermediaries, and specifically banks, form an important and significant body for financial intermediation and investment for any economy (Keynes, 1937). Given its intermediary role, the financial sector should be well researched and studied in order for policy makers to make effective policies, as its collapse causes turmoil in the economy as a whole. Fewer studies have been made on bank credit availability during economic stressful conditions. Most related studies focus on the causes of financial crises; their cross-border implications on different continents, countries, and industries; the regulatory environment; lessons learned from financial crises; and recommendations for the post-crisis period.

Some South African based studies have focused on the global financial crisis and its effect on the economy in general during the country's political challenges (Padayachee, 2012). While there may be fewer studies on the effect financial crises had on bank credit availability in South Africa, even their models only consider investment loans and not necessarily consumption loans, as well as consider private sector loans and not public sector loans. This is a major shortcoming and may result in inconclusive empirical analysis. Hence in order to provide an adequate insight and deeper understanding of financial crises' effects on the banking sector's credit practices, the objectives of this study would have to be met, providing a platform from which policy makers and the private sector can know more about financial crises and their implication on bank credit availability.

Hence, econometrically establishing the impact financial crises had on bank lending, with all relevant variables as guided by literature review, will help us identify the relationship these variables have, and fill in the literature gaps. In addition to that, this study will show how financial integration may have had a negative effect on South Africa's financial sector, provide policy implications for financial development and fund allocation efficiency, which will lead to economic growth and development.

This paper intends to investigate this subject by providing an overview of South African banks' lending patterns not just towards investment by the private sector but private sector consumption loans and public sector lending as well prior, during, and post financial crises. It would benefit policy makers, investors, financial institutions, and consumers to understand this relationship and help with further developments on policies for both the South African economy and the world economy.

1.7. Organisation of the study

The study will be divided into six chapters. Chapter 1 will focus on the background (Introduction) of the study; Chapter 2 will look at the overview of the South African bank lending and the financial crises that occurred locally and globally, their developments and characteristics; Chapter 3 will focus on the theoretical and empirical literature review. Chapter 4 gives details of the empirical framework, emphasising on the development and estimation of the specified model. Chapter 5 focuses on model robustness, reporting of results and articulates policy implications of the reported results, and Chapter 6 constitutes the summary and main conclusions of the study.

1.8 Ethical Consideration

The study will utilise secondary data and will maintain integrity during the execution of the study. The author of this study is aware of the university's ethics protocol and thus vows to follow it. The author will not manipulate the data in any unethical way.

CHAPTER TWO
Background and Overview
of Crises and Lending in South Africa

2.1 Introduction

A financial crisis is a situation when financial instruments suddenly lose value rapidly and South Africa has never had a crisis that was triggered by fundamentals of the domestic economy. Various financial crises have occurred throughout world economic history, followed by plunging recessions that take years, and sometimes decades, to recover from. Crises have been realised to appear periodically in financial systems. Financial intermediaries, particularly banks and investment firms, are the ones highly linked to financial markets and the financial system in general. When there is a financial crisis, banks reduce their credit to the private and public sectors to minimise risk exposure, investment firms and investors lose a lot of their investments and savings in value to the downturn of financial markets, the real economy reduces production and spending, leading to a close down in businesses and rise in unemployment. The effects of financial crises are undoubtedly disastrous thus no economic unit finds pleasure in this phenomenon.

Economists cannot fully agree on the actual causes of financial crises, making it inconclusive. However, there are general factors that various economic thoughts point out as causes and explain their implications on bank lending practices. In this chapter, the background, overview, and causes of various financial crises that, to some extent, had an effect on South Africa's economic indicators; as well as the development of the South African banking sector, its lending practices, and how it was affected by financial crises are explained and discussed. Generally, this chapter seeks to explicitly define and explain the development of various crises around the world that affected the South African economy as well as explain the development of South Africa's banking sector, particularly as it relates to lending, thereafter concluding the chapter.

2.2 An overview of financial crises

Michael Bordo (2009) in his publication mentions eras of financial crises recorded throughout global economic history. Allen et al (2007) further expands on them with special emphasis on the recent period of 1973 to 1997. Olivie (2009) also looks at financial crises from different eras, comparing one crisis to another. This section discusses and gives a layout of recent crises in different parts of the world economy.

2.2.1 Some Recent Financial Crises

Economic units witnessed financial crises in recent years and it is vital for literature to examine the details of these financial crises, comparing them to each other and perhaps crises in other eras.

The Scandinavian Crises

The Scandinavian economies like Norway, Finland, and Sweden experienced a boom that caused asset bubbles that burst and caused the twin-crises. According to Allen et al (2007), in Norway alone lending rose by 40 percent, increasing investment and consumption. The collapse in oil prices then triggered the most detrimental banking crisis and recession since the Great Depression of the 1930s, subsequently leading to banks restricting lending to riskless models. In Finland, it was fiscal expansion that caused massive lending, causing a housing bubble where in 1987 to 1988 housing prices rose by 60%. When the Soviet Union trade fell in 1990 and 1991, which followed a central bank interest rate increase in 1989, the crisis was amplified. Almost similarly to Norway, Sweden had a housing bubble which was essentially caused by credit expansion. When interest rates eventually increased in 1990 the following year had banks suffering as loans had been based on inflated asset values. Banks had to revisit their lending models and thus restrict lending. When eventually the government mitigated, the recession was exacerbated.

Japanese Crisis

The expansion of credit was led by financial liberalisation as well as their support for the United States dollar in the 1980s, argues Allen et al (2007). Household savings were strong against corporate fixed investment, leaving a pool of uninvested funds, thus expanding credit. This credit expansion ultimately caused a boom and eventually a bubble in the property and stock markets. In 1989, the new Governor of the Bank of Japan tightened monetary policy to avoid the bubble to have an effect on inflation in general, which sharply increased interest rates in early 1990. The bubble burst, and there was a sharp drop in currency value as well as property prices. Moreover, three major banks as well as one of the biggest four investment firms failed, retrenchments, a banking crisis, as well as defaults followed especially in the

financial sector. The real economy contracted and had small ups and downs in terms of growth during the 1990s and 2000s.

Asian Crisis

The Dragons (Hong Kong, Singapore, South Korea, and Taiwan) and Tigers (Indonesia, Malaysia, Philippines, and Thailand) had successful economic models that sustained economic growth and development at high rates from the 1950s until 1997 when these economies were victims of currency crises. In July 1997 the central bank of Thailand stopped defending their currency, the baht, in the currency market and it dropped by 14 percent and 19 percent onshore and offshore markets, respectively. That triggered what is today known as the Asian Currency Crisis (Olivie, 2009).

The Filipino peso and Malaysian ringgit were subsequently affected by the crisis. In a failed attempt to defend their currency, the Philippines central bank lost $1.5 billion worth of foreign reserves and still had the currency fall by 11.5 percent. The Malaysian and Indonesian central banks defended their currencies until the 11th of July and 14th of August, respectively.

Following the Tigers' crisis, the Singaporean central bank stopped defending its currency in August and by the end of the next month it had depreciated by 8 percent. Hong Kong's currency, which was pegged to the US dollar, was also in crisis but maintained its peg to the dollar; but the Taiwanese currency was hardly affected. The South Korean currency was almost a safer haven against other South East Asian currencies until in November when it lost 25 percent of value. By the end of the crisis, in December, the dollar had appreciated by 52, 52, 78,107, and 151 percent against the Malaysian, Philippine, Thai, South Korean, and Indonesian currencies, respectively (Allen et al, 2007). This crisis caused defaults both in the financial economy and the real economy. Various firms and companies were announced bankrupt, these economies contracted in output and had unemployment rise sharply.

The Russian Crisis and Long Term Capital Management (LTCM)

LTCM, founded by John W. Meriwether, raised about $1.3 billion to kick start its investment strategy. The company took advantage of inefficient bond markets, buying low and selling high. This brought back plausible returns of about 40 percent until in 1997 when returns were as low as 27 percent, which was equivalent to the equity rate of return that year. The company decided to return to investor $2.7 billion of the $7 billion under management as the company was struggling to bring high returns with such a large amount of money. The

Russian foreign market policy officials, in 1998, devalued their currency leading the Russian government to default on about 281 billion roubles of debt, resulting in a global crisis with extreme volatility in many financial markets. As a result, by September 1998, LTCM's assets in management decreased in value to $600 million. In intervention, American banks as well as the Federal Reserve Bank of America injected money in equity and debt into LTCM to prevent it from selling out its positions as well as prevent the possibility of a meltdown in assets and systematic global crises (Olivie, 2009).

The Argentina Crisis

After a series of inflationary episodes and crises for two decades in Argentina in the 1970s and 1980s, in 1991 its central bank decided to peg the peso to the US dollar. However, this foreign exchange rate policy was not working in the country's favour because public sector debt was increasing, exports were low, and this policy was particularly hurting the real economy given its limited number of sectors. In addition, in the late 1990s Argentina's economy was further affected by the devaluation of the Brazilian currency as a result of its crisis as well as the crisis Russia was also suffering from. Both fiscal and monetary policy could not stabilise the economy, thus the recession continued to deepen. In 2001, when the government noted that the situation was not getting any better, it introduced an international trade policy where government subsidises exporters and increases import taxes. However, because the Argentinian government was already in escalated debt, it could not sustain this form of intervention, the situation became worse as there was increased uncertainty (Olivie, 2009).

This led to a banking crisis in November 28 to 30 where economic units withdrew their deposits, which made the government set limits on the amount of withdrawal you could have in a week. Eventually in December, the economy collapsed. Industrial output had shrunk by 18 percent, imports and construction fell by 50 percent and 36 percent, respectively. The government defaulted on its debt, real GDP fell by 11 percent in 2002, and inflation rate for April 2002 went to 10 per cent a month. The economy only started to recover in 2003 (Olivie, 2009).

The Mexican Crisis

According to Olivie (2009), Mexico, along with many other Latin American countries, made economic reforms like deregulation of the domestic economy as well as opening up terms of

trade, finance, and privatised some state owned companies, which got attention from international investors. Given low interest rates in the US, investors were looking to Mexico as an alternative investment destination, mainly through the bond market denominated in foreign currency, a liquid but volatile market; thus foreign capital inflow was accounted to have increased by 10.3% of GDP in 1993. This raised foreign debt as well as internal high-risk credit. This capital inflow transformed into a credit boom financing domestic consumption and imports in addition to the speculative bubbles that emerged in the real estate sector and the stock market. However, these transactions were denominated by the Mexican peso and there was a rise in imbalance between assets and liabilities of the country.

Over the course of 1994, there were many perpetrations in the state of the economy from political to economic issues. The most notable was the US interest rates rising several times. In addition to economic pressure, the country suffered from political instability from the rebellion of its citizens, the murder of the presidential candidate, as well as the murder of the Secretary-General of the Institutional Revolutionary Party (IRP).

These events caused a plunge in the stock market, the international investors' profitability expectation decreased while they deemed the Mexican economy as a risky investment destination (Olivie, 2009). The stock market continued to fall, foreign currency reserves plunged, and interest rates hiked by November that year. By the 22nd of December, foreign exchange rate policy authorities abandoned the semi-pegged exchange rate leaving the peso to collapse. This crisis became infectious to the whole Latin American economy, causing the so-called Tequila effect.

The Global Financial Crisis of 2008

Throughout history, according to Payne (2013), humans have proven to be a greedy and money obsessed species. They often get themselves in huge debts just so that they can make more money, thereby compromising the stability of the financial system. There were a series of events that occurred in the global economy that were seeds to the global financial crisis. According to McKibbin et al (2009), these seeds occurred throughout the decade before the financial crisis.

Firstly there was an Asian crisis in 1997-98 which led to Asian economies having large current account surpluses that they invested offshore to keep their foreign exchange rate, in nominal terms, low. This capital migration from Asia to the US caused a large increase in

liquidity supply as well as a sharp increase in dotcom equity prices in the NASDAQ market. The dotcom bubble, which accumulated from 1998 to 2000, burst in 2001. The Fed then introduced a monetary easing policy in steps from 2001 to 2004. This increased demand for houses as interest rates were very low and property market prices rising. This led to a boom in the property market and a large demand for loans to finance these property purchases (McKibbin & Stoeckel, 2009).

Investors underestimated risk and leveraged loans became popular as investors chased returns on investments. The world economy was booming, and China and India had a large demand for commodities, thus the commodity markets and much more specifically for oil, food, and minerals experienced a boom between 2004 and 2007. This boom in commodity prices, especially oil prices, was as big as that of the 1970s. Inevitably, there was a rise in general prices due to the world economic boom, and this led to monetary authorities tightening monetary policy in mid-2004 to influence inflation rates. The world economic boom continued resulting in much more investments by investors with hope to increase their returns at low risks, as it were. However, there were three major events that were the onset of the global financial crisis (McKibbin & Stoeckel, 2009): the bursting of the housing bubble, a sharp rise in equity premiums over bond premiums, and reappraisal of risk by consumers; these are discussed below:

Firstly, the burst in the housing bubble affected household wealth, spending, as well as default in loans. The United States index of house prices fell by 6.1 percent in the first quarter of 2008 compared to the first quarter of 2009. During the housing boom, as housing prices increased, credit in general was liberal in order to meet the demand for durable and semi-durable household goods. Some, like Taylor (2009), blame monetary easing which had interest rates cut by 550 basis points for "far too long". He further asserts that had interest rates been raised earlier, the bubble would not have been of such magnitude. He further argues that low world interest rates mean low bond yields.

The crisis started in the housing market in the US when the housing bubble burst and plunged property prices, slowing down the US economy as household responded by increasing their savings given this plunge in housing prices. Eventually financial intermediaries failed and the equity market plunged. This resulted in chaos in the financial system where banks were failing, markets plunging, firms closing down. This affected the real economy, private sector debt reduced for the first time since 1955 and the housing market reached record low prices.

Consumer confidence readings were recorded to be the largest decline since the Second World War. Production in the industrial sector fell by 15 percent, unemployment escalated to highest levels since the 1980s. The Fed decreased interest rates to almost zero, bought bonds, and the government spent about $1 trillion to stimulate the economy. Over time, the economy was stimulated, confidence was lifted up a bit, and there was relative stability in financial markets. The equity market started recovering and by mid-2009 the whole economy was starting to recover (McKibbin & Stoeckel, 2009).

Secondly, there was a sharp rise in commodity prices, especially in 2006, which had inflationary implications and as such compelled monetary authorities in the US to increase interest rates. By virtue, economies whose currencies were pegged to the dollar had to also tighten their monetary policies. After taking large positions in the supreme mortgage market, the bursting of the housing bubble, and selling off $6 billion in assets, Lehman Brothers failed in September 2008. This failure affected risk premiums across markets, reflecting a rise in perceptions of risk by business as reflected in the equity risk premium over bonds (McKibbin & Stoeckel, 2009).

Thirdly, there was a rise in household risk as much as there was a rise in corporate risk. Households discounted their future earnings, affecting their decisions on whether to save or spend. They did this in fear for the future. And given the banking crisis that was later coupled with the financial crisis, households were likely to save their income "under their mattresses" (McKibbin & Stoeckel, 2009).

In essence, the bursting of the housing bubble had a bigger effect compared to risk on consumption and imports. However, rising risk had the biggest effect on investments, reflected in the equity risk premiums over bonds. Furthermore, households started having a higher perception of risk which caused them to discount their future earnings, which led to them consuming less and saving more, in so doing amplifying disinvestment process by business.

The South African Rand Crises episodes of 1998 and 2001

According to an article published by Bhundia et al (2005), between April and August in 1998, the rand depreciated by 28 percent against the US dollar. Short-term interest rates increased by 700 basis points and sovereign US dollar-denominated bonds yields increased by 400 basis points. The share prices in the Johannesburg Stock Exchange (JSE) plunged by

40 percent and output contracted in the third quarter (quarter-to-quarter). In 2001, between September and December, the rand depreciated by 26 percent. However, there was stability in short-term interest rates, long-term bond yields increased by about 100 basis points and sovereign U.S. dollar-denominated bond spreads decreased by about 40 basis points. The JSE share prices increased by 28 percent, and real GDP increased. Notably, there is a difference in effect in as far as these currency crisis episodes are concerned (Bhundia & Ricci, 2005).

The differences in the effect of the crisis episode in 1998 from those of 2001 are explained by macroeconomic policies set out by authorities. These policies are discussed below:

In the 2001 episode, there was high fiscal deficit by the country which accounts for 1.5% of GDP as well as an acceleration of money growth in summer 2001. Moreover, the privatisation of Telkom was initially announced to happen in 2001 but delayed partly because the weakening global markets would mean low price for Telkom. This caused implied negative sentiments toward the rand because financial markets started doubting the government's commitments to privatising Telkom and economic reform.

Also the South African Reserve Bank's (SARB) Net Open Forward Book (NOFB), inherited from the Apartheid regime, had large short-term liabilities and low reserve adequacy which increased the profitability of exchange rate pressure and sovereign spreads. For example, intervening in 1996 and 1998 by the central bank (which had a net loss of $14 billion and $10 billion respectively which accounts for 10 percent and 8 percent respectively), and borrowed in the forward market thus the status of NOFP. The SARB then decided to draw down the NOFP, causing vulnerability of the stable rand. However, it was an appropriate policy to strengthen the economy to have foreign reserves available for the economy to withstand market shocks. But when the rand was under significant pressure in late 2001, the policy seen to have been inappropriate as it would contribute to the rise in the demand for foreign currency and reduce the likelyhood of intervention by SARB. This depreciation led to the SARB controlling capital outflow (Bhundia & Ricci, 2005).

As for the 1998 episode, the Asian crisis caused havoc in financial markets and caused contraction of Asian economies, thus affecting the demand for commodities. This led to a subsequent decrease in commodity prices and thus affected South Africa. The authorities of policies have admitted to the fact that their policy interventions in 1998 were ineffective and inappropriate. They avoided adopting the same intervention policy in 2001, and in so doing proved to be a very successful strategy as the macroeconomic repercussions of the crisis were

limited and the rand strengthened over the next few years. The successful management of the currency crisis in 2001 was a reflection of a broader improvement in the overall macroeconomic policy framework, which helped to strengthen policy credibility (Bhundia & Ricci, 2005).

In essence, according to Bhundia et al (2005), the currency depreciation in 1998 was much more severe than that of 2001. In trying to mitigate, authorities borrowed currency in the forward market and sold it in the spot market, affecting the NOFP. The intervention was ineffective thus, step by step, the authorities increased short-term interest rates, worsening things as the economy was already experiencing contraction in output.

2.2.2 Graphic Review
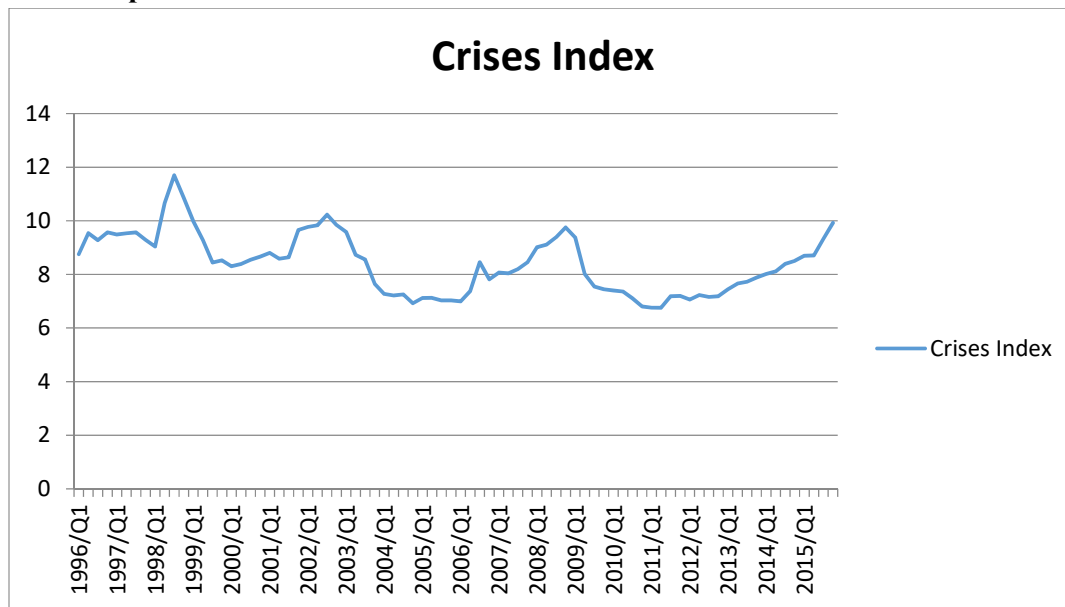
Source of data: Bloomberg

According to Gadanecz et al (2009), financial stability is not easy to define or measure given the interdependence and the complex interactions of different elements of the financial system among themselves and with the real economy.

Most literature concludes that South Africa mostly had financial crises that were not necessarily triggered by its domestic fundamentals. In fact, most crises or effects thereof were transmitted mainly through variables such as the stock market prices (for which in this study we use FTSE/All Share Index prices as the index capture various share prices across all sectors); foreign exchange market rates (USDZAR); or debt market interest rates. As a crises index, the study computed the standard deviation of the stock market prices, exchange rates,

and interest rates; given that crises are transmitted into the economy through these variables. The crises index measures the degree of financial stability of the financial system. In simple terms, it measures the ability of the system to absorb shocks and unravelling of financial imbalances.

From the index, we can tell that there was a crisis in the first quarter of 1998 until mid-1998, a crisis that is graphically expressed as a sharp rise in the index to almost 12. This was the first crisis since the dawn of democracy. The economy came to stability for about a year and a half but experienced another crisis as indicated by the increase in the crises index to just above 10. However, the second episode of the crisis was not as detrimental and sharp as the previous episode. However, the crisis was sustained from the end of 2001 to around the end of 2003 when the economy reached stability. Stability was only short lived in that towards the end of 2006 we could already see the traces of another crisis that reached its peak to almost 10 in 2009 in terms of the index. This crisis sustained for about three years and thus the longest crisis the economy ever had since the dawn of democracy.

It is also notable that during episodes of financial crises experienced in South Africa, various other countries were also experiencing financial crises. Between 1998 and 1999, Argentina, Russian, and Asia were also experiencing currency crises. An Argentinian crisis was caused by the change in the exchange rate policy as well as the devaluation of the Brazilian and Russian currencies. The Russian crisis was caused by exchange rate policy that resulted in the devaluation of its currency. Lastly, the Asian crisis was caused by the devaluation of the Thailand currency, which affected the Dragon and Tiger economies in Asia, which subsequently reduced demand for South African commodities, triggering a currency crisis.

It is therefore conclusive that many countries, including South Africa, either imported currency crises or responded to exchange rate policy changes of other countries by revising their own policies, which did not prevent the crises from being imported. However, in 2001, Argentina had a crises caused by government indebtedness and South Africa had a crisis caused by uncertainty regarding the privatisation of Telkom. This crisis for South Africa was domestically triggered and had effects on financial markets and the real economy.

According to the crises index above, from 2013 there is evidence of traces of a crisis again. By the end of 2015, the index implies that the economy reached a level that is the same as that of 2002 and 2008. Could the South African economy be experiencing another financial crisis? Could we see the economy getting to another crisis? Only the future will tell. It seems

to prevail that the South African economy experiences a crisis after every three years at most, each crisis lasting longer than its predecessor.

2.3 The South African Banking Sector
2.3.1 Background on the South African Banking Sector
The South African economy contributes less than 1% to the world GDP although it may be ranked the top 20 world economies by size (Baxter, 2008). Be that as it may, the economy still is Africa's second largest economy, following Nigeria, with the highest mineral production, industrial output, and Africa's largest supplier of electricity (Brand, 2009). South Africa's growth during the first ten years after the dawn of democracy in 1994 was an impressive average of 5%, more especially from 2004-2007, lowering its unemployment rate by 5%. This was due to the favourable global environment as well as growing domestic demand. In addition, the economy was supported by favourable macroeconomic fundamentals and policies, high commodity prices and high investor and consumer confidence.

These conditions kept the economy growing and to further facilitate this growth efficiently, the financial sector, specifically the banking sector, was critical. However, during the global financial crisis of 2008 the South African economy was hard hit along with the global economy. The economy was facing slower export growth, lower commodity prices and slower capital inflow (Kumbirai et al, 2010). The economy contracted in the fourth quarter of 2008 and was officially declared in recession in the beginning of 2009 (South African Reserve Bank, 2009). Despite economic hardships during the recession, the South African government maintained its macro-fiscal stabilising measures and thus sailed through the global financial crisis compared to other economies in the region and the world because of the socio-economic fronts it took during the years preceding the crisis.

During the mid-1980s, South Africa, under the apartheid government, was sanctioned by various parts of the world which had international banks terminate their operations in the country. After the dethroning of apartheid, welcome of constitutional democracy, and the opening of the financial system in 1994, the South African economy became an investment destination for foreigners with the biggest increase in new bank registrations in 1996 from 35 to 44, from 3 per cent in 1994 to 9.5 per cent of total banking sector assets by the end of October 2004 (Mboweni, 2004). However, most of these banks did not see the new

millennium. Most of them were liquidated in 1999, mostly locally controlled banks, due to economic pressures as the economy had just had a currency crisis as well as the competitiveness of incoming foreign banks that came with advanced technologies, resources, and experience (Mboweni, 2004).

During crises, the smaller locally controlled banks began giving credit to businesses and individuals with higher risk profiles, the rejects of bigger banks. More than half of banks in the country liquidated between the years 1996 and 2004. These banks include the small bank, Saambou, which was denied access to lender-of last resort facilities (Gilbert et al, 2009). This failure, Mboweni (2004) argues, was not due to failure of the small and medium banks but consolidation in the banking sector as a whole. According to Mboweni (2004), the political transformation in the country, policy authorities relaxing exchange controls and liberalisation of the economy resulted in South Africa becoming an important financial centre for foreigners. This financial liberty brought along with itself increased competiveness in the traditional banking environment, improving the quality and quantity of financial service in the country. As such Barclays, in September 2004, announced its interest in being a majority shareholder of Absa bank.

The South African banking sector is highly dominated by international banks or banks that have international institutions of investments as their major shareholders. Thus the regulation and supervision of banks is a critical issue especially in light of financial innovation such as derivative instruments in respect of the global financial crisis of 2008. The South African financial sector stability is largely influenced by the private sector and market behaviour, thus showing minimal government intervention requirement for systematic risk only (Rossouw, 2009). SARB is thus central to banking in so far as regulation goes. The country's banking sector is currently dominated by four banks, namely Standard Bank; First National Bank; Nedbank; and ABSA, that hold 86.4% of total industry assets (South African Reserve Bank, 2009). The South African banking sector was relatively cushioned against the global financial crisis of 2008 due to the central bank's regulation and monitoring of the sector, however negative sentiments of the crisis still had some impact on banks' balance sheets (South African Reserve Bank, 2008).

The aggregated balance sheet of the banking sector in South Africa equalled R344.6 billion in 1994, R724 billion by the end of 1999, R1 436 billion in October 2004, and R1 677 billion in 2005. The sector's balance-sheet size then grew to R3 177 billion 2008 (135, 4 % of GDP),

followed by a decline in asset growth during 2009, ending the year at R2 967 billion (118, 5 % of GDP) (Kumbirai et al, 2010; South African Reserve Bank, 2009). The assets in the banking sector are mainly loans and overdrafts, after which are derivative instruments. Loans grew from R270.8 billion as at end of 1994 to R 1.104 trillion as at end October 2004, with domestic deposits from the public being the main source of funding. Home loans and term loans take up about 52% of total assets while commercial mortgage made up 9.7%. However, Genesis (2013) states that since the financial crisis 2008 the smaller banks have been seen to move away from secured lending to unsecured lending for a number of reasons, including "unfavourable property market conditions with depressed property market values, costs relating to bond origination, difficulties in realising security where credit providers experience challenges in evicting tenants, debt review process challenges, relatively low margins, an anticipated increase in capital requirements" (Genesis, 2013).

As such there was a decrease in demand for mortgage loan to personal loans; these banks were losing in revenue; demand for, size of, and margin earned on personal loans was far more greater than before the crisis. In terms of liabilities, deposits made up a significant percentage of banking-sector liabilities amounting to about 79, 6 % in 2008 and 85, 4 % in 2009. This indicates an increase in total savings from 2008 to 2009. In 2009 42, 5 % of those deposits were corporate deposits, 22.3% retail customers, and 13.7% bank deposits.

In his lecture, Mboweni (2004) points out that from 1994 to 2004 there had been a decrease in the growth of total non-performing loans, saying:

"After reaching a peak of R29.2 billion in March 1999, growth in total non-performing loans declined to R23.8 billion as at end December 2003. During 2004, total non-performing loans continued to decrease to a level of R20.9 billion. Provisioning by banks remained adequate throughout the past decade despite non-performing loans being high in the late nineties…" (Mboweni, 2004)

However, there had been a series of "mini" bank crises throughout the history of the banking sector since the dawn of democracy (Mboweni, 2004). Small and medium size banks liquidated year after year, especially local banks during financial crises and recessions. As such, the SARB and the National Treasury made a guarantee that government will fund the withdrawals of depositors. This was an indication to the market that government is serious about maintaining stability in the banking and financial system as a whole. Thus the central bank erected a policy framework of dealing with banks in distress.

2.3.2 Graph Review
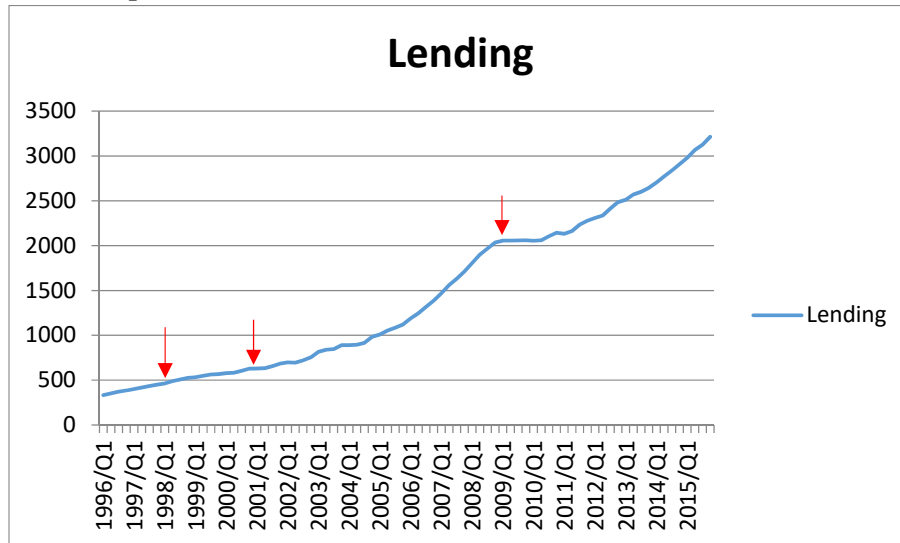
Source of data: SARB website

The lending variable consists of bank lending to both the private and public sectors. Looking at its trend throughout from 1996 you find that lending was increasing relatively slowly from 1996 until 2002/Q1 where we see a stagnancy in bank lending. However, this is short lived because lending picks up quickly after that. But, in 2004/Q1 again we see stagnancy that is short lived but longer than the previous stagnancy. In no time again we see an excessive rise in lending until 2009 where we see stagnancy again. This stagnancy is sustained until towards the end of 2010. Thereafter, we witness another steep increase in lending. It is apparent that each time we witness stagnancy in lending a sharp increase in lending precedes. Should we expect stagnancy in lending in the next few years perhaps? Chapter 6 will shed some light is this regard.

2.4 Conclusion

Crises have been recurring throughout the last 7 decades, each crisis having an impact on economies around the globe. Most financial crises start with financial market asset bubbles mostly due to policy reform and transpire into market causing chaos and crunches. When these bubbles eventually burst, they have turmoil effects on the economy and the financial system as a whole. Fundamentally, as established by theory, crises affect banks' balance sheets and as such their lending practices are affected as well. In most economies, when crises hit, central banks intervene and become lenders of last resort. Hence, during crises, money supply by central banks increase in order to prevent bank failures and the South African Reserve Bank has proven to have succeeded in protecting banks from crises. Be that

as it may, small and some medium size banks still fail and liquidate. Throughout global economic history, crises have shown to hit the banking sector heavily, and in particular their lending practices as risk is much higher. So due to economic and financial crises, they find themselves restructuring their lending models in order to mitigate and minimize risks.

CHAPTER THREE
Theoretical and Empirical
Literature Review

3.1. Introduction

Throughout the historical records of financial crises, only a few economists were able to predict and explain the causes and implications of financial crises, including the financial crisis of 2008. This chapter reviews and examines extensively literature on financial crises and their implication on bank lending practices before, during and post financial crises. Theoretical literature review will explore models that economists have erected to explain this particular subject theoretically. Following theoretical literature; empirical literature, on the other hand, will explore actual investigative studies done by various economists on various economies, including South Africa, to date; and the effect of financial crises have on bank lending is translated into real economic variables. An assessment of literature on this subject will follow after, thus critically analysing literature that would have been explored. This chapter will then be concluded by a summary and conclusion.

3.2. Theoretical Literature

Economists have developed theories in an attempt to explain the causes of financial crises and their effects on lending and borrowing on the financial system, particularly the banking sector. The following is a discussion on relevant theories that some economists have developed that relate to this study.

The Debt-Deflation Theory

In the 1930s a hypothesis known as Debt-Deflation theory, which Fisher developed, seeks to explain the effect financial instability has on bank lending practices (Fisher, 1933). In this hypothesis it is asserted that unregulated financial systems are the root cause of business cycles, specifically volatile lending and borrowing behaviour. During economic expansion periods, as lending increases and debt levels are getting ridiculously large, economic units become financially fragile. At that point, a negative external shock, such as a drop in profits or a decrease in money supply that pushes up interest rates will cause market participants (especially those indebted) to sell their assets thus the panic selling begins which will

inevitably drive down asset prices. The further asset prices drop, the worse the financial conditions of indebted economic units become because the nominal value of their debts is fixed (Fisher, 1933). This leads to insolvency of debtors and thus increases bad debts on lenders and deteriorate their financial position, leading to a banking crisis. Eventually lending is restricted to a point of completely halting in financial intermediation. Without financial intermediation, investment and consumption fall ridiculously. Firms cut production, unemployment escalates, and a recession (or potentially a depression) occurs. Therefore financial crises affect the availability of funds by financial intermediaries due to defaults by debtors, thus forcing them to restrict lending to safer borrowers and the purchasing of safer financial instruments.

Eventually, after a long period of time, asset prices will bottom out, financial positions will solidify, bankruptcies will stabilise, and lending will resume. Fisher asserts that a better solution is to prevent financial collapse in the first place by positioning monetary policy during the first phases of contractions. By so doing, influencing the stabilisation of asset prices and lending before they get out of control.

The Financial Instability Hypothesis

In this model, developed by Hyman Minsky, the role of financial systems is asserted to driving aggregate demand volatility and business cycles (Minsky, 1982). This theory, which borrows both from Keynes General Theory and Fisher's Debt-Deflation theory, reaffirms the interrelationship between the financial system and business cycles, emphasising how lending behaviour by financial intermediates does not only lead to financial crises but is also counteracted by financial crises. During economic expansions, firms pay back money easier thus borrowing more, leading to increased investment and further increase in growth. This decreases the level of hedged finance and increases the level of speculative and ponzi finance by firms. When a negative event occurs, like a drop in profitability or decrease in money supply which pushes up short-term interest rates, there will be a decrease in confidence, investment, credit, profits, and output. As lenders become stricter in their credit practices, lending falls and defaults begin to escalate. Panic selling of assets begins to occur and the process of financial collapse similar to that described in the Debt-Deflation theory takes place, dragging the entire financial system and economy down with it.

Thus according to Minsky, central bankers have to stand ready to be the lender of the last resort in order to minimize financial collapse and insulate the broader economy from the

effects of financial instability. The best way to avoid the collapse of the financial system is for government to put in place strict regulations so as to minimize speculative and ponzi finance.

The Financial Accelerator Model and the Role of Credit in Business Cycles

This model was developed by Ben Bernanke and Mark Gartler in their series of papers (Bernanke et al, 1987, 1989, 1990, 1995). The attributes of borrower and lenders affect bankruptcy risk, which in turn affects the costs of credit and the aggregate level of credit. Therefore, a small change in economic unit's balance of sheet and cash flows would have a large effect on the macro economy. The model focuses on the cost that borrowers and lenders incur in a financial transaction, what they refer to as the *cost of credit intermediation*. For borrowers, the cost of credit is not just the *interest rate* but information that they provide, *monitoring costs* which are the additional information provided to a lender over the life of the loan, the *collateral* which has opportunity costs, passed on *costs of resources* utilised to analyse information. Because of these costs of intermediation, firms usually finance a portion of their investment decisions using retained earnings and the balance using either financial markets or getting a loan

Debt levels are not the determining factor in the default risk of borrowers, and hence their credit worthiness because financial analysts use the borrower's asset base that can be collateralised. Instead, it is the net worth (total assets minus total obligations) which is the principal factor in determining the default rank of a borrower. The net worth of borrowers is not the only principal factor in determining the cost of intermediation and thus lending practices, but the net worth of lenders as well. During a recession, for example, a lot of borrowers default and as such the lender may lose their capital. This makes them increase the cost of intermediation so as to minimise the risk of capital loss. As a recession takes place, firms and households are once again forced to cut down on investment and consumption expenses due to increased cost of credit. This continues into a downward spiral of sustained falls in aggregate demand and supply, creating a larger and persistent recession.

The crucial implications of this model as far as lending practices is concerned is that the effects of financial instability are not felt the same by all borrowers. For larger firms with high net worths, established credit records, large sources of internal finance (through retained earnings), financial fundamentals, and financial accelerator play little role in determining their levels of credit and investment. However, smaller firms without established financial

channels and without adequate capital will find that their credit and investment fluctuate significantly with their net worths and other measures of financial soundness. As illustrated in (Matsuyama, 2007) these changes in the composition of credit between firms and industries can have long-term implications for investment and productivity, even leading to booms or busts in specific industries. For these same reasons, changes in net worth disproportionately affect poorer households and their demand for durable consumption goods. Likewise, smaller lenders (e.g. small banks) are the most likely to restrict their credit during recessions because of the impact of even a few defaults on their smaller asset portfolios.

A major critic of this theory as it relates to lending practices was that banks use a number of nonprice commitments to reduce risk, such as requiring collateral and asking for co-signers on loans. These factors are not directly incurred by borrowers but are still hard to be met by investors. Thus borrowers still find borrowing limited regardless of the price they are willing to pay for credit (i.e. they are credit constrained and not price constrained) (Chirinko, 1993). Lastly, the model argues that as default risk rises during recessions, the cost of credit rises as well, part of which is interest rates. However high interest rates exacerbate default risk in three ways. Firstly, higher interest rates increase the debt-servicing burden on borrowers, making payments harder to meet. Secondly, higher interest rates mean that more high-risk borrowers are likely to apply for credit. Thirdly, higher interest rates mean that borrowers that have already received credit are more likely to engage in riskier activities to cover their higher interest payments (Mojon, et al., 2002)

Models of Credit Rationing

These are a series of models that borrowed a lot of their features from the Financial Accelerator model, emphasising on the importance of asymmetric information and the heterogeneity of borrowers and lenders. This deems a risk perception about borrowers and is based on two factors, financial fundamentals of an individual borrower; and how future macroeconomic conditions might affect the borrower's balance sheet.

In contrast to the financial accelerator model, this model asserts that credit is quantity rationed. This therefore means that lenders impose on nominal quantity limits on the amount of credit they are willing to provide to any individual borrower regardless of the price that borrower is willing to pay (Brown, 2011). A few of these models are discussed below:

Hodgman (1960) focused on default risk as a possible rationale for credit rationing. He constructed an equilibrium model of credit rationing in which lenders evaluate potential borrowers by the loan's expected return, expected loss ratio. It assumes a maximum repayment that the borrower can credibly promise, which effectively limits how much the lender will offer the borrower regardless of the interest rate. Eventually the expected losses from increasing the interest rate become greater than the expected additional interest income. Implying that during recessions, bank credit availability will be limited.

Freimer et al (1965) defined two types of credit rationing: *i) weak credit rationing*- where a lender will vary the amount he is willing to lend a borrower with the interest rate up to a limit - but that beyond this limit the lender refuses to extend credit regardless of the interest rate.; and *ii) strict credit rationing*- where a lender sets an interest rate, lends a borrower whatever he wants up to a predetermined level at this rate, and refuses to lend him more regardless of the rate. Within their model, they find strict credit rationing for a limited range of parameters, and take the interest rate as exogenously determined.

Another theory was developed by Stiglitz et al (1981), arguing that increases in interest rates increase the default risk of individual borrowers and the default risk on the lender's entire portfolio. This theory asserts that this increase in interest rates has the above stated effect because of the incentive problems created by moral hazard and adverse selection. As a result, lenders are reluctant to charge higher interest rates implying that they are sticky during high risk periods. Thus this causes disequilibrium in the credit market where borrowers are willing to pay high interest rates but lenders not willing to charge them. Therefore, during recession banks cut back on lending smaller investors or consumers as increasing interest rates would increase the pool of riskier borrowers to apply for loans and encourage current borrowers to engage in risky behaviours.

Another model of credit rationing was developed by Kiyotaki et al (1995) where lenders require that all of the loans they provide be fully backed with collateral, imposing a credit limit on borrowers that equal to the total value of their assets. Under these conditions it is only changes in the price of the borrower's assets that tighten or loosen these constraints. By implication, during recessions when investment and consumption reduce, there is reduction in aggregate output which leads to continued reductions in assets prices and credit, which in turn leads to additional falls in output. Because these falls in asset prices are persistent, the

reductions in credit, investment and output are also highly persistent. Thus implying that recessions cause reductions in credit supply due to the fall of collateral values of borrowers.

3.3. Empirical Literature Review

Relatively few studies have been carried out to examine the relationship between financial crises and bank lending. Most of the studies investigated the impact of financial crises on banking in general, or particularly private investment loans thus excluding consumption and public sector lending. They give a smaller scope of the relationship between these variables, thus not providing sufficient information on their relationship (Rioja et al, 2011). Some studies were particularly interested in how the financial crisis of 2008 affected long run growth (OECD, 2009), some on policy responses mitigating the effects of financial crises on economies in general (Pesic, 2012). Some African studies, some of which this study discusses below, which were conducted on the relationship financial crises had with their bank lending for the period dating back from 1994 to 2011(range depending on study to study), reveal inconclusive results. This was due to a notable fact that some countries, like South Africa; Mozambique; Angola; and West Africa were more exposed to the global financial crisis than other countries in the region due to their openness to their European parent banks; South Africa being the most exposed (World Bank, 2012). Also, studies conducted in other regions of the world have common conclusions that financial stress affects bank lending practices (Ivashana et al, 2009). However, there were scopes that investigations on the impact of financial crises on bank lending did not cover as well as questions left unanswered, some of which are discussed below.

African Studies

Ashamu et al (2012) studied the impact the global financial crisis had on the Nigerian financial sector, which happens to be banking sector dominated. This study revealed that the financial crisis had caused depression on the Nigerian capital market and drop in the quality of credit extended by banks for trading in the capital market, exchange rate risk tightening of liquidity, greater loan-loss provisioning, slower growth rate of banks' balance sheet in response to the crisis and higher provisioning leading to lower profitability among others. However, this study focused on the financial system as a whole and as much as it may be dominated by the banking sector, it does not only compose of the banking sector. This

resulting in results that may be diluted with factors that come from the inclusivity of financial intermediation variables.

World Bank (2012) published its investigation of the impact of the debt crisis of Europe in Southern African countries; as well as Macias et al (2009) who studied the impact of the global financial crisis on sub-Saharan Africa. These studies assert that because South African banks are large borrowers from international banks and rely on the participation of European banks in syndicated loan funding, they were exposed to the effect of the crisis. However, this exposure is tempered by quite rigorous regulation in South Africa that limits individual bank exposure to foreign funding and is small in comparison to the size of the South African economy and financial sector. Thus it is concluded that the South African banking sector was not as harshly affected by the debt crisis as other countries were, especially in other regions

Esterhuysen et al (2012) studied how economic stressful conditions affected liquidity creation in the South African banking sector. This study noted that the liquidity growth from 2004 to 2007 was mostly on investments on illiquid assets, and the two largest banks (ABSA and Standard Bank, which enjoy the largest retail banking deposits) had the most loans to the private sector. During the period of 2007 to 2009 illiquid assets demonstrated virtually no growth but liquid assets continued to grow, according to the findings of this study. However, this paper does not address the question of while this stagnancy in lending, particularly illiquid assets, could be caused by the reduction in the supply or demand of loans, it may also result from increase in the maturity of loans, and/or, the rate at which loan borrowers refinance their loans. For instance, if firms extended the maturity of their loans during the climax of the credit boom, a decrease would be expected in the loans that reach their maturity during the financial crisis and, thus, we would witness less credit demand or supply activity. Furthermore, this study restricted its scope to liquidity creation as far as private sector lending is concerned and did not dwell much on public sector lending. This leaves more room for investigation. (Esterhuysen, et al., 2012)

International studies

Pesic (2012) and Rioja et al (2011, 2012) state that financial crises reduce credit investment demand during all episodes of financial crises for up to 7 to 9 years, depending on the financial development of each country. However this study leaves some questions

unanswered: if firms were more prone to refinance their loans during the credit boom, say, because interest rates were low and covenants were weak as it were, there would also be a decrease in new loan issuance during the following quarters. This study is not explicit in as far as the analysis of new loans pre, during, and post financial crises.

Studies on South Africa's BRICS partners

A study on the impact of the 2008 financial crisis on BRIC countries suggests that in India, only one bank, ICICI Bank, out of three privately owned banks in the country's banking sector felt the aftershocks of the 2008 financial crisis (Banerjee et al, 2010). This is because it was largely owned internationally and open to global markets and was the only bank in India that was listed in the New York Stock Exchange (NYSE), as such, its balance sheet was reduced and amount loanable to borrowers was reduced. Other studies assert that the rest of the nine out of ten banks in India (seven of which are owned by the Indian government) protected themselves by adhering to government policy framework issued out in 2004 which limited foreign investment as shareholders in domestic private banks from 74% to 49% and remained as low as 20% for nationalised banks (White, 2011). Moreover, the Reserve Bank of India had policies that directed bank credit to sectors that the government deemed socially and economically important. According to the results, these had an impact on the balance sheet of banks and, as such, limiting the banking sector's lending capacity for any form of credit. This study limits the exposition of what really happened to lending by banks pre, during, and post financial crises. In fact, this study focuses particularly on the recent financial crisis of 2008, giving a bleak view of the impact of financial crises (including the Asian crisis) on lending.

Mrowiec (2012), points out that the Chinese banking sector has grown by 388 times, at a 20% average growth rate a year from the late 1970s. Hence, during the boom that was succeeded by the financial crisis of 2008, the banking sector practiced risky lending as well as participated in risky financial markets. According to results of the investigation, by the end of 2009 assets owned by the Chinese banking sector amounted to $11 536 billion. By the third quarter of 2010, the banking sector assets had increased to $13 568 billion, showing a 17% increase which is lower than the 20% average. The increase in bank assets, according to Mrowiec, was due to mitigation models that minimized the effects of the crisis. The financial crisis affected Chinese banking sector, particularly their balance sheet, in such a way that the banking sector witnessed decrements in the size of credit and loans across sectors, including

syndicate loans (Chui, et al., 2010). This coincides with the *Models of Credit Rationing* which asserts that banks put ceilings on the amount they are willing to lend a borrower than increase interest rates during economic stressful conditions. However, this paper looks at banking in general and not specifically how lending was affected. This general assessment limits and dilutes the results and may not be that conclusive in as far as bank lending is concerned.

In a research publication by Jurgan Conrad (2009), in Russia, pre the crisis, given the oil price boom and rising export revenue, there was large capital inflow. This gave banks a larger balance sheet from which to practice their lending activities. In 2006, 2007, and 2008 lending to the private sector increased by 49.5%, 50.9%, and 36.4% respectively. This indicates a sharp decrease in private sector lending when the crisis began. The central bank of Russia had to inject liquidity into the system until February 2009 when there was relative stability in financial markets and banking sector activity. According to the findings of this investigation, during the economic boom of 2002 to 2007, banks practiced low risk management and as such almost found themselves in a bank crisis. Thus the amount of credit lent to the private sector particularly was affected, indicating that the financial crisis affected bank lending activities in Russia. However, it is notable that the banking sector of Russia is highly dominated by state owned banks, which in fact are mainly subsidised by government. This is to say that this investigation cannot provide an accurate exposition and an explanation of how bank lending activities were affected by financial crises in South Africa, particularly given that the South African banking sector consists of privately own banks as major banks in the country. This leaves some room for investigation into the South African economy.

A study was done by Kaminsky et al (1998) on Asian and Latin American crises. In the investigation, the volatility of a variable is calculated by determining the mean absolute deviations from tranquil periods as percentages for each indicator for the 18 months prior to the crisis. The study indicates that the banking sector, particularly deposits and thus the balance sheet of banks were affected by financial crises. However, this study is restricted in scope in the sense that, firstly, it compares crises that occurred in Asia against those that occurred in Latin America. This study has no interest in how these crises affected bank lending although it mentions it briefly. Also, Latin America includes 26 countries, one of which is Brazil. There are hardly studies on how financial crises affected bank lending in Brazil specifically. So this gives a dim picture of how these two variables relate, particularly in Brazil as a BRICS partner.

3.4. Assessment of Literature

The review of theoretical literature shows that economic stressful conditions affect the behaviour of banks as far as lending practices are concerned. However, these theories have different positions on the causality of these variables as well as the details of the causes of crises in general. In the Debt-Deflation Theory Fisher argues that the root cause of financial crises is inefficient monetary policies that by virtue do not modify lending, which steers up financial crises. The Financial Instability Hypothesis extends Fisher's theory by identifying the way through which borrowers finance their investments, and reasons for such practices. The Credit Rationing models, on the other hand, extends to say that the price of credit, and in particular short term interest rates do not affect lending during crises, rather lenders have loan ceilings on the amount lendable to borrowers given crises and the effect it is expected to have on each borrower's financial position. Thus, theoretical literature review shows that, generally, there is consensus on the effect financial crises have on bank lending practices, but not what causes the crises themselves.

Empirical literature shows inconclusive results in that some investigations focused to a larger extent on the global financial crisis of 2008, and some were exclusively focused on the recent global financial crisis of 2008. Also, the effect crises have on the banking sector varies from country to country given each country's different economic policies, how these policies relate to the banking sector and its financial intermediary role, and finally the country's banking sector balance sheet positions; thus inconclusive. It also shows that although South Africa was exposed the most to financial crises as compared to other African countries; policy intervention responses to the threat of financial crises, more especially the global financial crisis of 2008, were able to minimise the effect; posing a great challenge to the developing economies without efficient financial policies. Most of these studies furthermore examined collective reactions by an industry, country or continent; noting that studies focussing specifically on the South African banking sector are still limited and provide scanty information on the impact of financial crises on South African bank lending. Some studies focus on economies that have state owned banks dominating the banking sector, thus would not be an accurate description of South Africa's banking sector, and in particular their lending practices given their different base compositions. Also in themselves, these studies either have important variables that were omitted from their models or questions unanswered as it has been discussed above. Some studies on the BRICS partners were not specifically studying the variables whose relationship is being studied by this paper. Thus the studies do

not give a picture of the relationship between the variables in question. In investigating the subject of bank liquidity creation during crises, studies of research and policy issues in banking typically focus only on a few components of liquidity creation, particularly private investment lending. This perhaps is due to the fact that liquidity measures that incorporate all the on- and off-balance sheet activities of banks are in short supply. Moreover models that researchers used did not consider the public sector lending variable. Thus, this study seeks to provide a clearer and precise picture on lending practice during all financial crises whose effects implicated South Africa's banking sector, and policy implications for economic and financial development.

3.5. Conclusion

Financial crises have attracted a lot of attention by economists, investors, consumers, and governments. Particularly, some economists have studied these crises and have developed models that seek to explain this phenomenon. In this regard, economists, over the years, through both theoretical and empirical literature, have found that indeed financial crises put pressure on economies and, in particular, bank lending activities. Although literature varies in the causes and solutions to financial crises on bank lending, as well as a limited South African perspective on it, there is general consensus in that crises affect lending practices. However, as implied above, there is limited literature on how financial crises affected South African bank lending practices; which still is an area for study.

CHAPTER FOUR
Methodology

4.1 Introduction

A quantitative research approach is different from qualitative approach in that the former seeks to answer the question of *how many* and *how much* while the latter answers *how* and *why* (Acaps, 2012). The objective of this study is to quantitatively assess the long run impact financial crises have on bank lending in South Africa. It is to establish by *how much* crises would have affected lending in the banking sector in the long run. Given the quantitative nature of the research objective and questions, a quantitative approach is the one that will be utilised in this research. Furthermore, the intention of this study is to give a conclusive empirical analysis of the primary variables of the study, and to provide description of the long run relationship of the primary variables.

Although both quantitative approach as well as qualitative approach would have been appropriate for this study, the study uses the quantitative method to reach conclusive evidence. This will allow me to answer the objective question *by how much* crises determine lending in the long run.

In this chapter we use the theoretical framework outlined in the previous chapter to construct and establish the appropriate econometric model that will be used to explain the extent to which the major variables in this study are related. This study uses variables that would be applicable in the context of the South African economy over the period of 19 years.

4.2 VAR Technique

This research studies the long run relationship between two primary variables, the South African bank lending rate and financial crises. The theoretical and empirical analysis of this study has discovered that there is a relationship between these two variables, the extent to which one affects the other varies from country to country. This study will utilise the Vector Autoregressive (VAR) model to ascertain the characteristic of the relationship between financial crises and bank lending activities. The characteristics of variables given the research objective implies simultaneity and exogeneity of some variables. The VAR has special qualities in that it treats all variables as endogenous and simultaneity in variables on the same

footing. This type of modelling is much simpler and reliable as far as forecasting is concerned. However, before the model is presented, a brief discussion on the model that has been chosen for this study will be presented.

The variables of consideration, in this study, are simultaneously related and are expected to have a long run relationship. The VAR has proven to be a relevant since once estimated variables can be used to simulate the response over time of any variable in the set of either an own disturbance or a disturbance to any variable in the system.

The Financial Accelerator and Credit Rationing Models have empirical evidence for and thus the variables used in the study are underpinned by these models. Moreover, this study borrows its variables from models established by Pembangana (2013), Kershoff (2009),and United Nations et al (2009), which are discussed in chapter three above.

4.2.1 Justification for variables selected
Financial Crises Index

A financial crisis is a situation when financial instruments suddenly lose value rapidly and South Africa has never had a crisis that was triggered by fundamentals of the domestic economy. In fact, all crises or effects thereof were transmitted mainly through variables such as the stock market prices (for which in this study we use FTSE/All Share Index prices as the index captures various share prices across all sectors); foreign exchange rates (such as the USDZAR); or debt market interest rates. In this study a financial crises index was computed using the standard deviation of the stock market prices, exchange rates, and debt interest rates; given that crises are transmitted into the economy through these variables.

The study could have utilised indexes like the *Bloomberg Financial Condition Index, Citi Financial Conditions Index, Deutsche Bank Financial Condition Index,* and *Goldman Sachs Financial Conditions Index*; but these particular indexes are constructed in relation to variables through which financial crises emerge. In simple, financial crises are transmitted through various variables which differ from economy to economy.

That being said, the South African financial sector is different from that of the United State (US), Asian economies or European. The SA stock market capitalisation is relatively small, and the ability of financial markets, especially capital markets, to influence the real economy is relatively small compared to the giant economies. Therefore a blanket indices such as the Bloomberg Financial Condition Index, Citi Financial Conditions Index, Deutsche Bank

Financial Condition Index, and Goldman Sachs Financial Conditions Index would not be reflective of the SA economy. Esterhuyen *et al* (2012) used dummy variables to indicate a crises index however, this study will not go that route as financial crises is the major and primary variable in this study. Therefore, in this study a financial crises index was computed using the standard deviation of the stock market prices, exchange rates, and debt interest rates.

Business Confidence

In chapter three we discussed Kiyotaki et al (1995) who said that banks supplied credit under the impression that the borrower will be able to pay back. In order to arrive at that conclusion, banks don't only look at the balance sheet of the borrower but look if business, particularly the private sector, is anticipating favourable future economic outplays. That is, if returns on investments by the private sector are expected to gain momentum. The bank will look whether businesses and banks are generally optimistic about the future and hence lend on that basis. This is because banks understand that businesses make their revenue and grow through their interaction with the market. If the market looks gloomy businesses will be conservative in their business practices. Hence business cycles are triggered by a collective perception of the future by businesses. This implies that there is a link between business confidence and bank lending.

Money Supply

Money supply also plays an integral role in the determination of bank lending. M3, a South African monetary aggregate that includes M2 and all long-term deposits of the domestic private sector with monetary institutions, is regarded by monetary authorities as the most reliable indicator of developments in the monetary (or financial) sector of the economy. It is said to be a reflection of the store of value function and not only the function of money as a medium of exchange (Mohr, et al, 2008). According to the South African Reserve Bank (2011) and Keynes (1937), the availability and the supply of money determines the interest rate as influenced by the repurchase rate and lending in an economy. Hence this variable is critical in this study.

4.2.2 The Model
The following are the variables used in the models.

The dependant variable:

L_t = Bank Lending

is a function of the following independent variables:

C_t = Financial Crises Index;

BC_t= Business Confidence; and

MS_t = Money Supply (M3 as defined by SARB)

The VAR model discussed is as follows:

Assuming that L_t is the nx1 vector of variables, the intra-impulse transmission process of which is to be captured by the study, the dimension of L_t (that is n) is 5, given the five variables of the analysis. Using matrix algebra notations, a 5-variable structural dynamic economic model for the study can be stated as:

$$BL_t \quad = \mu + \Gamma X_{t-1} + \acute{\varepsilon}_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where B is the matrix of variable coefficients

L_t is the 5 x 1 vector of observations at time t of the variables of the study that is, vector L_t is defined as $L_t = f(C_t; BC_t; MS_t)$

Also, μ is the vector of constants

Γ is a matrix polynomial of appropriate dimension

$\acute{\varepsilon}_t$ is a diagonal matrix of *structural innovations* that has zero

means, constant variance, and are individually serially uncorrelated, i.e.

$\acute{\varepsilon}_t \sim (0, \Sigma)$

The model can be expressed in estimation form as follows:

$L = \beta_0 + \beta_1 C + \beta_2 BC + \beta_3 MS + \mu$

Where: β_0 = autonomous (intercept)

β_1 = coefficient of Financial Crisis Index

β_2 = coefficient of Business Confidence

β_3 = coefficient of Money Supply

μ = error term

The model can also be expressed in log form:

$LogL = \beta_0 + \beta_1 LogC + \beta_2 LogBC + \beta_5 LogMS + \mu$

Where: *LogL* is the log form of lending

       LogC is the log form of financial crises

       LogBC is the log form of business confidence

       LogMS is the log form of money supply

It is typical of macroeconomic data to have non-stationarity, and in order to properly estimate the lending function it will be necessary first to check the time series characteristics of the date in order to determine their stationary condition to avoid spurious estimates in the presence of the unit root series. The time series properties of lending will be analysed carefully through the Augmented Dickey Fuller (ADF) and the Phillips Peron (PP) test. The stochastic properties of the model will also be tested using tests such as residual normality and include the White test, Durbin Watson test and the Jarque-Bera normality test respectively.

4.3 The Results and Analysis of the Model
4.3.1 Unit Root Test
The variables where checked for stationarity through the Augmented Dickey Fuller and Phillps-Perron tests and the results are shown in Table 5.1 and Table 5.2.

Table 4.1: Unit Root Test at Level Series

	Augmented Dickey Fuller			Phillips-Peron		
Variables	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
Lending	-1.317235	-1.155166	4.064204	-1.683964	-1.302489	7.283207

Crises index	-2.277356	-2.001833	-0.079231	-1.969644	-1.888404	0.120137
M3	-1.947958	-1.709135	1.605651	-1.836059	-0.415018	7.499854
Bus Confid	0.035917	-1.376445	-3.541592***	-0.290974	-1.574536	-5.045904***

*   Statistically significant at 10% level

**   Statistically significant at 5% level

*** Statistically significant at 1% level

(Source: Author's Computation Using Eviews)

Table 4.2: Unit Root Test at First Difference

	Augmented Dickey Fuller			Phillips-Peron		
Variables	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
Lending	-5.387235***	-5.513913***	-1.393967	-5.301129***	-5.451643***	-2.544148**
Crises	-6.705438***	-6.771426***	-6.749293***	-6.705438***	-6.794165***	-6.749293***
M3	-2.051857***	-6.801281***	-1.152114	-6.737499***	-7.127977***	-2.715641***
Bus Con	-4.882861***	-4.825376***	-0.834894	-5.000302***	-4.940133***	-2.814058***

*   Statistically significant at 10% level

**   Statistically significant at 5% level

*** Statistically significant at 1% level

(Source: Author's Computation Using Eviews 8 Econometric Software)

The obtained results confirm that each series contain a unit root (non-stationary) at level series. However, business confidence only showed stationarity statistically significant at 1% when tested with no intercept or trend in both tests. Given that it is only stationary at the none model, we can conclude that it is relatively non-stationary.

However, all variables became stationary at first difference level in both tests, with business confidence, lending and M3 not being significant at the none model using the ADF test but

significant at 1 % level at every other test, except for lending, which was significant at 5% when using the PP test at none model. Thus all series are said to be relatively stationary at first difference level.

4.3.2 Lag length selection

Estimating the lag length of autoregressive process for a time series is a crucial econometric exercise in most economic studies. Often, financial theory has little to say on what an appropriate lag length is for a VAR and how long changes in the variables should take to work through the system.

According to Liew (2004), Akaike's Information Criterion (AIC) and Final Prediction Error (FPE) are superior than the other criteria under study in the case of small sample (60 observations and below), in the manners that they minimize the chance of under estimation while maximizing the chance of recovering the true lag length. One immediate econometric implication of Liew (2004) is that as most economic sample data can seldom be considered "large" in size, AIC and FPE are recommended for the estimation the autoregressive lag length.

In this study, the lag length order was chosen using Eview 7 and the results therefore are shown in the table 5.3, in the appendix. In order to choose the lag length order, the lag order that criterions AIC and FPE select would be chosen. The results show that SC and HQ indicate 1 lag usage while LR, FPE, and AIC indicate 2 lags. Therefore the lag length order of 2 is used for this particular study since AIC and FPE indicate lag length order of 2. AIC and FPE are superior criterions in that they minimise the chance of under estimation while maximasing the chance of recovering the truth lag length (Liew, 2004).

4.3.3 Residual Analysis

In the appendix shows that the vector error correction model satisfies the stability condition, that is, no root lies outside the unit circle hence the model is certain and does not produce spurious results.

4.3.3.1 Heteroskedasticity

As shown in Table 5.9, the model shows no level of significance. F-statistic is 0.290333 with observed R-squared of 60% with a probability of 0.7408, which is more than 5%. Testing the null hypothesis, that there is homoscedasticity against the alternative hypothesis of heteroscedasticity, we fail to reject the null hypothesis. Thereby concluding that there is homoscedasticity. In simpler terms the error terms do have a constant variance.

4.3.3.2 Normality

The normality test results are presented in Table 5.10. Based on the results we fail to reject null hypothesis of the residual being normally distributed. That is, the model is insignificantly positively skewed and leptokurtic. The skewness and Kurtosis values are 0.110327 and 2.644840, respectively, while the Jarque-Bera value is 0.560903 with the probability of 0.755443.

4.3.3.3 Autocorrelation

Autocorrelation or serial correlation refers to the case in which the error term in one time period is correlated with the error term in any other time period (Brooks, 2008). If the error term in one time period is correlated with the error term in the previous time period, there is first-order autocorrelation. This is common in time-series analysis and leads to downward-biased standard errors (and, thus, to incorrect statistical tests and confidence intervals).The Durbin-Watson (DW) is a test for first order autocorrelation, that is, it tests only for a relationship between an error and its immediately previous value. In the event that there is evidence of a relationship between the successive residuals, the null hypothesis which states that the error terms are independent is rejected.

The results shown in table 5.11 in the appendix test the presence of autocorrelation. At lag 12, the test statistic is 9.823463with a probability of 0.8757. Thus the model does not show any level of significance, hence we fail to reject the null hypothesis which states that the error terms are independent. These results show that the error term in one time period is not correlated with the error term in any other time period.

4.4 Impulse Response

Impulse responses trace out the response of current and future values of each variable to a one unit increase in the current value of one of the errors, assuming that this error returns to zero in subsequent periods and that all other errors are equal to zero (Stock, et al, 2006). The impulse response identifies the responsiveness of the dependent variables (endogenous variable) in the VAR when a shock is put to the error term. So, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted. Thus, if there are *g* variables in a system, a total of impulse responses could be generated (Stock, et al, 2001). This is achieved in practice by expressing the VAR

model as a VMA, that is, the vector autoregressive model is expressed as a vector moving average. If the system is stable, the shock will gradually die away (Brooks, 2008).

4.5 Variance Decomposition

The variance decomposition bids a somewhat different technique for inspecting VAR system dynamics. It gives the proportion of the movements in the dependent variables that are due to their 'own' shocks, versus shocks to the other variables (Kartsaklas, 2011). That is, a shock to the ith variable will directly affect that variable, but the shock will also be transmitted to all of the other variables in the system through the dynamic structure of the VAR (Brooks, 2008).

4.6 Data Source

For this study quarterly time series data will be used over the period, first quarter in 1996 to the fourth quarter in 2015. The data will be collected from the South African Reserve bank and Bloomberg database. Interest rate and money supply were collected from the South African Reserve Bank. Exchange rate, all share index, and business confidence were collected from Bloomberg.

4.7 Prior Expectation

A change in C is expected to have a negative relationship with lending in the short run as financial intermediates would deem it riskier to lend out funds to either consumers or investors given the escalating unemployment rate and unfavourable business cycle. However, the extent of the negative short run relationship is not expected to be much given the mitigation role played by the central bank by increasing money supply. The long run relationship is expected to be positive as policy authorities employ mitigative policies in order to neutralise the effects of financial crises.

A change in BC is expected to have a positive effect on lending both in the short run and long run, as Business Confidence rises, lending by financial intermediaries will rise as they would be expecting the investor to take advantage of the profitability anticipation, given favourable economic conditions optimism for the future.

A change in *LogMS* has a positive effect on lending. An increase in money supply decreases interest rates thus making the cost of financial intermediation cheaper, all other factors held constant, lending would increase.

4.8 Summary and Conclusion

In this particular chapter, we specified the model and the variables that would potentially transmit the effects of the financial crisis onto the banking sector, in particular lending. The chapter started by providing the technique used in this study, the model specification, analysing the time series properties of the data employing the formal tests for stationarity, as well as lag length selection. To validate the parameter estimation outcomes achieved by the model, diagnostic checks were carried out and results indicated that the model was robust. These test for the stochastic properties of the model, such as the homoscedasticity test, the Jarque-Bera normality test, and autocorrelation.

We note that the model employed in this study may suffer from misspecification. This may arise as a result of omitted variables bias, in which case the omitted variables would have been variables that have evidence of collinearity with other variables. Notwithstanding the possibility of misspecification, this particular model offers the possibility of making accurate forecasts when the underlying economic model is unknown (Hill, et al, 1997) or known but where there are restrictions on the collection of data relating to the other variables in the underlying economic model. We proceed to test the model in the next chapter.

CHAPTER FIVE
Empirical Analysis

5.1 Introduction

In this chapter, the model and techniques discussed in the previous chapter are applied to South African data. This chapter augments the analysis by applying that framework and the analytical techniques proposed on quarterly South African data covering the period 1996 to 2015. The results presented include cointegration test, the regression, impulse response, and finally variance decomposition. Cointergration is be done in order to establish the long run relationship, and since the test shows evidence of a long run relationship, the error correction model is then estimated and analysed using impulse response and variance decomposition, and the chapter will be concluded. The econometric package used in this study is E-views version 7. The following section presents the empirical findings.

5.2 Cointergration

Even though a series may be non-stationary, the variables can move closely together over time and their difference will be stationary. This is tested by cointegration test and it is a necessary step to check if the modelling empirically discerns meaningful relationships among non-stationary variables (Sjö, 2008). If variables have different trends processes, they cannot stay in fixed long-run relation to each other, implying that you cannot model the long-run, and there is usually no valid base for inference based on standard distributions. If you do not find cointegration it is necessary to continue to work with variables in differences instead.

The advantage of cointergration test is that it allows one to integrate the long-run and the short-run relationship between variables within a unified framework. There are two conditions that have to be met for two or more variables to be co integrated. The first one is that they have to be of the same order of integration. Secondly, linear combinations of the variables from the regression of the non-stationary variables (in level) must be stationary. According to Brooks (2008), cointegrated variables ensure that we eliminate spurious relations and as such share common stochastic trends. Now that we have established that our variables are integrated of the same order, table 5.4 in the appendix section shows the cointegration test results of the trace and maximum Eigen test for the variables used in this study.

According to the results, we reject the null hypothesis of no cointegrating vectors for two cointergration equations in the trace test given that the test statistic of both equations are greater than their respective critical values. Both tests conclude at the 5 per cent level of significance at first difference level in the VECM model. This reveals the existence of a long run equilibrium relationship between financial crises, lending, business confidence, and money supply.

5.3. Vector Error Correction Model

It was well established that there is long run associationship between all variables, thus a need to do a vector error correction model (VECM). A VECM is basically a VAR model with an error correcting term which allows the short and long run dynamics to be estimated in a single model. More so, the error correction term is the same with the standard error correction model and it measures any movement away from the long-run equilibrium. This error correcting term is able to isolate the speed adjustment parameter.

The following are computed results from the cointergration relations results from Table 5.5 in the appendix:

$L_t = -3.576054_t + 0.070180C_t + 0.335711BC_t + 0.979492MS_t + \mu_t$

Standard Error   (0.02944)   (0.12474) (0.01863)

T-statistic   [-2.38416] [-2.69137] [-52.5764]

Looking closely at the above equation, the numerical values of the co-efficients and their signs have a lot to say about the model. The relationship is interpreted as the opposite of the sign on Table 5.5.

Financial Crises

The equation indicates that in the long run a percentage increase in crises index causes lending rate to increase by 7%, thus a positive long run relationship. This is a long run expression of the relationship between these variables. This relationship was expected as monetary and financial authorities regulate and structure policies that influence the behaviour of financial and monetary markets. According to Bhundia (2005), the successful management of the financial crises in 1998 and 2001 was a reflection of strong macroeconomic policies and regulation. Thus, the impact of financial crises on lending become positive in the long

run as crises cause monetary authorities to restructure policies such that they neutralise its effect on the economy through the monetary and financial sectors.

Business Confidence

The equation indicates that in the long run a percentage increase in business confidence causes lending rate to increase by 34%, thus a positive long run relationship. These results were expected as empirical literature has suggested. Kiyotaki et al (1995) argued that banks look if other businesses and banks are generally optimistic of the future, and if lending is worth it. This is because banks understand that businesses make their revenue and grow through their interaction with the market. If the market looks gloomy, businesses will be conservative in their business practices. Hence business cycles are triggered by a collective perception of the future by businesses. Thus business confidence was expected to have an influence on lending.

Money Supply

The equation also indicates that in the long run a percentage unit increase in money supply causes lending rate to increase by 97,5%, thus a positive long run relationship. These results were anticipated as money supply also plays an integral and quite critical role in the determination of bank lending. According to the South African Reserve Bank (2011) and Keynes (1937), the availability and the supply of money determine the interest rate as influenced by the repurchase rate and lending in an economy. Thus, as per expectation, money supply determined lending.

5.3.1 Short run analysis: An Error Correction Model

In this particular section we examine how crises, business confidence, and money supply influence lending in the short run. These are the variables of interest in this study. The tenacity of the analysis is to determine whether the short run dynamics are influenced by long run equilibrium cointegrating vectors. Table 5.6 shows the results of short run vector error correction model. These results depict the absence of a self-correcting mechanism on variables, because they take a longer period to adjust than the lag used in the study.

According to the results in Table 5.6, the speed of adjustment (error correction term) is 36%, the coefficient of C(1), toward long run equilibrium. Also, the error correction term shows significant at 1% level of confidence and is a negative value. As implied in Table 5.5 and Table 5.6, the variables take longer to adjust than the lag length used in the study.

5.3.2 Impulse Response

From table 5.7 below on the response of lending on crises (graph B1) it is noted that for about half of the first quarter lending has no response to crises, but there is a sharp positive increase in the second quarter that slows down and sustains a relatively flat slope from the second quarter to the 5th quarter. On the response of lending to itself (graph A1), a shock is noted from the second half of the first quarter to around the fourth quarter, thereby showing stability from the fourth quarter onwards.

On the response of lending to business confidence (graph C1) it is noted that from about the second quarter to the third, there is a sharp short-lived decrease, then the negative response is sustained to the fourth quarter and then picks up but remains negative. Lending, however, shows that towards the end of the first quarter it responds positively to money supply (graph D1) and that response remains positive and upward sloping as shows on the graph.

5.3.3 Variance Decomposition

This section seeks to analyse the results from variance decomposition as postulated in table below. As shown on the table below, lending explains 100% of its own changes in the first quarter of lending shocks. Approximately 4% is explained by crises from the second quarter and climaxes on the fifth quarter to about 7% but decreases with time, reaching 3% in the long run. Virtually business confidence explains 0.4% and money supply 88% in the long run.

Variance Decomposition of Lending

Period	S.E.	Lending	Crises	Bus. Con	M3
1	0.006061	100.0000	0.000000	0.000000	0.000000
3	0.012968	86.21960	6.020677	1.412024	6.347696
5	0.019470	63.47433	6.846307	1.546218	28.13314
8	0.030485	42.62051	6.090931	0.893373	50.39518
70	0.177183	9.518239	2.754472	0.038189	87.68910
80	0.191835	9.209437	2.713252	0.032579	88.04473

Variance Decomposition of Crises

Period	S.E	Lending	Crises	Bus. Con	M3
1	0.021585	4.929299	95.07070	0.000000	0.000000
3	0.046135	9.851833	88.58078	0.116275	1.451114
5	0.063735	15.89073	81.88098	0.149967	2.078315

8	0.084440	20.39273	77.07599	0.592876	1.938409
70	0.276381	29.84452	67.79178	2.035160	0.328543
80	0.295988	30.00770	67.62009	2.066101	0.306114

The results show that crises explain little of lending in South Africa. This supports the notion that the South African banking sector is hardly affected by financial crises, particularly in as far as lending is concerned. These results were expected as they were supported by literature as discussed in chapter three. The results in terms of money supply were also expected as monetary policy plays an integral role in the determination of lending by banks. In essence, lending is almost entirely explained by money supply in South Africa. This has been established by both theoretical and empirical literature. However, variance decomposition shows results that are different from expectation. As established by literature, business confidence plays a role, although the extent differs from country to country, in the determination of lending by banks. However, variance decomposition results show that in the long-run business confidence has very little effect on lending. These results were not anticipated.

From the results, it is clear that the largest factor to explain lending is money supply, then crises, and lastly business confidence. However, as depicted by the results, it is clear that lending explains crises the most as it contributes 30% of crises, business confidence and money supply by 2% and 0.3%, respectively.

5.4 Conclusion
This chapter analysed the impact of the financial crises on bank lending practices and employed the Vector Error Correction Model in doing so. Based on theory, a background on the financial crisis and South African banking sector and data availability, the lending model was specified. The potential explanatory variables included in this model include the financial crises index, business confidence, and money supply.

The Johansen (1988, 1991, and 1995) cointegration technique was chosen as the preferred parameter estimation technique for the lending model because of its several advantages over alternative techniques. The variables were found to be integrated of the same order and the test provided evidence of one cointegrating relationship. The error correction indicates that if variables deviate from equilibrium in the short run, they tend to re-adjust themselves back to long run equilibrium. Finally, the model was estimated and the regression results were produced. The regression results from the model support the notion that financial crises has a

positive impact on lending in the second quarter in the short run and a little impact in the long-run.

Furthermore financial crises and business confidence explain lending changes to a much lesser extent as compared to the rate in which money supply explain changes in lending. In fact, money supply almost entirely explains lending activities by banks in South Africa. These results were not purely supported by economic theory in that it was expected that crises would have a significant implication on lending as well as business confidence. However, empirics show that South African bank lending particularly was insignificantly affected by financial crises. Hence these results are reliable and conclusive.

CHAPTER SIX
Summary and Conclusion, Policy Implications, and Recommendations

6.1 Summary and conclusions

This chapter attempts to draw conclusions and give policy implications and recommendations based on the results obtained in the previous chapter. The study investigated the relationship between financial crises on bank lending activities in the period 1996Q1-2015Q4, thus the general objective being to determine the relationship between financial crises and banks' lending patterns in the South African banking sector. The main variables background for the country was presented, and literature surrounding the relationship between financial crises and bank lending activity was discussed. Literature review found that indeed financial crises put pressure on economies and, in particular, bank lending activities, although it varies in the causes and solutions to financial crises on bank lending.

Based on an extensive review of literature on the relationship between financial crises on bank lending activities and on data availability, an empirical model that links lending and its potential determinants was specified. The variables used included a financial crises index, business confidence, and money supply. The first step employed was the analysis of the time series properties of the data by employing the formal and test for stationarity. The variables were found to be integrated of the same order and all of them were stationary after being differenced once. Lag length was done and the results indicated 2 lag length usage. Evidence of one co integrating relationship was established by the Johansen co integration test and this allowed for the estimation of VECMs which provided parameter estimates for the long run relationships. The model was then subjected to diagnostic checks and results indicated that the model was robust.

The regression results from the model support the notion that financial crises have a negative impact on lending in the second quarter in the short run and a positive impact in the long-run. The impulse response and variance decomposition functions showed that both the crises index and lending respond to their own shocks as well as the shocks from each other. Also, both lending and crises proved to respond positively to each other on the impulse response. An interesting parameter in the VECM is the speed of adjustment coefficient. This measures the speed of adjustment in lending following a shock in the system. The study revealed that

about 36% of the variation in output from its equilibrium is corrected within a quarter, meaning it takes about a year or so for full equilibrium to be reached after the shock in the system has occurred.

Although the financial crisis did negatively affect lending in the short run, the impact was by far less than the impact on other economies whose markets were not fully protected and regulated. In fact, in South Africa, crises only negatively affected lending during the first lag but recovered on the second lag. This therefore implies that bank lending in South Africa is able to absorb the shock of a crisis within a year, proving that authorities have established a strong policy framework in as far as financial stability is concerned as it relates to lending. However, the sustainability of financial stability given the political climate in South Africa is still questionable.

6.2 Recommendations and Policy Implications

This research makes a contribution to the policy debate by examining whether or not financial crises have a relationship with lending and also whether the relationship is significant or not. The South African banking sector experienced sluggish growth in lending during the periods of crises, more especially during the 2008 financial crisis. When the 2008 crisis occurred, South African financial markets were relatively healthy and well insulated by regulatory laws such as Credit Act and Basel II and III implementation and monetary policies. In addition, the financial stability model of the central bank is able to identify and monitor excessive domestic credit extension that could result in self-feeding asset-price bubbles. These factors cushioned bank lending as banks were not severely exposed to toxic loans as its international counterparts were. This is why the impact of the crisis was miniature.

The policy stance adopted by any government may differ from country to country because of the differences in financial sophistications, political climates or economic structures that may exist between countries. The South African Reserve bank has to take into consideration these characteristics before making policy decisions. The South African economy has a sophisticated financial economy which constituted 20.6% of GDP in 2015, showing the importance of financial assets, including money supply, in a financial economy such as South Africa. However, the country is considered highly indebted given its national income level. The country has a lot of unsecured lending generally; and growth prospects, discussant,

political uncertainty contribute largely to rating agencies such as Moody's and Standard and Poor being on the verge of downgrading the country to a notch below investment grade, which has a potential of facilitating a mini financial crisis.

According to IMF (2015), South Africa's indebtedness is currently sitting at 50.1% of GDP, and its counterparts Brazil (58.91%), Russia (17.7%), India (66.4%), and China (43.9%) are relatively around the same range. On the other hand, the United States of America's (USA) indebtedness is 104.5%. This means that the USA owes more than it produces. Thus, in my opinion, the indebtedness of South Africa is not necessarily bad, however given the economic growth outlook of 0.2% by the Finance Ministry, the ability of the country to pay its debt is increasingly worrisome. In addition, the depreciation of the rand over the last year or so leading to cycles of interest rate hikes makes it even more expensive for the country to pay back its debts. On the same breath, South Africa is the smallest economy compared to the BRICS economies and as such would require more debt (or investment, especially infrastructure) than larger countries would in order to sustain growth. In my view, the intention of government to curve unnecessary expenditure as a means to avoid a downgrade should be an interim measure. Government should invest a lot in infrastructure development, which will facilitate foreign direct investment and ultimately growth. This will, in the long run, avoid threats of credit rating downgrades and subsequently mini crises.

The mandate of the South African Reserve Bank is specifically to defend the domestic currency in order to protect its citizens from inflation. Thus, given the trade-off between interest rate hikes and lending (or between inflation targeting and growth stimulation), the central bank may not be in a position to sacrifice currency protection for lending stimulation and ultimately economic growth. On the other hand, in terms of policy, the National Treasury has a mandate to stimulate economic growth and does this mainly through government expenditure. However, the Minister of Finance in his 2016 budget speech mentioned and stressed the fact that government will curve expenditure during the current financial year and decrease its debt. National Treasury is the one institution left to drive growth stimulation in the economy, and thus curving expenditure, particularly infrastructure development expenditure, is a counter policy to growth. When growth increases, savings increase, and ultimately lending is stimulated, which further stimulates investment and growth. As a means to improve the country's credit rating, and given the country's debt levels and economic growth outlook, government expenditure should rather be redirected to infrastructure investment.

Also, in an effort to cushion the economy from the impact of the recent and future financial crises, the South African Reserve Bank should intensify its pursuit of a conscious operational investment-prudential framework. This policy should encourage lending for operational investment and discourage lending for equity participation as the latter is a transaction that relates to the exchanging of ownership rather than operational growth. This would limit financial system-wide distress that will result in significant losses in terms of real output. Equity transactions do not directly enhance the operational base of firms and as such bear a default risk with them. The authorities should also adopt countercyclical policies that will foster financial discipline during crises. This will help the economy have a sustainable lending pattern such that even during crises lending would be largely for reinvestment. This will ultimately lessen unintended consequences and direct the reaction of commercial banks and those of other financial institutions towards rational decision-making, rather than fuelling and reinforcing a particular cyclical phase.

In my opinion, the results obtained in the study have two policy implications: Firstly, the presence of the long run co-movements between lending and its determinants found in the study implies the effectiveness of targeting one of the variables in influencing the behaviour of the other variables. Supposing that this interpretation holds, this then justifies the stance taken by South African Reserve Bank in manipulating interest rates and money supply (and consequently the fixed capital investment and the credit extended to the private sector) in order to influence the long run behaviour of the other variables that also affect lending. Secondly, a crises may be imported from the external economy which may be outside the control of the authorities. The policy implication is that the authorities will have limited influence on the extent to which financial crises impact lending.

It is difficult to fully escape the impact of financial crises because of the international relationship that exists between countries and the global environment in which they operate. Financial crises therefore should always be a cause of concern especially for relatively small economies like South Africa with relatively small financial economies compared to its counterparts. Thus stringent regulatory measures should always be in place to avoid severe effects when these crises do occur.

6.3 Limitations of the study and areas for further research

The study focused on selected macroeconomic variables determining lending. This may have left other important variables, such as credit score, that may affect the decisions for banks to lend out money. Also, this work only considered the period from 1996 to 2015. Although the period has three difference episodes of financial crises it is limited in that it does not capture crises that may have occurred prior to 1996. As a result, the study excludes other economic variables that may have influenced bank lending prior to 1994 (for example, the international sanction of the apartheid government) which would have produced better results, making an even stronger model to the study.

The study investigated the specified period due to the economic transition during that period as well as the availability of data on the specified time period from credible sources. The study was limited to the South African economy only and the consequence is that the results obtained may not be applicable to other economies. However the study remains significant as the conclusions drawn from it may prove to be useful in the South African context.

The study mainly focused on the relationship between financial crises and bank lending as a whole. This means that the study only gives attention to a selected part of the financial system. Certain parts of the financial system may have adversely affected banks, which would have affected lending, and ultimately the results of this study. Therefore, from this aspect a useful extension of this study can be made.

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Appendix

Table 5.3 VAR Lag Order Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	533.8897	NA	5.82e-12	-14.51753	-14.39202	-14.46751
1	1049.316	960.2471	6.66e-18	-28.20045	-27.57293*	-27.95037*
2	1070.627	37.36657*	5.78e-18*	-28.34595*	-27.21641	-27.89581

* indicates lag order selected by the criterion

Table 5.4 Cointergration Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.471160	78.28174	47.85613	0.0000
At most 1	0.197767	29.22744	29.79707	0.0581
At most 2	0.147188	12.25998	15.49471	0.1449
At most 3	4.79E-06	0.000369	3.841466	0.9867

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.471160	49.05430	27.58434	0.0000
At most 1	0.197767	16.96746	21.13162	0.1736
At most 2	0.147188	12.25961	14.26460	0.1013
At most 3	4.79E-06	0.000369	3.841466	0.9867

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level

Table 5.5 Cointegration Relations

Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1
LOGLENDING(-1)	1.000000
LOGCRISESINDEX(-1)	-0.070180
	(0.02944)
	[-2.38416]

LOGBUSCON(-1)	-0.335711	
	(0.12474)	
	[-2.69137]	
LOGM3(-1)	-0.979492	
	(0.01863)	
	[-52.5764]	
C	3.576054	

Table 5.6 Lag variables

D(LOGLENDING) = C(1)*(LOGLENDING(-1) - 0.0701803106794
    *LOGCRISESINDEX(-1) - 0.335711409945*LOGBUSCON(-1) -
    0.979491508583*LOGM3(-1) + 3.57605376832) + C(2)
    *D(LOGLENDING(-1)) + C(3)*D(LOGLENDING(-2)) + C(4)
    *D(LOGCRISESINDEX(-1)) + C(5)*D(LOGCRISESINDEX(-2)) + C(6)
    *D(LOGBUSCON(-1)) + C(7)*D(LOGBUSCON(-2)) + C(8)*D(LOGM3(
    -1)) + C(9)*D(LOGM3(-2)) + C(10)

|	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.363372	0.077513	-4.687912	0.0000
C(2)	0.415448	0.117629	3.531865	0.0008
C(3)	0.036399	0.108864	0.334350	0.7392
C(4)	0.071405	0.033311	2.143599	0.0357
C(5)	-0.045464	0.034669	-1.311369	0.1942
C(6)	-0.172889	0.335532	-0.515267	0.6081
C(7)	-0.815559	0.328255	-2.484532	0.0155
C(8)	-0.126627	0.123888	-1.022108	0.3104
C(9)	-0.205864	0.116348	-1.769387	0.0814
C(10)	0.008695	0.001963	4.430149	0.0000

Table 5.7 Impulse Response

Response to Cholesky One S.D. Innovations
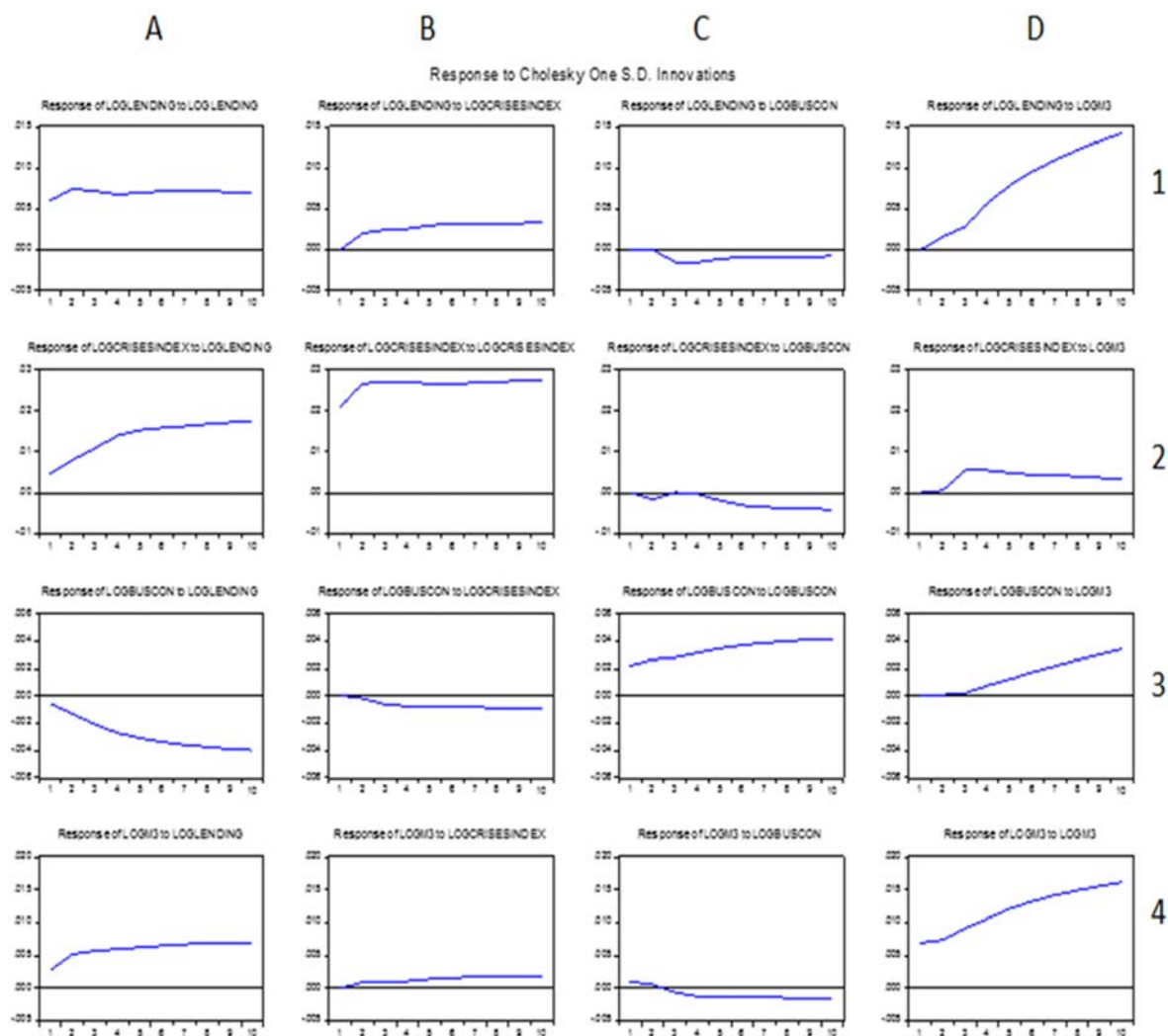
Table 5.8 Variance Decomposition

Variance Decomposition of
LOGLENDING

Period	S.E.	LOGLENDING	LOGCRISESI NDEX	LOGBUSCON	LOGM3
1	0.006061	100.0000	0.000000	0.000000	0.000000
2	0.009977	93.32079	4.144701	0.011120	2.523390
3	0.012968	86.21960	6.020677	1.412024	6.347696
4	0.016022	74.60354	6.556949	1.833575	17.00594
5	0.019470	63.47433	6.846307	1.546218	28.13314
6	0.023105	54.78230	6.759748	1.253528	37.20443
7	0.026788	48.03381	6.446087	1.046343	44.47376
8	0.030485	42.62051	6.090931	0.893373	50.39518

9	0.034186	38.20806	5.764703	0.770542	55.25670
10	0.037877	34.58122	5.475634	0.668054	59.27509
70	0.177183	9.518239	2.754472	0.038189	87.68910
71	0.178702	9.482699	2.749730	0.037542	87.73003
72	0.180208	9.448329	2.745143	0.036918	87.76961
73	0.181702	9.415073	2.740705	0.036313	87.80791
74	0.183184	9.382879	2.736407	0.035728	87.84499
75	0.184654	9.351697	2.732245	0.035162	87.88090
76	0.186112	9.321480	2.728211	0.034613	87.91570
77	0.187559	9.292186	2.724300	0.034081	87.94943
78	0.188995	9.263773	2.720507	0.033566	87.98215
79	0.190420	9.236202	2.716826	0.033065	88.01391
80	0.191835	9.209437	2.713252	0.032579	88.04473

Variance Decomposition of
LOGCRISESINDEX

Period	S.E.	LOGLENDING	LOGCRISESINDEX	LOGBUSCON	LOGM3
1	0.021585	4.929299	95.07070	0.000000	0.000000
2	0.035276	7.099424	92.67625	0.197852	0.026471
3	0.046135	9.851833	88.58078	0.116275	1.451114
4	0.055575	13.20742	84.74435	0.082669	1.965564
5	0.063735	15.89073	81.88098	0.149967	2.078315
6	0.071084	17.81306	79.82226	0.305943	2.058742
7	0.077949	19.23792	78.28946	0.462652	2.009972
8	0.084440	20.39273	77.07599	0.592876	1.938409
9	0.090574	21.37579	76.07113	0.704054	1.849020
10	0.096375	22.22107	75.22584	0.805323	1.747766
70	0.276381	29.84452	67.79178	2.035160	0.328543
71	0.278404	29.86296	67.77238	2.038655	0.326002
72	0.280412	29.88087	67.75354	2.042051	0.323535
73	0.282406	29.89829	67.73522	2.045352	0.321139
74	0.284386	29.91522	67.71741	2.048562	0.318811
75	0.286352	29.93168	67.70009	2.051684	0.316547
76	0.288305	29.94771	67.68323	2.054722	0.314346
77	0.290245	29.96330	67.66681	2.057680	0.312205
78	0.292172	29.97849	67.65083	2.060561	0.310120
79	0.294086	29.99328	67.63526	2.063367	0.308091
80	0.295988	30.00770	67.62009	2.066101	0.306114

Table 5.9. Heteroskedasticity

Heteroskedasticity Test: ARCH

F-statistic	0.290333	Prob. F(2,72)	0.7489
Obs*R-squared	0.600021	Prob. Chi-Square(2)	0.7408

Table 5.10. Normality

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)

Null Hypothesis: residuals are multivariate normal
Date: 08/31/16   Time: 21:59
Sample: 1996Q1 2015Q4
Included observations: 77

Component	Skewness	Chi-sq	df	Prob.
1	0.110327	0.156207	1	0.6927
Joint		4.661600	4	0.3238

Component	Kurtosis	Chi-sq	df	Prob.
1	2.644840	0.404696	1	0.5247
Joint		21.65619	4	0.0002

Component	Jarque-Bera	df	Prob.
1	0.560903	2	0.7554
Joint	26.31779	8	0.0009

Table 5.11 Autocorrelation

Lags	LM-Stat	Prob
12	9.823463	0.8757