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The Global Financial Crisis and its impact on the South African Economy

By

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Declaration and Copyright

I, the undersigned, Vongai Gwendolene Madubeko, student number 200509125, do hereby declare that this dissertation is my original work with the exception of quotations and references whose sources I have acknowledged. I also declare that the work has not been submitted, and will not be presented at another University for similar or any other degree award.

Vongai Gwendolene Madubeko



30 March 2011

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Acronyms and Abbreviations

JSE - Johannesburg Stock exchange

SARB- South African Reserve Bank

GDP -Gross Domestic Product

FCI- Financial Conditions Index

OLS- Ordinary Least Squares

ECT-Error Correction Term

ECM- Error Correction Model

LM- Lagrange Multiplier

Abstract

This dissertation investigates the effects of the financial crisis on the South African economy. In order to do this, an index which describes the financial conditions of the South African economy is constructed and computed. The index indicates that domestic South African financial conditions have deteriorated substantially during the period under study and so the study investigates how this has impacted on the country's economic growth. A VAR model with South African variables is specified and used to assess the quantitative effects of the financial crisis on South African real GDP growth. Results suggest that the South African economy was not significantly affected by the crisis, but economic growth was slowed down and may still grow substantially slower in the next few years due to the financial crisis. These results corroborate the theoretical predictions and are also supported by previous studies.

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Chapter one

Introduction to the Research Study

1.1 Background

An economy that is healthy and lively needs a financial system that transfers funds to economic agents with the most productive investment opportunities. A financial crisis interferes with this process because it can drive the economy away from equilibrium with high output in which financial markets perform well to one in which output declines sharply because the financial system is unable to channel funds to those with the best investment opportunities.

The global financial crisis which took a while to develop began showing its effects in the middle of 2007 and into 2008. The financial crisis has spread to developing countries through trade linkages, a decline in Foreign Direct Investments and remittances, and a large decrease in commodity prices. Despite the fact that the world economy is still expected to recover in 2010, the downside risk is high. According to Lin (2009), two factors are determinants of the recovery: whether world leaders can rise above growing popular protectionist pressure, and whether leaders endorse a decisive, coordinated fiscal stimulus. Coordination will be of great importance, as stimulus enacted by only one or two countries will be rendered ineffective by international diffusion.

The initial liquidity crisis resulted from the subprime mortgage crisis. According to Akkas A (2009), the opinion that the global crisis started with the burst of the US housing bubble is not an isolated phenomenon but is rather linked to the US recession that began in December 2007 following a boom of November 2007. The crisis was widely predicted by a number of economic experts and other observers, but it proved impossible to convince responsible parties such as the Board of Governors of the Federal Reserve of the need for action. One of the first victims outside the US was Northern Rock, a major British bank. The bank's inability to borrow additional funds to pay off maturing debt obligations led to a bank run in mid-September 2007. The highly leveraged nature of its business, unsupportable without fresh infusions of cash, led to its takeover by the British Government and provided an early indication of the troubles that would soon befall other banks and financial institutions.

Many authors see 2003 as an important threshold in the lead-up to the current financial crisis. This was the time when the US finally recovered from the IT bubble, growth rose around potential and Japan nationalized a major bank in response to the earlier financial crisis. The market for securitized assets grew rapidly especially in the US and investors began demanding more Asian equities.

China's economy had been booming and it had increased its production capacity. According to Dykes (2009), the Ned bank group chief economist, China used stimulus policies that included low interest rates and taxes and experienced large economies of scale therefore driving prices of its products down. These cheap products from China were exported to Europe and the USA. China had a large current account surplus which matched the large deficit for Europe and USA. This then resulted in a large buildup in liquidity and a fall of the cost of money.

South Africa's economy had also been doing well. The country saw its inflation rate going down to single digits and had achieved respectable GDP growth and maintained macro stability. According to Ngwenya, & Zini, (2008), annual GDP growth averaged 5.1% over 2004-07, up from 3.6% over 2000-03. This was driven by household consumption, private and public fixed investment on the demand side, financial and business services, construction, and wholesale and retail trade on the supply side.

From then until 2007, when the US housing market began to change, the world financial and economic environment was favorable. In Akkas' (2009) view, the US monetary policy enabled people to borrow at very low cost and this led to excessive lending and as a result the housing bubble developed. There were a large number of subprime mortgages and the effect of these high-risk loans had been perceived to be lessened by securitization. However, the strategy appears to have had the effect of spreading and amplifying it. The securitization schemes eventually failed and the subprime mortgage crisis thus resulted. Rising interest rates increased the monthly payments on newly-popular adjustable rate mortgages and property values declined greatly leaving home owners unable to meet financial commitments and lenders without a means to regain their losses. This led to sharp rise in foreclosures and an even larger number of homes were dumped into the market. The value of houses

in the United States declined because of this excess and the consequence was the developing financial crisis.

In the run-up to the crisis, low financial volatility, low nominal interest rate and ample liquidity had increased investors' appetite for risk. Hedge funds were joined by traditional institutional investors in the "search for yield" as they expanded their investment in search for wider spreads and higher returns. Investors did not pay much attention to the risks involved in the complex structured products they purchased, they trusted the rating agencies to evaluate the risks appropriately.

Akkas (2009) also suggests that the disintegration of the US sub-prime mortgage market and the problem of the housing boom in other industrialized economies had a ripple effect on the economy of the whole world. A number of financial products and instruments became so complex that as things started to untangle, trust in the whole system began failing. The financial system was already vulnerable because of complicated and highly-leveraged financial contracts and operations and a U.S. monetary policy that was making the cost of credit negligible therefore encouraging such high levels of leverage. The extent of this problem has been so severe that some of the world's largest financial institutions have collapsed.

As confidence deteriorated banks became unsure of their own liquidity needs and thus stopped lending to each other, leading to the credit crunch. They began hoarding liquidity worsening the situation. Initially, central banks provided liquidity to the financial system but the need for liquidity became persistent and they had to devise new ways of supplying it. Despite central bank's support, the crisis deepened and broadened leading to the failure of many financial institutions (such as the Lehman brothers).

Observers of the meltdown have cast blame widely. According to Ikhome (2008), some observers highlighted the lack of effective government supervision and described the lending practices of subprime lenders as greedy. Others have accused mortgage brokers of misleading borrowers into taking up loans they could not afford even though lenders offered these borrowers programs that found them acceptable risks, appraisers with inflating housing values, and Wall Street investors with backing subprime mortgage securities without verifying the strength of the portfolios. Critics have

also placed blame on borrowers for over-stating their incomes on loan applications and entering into loan agreements they could not meet. Some subprime lending practices have also raised concerns about mortgage discrimination on the basis of race. Ikhome (2008), argues that the effects of the meltdown spread beyond housing and disrupted global financial markets as investors, mostly deregulated foreign and domestic hedge funds, were forced to re-evaluate the risks they were taking and consumers lost the ability to finance further consumer spending, causing increased volatility in the fixed income, equity, and derivative markets.

The causes of the crisis have become fairly clear, the US housing bubble playing a major role among other causes. Factors such as the strong liquidity stemming from loose Monetary Policies, financial innovation, poor regulation and the Chinese surpluses contributed greatly to the global financial crisis. The US and the UK also had large buildups of debt with the US debt increasing from 90% of household income to about 130% of household income and UK's debt to about 175%. What is not so clear, though, is how the losses incurred could spread to other parts of the global financial system and most importantly how this affects other economies.

1.2 Statement of the Study

According to Ikhome (2008:2), the argument that Africa stands a reasonable chance of sailing through the global financial crisis, less bruised than other regions of the world, is based on the fact that some of the economic weaknesses that have slowed down development of the continent in the past now appear to serve as a useful shield against the full impact of the crisis. However, while this could be true of a majority of African economies, it is not true for all of them. Although South Africa, one of the global South's emerging markets, is an exception to this rule, its policies such as the exchange controls, interest rate policy and the National Credit Act insulated it from the direct effects of the crisis.

Although South Africa's financial markets have had greater regulation and oversight over the years that distinguishes them from the financial markets of the more advanced economies of Europe and North America, it is not completely immune to the effects of the financial crisis. According to Seeraj, (2008), the country's debt-driven, consumption-led growth makes it very vulnerable to the credit

crunch. In addition to this, South Africa's financial markets are more closely linked to those of the industrialized economies of the North and emerging economies than those of other African countries. Some of the major shareholders in some of the country's key banks are foreign investors such as Barclays Bank holdings in ABSA and China's ICBC recent acquisitions in Standard Bank South Africa.

The factors that drive South Africa's economic growth have also partly been a result of increased short-term, foreign portfolio capital flows. Over the years, this made certain the supply of credit and larger amount of liquidity to the private sector (Seeraj, 2008:13). Together with increased access to credit, these inflows led to greater speculation in financial and real estate markets and accelerated consumption growth, which however, did not lead to increased investment. Developing countries such as South Africa with large trade deficits, and that are dependent on short-term foreign capital inflows to finance trade deficits, are more vulnerable to the global credit crunch.

When the global financial crisis struck, some of South Africa's vulnerabilities had already started to surface. The country battled with high unemployment rate. The agricultural sector was also underperforming partly because of the floods that were experienced in early 2007. Because consumer demand was deteriorating globally and also because of the growing energy shortages in the country, the manufacturing industry suffered immensely, particularly the motor industry. The household debt as a proportion of GDP was rising fast and the current account deficit started widening. South Africa's Political developments especially prior the April elections were also breeding uncertainty and thus discouraging investment. Because of these vulnerabilities, South African economists and policy makers have felt the need to assess the effects of the crisis on the country's real economy in order to implement policies that would reduce the negative effects.

1.3 Objectives of the study

In the last 80 years, the whole world has been affected by the deepest and most serious economic crisis. Like other countries which are still developing and have a strong integration with the world economy and depend significantly on its good health, South Africa has been affected by the financial crisis but this has mainly been second round effects. The result is that growth expectations have had

to be sharply revised, downwards. The primary objective of the study is to establish the impact of financial crisis on the growth of the South African economy.

The specific objectives of this study include:

- To critically review the typology of global financial crises.
- To establish the extent to which financial crisis has affected South Africa's macroeconomic growth.
- To make conclusions and policy recommendations based on the findings of the study.

1.4 Hypotheses

The following hypotheses are tested in this study:

- An external crisis has a negative impact on South Africa's economy.
- There is a long run relationship between financial markets and the growth of the economy.

1.5 Justification of the Study

Considering the fact that the current financial crisis is more widespread than previous crises, thus exerting a greater effect on the industrial countries, the perception has arisen that the current crisis has been stronger in its impact on the affected economies. In this regard, however, recollections of the hardships endured during previous financial crises may have been dimmed by the passage of time. The impact of these previous crises has been at least as severe as that of the current crisis. The crisis has provoked South African economists to look at its causes and the resulting implications for South Africa. According to Ikhome (2008), when the storm hit, South Africa had been sitting on relatively strong fundamentals. However, the crisis allowed certain vulnerabilities of the economy to be exposed. Questions as to what it means for South Africa and its financial sector now that the global financial system is broken have been raised and thus this study analyses how the crisis that has impacted on South Africa and the possible solutions that can be undertaken by the government to lessen the impact.

The analysis will be useful in providing information to both investors wanting to invest in South Africa and to policy makers in their efforts to improve the growth of the South African economy. Clear-cut effects of financial crisis on the South African economy are of paramount importance in decision

making. Policy makers need information on the precise effects of financial liberalization on developing economies in order to formulate, evaluate and prescribe policies for the country and therefore the analysis also strives to identify policy factors that if addressed would prevent such a crisis from happening again. This study also strives to separate the causal effect of what happened to the country's gross domestic product and establish whether the crisis was significant in the reduction of economic growth.

1.6 Organization of the study

This study is divided into six chapters. The current chapter introduces the problem to be investigated and focuses primarily on the background of the intended research. It reveals the relevant comparative historical experiences that led to the financial crisis. Following this introductory chapter is Chapter 2 gives critical review of some of the financial crises that have occurred in the 1990s and also touches on the various policy responses implemented by countries in an attempt to stabilize the financial sector. It is intended to shed more light on what constitutes a financial crisis and how the current financial crisis compares to other financial crises that have been experienced in the past. Chapter 3 reviews both the theoretical and empirical literature pertaining to the financial crisis. Chapter 4 will present the analytical framework for analyzing the impact of the financial crisis. Following this chapter is Chapter 5 which will analyze and interpret the results obtained. Chapter 6 will have the conclusions and recommendations deduced from the results.

Chapter Two

Background to the Global Financial Crisis

2.1 Introduction

The financial integration of recent decades has had important benefits for emerging economies, but has also been associated with increased financial turbulence. South Africa has been no exception, with local financial markets severely affected by financial crises over the past ten years. These crises have motivated economists to study the dynamics and underlying causes of financial crises and also to look at the effects of this turbulence on the economy. This chapter is intended to shed more light on what constitutes a financial crisis and to also give an overview of the various types of financial instability experienced over the past decades. The chapter focuses mainly, but not entirely, on events in developed countries where securities markets as well as banks are important to the financial system and financial intermediation.

2.2 Overview of financial crises.

2.2.1 Crises in different eras.

The question of how the recent crisis compared with other crises has been touched on and authors have attempted to address it. According to Allen et al (2007), financial crises have occurred in four eras i.e. Gold Standard era (1880-1913), The Interwar years (1919-1939), The Bretton Woods Period (1945-1971) and the recent period (1973-2008). There are several individual financial crises that have occurred within these periods, the most notable one being the Great Depression of the 1930s. The different crises will be grouped under past and more recent financial crises and a number of similarities between the crises and important differences will be highlighted below.

2.2.1.1. Past Financial Crises

i. Pre Great Depression

The most benign period was the Gold Standard Era. During this period, banking crises occurred but were limited. Currency and twin crises were also limited compared to subsequent periods. The implication is that globalization does not inevitably lead to crises since the global financial system was fairly open at this time.

The interwar years were the worst with regard to the frequency of crises in the four periods. Given that this is when the Great Depression occurred, this is not so surprising. Banking crises were particularly prevalent during this period relative to the other periods.

ii. The Great Depression

The economic damage caused by the current crisis has been said to have worrisome parallels with the Great Depression of the early 1930s. The Great contraction of 1929-1933 was the worst recession in the United States of America. Output declined by 34%, prices by 24% and unemployment rose from 4% to 25%. In their monumental "A Monetary History of the United States" (1963), Friedman and Schwartz argue that the contraction was mostly as a result of a one-third disintegration in the supply of money which was accelerated by four major banking panics, occurring in succession, starting in October 1930 and also the failure of the Federal Reserve to follow its mandate and act as a lender of last resort by using open market purchases to offset these bank failures.

According to Bordo (2009), the many bank failures also resulted in an implosion of financial intermediation which further contracted the economy. In March 1933, the FDR declared a one week banking holiday during which solvent banks were separated from the insolvent. Only the solvent banks were to reopen. This is when the contraction ended. In April 1933, large purchases of gold by the Treasury increased the money supply and changed inflationary expectations from inflationary to deflationary. This together with the floating of the dollar quickly stimulated recovery.

Allen et al (2007) explains that after the Great Depression, most policymakers were so determined to prevent such an event from occurring again and so they imposed strict regulations or brought the banks under state control to prevent them from taking much risk. As a result banking crises were almost completely eliminated. This period was the Bretton Woods period. Besides the twin crisis in Brazil in 1962, there were no banking crises at all during the whole period. Frequently, currency crises did occur but these were mostly because macroeconomic policies were conflicting with the fixed exchange rates level set in the Bretton Woods system.

2.2.1.2. Some Recent Financial Crises

Both emerging and developed countries have become more prone to crises in recent years. There have been repeated comparisons between the current crisis and past crises such as the Mexican Crisis, the Asian Crisis and the most frequent one being with the Great Depression which also started in the USA.

i. The Scandinavian Crises (1985-1986)

According to Allen et al (2007), Norway, Finland and Sweden experienced a typical boom-bust cycle that led to twin crises. In 1985 and 1986, lending increased by 40 percent in Norway. Prices of asset hiked whilst consumption and investment also increased significantly. The bursting of the bubble was mainly due to the collapse in oil prices causing the most severe banking crisis and recession since the war. In Finland, the massive credit expansion was as a result of an expansionary budget in 1987. According to Allen et al (2007), housing prices rose by a total of 68 percent in 1987 and 1988. The central bank also raised interest rates and imposed reserve requirements to moderate credit expansion. In 1990 and 1991, the economic situation was worsened by a fall in trade with the Soviet Union. Prices of assets plunged, banks had to be supported by the government and GDP contracted by 7 percent. In Sweden, a steady credit expansion through the late 1980s resulted in a property boom. In 1990, credit also tightened and interest rates increased. Several banks experienced severe problems because of lending that had the foundation of inflated asset values. The government had to intervene and a recession followed.

ii. Japanese Financial Crisis

According to Allen et al (2007), in the 1980s, the Japanese real estate and stock markets were affected by a bubble. Japan faced a growing pool of investable funds relative to traditional domestic investment opportunities, as corporate fixed investment slowed while household saving remained strong. Financial liberalization throughout the 1980s and the desire to support the United States dollar in the latter part of the decade led to an expansion in credit. During most of the 1980s, asset prices rose steadily, eventually reaching very high levels. According to Davis (2003), the introduction of a new Governor of the Bank of Japan in 1989 who had less interest in supporting the U.S. dollar and was more concerned with fighting inflation led to the tightening of the monetary policy to counteract

the risk of a spill-over of asset price increases into general inflation. In 1990 quantitative restrictions were also applied to lending for real estate purposes. This led to a sharp increase in interest rates in early 1990. The bubble burst. Equity and real estate prices fell sharply in Japan from their 1990 peak. The next few years were marked by defaults and retrenchment in the financial system. Three big banks and one of the largest four securities firms failed as they faced problems of capital adequacy. The aftermath of the bubble affected the real economy and growth rates and the consequences were the banking crisis and recession.

iii. Mexican Crisis (1994)

According to Olivie (2009), in the years leading up to the Mexican crisis, a lot of Latin American countries initiated economic reforms that attracted the attention of international investors. In the case of Mexico, the terms for access to certain treaties or organizations (e.g. North American Free Trade Agreement, OECD and the General Agreement on Tariffs and Trade (GATT)) and domestic reform process conveyed an economic reform agenda that incorporated domestic economic deregulation, an opening up in terms of trade and finance and the privatization of public sector companies in several sectors. International investors, who considered the changes positive, were also encouraged by low interest rates in the US in the early 1990s.

Foreign financing entered Mexico mainly as bonds. Even though foreign direct investment and shares on the stock market also brought in money, for the most part, this came from privatization and was insignificant compared from debt. According to Olivie (2009), debt contracts and titles were also denominated in foreign currencies. This substantial entry of capital 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. And since these transactions were denominated in Mexican pesos, excessive foreign debt and a rise in internal credit directed at high-risk activities meant that there was a currency imbalance between assets and liabilities.

During the course of 1994, other complications compounded the situation. Some of these were of economic and others of a political nature. With reference to the economy, one complication that stands out most is the rise in interest rates in the US market. Moderate levels of interest rates were at

least somewhat responsible for capital entry into Mexico in the early 1990s. According to Olivie (2009), a lower differential in interest rates resulted in a lesser lure of Mexican debt. To make things worse, a series of events left Mexico engulfed in political instability.

The stock markets began to fall with the eruption of the Chiapas rebellion. Olivie (2009) also discusses how international investors' expectations as to profitability and risk intrinsic to the Mexican economy started to alter. Even though stock indices randomly continued to fall for the remaining months of the year, Mexican interest rates began to rise as foreign currency reserves declined. By year end, with exhausted currency reserves, the Mexican authorities had deserted the semi-fixed exchange rate system, accelerating the collapse of the Mexican peso. Just then, the crisis spread to the rest of Latin America, resulting in the so called Tequila effect.

iv. The Russian Crisis and Long Term Capital Management (LTCM)

The Long Term Capital Management (LTCM) fund was quite successful during the first two years and earned very high returns for its investors until in 1997 when returns declined. By this time, LTCM had about \$7 billion under management and thus decided to return about \$2.7 billion to investors as they were not able to earn high returns with so much money under management. In 1998, Russia devalued its currency and defaulted on about 281 billion roubles of government debt resulting in a global crisis with extreme volatility in many financial markets. Flight to quality caused prices to move in unexpected directions and many of the convergence trades that LTCM had made started to lose money and lost a lot of capital. According to Davis (2003), eventually, the Federal Reserve Bank of New York coordinated a rescue whereby the banks that had lent significant amounts to LTCM would put \$3.5 billion for 90 percent of the equity of the fund and take over the management of the portfolio. The reason behind this was to avoid the likelihood of a global meltdown in asset markets and the systemic crisis that would follow.

v. Asian Crisis (1997)

Up until 1997, Asian countries such as Singapore, Hong Kong, Taiwan (the Dragons) and Thailand Indonesia and Malaysia (the Tigers) experienced great economic performance. Their economies grew at sustained high rates for a very long time. According to Allen et al (2007), after sustained pressure,

the Thai Central bank stopped defending the Thai Baht and consequently it fell 14% in the onshore markets and 19% in the offshore markets marking of the start of the Asian financial crisis.

The Philippine peso and the Malaysian ringitt were next currencies to come under pressure. The Philippine central bank tried to defend the peso by raising interest rates, but it however lost \$1.5 billion of foreign reserves and consequently let the peso float, resulting in the currency falling by 11.5 percent. The Central bank of Malaysian also defended the ringitt before letting it float and so did the Indonesian central bank.

Singapore decided against defending its currency and by the end of September 1997, it had depreciated by 8 %. Taiwan also stopped defending their currency and let it depreciate but it was not affected much. According to Allen et al (2007), Hong Kong's exchange rate, which was pegged to the dollar, was affected severely but however, it was able to maintain the peg. The South Korean won appreciated against the other South East Asian currencies in the beginning but as time went by and things got more intense it lost 25 percent of its value. By the end of the crisis in December 1997, the dollar had appreciated against the Malaysian, Philippine, Thai, South Korean, and Indonesian currencies by 52, 52, 78, 107, and 151 percent respectively.

Real effects of the crisis were persistent and continued to be felt within the region even though the turmoil in the currency markets was over by the end of 1997. Output of many industrial and commercial firms fell sharply and a lot of financial institutions went bankrupt. The crisis was quite severe and extremely painful for the economies involved.

vi. The Argentina Crisis of 2001-2002

In the 1980s, Argentina's economy did poorly. It suffered through an extended period of economic instability including the Latin American debt crisis and hyperinflation and had a number of inflationary episodes and crises. In 1991, it introduced a currency board that pegged the Argentinean peso at a one-to-one exchange rate with the dollar and limited the printing of pesos only to an amount necessary to purchase dollars in the foreign exchange market. This ushered in a period of low inflation and the country enjoyed strong economic growth in the early 90s. Despite these favourable

developments, a number of weaknesses developed during this period. Following Mexico's December 1994 peso devaluation, capital flowed out of emerging markets and Argentina's GDP declined by 2.8%. In 1997, a number of events occurred, including the crisis in Asia. The financial crisis moved to Russia and then Brazil. Argentina entered prolonged recession in third quarter and unemployment began to rise. According to Davis (2003), the public debt the government had accumulated limited the amount of fiscal stimulation that the government could undertake. Also the currency board meant that monetary policy could not be used to stimulate the economy. The recession continued to deepen. At the end of 2001, it began to become clearer that Argentina's situation was not sustainable. The government tried to alter the way that the currency board operated as a means of rectifying the situation. Exporters were subject to an exchange rate that was subsidized and importers paid a tax. The situation in the country worsened. There was a run on the private sector deposits followed by looting of supermarkets. The government imposed bank withdrawal limitations of 250 pesos per week. According to Davis (2003), this resulted in protests and rioting spread to major cities. In December 2001, the economy collapsed. Industrial production fell 18 percent year-on-year. Imports fell by 50 percent and construction fell 36 percent. In January 2002, a new currency system was introduced by the fifth president which included allowing the peso to float. It soon fell to 1.8 pesos to the dollar. On the whole, the crisis was devastating. Real GDP fell by about 11 percent in 2002 and inflation in April 2002 went to a high of 10 per cent a month.

- **Common Elements of Current Crisis with the Asian and Mexican Crises**

The Asian and Latin American crises of the late 90s have a lot in common with the current global crisis, although there are also some big differences. It is clear that the three regions all had domestic economic problems before their respective crises began. A common problem that materializes in all three regions is the weakness of the system of financial regulation and oversight. With Mexico and Asia, this may have been the result of financial reforms that were undertaken too fast and/or in a disorderly fashion.

According to Allen et al (2007), when the asian crisis occurred, the South Korean economy deteriorated even more in earlier periods in some of its macroeconomic variables without slipping into a financial crisis. With regards to the Mexican crisis, studies that have been done attribute the

rise in interest rates in the US and domestic political instability as the factors that contributed to its occurrence. In the case of the US, the country has been posting twin deficits for decades. Since the 1990s the US has had a constant current account deficit which it has financed through a debt which the rest of the world economy has been willing to supply. This was partly because the US dollar is an international reserve currency.

- **Parallels of the current crisis with Great depression**

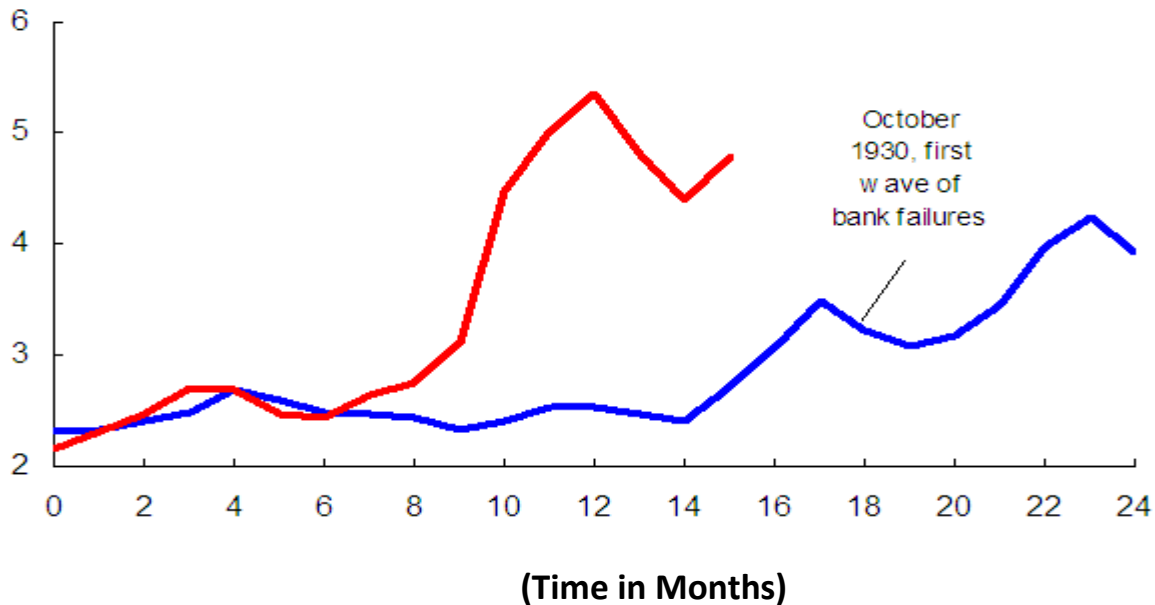
Although there has been success in controlling the damage caused by the current crisis, the risks involved should not be taken too lightly. According to Helbling (2009), the weakening in financial conditions from balance sheet contraction, asset fire sales, and increased demand for liquid assets has been more rapid than during the Great Depression and at least as strong, if not stronger. This can be seen in the diagram below. The current crisis peaked faster than the great depression.

Helbling (2009) also explains that feedback effects on the solvency of financial intermediaries from deteriorating economic activity have started to materialize. What turned the recession of 1929-30 into the Great Depression was the surfacing of adverse feedback loops between real and financial sector adjustment in the absence of an offsetting policy. Evidently, policy actions to stop asset price deflation, avoid debt deflation, reinstate confidence in the financial sector and support a global recovery need to be maintained.

Figure 2.1 below describes financial factors in the USA. (Baa corporate bond spread months after the business cycle peak)

Figure 2.1: Financial factors in the USA

Baa Corporate Bond Spread² (percent)



Source: Helbling (2009:23)

Comparisons of the current financial crisis and the great depression have been done by several authors. The distinction has been between the setting, initial conditions, transmission, and policy responses.

Helbling (2009) suggests that in both the Great Depression and the current crisis, the US economy was the centre of the financial contraction. This characteristic differentiates these episodes from the any of the financial crises that have occurred in the past few decades. A global impact has thus been all but certain from the onset because of the weight of the US economy and its financial system.

In both episodes rapid credit expansion and financial innovation that led to high leverage paved way for the crisis. According to Helbling (2009), however, the 2004-07 boom was global whilst the 1920s credit boom was mainly concentrated in the US. A financial shock to the US economy now has a greater and more immediate effect on global financial systems because of higher levels of real and financial integration than during the interwar period. These greater financial vulnerabilities must be balanced against weaker global economic conditions in 1929. Helbling (2009) also suggests that to a lesser extent, consumer prices in major economies had already stagnated or started declining before

the US recession started. Slowing activity in the economy thus led to deflation almost immediately. On the contrary, inflation which was above target in mid-2008 has provided an initial cushion in the current crisis. Key attributes in the financial sector transmission in both episodes were liquidity and funding problems. At the root of both crises were concerns about the net worth and solvency of financial intermediaries, although the specific mechanics differed given the financial system's evolution.

According to Helbling (2009), in the Great Depression, the problems were as a result of the erosion of the deposit base of US banks in the absence of deposit insurance. In four waves of bank runs, about one-third of all US banks failed between 1930 and 1933. The scene for bank runs in countries in Europe was set by the failure of the Austrian bank Creditanstalt, in 1931. However, in the recent global financial crisis, deposit insurance has provided some sort of reassurance and has to a greater extent prevented bank runs by retail depositors. Instead, financial intermediaries have experienced funding problems relying on wholesale funding, mostly those issuing or holding US mortgage-related securities whose value was affected negatively by increasing mortgage defaults. Because of increased cross-border linkages, the problems have immediately reached other nations. On the contrary, during the Great Depression, the spillovers were more gradual. Rising capital flows to the US and money supply contraction in the source countries were responsible for the transmission of the US funding problems.

There has been a strong, swift recourse to macroeconomic and financial sector policy support in the current crisis unlike in the Great Depression, when countercyclical policy responses were practically absent. Central banks in the major currency areas have intervened massively to provide financial systems with liquidity and lowered policy interest rates. Exceptional discretionary fiscal stimulus will support aggregate demand this year.

According to Bordo (2009), the current crisis which has led to a recession was not caused by a classic banking panic because the Federal Deposit Insurance Corporation (FDIC) successfully removed the incentives for depositors to stage runs on their banks. However, the causes were in fact losses in wealth that were related to the stock market crash that led to even greater wealth losses, contracted

consumer spending and investment and collapse of housing prices. Nevertheless a banking crisis is still a key element of present problems because the interbank lending market dried up, many banks became insolvent and lending is constrained. Helbling (2009) also explains that in addition to this, the failure of the subprime mortgage market led to the collapse of the derivatives markets, and because of the run by creditors on the uninsured investment banks, to the collapse of the shadow banking system. A major credit crunch also resulted and this is evident in the large hikes in quality spreads and the paralysis of some credit markets. This also resulted in a serious recession which in turn has intensified banking system and the financial sector problems. A similarity between the current recession and the Great depression is that both crises were driven by shocks to the banking and financial sector, but the orders of magnitude are much less now than then i.e. five quarters into the recession, real GDP reached about 6% below trend. At the same stage in the Great depression, it was 12% below trend and at its trough in 1933 it was 30% below trend.

2.2.3 What makes this financial crisis different?

The financial crisis that broke out in the US in 2007 and spread to the rest of the world's wealthy and developing economies over the course of 2008 caught analysts, governments and private-sector forces utterly by surprise. Credit crises in the past tended to be confined to the commercial banking and direct lending sectors. With the growth of the securitization market, investment banking firms became big players in the mortgage market, as well. This allowed the risk to spread far and wide, making this crisis that started with subprime lending in the United States both a bank and nonbank, as well as a global, problem.

Many economists have offered numerous analyses as to the causes of the crisis and have also debated over the best ways to respond to it. There have therefore been repeated comparisons between the current global crisis with other crises. One of the most frequent ones is the comparison with the Great Depression in 1929, which also started in the US. The consequences for the real economy are compared with those of World War II, and the work that the G-20 countries embarked on in November 2008 is compared with the process that led to the Bretton Woods accords of 1944.

According to Samuelson (2009), each financial crisis, however, has a resemblance to other crises and passes through similar phases. Nevertheless, each crisis also has its own distinctive characteristics. Three features distinguish the current economic crisis: Firstly, the proximate origins of the crisis were in the United States: despite of the amount of blame for the crisis placed on US macroeconomic policies and on financial regulatory policies, it still remains a fact that the United States led the way into the crisis. Secondly, if the leading economy in the world, whose currency and financial institutions are at the foundation of the global financial system, stops performing efficiently, it should not be surprising that the resulting crisis is global. In this crisis, the citizens and authorities of a country can run, but they cannot hide. Thirdly, it is quite common for a crisis to begin in the financial sector, spread to the real economy, cycle back to further deteriorate the financial sector, and in so doing further aggravate the conditions in the real economy.

According to Samuelson (2009), the analysis of the economic and financial situation was more complicated in the current crisis. During the greater part of 2008, global growth appeared to be holding up in general, and inflation, mainly in commodity prices, was still rising. Policymakers were sluggish in learning that they were dealing with two severe crises on a global scale i.e., in the financial system and in the real economy. Numerical evidence about dual crises in the traditional industrial countries on average reflects that financial decline led to real economy slump. Improvements in the real economy lead the financial upturns, except for equity prices.

2.3 Background of the South African Economy

South Africa is the economic powerhouse of Africa, leading the continent in industrial output and mineral production and generating a large proportion of Africa's electricity. The country has abundant natural resources, well-developed financial, legal, communications, energy and transport sectors, a stock exchange ranked among the top 20 in the world, and a modern infrastructure supporting efficient distribution of goods throughout the southern African region.

South Africa has experienced strong economic growth since the ending of Apartheid in the early 1990s. A profound restructuring of the economy has borne fruit in the form of macro-economic stability, booming exports and improved productivity in both capital and labor.

2.3.1 Financial Markets and Financial Policy

South Africa has a sophisticated financial structure with the JSE securities exchange, a large and active stock exchange that ranks 20th in the world in terms of total market capitalization as of March 2009. At the end of May 2009, the JSE's market capitalization amounted to USD614 billion (R4.9 trillion) and market turnover to USD300 billion (R3.1 trillion) for the 2008 calendar year. The liquidity ratio increased from 35.5 in 2005 to 41.4 in February 2009.

South Africa has a well-regulated banking sector. The Basel II capital framework was implemented in January 2008. The SARB started to publish benchmark overnight interbank rates in 2001 and in March 2007, introduced the improved South African Benchmark Overnight Rate on deposits (Sabor). The South African Reserve Bank (SARB) performs all central banking functions. The SARB is independent and operates in much the same way as Western central banks, influencing interest rates and controlling liquidity through its interest rates on funds provided to private sector banks.

According to Mboweni (2009:1-3), in 2009, monetary policy was faced with new challenges. For the first time since the introduction of the inflation-targeting framework in 2000, monetary policy had to be implemented in the context of a domestic recession and against the backdrop of the severe and synchronized downturn in the world economy. At the same time, inflation remained well above the upper end of the inflation target range and, despite the downside pressures; targeted inflation was only moderating at a very slow rate.

Even though inflation was still outside the target range, monetary policy was still eased and the MPC continued to apply monetary policy within a flexible inflation-targeting framework, cognisant of the economic downturn. Nevertheless, price stability remains the ultimate objective of monetary policy and the Reserve Bank remains committed to achieving the target over a reasonable time frame.

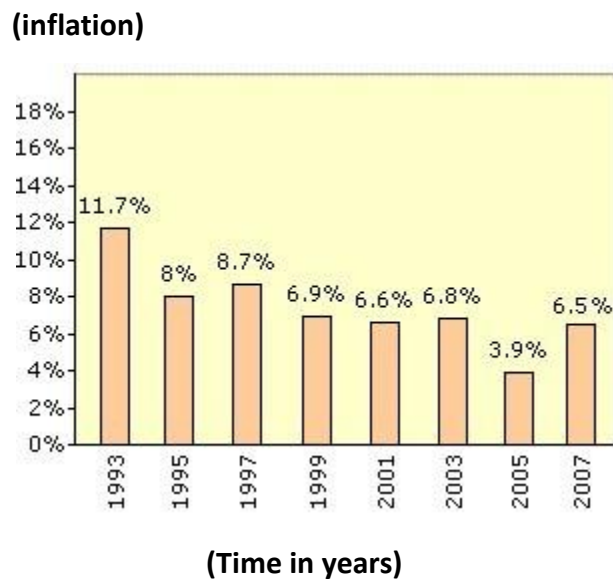
The South African Government has also taken steps to gradually reduce remaining foreign exchange controls, which apply only to South African residents. According to Faure (2007), private citizens are now allowed a one-time investment of up to R2 million in offshore accounts. Since 2001, South African companies may invest up to R750 million in Africa and R500 million elsewhere. Smaller South

Africa Companies can also move up to 50 Million Rand without SARB approval, allowing for swifter expansion to overseas markets.

2.3.2 Inflation Rate/ Exchange rate

The monetary authorities have tried to keep the country’s inflation rate under control. From 2004 through 2006 consumer inflation came in at under 5% before global prices pressed it up to 6.5% in 2007. In 1994 it stood at 9.8%. Figure 2.2 below shows South Africa’s inflation rate from just before independence (1993) to 2007.

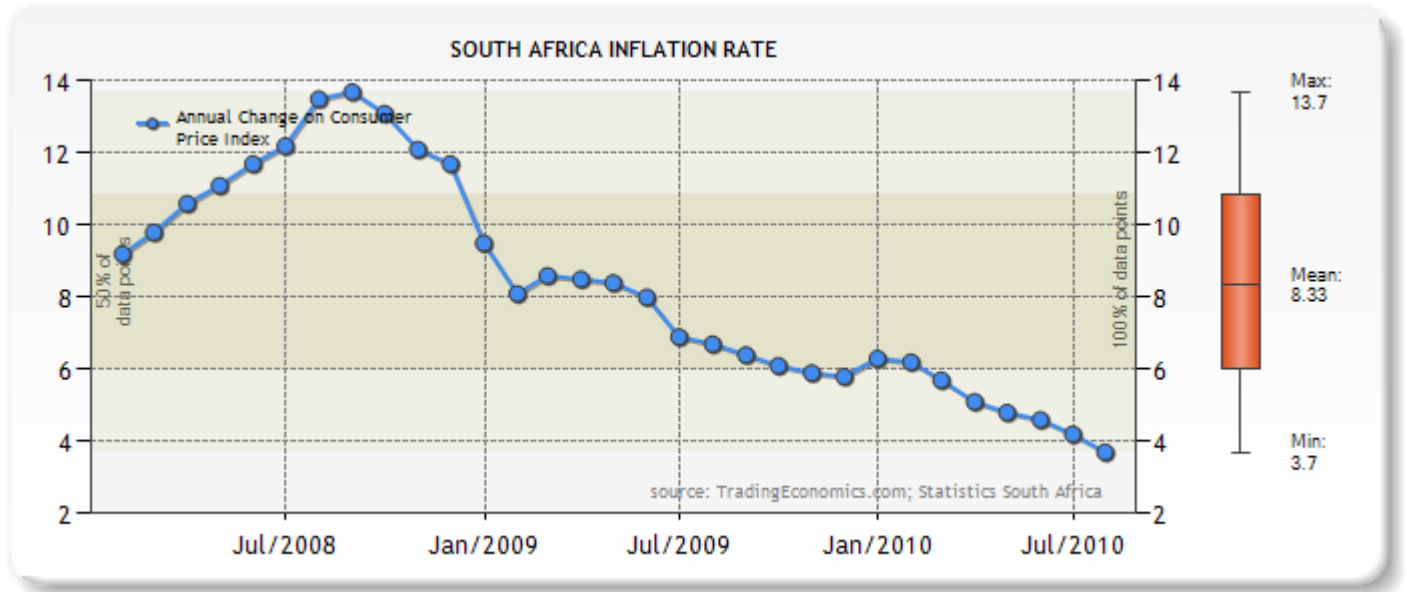
Figure 2.2: South Africa’s inflation rate (CPIX)



Source: Statistics South Africa (1997)

According to Mboweni (2009:1-3), inflation clocked in at 6.1% year on year in September, driven primarily by food price increases – but the rate of decrease is clearly slowing down. Currently, South Africa’s year-on-year inflation rate stands at 3.70 percent. In 2008, the South African Reserve Bank (SARB) took steps to compress price pressures. The SARB is allowing the currency to adjust rather than targeting a specific value for the exchange rate. The Rand plunged almost 30% against the US\$ in 2008, and in the early stages of 2009, before regaining lost ground through Q3.

Figure 2.3 below shows the country's inflation rate from January 2008 to July 2010.



Source: Trading Economics.com; Statistics South Africa (2010)

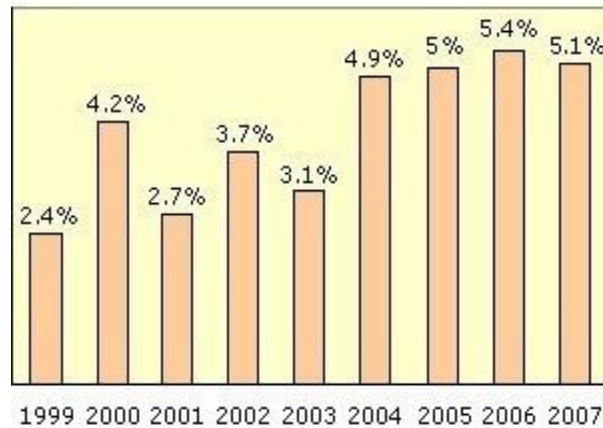
2.3.3 Economic growth

According to an article by SADC bankers (2009:2), South Africa's economy has been in an upward phase of the business cycle since September 1999, the longest period of economic expansion in the country's recorded history. As shown in figure 4 below, South Africa's real GDP rose by 3.7% in 2002, 3.1% in 2003, 4.9% in 2004, 5% in 2005, 5.4% in 2006, the highest since 1981 and 5.1% in 2007. In the fourth quarter of 2007, South Africa recorded its 33rd quarter of uninterrupted expansion in real GDP since September 1999.

South Africa's economy has been completely fixed since the inception of democratic government in the country in 1994. Bold macroeconomic reforms have boosted competitiveness, growing the economy, creating jobs and opening South Africa up to world markets. Over the years these policies have built up a rock-solid macroeconomic structure. Taxes have been cut, tariffs dropped, the fiscal deficit reined in, inflation curbed and exchange controls relaxed.

Figure 2.4: Growth of GDP in South Africa

(GDP Growth)



(Time in years)

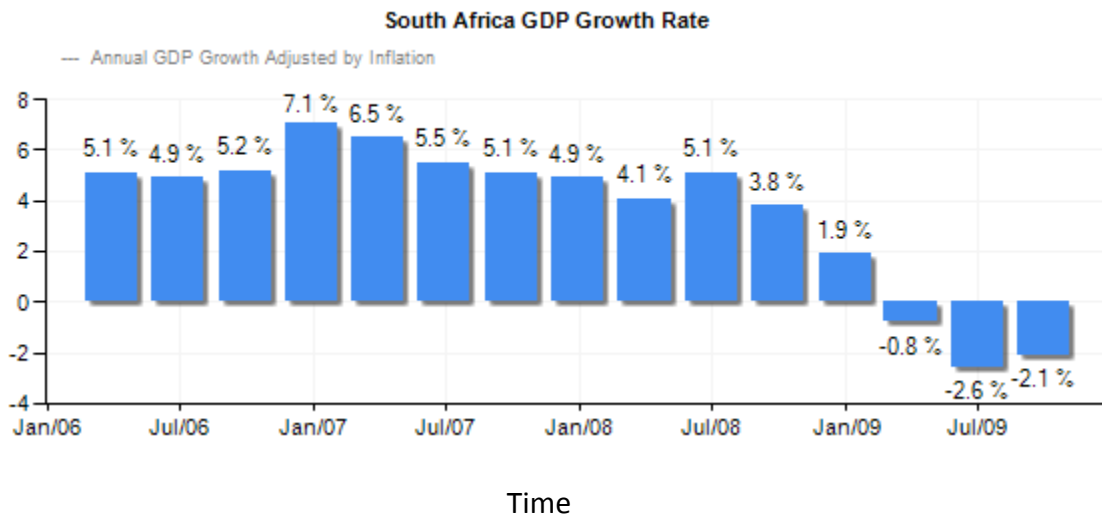
Source: Statistics South Africa (1997)

SADC bankers (2009:2-3) also noted that economic growth and prudent fiscal management have seen South Africa's budget deficit drop dramatically, from 5.1% of GDP in 1993/94 to 0.5% in 2005/06 - the second-lowest fiscal deficit in the country's history after the 0.1% reached during the gold boom in 1980. 2006/07 saw the country posting its first ever budget surplus of 0.3%.

According to the World Bank, South Africa Gross Domestic Product (GDP) contracted 2.10% over the last 4 quarters. In Q1/09 output posted an annualized 6.4% q/q contraction, followed by a 3% q/q decline in Q2/09. Currently, the South Africa Gross Domestic Product has a proportion of 0.45% of the world economy or is worth 277 billion dollars. According to Trading Economics (2009), South Africa has a two-tiered economy; one challenging other developed countries and the other with only the most basic infrastructure. It is therefore a productive and industrialized economy that displays many characteristics associated with developing countries, including a division of labor between formal and informal sectors and an uneven distribution of wealth and income. The primary sector, based on manufacturing, services, mining, and agriculture, is well developed.

The figure below shows the country's GDP growth rate from January 2006 to July 2009. It is evident from the diagram that since the start of the crisis, the growth of the economy has since deteriorated.

Figure 2.5: SA GDP growth rate in percentages against time in months



Source: Trading Economics, Global economics Research.2009

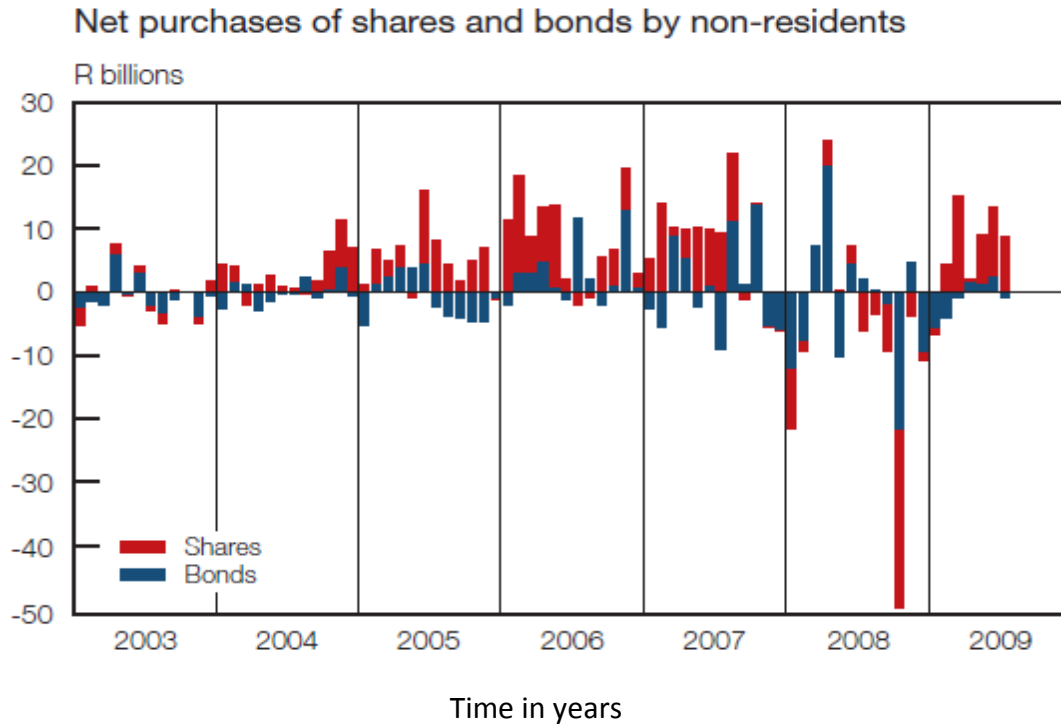
2.3.4 Developments in the Economy and Transmission of the Crisis into the South African economy

According to Kershoff (2009:5), the financial crisis was transmitted into the economy mainly through the financial markets, tightening of bank lending standards and trade linkages. The section below provides an analysis of the main developments in the South African economy including the financial system and the real sector. Developments in these sectors have a significant bearing on the stability of the domestic financial system.

2.3.4.1 Financial Markets

The spread of South African bonds widened at the height of the financial market crisis, but have narrowed in the meantime. Kershoff (2009:5) also explains that during the global crisis, risk aversion rose. As shown in figure 2.6 below, foreign portfolio investment flows to emerging countries, such as South Africa, reversed.

Figure 2.6



Source: SARB Quarterly Bulletin, Sep. 2009, p. 42

Figure 2.7: Rand exchange rate



Source: SARB Financial Stability Review, Mar 2009, p. 31

Figure 2.7 above shows that after dropping sharply in September 2008, the rand exchange rate recovered and returned to pre-crisis levels by May 2009.

According to SARB Financial Stability Review of March 2009, in the third quarter of 2008 the ratio of equity market capitalization to GDP dropped substantially even though it was still high. As shown in Table 2.1 below, an additional drop was experienced in the fourth quarter and this was in line with developments in the global equity markets. In the third and fourth quarters, no major changes were recorded with regard to the ratio of broad money supply to GDP and the ratio of private-sector credit to GDP, and in part this reflected relatively tight credit conditions together with still relatively high lending rates. Bank intermediation also remained relatively constant.

Table 2.1: Selected indicators of financial-sector development

	2007		2008		
	Dec	Mar	Jun	Sep	Dec
Equity market size					
Market capitalisation to GDP	269,22	263,95	262,87	195,73	193,46
Turnover ratio (liquidity)	35,80	48,30	46,40	67,70	41,30
Equity traded to GDP	9,65	12,74	12,13	13,73	7,52
Monetisation					
M3 to GDP	79,46	78,96	80,63	79,45	81,28
Bank assets to GDP	120,36	128,81	130,40	125,97	134,91
Central bank assets to GDP	11,68	13,70	12,85	13,28	14,53
Deposits to GDP	87,69	87,83	88,60	87,86	89,01
Bank intermediation					
Private-sector credit to GDP	81,41	83,88	85,03	83,28	83,97
Private-sector credit to total credit	100,65	99,56	99,98	98,49	97,30
Private-sector credit to deposits	92,83	95,50	95,97	94,78	94,34

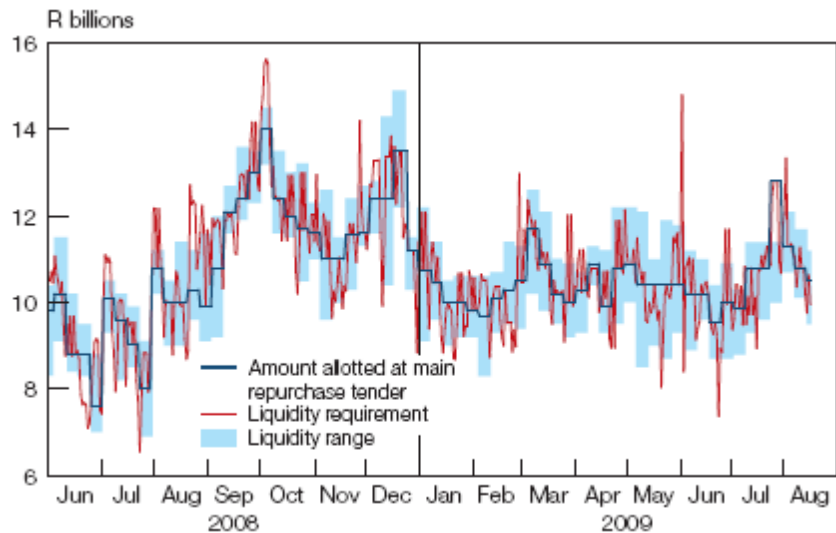
Source: SARB, Financial Stability Review (2009)

2.3.4.2 Banking Sector

South African banks have been largely protected against the direct effects of the global financial crisis. According to SARB (2009:8), domestic banks did not invest as heavily in high-risk securities or complex instruments. They maintained mostly a traditional and relatively conservative banking model, sustained relatively high lending standards, enjoyed high profitability for a number of years and maintained high capital levels. Banks also had low levels of foreign funding and limited activity outside the African continent. For this reason, no banking crisis occurred in South Africa in contrast to many other countries.

As shown in figure 9 below, the liquidity requirements of banks did not surge. According to SARB (2009:40), the interbank market also continued to operate normally. The South African Reserve Bank did not have to provide emergency liquidity that many countries had to provide for their financial institutions. The spread between the policy and market interest rate also did not widen in South Africa as in many other countries.

Figure 9. Liquidity requirement



Source: SARB Quarterly Bulletin, Sep. 2009, p. 40

2.3.4.3 Confidence in the financial Sector

As measured by the Ernst & Young Financial Services Index, in the fourth quarter of 2008, confidence in the financial sector dropped to its lowest level since the time the index was first used. According to SARB (2009:10), the drop, which stemmed from the worsening level of confidence in the areas of investment banking and specialized finance, was mainly attributed to the impact of the global liquidity crisis. The level of confidence of investment managers also reduced. Unstable global capital markets and a weak investment banking environment put a downward pressure on the volumes of business and this also affected fee income negatively. Investment income also dropped due to the poor performance of the equity markets.

After dropping significantly in the third quarter of 2008, the retail banking confidence level rose in the fourth quarter of the same year. However, it was still low compared to previously recorded levels.

Although interest income declined due to the decline in credit extension growth on the back of lending standards, the increase was recorded.

Table 2.2: Financial Services index and its components

	2007		2008		
	4th qr	1st qr	2nd qr	3rd qr	4th qr
Financial Services Index.....	98	84	70	58	50
Retail banking confidence index.....	95	78	57	43	53
Investment banking and specialised finance confidence index.....	100	79	79	81	46
Investment management confidence index.....	97	77	81	57	49
Life insurance confidence index.....	100	100	63	51	53

Source: SARB, Financial Stability Review (2009)

According to SARB (2009:8-9), falling income and rising expenditure resulted in a contraction in net profit of retail banks. The confidence level of life insurers was supported by rising premium income, although this is expected to slow due to adjustments made following a new commission payment method with effect from January 2009.

2.3.4.4 Bond, equity and currency markets

In the second half of 2008 domestic government bond yields declined, reflecting signs of a deepening global recession, an easing in inflationary pressure, interest rate cuts and continued weakening of the equity markets. According to SARB (2009), since January 2009, the yield on the short-dated R153 bond has declined further as a result of the appreciation of the rand, moderation in domestic inflation and expectations of further interest rate cuts following a cumulative 250 basis point cut since December 2008. The upward trend in longer-term bond yields since December 2008 can be attributed to the depreciation of the rand, which resulted in speculation about a possible rating downgrade and less demand for assets that were perceived as being riskier, as the global economic slowdown deepened. As the global financial crisis intensified and started to dampen economic growth in the second half of 2008, the domestic equity market continued its downward trend. According to SARB (2009), accelerated deleveraging, failures and near-failures of large financial institutions in the industrial countries, coupled with the weakening of global economic fundamentals, have resulted in falling asset prices and difficult financial conditions. As concerns over the risk of a global recession

gathered momentum and economic growth in EMEs slowed, more pronounced declines in financial asset values and increases in volatility ensued.

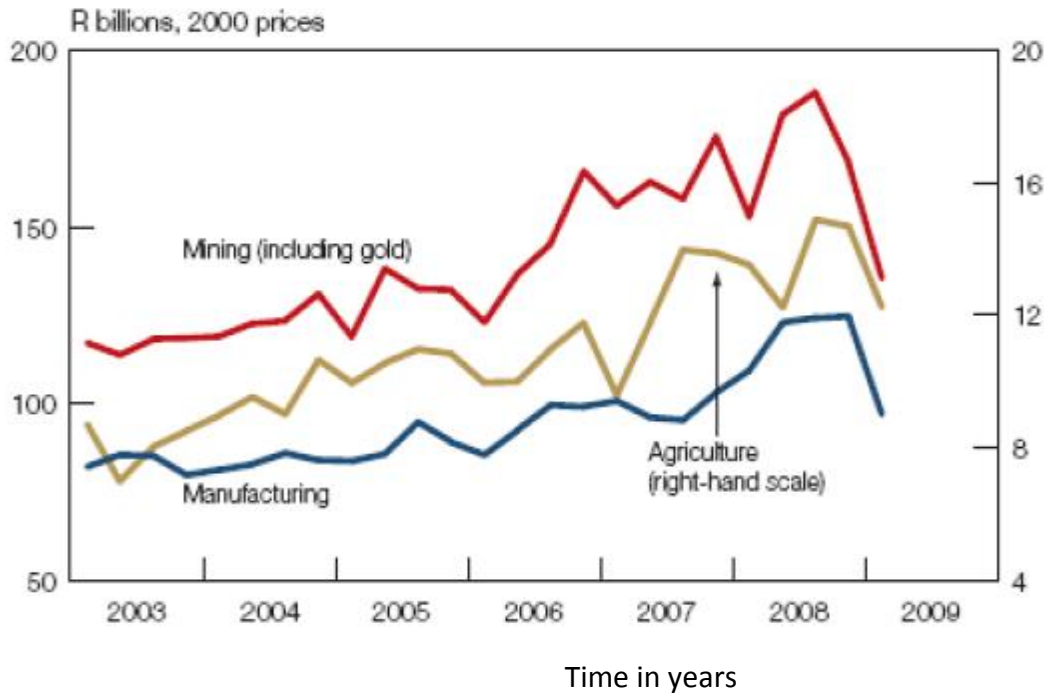
2.3.4.5 Tightening of bank lending standards

Before the onset of the crisis, banks in South Africa had already started tightening credit standards. These standards stemmed from the new national credit act (NCA) implemented in 2007, the change to Basel 2 accounting standards and capital requirements in 2008 and rising non-performing loans. However, in reaction to what happened to banks overseas during the global crisis, South African banks tightened credit standards even further. According to Kershoff (2009:9), this set a violent circle in motion. The cut in credit provision intensified the decline in house prices, slowdown in consumer spending and cut back in fixed and inventory investment. These developments, in turn, sped up business closures and retrenchments, which led to a further tightening of credit standards.

2.3.4.6 International trade

International trade plunged during the global crisis. South African exports of goods (see figure 11 below) and services fell sharply as a result. According to Kershoff (2009:8-9), South Africa was hit really hard by the drop in the international demand for vehicles and non-food commodities (industrial raw materials) mainly because these items dominate the country's exports.

Figure 11: South African exports of goods and services



Source: SARB Quarterly Bulletin, Mar. 2009, p. 24

2.3.4.7 Real Economic activity

The overall level of activity in the real economy dropped in the fourth quarter of 2008. Annual declines were recorded in building plans passed, new vehicle and passenger car sales, and electricity generated. According to SARB (2009:12), utilization of production capacity also dropped from 85 per cent in September 2008 to 83 per cent in December. Relatively higher lending rates, together with an uncertain outlook following developments in the global financial markets, may have contributed to the decline in real economic activity. The impact of the global economic slowdown on real economic activity in South Africa is also evident in the retrenchments and business closures particularly in mining and manufacturing. In the motor industry, for example, the drop in domestic and especially export demand and the resulting production cuts are a reflection of a sales slump in the rest of the world.

Below is a table showing selected indicators for real economic activity for 2007 and 2008.

Table 2.3: Selected indicators for real economic activity

Activity indicators	2007		2008		
	Dec	Mar	Jun	Sep	Dec
Building plans passed	-15,0	-7,3	-24,9	-20,2	-32,6
Buildings completed.....	-14,5	9,2	-6,1	5,3	2,1
Retail sales	-0,5	-1,3	-0,4	-4,7	0,5
Wholesale trade sales.....	2,3	10,5	6,4	2,6	4,1
New vehicle sales.....	-20,0	-11,0	-21,7	-24,6	-30,8
New passenger car sales ²	-19,0	-22,9	-25,2	-21,5	-24,7
Electric current generated	3,7	-2,1	-3,2	-0,5	-10,4
Utilisation of production capacity (percentage) ³	87,2	84,8	84,8	85,0	83,0

Source: SARB, Financial Stability Review (2009:12)

2.4 Concluding Remarks

The current financial crisis is more global than any other period of financial turmoil in the past six decades. The extent and harshness of the crisis reflects the union of several factors, some of which are common to previous crises and others are new. As in previous times of financial turmoil, the pre-crisis period was characterized by surging asset prices that proved unsustainable, a prolonged credit expansion leading to accumulation of debt, the emergence of new types of financial instruments and the inability of regulators to keep up.

As a result of the global financial turmoil and the slowdown in economic activity, South Africa is evidently experiencing pressure. Corporations have been affected directly through higher financing costs, as well as indirectly through the impact of the turmoil on their customers and, hence, their order books. Exports are under pressure due to the decline in world trade, and the risk of more job losses in some industries, wage pressures and the costs of production remain high.

Even though financial crisis may be similar with previous crises in some characteristics, the effects of the current crisis have been the worst ever experienced since the great depression and therefore it remains significantly different. On previous occasions, whenever the financial system came to the

verge of a collapse, the authorities got their act together and prevented it from going over the brink. This time the system actually broke down and what had been a mainly financial phenomenon transformed into a calamity that affected the entire economy.

Chapter Three

Literature Review

3.1 Introduction

This chapter reviews both the theoretical and empirical literature found on the issue being studied, that is, the financial crisis and its effects on the economy. Many economists clearly failed to predict the effects of the US financial crisis on the global economy. Only a few economists were anywhere near explaining how this crisis would affect different countries. Empirical literature is developed through taking note of the theoretical strides made to date in explaining how the effects of the financial crisis in the financial market can be transmitted to the real economy variables.

3.2. Types of financial crises

3.2.1 Definition of a financial crisis

Because it is not easy to determine a common and uniform definition of financial crisis, there is a huge collection of literature on financial crises based on historical case studies as well as current economic conditions written by economists. Within this literature there are also numerous “conclusions”, drawn and some of them are quite contradictory and thereby inconclusive.

Davis (2003) defines a financial crisis as a major collapse of the financial system, entailing inability to provide payment services or to allocate credit to productive investment opportunities. It is also an interruption to financial markets that disrupts the market’s capacity to allocate capital and therefore financial intermediation and investment come to a halt (Portes 1998). According to Nurul (2009:13), each financial crisis is distinctive in its nature, form, causes and effects, nevertheless a comprehensive theory can be used to explain the financial crisis. Financial crises are very diverse in terms of timing, the source of monetary expansion and the object of speculation depending on the time and location.

According to Zavala (2001) (as cited by Nurul (2009:14)), financial crisis are divided into two major parts; Currency crisis and Banking crisis. He defined Banking crisis as crises that occur when a financial system becomes illiquid or insolvent. They mainly constitute bank runs, closures, mergers, takeovers, or large-scale assistance by the government to a group of banks or banking systems, should the crisis turn out to be systematic. A recent approach to financial crisis is by Mishkin who defines it as, “...a

disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities”.

Not all financial crises have the same characteristics i.e. financial crises do not recur in an identical manner, both because institutional composition differ across countries and over time, and because individuals learn to some limited extent from such problems. According to Davis (2003:5), they can differ in the manner in which they affect the economy and also in their causes. Over the years, three principal types of financial instability have been identified and these may be intertwined in any particular episode.

Davis (2003:5) describes the most common type of financial crisis as that which is centred on bank failures. This follows a loan or trading losses, examples include the recent global financial crisis, the banking crisis in Japan and the Asian crisis, just to mention a few. These bank failures tend to result in a credit crunch, i.e. a contraction of credit supply to the non-financial sector, causing a wider economic disruption. Within these banking crises, a distinction can be made between those restricted to domestic financial system and those linked to cross border bank lending and indebtedness in foreign currencies.

A second type financial crisis mentioned by Davis (2003) entails severe market price volatility following a shift in expectations. This crisis is unique in that it tends to involve institutional investors as principals, and is focused primarily on the negative effects of quick price changes, for other financial institutions, which result from institutions imitating one another's strategies. Whilst volatile prices may not have systemic implications, these may, however, materialize when these price movements threaten institutions that have taken leveraged positions on the current levels of asset prices. An example to note is the Stock Market Crash of 1987. The Asian crisis had elements of this pattern where aggressive exchange rate movements aided in the set off of banking crises due to foreign currency exposures of banks and non banks.

Davis (2003) also discusses a third type of financial crisis which is similar to the second one. This type entails a prolonged crumbling of market liquidity and issuance. Like the second type, it also involves institutional herding, with the only difference largely having to do with whether markets are sufficiently resilient, and whether market maker structures are robust enough. Such crises also are inclined to affect debt and derivatives markets rather than equity or foreign exchange. Risks involved are severe not only for those holding positions in the market but also for those relying on the market for debt finance or liquidity and these are mainly banks. Past crises of this type were of typically specific and distinctive markets and these characteristically relied on a narrow investor base, market maker structure and/or issuer base (e.g. US junk bonds, international floating rate notes). An example of such a crisis was the collapse of the Russian liquidity market and issuance in 1998 but however, the events that followed this were much more severe. This was because liquidity failure was threatened in markets such as the US swaps, securities repurchase, commercial paper, corporate and Treasury bond market. A major historical precedent was the Penn Central Bankruptcy and its resulting effect on the US commercial paper market. In these examples, liquidity was threatened in core markets and as a result, the US authorities had to take a decisive action.

3.3 Theoretical Literature

This section presents the main theories on financial crisis in order to provide a general knowledge on the subject at hand and to facilitate further analyzing the current financial crisis from a South African perspective. By looking into the different views and approaches for financial crises, the section also briefly discusses what the theoretical literature offers as explanation of financial crises. The theoretical models also guided the choices of the financial and economic indicators used in the analysis.

3.3.1 Theories of Financial Crises

To understand the relationship between the current crisis and the different crises that occurred in the past, a conceptual framework to analyse financial crises is needed. According to Allen et al (2007), the difference between the majority view concerning the cause of crises in the 1930s and the view of many today is quite remarkable. In the 1930s, the problem was the market and the solution was government intervention through regulation or direct ownership of banks. Many now argue that

conflicting government macroeconomic policies or moral hazard in the financial system caused by government guarantees is the major cause of the recent crises. The opinion now is that government is the cause of crises and not the solution and market forces are now the solution.

3.3.2 Monetarist Approach

This approach explains that financial crises are impacted by bank failures on the economy through the decrease in the supply of money. The crises have a tendency of often being the consequence of policy miscalculations by monetary authorities generating “regime shifts” that unlike the business cycle are impossible to allow for in advance in risk-pricing.

According to Nurul (2009:15), banking panics have been identified as a sign of financial crisis by monetarists. Friedman and Schwartz (1963) pointed out that out of the six main contractions in the US over 1867-1960, four were mainly caused by major banking or monetary disturbances. This was due to the public’s loss of confidence in the Central Bank’s abilities to convert deposits into currency. Confidence on the Central bank deteriorates when a significant institution fails in the market, and that aids in the development of the crisis. In addition, Friedman and Schwartz’s (1963) view is that the banking panics were a major source of reduction in the money supply which led to a severe contraction in the aggregate economic activity.

Schwartz (1987) explains that financial instability is usually caused by inflation which is highly related with the interest rate as well as money supply and a rise in inflation leads to a rise in interest rate. This creates problems for the Central Bank particularly if the bank is engaged in fixed rate investment project or if the Central Bank lends in a fixed rate, even this instable price level may lead to insolvencies of the bank.

According to Nurul (2009:15), monetarists do not see a necessary link between business cycle and crisis and they do not rule out asset price bubble. In monetarist view ‘financial crisis’ is mainly a shift to money that leads to widespread run on banks. In particular, banking crises occur when financial systems become illiquid. This type of financial crisis refers to bank runs, closures, mergers, takeovers,

or large scale assistance by the government to a group of banks or to the banking systems, should the crisis turn out to be systemic.

3.3.3 Asymmetric Information: Mishkin's contribution

Numerous researches have been done on asymmetric information problem and how it is related to financial crisis. In simple terms, asymmetric information problem implies the unavailability of information among the entities in the financial market. According to Nurul (2009:18), in the financial market, asymmetric information problem might exist in the financial contract between the two most important entities, that is, the lender and borrower. The borrower has better information than lender about his return on project and the risk associated with that project. It follows that lender has either to increase the interest rate which eliminates some high quality borrower or he may choose credit rationing rather than raise interest rates, in order to avoid adverse selection.

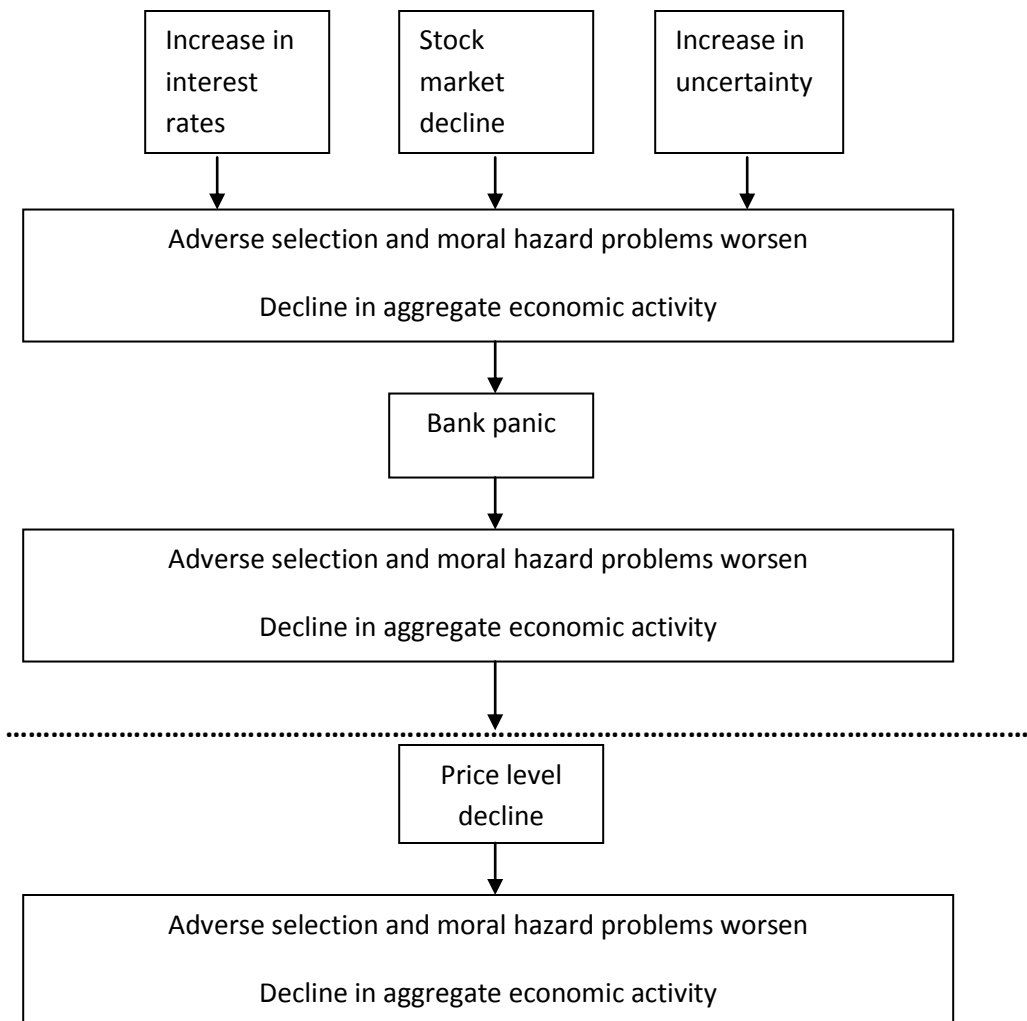
Mishkin (1992) (as cited by Nurul (2009:18)), by providing an analysis of asymmetric information, gave a framework for how disturbances in financial markets can cause a downturn in the economy. He defined a financial crisis as; *"..... a disruption to financial markets in which adverse selection and moral hazard become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities"*.

Asymmetric information and agency costs are aspects of a debt contract which create market failures of moral hazard and adverse selection and aid in explaining the nature of financial instability, for example, the tightening of credit as a result of rising interest rates and falling asset prices fall or, as mentioned by Allen & Gale (1999), the tendency of lenders to make high risk loans due to the shifting of risk linked to agency problems.

As defined by Mishkin (1992:2), asymmetric information refers to the phenomenon in which one player has more information than other stakeholders in the financial market. Transactions, that take place in financial markets, are therefore exposed to asymmetric information, leading to problems with adverse selection and moral hazard.

According to Mishkin (1992:4), adverse selection in financial markets occurs when the likely borrowers, who the potential to produce undesirable outcomes, are the ones who are likely to be chosen. Since adverse selection makes it more possible that loans be made to bad credit risks, lenders may decide against making any loans, even though there are good credit risks in the marketplace.

Mishkin (1992:5) defines moral hazard as that which occurs in financial markets after a loan has been extended; the lender is subjected to the hazard when the borrower might engage in activities that are not favourable to the lenders. These activities increase the probability of default. If the borrower invests in high risk projects, he may do well if the project succeeds, but the lender bears the risk of losing out if the project fails. Moral hazard and the conflict of interest between the two can result in lenders deciding not to make loans, and lead to suboptimal levels of lending and investments.



Source: Adopted from Mishkin (1992 p.123)

As shown in the diagram above, Mishkin (1992) (as cited by Binaku (2009:11-12)) identified five key factors in the economy, which can result into considerable worsening of the adverse selection and moral hazard in financial markets. This, in turn, can lead to a financial crisis.

These key factors are: 1.) increases in interest rates, 2) stock market declines, 3) increases in uncertainty 4) bank panics and 5.) Unanticipated declines in the aggregate price level. Increase in uncertainty, or an increase in interest rates and the stock market crash increased the severity of adverse selection problems in the credit market, while the decline in net worth of stemming from stock market crash increased in moral hazard which help lead to a crisis eventually.

3.3.4 Minsky's financial instability hypothesis

This hypothesis proposes that financial crises follow a credit cycle with an initial positive shock aggravating rising debt, mispricing of risk by lenders and an asset bubble, which is then burst by a negative shock, leading to a banking crisis. Patterns like these are perceived as a normal feature of the business cycle. This is similar to what happened in the recent crisis that developed in the US.

As economic theory, the financial instability hypothesis is an interpretation of the substance of Keynes's "General Theory" in viewing the capital system as innately unstable because of the instability of aggregate investments. The theoretical argument of the financial instability hypothesis starts from the characterization of the economy as a capitalist economy with expensive capital assets and a complex, sophisticated financial system. Minsky (1992:3-5), identifies the economic problem following Keynes as the "capital development of the economy." The focus is on an accumulating capitalist economy that moves through real calendar time. Minsky (1992:5), explains that the occurrence of instability in the financial sector is an increased result of inflation and an extreme use of debt deflation which goes out of control time to time.

The instability in the financial sector begins in the banking sector that is involved in a profit seeking activity. Minsky (1992:5), argued that banks are aware that innovation guarantees profits and therefore make every effort to innovate the assets and liabilities they market. As a result, the investment will take place by banks stretching liquidity in a way that makes the system more

vulnerable to disturbance. According to Binaku (2009:13) firms that seek profit are motivated to borrow more against equity, when the economy appears to be stable, which in turn has a weakening effect on the economy. Consequently, through the financial hypotheses theory, Minsky describes the impact of debt on the system and the method in which debt is validated.

Three distinct income-debt relations for economic units, which are labeled as hedge, speculative, and Ponzi finance, can be identified. According to Minsky (1992:6), in hedge financing the payment obligation is fulfilled from the cash flow: the greater the weight of equity financing in the liability structure, the greater the likelihood that the unit is a hedge financing unit. Speculative financing meets payment commitments on the liabilities even as they cannot repay the principle out of income cash flows. These units need to "roll over" their liabilities: (e.g. issue new debt to meet commitments on maturing debt). Governments with floating debts, corporations with floating issues of commercial paper, and banks are typically hedge units. Ponzi financing arises when the cash flow from operation is insufficient to fulfill either repayment of principle or interest due on the outstanding debt. Therefore, they have either to sell or borrow more, which lowers the safety of the debt holders.

According to Binaku (2009:13) an economy that uses hedge financing will be equilibrium seeking. In contrast, if the economy uses Ponzi and speculative financing, the probability is high that the economy is deviating from an amplified system. Binaku (2009), explains that the financial system over time, will transit from stable to unstable if the economy uses either speculative or ponzi finances. The change from a stable economy to an unstable one takes place when the economy moves from hedge finance to speculative and later, to Ponzi finance. Binaku (2009:13) further explains that if the economy over good times uses speculative finance it will face an increase in inflation. Consequently, if the Central Bank tries to cut down inflation restricting money supply, the speculative finance will become Ponzi finance, resulting in the decrease of net worth of the operations that have been financed by Ponzi finance.

According to Minsky (1992:6-7), the financial hypothesis model is not dependant on exogenous shocks. It nevertheless holds that business cycles are compounded out of the internal dynamics of capitalist economies and a system of intervention and regulations that plan to keep the economy

operating within reasonable bounds. The financial system has been made unstable by the increases of innovation, the complexity of the financial system, the involvement of the government as refinancing agent of financial institutions and businesses.

3.4 Theoretical Framework

Some financial crises have little effect outside of the financial sector, but other crises are believed to have played a role in decreasing growth in the rest of the economy. There are many theories that would show how the financial crisis effects could be transmitted to the rest of the economy. These include the Keynesian theory of aggregate demand and Mundell-Fleming model.

3.4.1 The Keynesian Theory of aggregate demand

This is the basis on which the financial fragility hypothesis by Minsky was developed. In Keynes's theory, there are some private sector decisions that can lead to aggregate macroeconomic outcomes in which the economy operates below its potential output and growth. Keynes explained that aggregate demand for goods might be insufficient during economic downturns, leading to unnecessarily high unemployment and losses of potential output. Keynes argued that government policies could be used to increase aggregate demand, thus increasing economic activity and reducing unemployment and deflation. Keynes sought to develop a theory that would explain determinants of saving, consumption, investment and production. In that theory, the interaction of aggregate demand and aggregate supply determines the level of output and employment in the economy.

Keynes theory aids in tracing the effects of an autonomous shock, such as a financial crisis, on the economy through the multiplier effect. According to Froyen (2005), a central notion in the Keynesian model is that equilibrium output be equal to aggregate demand. In the model, this would be

$$Y = E \dots \dots \dots (3.7)$$

Where Y is equal to total output (GDP) and E equal to aggregate demand. E consists of three components: household consumption (C), desired investment demand, (I) and the government sector's demand for goods and services (G). Thus an open economy in equilibrium is defined as:

$$Y = E = C + I + G + (X - M) \dots \dots \dots (3.8)$$

Investment, exports and government expenditure are taken to be exogenous components and the rest of the components, namely consumption and imports have an induced component. i.e. they are dependent on national income. According to Branson (1989), any proportionate change in the autonomous expenditures will lead to a more than proportionate change in national income due to the induced multiplier effect. This simple Keynesian model is then extended to make investment a function of the interest rate. Graphing the shifts in investment caused by changes in interest rates then reveals a simple version of the IS curve found in an IS/LM analysis.

The Structure of the IS-LM model

According to Ehnts (2008), the IS-LM model assumes a world with two sectors; the investment sector with investment I and the consumption sector with consumption C. Their sizes can differ, meaning that there might exist situation with over-investment (and under-consumption) and under-investment (with over-consumption). The investment sector is financed by the issuance of bonds, which has a positive return. Aggregate demand AD and the interest rate, i are the determinants of the level of investment. Whatever is invested has to be saved, so that $I = S$. Because resources are scarce, the budget constraint $Y = C + S + G - T$ applies (G is government expenditure, T are taxes). If they add up to zero, the government budget is balanced. For this reason, income can be either saved or consumed. If income is saved, the next decision is whether to invest in bonds or hold money. Ehnts (2008) explains that bonds are attractive at low interest rates whilst savings accounts at banks are attractive at high interest rates. Hence the amount of savings is invested into a portfolio containing bonds and money. This is one determinant of the demand for money, the other being the demand for liquidity in order to buy. The amount of cash held for purposes of buying goods depends on the income. A higher income translates into more money in the purse.

3.4.2 The Mundell-Fleming model

The Mundell-Fleming model is an extension of the Keynesian model. This theory links the financial markets and economic output through the use of the IS-LM and BOP curves. It integrates international monetary flows into macroeconomic analysis and describes the importance of international capital flows in determining key macroeconomic variables such as real national income,

unemployment, price level and the interest rate. The primary concept of the model is that it adds a balance of payments equilibrium condition (and a BOP curve) to an IS-LM Model. According to Burda et.al (2005) this extends the closed economy IS/LM framework to allow discussion of the interplay between monetary policy and exchange rate policy. In particular, the model emphasizes the differences between fixed and floating exchange rates and thus links the economy and financial markets through the exchange rate. The first round effects of any external shock on the economy will be felt on demand side of the economy by means of changes in exchange rates, interest rates and credit affecting autonomous demand variables and through this the growth performance of the economy.

The goods market condition reflects equilibrium for an open economy such that:

$$C + S + T \equiv C + I + G + X - Z \dots\dots\dots (3.1)$$

Where C= Consumption, S= Saving, T= taxes, I= Investment, G= Government expenditure, X= Exports and Z= Imports

Simplifying (3.1),

$$S + T \equiv I + G + X - Z \dots\dots\dots (3.2)$$

Rewriting (3.2),

$$S + T + Z \equiv I + G + X \dots\dots\dots (3.3)$$

The following assumptions are then made regarding these variables:

- S depends positively on Y
- T is a policy variable
- Z depends on Y and π , where π =exchange rate
- I depends on r, where r=nominal interest rate
- G is a policy variable
- X depends on Y_f and π , where Y_f = foreign income

With the above assumptions, the equilibrium condition for an open economy therefore becomes:

$$S(y) + T + Z(y, \pi) \equiv I(r) + G + X(Y_f, \pi) \dots\dots\dots (3.4)$$

The money market condition, $MS=M_d$, (hence the LM curve) remains unchanged so that

$$M_d= L(Y,r) \dots\dots\dots (3.5)$$

Where MS=fixed money supply, M_d = money demand, L=functional form, Y and r were defined before. The open economy version of the IS-LM model includes the balance of payment which is the line that shows the different combinations of Y & r that result in the BOP equilibrium for a given π . It is therefore also known as the IS-LM-BP.

The BOP condition is stated as:

$$X(Y^f, \pi) - Z(y, \pi) + F(r - r^f) \equiv 0 \dots\dots\dots (3.6)$$

Where F= net capital flow and r^f =foreign interest rate

When there is BOP equilibrium, this means that any difference in the Capital account balance will be offset by net Capital inflow. The underlying assumptions are as follows:

- X depends on Y_f and π
- Z depends on Y and π
- F depends on $(r-r^f)$

3.4.2.1. Under flexible exchange rate regime

South Africa has a flexible exchange rate system where the currency value is allowed to fluctuate according to the foreign exchange market. Monetary authorities do not control it.

Changes in Money Supply

According to Frenkel et.al (1987:10), one important assumption of the model is the equalization of the local interest rate to the global interest rate. An increase in money supply will shift the LM curve downward. This directly reduces the local interest rate and in turn forces the local interest rate lower than the global interest rate. This depreciates the exchange rate of local currency through capital outflow. The depreciation makes local goods cheaper compared to foreign goods and increases export and decreases import. Hence, net export is increased. Increased net export leads to the shifting of the IS curve to the right where the local interest rate will equalize with the global rate. This increases the overall income in the local economy. A decrease in money supply will cause the exact opposite of the process.

Changes in government spending

Increasing government spending shifts the IS curve to the right and this will cause the local interest rate to go above the global rate. According to Frenkel et.al (1987:11), an increase in local interest rate will encourage capital inflow making the local currency stronger compared to foreign currencies. This will also make foreign goods cheaper compared to local goods. This encourages greater import and discourages export and therefore, lowers net export. Accordingly, the IS curve will return to its original location where the local interest rate and the global interest rate are equal. The level of income of the local economy stays the same. The LM curve is not at all affected. A decrease in government expenditure will have the opposite effect.

Changes in global interest rate

A rise in the global interest rate will have an effect on increasing the local interest rate. Burda et.al (2005) explains that the pressure will go down as the local rate closes in on the global rate. When there is a positive difference between the global and the local rate, holding the LM curve constant, capital outflow will occur depreciating the local currency and boosting net exports. An increase in net exports shifts the IS curve to the right and this shift will continue to the right until the local interest rate becomes as high as the global rate. Decreasing the global interest rate will cause the reverse to occur.

3.4.3 Linking the Financial markets with the economy

According to the Keynesians, the link between the financial sector and the economy can be shown by the income flow from the household sector to the financial markets in the circular flow of income and output. Savings flow to the financial markets as leakages from the household sector. This means that part of the income saved is held in the form of some financial asset e.g. currency, bond or equities. These savings go back to the business sector as investment demand. The purchasers of investment goods are the firms in the business sector and these purchases must be financed by borrowing.

There has been intense focus on financial stability by Central Banks and the reasons behind this are linked to the factors that have increased the vulnerability of the macro economy to financial system stress. There are both structural and secular factors at work here.

According to Tsatsaronis (2005), on the structural side, the financial system has been transformed by deregulation and this has enabled financial firms to explore profitable opportunities more fully and to expand the scope of their activities. Efficiency has also been promoted by intensified competition and this has also encouraged innovation. As a result, the financial sector has grown rapidly both in size and in terms of its contribution to overall economic activity. At the same time, a deregulated environment is arguably also one more prone to volatility: failure is an integral part of the market adjustment mechanism in a competitive system and provides the natural check on participants' pursuit of profit.

Tsatsaronis, (2005) also adds on that on the secular side, the success of central banks in fighting high inflation might also have influenced the nature of the interaction between the real and financial sectors of the economy. Resources have been freed by reduced macroeconomic uncertainty to transact in other sources of risk. At the same time, this success may also have had the unintended consequence of cultivating a sense of private sector complacency about the potential downside risks. An environment like this might perhaps be more permissive of cumulative processes that gradually contribute to the build-up of financial imbalances, which in turn can be the source of macro instability when they unwind.

Many authors have tried to model equilibrium values of financial variables through relationships with real variables in macroeconomic models. The relationships between financial variables and the real economy are complex. Financial variables and the real economy may be driven by the same underlying forces, but they may also influence each other. Moreover, it may be difficult to differentiate between cause and effect. Because of this, many economists have seen the need to investigate this relationship and also to establish how exogenous shocks in either one of the two would affect the other.

3.5 Empirical literature

This section presents the empirical material that serve as a base for identifying the repercussions of the financial crisis on the South African economy. A sizeable number of economists have tackled the financial crisis related research and have attempted to ascertain the effect of the financial crisis on

the economy. Most of these researches have agreed with theory. The financial instability during the nineties has caused intense exchange and banking crisis in developed and, especially, in developing countries. According to Rajan et al (2007), financial crises are usually followed by low credit and GDP growth. A question that has been raised is whether this is because crises tend to take place during economic downturns, or whether banking sector problems have independent negative real effects. If financial crises exogenously hinder real activity, then sectors more dependent on external finance should perform relatively worse during financial crises.

Eichengreen & Rose (2009) analyzed the experience of more than 20 OECD countries, using data that stretch back to the late 1950s. They found that banking crises can have quite severe, macroeconomic effects. The disruptions associated with a banking crisis cause output growth to decline by 2 to 3 percent relative to the control group of non-crisis countries. That effect lasts only for a year, however; by the second year after a crisis, growth has recovered nearly to the levels typical of developing countries that are not in crisis.

Osterholm (2009) investigated the impact of the current financial crisis on the Swedish real economy by using the Bayesian VAR model which included both the US and Swedish variables. In order to do this, he used an index which describes the financial conditions of the Swedish economy and the results suggested that the Swedish economy would grow substantially slower in the next couple of years due to the financial crisis.

A study was also conducted in the United States by Guichard & Turner (2008) where they employed a financial index to determine the effect of the global financial crisis on the economy. They found that the effect was detrimental to economic growth. Broad financial conditions tightened significantly since the beginning of the crisis, despite lower real short- and long-term interest rates on government paper and the real effective depreciation of the dollar. Guichard & Turner (2008) also concluded that the trend deterioration in overall financial conditions continued.

Some studies have also shown that industries that are more dependent on external finance experience a sharper output contraction than other industries during economic downturns. Braun and

Larraín (2005), found a large positive differential effect. In their tests, they also found this effect to be larger in countries with poor accounting standards and for industries whose assets are less tangible, supporting the interpretation that financial frictions are at work, and thus may amplify economic fluctuations especially for industries more dependent on external finance.

The East Asian crisis is the latest economic catastrophe which can be used in comparison with the current financial crisis. Amongst the countries affected by the Asian crisis were Hong Kong, Japan and Malaysia. Though the Hong Kong dollar was defended by its Monetary Authority, that defense included temporary high interest rates, a halving of the value of the stock market and an approximately 30% fall in property prices. Output was stagnant through 1999. Japan's stock market had been declining since 1990 and its currency was under a lot of pressure. It stimulated its economy and attempted to reform its banking system. It was also under continuous pressure from the WTO to open its economy to international competition. The Malaysian currency depreciated by about 40% forcing the government to impose capital controls.

There is a long literature focusing on the effects of financial crises. In a summary of the early financial crisis experiences, Lindgren et al. (1999) concludes that episodes of vulnerability in the banking sector have been detrimental to economic growth in the countries affected. Cross-country studies of banking crises done by authors such as Kaminsky and Reinhart, (1999) have also shown that output growth and private credit growth drop significantly below normal levels in the years around banking crises.

Kamin (1999) conducted a survey where he compared the scope and impact of three emerging markets in the midst of a financial crisis: the debt crisis of the 1980s, the Mexican financial crisis of 1994-95, and the international financial crisis of 1997. The effect of these crises on the relevant economies was done by looking at the key macroeconomic variables; US interest rate, inflation, Gross Domestic Product (GDP), etc. Kamin found that, in all cases the crises led to sharp declines in economic activity and the Consumer Price Index (CPI), whereas there was no change in the US interest rate.

3.6 General Assessment of the Literature

The theoretical section illustrates different views on financial crises. No financial crises theory explains a crisis in a perfect way. Certain parts of the theories presented in the above sections give a better description and explanation combined, than one theory left alone. This might be explained by the fact that the theories were developed as a reaction on an earlier crisis, during a period with different economic conditions.

The East Asian crisis and the current crisis are different in terms of their characteristics and the manner in which the events played out. The Asian crisis started off with the exchange rate. The current crisis is relatively new and started off with the housing bubble. Nevertheless, the two crises can be compared as their effects on economic growth are the same.

Prediction and contagion of financial crisis has received much attention in recent years. Most of the empirical literature has focused on identification, prediction and contagion of currency crisis, rather than the macroeconomic effects of the crises. They have often been forgotten in favor of constructing mechanism to anticipate these events. As a result, not much literature can be found on this issue. However, those who did investigate the impact of financial crisis on the economy used cross sectional data and concluded that countries that were mostly affected by financial crisis were those that were mainly dependent on external finance and those whose financial systems were not adequately regulated.

The literature above reveals a number of relevant variables that are essential to investigate, in order to explain to what extent these literary theories on financial crises can explain the repercussion of current financial crisis on the South African economy. It is obvious that economic indicators such as stock market index, interest rates, exchange rate and gross domestic product are relevant to investigate, in order to explain the impacts on the South African economy. The literature has thus provided a guideline in the selection of the relevant variables to be used in the analysis. The table below summarizes the empirical literature on the effects of a financial crisis on the economy.

Table 3.1: Summary of selected empirical literature on the effects of a financial crisis on the economy.

Study	Countries	Empirics, effect on the economy
Kaminsky and Reinhart, (1999)	United States	Confirmed: Negative. Output growth & private credit growth dropped significantly below normal levels.
Lindgren and others (1999)		Confirmed: Negative. Episode of vulnerability in the banking sector was detrimental to economic growth.
Guichard & David Turner (2008)	United States	Confirmed: Negative. Decline in overall financial conditions
Mwenya (2009)	Kenya	Confirmed: Negative. Decline in growth of the economy.
Osterholm (2009)	Sweden	Confirmed: Negative. Decline in economic growth.
Adamu (2009)	Nigeria	Confirmed: Negative. Decline in commodity prices, export and economic growth.
Eichengreen & Rose (2009)	20 OECD countries	Confirmed: Negative. Output growth declined by 2 to 3 %.

Source: Own computation

3.7 Conclusion

This chapter sought to analyze the theoretical aspects that underline financial crises so as to fully understand the subject at hand and to help further examining the effects of the current financial crisis from a South African perspective. It is difficult to summarize literature on the determinants of financial crises. Previous researchers have conducted empirical researches based on some of the theories in the above section but have used different variables that suit their different situations. The theoretical models however, have guided our choices of the financial and economic indicators.

Chapter Four

Research Methodology

4.1 Introduction

The previous chapter outlined the theoretical and empirical considerations of the effects of a financial crisis on the economy and also provided a guideline of the variables to be used in the analysis. In this chapter, we formulate an equilibrium model that explains the extent to which the chosen variables representing an economy affected by a financial crisis will affect the real economy. The study uses a model that has been reformulated to suit the financial conditions in South Africa to analyze the impact of the financial crisis on the real economy of South Africa.

4.2 Model Specification

The approach taken in this study is to augment an index, similar to the one used by Guichard and Turner, (2008) and Osterholm (2009), with a broader set of financial variables that will show the financial conditions in the South African markets. To investigate how the financial crisis affected the South African real economy, a partial equilibrium model will then be used. The model is constructed based on the Keynesian theory of aggregate demand for an open economy discussed in the theoretical literature review. Given that the ultimate effect is felt on growth, the study specifies the economic growth function based on the presumption that exogenous shock would affect growth through a change in demand variable such as investment and exports. However, the study will also analyze in detail the effects of the crisis on exports and investment.

The following National Income Identity in an open economy forms the basis of our time series analysis:

$$Y = C + I + G + (X - M) \dots\dots\dots (4.1)$$

Where: Y is the Output, C is consumption, G is government expenditure, X are the exports and M are the imports.

However, this model does not capture some economic variables which play significant roles in determining output and therefore is remodeled to construct GDP function which incorporates unique variables pertinent to South Africa. Gross domestic product can be expressed in terms of either

expenditure (demand) or production (supply). This study will define GDP in terms of expenditure mainly due to the presumption that predominant constraints facing the economy and the external shock effects are on the demand side. The model is based on the Keynesian model of aggregate demand and is remodeled to capture the determinants of economic growth. Specifying the Gross Domestic Product (GDP) as:

$$GDP = f(NX, CR, FCI, DA) \dots \dots \dots (4.2)$$

In order to avoid any misrepresentation of empirical result, this section provides a description of all variables appearing in the estimated equation and also explains the *a priori* expectations. All the variables are converted to logarithms for the obvious reasons of obtaining elasticity coefficients on these variables and minimizing the impact of outliers. The rate of the growth in GDP is thus expressed in the form:

$$LGDP = \alpha_1 + \alpha_2 L D_A + \alpha_3 L NX + \alpha_4 L CR + \alpha_5 FCI + \epsilon_t \dots \dots \dots (4.3)$$

Where:

LGDP is the logarithmic of gross domestic product. GDP is the total value of final goods and services produced within a country over a period of time.

LD_A is the logarithmic of domestic absorption and is directly related to GDP. This is calculated as the summation of all income that is absorbed by the economy, that is,

$$D_A = \sum (\text{Consumption, Investment, Government Expenditure})$$

LN_X are the net exports and are expected to have a positive relationship with GDP. This has been empirically proven hence Ibrahim (2002) found that an increase in net exports will increase economic growth.

LC_R is the logarithmic of credit extension. This has a direct relationship with GDP and therefore α_4 is expected to be positive. An increase in credit extended to the private sector will lead to an increase in investment and therefore a growth in output.

FCI is the financial conditions index. The construction of this index is outlined in the following section. The impact of the existing financial conditions on economic growth is likely to be negative because of the uncertain environment it creates. A higher index indicates worsening market conditions and this would create uncertainties in the market therefore reducing investment demand and consequently economic growth.

$\alpha_1, \alpha_2, \alpha_3, \alpha_4,$ and α_5 are the coefficients to be estimated.

ε_t = is an error term.

4.3 Data sources and characteristics of variables:

The data covers the start of the decade in which the financial crisis started and would therefore be able to capture the various events that occurred in the decade that posed as important thresholds to the lead-up of the crisis. The period gives a clear trend of what happened including policies implemented in South Africa (e.g. National Credit Act) that could have a significant effect on the findings of the study and also the beginning of the financial crisis. All raw data are of quarterly frequency and are taken from the World Bank (World Economic Indicators), the Johannesburg Stock exchange (JSE) and the South African Reserve Bank (SARB) electronic data delivery systems.

Real GDP was used as a proxy for economic growth. Domestic absorption was calculated as the sum of consumption, investment and government expenditure. Credit extended to the private sector is measured in millions of rand. FCI is a computed variable to show the market conditions in the financial market. Yearly real Gross Domestic Product (GDP) of South Africa and United States of America are used as a measure for their respective real incomes. The study uses real U.S.GDP as a proxy for foreign income because it is South Africa's major trading partner.

Trade data are available in value terms rather than volume for South Africa, although theory and previous studies suggest that trade volume is a more appropriate measure than value. The trade variables are also measured at current prices as this takes into account effects of price movements. Because expected inflation cannot be precisely determined as it varies from individual to individual, this study will use actual inflation of the preceding years as a proxy for expected inflation for the

period under study. All variables used in the empirical analysis are transformed variables by the use of natural logarithms.

The Index

The purpose of a financial conditions index is typically either i) monitoring of financial markets, which often can be done in real time since financial data typically are available on a very high frequency, or ii) estimation of the impact of financial conditions on other parts of the economy. The primary concern of this study is the effect of the financial crisis on the South African real economy. The choice of variables included in the index is thus affected since a long enough series is needed to make estimation both meaningful and reliable. According to Osterholm (2009), from an econometric point of view, it should be beneficial to weight together the information from several financial variables into one index. By using fewer variables in the model the relationship between financial markets and the real economy can be modeled in a simpler and more robust way. This should generate better estimates of the effect on the real economy as well as improved forecasts.

The study uses three variables to build the financial index: real short-term interest rate, changes in real effective exchange rate and changes in the stock exchange index. The South African short real interest is calculated by subtracting expected inflation in the past four quarters from the Treasury bill rate. Consumption and investment decisions of firms and households are both functions of the real interest rate. Osterholm (2009) also argues that the currency of a country is usually affected by interest rate movements since both financial and real sector activity are influenced by financing costs and inflation expectations. However, there are times when real interest rates may change whilst external factors are at the same time causing the currency to depreciate. Changes in the stock exchange index benchmark the performance of the stocks. Developments in the stock market reflect many factors. Falling stock prices during the crisis can be an indication of a reduced risk appetite as investors dispose of stocks for safer assets. The macroeconomic consequence of falling asset prices is that consumption will generally be lowered due to the lower wealth of households. It will also be more expensive to raise capital for firms through new share issues (as the cost of equity capital rises with falling share values), which puts downward pressure on investment.

The single index for the state of the South African financial markets is generated as follows:

1. Each of the raw time series (real short-term interest rate, changes in real effective exchange rate and changes in the stock exchange index) data are standardized so that they have a mean of zero and a standard deviation of one.

$$z = \frac{(X-u)}{\delta} \dots \dots \dots (4.4)$$

2. They are then weighted together using weights of 1/3 for the three series. This is because they are considered equally important for describing the financial conditions.

Specifying the financial conditions index:

$$FCI = \sum_{t=1}^n (W)(reer + rt + \gamma) \dots \dots \dots (4.5)$$

Where W= weight of financial variable, reer = changes in real effective exchange rate (standardized), rt = short term interest rate (standardized) and γ = changes in stock exchange index (standardized).

These variables are perceived to be some of the most relevant when assessing the state of financial markets and should also have predictive power for the real economy since they capture several important aspects of how a financial crisis is transmitted to the real economy.

Once the model that links the economic growth to its potential determinants has been specified and variables defined, the next step is to estimate the parameters of the specified model. There are several methods of parameter estimation that involve several steps. This is the subject of the next section.

4.4 An overview of estimation techniques for the study of effect of the Financial Crisis on the Economy

Several techniques are available for parameter estimation, ranging from classical regression methods to co integration based techniques. The classical regression methods are based on the assumption that all the variables to be included in a regression are stationary but most economic series are not

stationary in their levels such that estimations based on this technique will be meaningless (spurious). A preferred approach would be to difference the variables to mechanically turn them stationary but this throws away useful long run information that may be in the data. This problem can be resolved by the new generation of models based on co integration and error correction modeling. Unit root or stationarity tests will be done on all the variables before proceeding with the tests for co integration and estimation of parameters. In order to directly test for stationarity, the study will employ the Augmented Dickey-Fuller test. There are also several co integration based methods and this study will employ the Johansen technique as this technique has been proven to be the most powerful and reliable.

Since the model used in this study is multivariate, there is likelihood of having more than one co integrating vector. According Harris, (1995), the Johansen (1991, 1995) approach is preferred to other techniques such as the Engle-Granger (1987) as it is able to take into account the underlying time series properties of the data and is a systems equation test that provides estimates of all co integrating relationships that may exist within a vector of non stationary variables or a mixture of stationary and non stationary variables.

The Engle-Granger technique assumes that there is only one co integrating relationship. In this case, the OLS estimation will be applicable only if there is only one co integrating vector. However since this is unlikely to be the case, the Engle-Granger model will not be valid and will not be able to identify all co integrating relationships.

In implementing the Johansen methodology, several steps have to be followed. The study follows the “generic to specific” framework suggested by Hendrel et.al. (2000) as opposed to the traditional “specific to general” framework. The first step in the estimation is unit root testing, to confirm whether all the variables are suitable to be included for co integration. If a variable is not stationary, it has to be differenced until it becomes stationary. The next step is performing co integration tests in order to identify any long run relationships in the variables. A short run vector error correction model is then estimated only if co integration is found. Lastly, residual diagnostic checks will be performed.

We review each of these steps in the following sections with the aim of considering alternative tests that can be employed in each step and choosing those to be applied in this study.

4.4.1 Testing for stationarity/ Unit Root testing

A stationary series (weakly or covariance) stationary is that which has a constant mean and variance for each given period of time and “the value of the covariance between the two time periods depends only on the distance or lag between the two time periods, not on the time at which the covariance is calculated” (Gujarati, 2003: 797). A series that is not stationary is referred to as non stationary. If a series is non stationary, it must be differenced d times before it becomes stationary. It is then said to be integrated of order d . This is denoted as $I(d)$, where d is the order of integration. The order of integration refers to the number of unit roots in the series, or the number of differencing operations it takes to make a variable stationary. An $I(0)$ series is a stationary one whilst an $I(1)$ series contains one unit root.

Classical regression models deal with the relationships between stationary variables, but most of the economic indicators usually follow a non stationary path. The use of non stationary data will lead to spurious results or the danger of running a nonsense regression. In such a case, the results will be meaningless. The usual t -ratios will not follow a t -distribution and the F -statistic will not follow an F -distribution. It is likely that significant t -ratios and a high R^2 will be obtained even though the trending variables are completely unrelated.

As a result, unit root or stationarity tests should be done on all the variables before testing for co integration and estimating the parameters. There are several tests for stationarity including a visual plot of the data, unit root test and those that directly test for stationarity, among others. This study will make use of the augmented Dickey-Fuller which is discussed in the section below.

4.4.2 The Dickey Fuller (DF) and the Augmented Dickey Fuller test (ADF)

According to Gujarati (2003), the stationarity of a time series can be tested directly with a unit root test. The Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) are the most frequently used unit

root tests. The objective of the DF test is to test the null hypothesis that $\omega = 0$ in the following equation:

$$y = \beta_2 t + \omega y_{t-1} + v_t \dots \dots \dots (4.6)$$

The hypotheses of for the above equation would be:

H_0 : Series contains a unit root ($H_0: \omega = 0$)

H_1 : Series is stationary. ($H_1: \omega < 0$)

In practice, models under the above hypotheses have three cases:

- When there is a test for a random walk against a stationary autoregressive process of order one (AR(1))
- When there is a test for a random walk against a stationary (AR(1)) with a drift
- When there is a test for a random walk against a stationary (AR (1)) with a drift and time trend.

For ease of computation and interpretation, Dickey Fuller test employs the following equation:

$$\Delta y = \beta_1 + \beta_2 t + \omega y_{t-1} + v_t \dots \dots \dots (4.7)$$

Where y_t is the relevant time series, Δ is a first difference operator, t is a linear trend and v_t is the error term. The error term should satisfy the assumptions of normality, constant error variance and independent (uncorrelated) error terms. According to Takaendesa (2006), the results based on the DF test will be biased if the error terms are not independent in equation (4.7). A limitation of the DF test is that it does not take account of possible autocorrelation in the error process or term (v_t). To accommodate for this weakness, the ADF can be used and this test ‘augments’ the test using m lags of the dependent variable. By adding a lagged differenced term on the right-hand side in the DF equation (4.7), this test corrects for high-order serial correlation. As a result, the ADF employs the following equation:

$$\Delta y = \beta_1 + \beta_2 t + \omega y_{t-1} + \sum_{i=1}^P d_i \Delta y_{t-i} + v_t \dots \dots \dots (4.8)$$

Equations (4.7) and (4.8) can also be estimated without including a trend term (deleting the term $\beta_2 t$ in the equation) and without a constant (leaving out β_1 in the equation). The lags of Δy_t now 'soak up' any dynamic structure present in the dependent variable, to ensure that v_t is not auto correlated. In both tests above, if the calculated statistic is less (in absolute terms) than the MacKinnon (1991, 1996) values, which are used by the E-views software, the null hypothesis is not rejected and will therefore mean that there is a unit root in the series. In other words, it means the time series is not stationary. The opposite is true when the calculated statistic is greater than the MacKinnon critical value.

Like any other unit root tests, the Dickey-Fuller test has its own weaknesses. The test is weak in its ability to detect a false null hypothesis. Gujarati (2003: 819) states that unit root tests have low power if the process is stationary but with a root close to the non stationary boundary, that is, they tend to accept the null of unit root more frequently than warranted. According to Thomas (1997: 410), this lack of power means that the Dickey-Fuller test fails to detect stationarity when the series follows a stationary process. This could occur either because the null hypothesis was correct or because there is insufficient information in the sample to enable rejection.

4.4.3 Phillips Perron Tests (PP)

The Phillips Perron test (PP) is a generalization of the ADF test procedure that allows for fairly mild assumptions concerning the distribution of the errors. The test regression is the AR(1) process:

$$\Delta y_{t-1} = \alpha_0 + \gamma y_{t-1} + e_t$$

According to Brooks (2008), the PP test makes a correction to the t-statistic of the coefficient from the AR(1) regression to account for the serial correlation in e_t whilst the ADF test corrects for higher order serial correlation by adding lagged differenced terms on the right hand side.

4.4.4 Co integration and error correction modeling.

According to Gujarati (2003:830), the co integration of two or more series suggests that there is a long run or equilibrium relationship between them. This means that even though the series themselves may be non stationary, they will move closely together over time and their difference will be stationary. Their long run relationship is the equilibrium to which the system converges over time and

the disturbance term can be interpreted as the disequilibrium error or the distance that the system is away from equilibrium at time t .

A set of variables is defined as co integrated if a linear combination of the two is stationary. In order to proceed to this stage, all the series of interest should be integrated of the same order, preferably $I(1)$. The reason for this is that if the series display level stationarity, or are $I(0)$, standard regression and statistical inference could be carried out, since there would be no problem of spurious regressions. On the other hand, if they are integrated of different orders the norm used to be difference all the variables to be included in regressions. Harris (1995: 80), however, shows that it is not necessary for all the variables in the model to have the same order of integration, especially if theory *a priori* suggests that such variables should be included. Thus, a combination of $I(0)$, $I(1)$ and $I(2)$ can be tested for co integration.

According to Brooks (2002:387), in most cases, if two variables that are $I(1)$ are linearly combined, their combination would also be $I(1)$. More generally, if variables with differing orders of integration are combined, the combination would have an order of integration equal to the largest. The exception to this rule is when the series are co integrated.

There are two broad categories of co integration: those that are residual based, such as the Engle-Granger approach and those that are based on maximum likelihood estimation on a VAR system, such as the Johansen method.

Engle and Granger (1987) came up with a four step procedure to determine if two $I(1)$ variables are co integrated of the order(1,1). The test is applied on the residuals and the initial step includes pre-testing the variables for their order of integration. Co integration of the variables necessitates that the two variables be integrated of the same order. The second step involves estimating the long run equilibrium relationship.

According to Choga (2008:81), the null hypothesis states that there is unit root in the potentially co integration regression and the alternative hypothesis states that the residuals are stationary. If the

null is rejected, the conclusion drawn is that a stationary linear combination of the non-stationary variables has been found. The variables would therefore be classified as co integrated. If, however, the null is not rejected, it means that there is no co integration.

The third step involves estimating the error correction model. If the variables are co integrated, the residuals from the equilibrium regression can be used to estimate the error-correction model. Finally, the model is assessed for adequacy.

The Engle-Granger approach suffers from numerous problems when applied to multivariate models. According to Harris, (1995: 76), such problems include the usual finite sample problem of a lack of power in unit root and co integration tests and the inability to detect more than one co integrating relationships that may exist in a model. Since our model is multivariate, there is a likelihood of having more than one co integrating vector. The Engle-Granger approach would therefore produce inconsistent estimates. Thus, in light of these problems, we prefer the Johansen methodology.

4.4.5 Johansen technique based on VARS

According Harris, (1995), the Johansen technique has several advantages over other co integration techniques. The main objective of these co integration tests is to determine whether the variables in our economic growth model are co integrated or not. The presence of a co integration relation(s) forms the basis of the vector error correction model (VECM) specification. Identifying the number of co integration vectors within the VAR model is the basis for this procedure. To identify the number of co integration vectors a likelihood ratio test of hypotheses procedure is used. The Johansen procedure consists of four steps:

1. Set the appropriate lag length of the model

The lag length test is used to find the number of lag values that should be included in the model. The Johansen test can be affected by the lag length employed in the VECM. It is therefore crucial to attempt to select the lag length optimally. The lag length that is chosen should produce the number and form of co integration relations that conform to all the *a priori* knowledge associated with economic theory. According to Brookes (2002:334), multivariate versions of the information criteria,

which includes the sequential modified likelihood ratio (LR), Akaike information criterion (AIC), Final prediction error (FPE) Schwarz information criterion (SIC) and the Hannan-Quinn information criterion (HQ) can be used to determine the appropriate lag length.

2. Choose the right model regarding the deterministic components in the multivariate system

The choice of deterministic components requires that all variables be pre-tested to assess the order of integration. It is easier to detect the possible trends when a series is plotted. The order of integration is important, because variables with different orders of integration pose problems in setting the co integration relationship. Order of integration is detected by the unit root test discussed earlier. the graphical analysis of the raw data and unit root tests, together with *a priori* knowledge from economic theory, should assist in selecting the deterministic trend assumption to be used in the Johansen test for co integration (rank of Π).

3. determination of the rank of Π

This step involves determining the number of co integrating vectors. The model considered for co integration can be estimated in several forms based on the specification of the constant and the time trend. If the model has a constant without a time trend, then it can be estimated in two forms: either the constant is inside the co integrating vector, or it is outside the co integrating vector. If the model has a time trend, then it is considered either inside or outside the co integrating vector.

It is important to evaluate whether the results of the analysis have a sound economic base. Apply causality tests on the error correction model to identify a structural model and determine whether the estimated model is reasonable.

Assuming a set, n , of variables [LGDP, LDA, LCR, DLNCA, and FCI] that are integrated of order one, $I(1)$, are thought to be cointegrated. A VAR with k lags could be set up:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_k Y_{t-k} + u_t \dots \dots \dots (4.9)$$

The Y_t 's are $n \times 1$ vectors of deterministic variables, and the coefficient estimates are contained in $n \times n$ matrices. To use the Johansen test, the VAR now needs to be turned into a vector error correction model (VECM) Y_t of the form:

$$\Delta Y_t = \Pi Y_{t-k} + \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \dots + \Gamma_{k-1} \Delta Y_{t-(k-1)} + u_t \dots \dots \dots (4.10)$$

On the LHS, the above VAR contains n variables in first difference form, a lag in the dependant variable and $k-1$ lagged differences of the dependant variables on the RHS. Because the Johansen test is sensitive to the lag length employed, the optimal lag length should be determined as described earlier.

The Π matrix can be interpreted as the long-run coefficient matrix; in the long-run equilibrium all the RHS lagged terms in Y_t should be zero and, setting $u_t = 0$, ΠY_{t-k} must equal zero so that Y_t has settled at its equilibrium level. It is thus the Π matrix that is of concern in testing for co integration.

The test for co integration between the Y_t s is calculated by looking at the rank of the Π matrix via its eigenvalues. The rank of a matrix is equal to the number of its characteristic roots (eigenvalues) that are different from zero or the maximum number of linearly independent rows or columns contained in the matrix; a *full rank* matrix is one where its rank is equal to its dimensions, and reflects no linear dependence at all in the rows or columns. Intuitively, the lower the rank of the matrix the greater will be the number of linearly dependent rows and/or columns in the matrix.

The *characteristic equation* of the matrix Π is given by:

$$|\Pi - \lambda I_n| \dots \dots \dots (4.11)$$

Where I_n is an identity matrix and the λ 's are the *characteristic roots* (obtained by factorization). The characteristic roots are also known as the *eigenvalues*, and the sum of the eigenvalues is the *trace* of the matrix.

Two test statistics for co integration are employed under the Johansen technique and are formulated as:

- $\lambda_{\text{trace}}(r) = -T \sum_{i=r+1}^g \ln(1 - \lambda_i)$ This is a joint test where the null is that the number of co integrating vectors is equal to or less than r , with the alternate being a general test that this number is greater than r .
- $\lambda_{\text{max}}(r+1) = -T \ln(1 - \lambda_{r+1})$ This is a separate test on each eigenvalues, where the null is that the number of co integrating vectors is equal to r against the alternative of $r + 1$.

r is the number of co integrating vectors under the null hypothesis and T is the sample size. Testing is conducted sequentially, starting with $r = 0$ and increasing r by one at a time. In each of the above cases, the null is rejected if the test statistic is greater than the critical value and the test is repeated at the next level of r . If the null cannot be rejected at any time then the testing process would be complete. The Johansen technique allows for hypothesis testing regarding the equilibrium relationships, and these are conducted by imposing restrictions on the matrix.

5. Estimating the VECM

The last and final step involves estimating the VECM if co integration is found. This is done by specifying the number of co integrating vectors, trend assumption used in the previous step and normalizing the model on the true co integrating relation(s). Thus, a VECM is merely a restricted VAR designed for use with non stationary series that have been found to be co integrated. The specified co integrating relation in the VECM restricts the long run behavior of the endogenous variables to converge to their co integrating relationships, while allowing for short run adjustment dynamics. Once estimation is complete, the residuals from the VECM must be checked for normality, heteroskedacity and autocorrelation.

4.4.6 Error correction model (ECM)

The error-correction mechanism corrects for disequilibrium in the short-run. The *Granger Representation Theorem* states that, if two variables X and Y are co integrated, then the relationship between the two can be expressed as an ECM. According to Enders (2004:329), in an error-correction model, the short-run dynamics of the variables in the system are influenced by the deviation from equilibrium:

$$\Delta y_t = \beta_1 \Delta x_t + \beta_2 (y_{t-1} - \gamma x_{t-1}) + \mu t \dots \dots \dots (4.12)$$

Where: $\Delta x_t \equiv x_t - x_{t-1}$ this is the characteristic “error correction” specification, where the change in one variable is related to the change in another variable, as well as the gap between the variables in the previous period. The term $y_{t-1} - \gamma x_{t-1}$ gives the error correction term. According to Brooks (2002:389), a necessary condition is that Y_t and X_t are co integrated with the co integrating coefficient γ then $y_{t-1} - \gamma x_{t-1}$ will be $I(0)$ even though the constituents are $I(1)$. It will then be possible to use the OLS and standard procedures for statistical inference on the equation above. It is also possible to add an intercept in either the co integrating term or in the model for ΔY_t .

ECMs can be interpreted as follows: Y is supposed to change between $t-1$ and t as a result of changes in the values of the explanatory variables, the X s between $t-1$ and t and also in part to correct for any disequilibrium that existed during the previous period. The error correction term has to appear with a lag for it would not be reasonable for it to appear without one. This would imply that Y changes between $t-1$ and t in response to a disequilibrium at time t . The long-run relationship between x and y is defined by γ whilst β_1 describes the speed of adjustment back to the equilibrium. Its strict definition is that it measures the proportion of last period’s equilibrium error that is corrected for. The ECM can therefore be measured for more than two variables.

4.4.7 Advantages of ECM

ECM is a convenient model measuring the correction from disequilibrium of the previous period and this has a very good economic implication. The model is also formulated in terms of first differences which typically eliminates trends from the variables involved and solves the problem of spurious regressions. ECMs also easily fit into the general to specific approach to econometric modeling, which is in fact a search for the most parsimonious error correction mechanism that best fits the given data sets. The error correction model is also particularly powerful since it allows an analyst to estimate both short term and long run effects of explanatory time series.

4.5 Diagnostic Checks

The following section is a very crucial stage in the analysis of the effects of a financial crisis on the economy as it confirms parameter estimation outcomes achieved by the estimated model. Diagnostic checks test the stochastic properties of the model, such as residual autocorrelation, heteroscedasticity and normality, among others.

4.5.1 Autocorrelation test: Lagrange Multiplier (LM)

The term autocorrelation may be defined as “correlation between members of series of observations ordered in time. Lagrange Multiplier (LM) test which is a multivariate test statistic for residual serial correlation up to the specified lag order. The LM test is formulated as below:

$$TR^2 \approx \chi^2(m)$$

Where: m is the number of regressors in the auxiliary and T is the number of observations. The test centers on the values of the R^2 for the auxiliary regression and the test statistic for the chosen lag order (m) is computed by running an auxiliary regression of the residuals (μ_t) on the original right-hand explanatory variables and the lagged residuals (μ_{t-m}) and multiplying it by the number of observation, T . If at least one of the coefficients in an equation is statistically significant, the value of the R^2 will be relatively significant. According to Harris (1995: 82), the lag order for this test should be the same as that of the corresponding VAR. The LM statistic tests the null hypothesis of no serial correlation against an alternative of auto-correlated residuals.

4.5.2 White Heteroscedasticity Test

White's (1980) general test of heteroscedasticity tests the null hypothesis that the errors are both homoskedasticity (no heteroscedasticity problem) and independent of the regressors and that there is no problem of misspecification. The test regression is run by regressing each cross product of the residuals on the cross products of the regressors and testing the joint significance of the regression. The null hypothesis for the White test is no heteroscedasticity and misspecification. If we fail to reject this null, we have homoskedasticity. The failure of any one or more of the conditions just mentioned above could lead to a significant test statistic.

4.5.3 Residual Normality Test

The normality test is used to find out whether the random variable is normally distributed or not. This test is applied to residuals from a linear regression model. If they are not normally distributed, the residuals should not be used in Z tests or any other tests derived from the normal distribution such as F-tests and the chi-square test. The residual normality test used in this study is the multivariate extension of the Jarque-Bera normality test, which compares the third and fourth moments of the residuals to those from the normal distribution. The preferred residual factorization method for the test is by Urzua (1997), which makes a small sample correction to the transformed residuals before computing the Jarque-Bera statistic. The joint test is based on the null hypothesis that residuals are normally distributed. A significant Jarque-Bera statistic, therefore, points to non-normality in the residuals. However, the absence of normality in the residuals may not render co integration tests invalid.

4.6 Conclusion

This chapter specified the variables that would potentially transmit the effects of the financial crisis onto the economy and explained the approach to be used in obtaining the regression results for the study. The technique for parameter estimation that is going to be used in this study was also discussed and this is the Johansen technique. To validate the parameter estimation outcomes achieved by the model, diagnostic checks will also have to be carried out. These checks test for the stochastic properties of the model, such as heteroscedasticity, autocorrelation and residual normality and include the White test, Durbin Watson test and the Jarque-Bera normality test respectively.

Chapter Five

Presentation and Analysis of Results

5.1 Introduction

This chapter applies the techniques discussed previously to South African data in order to achieve the objectives set out in chapter 1. This chapter augments the analysis by applying that framework and the analytical techniques proposed on quarterly South African data covering the period 2000 to 2009. The results presented include those of unit root tests, co integration test and finally the regression. Stationarity co integration and tests will be done in order to establish the long run relationship. Thereafter, the error correction model will be estimated. The econometric package used in this study is E-views version 6. The following section will present the empirical findings.

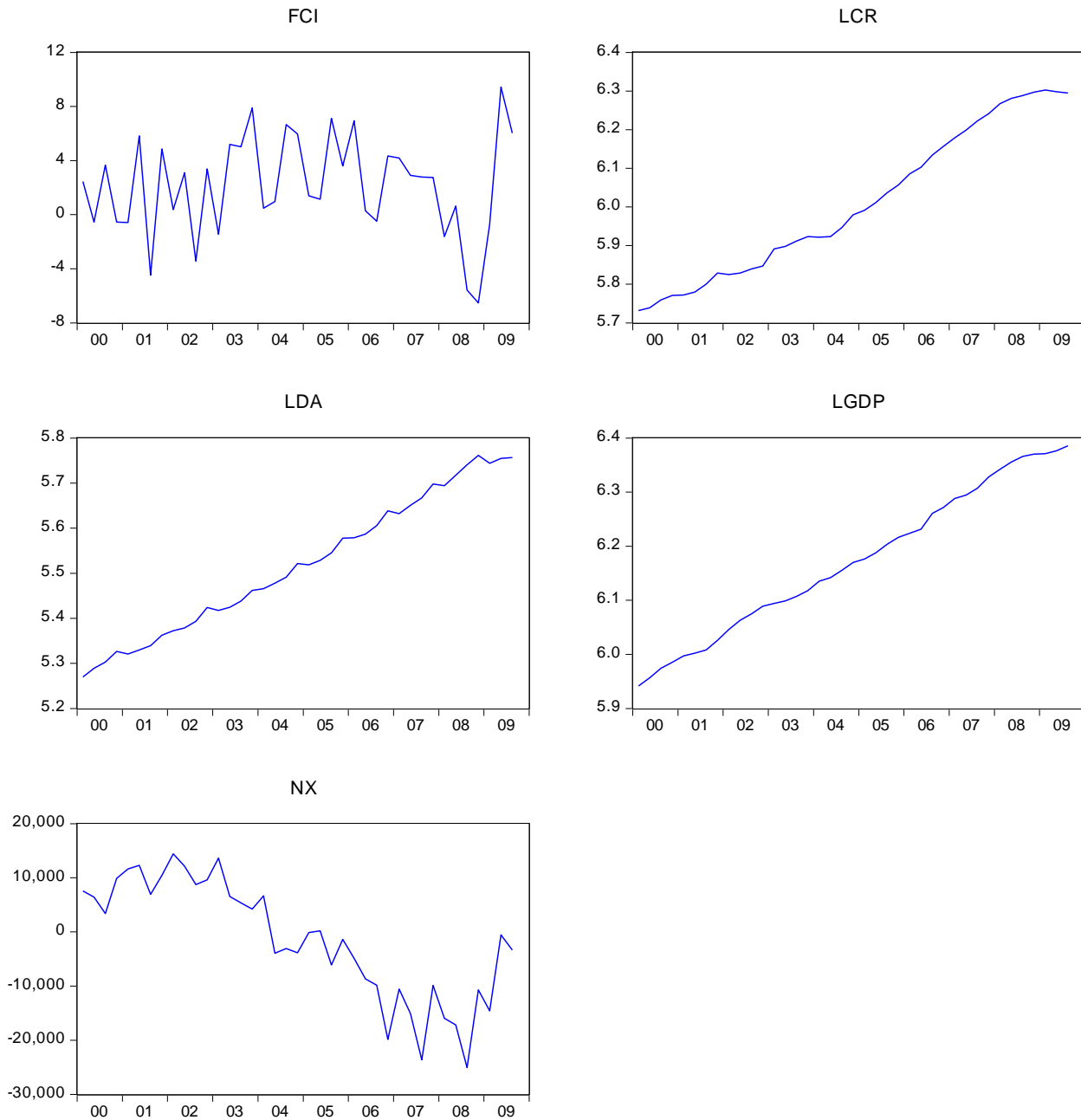
5.2. Empirical Findings

The following section is divided into four sub-sections. The first presents the results of stationarity/unit root tests, the second presents and discusses the co integration test results; the third discusses the long run relationship and presents the results from the analysis. Diagnostic checks results are provided in the fourth sub-section.

5.2.1 Stationarity results

Determining the order of integration of the series is the first step of the Johansen methodology and in this study, three tests for stationarity are employed including an informal one which is the graphical analysis of the series. A visual plot of the series is important and is usually the first step in the analysis of any time series before pursuing any formal tests. This allows the detection of any data capturing errors, and structural breaks or drifts that may bias the unit root tests and gives an idea of the trends and stationarity of the data set. The other two tests are used simultaneously as one test may not be fully reliable. If they give different results, the stronger one of the two is considered. The Phillip-Perron tests have been found to be more powerful than the augmented Dickey-Fuller test in finite samples. The figure below shows plots of all variables used in the model.

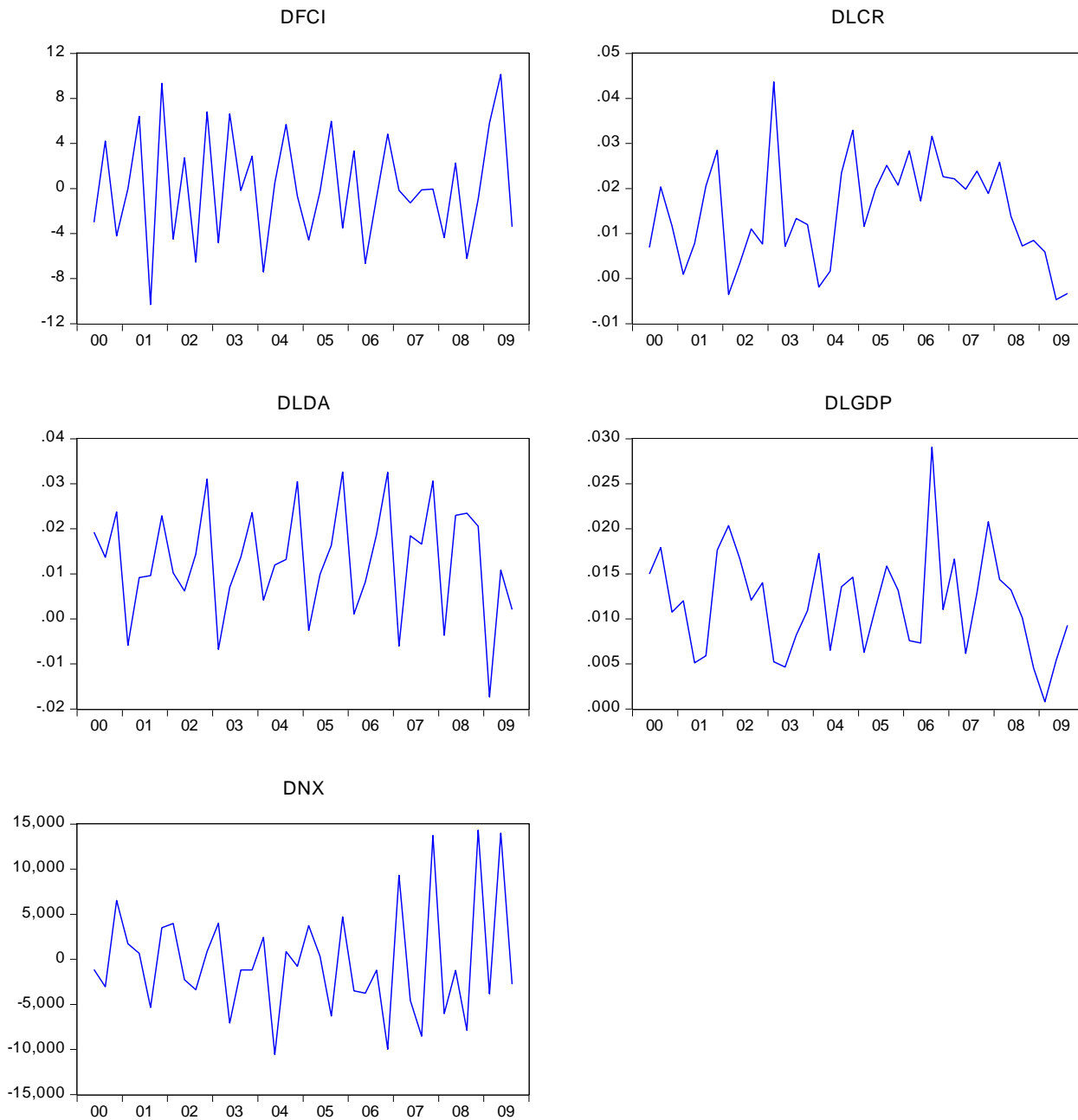
Figure 5.1 Stationarity graphs



The visual plot above shows that apart from the financial conditions index FCI, all the other variables have unit root present at level. The net exports variable seems to be slightly stationary. Although the amplitude is wide, the variable oscillates around the mean of zero.

Stationarity graphs after 1st differencing

To solve the unit root problem, the variables were differenced and after differencing once, all variables become stationary. This means that they are integrated of order one, that is, they are I(1).



The formal tests employed, as mentioned above, are the Augmented Dickey Fuller test (ADF) and the Phillips Peron. These are used to identify the order of integration i.e. the number of times a variable needs to be differenced to make it stationary. Below is table 5.1 that presents stationarity results for South Africa. These were arrived at after a number of preliminary trials.

Table 5.1: Stationarity test results

Variable	Augmented Dickey Fuller test			Phillips Peron			I
	None	Intercept	Trend & Intercept	None	Intercept	Trend & Intercept	
FCI	-1.184	-2.256	-5.177**	-1.184	-2.240	-5.163**	I(1)
LCR	8.052	-0.002	-1.516	6.587	-0.077	-1.725	I(1)
LDA	6.467	-0.453	-3.455*	13.906	-0.522	-3.512	I(1)
LGDP	12.548	-1.035	-1.827	11.539	-0.986	-2.120	I(1)
NX	-1.803	-1.840	-3.139	-1.803	-1.840	-2.984**	I(1)
DICI	-10.327**	-10.210**	-10.076**	-20.427**	-20.653**	-17.118**	I(0)
DLCR	-2.309*	-4.322**	-4.212**	-2.026*	-4.327**	-4.216*	I(0)
DLDA	-4.031**	-7.859**	-7.746**	-3.985	-12.545**	-12.005**	I(0)
DLGDP	-1.863	-4.910**	-4.910**	-1.579	-4.807**	-4.806**	I(0)
DNX	-9.685**	-9.578**	-9.499**	-9.776**	-9.673**	-9.589**	I(0)
Critical value 5%	-1.952	-2.956	-3.557	-1.950	-2.941	-3.533	
Critical value 1%	-2.637	-3.650	-4.271	-2.627	-3.616	-4.219	

** represents a stationary variable at 1% significance level

* represents a stationary variable at 5% significance level

The table and graphical analysis above present the stationarity tests for the South African variables used for the regression analysis. Some of the variables were first entered in their log values and the ADF and Phillips Peron results were obtained. The above results show that only FCI is not stationary at level with no constant and trend, with a constant only but is stationary with both a constant and a trend at 1% significant level in both tests. LDA is stationary at level with a constant and trend at 5% significant level in the ADF test and NX is stationary at level with a constant and trend at 1%

significant level in the Phillips Peron test. The rest of the variables LGDP, LCR and NX are not stationary at level in all forms.

All variables however become stationary in their 1st differences in both the ADF test and the Phillips Peron test. All variables are stationary where there is only a constant. DFCI, DLDA and DNX are stationary in all forms at 1% significant level after being differenced only once. According to the ADF test, both DLCR and DLGDP are stationary at 1% significant levels with a constant only and where there is a constant and a trend. However, only DLCR is stationary at 5% significance level where there is neither a constant nor a trend and DLGDP is not. The Phillips Peron test shows that after differencing; only DLDA and DLGDP remain non stationary where there is no constant. The rest of the variables are stationary at 1% significance levels in all forms except DLCR which is stationary at 5% significance level where there is a constant and trend.

The ADF results are in line with the graphical analysis. We therefore conclude that all of the series are of the I(1) order of integration therefore the investigation of the co integration properties is the next step. We then move on to do the co integration tests in the following section.

Co integration

Co integration analysis is conducted using the Johansen procedure to determine whether there is a long run equilibrium relationship between the gross domestic product and its theoretical determinants thus enabling the formulation of an error correction model. The advantage of this approach 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), co integrated 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 5.2 that follows shows the co integration test results for the variables we used.

Lag Length selection

The choice for the lag order for the VAR was made using the information criteria approach such as the Schwarz and Akaike information criteria as well as the Likelihood Ratio (LR) test amongst others, augmented by theoretical priors. Johansen's co integration approach has been criticized for being sensitive to the lag length chosen therefore important that a consistent procedure is used to choose the lag length for both the co integration analysis and the error correction model. When the lag lengths chosen by all information criteria are the same, this lag length will be used for both the co integration analysis and error correction model. Below is a table that shows the results of the lag length selection criteria.

Table 5.2 VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria

Endogenous variables: LGDP

Exogenous variables: C FCI LCR LDA NX

Date: 07/23/10 Time: 15:25

Sample: 2000Q1 2009Q4

Included observations: 35

Lag	LogL	LR	FPE	AIC	SC	HQ
0	123.365	NA	6.78e-05	-6.764	-6.542	-6.687
1	136.144	21.177*	3.46e-05*	-7.437*	-7.170*	-7.345*
2	136.959	1.303	3.51e-05	-7.426	-7.115	-7.319
3	137.333	0.577	3.64e-05	-7.390	-7.035	-7.268
4	138.110	1.155	3.70e-05	-7.378	-6.978	-7.240

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The lag that produces the best-behaved model in terms of diagnostic test will be chosen for the error correction model. Based on the results presented in table 5.2 above, a lag length of 1 was chosen.

The trace and maximum eigenvalues tests are undertaken to investigate the number of co integrating vectors in the model. Table 5.3 below presents the Johansen co integration test based on the trace test and on the maximum eigenvalue test.

Table 5.3: Co integration test results

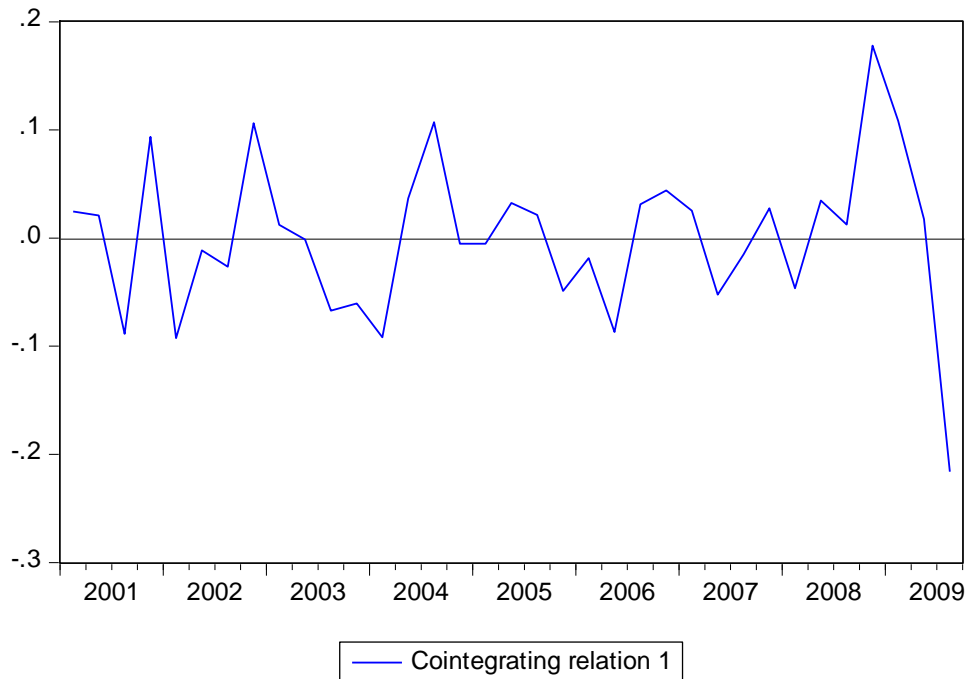
		Trace Statistic	Trace Statistic	Maximum Eigen Value Statistic	
HO: Rank = ρ	λ	-Tlog(1- λ)	$\lambda_{\text{Trace}95\%}$	-Tlog(1- λ)	$\lambda_{\text{max}95\%}$
$\rho=0$	0.694	88.604**	69.819	41.468**	33.877
$\rho<1$	0.533	47.136	47.856	26.650	27.584
$\rho<2$	0.279	20.487	29.797	11.433	21.132
$\rho<3$	0.194	9.054	15.495	7.565	14.265
$\rho<4$	0.042	1.489	3.841	1.489	3.841
Values marked with * represent a stationary variable at 5% significant level and ** represent a stationary variable at 1% significance level.					

The results of the trace test rejects the null hypothesis of no co integrating vectors, since the test statistic of about 88.6 is greater than the 1 per cent critical value of approximately 69.8. The trace test, therefore, concludes that there is a co integrating relationship (vectors) at the 5 per cent level of significance. The maximum eigenvalue test gives similar results and rejects the null hypothesis of no co integrating vectors, since the test statistic of about 41.5 is greater than the 1 per cent critical value of approximately 33.9. The maximum eigenvalue test also gives the same results for the economic growth model. The co integrating relationship can be shown graphically as below.

Co integration graph

The results presented above can be confirmed by plotting graphs of co integration vectors as shown in the figure below. The vector in the co integrating equation appears to be relatively stationary.

Co integration graph



Having established the existence of a long run relationship between gross domestic product, credit extended, domestic absorption and net exports, the short run and long run dynamics of the model can now be established with an error correction model.

5.3 The Error Correction Model (ECM)

The ECM technique allows the long run and short run dynamics to be estimated in a single step. The single error correction framework has a constant which is a combination of the long run and the short run constant thus isolating the speed of adjustment parameter which indicates how quickly the system returns to equilibrium after a random shock. The general-to-specific strategy was used and insignificant variables were sequentially eliminated, leading to a parsimonious specification.

Table 5.4 Regression results on SA GDP growth rate

INDEPENDENT VARIABLES	COEFFICIENT	T-VALUE
CONSTANT	-0.476	-2.59***
DLCR	1.555**	1.380*
DLDA	2.665**	1.866**
DFCI _{t-1}	-0.863	-3.825***
DNX _{t-1}	0.063	1.930**
ECT _{t-1}	-0.129	-3.462***
Number of observations: 35		
Adjusted R ² 0.890		
Note: Values marked with * represent a stationary variable at 10% significant level and ** represent a stationary variable at 5% significance level and *** represent a stationary variable at 1% significance level.		

Firstly, we look at effect of the financial market conditions on growth. This is the variable of interest in this study. The country's financial conditions, as represented by the index FCI have a negative effect on the country's economic growth. The variable carries an expected negative sign. The coefficient suggests that a 1% deterioration of the conditions in the financial market will result in a decrease in economic growth by about 0.863. The impact of financial crisis is highly significant indicated by the high coefficient and significant level of 1%. Theory does postulate a negative relationship between the financial conditions of a country and its economic growth and thus the variable bears the expected sign. Guichard and Turner (2008) found results almost similar to this; they found that economic growth slowed down due to worsening of the financial markets conditions.

According to an FNB economist, Nxedlana (2009), the impact of the credit and confidence crisis intensified during the financial crisis. The negative consequences on real economic activity in the industrialized were felt greatly in other countries. Some of the world's largest economies were driven into simultaneous recession. The variable CR represents the credit extended to the private sector. Increasing the credit extended to the private sector will push investment upwards as more loans become available. This will consequently lead to an increase in output. For that reason, supply of

credit to private sector has a direct relationship with GDP and is therefore expected to have a positive sign. This variable is correctly signed and suggests that in the long run, a 1% increase in credit extension will result in approximately 1.555% increase in economic growth. Significance of the variable was at 10% suggesting that credit extension did not play a major role on the reduction of economic growth in South Africa.

DA is a measure of domestic absorption and comprises investment, consumption and government expenditure. As expected, this has a correct positive coefficient of 2.665 which suggests that an increase in domestic absorption by 1% will lead to an increase in output by approximately 2.66%. This variable is significant at 1% indicating that it has significant impact on economic growth and this conforms to economic theory.

According to Dornbusch (1991), trade facilitates access to new goods, adoption of new methods of production, and the new organization of industries. Theory therefore postulates a positive relationship between net exports and economic growth. The variable net export (NX) in this study carries a correct sign. A priori, this variable is expected to be directly varying with economic growth. The results suggest that a 1 unit increase in net exports will result in economic growth increasing by approximately 0.063. The t-value and p-value both show a significant level of 5%.

The error correction term for this model shows that only 13% of the equilibrium error is corrected in one quarter. This means that it will take almost a 2years for full equilibrium to be reached. The speed of adjustment is relatively slow. This is mainly because the shock to the system was an exogenous one and therefore beyond the control of the South African government. Full recovery will also depend on the recovery of the global economy. The sign is negative therefore conforms to economic theory and it is significant at 1%. The South African Reserve Bank government is still trying to correct the negative effects the financial crisis had on the growth of the economy.

The results of the economic growth model that was estimated and tabulated in table 5.4 above were obtained using quarterly data on five variables. As shown by the high adjusted R^2 of 0.890428, data is robust. The adjusted R^2 measures the closeness of fit of the regression model and reveals that the

statistical fit of the model is satisfactory. The model was also subjected to a number of diagnostic tests. These checks are crucial in this analysis, because if there is a problem in the residuals from the estimation of a model, it is an indication that the model is not efficient, such that parameter estimates from such a model may be biased. Of importance in this analysis are the residual diagnostic checks for serial correlation, normality and heteroscedasticity. Results from the diagnostic tests performed in this study are presented in Table 5.5 below.

Diagnostic checks: Table 5.5

Test	Test statistic	P-value
Autocorrelation (LM)	24.01	0.51
White Heteroscedasticity Test	245.76	0.24
Normality (Jarque-Bera)	$\text{Chi}^2(2) = 1.352$	0.508

As mentioned in Chapter 4, the three tests are based on the null hypothesis that there is no serial correlation, there is normality (keeping in mind the CLRM assumption that the residuals are normally distributed with a mean of zero and a constant variance and that a violation of this assumption leads to inferential statistics of a regression model) and there is no heteroscedasticity problem for the LM, Jarque-Bera and White heteroscedasticity tests, respectively. The results of the test reveal that the model is relatively well specified.

5.4 Conclusion

This chapter analyzed the impact of the financial crisis on the economy. Based on theory, a background on the financial crisis and South African economy and data availability, an economic growth model was specified. The potential explanatory variables included in this model include the financial conditions index, domestic absorption, credit extension and net exports. The chapter started by analyzing the time series properties of the data employing both informal and formal tests for stationarity. The Johansen (1991, 1995) co integration technique was chosen as the preferred parameter estimation technique for the economic growth 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 co integrating relationship. Finally, the economic growth model was

estimated and the regression results were produced. The regression results from the model support the notion that a financial crisis has a negative impact on the growth of the economy. These results were supported by economic theory and empirics. The model was also subjected to diagnostic checks and results indicated that the model was robust.

Chapter Six

Conclusions, 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 impact of the financial crisis on the South African economy in the period 2000Q1-2009Q3. The macroeconomic background for the country was presented and literature surrounding impact of financial crises and empirics of past crises were also explained in the study.

Based on an extensive review of literature on the effects of financial crisis on the economy and on data availability, an empirical model that links economic growth and its potential determinants was specified. The variables used included domestic absorption, net exports, credit extension and financial conditions in the market. The Johansen co integration and error correction methodology was used because of its advantages over other techniques. The first step employed was the analysis of the time series properties of the data by employing both formal and informal tests for stationarity. The variables were found to be integrated of the same order and all of them were stationary after being differenced once. 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 study revealed that the financial conditions in the market are negatively related to economic growth. This means that if conditions in the financial markets worsen, growth of the economy deteriorates. The financial condition index coefficient was highly significant at 1% significant level revealing that the financial crisis had a significant effect on the South African economy. All the other variables which include domestic absorption, net exports, credit extension were positively related to the growth of the economy.

An interesting parameter in the VECM is the speed of adjustment coefficient. This measures the speed of adjustment in the economy following a shock in the system. The study revealed that about

13% of the variation in output from its equilibrium is corrected within a quarter, meaning it takes about two years for full equilibrium to be reached after the shock in the system has occurred.

Although the financial crisis did affect the South African economy, the impact was by far less than the impact on other economies whose markets were not fully protected and regulated. This however does not necessarily imply an easy task for the South African authorities as a lot still needs to be done to restore the country's equilibrium.

6.2 Recommendations and Policy Implications

This research makes a contribution to the policy debate by examining whether or not the financial crisis was responsible for the decline in the growth of the economy and also whether the effect was significant or not. The South African economy experienced sluggish economic growth during the period of the crisis although it was not significantly affected by it. When the crisis occurred, South African financial markets were relatively healthy and well insulated by regulation laws and supervision such as (Credit Act and Basel II implementation) and therefore have not been as severely exposed to toxic loans as its international counterparts. This is why the impact of the crisis was miniature. However, since the crisis, the SA financial, foreign exchange markets including markets for commodity exports declined. In addition, risk premium increased and the stock market's overall index also fell, but the fall was lower than the decrease in emerging markets index. The rand came under pressure in line with experiences in other resource-dependent emerging markets running current account deficits.

The performance of the country's gross domestic product growth up to the second quarter of 2008 was mainly influenced by domestic developments such as interest rates hikes and power shortages, as well as vigorous growth in commodity prices. With the commodity price implosion and escalating risk aversion, South Africa only started to feel the impact during the third quarter of 2008. Consequently, the economy weakened due to a significant decline in manufacturing sector and recorded the lowest growth rate in ten years.

The policy stance adopted by any government may differ from country to country because of the different financial, political or economic situations that may exist in a particular country. The South African Reserve bank has to take into the consideration these characteristics before making a move. The government has various options in dealing with the effects of the crisis. Considering the importance of financial assets in the financial economy, the South African Reserve Bank can also intervene in the money market by accommodating the increased borrowing pressure and thus avoiding or reducing the pressure on interest rates; this will shift the burden of adjustment onto the exchange rate. SARB can intervene in the spot and/or forward exchange markets to reduce pressure on the exchange rate and shift the burden of adjustment onto interest rates. Keeping in line with international policy guidelines, the financial stability of the Bank can identify and monitor excessive domestic credit extension that could result in self-feeding asset-price bubbles.

In an effort to cushion the economy from the impact of the recent and future financial crises, the SARB should intensify its pursuit of a conscious macro-prudential framework. This would limit financial system-wide distress that will result in significant losses in terms of real output. The authorities should adopt countercyclical policies that will foster discipline during upward and downward phases of the business cycles. These policies should help to smooth the effects of economic cycles, 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 the economy and its determinants found in the study implies the effectiveness of targeting one of the variables in influencing the behavior of the other variables. Supposing that this interpretation holds, this then justifies the stance taken by SARB in manipulating interest rates (and consequently the FCI and the credit extended to the private sector) in order to influence the long run behavior of the other variables that also affect the economy.

Secondly, the South African economy may be affected by external shocks that are outside the control of the authorities. The policy implication is that the authorities will have limited influence on the extent to which the financial crisis impacts on the economy.

It is difficult to fully escape the impact of financial crises of this nature because of the international relationship that exists between countries and the global environment in which they operate. Financial crises of this nature therefore should always be a cause of concern especially for relatively small economies like South Africa and 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 economic growth. This may have left other important variables, such as power shortages, that may affect the growth of the economy. This work only considered the period from the start of the decade in which the global financial crisis began up to the current period. The study will be 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 effect of financial crisis on growth of the economy as a whole. Certain sectors of the economy may have been adversely affected which may not have been reflected by the growth rate of the economy. Therefore, from this aspect a useful extension of this study can be made.

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8.0 Appendices

Appendix 1: Data for South Africa

Years	GDP	Domestic Absorption (millions)	Net Exports (millions)	Credit extended to private sector	Financial Conditions Index
2000 Q1	874,150	186,167	7,553	539,421	2.454581
2000Q2	904,844	194,602	6,425	548,058	-0.5412
2000Q3	942,974	200,824	3,376	574,362	3.664413
2000Q4	966,624	212,110	9,900	590,063	-0.54248
2001 Q1	993,739	209,256	11,630	591,354	-0.57259
2001Q2	1,005,513	213,727	12,286	602,096	5.826638
2001Q3	1,019,273	218,513	6,943	631,232	-4.47736
2001Q4	1,061,503	230,337	10,443	674,047	4.870628
2002Q1	1,112,432	235,807	14,412	668,609	0.372501
2002Q2	1,155,893	239,201	12,137	673,959	3.102605
2002Q3	1,188,512	247,247	8,747	691,265	-3.43625
2002Q4	1,227,507	265,552	9,628	703,581	3.375429
2003Q1	1,242,402	261,454	13,618	778,066	-1.44446
2003Q2	1,255,761	265,695	6,551	790,995	5.198541
2003Q3	1,279,693	274,218	5,380	815,664	5.022411
2003Q4	1,312,292	289,538	4,201	838,500	7.886235
2004Q1	1,365,518	292,319	6,644	834,852	0.482045
2004Q2	1,386,184	300,477	-3,927	838,020	0.964597
2004Q3	1,430,199	309,751	-3,082	884,561	6.661506
2004Q4	1,479,191	332,243	-3,864	954,224	5.968928
2005Q1	1,500,782	330,277	-123	980,103	1.392367
2005Q2	1,539,913	337,878	206	1,025,880	1.142731
2005Q3	1,597,211	350,803	-6,086	1,087,014	7.113534
2005Q4	1,646,422	378,145	-1,387	1,140,195	3.599027
2006Q1	1,675,400	379,072	-4,892	1,217,155	6.945947
2006Q2	1,703,877	386,273	-8,655	1,266,362	0.294575
2006Q3	1,821,774	403,339	-9,865	1,362,014	-0.49175
2006Q4	1,868,637	434,731	-19,844	1,434,873	4.346698
2007Q1	1,941,644	428,748	-10,536	1,509,927	4.189433
2007Q2	1,969,442	447,360	-15,087	1,580,492	2.909451
2007Q3	2,028,948	464,772	-23,632	1,669,685	2.786359

2007Q4	2,128,374	498,720	-9,905	1,743,858	2.742021
2008Q1	2,199,992	494,551	-15,936	1,850,718	-1.61984
2008Q2	2,267,938	521,454	-17,172	1,910,655	0.641362
2008Q3	2,321,448	550,373	-25,051	1,942,746	-5.57783
2008Q4	2,345,914	577,073	-10,732	1,981,051	-6.52029
2009Q1	2,350,240	554,525	-14,562	2,008,154	-0.70019
2009Q2	2,379,674	568,550	-566	1,986,722	9.430158
2009Q3	2,431,057	571,264	-3,333	1,971,745	6.035646