

THE BANK LENDING AND BALANCE SHEET CHANNELS OF MONETARY POLICY: A
THEORETICAL ANALYSIS

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF

MASTER OF COMMERCE (FINANCIAL MARKETS)

DEPARTMENT OF ECONOMICS AND ECONOMIC HISTORY
RHODES UNIVERSITY, GRAHAMSTOWN

JANUARY 2013

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ABSTRACT

The credit channel and its significance in the monetary policy transmission mechanism has been a point of contention among policy makers and economists for many years. In the early stages of this debate the monetarist view shaped thinking on the topic and cultivated the belief that the money supply is exogenously determined and that commercial banks play a minor role in the monetary transmission process. However, over the years, the credit view presented by Bernanke and Blinder (1988) has gained momentum. In contrast to the monetarist view, the credit view abandons the assumption of perfect substitutability and argues that due to their credit provision activities, financial institutions play a significant role in the transmission of monetary policy.

The credit channel consists of two sub channels, the bank lending and balance sheet channels. In both, deposits drive loans and changes in monetary policy are effected through interest rates and their impact on borrowers' balance sheets, bank reserves, bank deposits and ultimately the quantity of bank loans supplied. Disyatat (2010) re-examines the conventional view and presents an argument against the foundation upon which the theories are based. Using this as a basis, and motivated by the vast amount of empirical literature that already exists on this topic, both in South Africa and abroad, this research provides a theoretical analysis of the credit channel and its relative importance in the monetary policy transmission mechanism.

The exogenous/endogenous nature of money supply is considered and its implications for the existence and operation of the credit channel set out. It is found that, in order for a credit channel to operate efficiently in an economy, money supply should be endogenously determined. Moreover, a theoretical argument supporting Disyatat's (2010) revised credit channel is presented; it is concluded that, with a slight variation to Disyatat's proposed model, a single, unified channel exists.

DECLARATION

Except for references which are explicitly stated and acknowledged, this thesis is wholly my own work and has not been submitted to any other University, College or Technicon for degree purposes.

Nondumiso Gumede

December 2012

ACKNOWLEDGEMENTS

I would like to thank my parents and family for their tremendous support throughout the writing of this thesis. Your prayers and encouragement have been invaluable. My sincere gratitude goes out to my supervisor Rob Stuart. Thank you for your guidance, feedback, patience and understanding throughout this process. I would also like to extend my appreciation to the staff in the economics department at Rhodes University for their assistance throughout my undergraduate and post graduate studies.

The financial support from Economic Research South Africa (ERSA) towards my master's studies (and this research) is gratefully acknowledged. Views and opinions expressed are those of the author and do not necessarily represent those of ERSA or Rhodes University.

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CHAPTER 1

INTRODUCTION

Monetary policy is one of the most important tools that central banks can use to shape the economy. In order to ensure the successful implementation of such policy, Mishkin (1995: 4) suggests that monetary authorities should evaluate the timing and effects of their policies more accurately and thus gain a clear understanding of the channels through which monetary policy is transmitted. These mechanisms include the interest rate channel, the other asset price channel and the credit channel.

According to Morris and Sellon (1995: 60) a general agreement exists among economists and policy makers that monetary policy operates primarily through interest rates. The central bank discount (or repurchase) rate is, in many countries, the primary instrument for monetary policy and is thus the initiating force behind these monetary policy mechanisms. As such any changes made in these rates by central banks activate a sequence of events. For example; when monetary policy is tightened through open market operations that reduce bank reserves, interest rates rise. This rise in interest rates leads to a decrease in spending by interest sensitive sectors of the economy and, as explained by Smal and de Jager (2001: 5), has a direct impact on market interest rates, money, the demand and supply of credit, consumption, investment decisions, asset prices and exchange rates. Consequently changes in these variables affect the demand for and supply of goods and services which in turn determine inflationary pressures and fluctuations in output (Ludi and Ground, 2006: 3).

This series of events is referred to as the monetarist (money or interest rate) view of the monetary policy transmission mechanism, and argues that the role played by financial institutions in the transmission process is limited to the impact of monetary policy changes on bank deposits. In this model, commercial banks are principally concerned with the liability side of their balance sheets while central banks control money supply (Kashyap and Stein (1993: 1-2); Lungu (2007: 436)). The money view therefore highlights the significant roles played by the interest rate and other asset price channels in the transmission of monetary policy and, although it has formed the basis for numerous studies, Lungu (2007), Mishkin (1995), Smal and de Jager (2001), Bean *et al.* (2003: 107) and Kocherlakota (2000) identify a number of weaknesses in this conventional approach. In order to address these shortcomings, Bernanke and Gertler (1995: 33-34) propose an

extention of the money view to include a credit channel and thus an approach referred to as the credit view.

The credit channel is made up of two components. The first is the balance sheet channel, which is concerned with the effect of monetary policy on borrowers' balance sheets and the second is the bank lending channel, which is focused on the impact that monetary policy has on banks and their ability to supply loans (Lungu, 2007: 438). The credit view is Bernanke and Blinder's (1988) modification of the Keynesian IS/LM framework and, as opposed to the money view, places particular emphasis on the important role played by financial intermediaries in the economy. It argues that the significant function played by intermediaries has been ignored in the monetary literature through making the assumptions of homogeneous financial structures and perfect capital markets. As a result, these assumptions have cultivated the belief that banks and financial institutions are unnecessary and irrelevant to changes in aggregate demand (Lungu, 2007: 437). The credit view rejects this hypothesis and puts forward that, due to their credit provision facilities, intermediaries do have a significant impact on real economic activity.

Bernanke and Blinder's (1988) model abandons the assumption of perfect substitutability and focuses on the following three assets: bonds, money and loans. They suggest that when loans are assumed to be imperfect substitutes, the monetary transmission mechanism operates through the interest rate and credit channels. As such firms are no longer confined to obtaining capital through the issuing of bonds, but are now able to acquire additional capital by using bank loans (Lungu, 2007: 437).

Internationally, while a vast amount of empirical literature exists on the credit channel, there has been conflicting evidence regarding the existence of each of the bank lending and balance sheet channels in both the United States and Europe. The same situation holds in South Africa, where agreement on the existence and importance of the two components of the credit channel is yet to be reached. It has been suggested (Disyatat (2010)) that the lack of consensus in credit channel research could be due to investigations being partially based on traditional theory and having failed to include key variables mentioned in the theory in actual regressions.

Disyatat (2010) challenges the monetarist and credit views (which argue that deposits drive loans) by presenting a credit channel where loans drive deposits and money supply is endogenously determined. Here, the role of commercial banks is to determine the quantity of loans to supply and thus the level of money supply. This decision is informed by the current monetary policy stance,

prevailing economic conditions and the impact of these on the present and future health of bank balance sheets. The central bank then sets the price (the central bank discount rate) at which it is willing to satisfy this demand for money from the banking system. Within this model, Disyatat (2010: 8) argues that the mechanism underlying the bank lending channel is largely one and the same as that of the balance sheet channel. It is proposed that, since the bank lending channel operates through the impact of monetary policy on the external finance premium (EFP) of banks' as determined by their perceived balance sheet strength, and given that the balance sheet channel¹ works through a similar path, evidence in support of the balance sheet channel could also provide support for the bank lending channel.

Notwithstanding Disyatat's suggested revision of the bank lending channel, and given the lack of empirical consensus, the purpose of this study is to consider the operation of the credit channel from a theoretical perspective; this will to an extent, be based on the endogenous/exogenous nature of money supply. For the purpose of this study, international and local literature will be examined and used in the theoretical analysis of the credit channel; this will be extended by offering a proposal for a unified credit channel that differs to that proposed by Disyatat (2010).

The study is set out as follows: Chapter 2 will review the theoretical and empirical literature on the credit channel and consider the evolution of views on this mechanism of monetary policy transmission. Chapter 3 will focus on the South African monetary policy transmission mechanism and the history of monetary policy in the country. This will be supported by an examination of the structure of the South African banking sector and thus whether the conditions necessary for the existence of a credit channel are present in the country. Chapter 4 will discuss the endogenous and exogenous nature of money supply and the implications of this for the existence and operation of a credit channel. Disyatat's (2010) revised credit channel will be used as the base for a theoretical argument that dispels traditional views of the credit channel and argues for a mechanism that is more in line with Disyatat's (2010) propositions. Chapter 5 provides a summary of the findings and concludes the study.

¹ The theory behind the balance sheet channel holds that policy induced changes in interest rates affect the value of borrower's collateral and thus their credit worthiness and EFP through their impact on asset prices (Bernanke, 2007: 3).

CHAPTER 2

THEORETICAL ISSUES AND LITERATURE REVIEW

2.1 Introduction

This chapter examines the theoretical underpinnings and empirical literature on the credit channel and its role in the monetary policy transmission mechanism. The aim of the review is to consider the different schools of thought behind the monetary policy transmission mechanism, with a focus on the credit channel and its components, the bank lending and balance sheet channels. The evaluation of existing theoretical and empirical work is aimed at identifying the various criteria necessary for the existence and operation of the credit channel and at addressing the issue of the differences between the bank lending and balance sheet channels. The chapter begins with a discussion on the goals of monetary policy and how these are achieved in section 2.2. This is followed by a description of the components of the credit channel and an examination of the conflicting views of the monetary policy transmission mechanism in section 2.2.1. Section 2.3 contrasts the original theory of the credit channel with the credit view and analyses the necessary conditions for the existence of the bank lending channel. Section 2.4 presents an empirical review on research conducted internationally and in South Africa on the credit channel, while section 2.5 takes a closer look at views that contradict the conventional credit approach. Section 2.5.1 outlines the different types of empirical models that have been used to investigate the credit channel and section 2.6 concludes.

2.2 Monetary Policy and the Monetary Policy Transmission Mechanism

Monetary economics, as in other areas of the discipline, is continuously evolving; there have been numerous discussions on issues concerning the goals, instruments and impact of monetary policy (Rangarajan, 2001: 2142). According to Hammond *et al.* (2009: 5), the primary objectives of monetary policy are price, output and financial market stability. These goals are identified by Friedman (1968: 1) and Rangarajan (2001: 2142) as being closely related to the objectives of fiscal policy which include price stability, a low unemployment rate and accelerated growth. The question that then arises is whether or not monetary policy should be carrying out the same job as that assigned to fiscal (economic) policy and hence if the goals of the two policies are compatible. According to Rangarajan (2001: 2143), the objectives of monetary policy should not differ greatly from the broad objectives of fiscal policy. Instead, monetary policy should emphasise the overall goals of fiscal policy and, in so doing, increase the effectiveness of both by ensuring the attainment of mutual goals. Although Friedman (1968) agrees with the notion that monetary policy is one of the instruments that can and should be used in achieving fiscal policy objectives,

it is argued that not all of these goals are attainable with the use of this one tool. According to Friedman (1968: 5), there are a number of things that monetary policy cannot do, including fixing interest rates and the rate of unemployment. Despite these limitations, Friedman (1968: 11-14) does suggest that, through its assistance in creating a stable economic environment and offsetting shocks to the economy, monetary policy still plays an important role in economic policy.

More recently, Mishkin (2011) investigated the impact of the recent (2007–2009) financial crisis on the core elements of monetary policy strategy. Contrary to the view of Hammond *et al.* (2009:5), who regard financial stability as one of the major objectives of monetary policy, Mishkin (2011: 18) noted that, prior to the financial crisis, many central banks adhered to the new neoclassical synthesis; this saw the widespread use of “...general equilibrium modelling frameworks...” that excluded financial frictions as a significant factor in business cycle fluctuations. It is argued that this led to a separation between monetary policy and financial stability policy and a situation where financial stability was no longer a goal of monetary policy. Supervision and prudential policies were the two tools used to prevent unnecessary risk and to bring about financial stability, while monetary policy instruments were used to reduce output and inflation gaps. Thus, despite views (Hammond *et al.*, 2009: 5; Rangarajan, 2001: 2142; and Friedman, 1968: 11-14) that monetary policy should be used to promote financial stability and hence that financial frictions should be taken into account when formulating monetary policy strategies, Mishkin (2011: 18) argued that this was not the case prior to the 2007-2009 financial crisis. Instead a “...dichotomy between monetary policy and financial stability policy...” occurred which saw the role of financial frictions as a key guiding factor in the development of monetary policy strategy being largely ignored. Mishkin (2011: 49) thus regards the fact that the close relationship between monetary policy and financial stability policy as being one of the principal lessons that have been learnt from the financial crisis, and argues for the use of monetary policy instruments to “...address financial stability issues...” as well (Mishkin, 2011: 18), further advocating for the synchronization of monetary policy and macro prudential policy.

2.2.1 Conflicting Views of the Monetary Policy Transmission Mechanism

In practice, most central banks conduct monetary policy in a similar manner and therefore, with the exception of those that peg exchange rates, a strategy of actively controlling interest rates is pursued in order to influence the course of economic activity (Greenspan, 2004:39). These actions are then channelled through the economy by means of the monetary policy transmission mechanism, which comprises the interest rate channel, the other asset price channel and the credit

channel. According to Mishkin (1995: 4), a clear understanding of this mechanism and hence the channels through which monetary policy is transmitted is essential for the successful implementation of central bank decisions. This knowledge can also assist monetary authorities in evaluating the timing and effects of policies more accurately. The primary focus of this section will be on the classic *interest rate channel* and the *other asset price channel* which have been standard features in monetary policy literature since the introduction of the Keynesian IS/LM model.

According to Peersman (2000: 9), an expansionary monetary policy through an increase in the money supply would, via the interest rate channel, cause a decline in interest rates as households use the excess money to acquire bonds. This in turn reduces the cost of capital and leads to increases in aggregate output and investment. A contractionary policy, on the other hand, through a reduction in the quantity of money supplied, cause an increase in interest rates and a decline in aggregate output (Mishkin, 2006: 513).

The other asset price channel is another channel through which monetary policy can be transmitted. Here, Mishkin (1995: 5-6) argues that asset prices and real wealth act as channels for the transmission of monetary policy. The former performs this function through changes in equity prices and the price of foreign exchange. That is, policy induced changes in interest rates affect the value of domestic deposits relative to foreign deposits (deposits held in foreign currencies). This in turn affects the value of foreign and domestic goods, thus influencing net exports and eventually aggregate output. For example, Smal & de Jager (2001: 8) suggest that an expansionary monetary policy stance will reduce real interest rates and in so doing, lower the value of domestic deposits thus making them less attractive compared to foreign deposits. Consequently the reduced value of the domestic currency will make domestic goods cheaper than foreign goods and thus cause an increase in net exports and total output. Furthermore, policy changes that cause a depreciation in the domestic currency also have an impact on inflation through its influence on domestic price levels.

The equity price channel is another means through which asset prices transmit monetary policy. This mechanism is primarily concerned with the effects of monetary supply on the value of shares and therefore on investment spending and aggregate output. According to Smal & de Jager (2001:9), real wealth is the final route through which the other asset price channel can operate and involves the value of individuals' life time resources or wealth. In this case, a monetary expansion

will cause an increase in the prices of property and equity thereby enhancing individuals' wealth. This will in turn result in increased consumption and thus a rise in aggregate output. Peersman (2000: 20) shares a similar view to Smal & de Jager (2001) and to Mishkin (1995) on the other asset price channel and suggests that monetary policy is effective due to the impact it has on exchange rates and asset prices. The other asset price channel and the traditional interest rate channel, also form the basis for models such as the 'money view' of policy transmission.

The money view is presented by Lungu (2007: 436) and used by Bernanke and Blinder (1992) to understand the transmission of monetary policy. Lungu refers to this approach as the 'pure money version' of the monetary policy transmission mechanism, which is constructed in a world where there are effectively only two assets: money and bonds. In this world banks are only viewed as important aspects of the transmission mechanism due to their ability to create money by issuing deposits. The liability side of bank balance sheets is therefore considered to be an important factor in the transmission of monetary policy while the asset side plays no role. Under this approach; when central banks engage in open market operations (sell bonds), interest rates rise and the quantity of bank reserves decreases. Romer & Romer (1990: 150) and Kashyap and Stein (1993:1) suggest that this decrease in bank reserves decreases banks' ability to issue demand deposits and thus money supply. This limits the amount of money held by the household sector; decreasing aggregate demand and eventually leading to a decrease in investment spending.

A similar model is examined in Meltzer (1995) who presents a different angle of the money view. According to Meltzer (1995), one of the main objections that monetarists have against the Keynesian paradigm is that it highlights interest rates as the only relative asset price; monetarists deem it imperative to observe the impact of monetary policy changes on all relative asset prices as well as on real wealth (Mishkin, 1995: 6). Consequently, monetarists provide their own explanation of the monetary transmission mechanism based on Tobin's (1969) q theory. This theory is chiefly focused on the effects of investment and wealth on consumption and thus suggests a mechanism that transmits changes in monetary policy through its impact on equity valuations. From this, monetarists conclude that when money supply decreases, consumers find that their demand for money exceeds the quantity being supplied and, as a result, reduce spending in order to hold more money. This reduction in spending primarily affects the stock market, as investors demand less equity, which in turn lowers equity prices². Mishkin (1995: 6) takes the

² Peersman (2000: 20) shares a similar view to the monetarists and also acknowledges the close link between Tobin's q (defined as the market value of firms over the replacement cost of physical capital) and investment spending. According to Peersman (2000), when q is low firms invest less as the replacement costs of capital exceed firms' market value and

monetarist argument a step further and highlights the fact that this view and that of the Keynesians can be combined. That is, since a decline in investment spending is the culmination of the monetarist view, the Keynesian paradigm can explain the ensuing implications of this fall for the economy; which is an eventual decline in aggregate output.

Lungu (2007) and Bernanke and Blinder (1992) describe this model as one that is based on the idea that decreases in the quantity of money cause an increase in interest rates, in turn reducing investment spending as the number of profitable ventures offering net high rates of return falls. Thus, this view is similar to those presented by Mishkin (1995), Romer and Romer (1990) and Keynes (1936), in that they all culminate in an increase in interest rates and a decline in aggregate output. These theories are accordingly slight variants or extensions of the traditional Keynesian explanation of the monetary transmission mechanism. Indeed, Kashyap and Stein (1993: 1) argue that these approaches are alternative versions of the 'money view'³⁴ as they assume the presence of only two assets – money and bonds. For this reason, all of the above explanations of the transmission of monetary policy to the real economy can be viewed as different descriptions of how the classical interest rate and other asset price channels operate.

Although this theory has formed the basis for numerous studies, Bean *et al.* (2003: 107), Bernanke & Gertler (1995: 33-34) and Kocherlakota (2000) identify a number of weakness in this conventional view. Bernanke and Gertler (1995: 33-34) summarize these shortcomings by identifying three puzzles that the classical view does not solve, namely:

- Why policy induced changes in interest rates lead to significant shifts in the level of output while the measures of the cost of capital appear to be unimportant in explaining movements in individual expenditure;
- Why movements in short term interest rates impact long term assets, such as residential investments, which are meant to respond primarily to long term interest rates;⁵
- Why it takes time for certain components of spending to adjust following a change in short term rates.

when q is high, investment spending increases as the market value of firms is greater relative to the costs of replacing physical capital.

³ The monetarist or money view can be seen a graduation from the Keynesian position, which saw money as an insignificant factor in the transmission of monetary policy. Monetarists recognized the fallacy of this position and presented a model of monetary transmission that demonstrated the importance of money in this mechanism (Mishkin, 2006: 596).

⁴ Other forms of this view include the dynamic equilibrium/cash-in advance models presented by Rotemberg (1984), Christiano and Eichenbaum (1992), Grossman and Weiss (1983) and Lucas (1990).

⁵ The assumption made in this puzzle is that there are frictions in the durable goods market and thus, if perfect second-hand markets exist and if individuals and firms do not incur any costs when adjusting their stocks of capital, short term interest rates represent the opportunity cost of holding these goods.

As such, the credit channel presented by Mishkin (1995: 7) can be seen as extending on the traditional approach and, in the process, filling in the gaps that Bernanke & Gertler (1995: 34) argue are present in the traditional story. Kashyap & Stein (1993: 2) however, do not view the credit channel as just an extension of the money view, but rather see it as a stronger means of transmitting monetary policy compared to the interest rate channel. This assertion is based on the argument that the money channel transmits monetary policy decisions through its impact on bond market interest rates, while the components of the credit channel can convey changes in monetary policy in three ways: namely, through their impact on banks' and borrowers' balance sheets, banks' supply of loans, and interest rates in the bond market.

Kocherlakota (2000) identifies asymmetry as another aspect of the transmission mechanism that cannot be explained by the interest rate and other asset price channels. Diamond (1984: 393) explains that this is due to the assumption of perfect capital markets made in the traditional view. Hence, the traditional interest rate channel holds that households and firms make spending decisions based on the cost of capital and not on the external finance premium which Bernanke and Blinder (1988: 437) have argued arises from imperfect information. These conflicting views thus demonstrate the fact that there are a number of different approaches to understanding the monetary policy transmission mechanism and that these vary in terms of the emphasis placed on factors such as interest rates, credit, money, asset prices, exchange rates and the role played by financial intermediaries (Taylor, 1995: 11). Moreover, these views demonstrate that the existence and operation of the interest rate channel and the other asset price channel are well established in monetary literature. The question of the relative importance of these channels with regards to the extent of monetary policy changes transmitted through each component, and the effectiveness with which this is done, has not been widely addressed.

These sometimes opposing views highlight a lack of consensus on the importance of the interest rate and other asset price channels in monetary policy transmission and have led to increasing interest in the credit view of monetary policy transmission. This view represents Bernanke & Blinder's (1988) modification of the Keynesian framework and, as opposed to the traditional interest rate channel, places particular emphasis on the important role played by financial intermediaries in the economy. It argues that the significant function played by intermediaries has been ignored in the monetary literature through making the assumptions of homogeneous financial structures and perfect capital markets. As a result, the belief has been cultivated that

banks and financial institutions are unnecessary and irrelevant to changes in aggregate demand (Lungu, 2007: 437). The credit view, however, rejects this hypothesis and suggests that, due to their credit provision facilities, financial intermediaries do have a significant impact on real economic activity and thus a significant role in the transmission of monetary policy.

2.3 THE CREDIT CHANNEL

The credit channel operates through two highly interlinked channels; the bank lending and the balance sheet (or broad credit) channels. The inconsistencies in the conventional view of monetary policy transmission have led to a large empirical literature on the credit channel. According to Bernanke & Gertler (1995: 28), the primary focus of this research has been on investigating the asymmetries present in the credit market and exploring how these frictions can assist in formulating a view that closes the gaps in the traditional story.

2.3.1 The Money View Versus the Credit View of Monetary Policy Transmission: Theory of the Bank Lending and Balance Sheet Channels

2.3.1.1 The Bank Lending Channel

The traditional (monetarist) view of the bank lending channel is premised on the ability of central banks to use their powers as lenders of last resort to influence the level of deposits in the banking system. Inherent in this view is that the level of bank deposits determines the quantity of bank loans and thus that central banks' implementation of monetary policy changes via open market operations affect the level of bank reserves. This, together with the binding effects of central bank reserve requirements, restricts the amount of bank deposits to the amount of bank reserves available and connects changes in monetary policy to changes in bank reserves, bank deposits and ultimately, bank loans (Disyatat, 2010: 4-5). The traditional view therefore suggests that contractionary monetary policy reduces the quantity of money in the banking system (as commercial banks purchase financial assets from the central bank), and leads to a decrease in bank reserves. The decline in the level of bank reserves in turn reduces the quantity of bank deposits and, since the level of deposits dictates the quantity of loans that banks can supply, the policy induced change in bank reserves eventually reduces bank loans (Mishkin, 1995: 7).

Kashyap & Stein (1993: 1-2) suggest that the monetarist view is based on the assumption that there are two assets in the economy - bonds and money. Under this view commercial banks are

primarily concerned with the liability side of their balance sheets; a tightening of monetary policy will have a dampening effect on bank reserves and deposits. From an accounting perspective this implies that contractionary monetary policy constrains the liability side of bank balance sheets and decreases the quantity of bonds held by these financial institutions. This in turn reduces loan supply and has a real effect on investment spending and inflation.

The credit view of the bank lending channel (presented by Bernanke & Gertler (1995), Cecchetti (1995) and Hubbard (1995)) can be seen as a graduation from the monetarist hypothesis. Bernanke & Gertler (1995) examine the credit view, which holds that financial and banking markets are characterised by the asymmetric distribution of information between market participants. This information asymmetry leads to agency problems and, as argued by Mishkin (1995: 7), has led to the development of the bank lending and balance sheet channels. The credit view proposes that banks are particularly well suited to deal with information asymmetries that arise between lenders and borrowers and, as a result, play an important role in the financial system.

According to theory on the credit view, there are three types of assets – money, bonds and loans. The assumption of perfect substitutability between loans and bonds (which is made in the traditional view of monetary policy transmission) is abandoned and instead bank loans and bonds are seen to be imperfect substitutes (Peersman, 2000: 24; Kashyap & Stein, 1993: 2). According to Mishkin (1995: 7), changes in monetary policy that are effected through open market operations affect bank reserves and bank deposits. This in turn influences the supply of bank loans and consequently has an impact on investment and aggregate output. Therefore, a contractionary monetary policy will reduce the level of bank reserves and bank deposits. Moreover, since bonds and loans are not perfect substitutes, this decrease in bank reserves brings about a fall in the quantity of loans supplied and eventually a decrease in investment spending and output (Peersman, 2000: 24). An expansionary monetary stance, on the other hand, will increase bank reserves and bank deposits, forcing financial intermediaries to adjust their balance sheets and raise the quantity of loans supplied (Ehrmann and Worms, 2004: 1148). This rise in loan supply affects bank dependent firms and borrowers who respond by increasing investment spending which ultimately results in a rise in output. Therefore, although it differs from the conventional approach in terms of the number of assets it proposes are present, the credit view still suggests that policy induced changes in interest rates reduce bank reserves, bank deposits and bank credit. Kashyap & Stein (1993:2) argue that the lending view strengthens the bank lending channel by including

loans in its three-asset model because, as opposed to money and bonds (which are close substitutes), loans are exclusively created by banks and the effects of a decline in loan supply cannot be mitigated through substitution. Therefore, since loans and bonds are not perfect substitutes, contractionary monetary policy will lead to a decrease in bank lending⁶.

In line with the traditional credit view, Sinko (2009: 3) notes that the effects of monetary policy are further intensified by the demand side of the bank lending channel. Here, a monetary contraction increases the interest rate at which banks are willing to supply loans, thereby raising the cost of borrowing. The higher costs of borrowing reduce the demand for loans and cause a fall in consumption, investment spending and ultimately aggregate output. It is therefore as a result of the demand and supply sides of this mechanism that Bernanke and Blinder (1988: 437) conclude that, in the bank lending channel, monetary policy contractions and expansions are more potent than those in the conventional interest rate channel.

2.3.1.2 The Balance Sheet Channel

According to Bernanke (2007: 2), credit markets are characterized by imperfect information that causes lenders to charge a premium. This additional cost protects them from potential losses that may be incurred as a result of adverse selection and moral hazard problems. For firms, this premium is called the *external finance premium* and represents the cost to borrowers of raising external funds as well as the opportunity cost of using internal funds. The external finance premium varies inversely with borrowers' balance sheets; borrowers with healthy balance sheets and large amounts of collateral pay a lower premium for external finance compared to borrowers with relatively illiquid balance sheets and small amounts of collateral. Therefore, unless external funding is fully collateralized, it is always more expensive than internal financing (Bernanke *et al.*, 1996: 2). This inverse relationship between borrowers' net worth and the external finance premium creates a channel that amplifies small shocks to the economy; a positive shock will increase firm output, raise cash flows and improve firm balance sheets. This in turn reduces banks' monitoring costs, as firms with strong balance sheets have more incentive to make good investment decisions in order to ensure the continued success of their businesses, and lowers the external finance premium for these firms. The lower external finance premium increases firms' investment spending, thereby promoting further expansion and increasing net worth. This results in an even greater lowering of the external finance premium and ultimately, a magnified increase in output and investment.

⁶ Peersman (2000: 24), who also subscribes to this view, adds that the affect that changes in monetary policy have on bank loans only occurs if potential borrowers have no alternative means of raising investment funds.

The financial accelerator is closely linked to the balance sheet channel and is seen by Angelopoulou & Gibson (2007: 8) as the foundation upon which literature on this mechanism has been developed. According to the 'credit view theory' on the balance sheet channel, changes in monetary policy impact on interest rates which in turn affect asset prices. Consequently, movements in asset prices influence the value of borrowers' collateral, thereby altering their credit-worthiness and thus the costs they face when raising external funds (Bernanke, 2007: 3). As such, a monetary tightening will decrease asset prices and reduce the value of collateral. This increases banks' monitoring costs and the external finance premium faced by firms when raising external finance. These higher costs and weaker balance sheets deter banks from lending and in so doing decrease consumption, investment spending and output.

Mishkin (1995) and Rabin & Yeager (1997), in their analysis of the credit view of the monetary policy transmission, separate the effect that a change in borrower's balance sheets has on real economic activities into two (Taylor, 2000: 67). A monetary tightening increases interest rates which in turn reduces firms' net worth in two ways:

Firstly, a rise in interest rates is usually associated with a fall in equity prices, causing a decline in the value of firms' collateral. A lower collateral value means a lower net worth and thus an increase in the likelihood of losses incurred by lenders as a result of adverse selection. The weakening of firms' balance sheets and the subsequent rise in the moral hazard problem increases the EFP faced by firms when attempting to raise additional funds. The state of firms' balance sheets therefore reduces their ability to access funds in the form of bank loans and reduces banks' desire to extend loans to these borrowers. This eventually leads to a decrease in investment spending and aggregate output.

Secondly, the health of firms' balance sheets is further compromised by the impact of the policy-induced increase in the interest rate on cash flows. That is, an increase in interest rates decreases cash flow and thus the strength of firms' balance sheets. Similar to the first process, and that described by Bernanke (2007) and Bernanke *et al.* (1996), a weakening of firm balance sheets means a lowering of net worth, increasing adverse selection and moral hazard problems as firm owners, with a now lower stake in their companies, have a greater incentive to engage in risky investment projects. Since a deterioration of firms' balance sheets and a rise in risky spending increases firms' probability of default on loan payments, banks are less inclined to lend to these

borrowers. This causes a decline in the supply of bank loans and results in a decrease in aggregate output⁷ (Mishkin, 1995: 6-9; Rabin & Yeager, 1997: 294).

The credit view shares some similarities with the money view of monetary transmission but, overall, there appear to be more differences than similarities between the two. In both views lending in the credit market is seen as an important aspect of the transmission mechanism. However, as opposed to the credit view, the money view is constructed within the context of the Modigliani – Miller theorem which sees financial intermediaries and the financial structure of firms as unimportant to real output effects (Lungu, 2007: 437). Hence, the model makes no distinction between different sources of finance and views the manner in which investments are financed as irrelevant in the transmission of monetary policy. Another difference between these two approaches is identified by Meltzer (1995: 64) who argues that, while the money view is primarily focused on relative prices, the credit view of monetary transmission places emphasis on changes in the distribution of bank loans between small and large firms. Thus, apart from the fact that the monetarist's view of monetary policy transmission is constructed within a two asset framework and the credit view within a three asset framework, there appears to be significant differences between these concepts.

2.3.2 Necessary Conditions for the Existence of the Bank Lending Channel

Theoretical and empirical literature (Bernanke & Blinder (1988); Bernanke & Gertler (1995); Kashyap & Stein (1990) and Taylor (1995)) regarding the bank lending channel has been quite outspoken in identifying this as a mechanism that propagates and intensifies traditional interest rate effects. However, aside from Bernanke & Blinder (1988), Kashyap & Stein (1993) and Oliner & Rudebusch (1995), a large portion of this research has remained relatively silent on some of the conditions required for a bank lending channel to operate. According to Bernanke & Blinder's (1988: 435) model, there are three conditions that must hold in order for a bank lending channel to be effective in the transmission of monetary policy. The first requires that bonds and bank loans be imperfect substitutes. This ensures that households are dependent on intermediated loans to finance their consumption and investment spending and, as a result, are unable to offset monetary

⁷ Mishkin (1995: 8) uses Fisher's (1933) debt-deflation view of the Great Depression to further explain this secondary impact of a contractionary monetary policy on firms and their ability to raise external funds. According to Mishkin (1995) contractionary monetary policy not only reduces firms' net worth through a decrease in the value of their assets, but it also raises the value of firms' liabilities. That is, due to debt payments being fixed in nominal terms, an interest rate-induced decline in price levels will cause an increase in firms' real liabilities without improving the asset side of their balance sheets. This deterioration in the health of firm balance sheets reduces their net worth, increases adverse selection and moral hazard problems, and ultimately decreases investment spending and aggregate output.

policy induced decreases in loan supply. The second suggests that the central bank must be able to use monetary policy to influence the level of bank reserves in order to control bank lending (Kashyap & Stein, 1993: 8). Sinko (2009) suggests that this condition has two implications. The first is that the bank lending channel must be supply driven and the second is that banks will be unable to issue securities or reduce their bond holdings in order to protect their lending activities from variations in their reserves. The third and final condition requires that there be imperfect price adjustments so as to ensure that monetary shocks are never neutral.

In the next section (section 2.4.1) empirical evidence on the existence of a bank lending channel in the United States and Europe is examined and common elements, with regards to the type of data used, methodology and findings are identified.

2.4 EMPIRICAL EVIDENCE ON THE CREDIT CHANNEL

2.4.1 The Bank Lending Channel

Empirical evidence on the existence of a bank lending channel has yielded mixed results in both the United States and Europe. Early literature focuses on measures of money and credit and the associated relative forecasting abilities and timing relationships. The principal methodology is to ask whether or not credit variables are informative about future movements in output once money has been taken into account. Bernanke & Blinder (1988) use a modified version of the Keynesian IS/LM framework and data from the 1970s and 1980s to examine the policy implications of this model for traditional targets and indicators of monetary policy. Based on observations of the quantitative responses of money, credit, bond interest rates and GNP to a variety of shocks, Bernanke & Blinder (1988) suggest that money is a good predictor of future movements in GNP when money demand shocks are empirically insignificant, and that credit is only a good indicator of future movements in GNP when shocks to credit demand are insignificant. The demand for and supply of bank loans is modelled and these models used to estimate credit and money equations; evidence in support of a supply-driven bank lending channel in the United States was found.

In a follow up paper, Bernanke & Blinder (1992) examine how informative the federal funds rate is in forecasting changes in real macroeconomic variables. It was found that the federal fund rate records movements in bank reserves and thus that it is a good indicator of the impact of monetary policy. The results also show that, following a contractionary monetary policy shock, banks re-

balance their portfolios by selling securities, terminating old loans and restricting the supply of new loans. This implies that a decline in credit is not driven by changes in the demand for credit but rather by the supply. This conclusion supports Bernanke & Blinder's (1988) earlier findings and thus similarly provides evidence in support of a supply-driven bank lending channel⁸. Kashyap *et al.* (1993) and Morgan (1998) reach a similar conclusion in their investigations into credit effects in the United States. Using contractual differences between commercial banks, Morgan (1998) finds that loans granted under a commitment increase or remain unaffected following a contraction in monetary policy, while loans granted without a commitment decrease. Since the latter leads to decreases in the supply of loans and not a decline in loan demand, Morgan (1998), interprets these findings as evidence in support of a supply-driven bank lending channel in the US.

Romer & Romer (1990) and Ramey (1993) also provide evidence based on the timing relationships of money and credit and find that monetary aggregates are better predictors of future movements in output than credit aggregates. Romer & Romer (1990) investigate the presence of a bank lending channel during episodes in which the Federal Reserve made changes to monetary policy and failed to find a lag between changes in money supply and bank lending; the lack of a causal relationship between these variables as confirmation of a demand-driven bank lending channel in the US was inferred. Thus, unlike Bernanke & Blinder (1992), Romer & Romer's (1990) results suggest that changes in bank lending are, to a large extent, determined by changes in the output level. Disyatat (2010) disputes this and argues against the notion of a demand-driven bank lending channel. Based on a revised model of the credit channel, which views loans as the driving force behind deposits, Disyatat (2010) suggests that such findings are evidence against this channel.

King (1986) examines the predictive power of measures of money, lending and interest rates for real economic activity. Similar to Romer & Romer (1990), King (1986) finds very little evidence of bank loans' ability to predict spending and concludes that the bank lending channel is insignificant in US monetary policy transmission. Consistent with these results, Meltzer (1995) rejects the existence of a bank lending channel in the United States and suggests that the balance sheet channel is a more effective transmitter of monetary policy⁹. The problem with these

⁸ With regards to the timing patterns of the lending-output and money-output relationships, Bernanke and Blinder (1992) find that money responds more rapidly to changes in monetary policy than lending.

⁹ More recent research, such as that done by Carlson *et al.* (2008), Maechler and McDill (2006) and Peek *et al.* (2003) has focuses on the link between banks' external finance premium and the health of their balance sheets. These investigations find evidence that banks' external finance premium are sensitive to changes in the strength of bank balance sheets.

findings, and early literature on the bank lending channel, is that the theories that underlie them are unable to provide precise predictions about the timing patterns that are essential for drawing conclusions (Peersman, 2000). According to Walsh (1998) this is particularly the case when behaviour depends on forward looking expectations (Walsh: 1998). These mixed outcomes reflect the lack of consensus on the existence of a bank lending channel in the United States and, moreover, the inherent difficulty in identifying the individual impact and thus importance of each component of the credit channel.

Over the years, studies on the bank lending channel have become increasingly focused on the impact that monetary policy has on banks' lending activities (given their size) and thus their ability to raise external funds. Kashyap *et al.* (1993) find that decreases in bank lending following monetary policy contractions compel borrowers to substitute¹⁰ away from bank loans towards commercial paper. This is interpreted as evidence in support of a bank lending channel in the United States. Oliner & Rudebusch (1995), however, contest this conclusion and argue that the offsetting is not a result of loan supply effects but rather of differences in loan demand. They show that, following a monetary contraction, small firms decrease their demand for external finance – due to their weak balance sheets and hence their inability to access the commercial paper market – and large firms increase their demand for additional funding. Furthermore, using Gertler & Gilchrist's (1994) argument that large firms typically deal with large banks and small firms with small banks, Peersman (2000) contends that differences in loan demand can also be used to explain Kashyap & Stein's (1995, 2000) results. The latter find that, in comparison to large banks, small US banks tend to have a greater response to changes in monetary policy. They attribute this to the difficulties faced by smaller banks when attempting to access alternative forms of finance as well as heterogeneity in loan demand between small and large banks. These results are consistent with the conventional model of the bank lending channel, which predicts illiquid banks to be more sensitive to monetary policy changes than banks with healthy balance sheets. Kishan & Opiela (2000, 2005) and Altunbas *et al.* (2002) use the conventional model of the bank lending channel. Kishan and Opiela (2000, 2005), find evidence in support of this view and thus prove that banks with low capital ratios respond more to monetary policy changes than banks with high capital ratios; this is taken as evidence in support of a bank lending channel in the US.

European studies into the existence and importance of the bank lending channel have also been inconclusive. A large portion of the research uses bank data to investigate the presence of a

¹⁰ Kashyap *et al.*'s (1993) results suggest that borrowers who are not solely dependent on banks for financing, offset decreases in bank lending by increasing their use of external funding.

lending channel. This method involves using bank balance sheets to evaluate the impact of changes in monetary policy on banks and thus the response of bank lending and the composition of bank balance sheets to monetary shocks. De Bondt (1998) employs BankScope¹¹ data when testing for a credit channel the Netherlands, Germany, Belgium, Italy, France and the UK. The results show that small and large banks respond differently to monetary policy changes. These responses are found to be based on the liquidity of banks' balance sheets, with big banks being associated with a high level of liquidity and smaller banks with a lower level of liquidity. Consequently the analysis finds that, due to their illiquid balance sheets, small banks are more responsive to changes in monetary policy. De Bondt (1998) identified this as strong evidence in support of a bank lending channel in the first three countries. In Italy and France, evidence of a bank lending channel is found when stances in monetary policy are measured using a monetary index instead of movements in short term interest rates, while no evidence of this mechanism in the UK was found. King (2000) reports conflicting findings. That is, whereas De Bondt (1998) finds weak evidence of a bank lending channel in Italy and France, King's (2000) results support the existence of this mechanism in these two countries.

In a similar investigation, Ehrmann *et al.* (2001) employ both BankScope data and more comprehensive data sets for the eurosystem, and conclude that following a monetary tightening, bank lending contracts significantly in the region¹². Similar to De Bondt (1998) and King (2000), Ehrmann *et al.* (2001) identify bank liquidity as an important factor in determining the reaction of bank lending activities to changes in interest rates. Banks with low levels of liquidity are thus found to have a stronger reaction to changes in monetary policy when compared to more liquid banks. However, in contrast to De Bondt (1998) and King (2000) who identify size as an important bank characteristic, Ehrmann *et al.* (2001) find that bank size and the degree of bank capitalization are unimportant factors in determining the reaction of bank lending to changes in monetary policy. Ehrmann *et al.* (2001) suggest that the absence of capitalization and size effects in Europe can be attributed to the low level of information asymmetries in the region. It was argued that, with the low number of bank failures in European countries, the role played by

¹¹ BankScope is a database of bank data that includes the balance sheet data; income and expenses; ratios and annual financial data of over 30000 banks worldwide.

¹² Altunbas *et al.* (2002) and Angeloni *et al.* (2003) reach the same conclusion for Europe and also find evidence supporting the existence of a bank lending channel in this area.

government and the structure of banking networks have all contributed to a decline in information frictions and hence a reduction in the importance of capitalization and size effects¹³.

Favero *et al.* (1999) find opposing results to those of De Bondt (1998) and Ehrmann *et al.* (2001). Using information contained in the balance sheets of French, German, Italian and Spanish banks, Favero *et al.* (1999) examine the response of these banks to monetary policy tightening. Although evidence in support of a credit channel and its importance in the transmission of monetary policy is found, they find no such support for the bank lending channel. Instead, bank loans are found to have an insignificant response to movements in monetary policy. Thus, unlike De Bondt (1998), Favero *et al.* (1999) find no evidence of a bank lending channel in Europe. According to Ehrmann *et al.* (2001) these conflicting results can be attributed to the widespread use of BankScope data in European investigations into the lending channel. That is, Ehrmann *et al.* (2001) argue that the BankScope data that has been used in research into the lending channel in Europe is flawed by two intrinsic weaknesses. First, the data are collected on an annual basis which Ehrmann *et al.* (2001) argue may be too irregular to capture changes in loans following a monetary shock. Second, the sample of banks available in the BankScope database is biased towards large banks, with small banks being inadequately represented in the sample. The presence of these weaknesses may explain both the contradictory and supportive evidence on the operation of a bank lending channel in certain areas of the European region.

For the Netherlands, both VAR and panel data analysis is used to find evidence of a bank lending channel. According to Haan (2003), VAR analysis has generally found no evidence of a bank lending channel, while panel data analysis of the cross-sectional differences in bank lending behaviour finds some evidence of a lending channel in the Netherlands. Garretsen & Swank (1998), Van Ees *et al.* (1999) and Kakes (2000) test for a bank lending channel. Kakes (2000) used the Johansen (1988) Cointegration procedure to estimate a vector error correction model and found a demand-driven bank lending channel. Van Ees *et al.* (1999) employ data for the period 1957–1992 and examine the effects of monetary policy changes on banks' balance sheets. In contrast to Kakes (2000) findings, no evidence of a bank lending channel in the Netherlands was found; given Disyatat's (2010) argument against the existence of a demand-driven bank lending channel, Van Ees *et al.*'s (1999) conclusion appears to be better supported. Moreover, Garretsen & Swank (1998), Van Ees *et al.* (1999) and Kakes (2000) argue that the bank lending channel in

¹³ More recent studies have also shown evidence of a bank lending channel in Europe. Gambacorta (2008) for example uses bank prices in an investigation into a narrow credit channel in Italy and in the process, provides an alternative means of distinguishing between loan supply and loan demand. Jimenez *et al.* (2007) use information from loan applications and find evidence of this mechanism in Spain.

the Netherlands is partially offset by banks that, through their use of security holdings as a buffer to protect their loan portfolios, mitigate the effects of monetary shocks on bank balance sheets. Kakes *et al.* (1999) reach a similar conclusion to Van Ees *et al.* (1999) for Germany where they explore the contribution of the bank lending channel to the transmission of monetary policy. This research finds that German banks tend to insulate themselves from contractions in monetary policy by holding more securities instead of decreasing loan supply. Kakes *et al.* (1999) interpret this as proof of the insignificance of the bank lending channel in the transmission of monetary policy in the country.

Angeloni *et al.* (2003) find evidence of a bank lending channel for some of the larger European countries. However, in contrast to De Bondt (1998), they find that changes in monetary policy have the same influence on the lending of small and large banks in Europe. Structural characteristics of the European banking sector, such as public ownership and state guarantees, are used to explain these results. Peersman (2000) argues that the bank lending channel should not be an important component of monetary policy transmission in developed countries and hence supports Ehrmann *et al.* (2001), Favero *et al.* (1999), Van Ees *et al.* (1999) and Kakes *et al.*'s (1999) findings of a limited bank lending channel in Europe. Two reasons are identified as contributing towards reaching this conclusion. The first is that the European financial sector is characterized by large banks that have easy access to additional funds and hence can insulate their lending activities from policy induced changes in their reserves. Second, Peersman (2000) identifies increases in securitization and technological innovation in this sector as another factor that has diminished the importance of the bank lending channel in the Euro area. From these studies, it can be concluded that evidence of a bank lending channel is stronger in the United States than in Europe.

2.4.2 The Balance Sheet Channel

In contrast to the bank lending channel, the broad credit channel is relatively well supported. At the core of the balance sheet channel is the notion that internal and external finance are imperfect substitutes due to information asymmetries that hinder the performance of securities markets (Oliner & Rudebusch, 1995: 8). Such information asymmetries induce an external finance premium which tends to be more severe for small firms than for large firms. Consequently, early studies (Gertler & Hubbard, 1988; Bernanke & Gertler, 1989 and Stiglitz, 1992) into the existence and operation of this mechanism focus on the relationship between liquidity and investment

spending. These studies find that in the United States, the conditions of firms' balance sheets have a major influence on their ability to access external funds and even more so when their net worth is low. Similarly, Kashyap *et al.* (1994)¹⁴ find that, subsequent to a monetary contraction, small firms experience difficulty accessing bond markets and as a result, face liquidity constraints that reduce inventory investment. Gertler & Gilchrist (1994) also find evidence of this link between changes in monetary policy and the strength of firms' balance sheets. The research examines shifts in the inventories and sales of small and large firms and shows that, after a monetary tightening, these factors decrease more for smaller firms who experience financing problems. In addition, Gertler & Gilchrist (1994) find that monetary policy has a greater affect on small firms when the industry as a whole experiences decelerated growth.

This non-linearity in monetary policy effects is also detected by Oliner and Rudebusch (1996). In an investigation into the credit channel in the United States, Oliner and Rudebusch (1995) examine the effects of monetary policy on the composition of bank and non-bank debt from 1973 to 1991. The results find that a monetary contraction induces a widespread shift in total lending away from small firms towards large firms and thus find that small firms exhibit a greater response to changes in monetary policy than large firms. Therefore, as opposed to Bernanke & Gertler (1995) whose evidence of a balance sheet channel in the US is inconclusive, Oliner & Rudebusch (1996) find strong support of a broad credit channel in the USA¹⁵.

In Europe, Angelopoulou & Gibson (2007) and Bougheas *et al.* (2006) reach a similar conclusion regarding the existence of a balance sheet channel in the UK. Angelopoulou & Gibson (2007) use data from UK firms to test the responsiveness of investment to changes in cash flows. The results illustrate that the link between cash flows and investment is strongest during periods of monetary tightening and thus provides evidence in support of a broad credit channel. Ehrmann (2000) also finds evidence in line with the balance sheet channel view; small firms are more sensitive to shifts in monetary policy than large firms, providing support for a balance sheet channel in Germany. Vermeulen (2000) tests for a balance sheet channel in four European countries and finds that the conditions of firms' balance sheets play a larger role in explaining investment spending during downturns than upturns.

¹⁴ Similar evidence is provided by Gertler and Hubbard (1988).

¹⁵ More recent research, such as that done by Carlson *et al.* (2008), Maechler and McDill (2006) and Peek *et al.* (2003) has focuses on the link between banks' external finance premium and the health of their balance sheets. These investigations find evidence that banks' external finance premium are sensitive to changes in the strength of bank balance sheets.

Although this research shows evidence of a broad credit channel in different European countries, it does not address the quantitative importance of the credit channel in the monetary policy transmission mechanism. Peersman (2000: 27) and Dedola & Lippi (2000) address this issue and examine the significance of the balance sheet channel at an aggregate level and find that this component makes a substantial contribution to the overall transmission of monetary policy in Europe. Similar to Vermeulen (2000), Peersman (2000: 27) finds that monetary policy is more potent, at the industry level, during economic downturns than upturns.

2.4.3 The Credit Channel in South Africa – Empirical Evidence

Few studies exist on the credit channel in South Africa and, amongst these, evidence on the credit channel has been mixed. Literature in South Africa suggests that, under the repo rate system, loans are demand driven. This means that the Central Bank targets the demand for, rather than the supply, of loans; the balance sheet channel is regarded as the relevant component in the credit channel of monetary policy transmission. This is the case in South Africa (and elsewhere) where the Reserve Bank sets an interest rate and stands willing to supply all of the reserves (liquidity) that banks require.

Ludi & Ground (2006) test for a supply-driven bank lending channel in which monetary tightening raises the probability of higher earnings and loosens credit limits. This in turn increases loan supply, deposits and ultimately boosts consumption, investment spending and output. No evidence in support of a supply-driven bank lending channel was found; instead it was found that loans in South Africa are demand-driven. Given the fact that, under the repo rate system, monetary policy seeks to control demand for loans, these results suggest that the bank lending channel is a weak¹⁶ component of monetary transmission in South Africa¹⁷.

Sichei (2005) employs bank-level data to investigate the existence and importance of a bank lending channel in South Africa and finds that banks with strong balance sheets and thus a high

¹⁶ Moreover, Kashyap and Stein (1993: 8) state that in order for a bank lending channel to exist, the central bank must be able to constrain bank lending and thus ensure that banks are dependent on it for additional reserves. Thus, if this condition holds, a contractionary monetary policy will increase interest rates thereby raising the cost to commercial banks of borrowing from the central bank. This discourages banks from engaging in borrowing activities with the central bank and consequently, limits their reserves and ability to supply loans.

¹⁷ Ludi and Ground (2006) follow a similar approach to that used by Kakes (2000), who also tests for a supply driven bank lending channel in the United States. Similar to Ludi and Ground (2006), Kakes (2000) fails to find evidence of a supply driven bank lending channel.

level of liquidity are able to mitigate the effects of monetary tightening¹⁸. The results also provide support for a supply-driven bank lending channel and thus, as opposed to Ludi & Ground (2006), find that the supply of bank credit decreases after a monetary contraction. Burger (2008) also investigates the credit channel. Using the Johansen (1988) cointegration procedure to estimate a Vector Error Correction Model, Burger (2008) finds strong evidence of a bank lending channel in South Africa. Similarly, Lungu (2007) examines the link between loan supply and changes in monetary policy. The investigation focuses on the SADC region and utilizes bank data to test for a bank lending channel. In general, a bank lending channel is found for all the SADC countries.

This apparent lack of consensus in the theoretical and empirical literature on the existence of the bank lending channel is mirrored for the balance sheet channel. Indeed, studies conducted by Ludi & Ground (2006), Sichei (2005), Lungu (2007) and Burger (2008) have provided mixed views on the existence and importance of the balance sheet channel in South Africa's monetary transmission mechanism. Ludi & Ground (2006) find that loans in South Africa are driven by consumer demand and not bank supply. These results find evidence in support of a balance sheet channel which, according to Smal and de Jager (2001: 9), implies that an increase in the repo rate (representing a contractionary monetary stance), will affect firms' and households' balance sheets. This reduces their creditworthiness and thus their eligibility for bank credit, leading to a decline in consumption, investment and output. Conversely, Sichei (2005), Lungu (2007) and Burger (2008) find no evidence of a broad credit channel in the country

2.5 THE CREDIT CHANNEL RE-EXAMINED

A number of researchers have presented views that contradict the conventional credit approach. For example, in contrast to the traditional bank lending view, Stein (1998: 468 – 473) develops a model in which the management of bank liabilities (and not bank assets) plays an important role in monetary transmission. In this model, banks hold two assets, loans and reserves, and two liabilities, wholesale market liabilities and insured deposits. This model suggests that financial intermediaries may face adverse selection problems as a result of individual investors' incomplete information regarding the value of banks' assets. Stein (1998: 468 – 473) uses this factor to distinguish between small banks that are unable to gain access to wholesale liabilities and rely solely on deposits to fund their lending activities, and large banks that are able to gain additional

¹⁸ Although in contrast with Disyatat's (2010) argument that the effects of monetary policy within the bank lending channel cannot be mitigated, these results are consistent with Kishan and Opiela (2000) and Kashyap and Stein's (2000) finding for the US.

funding from the wholesale market. Although Stein's (1998: 468) model acknowledges the amplifying effects of the bank lending channel, it shows that this effect is limited to small banks that have little or no access to wholesale markets. Moreover, Stein (1998) points out that any disturbances to the deposits of these small banks impacts their ability to supply credit (Milne & Wood, 2009: 10-11).

In a re-examination of the bank lending channel, Disyatat (2010: 2) contends that there are common elements between the traditional explanations and more recent interpretations of the bank lending view. Bernanke & Blinder (1988), Kashyap & Stein (1993, 1995) and Walsh (2003) all address the traditional view of the bank lending channel. This is based on the concept of the money multiplier and holds that central banks have the ability to use monetary policy to induce changes in bank reserves and, in so doing, influence the quantity of bank deposits. In more recent explanations¹⁹, such as those found in Ehrmann *et al.* (2001), and Kishan & Opiela (2005), contractionary monetary policy is said to decrease the relative yield on bank deposits and as a result reduce the quantity of bank deposits held by households. The common element in these interpretations is that changes in bank deposits are seen as the driving force behind bank loans. Although Disyatat (2010: 4) identifies this as a common factor, it is clearly asserted that the emphasis placed on deposits as the catalyst for changes in the supply of bank loans in both the traditional view of the bank lending channel and the more recent explanations of this mechanism is erroneous. Instead, Disyatat presents four key propositions that form the basis of an argument against the traditional bank lending view. First, Disyatat (2010) suggests that bank loans are the driving force behind bank deposits; second, that the health of bank balance sheets and their perception of risk form a more pertinent channel for the propagation of monetary policy shocks; third, that a bank lending channel exists even when banks have access to market based funding; and fourth, that the bank lending and balance sheet channels work through a similar path.

Following in the footsteps of Gale & Hellwig (1985) and Holmstrom & Tirole (1997), Disyatat (2010) introduces credit market imperfections "...in a setting where firms are dependent on bank credit..." to fund operations (Disyatat, 2010: 8). This model of the banking sector, which considers the role of bank balance sheets, allows for the examination of how changes in the financial health of financial intermediaries impact the real effects of monetary policy. Thus, as opposed to focusing on movements in the components of bank funding (such as Stein (1998)),

¹⁹ Which are based on the portfolio rebalancing view of households' assets (Disyatat, 2010: 1).

Disyatat's (2010) model is centred on policy-induced changes in the external finance premium that influences the cost of external finance for banks.

A key proposition of the traditional bank lending view is that changes in monetary policy have a direct impact on deposits and, since deposits constitute the supply of bank loans, this approach holds that these deposits are the driving force behind the bank lending channel (Bernanke & Blinder, 1995; Disyatat, 2010: 1). Disyatat (2010: 2), however, argues that the traditional bank lending view is flawed and that the emphasis given to deposits is misplaced. In a liberalized financial system where the supply of credit is not exogenously constrained by central banks, Disyatat (2010: 2) contends that a liquid banking system is able to meet loan demand. It is from this basis that Disyatat (2010) formulates an alternative mechanism for the bank lending channel in which central banks' ability to directly influence the level of deposits in the banking system is diminished and no longer the foundation of this mechanism. Disyatat (2010) therefore refutes the link between monetary policy and bank reserves from a theoretical basis and argues that a central bank achieves its desired interest rate target by manipulating the rate at which reserves are remunerated. Thus, if the remuneration rate is below the market rate, the central bank is forced to supply reserves that meet the demand in the system in order to reach its interest rate target. In a situation where the remuneration rate is equal to the market rate, reserves become a close substitute for short term liquid assets and the amount of reserves supplied lie at the discretion of the central bank. In both of these cases, the interest rate target "...can be set independently of the amount of reserves in the system..." (Disyatat, 2010: 5); monetary policy changes need not alter this amount. Disyatat (2010: 5) accordingly suggests that a direct relationship between monetary policy and the amount of reserves in the system does not exist and consequently that there is "...no causal relationship from reserves to bank lending..."²⁰

At the heart of Disyatat's (2010) model are two propositions; that loans drive deposits and that the health of banks' balance sheets and their perception of risk form a more pertinent channel for the propagation of monetary policy shocks²¹. This argument is similar to that presented by Rochon (2006: 177) who also argues that loans create deposits. Based on the post-Keynesian theory of money which holds that banks create money in response to the general public's demand for credit, Rochon (2006) states that the creation of money results in borrowers' debts being recorded on the liability side of bank balance sheets and that it is in this "...sense that loans create deposits..."

²⁰ This is discussed in more detail in Disyatat (2008) and Borio and Disyatat (2009).

²¹ According to Disyatat (2010: 7), when banks extend credit, new liabilities are created in the form of deposits. Moore (2006), Wray (2007) and Palley (2008) share this view and similarly argue that deposits are not the initiating force but rather a result of the banking sectors response to monetary policy changes.

(Rochon, 2006: 177). Disyatat (2010) and Rochon's (2006) views on the bank lending channel suggest that loans create deposits not only in a purely accounting sense but also in a causal sense.

Disyatat's (2010) second proposition, that the bank lending channel operates through the impact of monetary policy on bank balance sheets and risk perception, is also addressed by the post-Keynesian view. According to Rochon (2006: 177), post-Keynesians share a similar view to Disyatat (2010) regarding the importance of both borrowers' and banks' balance sheets. As opposed to New Keynesianism which advocates a "...supply-determined theory of credit ..." (Rochon, 2006: 177), thus placing emphasis on credit rationing, post-Keynesians do not view credit supply as limited (thus necessitating that it be rationed between borrowers) but rather see the health of borrowers' balance sheets and thus their creditworthiness as the only constraint to banks supply of credit. Hence, Rochon (2006: 177) suggests that any theory of credit supply must simultaneously focus on the credit worthiness of borrowers and the actions of banks; as the latter are the parties responsible for establishing the conventions used to determine the health of potential borrowers' balance sheets.

As a result, Disyatat's (2010: 18) model suggests that the propagation and amplification of monetary policy occurs through two avenues; the impact of monetary shocks on bank balance sheets and the link between monetary policy and risk perception²². Under this framework policy induced changes in interest rates directly affect the discount factor and in turn cash flows, the valuation of assets and net interest margins. These changes indirectly influence the health of firms' balance sheets, economic activity and inevitably the quality of bank assets. Therefore, a monetary tightening will lower firms' net worth, increase the cost of bank loans and reduce output. This outcome is further reinforced by the relationship between monetary policy and risk perception. In this case, a monetary contraction not only weakens bank and firm balance sheets by reducing cash flow, but also increases their level of risk aversion. As a result, the impact of monetary policy on the real economy is further amplified by widening risk spreads that have a direct impact on firms' cost of funds (Disyatat, 2010: 20)²³. Therefore, Disyatat (2010: 4) argues that the information asymmetries found in the credit channel create frictions that amplify and propagate the effects of monetary policy on the availability and cost of credit as well as on banks' and borrowers' balance sheets.

²² See Bernanke (2003).

²³ A similar effect could also be observed for households. Here, a monetary tightening may cause agents to become more risk averse (take less investment risks) and thus lead them to associate an increase in interest rates with an increased possibility of losses on unpaid loans.

In highlighting the effect of monetary policy on banks' perceived financial health, Disyatat's (2010) model contradicts Stein's (1998: 468) proposition that the magnifying effects of the bank lending channel are limited to small banks due to their restricted access to the wholesale market, and instead suggests that a bank lending channel exists even when banks have full access to market-based funding. This is Disyatat's (2010) third proposition, which corresponds with the second condition identified by Bernanke & Blinder (1988) as necessary for the existence of a bank lending channel. Disyatat's (2010) revised model of the credit channel proposes that banks cannot completely mitigate the effects of policy induced changes in interest rates. That is, Disyatat (2010) suggests that monetary policy changes do not have a direct impact on bank reserves but instead are transmitted by the credit channel through their influence on bank and borrower balance sheets and banks' perception of risk. The condition of these three factors in turn determines bank credit extension activities and ultimately, the amount of deposits held by these banks. Thus, although financial intermediaries can slightly offset the effects of monetary policy changes on bank lending by gaining access to additional funds from the wholesale market, Disyatat (2010) argues that banks cannot use additional funds to completely insulate themselves from the effects of monetary policy changes; these will still have an impact on borrowers' balance sheets and on banks' risk perception and thus ultimately still influence loan supply. Moreover, in contrast to Romer & Romer (1990), Peersman (2000) and other traditional literature on the bank lending channel, which conclude that changes in monetary policy that encourage banks to seek additional funding from non-deposit sources mitigate the significance of the bank lending channel, Disyatat (2010: 3) argues that greater dependence on market based funding could in fact increase the importance of this mechanism by strengthening the link between monetary policy and the cost of external finance.

The fourth argument presented by Disyatat (2010) against the conventional bank lending view stems from the second proposition in the study, namely that the bank lending channel operates through monetary policy's impact on banks' external finance premium as determined by their asset quality and amount of leverage. Since the balance sheet channel works through a similar path, Disyatat (2010: 8) reaches a similar conclusion to Bernanke & Gertler (1995) and suggests that the mechanisms underlying the bank lending channel and the balance sheet channel are largely the same and thus that evidence in support of the balance sheet channel could also provide support for the bank lending channel²⁴. That is, Bernanke & Gertler (1995: 42) find that the

²⁴ The reformulation of the bank lending channel to include an EFP borne by the banks that is similar to that paid by other borrowers "unifies the ... (balance sheet and bank lending channels) ... as the central mechanism of both is seen to be the external finance premium and its relationship to borrowers' balance sheets. The only difference (lies in the fact)

relationship between interest rate spreads and terms of lending is consistent with Bernanke & Blinder's (1988) bank lending channel and the operation of a balance sheet channel. This not only supports Disyatat's (2010: 8)) model which shows that the bank lending and balance sheet channels reinforce each other and act to increase the responsiveness of output to changes in monetary policy through their impact on loan supply, but also demonstrates the difficulty in separating the bank lending channel from the balance sheet channel (Bernanke & Gertler, 1995: 42; Stein, 1998 and Milne & Wood, 2009: 14). Moreover, it raises the question of whether there is such a thing as a bank lending channel or whether this component of the credit channel and the balance sheet channel are one and the same.

The lack of consensus on the importance of this mechanism in the transmission of monetary policy, both in South Africa and abroad, can be seen as evidence of the latter; however, Disyatat (2010: 3) argues that general agreement may not have been reached due to the errors present in empirical research. Indeed, it is proposed that these studies have only been partially based on traditional theory; while the conventional view places emphasis on deposits as the driving force behind the bank lending channel, the former are rarely included in actual regressions and attention is focused on the link between banks and financial markets. According to Disyatat (2010: 28), the theoretical underpinnings of the bank lending channel have implications for empirical studies and the interpretation of their results. As demonstrated in section 2.4, the majority of research uses bank specific characteristics as proxies for interest rate sensitivity and observes the response of bank lending to changes in monetary policy. This has generally yielded results that show large, well capitalized banks and heavily securitized financial intermediaries with large international operations²⁵ to be immune to monetary shocks. These results imply that certain factors attenuate the impact of monetary policy on bank lending by altering the composition of banks' external funding. However, Disyatat (2010: 28) suggests that this interpretation is incorrect and that these factors immunize banks from monetary shocks by decreasing the interest rate sensitivity of their external finance premiums. As a result, Disyatat (2010) advises empirical researchers to focus less on quantitative and compositional movements in bank balance sheets, and instead move towards examining endogenous variations in external finance premia caused by changes in the health of bank balance sheets.

that financial intermediaries are the relevant borrowers in the theory of the (bank lending channel)" (Bernanke, 2007:3). Disyatat (2010) concurs and proposes a model that is argued to be more consistent with recent developments in the financial system.

²⁵ See Cetorelli and Goldberg (2008) and Altunbas *et al.* (2009).

2.6 SUMMARY AND CONCLUSION

This chapter reviewed the theoretical issues surrounding the monetary transmission mechanism and the credit channel. A brief discussion on what the goals of monetary policy should be, and on the conflicting views of the monetary policy transmission mechanism was provided. These opposing views highlighted the lack of consensus that exists on the importance of the credit channel in monetary policy transmission and demonstrated why there has been increasing interest in this aspect of monetary policy transmission in recent years.

Surveys of empirical research on the credit channel (regarding its existence and relative importance) reveal that an extensive amount of literature exists on this topic internationally and that not enough studies have been undertaken locally. The empirical literature revealed a few common threads. First, evidence on the BLC is mixed in both Europe and the United States. This is also mirrored in research into the BSC in these areas, which too yields contradicting results. For example, Bernanke & Blinder (1992) and Morgan (1998) found evidence in support of a BLC in the US while others such as Romer & Romer (1990) and Meltzer (1995) found no such proof. Similarly, in Europe, De Bondt (1998) found strong evidence in support of this channel in the Netherlands, Germany and Belgium while Ehrmann *et al.* (2001) found no evidence of this mechanism in this region. Secondly, compared to the BLC, the BSC is relatively well established in both areas.

Studies on the credit channel in South Africa demonstrate a similar pattern to those done internationally and similarly provide contradictory results with regard to the existence and importance of the credit channel and its sub components in the monetary transmission mechanism. A recent study by Disyatat (2010) argues that the BSC and BLC share a similar theoretical base and as such are one in the same. That is, evidence in support of a BSC can also be taken as evidence of a BLC in a country and thus it can be concluded that the balance sheet channel may be the only relevant component of the credit channel and hence that the BLC is just an aspect of this process. As a result, Disyatat (2010) suggests that empirical research shifts its focus away from quantitative and compositional changes in bank balance sheets towards examining movements in external finance premia due to variations in the health of bank balance sheets. Thus, using Disyatat's (2010) theoretical basis, arguments and suggestions, this study seeks to address these issues from a theoretical perspective.

CHAPTER 3

OVERVIEW OF THE MONETARY POLICY TRANSMISSION MECHANISM AND THE BANKING SECTOR IN SOUTH AFRICA

3.1 INTRODUCTION

There have been several significant changes in the design and conduct of monetary policy in South Africa since the 1960s. Three key examples of these changes are the country's movement away from fixed exchange rate regimes toward more flexible regimes, its growing monetary independence over time and the adoption of inflation targeting as the monetary policy framework. The new rules stemming from these changes, together with the different views on the transmission mechanism, have triggered a debate on the impact of monetary policy. The principal question here has been whether or not monetary policy changes affect GDP/output through the traditional money channel or through the substitute credit channel (Khan, 2011: 16-17). This Chapter begins with an overview of South African monetary policy over the past four decades in section 3.2, followed by an outline of the traditional explanation of the monetary policy transmission mechanism and how this system operates in South Africa in section 3.3. Section 3.4 sets out the structure of the country's banking sector and section 3.5 concludes.

3.2 HISTORY OF MONETARY POLICY IN SOUTH AFRICA

The history of monetary policy in South Africa can be divided up into five distinct regimes: the liquid-asset system; a mixed system; a cost of cash reserves-based system with monetary targeting; a repurchase agreement (repo) system with monetary targeting as well as informal inflation targeting and lastly, the repurchase (repo) system with formal inflation targeting (Mohr *et al.*, 2004: 373). During the 1970s and early 1980s, monetary policy in South Africa was aimed at restricting growth in the money stock and characterised by direct controls such as liquid asset requirements, interest rate controls, cash reserve requirements and credit ceilings. Under this mixed system (which was a combination of a liquid asset based system and a cost of cash reserves based system), commercial banks kept a certain portion of their reserves with the South African Reserve Bank (SARB). The reserves earned no interest and could be retrieved by exchanging eligible financial instruments at the central bank discount rate (Sichei, 2005: 5). The cost of credit for the general public was also correlated to the SARB discount rate.

During this time (mid 1960s to the early 1980s), the SARB restored the bank rate as the rediscounting rate for Treasury bills. By the end of 1983, the central bank's refinancing rate was linked to the then current market rates and fixed above the Treasury bill rate at a predetermined margin and in accordance with the paper rediscounted. Refinancing rates, including the bank rate, were now set and varied at the discretion of the Reserve Bank and, in addition, used to influence the broad level of interest rates in the economy and ultimately economic aggregates such as the inflation rate, money supply and bank credit extension (van der Merwe, 2001: 243).

Initially, the bank rate was adjusted frequently and by relatively large amounts but, over time and with a shift in the monetary policy system "...from a cyclical to a more medium and long term approach..." (van der Merwe, 2001: 234), the Reserve Bank began to reduce the frequency with which it altered interest rates. This use of the Bank rate to influence other market rates and thus the use of the monetary transmission mechanism to affect important economic variables proved to be very effective through forcing commercial banks to borrow from the Reserve bank at the refinancing rate. As the lender of last resort, the central bank controlled liquidity in the money market and fully accommodated banks' demands for reserves at the refinancing rate. According to van der Merwe (2001: 235), this rate (charged by the Reserve Bank for additional cash balances) placed a ceiling on short term or money market rates.

Commercial banks, however, found it fairly easy to comply with liquid asset requirements, bringing about a downward bias in interest rates and encouraging monetary growth (Gidlow, 1995). According to Strydom (2000: 2), it was due to this ineffectiveness, coupled with a series of international disruptions, including oil price shocks in the 1970s and the end of the Bretton Woods system, that credit ceilings were introduced. This inefficiency led to the 1977 appointment of the Gerhard de Kock Commission of Enquiry into monetary policy and the monetary system (Ludi & Ground, 2006:6). In 1979, during the course of the commission's investigation, a dual exchange rate system was introduced. Under this regime, the financial rand was a free-floating market-based currency for capital transactions while the commercial rand was deliberately held at high levels in order to attract foreign investment. This dual system came to an end in 1983 and was replaced by a floating rate system which made allowance for central bank intervention. Similar to previous monetary policy regimes, this approach was faced with both local and international disturbances, including economic sanctions against the country, the Rubicon speech and the debt-standstill agreement. These events fuelled the economic instability at the time, resulting in the reintroduction of the finrand from 1985 to 1995 (Ludi & Ground, 2006:6).

The De Kock Commission's report was released in 1985 and proposed a monetary policy framework that was aimed at establishing and maintaining a stable financial environment. This suggestion was in line with the actions of most central banks at the time, who viewed economic stability as an important prerequisite for low inflation rates. The report stated that, in the long run, high levels of inflation would hamper employment and economic growth; maintaining domestic price stability and creating a climate that is conducive to growth and employment was vital for the success of the country's economy (Stals, 1997: 1; in Smal & de Jager, 2001:2; De Kock, 1985:A10). According to Ludi & Ground (2006: 7), the commission's recommendations changed the mindset of monetary policy in South Africa and monetary targeting was adopted as the monetary framework. The Reserve Bank essentially fitted its monetary policy decisions to movements in the growth rate of M3 money supply and indirectly pursued preannounced targets of M3 by changing the discount rate (bank rate) and thereby impacting credit demand.

Under this system, the discount rate affected market interest rates through its impact on "...the cost of overnight collateralized lending..." and bank credit extension was influenced by open market operations (Aron & Muellbauer, 2006: 2). The Reserve Bank created a close link between commercial bank rates and the refinancing rate by cultivating a constant shortage in the money market and setting the central bank rate at a relatively high level. Thus, monetary policy was conducted indirectly by reducing the demand for credit and eventually impacting inflation with an estimated lag of twelve months. In line with the recommendations of the De Kock commission, pre-announced monetary target ranges were used from 1986 to obtain a broader definition of money (M3). These targets were determined annually with the use of a three-month moving average of broad money growth and "...were announced in the March Budget to cover the period from the forth quarter of the previous year to the fourth quarter of the current year..." (Aron & Muellbauer, 2006: 3). The main objectives of this approach were to accommodate expected GDP growth, successfully manage inflation and, more importantly, to act as a guideline for monetary policy implementation in the country. This gave the SARB the discretion to contravene targets when dealing with unexpected economic shocks.

Monetary targeting proved to be very effective in the 1980s and early 1990s while the country faced economic isolation, but with increased financial liberalisation and exposure to the global economy in the 1990s, this system became more difficult to control. Monetary targets were missed due to these structural changes and what van der Merwe (1997) (in Smal & de Jager (2001:2)) describes as the distortion of the monetary policy transmission mechanism. Under these

conditions, the link between interest rates, money supply and the inflation rate became increasingly obscure, with the inward flow of foreign investment causing changes in the domestic interest rates that mirrored changes in the exchange rate. It soon became apparent that M3 money supply was not a reliable indicator of underlying inflation and thus was an inappropriate anchor for monetary policy (Smal & de Jager, 2001: 2-3).

Accordingly, the SARB began stepping away from monetary targeting towards a "...more eclectic approach to monetary policy decision making..." (Ludi & Ground, 2006: 7). Instead of formally targeting the money supply the central bank adopted a wider range of economic indicators to guide policy actions. Stals (1997) (in Smal & de Jager (2001: 3)) identified these indicators as: changes in bank loan extensions; total liquidity in the banking system; the level of the yield curve; changes in the external value of the rand; variations in official foreign reserves and the actual and expected changes in the inflation rate. Aron & Muellbauer (2006: 3) argue that similar instruments were probably used to guide monetary policy in previous regimes, but that the weights assigned to each variable were not revealed. Under this eclectic approach, monetary policy became increasingly obscure, with the Reserve Bank taking questionable policy actions during the period 1996 to 1998. This diminished the central bank's accountability and culminated in its reduced credibility. In an attempt to increase the flexibility of these financial instruments and reduce the response time, thereby enhancing the sensitivity of interest rates to changes in monetary policy, the repurchase rate (repo rate) system was introduced in 1998 (Smal & de Jager, 2001: 3). This approach was thought to be more transparent than its previous counterparts as the SARB's policy intentions and the amount of liquidity supplied by the bank were regularly disclosed. This reform also marked the beginning of the gradual phasing out of the diverse or eclectic regime of monetary policy and thus an attempt by the central bank to address its shortcomings.

The change in regime also brought with it a change in the Reserve Bank's operating procedures and its use of liquidity management as a monetary policy tool. As opposed to completely and fully accommodating the liquidity demands of the money market, a more direct method to liquidity management was applied through the use of discretionary market operations²⁶. With these new operating procedures, repurchase transactions between commercial banks and the SARB became the principal tool for the regulation of liquidity, with the former being given greater scope to effectively manage their liquidity positions (van der Merwe, 2001: 246). These procedures (or

²⁶ It can therefore be said that during this time, the SARB shifted from an accommodationist view of monetary policy and money supply to a more structuralist approach.

what Aron & Muellbauer (2006:4) described as “...auctions with a predetermined fixed interest rate...” had a number of advantages, such as an increase in the speed with which they could be implemented, their insignificant effects on the price of underlying assets and their adaptability to changes in the economic environment. However, despite this, Aron and Muellbauer (2006: 4) argue that commercial banks were still predominantly influenced by the bank rate. With an inadequately performing money market and a handful of large banks controlling the market, interest rates eventually became rigid “...and the interbank market did not always clear effectively.”

The SARB completely abandoned its eclectic approach to monetary policy on 23 February 2000, when the minister of finance announced inflation targeting as the new monetary policy framework in South Africa. The main objective of this approach is to protect the value of the Rand so as to promote sustained economic growth in the country. In order to achieve this goal, the inflation target range was set to be between 3 and 6 percent of the consumer price index excluding mortgage interest costs (the CPIX). This current approach to monetary policy decision making involves the use of the repo rate as the primary policy instrument and requires regular meetings of the SARB monetary policy committee, who determine if and by how many basis points the repo rate should be adjusted (Sichei, 2005: 5). Under this institutional design, inflation is not managed in the short run by using volatile and aggressive policy but is rather controlled over “...a longer horizon of two to three years” (Aron and Muellbauer, 2006: 6).

Based on this discussion on the different monetary policy regimes employed by the SARB, it can be argued that South African monetary policy has shown characteristics of a market based system since the 1960s. The SARB has used open market operations in the form of repurchase transactions as one of the tools for creating the conditions necessary to obtain their desired growth rate in money supply. Although this method had been used for decades, the shift towards a more market based system became more apparent following the recommendations from the De Kock commission in 1985. One of the commission’s recommendations was for financial intermediaries to be given more independence so they could use market forces and the actions of their competitors as a guide to determine their own prime overdraft rates. The De Kock commission’s recommendations and the simplification of the accommodation system in 1993 (the discontinuation of refinancing through rediscounting; the reduction of the penalty rate from 4% to 1.5%, the decisions to alter the SARB rate less frequently and to remove the special status given to discount houses in the banking sector), can therefore be seen as having contributed to greater stability in

the money market interest rate and the interbank call rate range during this time. Hence, the period from 1985 onward saw a shift towards a more market-based system of monetary policy in South Africa.

Accordingly, investigations into the existence of a credit channel in the country commonly employ data from the 1980s onward. For example, Burger (2008) investigates the existence of a bank lending channel in South Africa using data from 1982 to 2007²⁷. The study finds evidence of a bank lending channel, making 1982 the earliest time that South African monetary policy can be identified with a component of the credit channel. Similarly, Ludi & Ground (2006) examine the credit channel of monetary policy in South Africa for the period after the implementation of the De Kock commissions' recommendations (1987) up to the last quarter of 2004 and find evidence of a demand-driven bank lending channel during this period. Evidence in support of the existence and operation of a component of the credit channel is also found under the inflation targeting and repo rate regime by Sichei (2005).

3.3 THE MONETARY POLICY TRANSMISSION MECHANISM IN SOUTH AFRICA

3.3.1 The Interest Rate Channel

Monetary policy has, as argued by Mishkin (1995), increasingly become the centre of macroeconomic policymaking, thus requiring an understanding of the channels through which policy initiatives are transmitted to the economy. The Keynesian interest rate channel, including expenditure by both firms and households (on durable goods) has endured as a standard feature of the transmission mechanism in the literature (Stuart and Gumede, 2011). *Figure A-1* in *Appendix A* shows all three channels of the monetary transmission mechanism; illustrating how monetary policy induced changes in the repo rate use these paths to travel through the economy and control inflation. The interest rate channel is induced by monetary policy changes in interest rates which impact real economic variables such as investment and consumption. Thus policy induced changes in the repo rate affect bank deposits and prime rates as well as money market interest rates. As a result, firms and individuals adjust their consumption and investment patterns which in turn alters fixed capital formation (I), consumption spending (C) and real output (Y). According to Smal & de Jager (2001: 6), it is through this transmission mechanism that demand pressures, via the output gap, bring about changes in inflation. In line with Mishkin (1995: 4) and Smal & de Jager (2001: 6) the following schematic diagram can be used to illustrate the interest rate channel:

²⁷ According to Burger (2008), this period is characterized by financial market liberalization (in the 1980s) and financial market deepening (from the mid 1990s onward).

$$\downarrow \text{Repo Rate} \rightarrow \downarrow \text{Interest Rates} \rightarrow \uparrow I; \uparrow C = \uparrow Y$$

If the South African Reserve Bank (SARB) reduced the repo rate and hence took an expansionary monetary stance, this would bring about a decrease in money market rates and bank prime rates. Accordingly, firms and individuals would respond to these changes by increasing their investment and consumption expenditure which would ultimately cause real output to rise (Sichei, 2005: 4).

3.3.2 The Other Asset Price Channel

Asset prices and real wealth also act as a channel for the transmission of monetary policy. As depicted in *Figure A-1*, asset prices perform this function through changes in equity prices and the foreign exchange rate. That is, policy induced changes in the repo rate affect the value of rand-denominated deposits relative to deposits denominated in foreign currencies (ER). This in turn affects the value of foreign and domestic goods thus influencing net exports (NX) and eventually aggregate output (Smal & de Jager, 2001: 8). For example, an expansionary monetary policy stance in this case would reduce real interest rates and, in so doing, lower the value of rand-denominated deposits, making them less attractive compared to deposits denominated in foreign currencies. Consequently the reduced value of the rand would make domestic goods cheaper than foreign goods and cause an increase in net exports and consequently total output. In addition, policy changes that cause a depreciation in the rand also have an effect on inflation through their negative influence on domestic price levels. The following schematic shows this effect:

$$\downarrow \text{Repo Rate} \rightarrow \downarrow \text{Interest Rates} \rightarrow \downarrow \text{ER} \rightarrow \uparrow \text{NX} = \uparrow Y$$

The equity price channel is another avenue through which asset prices transmit monetary policy. This mechanism is primarily concerned with the effects of monetary supply on the value of shares and therefore on investment spending and aggregate output. In this case, a monetary expansion will cause an increase in property prices and equity, thereby enlarging individuals' wealth. This will in turn result in increased consumption and thus aggregate output. This can be represented schematically as:

$$\downarrow \text{Repo Rate} \rightarrow \uparrow \text{Equity Prices} \rightarrow \uparrow I = \uparrow Y$$

3.3.3 The Credit Channel

As mentioned in the previous chapter, the bank lending channel is founded on the special role that banks play in the financial system by dealing with borrowers (particularly small firms and households) for whom asymmetric information problems are more severe. In terms of the traditional monetarist view of this channel, a rise in the repo rate, and thus a contraction in the money supply, which is associated with a loss of reserves and hence deposits will mean that fewer loans can be funded and hence that the supply of loans will be reduced. Schematically, the effect is

$$\uparrow \text{Repo Rate} \rightarrow \downarrow M \rightarrow \downarrow \text{Bank Deposits} \rightarrow \downarrow \text{Bank Loans} \rightarrow \downarrow I \rightarrow \downarrow Y$$

The effects of the balance sheet channel are felt through the impact of net worth on business firms; in effect, lower net worth means that less collateral is available to lenders and the losses from adverse selection are accordingly higher. Further, with business owners having a lower equity stake in their firms, moral hazard problems become more severe. Both of these problems would lead to a decrease in lending and thus a decline in interest-sensitive spending (Stuart & Gumede, 2011). This effect is summarized in the following schematic:

$$\begin{aligned} \uparrow \text{Repo Rate} \rightarrow \downarrow M \rightarrow \downarrow \text{Equity Prices} \rightarrow \uparrow \text{Asymmetric Information Problems} \rightarrow \\ \downarrow \text{Lending} \rightarrow \downarrow I \rightarrow \downarrow Y \end{aligned}$$

A monetary contraction with higher interest rates would have a further negative effect on firms' balance sheets because of a reduction in cash flow. This provides the following additional schematic for the balance sheet channel:

$$\begin{aligned} \uparrow \text{Repo Rate} \rightarrow \downarrow M \rightarrow \uparrow i \rightarrow \downarrow \text{Cash Flow} \rightarrow \uparrow \text{Asymmetric Information Problems} \rightarrow \\ \downarrow \text{Lending} \rightarrow \downarrow I \rightarrow \downarrow Y \end{aligned}$$

The link between the traditional balance sheet channel, financial accelerator theory and the concept of the external finance premium (EFP) further amplifies small shocks to the economy. As noted in Chapter two, the EFP represents the costs of evaluation and monitoring borne by banks and passed on to borrowers. The external finance premium varies inversely with the strength of borrower's balance sheets; an increase in the repo rate and thus a negative shock will decrease productivity, reduce cash flows and dampen firms' balance sheets. This in turn raises the banks'

monitoring costs - firms with weak balance sheets have less incentive to make good investment decisions - and increases the external finance premium for these firms. The higher external finance premium decreases firm's investment spending, thereby discouraging further expansion and reducing net worth. This results in a further rise of the external finance premium and ultimately a magnified decrease in investment and output (Bernanke, 2007). The increased cost of credit (by more than the change in risk-free interest rates) therefore serves to intensify the policy action (Stuart & Gumede, 2011).

3.4 STRUCTURE OF THE SOUTH AFRICAN BANKING SECTOR

The financial structure of a country plays a critical role in the transmission of monetary policy. For instance, Bernanke and Gertler (1995) stress the importance of financial intermediaries in the transmission of monetary policy and, more specifically, the important role played by the banking sector in the transmission of monetary policy through the credit channel. Mishkin (1995) and Bernanke (2007) present similar arguments for the relevance of the banking sector in the existence and operation of the credit channel and the overall transmission of monetary policy impulses.

As noted in Chapter two, bank characteristics such as bank size, bank liquidity, the capitalization of banks and hence bank balance sheets, are important factors for the existence and operation of the credit channel and its components. It is therefore necessary to discuss the structure and characteristics of the South African banking sector so as to ascertain whether or not the conditions necessary for the transmission of monetary impulses through the components of the credit channel exist with regards to bank characteristics.

The South African financial sector is relatively well-developed when compared to BRIC countries such as India, Russia and Brazil. This can partially be attributed to the gradual reformation of the banking sector that began in the early 1990s and that has resulted in an efficient, profitable and relatively sound industry. Although different from the 'big bang' approach implemented in Nigeria during its own financial restructuring, the 'gradualist' approach adopted by South Africa not only ensured that reforms were comprehensive and well structured over a lengthy period of time, but that they would enhance competition in the banking sector (Kasekende *et al.*, 2009: 51). These reforms, together with complementary restructuring in the insurance industry and capital

markets, as well as the implementation of new policies²⁸ by commercial banks, created new challenges and opportunities for banking institutions in South African²⁹.

For example, financial liberalization exposed domestic banks to a higher degree of competition and the volatility of international capital markets. This change in environment offered South African banks a number of lessons with regards to how they could operate more efficiently in an increasingly competitive industry, thus forcing banks to "...adopt an international approach to managing their daily activities" (Kasekende *et al.*, 2009: 52). The opening of the South African economy in 1994 also brought with it increased international participation in the domestic banking sector, with a significant 6.5 % rise in total banking sector assets. The number of foreign banks with official branches or subsidiaries in the country now exceeds 10, and with over 40 foreign banks with formal offices in South Africa, the competition level in this industry has increased (SARB, 2011b: 2).

This rise in competition (and to a certain extent, efficiency) was further emphasised in the 2008 Banking Inquiry conducted by the South African Competition Commission. This investigation found that the South African banking industry does not exhibit cartel³⁰ behaviour but rather shows signs of competitiveness³¹. The report also warned that certain factors, such as the financial burdens conferred on customers (by financial institutions) when changing banks, were diminishing "...the competitive effect of price differences between banks..." (Greenberg & Simbanegavi, 2009: 4-5) and thus that an intervention was necessary to change certain aspects of bank behaviour. In order to improve competition, the panel recommended that banks, make provisions for greater transparency by disclosing product and pricing information, reduce the costs of switching banks, assist customers in making the transition and lastly decrease search costs and increase "...comparability between products...".

Greenberg & Simbanegavi (2009: 5), however, caution that the implementation of these recommendations may not result in an increase in competition but rather could aid collusion³² in

²⁸ A number of banking institutions implemented their own internal policies, allowing them to make a greater contribution towards social regeneration in the country (Kasekende *et al.*, 2009: 52).

²⁹ Moreover, Mlambo and Ncube (2011: 7) argue that these changes in the banking system and its regulatory framework enabled the South African economy to make it through the 2008 global financial crisis and emerge relatively unscathed.

³⁰ This conclusion was reached based on a qualitative analysis of the South African banking industry (Greenberg and Simbanegavi, 2009: 4).

³¹ "The Herfindahl- Herschman index, which is often used as a proxy for market competition, averaged 0.19 between 2006 and 2009" (Mlambo and Ncube, 2011: 7).

³² A famous example of the harmful effects that an increase in market transparency can have on an industry is that of the Danish Cement sector. An intervention by the country's competition authority, which sought to enhance competitive

the market³³. This sentiment is shared by Ncube (2009: 13), who holds that the South African banking sector is oligopolistic in nature with the industry being dominated by four major banks namely, Standard Bank, ABSA, Nedbank and Firstrand (or First National Bank). As shown in *tables 3.1* and *3.2*, these banks held more than 90% of the market share (in terms of the amount of deposits and total assets held) in 2007, leaving 5% and 9% respectively for banks such as African Bank, Capital Bank, Investec Bank and Teba Bank. According to the 2011 SARB Financial Stability Review, the market share of the top four banks decreased to 84,64% in 2010 following the instability caused by the 2008 global financial crisis (SARB, 2011a: 18).

Table 3.1 – Market Share by Deposits (2007)

Bank	Total Deposits (R mil)	% of Industry Deposits
Standard	705,843	36%
Firstrand	416,507	21%
Nedbank	384,514	19%
ABSA	368,545	19%
Other	96,242	5%

Source: Greenberg & Simbanegavi (2009: 5)

Table 3.2 – Market Share by Total Assets (2007)

Bank	Total Assets (R mil)	% of Industry Assets
Standard	1,175,409	36%
Firstrand	717,257	22%
Nedbank	483,609	14%
ABSA	640,608	19%
Other	290,277	9%

Source: Greenberg & Simbanegavi (2009: 6)

This implies that the South African financial sector is characterized by large banks that have relatively easy access to additional funds through capital markets. Compared to their smaller counterparts (in terms of market share), the four largest banks in South Africa should theoretically have stronger balance sheets and as a result face lower finance premia when attempting to raise

conditions by forcing companies to disclose their daily price lists, resulted in collusion among cement makers and ultimately, "...reduced price dispersion" (Albaek *et al.*, 2003).

³³ See Tirole (1988).

extra funds. If Disyatat's (2010) argument is employed here, the state of the South African banking industry suggests that a credit channel should exist in the country since such conditions strengthen the impact of monetary policy on the cost of external finance and in turn have greater influence on banks' decisions to extend credit. In addition, the effect of changes in monetary policy on the external finance premia faced by banks and potential borrowers and thus on the creditworthiness of these borrowers and the banks' level of risk aversion, should be more potent in a banking sector dominated by a handful of banks.

Over time, the number of registered financial intermediaries in the South African banking sector has marginally declined, decreasing from 58 (41 local banks, 15 branches of foreign banks and 2 mutual banks) in 2003 to 34 banks in 2009 comprising 18 domestic banks, 13 internationally owned banks, and 2 mutual banks (Mlambo & Ncube, 2011: 7). It can therefore be said that this is a relatively concentrated industry, with domestic banks being the key players and foreign intermediaries primarily focused on capital and treasury market dealings as well as corporate and merchant banking (Ncube, 2009: 13). The four largest commercial banks' control of the majority of deposits together with the amount of loans they extend to both the public and private sectors, make them an important part of the credit process and thus, a prime element in the transmission of monetary policy through the credit channel. However, Greenberg & Simbanegavi (2009: 5) view this dominance as a danger and a factor that could potentially encourage collusive behaviour amongst banks and eventually a rise in the lending rate and a decline in the deposit rate.

Table 3.3 overleaf illustrates the key indicators of bank soundness in South Africa from 2003 to 2009. It shows that the risk weighted capital asset ratios (the regulatory capital to risk-weighted assets and regulatory tier 1 capital to risk-weighted assets), have remained above the minimum requirement during this period and, indeed, that they have increased gradually from 12.2 and 7.9 in 2003 to 14.1 and 10.97 respectively in 2009. This demonstrates that South African banks are sufficiently capitalised. The quantity and quality of credit extended by banks, as calculated by the non-performing loans (NPL) to total loans ratio showed considerable improvement between 2003 and 2006 but began to weaken in 2007, increasing to 5.9 percent in 2009. As with most financial indicators during 2007 and 2008, this deterioration can be credited to the global financial crisis that began towards the end of 2007. This event severely weakened both borrowers and banks' balance sheets, causing a rise in banks' levels of risk aversion. As such, the supply of bank loans decreased dramatically with a steepening of banks' credit worthiness criteria; fewer being able to

meet the various criteria and banks' struggling to raise external funds both due to their own deteriorating balance sheet and instability in the global financial/capital markets.

Table 3.3 – Key Financial Indicators

	2003	2004	2005	2006	2007	2008	2009
Herfindahl - Herchman Index	-	-	-	0.18	0.19	0.19	0.19
Market Share of Top 4 Banks	80.9	83.6	83.8	84.1	85.1	84.4	84.6
Regulatory Capital to risk-weighted assets	12.2	13.3	12.8	12.3	12.8	13	14.1
Regulatory Tire 1 Capital to risk-weighted assets	7.9	9.3	9	9	9.5	10.2	10.97
Non- Performing Loans (NPL) to total Loans	2.4	1.8	1.5	1.1	1.4	3.9	5.9
Return on Assets	0.8	1.3	1.2	1.4	1.4	-	0.94
Return on Equity	11.6	16.2	15.2	18.3	18.1	28.7	15.8
Interest Margin/Gross Income	38.3	41.6	38.2	43.9	58.5	44.6	49.5
Non-interest Expense Gross Income	74.8	68.5	61.6	48.4	48.6	42.2	51.1
Liquid Asset Ratio	4.7	4.7	4.8	4.6	4.6	4.9	6.3
Liquid Asset to Short Term Liability	9.2	9.4	9.3	8.7	8.7	9.8	13
Net Open Position in Foreign Exchange to Capital	0.9	0.9	1.1	1.5	0.7	0.5	0.7

Source: South African Reserve Bank (various issues) and the World Bank Financial Structure Database 2009, in Mlambo and Ncube (2011: 7).

Similar to the NPL and the risk weighted capital asset ratios, the liquidity ratios also exceeded prudential limits over this period, indicating that domestic banks' liquidity levels were adequate to deal with any unexpected rise in the demand for deposits. These measures therefore illustrate that financial intermediaries in South Africa are profitable and efficient. This is further supported by the net interest margin (which showed a general improvement in efficiency) and the rates of return on assets (ROA) and rates of return on equity (ROE), which demonstrate that the banking sector is profitable. Overall, the majority of these indicators paint a picture of a well-regulated and adequately supervised banking system (Mlambo and Ncube, 2011: 7). They also suggest a high probability that the conditions necessary for the presence and operation of a credit channel are present. However, despite the immense progress that has been made since 1994, Mlambo and Ncube (2011: 7) argue that the country's financial sector is still somewhat exclusive and characterized by high barriers to entry.

3.5 SUMMARY AND CONCLUSION

This chapter provided an overview of both monetary policy in South Africa and the structure of the country's banking sector. Although some of the vital changes in these areas occurred as a result of financial liberalization following the adoption of democracy in 1994, they have continued to develop over time. With regard to the monetary policy framework, South Africa adopted an inflation targeting regime in the year 2000 and has used this forward looking strategy to keep the inflation rate between 3 and 6 percent. This in turn allows monetary authorities to protect the value of the rand and maintain economic stability. In the banking sector, bank level data painted a picture of a well functioning and sufficiently supervised banking sector amid concerns about the high barriers to entry and exclusivity that characterises this sector. (Mlambo and Ncube, 2011: 7). The nature of South African monetary policy operational procedures and the structure of the banking system were aligned, where appropriate, to the functioning of a credit channel, in particular regarding its two sub-components, the bank lending and balance sheet channels.

As noted in the previous chapter, the traditional theories that underlie the monetary policy transmission mechanism, and more specifically the credit channel, have in some instances led to the misspecification of models and thus incorrect conclusions about the significance of the BLC in the transmission mechanism. Similar to the argument presented by Disyatat (2010), this paper proposes that evidence found in support of the BLC can also provide support for the existence of a BSC and that these are not separate components of a single channel but are rather one channel – the BSC. The following chapter focuses on the nature of money supply and its importance in understanding the credit channel.

CHAPTER 4

A UNIFIED CREDIT CHANNEL

4.1 INTRODUCTION

While some reference to the fact that loans create deposits³⁴ can be found in the literature regarding the credit channel and its two subcomponents, the concept of an endogenous money supply does not appear to be formally recognized. This is somewhat surprising since, as Davidson (2006:141) argues, "... it is fair to say that central bankers in the twenty-first century have discarded the exogenous money supply concept and instead explicitly developed monetary policies that are more compatible with Moore's endogenous supply concept".

The endogenous nature of the money supply has some fundamental implications for both macroeconomic policy and theory. Pollin (1991) holds that, at the policy level, it suggests that the tools used by central banks to manage the growth rate of money and credit are not as effective as mainstream literature suggests, while in terms of theory it advocates the rejection of all models that view money supply as exogenous (Haghighat, 2011:64). This chapter examines the endogenous versus exogenous view of the money supply in section 4.2, and discusses the implications of each with regards to direction of causality between deposits and loans and thus, the role played by central banks in money supply. Section 4.3 contrasts the credit channel described under the traditional monetarist view with that proposed by the endogenous view of money supply and section 4.4 concludes.

4.2 ENDOGENOUS VERSUS EXOGENOUS MONEY SUPPLY

Howells (1995:103-104) notes a broad agreement in the economics profession that the money supply is endogenous; in essence, the central bank sets the official discount rate and the banks, using that as a base, meet the demand for loans from (qualifying) borrowers. The central bank then supplies the monetary base necessary to validate the loans and "... 'loans create deposits' in a causal sense as well as in a purely accounting sense." The demand for credit is influenced by a number of factors including spending plans, real income and costs, which makes this variable exogenous from the perspective of commercial banks but with the resulting deposits being endogenously determined (Howells, 1995: 90).

³⁴See, for example, Disyatat (2010).

When making a decision on whether or not to grant loans, banks typically have to deal with two different types of uncertainty. Rochon (2006: 178) labels these 'micro-uncertainty' and 'macro-uncertainty' while Moore (1988: 48) refers to them as 'credit risk' and 'interest rate risk'. In both cases micro-uncertainty and credit risk refers to the probability of a borrower defaulting on a bank loan due to falling sales and therefore profits. This is closely linked to Keynes's lenders risk resulting from moral hazard. The second source of uncertainty in the banking system, macro-uncertainty or interest rate risk, refers to the banks inability to predict the future movements of the business cycle and subsequently how these shifts will impact households and firms. Rochon (2006: 179) argues that, due to the presence of these uncertainties, banks place two bets; the first on the borrower and the second on "... their expectations of the business cycle..." (Rochon, 2006: 179-180). Moreover, Lavoie (1992: 106) suggests that banks' uncertainty about the future and the information asymmetry regarding the profitability of projects, as well as the competence and underlying intentions of borrowers and their managerial teams, force banks to formulate a set of criteria to guide their lending activities. Banks thus essentially have two tools at their disposal to deal with uncertainty, namely the interest rate they charge on loans and their creditworthiness ratings (Rochon, 2006: 180).

Moore's (1988) approach to money endogeneity is shared by the *accommodationist* and *structuralist* approaches to the money supply. These views focus on the degree to which central banks accommodate the system's demand for liquidity. While the monetarist and lending approaches argue that the money supply is exogenously determined by central banks and that deposits drive loans, the accommodationist and structuralist views suggest differently. The accommodationists argue that the money supply is credit driven, with monetary authorities determining the interest rate and fully accommodating increases in the demand for reserves which are caused by variations in bank lending. The money supply function is thus viewed as being perfectly elastic (Davidson, 2006: 144) and set at the interest rate exogenously determined by the Central Bank; if the (policy) interest rate remains unaltered, any observed changes in the quantity of money in circulation can be attributed to changes in money demand, which are 'validated' by a fully accommodating banking system. Under this analysis, central banks allow the money supply to vary endogenously in response to changes in the actions of private banks, which in turn mirror the behavior of their clients' demand for loans (Davidson, 2006: 145).

Howells (1995: 90-91) accepts the accommodationist thesis and, similar to Rochon (2006), suggests that commercial banks determine the quantity of loans supplied. According to Howells

(1995), banks are able to identify creditworthy borrowers by setting loan rates and establishing collateral standards. Once this screening process has been completed, the role of central banks is then to set the price (and not the quantity) of the monetary base necessary to validate the approved loan requests and thus to use the remuneration rate (price) to reach interest rate targets.

The structuralist position also holds that the money supply is endogenously determined. However, as opposed to the accommodationists, argue that monetary authorities do not fully accommodate reserve demands but instead exert some control over credit demand. Steiger (2006: 150), for instance, argues that, although endogenous, the money supply cannot be completely determined by demand; Central Banks cannot and do not fully accommodate all demands for cash reserves from the banking system at the minimum lending rate but rather exert some degree of exogenous control over the quantity of money supplied by curbing the demand for money through rationing or queuing. This is necessary when the central banks' accommodation of the quantity of money demanded threatens to interfere with monetary policy goals or can potentially endanger Central Bank capital. In other words, the degree of accommodation by monetary authorities, under this view, will depend on monetary policy and on the private objectives of banks³⁵ (Nell, 2001: 316; Palley, 1994: 1).

Pollin (1991) and Palley (1991) both broadly support the structuralist approach, and argue that central banks consider their own goals (interest rate and inflationary targets), as well as numerous other factors, into consideration when determining whether or not to meet reserve demand. Palley (1991) acknowledges that observational equivalence problems can make it difficult to clearly distinguish between a central bank that employs a structuralist approach to the money supply and one that subscribes to the accommodationist approach. Palley (1991) does, however, highlight some flaws in the structuralist approach which, together with the large degree of support for the accommodationist view,³⁶ suggest that under 'normal' circumstances, it may be assumed that the accommodationist view of money supply is the position taken by Central Banks.

4.3 ENDOGENOUS MONEY AND THE CREDIT CHANNEL

The original theory of the credit channel suggests that, under the bank lending channel, monetary policy changes affect bank reserves, bank deposits and the quantity of bank loans. As noted in

³⁵ Banks determine the amount of loans they will supply based on a number of factors such as, their own level of risk aversion – which is in itself partially influenced by the impact of monetary policy on bank balance sheets and the EFP banks face when attempting to raise additional funds – and the credit worthiness of borrowers.

³⁶ See Moore (1988, 1997), Howells (1995) and Davidson (2006).

section 2.3.1.1, this view is built on the notion that the level of bank deposits determines the quantity of bank loans; contractionary monetary policy will decrease the level of reserves in the banking system, reduce bank deposits and in so doing restrict the quantity of bank loans supplied to the quantity of bank deposits. This lowers investment spending and eventually causes a decline in output.

In the case of the balance sheet channel, the original theory holds that contractionary monetary policy can also affect investment spending and output through its impact on potential borrowers' balance sheets. Here a contractionary monetary stance increases interest rates, causing a decrease in either (or both) of equity prices and cash flows. This raises adverse selection and moral hazard problems, increasing the EFP faced by firms and reducing banks' willingness to extend loans to these borrowers. Eventually, the deterioration in potential borrowers' balance sheets and the subsequent decrease in loan extension by the banks reduces investment spending and output (Mishkin, 1995: 7-8).

The traditional theory of the credit channel is therefore premised on the exogenous (verticalist) view of the money supply implying that, under this monetarist approach, deposits drive loans and central banks completely control the quantity of money in the system. Although this theory of the credit channel and its implications are widely known, Disyatat (2010) argues that much of the testing of the credit channel has been a departure from the original models of the BSC and BLC. Empirical research into the credit channel, and more specifically into the bank lending channel, has ignored parts of the traditional theory; excluding deposits as a variable in investigations despite their being viewed as the driving force behind loans and thus the bank lending channel.

According to Pollin (1991), the endogenous nature of money supply has some fundamental implications. First, the inability of central banks to use open market operations to affect bank reserves, bank deposits and thus loan supply in an endogenous money supply system makes it impossible for the 'original' BLC to exist, as the foundation upon which the model is built (deposits drive loans) no longer holds. Central banks are thus only able to use the remuneration rate charged for additional reserves as a tool for managing output and inflation. Second, this suggests that under the endogenous money supply perspective, credit is demand-driven and that, even though central banks accommodate money demand in the economy (as indicated by banks through their demand for reserves), they do not have a direct influence on loan supply. As such, a decline in the number of loans supplied should not be attributed to insufficient funding by the

central bank, but rather on the impact that monetary policy changes have on factors that influence banks' decisions to grant loans. These factors include credit demand and the creditworthiness of potential borrowers.

The essence of the original BSC can, however, be accommodated within the endogenous money paradigm. It has been argued earlier that changes in interest rates will affect the balance sheets of both current and potential borrowers; increased interest rates could mean both an increase in the EFP (higher interest rates) as well as higher collateral standards set by the banks. The balance sheets of the banks themselves would also be adversely affected by higher interest rates. Disyatat (2010) proposes a modified version of the BLC which operates through the impact of monetary policy on banks' balance sheets and on the EFP they face when looking to raise additional funds in the market. A monetary contractionary and higher interest rates would weaken bank balance sheets; this can be attributed to the impact that interest rate changes have on the discount factor and thus cash flows, the value of assets and thus the value of collateral and on net interest margins or bank profits. In turn, these factors indirectly influence the health or quality of bank assets, reducing their value and hence the health of bank finances. Pressure on the banks' balance sheets could also arise through increasing the probability of default on loans already on their books, making them unwilling to take on further risky loans. Banks understand the effect that policy induced changes in interest rates have on the value of potential borrowers' balance sheets and thus the additional negative impact that this could have on their own financial standing (following the negative impact of a contractionary monetary policy stance on bank balance sheets). As a result, this entire process also affects banks' perception of risk, making them increasingly risk averse as the probability of potential borrower default increases.

The effects on the balance sheets of both borrowers and the banks have received empirical support. According to the empirical evidence reviewed on the credit channel in the United States and Europe, credit effects are an important factor for small firms, particularly during periods of monetary tightening. This suggests that a policy-induced change in interest rates (a contractionary monetary stance) has a negative impact on small firms' balance sheets, increasing their likelihood of facing information problems and ultimately resulting in them being subjected to credit constraints. As Kamin *et al* (1998) note, firms with strong balance sheets and assets that far exceed their debt repayment obligations have a lower probability of experiencing financial distress following a monetary tightening than firms whose balance sheet positions are weak. Bean

et al (2003) argue that there are also clear links between banks' lending activities and the impact of interest rates on the liquidity of bank balance sheets.

Fazzari *et al* (1988), divide a sample of US firms into those with strong (unconstrained firms) and those with weak balance sheets (constrained firms). It was found that, compared to unconstrained firms, constrained firms show a greater level of sensitivity to cash flow. Gilchrist and Himmelberg (1995) reach a similar conclusion using a VAR model, while Bond and Meghir (1994) "allow firms to be subject to time-varying credit constraints" in an investigation into the effects of policy-induced changes in interest rates on firms' ability to access bank credit. It was found that the investment activities of firms with constrained balance sheets are more sensitive to cash flow than the investment activities of firms with unconstrained balance sheets. Moreover, in a study into lending activities following a monetary contraction, Oliner and Rudebusch (1996) find that the link between cash flow and investment becomes stronger for small banks after a monetary tightening but does not vary for large firms.

Kashyap *et al* (1993) provide evidence based on observed changes in the composition of borrowers' external finance. They find that following a monetary tightening, the issuance of commercial paper, which is considered a substitute for bank loans, increases while bank loans decline. This change in the composition of external finance was taken as evidence of a supply-driven bank lending channel where contractionary monetary policy results in a decrease in the quantity of loans supplied. Oliner and Rudebusch (1995) examine the behaviour of bank and non-bank debt following a shift in monetary policy and observe any changes in the composition of debt for small and large firms. In contrast to Kashyap *et al* (1993), they find no evidence that a contractionary monetary shock alters the composition of bank and non-bank debt for both small and large firms. Instead, Oliner and Rudebusch (1995) argue that the decline in the supply of bank loans observed by Kashyap *et al* (1993) is due to banks' redirection of debt from small firms to large firms. Thus, despite both of these studies finding evidence of a BLC and thus of the fact that banks consider the financial positions of potential borrowers when deciding on the quantity of loans to supply, neither answer the question of whether banks consider the impact on their own balance sheets of granting loans to risky borrowers. Kashyap and Stein (2000) however, deal directly with this issue. In an investigation into the response of bank lending to changes in monetary policy, Kashyap and Stein (2000) "find significant links between the size of banks' lending contraction and the banks' liquidity position as measured by the ratio of securities to total

assets". It is argued that "up to a quarter of the response of lending to a monetary shock is due to banks' liquidity constraints".

Kashyap and Stein's (2000) results represent one of three arguments found in empirical literature on the different factors that influence the sensitivity of loan supply to changes in monetary policy. One strand of this literature (Stein (1998); Kashyap and Stein's (2000); Ashcraft (2001)) draws a distinction between more and less liquid banks and argues that, following a monetary contraction, liquid banks are able to shield their loan portfolios using liquid assets while illiquid banks are forced to reduce loan supply. Another strand (Kishan and Opiela (2000); Peck and Rosengren (1995)), examines the relationship between bank capitalization and their access to non-deposit financing. It is proposed that poorly capitalized banks have limited access to non-deposit financing and, as a result, have to reduce loan supply following a monetary tightening. Lastly, bank size and its role in credit extension has also been explored within this literature (Kashyap and Stein (1995)). The key argument here holds that small banks are exposed to a greater degree of information asymmetry problems than large banks and thus find it more difficult to raise additional funds following a monetary contraction. This again forces small banks to decrease their loan provision activities.

It may therefore be argued that banks refuse credit to borrowers whose financial affairs have deteriorated due to the state of banks' own balance sheets and the negative effect that taking on additional risky borrowers may have on their balance sheets in the future. Davidson (2006: 142 - 145) argues that commercial banks use collateral standards and lending rates to determine the state of potential borrowers' finances and to reduce the problems associated with asymmetric information. As such, it can be argued that commercial banks refuse credit to borrowers with weak balance sheets in order to protect themselves and their finances from costs relating to asymmetric information (such as payment defaults). Moreover, if borrowers find themselves in financial positions that no longer allow them to raise additional funds, this is taken as an indication of their poor investment decisions and raises banks' concerns regarding their ability to manage potential loans in a profitable manner and hence their ability to repay these loans. Banks therefore refuse loans to poorly collateralized borrowers due to their weak balance sheets (and what this indicates about their ability to make sound financial decisions) and as a means of protecting themselves from the negative impact that repayment defaults could have on the health of their own balance sheets.

The argument clearly becomes a little ‘nuanced’; is the reduction in credit granted the direct result of state of borrowers’ balance sheets, the current state of banks’ balance sheets or because of the fact that the banks’ balance sheets would deteriorate if these loans were granted? Whichever is the case, it cannot be contested that it is the actual or potential effects on the balance sheet of both borrowers and the banks that is the operative mechanism. The key proposition is that the mechanism underlying Disyatat’s (2010) revision of the bank lending channel is largely one and the same as that of the balance sheet channel; it should, however be more correctly termed as the balance sheet channel.

4.4 SUMMARY AND CONCLUSION

This chapter briefly examined the endogenous versus exogenous theories of money supply and concluded that, for the most part, the money supply is endogenously determined with central banks fully accomodating commercial banks’ demand for liquidity. Thus, although loan applications are initiated on the demand side, the decision as to whether or not the credit is extended lies with the bank. This depends to a large extent on the borrowers’ creditworthiness, which in turn depends on factors such as the strength of their balance sheets and ability to provide adequate collateral. Remembering that loans are taken in order to spend, the effects of changes in interest rates on the factors that determine the spending decision, as well as on the balance sheet position of both borrowers and the banks, need to be taken into account.

To the extent that credit is limited at the instance of the banks, it will be for reasons related primarily to borrowers and not as a result of an insufficiency of funding. This means that testing for the existence of a bank lending channel without reference to the financial position of the borrower is misdirected. Indeed, it is argued that the balance sheet channel, through its impact on both the borrowers’ decisions to apply for loans and that of the banks in making the decision of whether or not to extend the credit, is the only relevant channel that should be considered (Stuart & Gumede, 2011).

CHAPTER 5 CONCLUSION

5.1 SUMMARY OF STUDY AND FINDINGS

The credit channel of monetary policy transmission has formed the basis of the monetary policy debate for many years. Central to this has been the monetarist view and the belief that central banks exogenously determine the quantity of money supplied to the banking system through open market operations. This view links changes in monetary policy to changes in bank reserves, bank deposits and the level of credit extension by commercial banks, and has been the basis of numerous investigations (Burger (2008); Angelopoulou and Gibson (2007); Morgan (1998); Kashyap *et al* (1993); Bernanke and Blinder (1992)) into the existence and relative importance of one or both components of the credit channel.

A review of this empirical literature and the theoretical foundations of the monetary policy transmission mechanism was conducted in chapter 2, and a comparison made between the monetarist and credit views of the credit channel. This highlighted the similarities and differences between these two approaches and showed that past research into the credit channel had either been based on the traditional monetarist view or on the credit view. It also became evident that investigations into this component of the transmission mechanism had primarily been empirical, with very few studies questioning the theoretical foundations of this mechanism and the subsequent adherence to it. As such, this study sought to undertake a theoretical analysis of the credit channel and its operation and relative importance in monetary policy transmission. To this end, three objectives were set: Firstly, to examine the endogenous/exogenous nature of money supply; secondly, to examine what the nature of money supply implies about the existence and potential significance of the credit channel in the transmission of monetary policy; and finally, to use the findings from the first two sub goals to draw conclusions about the nature of the credit channel.

Disyatat's (2010) revised bank lending channel was used as a basis for this study. This approach, which is a departure from the monetarist and credit approaches, is built on the premise of an endogenously determined money supply and a banking system in which the quantity of bank reserves no longer affect the level of bank deposits and thus the quantity of loans supplied. Here, loans drive deposits and the role of central banks is to set the price (and not the quantity) of the

monetary base necessary to validate the systems' demand for liquidity. This new take on the operation of the credit channel linked the exogenous/endogenous nature of money supply; the accommodationist, structuralist and liquidity preference views on the role of Central banks in monetary policy transmission to the credit channel. As a result, a connection was made between these factors that helped to build the key arguments of this study. A summary of the results is given below.

The literature review presented in chapter 2 (section 2.3.2) drew attention to the conditions necessary for the existence and operation of a bank lending channel (and as argued in chapter 4; the conditions required for the operation of a credit channel). The first condition requires bonds and bank loans to be imperfect substitutes, the second that central banks be able to use monetary policy to influence bank reserves and thus bank's lending activities and the third that there be imperfect price adjustments (Bernanke and Blinder, 1988). Based on Disyatat's (2010) revised credit channel, the study argued against the very basis of the second condition, suggesting instead that in order for a credit channel to operate in an economy, the money supply should be endogenously determined and hence that loans drive deposits. The study therefore advocates for an accommodationist monetary policy system where commercial banks determine the quantity of money supply (through their identification of creditworthy borrowers) and central banks stand willing to fully accommodate this demand for liquidity. It is argued that, in such an economy, central banks are unable to influence the level of bank reserves, bank deposits and thus bank loans. This breaks the link between central banks and bank reserves, dismissing the notion that deposits drive loans and invalidating the very foundation upon which the credit and monetarist views on the operation of the bank lending and balance sheet channels are built.

This had a number of implications for the existence and potential significance of the credit channel. Firstly (and in line with Moore (1988); Davidson (2006) and Rochon's (2006) arguments), it was suggested that, in order for a credit channel to operate, the money supply must be determined within the system. Secondly, it implied that the Central Banks' primary role within this process should be to set the price (and not the quantity) of the monetary base necessary to validate approved loan requests. The study therefore found that Central Banks should use the remuneration or repurchase rate to achieve interest rate targets and to transmit monetary policy changes through the credit channel. Lastly, the endogenous nature of money supply provided support for Disyatat's revised (2010) credit channel and the propositions that credit is demand-driven.

The study argued that, with money endogeneity as a basis, policy induced changes in interest rates affect bank balance sheets, banks' EFP and their perception of risk, while changes in monetary policy are transmitted via the BSC through their impact on borrowers' balance sheets and the EFP they face when attempting to raise external funds. Therefore, similar to Disyatat's (2010) proposition, this study suggests that even in the absence of a BLC, a BSC would still exist and changes in monetary policy would still influence banks' risk perceptions. This, combined with the effects of monetary policy on borrower's balance sheets, then informs banks' creditworthiness evaluations and the quantity of loans supplied. In addition, it is concluded that banks not only consider the impact of monetary policy changes on borrowers' balance sheets when determining the quantity of credit to provide, but that they also take into account the possible impact on their own balance sheets and their own financial health of taking on certain borrowers (Disyatat (2010); Kashyap and Stein (2000, 1995); Kishan and Opiel (2000); Peek and Rosengren (1995)).

Based on the structure of the South African banking sector discussed in section 3.4 (which showed that the characteristics of banks in this industry support the existence and operation of a credit channel), the findings of one or both of the components of the credit channel by, *inter alia*, Burger (2008), Ludi and Ground (2006) and Sichei (2005) and the conclusion of an endogenously determined money supply reached by Nell (2001), a number of conclusions were drawn about the operation and possible significance of the credit channel in the country. The study concluded with a revised theoretical interpretation of the credit channel that, given the fact that the money supply in South Africa is endogenous, should be operative.

5.2 POLICY IMPLICATIONS AND RECOMMENDATIONS

According to Nell (2001), the problems faced by the SARB from 1980 onwards can partially be attributed to its belief that the quantity of money in the system was exogenously determined, while in fact the money supply was and is endogenous in this country. That is, one of the principal reasons that the central bank struggled to reach monetary targets after 1980 was the endogenous nature of the money supply and the failure of the SARB to use the tools appropriate to reach their monetary goals in such an economy. Despite numerous changes in the monetary policy regime over the years, the study found that this problem persisted - suggesting that the central bank needs to employ monetary policy tools that are more compatible with endogenous money supply. Furthermore, a change in the fundamental assumptions about the functioning of the credit channel

could encourage the re-evaluation of the monetary targets used (e.g. bank reserves) as targets for monetary policy and hence the identification of more suitable variables.

To this end, the monetary authorities should move away from theories of the credit channel that link changes in the quantity of loans supplied to bank deposits and bank reserves, and adopt views that are built on the endogenous theories of money supply. Disyatat (2010) suggests that empirical research into the credit channel should be firmly grounded in theory and include variables that are in line with the key aspect of the theory (loans drive deposits) in regressions. This may assist in reducing the lack of consensus on the operation and relative importance of the credit channel and its sub components that has characterised research into this aspect of the monetary policy transmission mechanism in South Africa and internationally.

5.3 AREAS FOR FURTHER RESEARCH

This study focused primarily on providing a theoretical perspective on the credit channel of monetary policy transmission and how an evaluation of the nature of money supply could assist in determining whether such a channel exists and operates in South Africa. A possible area for further research may be to use the arguments presented in Disyatat (2010) and in the present study to undertake empirical research into the existence of such a credit channel in South Africa. This could further validate these arguments for a revised credit channel and the importance of an endogenous money supply for the existence and operation of a credit channel. Moreover, such an investigation would provide more information about the operation of the credit channel and the impact of monetary policy on its various elements i.e. the EFP and banks' and borrowers' balance sheets. An examination of how banks' risk perceptions change with changes in monetary policy could also be undertaken. Disyatat (2010) advises research to focus less on quantitative and compositional movements in bank balance sheets and instead move towards examining endogenous variations in external finance premia caused by changes in the health of bank balance sheets.

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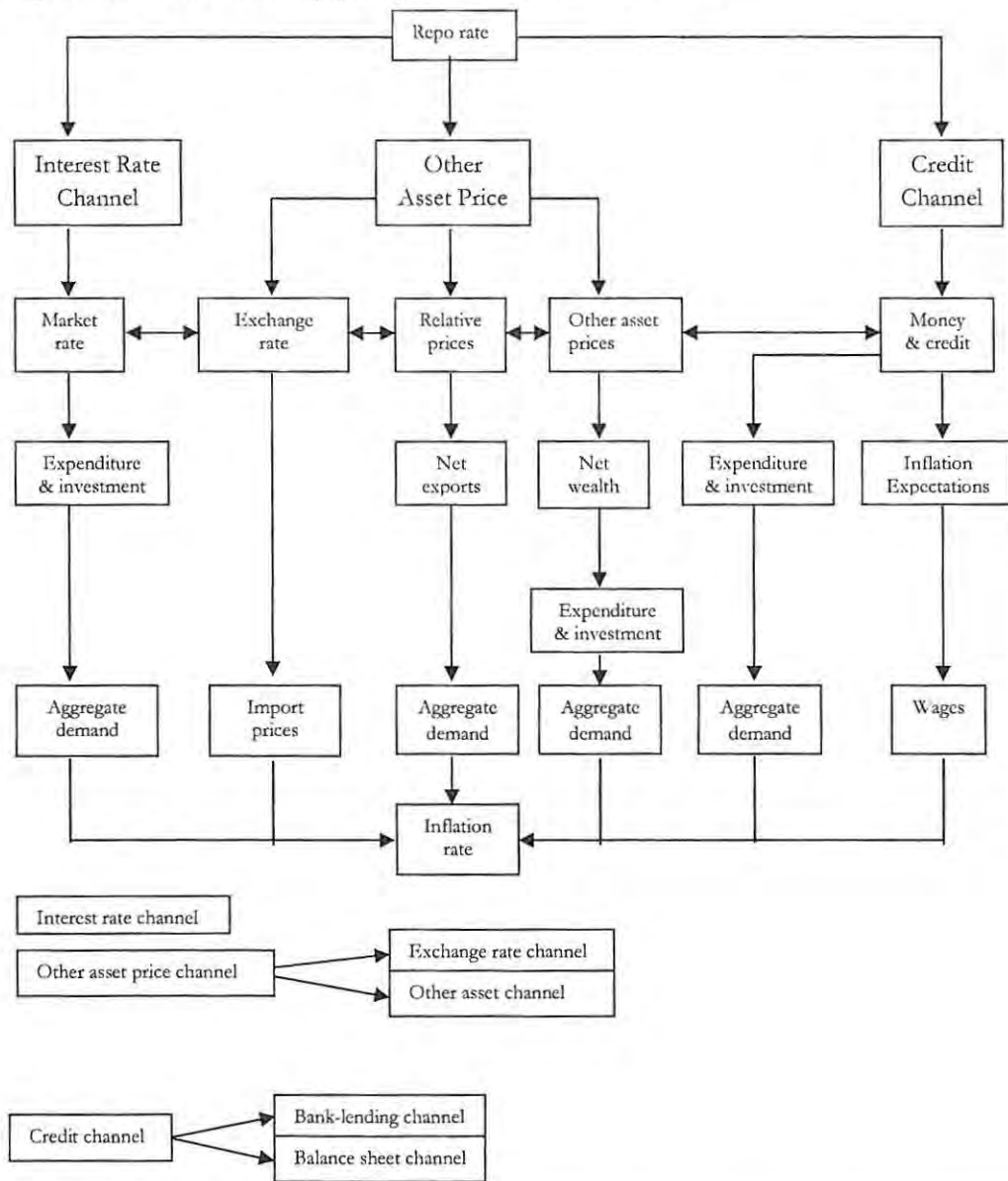
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Appendix A: The Monetary Policy Transmission Mechanism

Figure A-1: The monetary policy transmission mechanism



Source: Compiled from Smal and de Jager (2001: 15) and Ludi and Ground (2006: 4)