CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical Underpinnings of the Credit Channel

According to Mishkin (1995), dissatisfaction with the conventional stories that interest rate effects explain the impact of monetary policy on expenditures on durable assets has led to a new explanation based on the problem of asymmetric information in financial markets. This explanation, known as “credit view” proposes two types of monetary transmission channels arise due to informational asymmetry existing between borrowers and lenders in financial markets, namely the balance sheet and the bank-lending channel. Clearly, the theoretical construct underlying this credit view is the asymmetric information of credit market imperfection, which has
proved to be useful in explaining many other important financial markets phenomena. Romer and Romer (1990) stressed that information asymmetries are extremely important in credit markets.

This relatively new perspective of monetary transmission mechanism argues that the direct effect of monetary policy on interest rates are further augmented by endogenous changes in external finance premium, a wedge between the cost of funds raised externally (by issuing equity or debt) and the opportunity cost of funds raised internally (by retaining earnings). The magnitude of the external finance premium reflects imperfections in the credit markets, creating a wedge between the expected return received by the lenders and the cost faced by potential borrowers.

The credit channel argues that an alteration of the monetary policy will then alter the external finance premium in the same direction. Following this additional policy impact on the external finance premium, the effect of monetary policy on the cost of borrowing and in real activity is amplified. "This complementary movement in the external finance premium may help explain the strength, timing and composition of the monetary policy effects better than a reference to interest rates alone". (Nualtarrance, 1999).
2.1.1 The Balance Sheet Channel

The balance sheet channel rests on the theoretical prediction that the external finance premium facing a borrower should depend on borrower's financial position. The greater the borrower's net worth, the lower the external finance should be. It stems from the fact that monetary policy has non-neutral effects on the balance sheet of firms. Tight monetary policy directly weakens borrowers' balance sheet in at least two ways.

First, as interest rates rise due to contractionary monetary policy, servicing of outstanding debt becomes more expensive and firms' experienced decreasing cash flows. Second, rising rates are also typically associated with declining in assets' prices. As a result, the value of marketable collateral declines, the wedge between the interest rates at which corporations can borrow and the yields on otherwise risk free assets rises. These adverse developments lead to more stringent conditions under which external finance becomes available. In practice, the external cost of finance rises, which ultimately causes interest-sensitive expenditures such as investment, to decline.

It is important to note that, most small and medium sized firms, have relatively lower collateralizable net worth. They are being perceived as borrowers with lower creditworthiness, than large firms. Therefore, they
are most likely to face a disproportionately larger premium for external finance. Hence, small and medium-sized firms that have relatively poor access to short-term credit markets respond to the deteriorated balance sheet positions principally by drawing down inventories and cutting down investment more than large firms do. This shrinkage in investment provides an additional source of amplifying and propagating the initial decline in investment that would be predicted if only interest channel is operative following a tight monetary policy.

2.1.2 The Bank Lending Channel

The bank-lending channel acknowledges the special role played by banking institutions in the financial system, in the sense that they are well suited to deal with asymmetric information problems in the credit markets. According to Kim (1999), "it centres on the premise that bank loans are of special importance particularly for bank dependent small firms in monetary policy transmission." This is attributable to the more realistic presumption that bank loans differ from publicly issued securities in a meaningful way. Again, the underlying argument rests on the idea of imperfect information in credit markets. Lenders are uncertain about the characteristics of borrowers, leading to adverse selection problems. On top of that, lenders are also sceptical about borrowers' actions during and at the end of the period of the credit contract, leading to moral hazard and enforcement problems.
Nevertheless, the severity of these information problems differs among borrowers. Some borrowers, like large firms, are easily observed. Lenders will provide credit without too much screening and monitoring. On the other hand, small firms suffer from this informational asymmetry. Lenders will try to bridge this information gap before extending credit. This is where the argument that banks are special comes in. Banks are special in the sense that they are proficient in dealing with information problems. They are the main providers of screening and monitoring and social accounting services for the allocation of credit. Other lenders, such as some alternative types of financial institutions and individual savers, focus on providing credit directly or through marketable credit instruments to easily observable borrowers.

Following that, lending channel presumes that small and medium sized firms, facing informational frictions in financial markets, rely heavily on bank loans for external finance because it is prohibitively expensive for these borrowers to issue securities in the open market. This implies that tight monetary policy will have a greater adverse impact on small and medium sized firms that are relatively dependent on bank loans.

An insight into a distinctive feature of the lending channel could be gained by studying the adverse consequences of a sharp increase in interest rates following tight monetary policy. What is important is the fact
that these adverse consequences may be amplified through the lending channel beyond what would be predicted if policy were transmitted solely through the traditional interest rate channel.

The key point is to correctly identify that the reduction in bank lending following tight monetary policy is largely attributed to the inward shift in loan supply, rather than just a decrease in loan demand. Kakes (1998), put forward the argument that a lending channel is irrelevant if the decrease in credit observed after a monetary contraction is induced by a fall in borrowers' demand rather than banks' unwillingness to lend.

Dornac (2000) has pointed out three main effects of a higher interest rate on both lending and aggregate economic activities. One is as being brought up by Stiglitz and Weiss, (1981), where asymmetric information and the resulting adverse selection problem can lead to credit rationing in which some borrowers are denied loans even when they are willing to pay higher interest rates. Therefore, a higher interest rate leads to even greater adverse selection. Due to the resulting increase in adverse selection, banks will want to make fewer loans; possibly causing a sharp decline in lending that might lead to substantial decline in investment and aggregate activity.
Another aspect was pointed out by Bernanke and Gertler (1995). Increases in interest rates have a significant impact on the balance sheets of both firms and households. A rise in interest rates will be followed by an increase in the interest payment or debt servicing payment, shrinking firms' cash flow, which causes deterioration in their balance sheets. This, in turn makes it harder for lenders to judge the creditworthiness of the borrowers. Consequently, adverse selection and moral hazard problems become more severe for potential lenders, leading to a decline in lending and economic activity.

This is also known as "flight to quality in bank lending." Flight to quality in bank lending might in turn trigger financial accelerator effect along the following causal chain where negative shock pushes the economy into a recession and the recession tightens borrowing constraints; and thus tighter borrowing constraints amplify the recession and the cycle goes on.

Another measure of flight to quality in bank lending is when the banks increase their holdings of government securities as their assets, in response to a tightening of monetary conditions, usually during recession. This, combined with the decrease in loans in relative to bank assets, is often interpreted as a sign of a declining bank willingness to extend new loans.
A third measure is the impact on banks' balance sheets. Since banks typically borrow short and lend long, a rise in interest rates directly causes a decline in networth. It lowers the value of assets with longer duration more than it raises the value of liabilities with shorter duration. Therefore, even if the credit quality of banks were to remain unaffected, a rise in interest rate causes a decline in networth, which then lead to a decline in bank lending.

As highlighted earlier, to assert the existence of a distinctive lending channel of monetary policy, it is important to certify that the decline in bank lending activity emanates from the supply side, not from the demand side. However, a decline in either bank loans or a decline in their growth following a monetary tightening is insufficient to pin down an adverse movement in banks' loans supply. An adverse shift in loans can only be argued as curtailing credit only if the decline in the quantity variable is coupled with a widening of the spread between bank lending rates and interest rate on non-bank debt. In fact, that situation is consistent with only two possibilities: either supply has declined whereas demand has not or supply has declined more than demand.

According to Domac (2000), interest rate spread, (a price based variable), which capture the credit channel effects of the transmission mechanism of monetary policy can be presented as follows:
SPREAD $= LR - TB$

$= \text{SPREAD}1 + \text{SPREAD}2$

where

LR $= \text{Lending Rate}$

TB $= \text{Treasury Bond Rate}$

SPREAD1 $= \text{Corporate Bond Rate - Treasury Bond Rate}$

SPREAD2 $= \text{Lending Rate - Commercial Paper Rate}$

SPREAD1 measures the general risk premium, as it is perceived by the market. If the balance sheet effect is at work, it is expected that this spread will increase after the monetary restriction, reflecting the fact that public sector debt has become relatively riskier vis-à-vis a sovereign debt.

SPREAD2 on the other hand is a proxy for the lending channel effect. The difference between lending rates and commercial paper rates quantifies the premium that bank-dependent borrowers must pay in order to raise external finance relative to those firms able to issue debt on the market. The lending channel effect contends that this spread will increase in the aftermath of the monetary squeeze.

For this credit-lending channel to play a significant role, there are several conditions that have to be satisfied. Bernanke and Blinder (1988)
had listed down those conditions neatly. Kashyap and Stein (1993) even acknowledged their model as the best-known formulation of the lending view. Three conditions were stated clearly, as a must hold condition if there is to be a distinct credit-lending channel of monetary policy transmission.

The first condition stresses that intermediate loans and open-market bonds must not be perfect substitutes for some firms on the liability side of their balance sheet. It is a clear deviation from the traditional money view that treats all non-money assets as perfect substitute. It objects the assumption of perfect substitutability between bank credit and marketable securities. Owing to imperfect information problems, firms, especially the small and medium sized are unable to offset a decline in the supply of bank loans simply by borrowing more directly from the household sector in public markets. Consequently, there exist in the economy a group of bank dependent borrowers, whom the shrinkage in loan supply will cause a decline in their business activity as well, leading to a decline in aggregate output.

The second condition claims that tight monetary policy must provide a binding constraint on bank loans. It deals with the ability of the Federal Reserve in reducing the loan supply whenever tight monetary policy is pursued. By changing the quantity of reserves available to the banking
system, they must be able to affect the supply of intermediate loans. The banking institutions as a whole must not be able to insulate its lending activities from shocks to reserves, either by switching from deposits to less reserve-intensive forms of finance, such as certificate of deposits, commercial papers or by paring its net holdings of bonds. In other words, there are no perfect substitutes available on the asset side of banks' balance sheets and no other liabilities are available to cushion the impact of monetary policy on the demand deposits.

According to Kaspar and Stein (1993), if either of these two necessary conditions fail to hold, loans and bonds will effectively become perfect substitutes, and we are reduced back to the pure money view of monetary policy transmission. If the first condition is violated, intermediaries will completely arbitrage away any cost differentials between loans and bonds. If the latter is violated, intermediaries will do the arbitrage. In either case, the net result will be that loans and bonds will be priced identically in equilibrium.

Lastly, there must be some form of imperfect price adjustment that prevents neutralization of monetary policy shocks. If prices adjust frictionlessly, a change in nominal reserves will be followed with equiproportionate change in prices and both bank and corporate balance
sheets will remain unaltered in real terms. In this case, there can be no real effects of monetary policy, be it through lending or money channel.

Apart from the three conditions underlined by Bernanke and Blinder (1988), Ongena (1995) has listed down another related mechanism, that is credit rationing, which is not a necessary condition for the existence of a credit channel, but becomes possible as an equilibrium solution.

Stiglitz and Weiss (1981) defined equilibrium credit rationing as present whenever "either among loan applicants who appear to be identical, there are some received a loan and others do not. The rejected applicants would not received a loan even if they offered to pay a higher interest rate. In other words, there are identifiable group of individuals in the population, who, with a given supply of credit are unable to obtain loans at any interest rates, even though with a larger supply of credit, they would."

Walsh (1998), in his book, Monetary Theory and Policy stressed that the critical part of the definition of credit crunch is that, "at an equilibrium interest rate, there is an unsatisfied demand for loans that cannot be eliminated through an increase in interest rate. Rejected loans applicants cannot succeed in getting loans by offering to pay a higher interest rate".
He further claimed that the existence of a credit rationing is sufficient but not necessary for a credit channel to exist.

Kim (1999) put it as an unusual sharp decline in the supply of bank loans usually perceived as quite possible to occur even with prevailing loan rates and quality of borrowers. It is widely recognized as having substantial real effects by severely restricting borrowers' ability to obtain credits and thereby causing a significant reduction in their spending on investment. Bernanke and Blinder (1998) claimed that if the credit rationing is accompanied by a monetary tightening immediately followed by a rise in market interest rates, then it would provide the important source of propagating the economic decline beyond what would be predicted by the interest rate channel.

2.2 Empirical Findings

This credit-lending view explanation of the transmission mechanism of monetary policy has gained a lot of attention and drawn a large number of researches to test for its validity. Some of them resorted to aggregate data to test for the macro economic consequences but there are those who chose to make use of cross sectional data at the micro level, taken into considerations the distribution consequences of the monetary policy.
Bernanke and Blinder's (1988) work, "Credit, Money and Aggregate Demand," has been referred to as the pioneers of this particular field. Their results have stimulated interest for further researches. Using United States economic data, they claimed that money-demand shock is more important compared to credit-demand shock, during the 1980s.

Romer and Romer (1990) presented evidence that traditional money view is much more important than the credit view through their research, "New Evidence on the Monetary Transmission Mechanism". They used the basic approach that was similar to the St. Louis approach. In order to overcome the endogenous problem, they added the future production to their equation and estimated it by two-stage least square method, instrumenting for the financial variable with a dummy variable for a shift in policy.

To complement their research, they further demonstrated that the disproportionate impact of tight monetary policy on banks' ability to lend is not an inherent feature of the monetary transmission mechanism. Rather, it is largely the consequence of Federal Reserve actions aimed at reducing bank loans directly. In the paper by Romer and Romer (1993), "Credit Channel or Credit Actions? An Interpretation of the Post-war Transmission Mechanism, " they even concluded that bank credit channel
is not needed to explain the movements in the financial variables in response to tight policy.

Another findings that are consistent with those Romer and Romer (1990) are Ramey's (1993) work, who tested for the transmission mechanism of monetary policy by using a cointegration analysis in order to develop Romer and Romer's approach. She estimated the impulse responses of industrial production to the policy shock. She found out that shutting down the bank loan channel did not give any noticeable impact on the response of index of industrial production to policy innovation. On the other hand, applying the same method on the money channel essentially eliminates the impact of policy on industrial production. With that she concluded that money channel is much more important than the credit channel.

Apart from those applying the United States economic data, Kakes (1998), investigated the importance of bank lending in Netherlands' monetary transmission. Similarly, she found out that bank lending channel is not likely to be an important component in the transmission mechanism in the economy since banks hold a buffer stock of securities which they use to offset monetary shocks. However, the case is different in the Korean case.
A research carried out by Bank of Korea (1992), which is neatly documented in "Korea’s Experience of the Monetary Transmission Mechanism", presented evidence that support the bank lending channel. Applying the method that is similar to Romer and Romer (1990), their findings strongly support the view that bank lending has played an important independent role in amplifying the real effects of policy tightening implied by the interest rate channel in the major episodes of restrictive monetary policy since the second half of the 1970s.

Another research that finds supportive evidence of this so-called credit-lending channel is the one carried out by Gertler and Gilchrist (1992). They disaggregated bank loans and compared the behaviour of small and large firms. They found out that large firms issued commercial paper during the times of tight monetary policy while small firms and consumers who had no access to the securities market shoulder the burden of the decline in bank loans.

One important observation from the empirical findings is most researches that found the supportive evidence are the ones relying on micro level data, for example those that disaggregating small and large firms or small and large banks. On the other hand, researches that manipulate aggregate data mostly reveal the importance of money view rather than the credit view.
The possible explanation could be that the distribution effect of the monetary policy is not balance. Since the informational canyon separating lenders and borrowers is not everywhere equally wide, some borrowers, like large firms are easily observed. Thus, either lender will provide them credit or they are able to issue commercial paper during tight monetary policy, they are spare from the impact. On the contrary those small firms will feel the impact the most. Unless these differences are taken into account, overall, those big firms might be able to increase their activities, offsetting the ones felt by the small firms. Ultimately, this will mask the effect of the credit channel during tight monetary policy. One clear example would be research by Gertler and Gilchrist (1994). They found evidence that following a monetary contraction, small firms reduced their amount of bank credit while large firms initially attract more credit.

Obviously, credit-lending channel could not be detected through aggregate data since the effects some sort like cancel out each other. This is why the empirical evidence of a bank-lending channel has been much less conclusive, since most studies based on aggregate data. Clearly, the studies using micro level data are more informative. Unfortunately, detailed time series data at the individual firm or bank level are not readily available for research purposes.
2.3 Conclusions

Theoretical explanations of the existence of the credit-lending as another transmission mechanism rests on the micro foundations; the imperfect information problem. However, the existence of credit-lending as a policy transmitter into the real economy depends on the condition that the policy itself could first influence the evolution of bank lending. Otherwise, the link between interest rates, loans and the aggregate demand or investment will collapse, implying that credit-lending channel is not operative in the economy. The supporting evidence on credit-lending channel somehow is mixed, with studies using aggregate data failed to find conclusive evidence but studies manipulating micro-level data yielded more informative results.