

The Effects of Monetary Policy under the Credit Scoring System: The Experience from Korea in the Early 2000s*

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This paper investigates why an expansionary monetary policy was ineffective in mitigating the credit-rationing problem in Korean bank loan markets in the early 2000s. We focus on the strict regulation on capital adequacy and the sticky implementation of the credit scoring system to explain monetary policy ineffectiveness. In a theoretical model, we show that, if the supply of loans responds more sensitively to the credit score than the demand for loans, an expansionary monetary policy cannot resolve the credit rationing problem. By estimating a disequilibrium model for bank loans, we find that excess supply existed in bank loan markets in the early 2000s, and thus expansionary monetary policy did not help to reduce disequilibrium in loan markets. This finding implies that banks should adjust the critical credit rate as well as interest rates for the efficacy of monetary policy.

JEL Classification: E44, E51, G21

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1. INTRODUCTION

One of the long-standing consensus in monetary economics is that monetary policy is effective at least in the short run. However, opinions vary with regard to how monetary policy affects output. Recently, the bank lending channel has attracted a lot of attention as an important mechanism of the transmission of monetary policy. The bank lending channel suggests that an easing of monetary policy enhances economic activities through an increase in the supply of bank loans. When a credit rationing problem prevails in financial markets, the bank lending channel offers a good explanation about the effects of monetary policy.

However, it is puzzling that the expansionary monetary policy did not help to increase loan supply in Korea in the early 2000s. At the time, the Korean economy experienced a credit rationing problem despite a substantial expansion in the monetary stock.¹⁾ This paper aims to explore why monetary policy was ineffective during that time. We claim that the credit scoring system (CSS) that has been rapidly adopted in Korea decreased the efficacy of monetary policy.

The rapid development of information technology and the strict regulation of capital adequacy forced banks to apply the CSS in loan decisions. The effects of the CSS have been widely investigated in the prior literature. However, few studies have focused on the effectiveness of monetary policy under the CSS. In this paper, we attempt to investigate how the increasing adoption of the CSS affects the effectiveness of monetary policy.

We construct a simple model in which monetary policy can be ineffective under certain conditions. If the supply of loans responds more sensitively to the credit rating than the demand for loans does, and the critical credit rating level remains above the equilibrium level, expansionary monetary policy fails to resolve credit rationing problems. Under the CSS, only those borrowers whose credit rating exceeds the critical credit rating level can obtain bank loans. Unless the critical credit rating level is lowered, less

¹⁾ The average annual growth rate of M2 for 1999-2004 was 7.8%.

creditworthy borrowers cannot gain credit in spite of the excess supply of loans.

By estimating a disequilibrium model for bank loans, we obtain supporting evidence for our theoretical predictions. Korean bank loan markets are estimated to be in excess supply in the early 2000s. An expansion of the monetary base did not increase the supply of loans to borrowers with low credit rating; it only aggravated the excess supply problem. If banks lowered the critical credit rating over which loans were made, the expansionary monetary policy would have been successful in expanding credits to borrowers. These findings imply that monetary policy may not be effective despite an increase in monetary base if there is no adjustment of critical credit rating. The monetary authority needs to carefully monitor the behavior of financial institutions, when implementing monetary policy.

The rest of the paper is organized as follows. In section 2, we review the existing literature concerning the transmission mechanism of monetary policy, focusing on the bank lending channel. We also describe the effect of the regulation on capital adequacy on monetary transmission mechanism and the effect of the CSS on the availability of credit. Section 3 is devoted to reviewing the recent experience of the Korean banking industry. In section 4, we construct a theoretical model in which the effectiveness of monetary policy depends on the relative sensitivity of loan supply and loan demand to the credit rating. Section 5 attempts to present evidence for theoretical predictions using Korean aggregate data. We briefly conclude in section 6.

2. LITERATURE REVIEW

2.1. Transmission Mechanism of Monetary Policy

It is conventional wisdom that monetary policy affects output, at least in the short run. However, there has been no consensus about how monetary

policy affects real activity. Economists have long questioned how, i.e., through which channel, monetary policy affects output.²⁾ Traditional view is that changes in interest rates resulting from monetary shocks play a critical role in transmitting monetary policy to economic activity. The recent credit view is, however, based on the observation that interest rates do not significantly change in response to monetary changes. Under the credit view, imperfections in financial markets are seen as a key to understanding the transmission mechanism of monetary policy.

The credit view relies on two channels: the bank lending channel and the balance sheet channel. The former channel stresses that bank behavior is important in the transmission of monetary policy. It suggests that monetary policy affects output by altering the supply of bank credit. In the presence of credit rationing, an expansionary monetary policy is effective in increasing credit to credit-constrained borrowers. An increase in credit, in turn, affects expenditure by firms and households, and thus, boosts the economy. Bernanke and Blinder (1988) develop a model in which banks alters loans in response to a shift in monetary regime, which results in business cycles.

On the other hand, the balance sheet channel focuses on the broad aspect of financial markets. Models in this area derive the role of credit in general in the monetary transmission mechanism. Monetary policy impacts the financial positions of borrowers and, consequently, investment spending and consumption. In this perspective, a monetary contraction aggravates the problem of imperfect information in financial markets, and thus shrinks economic activity. Bernanke, Gertler, and Gilchrist (1999) argue that monetary shocks tend to amplify business cycles because of frictions in financial markets.

2.2. Regulation of Capital Adequacy

In line with the Basel Accord, regulatory agencies have typically regulated

²⁾ Kashyap and Stein (1994) provide an extensive survey of the monetary transmission mechanism.

banks based on the capital-asset ratio. The Accord requires banks to hold capital that is specified as a percentage of their risk-weighted assets. Besides the Basel conditions, banks are subject to additional supervision by the central bank and regulatory agencies. The regulation of the capital requirement offers one plausible mechanism that may affect banks' willingness to lend when their capital is close to the regulatory minimum.

Researchers have investigated how strict regulation of bank capital affects bank behavior. Many authors find that the capital regulation by the Bank for International Settlements (BIS) decreases bank lending and weakens the effectiveness of monetary policy.³⁾ Among them, Thakor (1996) argues that capital requirements, which are linked to credit risk, increase credit rationing and lower aggregate lending. Thus, the central bank is not able to stimulate bank lending by increasing money supply under the regulation of bank capital. Kopecky and VanHoose (2004) also show that binding bank capital requirements cause a decline in loans and alter the effects of monetary policy. Using Austrian data, Engler *et al.* (2007) discern the role of bank capitalization in the transmission of monetary policy. Jin (2005) also finds evidence that the capital ratio affects the loan share in Korea. He argues that the adoption of the Basel Accord reinforces the pro-cyclicality of bank loans in Korea. Shimizu (2007) asserts that the Japanese economy experienced prolonged deflation and recession due to the BIS regulation.

2.3. Credit Scoring System

Most financial institutions utilize the CSS to overcome the problem of asymmetric information when deciding to offer loans. The effect of the CSS on credit availability has been investigated in depth, using US data.⁴⁾ Among them, using U.S. banking data, Berger, Frame, and Miller (2005) find that the CSS serves to increase the portfolio share of small-business loans.

³⁾ VanHoose (2008) surveys the existing literature that investigates the effect of bank capital requirements on the monetary transmission mechanism.

⁴⁾ Berger and Frame (2007) provide a broad overview of the effects of the CSS on credit availability.

After controlling for bank size and other differences across banks, they find that credit scoring is associated with expanded quantities, higher average prices, and greater average risk levels for small business. Berger and Udell (2007) also state that the CSS increases credit availability for small business by reducing lending costs. However, the adoption of the CSS may decrease relationship lending and shrink loans to small business. Frame, Srinivasan, and Woosley (2001) conclude that the CSS lowers information costs between banks and borrowers, and thereby reduces the value of local-bank lending relationships. Contrary to the US experience, Kang (2006) finds that the adoption of the CSS has weakened the role of financial intermediation of Korean banks.

3. RECENT EXPERIENCES FROM KOREA

The financial crisis at the end of 1997 gave rise to substantial changes in Korean financial markets. In this paper, we focus on two major changes in the banking industry that we have experienced since 1998: BIS regulation and the CSS.

The Banking Act provides for bank capital adequacy.⁵⁾ The minimum legal capital requirement is 100 billion won for a nationwide commercial bank and 25 billion won for a local bank. In addition to the minimum capital requirement, the Financial Supervisory Committee and the Financial Supervisory Service (FSC/FSS) maintain consolidated and risk-adjusted capital standards that are recommended by the Basel Committee on Banking Supervision as another prudential measure for ensuring capital adequacy. The basic credit risk-based capital adequacy requirements became effective at the end of 1995. To reinforce the effectiveness of regulation, the market risk-adjusted capital adequacy requirements were newly imposed on 2002. Currently, all domestic banks are required to maintain a minimum capital-asset ratio of eight percent based on either credit-risk or

⁵⁾ Refer to FSS (2008) for overview on the current supervision system of banks in Korea.

market-risk-incorporated criteria. Banks with the BIS capital ratio below eight percent are subject to prompt corrective action by the FSC. The FSC/FSS started to implement the New Basel Accord from the end of 2007 that contains more risk-sensitive capital requirements.

The BIS ratio is the ratio of the capital to the risk-adjusted assets. The strict imposition of the BIS ratio by regulatory agencies significantly affects the behavior of banks, whose attitude towards risky loans has become more conservative. Banks became more likely to reject the demand for loans of small and medium firms and of new firms that lack a good credit record.

In 1999, the FSC/FSS introduced new, Forward Looking Criteria (FLC), which fully reflects a borrower's capacity to service all obligations and not just past performance.⁶⁾ In the classification of assets, the risk of borrower default is a major consideration. Banks are required to take into account the future, debt-servicing ability of the borrower as well as past debt service and credit history. In principle, banks should consider borrowers' management, the external environment, borrowers' financial status, and cash flow. The FSS have regularly issued revised guidelines for the classification and provisioning for all loans, guarantees and commitments. Furthermore, audited financial statements are required to reflect the valuation of assets according to the FLC and to the new accounting standards.

In response to the strict regulation of capital adequacy and the compulsory introduction of the FLC, most banks have adopted the CSS for loan decisions. FSS (2006) reports that the CSS had been applied to 71.8% of client-firms as of the end of 2005. Since then, the percentage of the CSS application has gradually increased. The FSS regularly reviews the CSS of banks and their implementation status. Under the CSS, the credit score is the most important criterion for whether or not loans are to be sanctioned.

⁶⁾ A detailed description of the FLC is in FSS (1999).

4. A THEORETICAL MODEL

4.1. The Effects of Monetary Policy under Asymmetric Information

Let both the supply of loans and the demand for loans be linear functions of the interest rate.

$$L^s = a_0^s + a_1^s r, \quad L^d = a_0^d + a_1^d r, \quad (1)$$

where $a_1^s > 0$, $a_1^d < 0$.

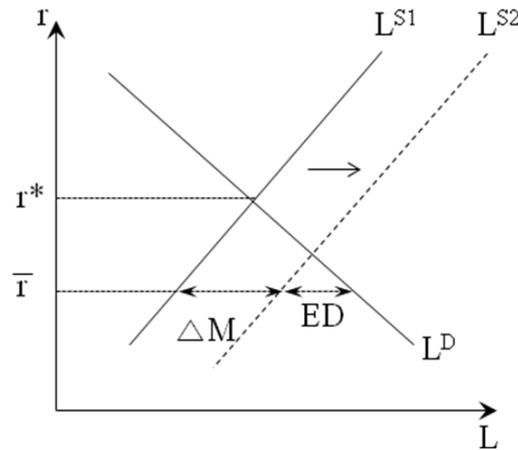
Then, the equilibrium interest rate (r^*) is the level at which the supply of loans equals the demand for loans. In practice, the actual interest rate (\bar{r}) is not necessarily equal to the equilibrium rate; actual rates are generally lower than the equilibrium rate, with the excess demand remaining in loan markets. Many researchers have investigated why interest rates fail to equilibrate demand for and supply of loans. Among them, Stiglitz and Weiss (1981) claim that excess demand for loans arises from asymmetric information between lenders and borrowers.⁷⁾ Credit rationing problems occur in that some borrowers cannot obtain credit as much as they want.

Figure 1 shows that an increase in money supply can ease a credit-rationing problem. If the monetary authority expands the monetary base, the excess demand for loans decreases without change in interest rates.⁸⁾ In figure 1, in response to shifts in money supply (ΔM), the loan supply changes from L_1^s to L_2^s and the excess demand (ED) declines. Monetary policy is, therefore, effective under credit-rationing.

⁷⁾ Stiglitz and Weiss (1981) focus on adverse selection and moral hazard problems to explain why credit rationing occurs in loan markets. Since less risky borrowers can drop out of the borrowing pool in response to an increase in interest rates, banks tend to impose lower interest rates despite excess demand. Furthermore, in the presence of substantial monitoring costs, the borrower is likely to undertake more risky projects, thereby reducing the lender's expected return. Banks, therefore, prefer to ration credit rather than increase interest rates.

⁸⁾ This is consistent with the old availability doctrine, which states that credit is determined not by the price of credit but by the availability of credit. This explains why relationships between the rate of interest and the demand for loans are weak.

Figure 1 Effects of Monetary Policy under Credit Rationing



4.2. The Effects of Monetary Policy under the Credit Scoring System

It is arguable that moral hazard and adverse selection problems strongly prevail in credit markets. Because banks have a comparative advantage in gathering information about borrowers, they tend to become aware of the characteristics of risky borrowers and devise means of differentiating *ex ante* between risky and safe borrowers on the basis of past experience. Actually, of late, the CSS is being widely adopted in loan markets to identify the riskiness of borrowers.

Let the credit rating of a borrower be *R*. Banks utilize information on the credit rating when they decide to grant loans. The supply of and demand for loans depend on the interest rate and the credit rating.

$$\begin{aligned}
 L^s &= b_0^s + b_1^s r + b_2^s R, \\
 L^d &= b_0^d + b_1^d r + b_2^d R,
 \end{aligned}
 \tag{2}$$

where $b_1^s > 0, b_1^d < 0, b_2^s > 0, b_2^d < 0$.⁹⁾

⁹⁾ Since firms with high credit rating are able to raise funds from capital markets, the

In practice, banks differentiate the loan rate across customers based on their credit ratings. The loan rate applied to a client decreases with his credit rating.¹⁰⁾ That is,

$$r = \delta_0 + \delta_1 R, \quad \delta_1 < 0. \quad (3)$$

Substituting (3) into (2), we obtain the following equations in which loan supply and demand for loans depend on the credit rating.

$$\begin{aligned} L^s &= \alpha^s + \beta^s R, \\ L^d &= \alpha^d + \beta^d R, \end{aligned} \quad (4)$$

where $\alpha^s = b_0^s + b_1^s \delta_0$, $\beta^s = b_1^s \delta_1 + b_2^s$, $\alpha^d = b_0^d + b_1^d \delta_0$, $\beta^d = b_1^d \delta_1 + b_2^d$. The signs of β^s and β^d are ambiguous because they depend on various parameters. The first terms in the expressions for β^s and β^d capture the indirect effects of the credit rating on the sensitivities of loan supply and demand, and the second terms reflect direct effects.

The equilibrium credit rating, R^* , where the supply of loans equals the demand for loans is:

$$R^* = \frac{\alpha^d - \alpha^s}{\beta^s - \beta^d}. \quad (5)$$

By definition, R^* is positive. All clients whose credit rating exceeds R^* are offered credit.

We assume that banks set the critical credit rating, \bar{R} higher than R^* .¹¹⁾ If banks offer loans to clients whose credit ratings are higher than \bar{R} ,

sensitivity of loan demand to the credit rating is assumed to be negative.

¹⁰⁾ Edelberg (2006) observes that banks increasingly use risk-based pricing of interest rates in the US.

¹¹⁾ Owing to strict capital regulation, Korean banks tend to apply higher critical credit rating than the equilibrium credit rating.

disequilibrium will exist in loan markets. Some borrowers experience credit rationing problem because their credit ratings are lower than the critical credit rating.¹²⁾

The question here is whether a credit-rationing problem is resolved if the monetary authority expands money supply. The answer depends on the relative sizes of the responsiveness of loan supply and loan demand to the credit rating.

(i) Case 1: The responsiveness of loan supply to the credit rating is *lower* than that of the demand for loans ($\beta^s < \beta^d$)

In this case, excess demand occurs in the loan market at \bar{R} . The magnitude of the excess demand is: $ED = (\alpha^d - \alpha^s) + (\beta^d - \beta^s)\bar{R}$. When the monetary authority increases monetary base by ΔM , the loan supply changes to $L^s = \Delta M + \alpha^s + \beta^s R$.

Then, an expansionary monetary policy successfully decreases excess demand by ΔM although the critical credit rating does not change at all.¹³⁾ Figure 2 depicts three cases based on the signs and the sizes of β^s and β^d . In all cases, expansionary monetary policy successfully reduces excess demand in loan markets. Borrowers, who missed out due to credit rationing, can be offered credit when money supply increases.

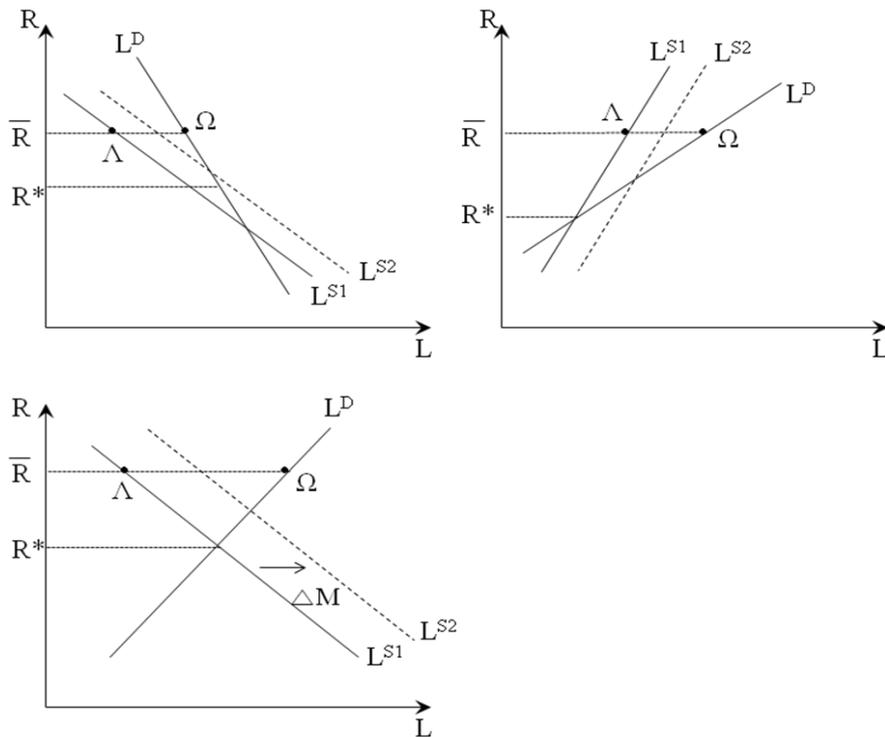
(ii) Case 2: The responsiveness of loan supply to the credit rating is *greater* than that of the demand for loans ($\beta^s > \beta^d$)

In this case, excess supply occurs in loan markets at \bar{R} . Borrowers with lower credit rating than \bar{R} cannot obtain credit in spite of excess supply in loan markets. Unless \bar{R} is not lowered, an increase in money supply fails

¹²⁾ It is noted that credit rationing problem arises from high critical credit rating under the CSS, not from screening under asymmetric information between banks and borrowers.

¹³⁾ Due to the strict regulation of capital-asset ratios, the critical credit rating does not change rapidly in response to changes in monetary policy. Banks rigidly segment firms into the investment group and the speculation group based on their credit score. In practice, the critical credit rating does not change easily with shifts in the monetary regime.

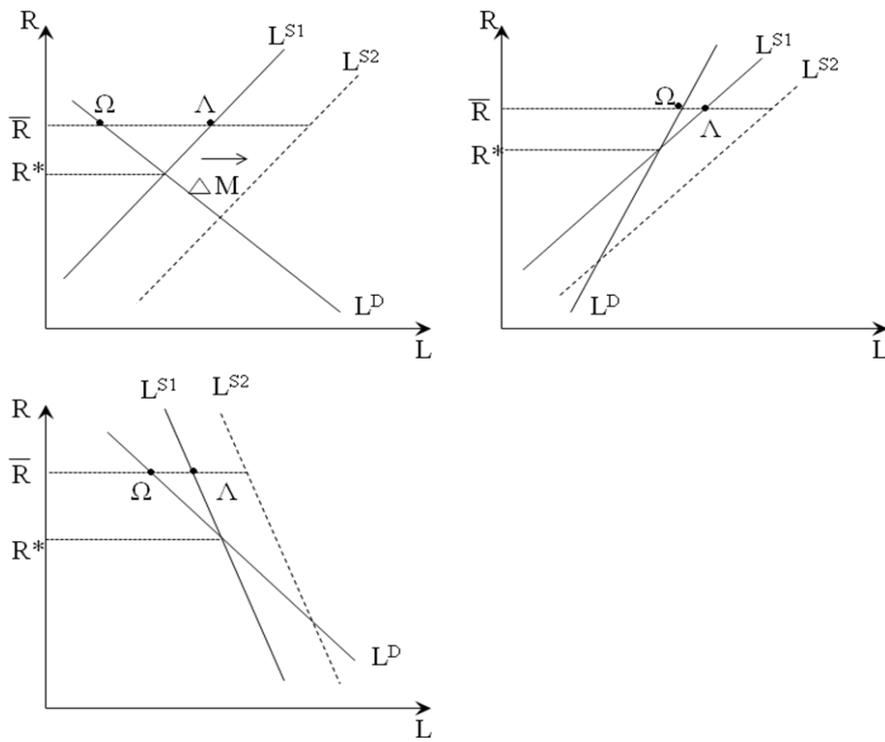
**Figure 2 Effects of Monetary Policy under the Credit Scoring System:
Case 1 ($\beta^s < \beta^d$)**



to resolve the credit rationing problem and only aggravates the excess supply problem. Figure 3 depicts all possible cases in which expansionary monetary policy is ineffective in increasing the supply of credit in loan markets.

The effect of monetary policy on reducing disequilibrium, therefore, depends on the relative sizes of the responsiveness of the loan supply and of the loan demand to the credit rating. In particular, we find that when the responsiveness of loan supply to the credit rating is greater than that of loan demand, the sticky application of the CSS renders monetary policy ineffective.

Figure 3 Effects of Monetary Policy under the Credit Scoring System:
Case 2 ($\beta^s > \beta^d$)



5. EMPIRICAL EVIDENCE

5.1. A Disequilibrium Model of Bank Loans

We use aggregate data to investigate whether the credit rating affects the supply of and demand for loans as predicted in the previous section. Since data on credit ratings are not available at the aggregate level, we use cash flow as a proxy for the credit rating.¹⁴⁾

¹⁴⁾ Banks use cash flow as an important criterion of the credit rating together with trends in asset values, operating incomes, capital ratio, leverage and etc. When we use leverage

We adopt a disequilibrium model to estimate the supply of and demand for bank loans.¹⁵⁾ The disequilibrium model assumes that the short-side prevails in disequilibrium. We specify the supply of and demand for bank loans as follows.

$$\begin{aligned} L_t^d &= \alpha_0 + \alpha_1 L_{t-1} + \alpha_2 INV_t + \alpha_3 LR_t + \alpha_4 CF_t + \alpha_5 p_t, \\ L_t^s &= \beta_0 + \beta_1 L_{t-1} + \beta_2 CF_t + \beta_3 (LR - MSB)_t, \\ L_t &= \min(L_t^d, L_t^s), \end{aligned} \quad (6)$$

where L is bank loans outstanding, INV is the equipment investment index, LR is the average loan rate, CF is the cash flow, p is a random-walk predictor of the consumer price index, and MSB is the yield on a monetary stabilization bond.¹⁶⁾ L and INV are transformed into their natural logarithms. The sample period runs from 1999:IV to 2004:IV.¹⁷⁾ As the theoretical model predicts, we expect that $\alpha_3 < 0$, $\alpha_4 < 0$, $\beta_2 > 0$, and $\beta_3 > 0$.

We apply the maximum likelihood estimation method developed by Maddala and Nelson (1974).¹⁸⁾ Table 1 presents the estimation results. We implement a Wald test of joint significance of the estimated coefficients in the demand and supply equations respectively, rejecting the null hypothesis of all coefficients in each equation being zero. We also compare the disequilibrium model to the equilibrium model in which the actual loans outstanding is used in both demand and supply equations. The equilibrium

ratio instead of cash flow, there is no substantial difference in main results.

¹⁵⁾ Laffont and Garcia (1977), and Ito and Ueda (1981) originally apply the methodology of disequilibrium econometrics to bank loan markets.

¹⁶⁾ Melitz and Pardue (1973), Blundell-Wignall and Gizycki (1992), Pruteanu (2004), and Baek (2005) adopt a variety of specifications of loan supply and demand functions. A distinct feature of our specification is the inclusion of cash flow as a proxy for credit rating.

¹⁷⁾ The sample period commences from 1999:IV when the FSC/FSS adopted the FLC, and ends in 2004 because consistent cash flow time series after 2005 is hard to obtain from the Flow of Fund Table.

¹⁸⁾ The likelihood function of eqs. (6) is derived in Maddala and Nelson (1974). The model can be estimated by the full-information maximum likelihood approach with a numerical maximization of the likelihood function.

Table 1 The Supply and Demand Equations for Bank Loans

α_0	α_1	α_2	α_3	α_4	α_5	σ
24.083** (11.996)	0.001 (0.717)	-0.445 (0.525)	-0.142* (0.075)	-0.194** (0.089)	0.029 (0.020)	0.082** (0.037)
β_0	β_1	β_2	β_3	—	—	σ
9.781 (6.465)	-0.000 (0.452)	0.133*** (0.051)	0.106** (0.052)			0.050** (0.019)

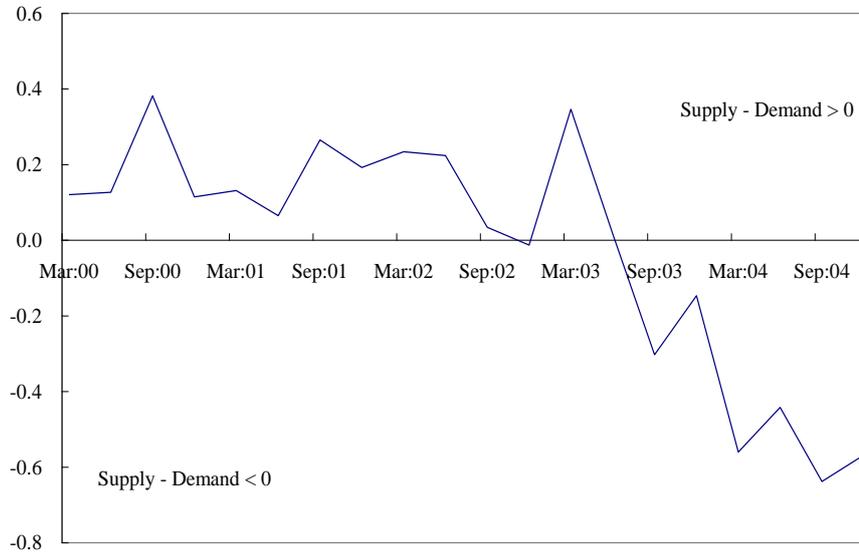
Notes: *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are in parentheses.

model does not perform well in that some coefficients have wrong signs. Additionally, the standard deviations of errors in both demand and supply equations are smaller in the disequilibrium model than the equilibrium model. Correlation coefficient, which is ignored in the equilibrium model, of the two equation errors is significantly positive. We, therefore, conclude that the disequilibrium model in this paper is valid.

It is noted that all coefficients have the proper signs. In particular, we find that loan supply responds positively to the credit rating that is proxied by the cash flow and that loan demand responds negatively to the credit rating. This result is consistent with the assumptions of equations (2).

The estimated excess supply is depicted in figure 1. The excess supply of loans considerably fluctuates over time. The bank loan market is largely characterized by excess supply, especially from 2000 to the early 2003.¹⁹⁾ After that time, the bank loan market is marked by excess demand. These findings suggest that banks supplied more loans than the client-firms demanded in the early 2000s. Less creditworthy borrowers could not access bank loans despite the excess supply in bank loan markets.

¹⁹⁾ This result is consistent with Baek (2005), which reports that the excess supply of bank loans lasted for 2001-2003.

Figure 4 Excess Supply in Bank Loan Markets

5.2. Effects of Monetary Policy on the Excess Supply of Loans

The next question is whether an expansion of money supply is effective in supplying more credit to less creditworthy borrowers. We estimate the following equation to investigate whether monetary policy is effective in reducing disequilibrium in loan markets.

$$ES_t = CONST + \gamma_0 MP_t + \gamma_1 MP_{t-1} + \gamma_2 MP_{t-2} + \gamma_3 MP_{t-3} + \gamma_4 MP_{t-4}, \quad (7)$$

where ES denotes the excess supply of loans and MP stands for monetary policy.²⁰⁾ We use two measures to identify the monetary policy stance: changes in the monetary base and the call rate.

In table 2, we find that most coefficients in changes in the monetary base are positive, implying that the excess supply in bank loan markets increases

²⁰⁾ Since monetary policy exerts its effects with time lags, we need to consider both contemporaneous and lagged coefficients.

Table 2 The Effects of Monetary Policy on Excess Supply

	Constant	γ_0	γ_1	γ_2	γ_3	γ_4
Monetary Base	-0.506 (0.128)	2.505 (2.468)	4.225** (1.866)	4.209** (1.858)	3.078 (2.030)	3.765 (1.525)
Call Rate	-0.029 (0.092)	9.189 (31.291)	2.698 (31.511)	-5.603 (31.606)	3.193 (7.621)	4.063 (7.613)

Notes: *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors are in parentheses.

with an increase in the monetary base. Most coefficients in changes in the call rate are also positive but not statistically significant. These findings suggest that expansionary monetary policy aggravates the excess supply problem in bank loan markets. Since the Korean bank loan market was marked by excess supply in the early 2000s, as estimated in the disequilibrium model, expansionary monetary policy seem to worsen the problem of excess supply in bank loan markets. Under the sticky critical credit rating policy, an expansion in the money stock was not helpful in resolving credit rationing problems.

This result is consistent with Case 2 in section 4 in which loan supply is assumed to be more responsive to the credit rating than loan demand. Since banks cannot adjust the critical credit rating in response to changes in monetary policy, the problem of excess supply is aggravated without an increase in the credit supplied. Borrowers, who miss out due to credit rationing, cannot enjoy wider access to loans although monetary policy might become more expansionary. If banks were able to lower the critical credit rating, more borrowers would be offered credit. However, because of strict capital regulation, banks seem to implement the sticky level of critical credit rating despite the existence of credit rationing problem.

6. CONCLUDING REMARKS

We attempt to explore why the effectiveness of monetary policy was weakened in the early 2000s in Korea. The wide adoption of the CSS by banks is offered as one plausible reason for the ineffectiveness of monetary policy. If banks decide to offer loans based on clients' credit ratings, disequilibrium in loan markets cannot be easily resolved by an expansionary monetary policy without the adjustment of the critical credit rating. We find that the Korean bank loan market was marked by excess supply and that expansionary monetary policy only aggravated the problems of excess supply in the early 2000s. Those who were not offered credit because of low credit score could not gain credit despite an expansion in money supply. That is, there was a chronic credit rationing problem in the Korean bank loan market.

These findings suggest that the monetary authority needs to carefully monitor the behavior of financial institutions when implementing monetary policy. The sticky application of the CSS and the strict regulation of capital adequacy may result in the ineffectiveness of monetary policy. For the efficacy of monetary policy, the critical credit rating should be adjusted elastically with respect to shifts in monetary policy stance.

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