

# The Retained Profits and Discount Windows : The Case of the Bank of Korea \*

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## <ABSTRACT>

Many central banks retain internally at least part of their profits. A recent study by Kim and Kim (2007) revealed, with the cross-section data of 71 countries, that such retained profits served as a *financial leverage* to the central bank's discretion to choose the *discount window*, which is known to confer more benefits to its bureaucrats than other monetary instruments. As a direct extension of their finding, this paper investigates the intriguing case of Korea. Since the Bank of Korea (BOK) Act in 1962 introduced a monetary institution called the "profits-retaining clause (PRC)," BOK has retained a substantial portion of its annual profits. BOK elucidated two purposes of PRC: to reduce the monetary base, and to secure its credibility. We first argue that the two purposes of PRC are without sound bases. We further empirically prove that it most probably served other bureaucratic interests within the monetary authority. Particularly, this paper supports the *cross-country* study by Kim and Kim by directly verifying the relationship between the retained profits and discount windows using the *time-series* data of Korea. Combining the previous research critical of the 1947 U.S. Fed's rule (*i.e.*, returning almost all profits to the Treasury), which is exactly opposite to PRC, we consequently submit a rather provocative proposition: Bureaucratic discretion-seeking, *if* not properly contained, could come into play pervasively in monetary policy, regardless of the *nominal* direction of its change.

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## I. Introduction

The theory of bureaucracy assumes that a bureaucratic organization is concerned with prestige and self-preservation. Accordingly, a preference ordering that stresses these concerns to a central bank throws considerable light on the actual operation of monetary policies (Chant and Acheson, 1972, p. 14). In fact, researchers have been highlighting bureaucratic perspectives of the central bank (e.g., Friedman, 1982, p. 114; Leijonhufvud, 1984, p. 95; Buchanan and Brennan, 1991, p. 86; Conant, 1991, p. 155; Havrilesky, 1995, p. 33; Broz, 2002, p. 866).

Broadly-defined political economic analyses of the central banking organization were launched in full force in the 1970s.<sup>1</sup> Examples include positive analyses regarding policy-making and implementation in appropriating and allocating the budget of the Fed. Beginning in 1947, the Fed, which had been legally able to spend or retain all profits since 1933, abruptly started transferring the remaining portion of the profits net of its operating expenses to the Treasury.<sup>2</sup> This policy change caught researchers' attention

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<sup>1</sup> The literature generally distinguishes the political economic models in a broad sense into four different types; public interests models, presidential partisan models, congressional partisan models, and public choice models. For details, see Caporale and Grier (1998, pp. 410-413). In fact, the study of monetary institutions and their actual implementation from the political economy perspective is no longer the domain only of mostly economists and just a few political scientists. For example, see a special issue of *International Organization* (2002, v. 56, no. 4) for this topic. See further Kim and Kim (2005) for such literature especially regarding the exchange rate policy of the central bank.

<sup>2</sup> The Federal Reserve Act of 1914 stated that the Fed first were to use earnings for paying their expenses and for paying dividends to member banks. Then, half of their yearly net earnings were to be paid to the government in the form of a franchise tax. The other half could be retained by the Fed as long as its surplus was less than 40% of paid-in capital. However, over the period of 1933-1947, all earnings could legally be spent or retained by the Fed (Toma, 1982, p. 165). According to Toma (1982, p. 166), these excess earnings sparked congressional interest which the Fed feared might be expressed in the form of a legislative measure, mandating a particular disposition of excess earnings. This fear, at least partially, accounted for the Fed's

tightly, and they subsequently established and empirically confirmed the *discretion-seeking hypotheses*: The Fed has, since the budgetary regime change, increased the use of inputs such as employees and amenities, and such change in the Fed's behavior has caused inflationary bias since it can appropriate higher profits from inflation and thus a higher budget.<sup>3</sup>

In fact, currently the central bank's profits are transferred to the government in many countries. Naturally, a question arises: what will happen to the central bank's behavior if, conversely, its profits are legally allowed to be retained? Would it then reduce the use of inputs? We suspect that the effect would not be symmetric.

Recently, Kim and Kim (2007), with the 2000-2001 data of 71 countries, investigated the major determinants of the degree of the reliance on discount windows, as a monetary instrument, relative to the open market operation. They strongly confirmed that the retained profits worked as a *financial leverage* to the choice of the discount window vis-à-vis open market operation: the former might be a major outlet through which the central bank can have considerable leeway in how to manage the reserve fund.

As a direct and meaningful extension of Kim and Kim (2007), this paper intends to put forward solid evidence supporting their conclusion using the time-series data of Korea. Indeed, the case of the Bank of Korea (*hereafter* BOK) provides a very unique and lucrative research opportunity. In 1962, the BOK Act introduced a monetary institution called the "profits-retaining clause (*hereafter* PRC)" which allowed it to retain a big portion of its annual profits allegedly for two purposes: i) to reduce the monetary base and ii) to secure the credibility of BOK by earmarking part of its funds for potential losses. Previously, most of profits had been submitted to the government.

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"voluntary" transfer of a portion of its revenue to the Treasury in 1947. Boyes et al. (1988, pp. 182-183) also argue that, fearing legislative sanctions, the Fed began to submit the most of the remaining portion of its earnings above system expenses to the Treasury, a practice that continues to this day.

<sup>3</sup> See, for example, Toma (1982), Shughart and Tollison (1983), Toma and Toma (1985), Boyes et al. (1988, 1998), and Mounts and Sowell (1996).

We argue that these two announced purposes are without sound bases, and that PRC has mainly served bureaucratic interests (*i.e.*, *discretion-seeking*) for the past four decades.

Specifically, we posit that BOK, just as private firms, can buy more assets as retained profits increase. We pursue, borrowing insights from Poole (1990) and Schwartz (1992), the hypothesis that BOK, with its retained profits, prefers to increase the use of discount windows with a higher discretionary power, for example, over the purchase of securities through the open market operation. This is because discount windows by nature provide for BOK members many more benefits, both pecuniary and non-pecuniary. To the extent that retained profits enhance BOK members' utility, this paper portrays them as "discretionary budget" as defined by Niskanen (1975).

If our arguments hold, combining the aforementioned research results critical of the Fed's rule, we will have shown that discretion-seeking incentives can always come into play regardless of the *nominal* direction of a change in monetary institution, and that bureaucratic discretion *per se* matters in assessing their *real* consequences. To be sure, this implication would not be confined to Korea, because retainment of profits by the central bank seems to be a worldwide practice.<sup>4</sup>

For these goals, the order of the paper is as follows: Section II examines the validity of BOK's claims regarding the two purposes of PRC, and effectively refutes them. Section III, through a simple model, illustrates the Korean experience in allocating the central bank's profits and their economic effects on bureaucratic behavior, with a remark on a slight distinction in underlying characteristics of the models between the literature, basically following Shughart and Tollison (1983) and ours.

Nonetheless, an existence of the bureaucratic benefits associated with discount windows is hard to substantiate, despite sometimes anecdotal evidence. Clearly, its empirical proof is a tough task inherently because "*disentangling economic (i.e., public*

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<sup>4</sup> According to our preliminary survey, many developing as well as developed countries retain profits at least partially. The ratios of the retained profits to the monetary base are: Iceland (38%), U.K. (3%), Germany (1%) in Europe, Indonesia (14%), Korea (13%), Japan (2%) in Asia, and Venezuela (5%), U.S. (2%), Australia (20%) in America and Oceania as of the end of 2005, to name a few.

*interest) and political influences*” (Crone and Tschirhart, 1998, p. 106) is usually difficult. Hence, in Section IV, we first establish: Discount windows are more likely to allow monetary authorities not only to extract private benefits to themselves, but to exercise their *bureaucratic discretion* more freely than in open market operation. We then take up our hypothesis concerning the nexus between retained profits and discount windows, the major tenet of which is that the former is used to facilitate the latter. In Section V, we empirically test this hypothesis. Section VI concludes the paper with suggestions for future research.

## **II. The Announced Goals of Retained Profits: A Refutation**

### **1. Outline of the Profits-Retaining Clause**

According to the 1962 PRC, now stipulated in the BOK Act (1999) §99, BOK must retain 10% of its profits as “required retained profits”, and, with the government’s permission, is allowed to retain a certain amount as “special retained profits” for specially designated purposes. All remaining profits should be transferred as general taxes.

To initiate our inquiries, in <Appendix 1> we collected the balances of these retained profits (*RRP*, *SRP*, *RP*) from 1964 to 1996 right before the catastrophic 1997 Korean financial crisis.<sup>5</sup> Also, to make later empirical analyses more rigorous, we thoroughly calculated inflows and outflows of these variables (*RRP\_IN*, *SRP\_IN*, *SRP\_OUT*) since we did not know *a priori* whether the stock or the flow variable would have a higher explanatory power. Here we immediately identify quite interesting facts from <Appendix 1>.

First, BOK began to accumulate a sizable amount of the special retained profits from 1969, and it retained all the rest of the profits net of the required retained profits for the periods of 1973-1996. Surprisingly, this means that BOK did not transfer a penny as taxes during that period (*TAX* =0), which, intriguingly, compares to the

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<sup>5</sup> The special retained profits began to be accumulated from 1963, and the data were reported lagging one year, due to the reason explained in <Appendix 1>. The reasons for this sampling period for our study are elaborated in detail in <Appendix 3>.

1933-1947 time interval of the Fed's no transfer.

Second, the balance of special retained profits has well exceeded that of required retained profits since the late 1970s. In 1996, special retained profits amounted to around US\$1 billion, almost four times as much as required retained profits. Furthermore, there were only eight years when BOK experienced negative profits, while the maximum of the annual losses was below \$0.2 billion. Retained profits were close to \$1.2 billion in 1996, obviously too big a scale for *potential losses*.

What then would be the reason for reserving these large sums of money? BOK officially claims that they serve the two important functions mentioned earlier. An evaluation of these claims is in order.

## 2. Refuting the BOK's Claims

### 2.1 Role of Curbing the Monetary Base

This first claim (BOK, 1999a, p. 277) is that the monetary base is scaled down by the retained profits, while the fiscal use of them increases the monetary base. We use the simple balance sheets (B/Ss) of BOK in order to check legitimacy of this claim. Suppose that BOK loans \$100 to a commercial bank (<BOK's B/S ①>).

<BOK's B/S ①>			
Assets	+\$100	Currency	
		Reserves	+\$100

#### (i) The Case of Transferring Profits as Taxes

When, after a year, BOK receives interest for the loan, \$20, which is deducted from the commercial bank's reserves deposits, BOK's profits first increase by \$20 (<BOK's B/S ②>). If the profits are transferred as taxes, government deposits increase by \$20, making the monetary base temporarily decline by \$20 (<BOK's B/S ③>). Following the BOK's presumption that "all the tax revenues are fiscally spent," the reserves at BOK (so, the monetary base) will ultimately recover back to \$100, which vindicates BOK's claim (<BOK's B/S ①>).

<BOK's B/S ②>			<BOK's B/S ③>		
Assets	+\$100	Currency	Assets	+\$100	Currency
		Reserves			Reserves
		+\$80			+\$80
		+\$20			Gov. Dep.
					+\$20

**(ii) The Case of Retaining Profits within BOK**

What happens if the profits are retained? <BOK's B/S ②> then changes to <BOK's B/S ④>, causing the monetary base to be reduced, as BOK claims. Nevertheless, we have to resolve the serious question of whether the Monetary Policy Committee<sup>6</sup> actually undertakes monetary policy reflecting the balances of retained profits, that is, under-targeting the growth rate of the monetary base with the balance increase taken into account. We made enormous endeavors to answer this question. Yet, we could find no such evidence either through the directives of the Committee since 1962, or through informal interviews with BOK members. On the other hand, note the important fact that retained profits are by no means just sitting in BOK's vault, but are constantly utilized for purchasing BOK's assets. The purchase of assets indicates a plugging-in of the monetary base. Combining all these inquiries, the monetary base recovers back to the initial position (<BOK's B/S ⑤>).

In sum, an inspection of <BOK's B/S ①, ②, ⑤> refutes BOK's first claim that PRC reduces the monetary base. Furthermore, one critical question remains: why not use the traditional instruments of monetary policy instead?

<BOK's B/S ④>			<BOK's B/S ⑤>		
Assets	+\$100	Currency	Assets	+\$120	Currency
		Reserves			Reserves
		+\$80			+\$100
		+\$20			+\$20

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<sup>6</sup> This Committee serves similar functions to those of the Board of Governors and FOMC in the Fed.

## 2.2 Role of Securing the Credibility of the Central Bank

First of all, BOK argues that retained profits are “to prepare for potential losses” (BOK, 1999a, p. 275). The current balances of retained profits, however, are so far too large for the actual losses. Moreover, if losses occur, according to the BOK Act §100, the government, rather than BOK, is responsible for them.

If the losses are then made up by the government rather than by the retained profits, is the monetary base increased, inflation caused, and, BOK’s credibility impaired? <Appendix 2> shows that there is no change in the size of the monetary base no matter who makes up the losses, hence, making no difference in the credibility of BOK. Consequently, we also refute BOK’s claim on this second role of retained profits.

## III. A Simple Theoretic Account

### 1. Outline

This section asks a very illuminating question: what happens to BOK with PRC? The literature would predict a reduction in BOK’s consumption of amenities, since PRC is a legal switch exactly opposite to the 1947 U.S. case explained in the Introduction. We instead show increases both in amenities and, more importantly, in retained profits as BOK’s discretionary budget. Section IV will explain how bureaucrats use the latter through discount windows to benefit themselves. Finally, we test the positive relationship between retained profits and discount loans in Section V.

### 1.1 Definitions of Variables

- $r$  : retained profits within BOK defined as discretionary budget.
- $a$  : amenities consumed by BOK members.<sup>7</sup>
- $P_r$  : the retaining cost per unit of  $r$ , including costs to justify PRC politically, and all the administrative costs.  $P_r$  will increase with the intensity of outside monitoring.
- $P_a$  : the administrative cost per unit of  $a$ , including accounting and auditing costs.

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<sup>7</sup> Traditionally, these would include salaries, office space, funds for employee travel, number of workers, and other perquisites (Shughart and Tollison, 1983, p. 293).

- $b$  : the total discretionary budget of BOK defined as  $b = P_r r + P_a a$ , where  $P_r r$  is the total expenditure for retained profits and  $P_a a$  is the ordinary operating budget of BOK.

## 1.2 Maximization of Discretionary Budget

Suppose that bureaucrats at BOK have a utility function which has, as two arguments, retained profits and amenities, basically as in Shughart and Tollison (1983). We expect retained profits to provide varying types of utility, although they cannot be spent to purchase amenities directly because of regulations. Specifically, such varying types of utility distinguish themselves from the other argument in the utility function, amenities, in that they are usually offered from the *outside* of BOK. (These will be discussed in detail in Section IV.) Equation (1) represents the usual optimization, and shows their optimal choice  $E_0$  ( $a_0$  and  $r_0$ ), given  $b$ .<sup>8</sup>

$$\begin{aligned} \text{MAX } & U(r, a) & \text{s.t. } & P_r r + P_a a = b. \\ & \{r, a\} & & \end{aligned} \quad (1)$$

## 2. Increasing the Retained Profits under PRC

Let us examine how PRC of 1962 has affected the bureaucratic incentives regarding the allocation of its total budget. Note that PRC is interpreted as a legal support for BOK's retaining profits on a regular basis, which is polar-opposite to the 1947 U.S. policy change. This means a decline in the cost of retaining,  $P_r$ , since BOK does not have to either defend, or lobby for, as strongly as it used to, the accumulation of funds inside. Indeed,  $P_r$  must be very low during 1973-1996 when, as explained earlier, BOK was legally allowed to keep its entire profits, which would make the original budget line steeper in <Figure 1>. We then readily find out that PRC must have induced the optimal level of retained profits to increase (from  $E_0$  to  $E_1$ ). As to  $a$ , it may increase or decrease, depending on the relative sizes of the income and the substitution

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<sup>8</sup> This assumption is reasonable because, even before 1962, BOK appears to have sporadically maintained small sums of retained profits for various purposes.

effect.

**<Figure 1> Here.**

A brief recap as to the case of the Fed in 1947 seems useful. As expected, Shughart and Tollison (1983) show that, after 1947, the Fed chose  $a$  more. This is because, the authors explain, the relative price of  $a$  declined due to increases in overall costs related to the transfer procedure. <Figure 1> displays this movement from  $E_0$  to  $E_2$ .<sup>9</sup>

We note a distinctive treatment at this juncture. Shughart and Tollison (1983, pp. 293-295) posit that “*funds in the amount  $\overline{0r_2}$  are turned over to the government’s general revenue account.*” Treating identically the two different dispositions of residual profits before and after 1947, the authors are implicitly assuming that the Fed is indifferent to who finally retains the profits, the Fed itself or the government. It also follows that  $r$  in equation (1) can be either the retained profits at the Fed or those transferred to the Treasury. As explained earlier, however, BOK used to be fairly hostile to the transfer, which has as a matter of fact led us to presuppose that the profits retained only *within* BOK would enter its utility function in this paper.

In sum, PRC of 1962 must have induced BOK to increase the level of retained profits vis-à-vis the increased amenities of the U.S. experience after 1947. The subsequent question is how  $r$  increases the utility of BOK members.

## **IV. Discretion-Seeking Behavior through Discount Windows**

### **1. Why Prefer PRC: A Clue**

BOK used to be very hostile to the transfer of profits. We gave much thought to what could be the major motivation underlying BOK’s tenacity for retained profits. In

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<sup>9</sup> According to the authors, this would indicate the Fed’s tendency to rely more on  $a$  upon the change in disposing profits, as long as the substitution effect dominates the income effect. Other input choices arguments, similar to this Fed’s stronger tendency toward amenities, have been portrayed in Toma and Toma (1985), Boyes et al. (1988, 1998), and Mounts and Sowell (1996). See Crihfield and Wood (1993) for a more neutral position.

other words, how do we give rationale for treating them as discretionary budget? Experiences in Canada and the U.S. gave a clue.

First, the Bank of Canada used to utilize government deposits for its discretionary power: its use of arbitrary transfers of government deposits between itself and the chartered banks.<sup>10</sup> Second, interestingly enough, the Federal Reserve Act §13.b revised in 1934 made the Fed's aggregate amount of loans at discount windows subject to the level of its "retained profits."<sup>11</sup>

Based on these two observations, we establish a hypothesis, as the driving vehicle of this paper: BOK would intend to retain profits as discretionary budget, as modeled in Section III, in order to use them through the discount windows which are essentially operated under greater secrecy with a higher discretionary power.

In spite of the problems associated with the demand side of discount windows,<sup>12</sup> the central banks in many countries have used them. One reason might be the request or pressure from the demanders: that is, the result of rent-seeking. Nonetheless, we believe that there exists another reason: the suppliers opt for the discount window, the biggest reason of which seems to lie in its *secrecy and discretion*.

Open market operations are anonymous. They allocate reserve injections or withdrawals among participants according to the market mechanism. However, much greater discretion is exercised by the central bank in allocating reserves through

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<sup>10</sup> Chant and Acheson (1972, p. 28) argue that the practice has a clearer rationale in terms of bureaucratic behavior rather than in relation to monetary control. In particular, we were inspired by their assertion that a significant advantage of this practice is "greater covertness" relative to open market operations, and that this greater covertness renders a higher degree of discretionary power.

<sup>11</sup> "The aggregate amount of discount loans (to nonbanks) was limited by law to the surplus of the Fed as of July 1, 1934, plus \$139 million that the Treasury was to repay the Fed for their required subscription to the Federal Deposit Insurance Corporation in an amount equal to one-half of their surplus on January 1, 1933." (Schwartz, 1992, p. 61)

<sup>12</sup> The problems can be summarized as moral hazard and adverse selection. See, for example, Poole (1990), Kaufman (1991), Schwartz (1992), and Hakkio and Sellon (2000).

discount windows since the central bank knows the institutions that request discount accommodation. The secrecy leaves open the question of whether provision of loans on a case-by-case basis assures equal treatment for all (Friedman, 1960, p. 38). Similarly, central banks appear to have a predictable but contrary desire not to leave a clear record of their actions, preferring to have the power to select a favorable account of their actions (Chant and Acheson, 1972, p. 15). Furthermore, Poole (1990, p. 266) argues that the subsidy discount window enables the Fed to establish regulatory constraints or other powers that might not otherwise exist. The “other powers” here would clearly include pecuniary and/or non-pecuniary benefits.<sup>13</sup> In conclusion, all these constitute reasons for retained profits to enter the utility function of the central bank in equation (1).

## **2. BOK’s Actual Operation of Discount Windows: Discretion-Seeking**

BOK provides discounted loans, at interest rates determined by the Monetary Policy Committee. The following claim by Poole (1990, p. 256), however, lends a particularly significant insight to our paper: “*The real purpose of the discount window today is to serve the political and bureaucratic needs of the Fed.*” It is well known that Korea heavily relies on discounted loans as the major instrument of monetary policy. This is partly because of the chronic excess demand for loanable funds, partly because of the unfledged development of various financial markets, and, most importantly, because of their effective role as selective subsidies to industries and firms (BOK, 1999b, p. 41). Naturally, the proportion of discounted loans in monetary operation is extraordinarily high in Korea. In particular, during most of the 1980s, discounted loans even exceeded the monetary base, and peaked more than twice as much as the monetary base in 1985.<sup>14</sup>

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<sup>13</sup> Refer to Kim and Kim (2007) for more extensive discussion of the bureaucratic incentives associated with discount window.

<sup>14</sup> In fact, BOK has been forced to issue a huge amount of the Monetary Stabilization Bond rather to withdraw the monetary base expanded by the discounted loans. Beckerman (1997, p. 169) seriously warned the danger of the central bank’s issuing its own securities in developing countries. Kim and Kim (2007) further submitted that such security-issuing can be another proxy of the central bank’s discretionary power, and empirically showed its positive relationship with the reliance on the discount window.

Admitting these problems officially in 1986, BOK declared that, as to the discount window, it would now focus more on its role as a monetary instrument, rather than on its previous role as subsidies to industries (BOK, 1999b, pp. 41-42). Subsequently, in order to strengthen its function of the liquidity control, it abolished all kinds of designated loans given to varying sectors as subsidies, and introduced the “aggregate loan ceiling system.”<sup>15</sup>

Yet, we still believe that BOK was able to practice a significant degree of discretion in the allocation of discounted loans. The reasons are three-fold. First, the legal clauses for “special loans” encompass a wide scope,<sup>16</sup> which, other things being constant, would allow more for BOK’s discretion. Second, in spite of BOK’s official change into the aggregate loan ceiling system, the special loans exception above still occupied a big portion. Third, one can easily spot several clauses indicative of BOK’s great leeway, even in the aforementioned Guidelines for Loans to Financial Institutions.<sup>17</sup>

The final question remains: In which way was the discretionary power exercised? We predict that it must have been exercised, at the margin, to increase the utility of BOK’s members. In fact, especially up to the 1990s there were occasional media reports on bribery scandals between certain BOK members and banks associated with loan arrangements. BOK officially and somewhat successfully managed to downgrade such occasions as only individual irregularities. Nonetheless, we believe there clearly existed varying degrees and scopes of private benefits derived from BOK’s discretionary power in the discount window, based on the following (partly anecdotal) evidence.

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<sup>15</sup> Under the system, loans to each bank are limited only by the aggregate ceiling, determined by the Monetary Policy Committee.

<sup>16</sup> Special loans, based on the BOK Act §64 and §65, are given to specific financial institutions with even more privileged interest rates. Even worse, they are not subject to the Guidelines for Loans to Financial Institutions, prepared to enhance transparency in discount windows, but determined on a case-by-case basis (BOK, 1999a, pp. 172-173).

<sup>17</sup> Among several others, Clauses §5-2, §10-2 and §10-3 entitle to the BOK’s Chairman a tremendous amount and range of discretion on the allocation of loans.

First, monetary benefits apparently existed. For example, the Auditing and Inspection Office of the Government revealed that more than 30 BOK bureaucrats had received extraordinary levels of household loans from banks with uncommonly privileged conditions (*Korea Economic Daily*, April 7, 1997).<sup>18</sup> A series of bribery scandals exposed around 2000 put the Korean financial market into turmoil.<sup>19</sup>

Second, it seems that the presence of non-monetary benefits was even clearer. It is well known that BOK's ex-bureaucrats, upon retirement, found relatively lucrative positions at financial institutions to which BOK provides discounted loans as well as prudential regulations.<sup>20</sup> As to the job turnover of ex-bureaucrats to the industries they used to regulate, called *revolving doors* or *amakudari* (meaning "descent from heaven" in Japanese), there has been a defense, on the part of the ex-bureaucrats as well as of the hiring firms, of regulatory expertise accumulated at the bureau. Again, anecdotal evidence refuting such defenses abounds, but it has been hard to substantiate it.

Cho and Kim (2001) indeed showed that such a job turnover can be viewed as no more than deferred payment for privileges earlier supplied by ex-bureaucrats. The authors named it as the "corruption-facilitating-mechanism (CFM)." According to their empirical analysis on the degree of CFM across 22 ministries in Korea, CFM was unambiguously working (at least to the 1990s).<sup>21</sup> We strongly suspect that there was an

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<sup>18</sup> For instance, one bureaucrat obtained loans of \$0.7 million from 15 banks. More surprisingly, those loans were mostly unsecured, which would obviously have been a huge favor to non-BOK people with comparable credit records. Some BOK borrowers of such unsecured loans were paying monthly interest in excess of their salaries.

<sup>19</sup> An example is the bribery scandal associated with high officials of the Financial Supervisory Agency, a big part of which belonged to the BOK organization up to 1998. (*Joongang Ilbo*, October 24, 2000)

<sup>20</sup> For example, as of December 1998, seven of the eleven commercial banks then in Korea had employed retired BOK's old members as their auditor (*Chosun Ilbo*, December 20, 1998).

<sup>21</sup> 70% of the BOK's ex-bureaucrats included in the sample obtained post-employment at financial institutions they used to regulate. Also, BOK's degree of CFM designed by the authors was higher than the ministry average. See further Cho and Kim (2002) for pervasiveness and irregularity of bureaucratic discretion generally related to policy implementation in Korea.

intimate relationship between this CFM and the discretionary power from discounted loans.

### 3. Summary of Findings

So far we have submitted: ① BOK's own two arguments to justify PRC are barely convincing, ② Balances of retained profits are not hoarded, but continuously used to purchase BOK's assets, ③ Discount windows, compared to other monetary instruments, render a greater discretionary power to BOK, ④ BOK members in all likelihood benefited in various ways from the financial institutions which were heavily dependent on BOK's discounted loans. It then follows that we can establish our main hypothesis that "*BOK's real motivation for PRC lies in using retained profits for discounted loans as its discretionary budget,*" although BOK officially leaves no trail with respect to the disposition of retained profits. Again, to the extent that this hypothesis holds, our putting the retained profits into the utility function, different from Shughart and Tollison (1983), in Section III.1 might be well justified.

## V. Empirical Analysis

### 1. The Empirical Model and the Data

In this section we intend to empirically test our main hypothesis by showing that there exists a positive correlation between past years' retained profits and the current year's discounted loans. It is important to note that the two variables in principle should be independent of each other *if* PRC, as BOK claims, serves only the two purposes of reducing the monetary base and securing BOK's credibility.<sup>22</sup>

We estimate, using the time-series data, the discounted loan function utilizing a monetary reaction function because the discounted loan was used as a very important monetary instrument in Korea. The empirical equation included a group of the macroeconomic variables and a political variable in *CONTROL*, and a retained profits

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<sup>22</sup> Note that the two roles were logically refuted earlier, and particularly that the role of reducing the monetary base will be even empirically rejected as will be shown later.

variable,  $\Delta \ln (RET)$ , as in equation (2).

Khoury (1990) surveyed 42 papers in which varying forms of the monetary reaction function were estimated, and showed that the unemployment rate ( $U$ ), the inflation rate ( $INF$ ), and the economic growth rate ( $\Delta \ln (IP)$ ) in order were most frequently used as explanatory variables. In addition to those variables, we included into  $CONTROL$  the cash-deposit ratio ( $\Delta \ln (CD)$ ) (See Shughart and Tollison (1983)), the investment-GDP ratio ( $\Delta \ln (INV)$ ) (See Caporale and Grier (1998)), the interest rate spread between the bank-loan rate and discount rate ( $SPD$ ), and an election dummy ( $DUMMY$ ) as a political variable.<sup>23</sup>

$$\Delta \ln (LOAN_t) = const + \sum_{i=1}^n \alpha_i \cdot CONTROL_{i,t-1} + \sum_{j=1}^k \beta_j \cdot \Delta \ln (RET_{t-j}) + \varepsilon_t, \quad (2)$$

where  $LOAN$  is discounted loans, and the  $CONTROL$  is lagged by one period except the political dummy variable, to avoid the simultaneity problem.  $DUMMY$  is one for the previous year of all the direct elections for the president and the parliamentary members, and zero, otherwise.

To the extent that the discount window is one of the monetary policy instruments, we expect the coefficients of  $U_{t-1}$  and  $INF_{t-1}$  to be positive and negative, respectively. Assuming that the central bank responds to the real balance demanded by the economy, the coefficient of  $\Delta \ln (IP_{t-1})$  is predicted to have a positive sign. The coefficient sign of  $\ln (CD_{t-1})$  is predicted to be positive because the central bank will respond to increases in the cash-deposit ratio, which reduce bank reserves by expanding the monetary base. The coefficients of  $\ln (INV_{t-1})$  and  $SPD_{t-1}$  will be positive assuming that the central bank accommodates the demand for the discounted loans by the banks.

As for  $DUMMY$ , the literature offers two opposite arguments concerning its sign. One is the “political business cycle” approach in which the central bank is under money-expansionary pressure before the election (See Havrilesky (1995) for the survey).

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<sup>23</sup> See <Appendix 3> for data description.

Then the coefficient will be positive. The other argument is around the exchange rate policy. It claims that the incumbent government, right before the election, tends to appreciate the currency to temporarily increase exports by the J-curve effect, and, subsequently through declining import prices, to lower the domestic price level to temporarily increase real income.<sup>24</sup> To appreciate the currency, the central bank will follow contractionary monetary policy. If such a policy is reflected in the discounted loans, then the coefficient of the election dummy will be negative.

The major tenet of this paper,  $\hat{\beta}_j$  ( $j=1, \dots, k$ ), is expected to be positive if our aforementioned hypothesis holds. Since we did not know *a priori* which of the *RET* variables (*e.g.*, stock vs. flow variables, or special vs. the sum of required and special retained profits) in equation (2) would have proper explanatory power for  $\Delta \ln(LOAN)$ , we have gone through trial and error. The result is that the estimation with the balances of the total retained profits or the special retained profits ( $RP_t$  and  $SRP_t$  in <Appendix 1>) has shown the highest explanatory power, which will be reported below.

## 2. Estimation Results

Before running the regression, we confirmed that the variables used are stationary with the Augmented Dickey-Fuller (ADF) test.<sup>25</sup> <Table 1> compares nine sets (Cases 1 through 9) of the regression results of equation (2). Case 1 includes only the “Khoury variables” (*i.e.*,  $U_{t-1}$ ,  $INF_{t-1}$  and  $\Delta \ln(IP_{t-1})$ ) in  $CONTROL_{t-1}$  as the explanatory variables. Cases 2 and 3 add  $\Delta \ln(RP_{t-j})$  and  $\Delta \ln(SRP_{t-j})$ , respectively, to Case 1.

<sup>24</sup> See, for examples, Dornbusch (1987), van der Ploeg (1989), Stephan (1992), Blomberg and Hess (1997), or Kim and Kim (2005).

<sup>25</sup> ADF test statistics are as follows:

$\Delta \ln(LOAN_t)$ (lag=0)	$U_t$ (lag=3)	$INF_t$ (lag=0)	$\Delta \ln(IP_t)$ (lag=0)	$\ln(CD_t)$ (lag=0)	$\ln(INV_t)$ (lag=3)	$SPD_t$ (lag=2)	$\Delta \ln(RP_t)$ (lag=0)	$\Delta \ln(SRP_t)$ (lag=0)
-3.69**	-2.81*	-3.40**	-3.72**	-3.18**	-2.70*	-3.57**	-3.66**	-3.37**

\*\* and \* represent the 5% and 10% significance level, respectively. The 5% critical values for lag=0 and 2 are -2.95 and -2.96, respectively. The 10% critical value for lag=3 is -2.61.

Case 4 includes only the “Khoury variables” and other control variables (*i.e.*,  $\ln(CD_{t-1})$ ,  $\ln(INV_{t-1})$  and  $SPD_{t-1}$ ) in  $CONTROL_{t-1}$ . Meanwhile, in Cases 5 and 6,  $\Delta \ln(RP_{t-j})$  and  $\Delta \ln(SRP_{t-j})$  are also added, respectively, to Case 4. Case 7 includes all  $CONTROL_{t-1}$  variables additionally with the election dummy ( $DUMMY_t$ ). Lastly, Cases 8 and 9 expand Case 7 again to include  $\Delta \ln(RP_{t-j})$  and  $\Delta \ln(SRP_{t-j})$ , respectively. The lag order,  $k$ , in  $\sum_{j=1}^k \beta_j \Delta \ln(RP_{t-j})$  and  $\sum_{j=1}^k \beta_j \Delta \ln(SRP_{t-j})$ , was decided as 2, according to the Akaike’s Information Criteria (AIC).

In general, the coefficient estimates show, if not all significant, the expected signs. The coefficients of  $U_{t-1}$  and  $\Delta \ln(IP_{t-1})$  are significant in most cases, or at least close to the 10% significance level. However, the coefficient of  $INF_{t-1}$  is not significant except for Cases 8 and 9, which reveals that BOK tended to respond more sensitively to unemployment or economic growth rates than to inflation.<sup>26</sup>  $\ln(INV_{t-1})$  is also a significant factor in determining the discounted loan’s growth rate. However,  $\ln(CD_{t-1})$  or  $SPD_{t-1}$  appears not to be a determining factor. Intriguing enough, the coefficient of  $DUMMY_t$  is significantly negative. This means that BOK has been under the political pressure of contracting discounted loans before election, exploiting the J-curve effect.

Note, most importantly, that the coefficients of retained profits variables, specifically those of  $\Delta \ln(RP_{t-j})$ , turn out to be significant with the expected sign in all cases. The coefficients of  $\Delta \ln(SRP_{t-j})$  are also significant at least at lag 2 in every case. The adjusted  $R^2$  improves substantially when retained profits variables are included, for example, from 37% to 52% in Case 8. It seems that the retained profits variables did matter.

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<sup>26</sup> This finding did not catch us by great surprise. It was only in the 1997 revision of the BOK Act right after the financial crisis when the objective of monetary policy was simplified solely to “price stability” (or “containment of inflation”). Before then, there had existed at least two more objectives, such as growth of the national economy and steady development of financial institutions. To be sure, they were frequently in severe contradiction with the price stability goal. In fact, this is one of the reasons why we included the data period up to 1996 in our estimation. See <Appendix 3> for more details.

We can test the null hypothesis that the past years' retained profits variables overall did not influence the current year's discounted loans, with Likelihood Ratio (LR) statistics. The test results are shown in <Table 2>. In both cases of  $\Delta \ln(RP_{t-j})$  and  $\Delta \ln(SRP_{t-j})$ , the null hypothesis is rejected at the 5% significance level in all comparisons, except for the comparison of Case 1 with Case 3 where the test statistic is slightly less than the 5% critical value.<sup>27</sup>

To summarize, this result implies that the greater the past years' retained profits of BOK, *ceteris paribus*, the greater the current year's discounted loans to banks. In other words, our main hypothesis that “*BOK's real motivation for PRC did lie in using retained profits for discounted loans as its discretionary budget*” cannot be rejected.<sup>28</sup>

Furthermore, we examined the validity of BOK's aforementioned argument that the retained profits were intended to reduce the monetary base expanded in undertaking monetary policy. We ran the regression in which the dependent variable was replaced

<sup>27</sup> We also checked the causality between the discounted loans and retained profits. Unfortunately, we could not find “Granger-causality” between  $\Delta \ln(RP_t)$  (or  $\Delta \ln(SRP_t)$ ) and  $\Delta \ln(LOAN_t)$  in either direction. Nevertheless, we note that Shugart and Tollison (1983) used the ratio of Fed employment to the total number of paid civilian workers in the federal government in order to find the influence of Fed employment on the monetary base in the regression. We thus tested the Granger-causality between  $RP_t / MB_t$  (or  $SRP_t / MB_t$ ) and  $LOAN_t / MB_t$ , where  $MB_t$  is the monetary base. The table below clearly confirms the one side Granger-causality from  $RP_t / MB_t$  (or  $SRP_t / MB_t$ ) to  $LOAN_t / MB_t$ .

	lag	$RP_t / MB_t \Rightarrow LOAN_t / MB_t$	$LOAN_t / MB_t \Rightarrow RP_t / MB_t$	$SRP_t / MB_t \Rightarrow LOAN_t / MB_t$	$LOAN_t / MB_t \Rightarrow SRP_t / MB_t$
F -	2	2.82*	0.72	2.98*	0.78
statistics	3	4.22**	1.05	4.24**	1.14

\* and \*\* represent the 10% and 5% significance level in the Wald test, respectively.

<sup>28</sup> We extend and reinforce our empirical work at a fuller stretch. If the past years' retained profits had been positively correlated with the current year's open market purchases, our argument would be hampered. Therefore, we ran the regression in which the dependent variable was replaced by the growth rate of BOK's security holdings in Case 8. However,  $\Delta \ln(RP_{t-j})$  rather reduces the current year's security holdings. The estimation results are available upon request.

by the growth rate of the monetary base in Case 8, which is the Case 10 in <Table 1> ( $k$  in  $\sum_{j=1}^k \beta_j \Delta \ln (RP_{t-j})$  was decided as 1 according to the AIC). We found that the coefficient estimate of retained profits variable is not significant at all, effectively reinforcing our main hypothesis.

## VI. Conclusions and Future Research

Public policies are introduced and enforced by the “ordinary people” à la Buchanan (1994). We started this paper from a simple belief that monetary policies and the bureaucrats in charge should be by no means an exception. We have focused on BOK’s PRC introduced in 1962, since the contents of the clause were polar-opposite to the previous experience of other central banks, including the Fed of 1947. Accordingly, this case study renders a very intriguing opportunity to compare with existing studies, and, more importantly, to test the hypothesis that the *discretion-seeking* activity always comes into play *innovatively* in that it maximizes bureaucrats’ interest within the organization regardless of the nominal direction of a change in monetary institution.

Encountering experiences in the U.S. and Canada triggered our efforts. Specifically, we have arrived at our main hypothesis that “BOK’s real motivation for PRC lay in using retained profits for discounted loans as its discretionary budget.” Empirical analysis has persistently revealed that there exists a positive correlation between the growth rates of the past retained profits and the current discounted loans.

Drawing closely upon a cross-country study by Kim and Kim (2007), this paper, with the time-series data of Korea, has provided strong evidence supporting the argument therein: that is, the retained profits worked as a *financial leverage* to facilitate discount windows. We therefore temporarily submit that some external changes in monetary institutions would not alone warrant a desired result *without* the bureaucratic organization’s *discretion-seeking* in proper check; a more fundamental task is how to balance such powers of discretion with effective accountability measures and incentive-compatible conditions. This proposition is believed to provide many countries with a critical implication for strengthening the meaningful central bank independence not only from the outside political pressures, but from the inside excessive

*discretion-seeking.*

Although our hypothesis holds true to a non-trivial extent, we are currently not in a position to comment on related questions regarding ultimate performance such as the size of inflationary bias and or any other social costs to Korea since 1962. It is imperative, however, for researchers in the field to make creative endeavors to answer such essential questions, just as Kane (1990, p. 291) set forth more than a decade ago: *“Empirical research has yet to assess quantitatively how much the operation of myopic and redistributive politics fostered by looseness in monetary policy reporting and decision-making damages macroeconomic and financial performance.”*

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**<Table 1> Retained Profits and Discounted Loans: Estimation Results (1964–1996)**

	$\Delta \ln (LOAN_t)$									$\Delta \ln (MB_t)$
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
constant	-0.24	-0.24	-0.27	0.62	0.40	0.51	0.56	0.35	0.66	0.36
$U_{t-1}$	0.07*	0.09*	0.09*	0.09	0.14**	0.12*	0.08	0.13**	0.09	0.04
	(1.70)	(1.92)	(1.84)	(1.63)	(2.19)	(1.75)	(1.58)	(2.16)	(1.58)	(1.31)
$INF_{t-1}$	0.21	-1.02	-0.77	-0.03	-1.44	-1.28	-0.37	-1.73*	-1.65*	0.15
	(0.24)	(-1.00)	(-0.72)	(-0.03)	(-1.46)	(-1.37)	(-0.39)	(-1.87)	(-1.85)	(0.30)
$\Delta \ln (IP_{t-1})$	0.83*	0.84*	1.01	1.08*	1.22**	1.28	0.96*	1.10*	1.06	1.06***
	(1.90)	(1.72)	(1.57)	(1.88)	(2.09)	(1.65)	(1.84)	(1.95)	(1.37)	(2.90)
$\ln (CD_{t-1})$				-0.06	-0.03	0.03	0.02	0.04	0.13	-0.45***
				(-0.22)	(-0.10)	(0.09)	(0.10)	(0.14)	(0.49)	(-2.87)
$\ln (INV_{t-1})$				0.18***	0.18***	0.19***	0.15***	0.15***	0.17***	0.08**
				(3.23)	(4.12)	(4.38)	(2.84)	(3.89)	(4.98)	(2.65)
$SPD_{t-1}$				0.01	0.04	0.03	0.02	0.04	0.03	-0.02
				(0.62)	(1.49)	(1.08)	(0.79)	(1.64)	(1.04)	(-1.36)
$DUMMY_t$							-0.19*	-0.18**	-0.21**	0.07
							(-1.82)	(-2.31)	(-2.15)	(1.52)
$\Delta \ln (RP_{t-1})$		0.09*			0.11**			0.12**		-0.02
		(1.95)			(2.38)			(2.57)		(-0.71)
$\Delta \ln (RP_{t-2})$		0.14***			0.15**			0.14**		
		(2.72)			(2.29)			(2.64)		
$\Delta \ln (SRP_{t-1})$			0.01			0.04			0.04	
			(0.13)			(0.63)			(0.75)	
$\Delta \ln (SRP_{t-2})$			0.14**			0.13**			0.11*	
			(2.44)			(2.42)			(2.04)	
$Adj. R^2$	0.23	0.32	0.30	0.32	0.47	0.46	0.37	0.52	0.53	0.36
Log-likelihood	6.29	9.55	8.07	10.16	15.30	13.68	12.01	17.58	16.46	23.65

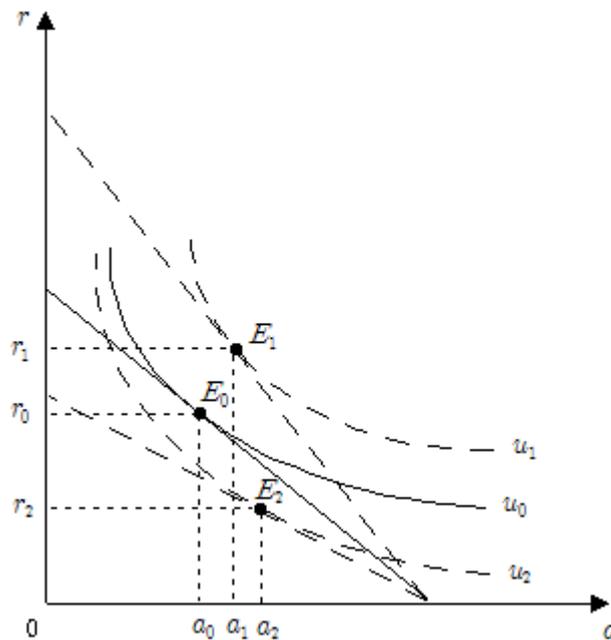
t-values are in parentheses. \*, \*\*, and \*\*\* represent the 10%, 5%, and 1% significance level, respectively. The Newey and West estimation method was used since the D-W statistics were small in OLS.

**<Table 2> The LR Tests for the Significance of  $\Delta \ln (RP_{t-j})$  and  $\Delta \ln (SRP_{t-j})$**

$\Delta \ln (RP_{t-j})$	Case 1 vs. Case 2	$2 * (9.55 - 6.29) = 6.52 \sim \chi_{d.f.=2}^2$
	Case 4 vs. Case 5	$2 * (15.30 - 10.16) = 10.28 \sim \chi_{d.f.=2}^2$
	Case 7 vs. Case 8	$2 * (17.58 - 12.01) = 11.14 \sim \chi_{d.f.=2}^2$
$\Delta \ln (SRP_{t-j})$	Case 1 vs. Case 3	$2 * (8.07 - 5.24^a) = 5.66 \sim \chi_{d.f.=2}^2$
	Case 4 vs. Case 6	$2 * (13.68 - 9.79^a) = 7.78 \sim \chi_{d.f.=2}^2$
	Case 7 vs. Case 9	$2 * (16.46 - 12.94^a) = 7.04 \sim \chi_{d.f.=2}^2$

Note) The 5% critical value of the  $\chi_{d.f.=2}^2$  distribution is 5.99. The observation of  $SRP_t$  in 1988 is zero as shown in <Appendix 1>. Thus, when log-differenced, the observations of  $\Delta \ln (SRP_t)$  in 1988 and 1989 are not available. Therefore, when we test the significance of  $\Delta \ln (SRP_{t-j})$ , to correctly compare the log-likelihood of Case 3 with Case 1, for example, the log-likelihood of Case 1 with the two years excluded should be used. <sup>a</sup> denotes the log-likelihood of the out-sampled regression, which is not reported in <Table 1>, though.

**<Figure 1> Increasing  $r$  with the Profits-Retaining Clause**



**<Appendix 1> Inflows, Outflows, and Balances of BOK's Retained Profits (thousand \$\*)**

year	PROFITS <sup>1)</sup>	stocks			flows				LOAN <sup>9)</sup>
		RRP <sup>2)</sup>	SRP <sup>3)</sup>	RP <sup>4)</sup>	RRP_IN <sup>5)</sup>	SRP_IN <sup>6)</sup>	SRP_OUT <sup>7)</sup>	TAX <sup>8)</sup>	
1964	890.8	161.5	118.5 <sup>e</sup>	280.0	40.9	▽1.0 <sup>e</sup>	0.0	779.0 <sup>e</sup>	10,201.0
1965	580.0	206.1 <sup>e</sup>	118.0 <sup>e</sup>	324.0	44.6 <sup>e</sup>	▽0.8 <sup>e</sup>	0.0	847.0 <sup>e</sup>	19,391.0
1966	1,806.3	235.1	118.0 <sup>e</sup>	353.0	29.0 <sup>e</sup>	0.0 <sup>e</sup>	0.0	551.0 <sup>e</sup>	24,628.0
1967	897.0	325.4 <sup>e</sup>	117.6 <sup>e</sup>	443.0	90.3 <sup>e</sup>	▽0.3 <sup>e</sup>	0.0	1,716.3 <sup>e</sup>	32,075.0
1968	2,540.0	370.2 <sup>e</sup>	117.8 <sup>e</sup>	488.0	44.9 <sup>e</sup>	0.1 <sup>e</sup>	0.0	852.0 <sup>e</sup>	46,777.0
1969	6,858.0	497.2 <sup>e</sup>	1117.8 <sup>e</sup>	1,615.0	127.0 <sup>e</sup>	1,000.0 <sup>e</sup>	0.0	1,413.0 <sup>e</sup>	67,158.0
1970	11,855.0	840.0	3,900.0	4,858.0	342.9 <sup>e</sup>	2,782.2	0.0	3,615.0 <sup>e</sup>	119,754.0
1971	7,139.7	1,432.9	6,900.0	8,332.9	592.9	3,000.0	0.0	8,380.1 <sup>e</sup>	143,555.0
1972	1,089.7	1,789.9	6,900.0	8,689.9	357.0	0.0	0.0	6,782.7 <sup>e</sup>	213,337.0
1973	1,478.0	1,844.0	7,935.0	9,779.0	54.1	1,035.0	0.0	0.0	323,035.0
1974	34,744.4	1,918.3	9,339.3	11,257.6	74.3	1,404.3	0.0	0.0	686,476.0
1975	1,246.1	2,000.0	44,002.0	46,002.0	81.7	34,662.7	0.0	0.0	796,146.0
1976	50,589.2	2,000.0	42,763.9	44,764.0	0.0	1,246.1	2,484.2	0.0	796,413.0
1977	36,155.3	2,000.0	89,784.2	91,784.2	0.0	50,589.2	3,569.0	0.0	916,656.0
1978	63,983.8	2,000.0	124,368.3	126,368.3	0.0	36,155.3	1,571.2	0.0	1,418,534.0
1979	159,714.2	8,398.4	180,572.3	188,970.7	6,398.4	57,585.4	1,381.4	0.0	2,125,801.0
1980	501,682.0	24,369.8	311,604.5	335,974.3	15,971.4	143,742.8	12,710.6	0.0	2,715,031.0
1981	175,299.7	74,538.0	753,703.7	828,241.7	50,168.2	451,513.8	9,414.5	0.0	3,741,130.0
1982	▽131,771.7	92,068.0	892,825.4	984,893.4	17,350.0	157,769.7	18,648.1	0.0	4,608,934.0
1983	▽108,768.0	92,068.0	731,535.7	823,603.8	0.0	0.0	161,289.6	0.0	5,765,481.0
1984	▽194,825.3	92,068.0	587,269.8	679,337.8	0.0	0.0	144,266.0	0.0	7,622,634.0
1985	▽130,604.4	92,068.0	279,971.5	372,039.5	0.0	0.0	307,298.3	0.0	9,641,264.0
1986	▽57,168.0	92,068.0	97,406.0	189,474.0	0.0	0.0	182,571.3	0.0	10,157,160.0
1987	▽87,027.8	92,068.0	40,251.8	132,319.8	0.0	0.0	57,168.0	0.0	10,783,280.0
1988	48,396.4	45,292.0	0.0	45,292.0	▽46,776.0	0.0	40,251.8	0.0	9,725,172.0
1989	294,844.9	50,131.5	43,556.7	93,688.2	4,839.5	43,556.9	0.0	0.0	10,290,492.0
1990	654,329.8	79,616.0	244,317.2	323,933.2	29,484.5	265,360.5	64,599.9	0.0	11,604,795.0
1991	563,704.4	145,049.0	833,214.0	978,263.0	65,433.0	588,896.8	0.0	0.0	13,551,283.0
1992	62,400.0	201,400.0	1,140,500.0	1,341,900.0	56,351.0	507,353.4	200,067.4	0.0	16,998,541.0
1993	▽142,842.9	207,664.0	996,749.2	1,204,413.2	6,264.0	56,136.0	199,886.8	0.0	16,487,769.0
1994	▽73,331.2	207,664.0	813,906.2	1,021,570.2	0.0	0.0	182,843.0	0.0	14,025,166.0
1995	349,405.1	207,664.0	697,017.1	904,681.1	0.0	0.0	116,889.1	0.0	11,649,189.0
1996	319,046.6	242,604.6	973,181.7	1,215,786.3	34,940.6	314,464.5	38,299.9	0.0	7,108,419.0

<sup>e</sup>: estimated values. \*: The U.S. dollar figures calculated by using the early 2006 exchange rate (₩1,000/\$1).

Data Sources: *Annual Report* and *Economic Statistics Annual* of BOK, *Fund Settlement Report* of the Treasury of Korea, and Seo (1994).

Note: The data, except *PROFITS* and *LOAN*, are reported with one year lag, since they are settled and reported only in February of the next year: e.g., *RRP\_IN* in 1990, \$29,484 thousand, which is the 10% of *PROFITS* in 1989, must be interpreted as occurring actually in 1989, even if reported as the value of 1990.

1) BOK's profits.

2) The required retained profits. The data for 1965 and 1967-1969 were estimated according to the BOK Act (the revised one in 1962), which stipulated a retention of 5% of the profits.

3) The special retained profits. The data for 1964-1969 were estimated by subtracting *RRP* from *RP*.

4) The retained profits which are the sum of the required and the special.

5) The inflows of required retained profits, ( $RRP_t - RRP_{t-1}$ ), whereas zero if negative profits occurred.

6) The inflows of special retained profits, ( $PROFITS_{t-1} - (RRP\_IN_t + TAX_t)$ ), whereas 0 if BOK incurred losses.

7) The outflows of special retained profits. ( $SRP_{t-1} - SRP_t$ ) if BOK incurred losses, whereas ( $SRP_{t-1} + SRP\_IN_t - SRP_t$ ) if not.

8) The amount transferred to government as general taxes.

9) The discounted Loans by BOK.

## <Appendix 2> Financing BOK's Losses & the Size of the Monetary Base

If losses occur, for example, from bad loans, <BOK's B/S ①> in the text becomes <BOK's B/S ⑥>. Using the retained profits for the losses does not affect the monetary base (<BOK's B/S ⑦>). On the other hand, if the government is responsible for the losses, government deposits in <BOK's B/S ⑥> are reduced by \$20 (<BOK's B/S ⑧>), which again makes no effect on the monetary base.

<BOK's B/S ⑥>		<BOK's B/S ⑦>		<BOK's B/S ⑧>	
Assets	+\$80	Currency		Assets	+\$80
Losses	+\$20	Reserves	+\$100	Losses	\$0
		Gov. Dep.			
				Reserves	+\$100
				Ret. Profits	-\$20
				Gov. Dep.	-\$20

Now suppose that there are no government deposits in BOK. After BOK then gives loans to the government (<BOK's B/S ⑧-1>), the government deposits will be used to make up the losses (<BOK's B/S ⑧-2>). Based on <BOK's B/S ⑦> and variants of <BOK's B/S ⑧>, there is no change in the monetary base.

<BOK's B/S ⑧-1>				<BOK's B/S ⑧-2>			
Assets	+\$80	Currency		Assets	+\$80	Currency	
Losses	+\$20	Reserves	+\$100	Losses	\$0	Reserves	+\$100
Gov. Loans	+\$20	Gov. Dep.	+\$20	Gov. Loans	+\$20	Gov. Dep.	\$ 0

## <Appendix 3> Descriptions of the Data and the Sampling Period

In addition to the description of the variables used in equation (2) in the text,  $INF_t = \Delta \ln(CPI_t)$  where  $CPI_t$  is the consumer price index.  $IP_t$  is the industrial production index. We used the demand deposits to calculate the cash-deposit ratio,  $\ln(CD_t)$ . The investment in the investment-GDP ratio,  $\ln(INV_t)$ , is the sum of "Gross Fixed Capital Formation" and "Increase/Decrease in Stocks," which are lines 93e and 93i, respectively, in the IMF's *International Financial Statistics*. The data sources are the following unless specified otherwise;  $LOAN_t$  from BOK's B/Ss in *Annual Report*,  $RET_t$  from <Appendix 1>, and other variables from BOK's internet database.

We have only included 1964-1996 annual data for estimating equation (2) for the

following two reasons. First of all, BOK never transferred any of its profits to the Treasury from 1973 up to 1996, i.e., until the 1997 financial crisis occurred (Before 1973 it had transferred some, but the amounts were very trivial.) BOK suddenly began to transfer sizable amounts of profits to the Treasury from 1997: for example, in 1997 \$216 million out of the 1996 profit \$319 million (67%), in 1998 \$993 million out of the 1997 profit \$1,825 million (54%), and in 1999 \$1,357 million out of the 1998 profit \$3,381 million (40%), etc. We believe *a priori* that this returning of the profits to the government must somehow have changed the incentives of BOK bureaucrats toward a certainly different direction from the way as we currently portray them in the text. Accordingly, the period up to 1996 would allow us better to compare the very behavior of the Fed that had been retaining its profits up to 1947.

Secondly and more importantly, according to the 1997 revision of the BOK Act, the objective of monetary policy was simplified only to “price stability.” Before then, there had existed at least three different but often mutually conflicting objectives: healthy growth of the national economy, steady development of financial institutions, and price stability. Anecdotal evidence abounds that this multitude of BOK’s pre-1997 objectives rendered it easier for BOK to exercise arbitrary discretion through discount windows, for example, under the pretext of balanced growth of specific sectors. We suspect that this simplification in its objective from 1997 appears to have constrained much BOK’s leeway associated with the allocation of discounted loans, and in turn the attitudes toward retained profits. In fact, as the Korean economy was getting into the IMF-supported program after 1997, the government was strongly forced to commit itself to restructuring the financial system as well as to the IMF-recommended monetary policy. Strict monitoring was subsequently imposed, since any extension of the IMF lending was conditional upon progress in reform and compliance. Further, almost simultaneously, BOK abruptly started to size down the discounted loans, too.

In conclusion, these changes are believed in all likelihood to have resulted in a substantial curtailment of BOK’s freedom in giving away discounted loans since 1997, making appropriate the selection of our sampling period for estimating empirical equation (2).