The Developing Economies, XXVI-3 (September 1988)

FINANCIAL MARKET BEHAVIOR AND BALANCE OF PAYMENTS DURING THE PERIODS OF PARTIAL FINANCIAL REFORM IN KOREA, 1976–81

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I. INTRODUCTION

THIS paper seeks to understand financial market behavior and its linkage to the balance of payments during the periods of partial financial reform carried out in the Republic of Korea in the 1970s. The reform measures were intended to induce the flow of private funds from the unregulated financial sector, or "curb market," into organized institutional financial sectors, and, generally, to improve domestic financial market structure. This study aims to specify and estimate a structural portfolio-balance model of Korean financial market behavior with special emphasis on the structure of the domestic financial system. In addition, with the dynamic and deterministic simulation results, the importance of domestic financial market liberalization and its implication for the behavior of the overall balance of payments are spelled out.

II. MODEL SPECIFICATION

A. *Korean Financial System and the Partial Financial Reform in 1972*

The financial system in Korea consists of a highly regulated formal sector, composed of deposit money banks and nonbank financial institutions, and an unorganized sector commonly known as the "curb market." The banking sector remains highly regulated. The Korean Monetary Board determines interest rate policies, not only through the rediscount rate but also through the setting of ceilings on bank loan and deposit rates. In addition, selective credit controls were adopted to control the supply of funds to designated strategic sectors such as export-related, chemical, and heavy industries. These credit controls were comprehensively enforced according to objective, type, and coverage.[1]

Nonbank financial institutions comprise the short-term money market in the Korean financial system and have been growing rapidly due to the new financial instruments issued exclusively by these institutions, and the higher yields on these instruments than on bank deposit rates. Before the partial financial reform in 1972, it was reported that there were at least a hundred large-scale informal

[1] For the thorough discussion on the actual selective credit controls in Korea, see [8].

credit brokers or houses around the business center in Seoul [2, July 20, 1971]. Since informal credit brokers' operations were technically subject to the usury law, which limited the maximum interest rate on private loans to 30 per cent per annum after August 1965, their credit transactions were carried out with considerable secrecy.

This dualistic structure is an important characteristic of the Korean financial system. Credit demands that cannot be met in the formal sector, because of interest rate ceilings or credit allocation policies, are satisfied in the curb market. The Korean government has made two major attempts to absorb the curb market into the formal financial system, first in the early 1960s and again in the early 1970s.

In the early 1960s, some foreign economists advised the Korean government that the development policy would be effective if the then distorted price mechanism was corrected. The government accordingly devalued the won in 1964 and increased the interest rate ceiling through the monetary reform of 1965. As a result, the interest rate on time deposit of one-year maturity rose from 15 per cent to 26 per cent and the bank loan rate was raised from 14 per cent to 24 per cent. The negative interest rates margin, in which bank deposit rates are higher than bank loan rates, was adopted for the purpose of increasing bank deposits by inducing the inflow of private funds from the curb market to the official banking system. These savings were then to be channeled to government-targeted investment projects.

There is a view, held by McKinnon [12], that the sharp rise in interest rates in 1965 can be regarded as a financial liberalization measure. This view is, however, only partially correct. There was a move toward financial liberalization in the sense that the official interest rate was moved closer to the market rate. However, at the same time, financial liberalization was inhibited by the government action to strengthen intervention and control over the banking system and its allocation of funds.

The most dynamic attempt to eliminate the curb market occurred in 1972. On August 3, 1972, the Korean government announced a Presidential Decree for Economic Stability and Growth. This decree had two purposes. On the one hand, it was intended to stimulate economic activity by reviving investment demand through expansionary measures, a short-run objective. On the other, policymakers were concerned about the long-term structural problems of chronically unstable and weak financial structures of business firms, especially large ones. The exceptional performance of the economy during 1965–69 had led business firms to maintain a high rate of investment with funds obtained from domestic financial institutions and foreign sources, supplemented by short-term funds from the curb market. However, there was a major (18 per cent) devaluation in 1971 to stimulate exports. This caused a sudden increase in the cost of foreign debt servicing and created severe short-run financial problems for those larger firms that had borrowed abroad most heavily. Consequently, many of them turned to their customary source of emergency financing—the unregulated curb markets. With the decree, the government finally moved in to reform the financial and investment sectors in order to improve the domestic mobilization

of funds. The plans of the government were embodied in various laws designed to diversify and expand available funding sources. Of particular relevance was the Short-Term Financing Business Act of August 1972. This aimed to establish the necessary framework to induce the flow of private loans into institutional financial sectors.

The implementation of the act can be regarded as a turning point for the development of the short-term money market in Korea. Under it, investment and finance companies (IFCs) were founded and, with the other nonbank financial institutions, they have subsequently played a leading role in the formation of the short-term money market. They are supposed to induce the flow of funds from the unorganized money market and to develop the domestic financial market by dealing extensively in commercial paper, short-term government securities, and call money, and by supplementing the traditional short-term deposit and loan market of commercial banks. Their interest rates are technically market-determined, but in reality they are controlled by the Korean Ministry of Finance. In recent years, the government's ceiling on interest rates for commercial paper has been about 4 percentage points above bank lending rates. Consequently, these IFCs have been able to attract a substantial amount of deposits by offering higher deposit rates than banks.

B. *Model Specification*

The financial reform undertaken in Korea during the 1970s has been associated with destabilizing flows *within the domestic financial system.* Such flows usually occur when there is only a partial financial reform, that is, some financial institutions are allowed to offer much higher interest rates than other institutions. The Korean monetary authority anticipated flows of private funds from the unregulated curb market to the formal financial system, particularly to the newly created nonbank financial institutions. Given the Korean financial reform package, the following model of financial market behavior can be considered. In the financial market, the model distinguishes between the behavior of banks, nonbank financial institutions, and the nonfinancial sector.[2]

1. *The nonfinancial sector*

The nonfinancial sector consists of households and firms. They are taken to hold not only currency, demand deposits, time deposits, and real capital as assets, but also bank, nonbank financial institution, and foreign loans as liabilities. In order to capture the response of the nonfinancial sector to the partial financial reform undertaken in the early 1970s, that is, the creation of new nonbank financial institutions to attract deposits from the curb market, the following two variables are explicitly specified: (1) the expected real yields on nonbank financial institution deposits ($RFT - PE$) and (2) the expected real cost of nonbank financial institution loans ($RFL - PE$).[3]

[2] The framework to be analyzed is adopted from Mathieson [13] [14] but differs from this author's work in some details.

[3] The definitions of variables and sources of data are listed in Appendix.

In describing the behavior of currency holdings outside banks, it is assumed that the currency component of broad money, which is the sum of the currency holdings, demand deposits, and time deposits, will respond inversely to changes in the expected real yields on time deposits ($RT - PE$) and nonbank financial institution deposits ($RFT - PE$). In addition, this currency to broad money ratio is assumed to be a positive function of the expected real yields on currency ($-PE$) and income ($\ln Y$). Since the nominal interest rate on demand deposits in Korea is negligible, the expected rate of inflation can be taken as a proxy for the real return on demand deposits. Thus,

$$\ln(C/M) = a_0 + a_1(-PE) + a_2(RT - PE) + a_3(RFT - PE) + a_4(\ln Y), \quad (1)$$

where $a_1,\ a_4 > 0;\ a_2,\ a_3 < 0.$

In a similar manner, the behavior of the time deposit component of broad money (T/M) will be given by

$$\ln(T/M) = b_0 + b_1(-PE) + b_2(RT - PE) + b_3(RFT - PE) + b_4(\ln Y), \quad (2)$$

where $b_2 > 0;\ b_1,\ b_3,\ b_4 < 0.$

Theoretically, $\ln(T/M)$ is inversely related to the expected real yields on currency and demand deposits ($-PE$) and nonbank financial institution deposits ($RFT - PE$) but will increase as the expected real yield on time deposits ($RT - PE$) increases. Since the currency and demand deposit components are regarded as more sensitive to transaction requirements than the time deposit component, b_4 should be negative.

To be consistent with the specification of the C/M and T/M functions, the desired stock of broad money (M/P) will be taken as a function of the expected real yields on currency and demand deposits ($-PE$), nonbank financial institution deposits ($RFT - PE$), time deposits ($RT - PE$), and income. Thus,

$$\ln(M/P) = c_0 + c_1(-PE) + c_2(RT - PE) + c_3(RFT - PE) + c_4(\ln Y), \quad (3)$$

where $c_1,\ c_2,\ c_4 > 0;\ c_3 < 0.$

Since the demand for broad money reflects the underlying demands for currency, demand deposits, and time deposits, there is some ambiguity surrounding the signs of the partial elasticities of $\ln(M/P)$ with respect to the expected real returns on currency ($-PE$) and time deposits ($RT - PE$). An increase in the expected real return on time deposits, for example, would increase the demand for time deposits but reduce the demands for currency and demand deposits. Since the partial elasticity of the demand for broad money with respect to any given real asset can be viewed as the weighted sum of the partial elasticities of the demands for currency, demand deposits, and time deposits, it can be said that, if these assets are gross substitutes, then the overall demand for money would have a positive partial elasticity for the expected real returns on currency ($-PE$) and

time deposits ($RT - PE$). However, if time deposits, currency holdings, and demand deposits are not gross substitutes, and the demand for time deposits is more sensitive to changes in the expected real return on currency and demand deposits ($-PE$), the sign of c_1 can be negative.

The final nonfinancial sector portfolio demand is that for loans from the domestic banking system and it can be summarized as follows:

$$\ln(B/P) = d_0 + d_1(RB - PE) + d_2(RF' - PE) + d_3(RFL - PE), \quad (4)$$

where $d_2,\ d_3 > 0;\ d_1 < 0.$

The nonfinancial sector's demand for bank loans, equation (4), is taken as a negative function of the expected real cost of bank loans ($RB - PE$), and as a positive function of the cost of foreign loans ($RF' - PE$) and the expected real cost of nonbank financial institution loans ($RFL - PE$). The true cost of foreign borrowing is one of the most difficult variables to measure in Korea. In an economy where there are no restrictions on capital flows, this cost would be made up of the nominal foreign interest rate (RF) and the expected cost of forward cover or, in the absence of a well developed forward market or central bank guarantees on forward foreign exchange, the expected rate of depreciation of the exchange rate (X^e). In Korea, however, it was not until July 1, 1980 that authorization was granted for forward exchange transactions between the Korean currency and specified foreign currencies [7, pp. 251–53]. In this study, it is simply assumed that the cost of foreign borrowing is equal to the nominal foreign borrowing rate (RF) plus the expected rate of depreciation of the exchange rate (X^e).

2. *The banking system*

In Korea, as mentioned earlier, the decision-making process regarding what sources of funds banks will utilize and what earning assets banks will purchase is entirely dictated by the government through highly restrictive regulations such as credit allocation policy, interest rate ceilings, and restrictions on portfolio selection. As a result, the profits of banks were severely suppressed. Financial intermediation was no longer the principal source of profit for these banks. Deposit money banks offset their reserve shortages by borrowing from the central bank. The central bank supplies funds so that the deposit banks could pay interest on required resserves and maintain profits. Thus it can be assumed that bank portfolio structure and its behavior is determined outside the financial system, regardless of the banks' profitability.

3. *Balance of payments*

The overall balance of payments, in terms of the movements in international reserves, can be specified as a function of purchasing power disparity ($D\ln Pd - D\ln Pf$) and interest rate differentials ($RB - RF'$) between countries. Short-run departures from either relative purchasing power parity between domestic and foreign price level or interest rate parity will result in arbitrage flows of goods

and capital that will lead to changes in the authorities' stock of foreign exchange reserves, assuming that the exchange rate is not perfectly flexible and transaction costs are negligible.

In addition, domestic financial developments can influence the behavior of the overall balance of payments. Since the domestic monetary base can increase as a result of central bank purchases of foreign or domestic assets, the overall status of the balance of payments will necessarily be closely related to the monetary disequilibrium. That is, any excess flow demand for money ($D\ln M$) implies an excess demand for base money. If this excess demand for base money is not satisfied by central bank creation of domestic credit ($D\ln R$), then the resulting portfolio adjustment will help to generate a balance of payments surplus. Thus,

$$\begin{aligned}(XR/H)D\ln R = {} & e_0 + e_1(D\ln Pd - D\ln Pf) + e_2(RB - RF') \\ & + e_3[e_4(\ln M - L\ln M) - D\ln CR] + e_5 W(D\ln Pd - D\ln Pf) \\ & + e_6 I(RB - RF') + e_7 Q(D\ln M), \end{aligned} \tag{5}$$

where $e_2, e_3, e_4, e_6, e_7 > 0$; $e_1, e_5 < 0$, and

$$D = 1 - L \ (L = \text{log operator}).$$

At the turn of the decade, however, the Korean economy underwent a major crisis resulting from external and domestic shocks. The main external shocks were the worldwide increase in oil prices in 1979 and the rapidly increasing world interest rates during 1979–81. These together caused Korea's balance of payments to deteriorate by the equivalent of 6 per cent of GNP during 1979–80. Moreover, the slowdown of economic activity in industrial countries magnified the effect of Korea's weak external competitiveness. On the domestic side, the economy was worsened by sharply reduced agricultural production due to a drought and by severe political disturbances. The authorities tightened credit policy in 1979 in order to offset the impact of the oil price shock on other domestic prices and the balance of payments. The government reduced its debt with the banking system and restrained the expansion of bank credit to the private sector by lowering credit ceilings for each bank. According to the Korean Ministry of Finance, the growth rate of bank credit declined from 45 per cent in 1978 to 36 per cent in 1979 and the growth rate of broad money decelerated even faster than credit—from 35 per cent to 25 per cent—reflecting a substantial decline in net foreign assets. In order to measure the effect of these external shocks and domestic adjustment policies, the three slope dummy variables are introduced in the following way where W, I, and Q represent respectively world-wide increase in oil prices and interest rates, and domestic monetary adjustments during the corresponding period:

$W = 1$ from 1979 to 1980, 0 otherwise.
$I = 1$ from 1979 to 1981, 0 otherwise.
$Q = 1$ from 1979 to 1980, 0 otherwise.

4. *Expectations structure*

The expected rate of devaluation between periods t and $t+1$ can be replaced

by the actual rate of depreciation in period t. This assumption implies that, during the period under consideration, the rate of devaluation can be represented approximately as random walk process with zero drift [5].[4] Due to the fact that Korea was mostly under a fixed exchange rate regime during the sample period, it can be simply assumed that $X_t^e = X_t$. For simplicity of analysis, it is also assumed that $P_t^e = P_t$.[5]

Given the model outlined above, several issues can be addressed: (1) Does the creation of new nonbank financial institutions significantly affect the short-run portfolio behavior of the nonfinancial sector regarding demand for currency holdings outside banks, time deposits, and bank loans?; (2) How elastic is the short-run demand for bank loans with respect to the bank loan rate? The answer to this question will provide a test of McKinnon's hypothesis that the short-run demand for bank funds is dominated by the demand for working capital in the financially repressed economies [12]; and (3) Is there any significant link between financial phenomena such as domestic monetary disequilibrium, interest rate disparity, and the behavior of the overall balance of payments? In addition, the simulated impact of an alternative policy scenario involving sharp increases in ceiling interest rates will be investigated.

III. EMPIRICAL ESTIMATION OF THE MODEL

A. *Empirical Results*

The model specified is estimated from the monthly data of Korea for the sample period of 1976–81 using a nonlinear least-squares (NLS) procedure.[6] Table I presents the empirical results of the model for Korea. Despite low R^2 in the first two equations, coefficients for the key explanatory variables are estimated with statistical significance and, especially, the interest rate parameter estimates are statistically significant. In addition, the nonfinancial sector's demands for currency outside banks, time deposits, broad money, and bank loans are generally inelastic with respect to changes in banks' and nonbank financial institutions' interest rates (see Table II).

One interesting result in equation (1) is the positive and significant estimate for the expected real yields on nonbank financial institution deposits ($RFT - PE$). This implies that newly created nonbank financial institutions cannot attract cur-

[4] If the rate of devaluation follows a random walk with zero drift, $X_t = X_{t-1} + w_t$, where w is a white noise, then $X_t^e = E_t(X_{t+1}) = X_t$.

[5] According to Edwards and Kahn [5], the expected rate of inflation between two periods, P_t^e, can be calculated by fitting an autoregressive process to the actual rate of inflation, then using the predicted values to represent P_t^e. However, they further indicated that using the actual rate of inflation (P_t) did not produce any significant differences in the results.

[6] According to Kmenta [11], the resulting NLS estimators of the parameters are equivalent to the estimated unconstrained coefficients of linear equations. One good reason for the use of NLS is that, unlike ordinary least-squares (OLS), it can estimate parameters by continuously executing iterative phases until a built-in convergence criterion is met.

TABLE I

ESTIMATES OF PARAMETERS

Equation	Dependent Variable	Explanatory Variable	Parameter	Estimate	T-Ratio	R^2
(1)	$\ln(C/M)$	Constant	a_0	−2.2607	4.078**	
		$(RT-PE)$	a_1	−1.0946	1.872	
		$-PE$	a_2	−0.0259	2.583*	0.206
		$(RFT-PE)$	a_3	0.3512	2.698**	
		$\ln Y$	a_4	0.0313	0.290	
(2)	$\ln(T/M)$	Constant	b_0	−0.3911	1.924	
		$-PE$	b_1	−0.6017	2.776**	
		$(RT-PE)$	b_2	0.0143	3.898**	0.455
		$(RFT-PE)$	b_3	−0.1397	2.928**	
		$\ln Y$	b_4	−0.0336	0.849	
(3)	$\ln(M/P)$	Constant	c_0	−2.8738	6.697**	
		$-PE$	c_1	0.7795	1.718	
		$(RT-PE)$	c_2	−0.0309	4.002**	0.878
		$(RFT-PE)$	c_3	0.3674	3.675**	
		$\ln Y$	c_4	1.2948	1.548	
(4)	$\ln(B/P)$	Constant	d_0	3.3500	30.028**	
		$(RB-PE)$	d_1	−0.0361	3.128**	0.820
		$(RF'-PE)$	d_2	0.0344	10.741*	
		$(RFL-PE)$	d_3	0.5141	4.671**	
(5)	$(XR/H)D\ln R$	Constant	e_0	−10.2494	1.866	
		$(D\ln Pd-D\ln Pf)$	e_1	−89.7624	2.064*	
		$(RB-RF')$	e_2	2.1503	2.419*	
		$e_3[e_4(\ln M-L\ln M)$	e_3	20.1951	2.155*	
		$-D\ln CR]$	e_4	10.8363	2.441*	
		W	e_5	37.8450	2.021*	
		I	e_6	−0.4553	1.235	
		Q	e_7	−362.3029	2.045*	

* Statistically significant at the 0.05 level.
** Statistically significant at the 0.01 level.

rency holdings circulating outside banks. In equation (2), the time deposit to broad money ratio, all interest rates, and income parameters have the expected signs as assumed in Section II, B. The significant coefficient estimate for $(RFT-PE)$ indirectly reveals that there was some shifting of deposits between deposit money banks and nonbank financial institutions. In equation (3), the positive estimate of c_3 is consistent with the estimate of a_3 in equation (1). Although the relatively higher interest rates on nonbank financial institution deposits attract time deposits from the banking system, this incentive is not sufficient to absorb currency holdings of the nonfinancial sector which share a large proportion of demand for broad money and are a main source of funds circulating in the unregulated financial market on a short-term basis.

The first three equations imply two important conclusions. First, despite the partial financial reform associated with the creation of new nonbank financial

TABLE II

ELASTICITIES

Equation	Dependent Variable	Explanatory Variable	Elasticities
(1)	$\ln(C/M)$	$-PE$	−0.0106
		RT	0.4699
		RFT	−0.5053
(2)	$\ln(T/M)$	$-PE$	−0.0100
		RT	0.2594
		RFT	0.2010
(3)	$\ln(M/P)$	$-PE$	0.0154
		RT	−0.5606
		RFT	−0.5286
(4)	$\ln(B/P)$	$-PE$	0.0071
		RB	0.7032
		RF'	0.3671
		RFL	0.9243

Note: Partial elasticities from semi-log functions can be calculated by multiplying the parameter estimate of each explanatory variable by its sample mean.

institutions offering relatively higher yields on deposits and more attractive financial instruments than banks, there appear to be no significant anticipated flows within the domestic financial system, especially from the "curb market" to the newly created nonbank financial institutions. Second, the demand for currency, time deposits, and broad money appears to be quite inelastic with respect to changes in either the time deposit or nonbank financial institution deposit rates (given a constant expected rate of inflation).

In equation (4), the nonfinancial sector's demand for bank loans, the interest parameters are significant and have the expected signs. However, the elasticity for the bank loan rate is only 0.703. This low short-run interest rate elasticity with respect to the bank loan rate may be consistent with the view that such loans are primarily for the purpose of satisfying the demand for working capital in most of the financially repressed developing countries [12].

The parameter estimates of equation (5) indicate that the overall state of the balance of payments is significantly influenced by domestic monetary disequilibrium. The results for parameters e_3 and e_4 show that whenever central bank domestic credit creation was in excess of the flow demand for broad money, it led to a deterioration in the balance of payments. Additionally, the growth rate of international reserves moved in the expected direction with respect to changes in purchasing power disparity and interest rate differentials. For example, an increase of 1 per cent a month in the differential between domestic and foreign interest rates led, ceteris paribus, to an increase of 2.15 per cent a month in the growth of international reserves (see Table I).

To the degree that the estimate for e_5 captures the influence of the worldwide oil price increases on the balance of payments in Korea, its coefficient suggests that this external shock caused significant deterioration in Korea's balance of

payments position during 1979–80. The coefficients on the remaining dummies (e_6 and e_7) in equation (5) have negative signs, although the estimate for e_6 is insignificant.

B. *Implications*

1. *Interactions of formal financial system and curb markets*

The positive coefficient estimates for the expected real yield on nonbank financial institution deposits (a_3 and c_3) reveal that the creation of new nonbank financial institutions had a significant adverse effect on the short-run portfolio behavior of the nonfinancial sector regarding demand for currency holdings and real broad money. Specifically, the incentives given to nonbank financial institutions in the form of relatively higher yields on deposits could not induce any significant anticipated flows of money holdings from the curb market.

Notwithstanding this partial financial reform, the curb market has continued to be a significant element of the financial system in Korea. A newspaper article [2, March 24, 1979] indicates that the curb market has been thriving as an important source of short-term loans to large businesses and has retained its major characteristics and mechanics of credit transactions. Various estimates place the size of the market at the beginning of 1979 at somewhere between 800 billion and 1,000 billion won, close to 15 per cent of total deposit money banks' loans at the end of 1978 [4, March 13, 1979]. Although nonbank financial institutions have provided an important link between the formal financial system and the curb market, they have not been able to replace the curb market for several reasons.

First, the regulations imposed on these new institutions have limited their ability to compete with the unorganized curb market. Investment and finance companies' (IFCs') interest rates are theoretically allowed to be freely determined in accordance with the Short-Term Financing Business Act of 1972. However, in practice, IFCs' rates have also been regulated to ensure uniformity within the ceiling rate of 40 per cent per annum determined by the Korean Ministry of Finance.[7] In spite of the higher interest rates offered by IFCs compared with commercial banks, the inflexibility of the interest rate structure made it difficult to attract funds from the curb market.

Additionally, nonbank financial institutions can supposedly exercise greater discretion in allocating credits as compared with the banking system, and they are not restricted to the same degree of government credit control as hte banking system. However, in effect, their operations are circumscribed by limitations on the amount of funds they can lend to a single borrower, and by other restrictions on their equity and real estate holdings, and on their underwriting operations. With the limited ability of the nonbank financial sector to mobilize financial resources, there has been a chronic shortage of loans for financing business firms' working capital.

[7] The average deposit rate of IFCs and commercial banks in 1980 were, respectively, 17.51 and 11.87 per cent, with the gap being 5.64 percentage points. Average loan rates of IFCs and commercial banks were 23.11 and 18.75 per cent, respectively, with the gap being 4.36 percentage points [9].

As a result, larger firms that have access to bank resources for financing fixed investment depend on the curb market for their short-term working capital needs. Smaller firms that have little access to the banks tend to rely on the unorganized money market for most of their working capital and some financing of fixed capital. On the supply side, household savers who would otherwise have gone to the regulated financial markets have been encouraged to enter the curb markets as lenders, induced by the high rates of return in those markets. Also, business firms that find themselves with excess liquidity in the short-run are able to maximize profits by channeling that liquidity into the unregulated money market on a short-term basis. Thus, according to Cole and Park [3], there has been a close and symbiotic relationship between the regulated and unregulated financial markets over the years despite the strong incentives given to the newly created nonbank financial institutions by the partial financial reform of the early 1970s to promote the flow of private funds to organized financial markets.

Secnd, the competitive structure of the newly created nonbank financial institutions is oligopolistic. Of the eleven IFCs in 1978, for example, nine are owned, or directly controlled, by large business conglomerates. Since they are purchasing or discounting mainly the paper issued by these large firms, they have not been effective in supplying short-term working capital to small-sized enterprises. Consequently, the small firms are forced to rely on the unregulated money market for their working capital needs at extremely high loan rates. This, then, is a major factor accounting for the currency holdings of the nonfinancial sector.

Finally, the newly created nonbank financial sector has extended their business into a field that overlaps with the deposit money banks. Their existence should have led to the integrated development of financial markets by supplementing, not competing with, the functions of banks. They should have specialized in the bill dealing and brokerage functions in order to attract funds from the curb market. However, until recently, they may have placed too much emphasis on raising funds by issuing their own bills which have characteristics similar to bank deposits.

2. *The interest-inelastic nature of the demand for bank loans*

In the financially repressed economies, bank lending is highly regulated by a package of government regulations such as stipulation of loan and deposit rates at banks and other institutions in the "organized" financial market [16]. As a result, there exists a chronic excess demand for bank loanable funds that results from the combination of a long array of investment opportunities and controls over interest rates in financial intermediation.

As noted in Section III, A, the Korean nonfinancial sector's demand for bank loans had a relatively low short-run interest rate elasticity. This elasticity alone would mean that an exogenous increase in the demand for loans or a reduction in the supply of loans would ensure a sharp increase in the loan rate unless the supply of bank loans was quite elastic.[8] According to the seminal work of McKinnon [12], this interest-inelastic nature of loan demand provides support for the

[8] This occurred in the Chilean financial reform in the 1970s [17].

hypothesis that the short-run demand for bank funds is dominated by the demand for working capital in financially repressed economies.

In Korea, contrary to McKinnon's hypothesis, deposit money banks have been the dominant long-term lending institutions in the domestic financial system despite the interest-inelastic nature of the nonfinancial sector's demand for bank loan. At the same time, there have been no adequate institutional arrangements for short-term credit needs within the regulated financial sector. Despite the rapid growth of the IFCs since 1972, the size of the short-term money market still remains relatively small. The unregulated money market, or curb market, has filled the gap in the regulated financial system by supplying largely short-term credit. There are several reasons for the predominant role of the deposit money banks in long-term business financing.

First, the capital market, which is the major source of long-term funds in advanced countries, was quite insignificant until the 1970s in Korea. In addition, deposit money banks have also been the cheapest source of financing. Even during the high-interest-rate period (1965–71), the average lending rate at deposit money banks was about 13 per cent in real terms because of various concessionary loan rates for export financing, machinery-industry promotion, equipment for export industries, and others. On the other hand, the real rate of return to capital in manufacturing averaged over 30 per cent per annum [6].

A second institutional reason for the heavy involvement of the banking system in long-term finance has been the government development strategy in which the regulated financial system has been the principal means for allocating financial resources to preferred sectors. These have consisted of large-scale exporters and manufacturers. To promote this pattern of capital formation, the industrial borrowers are allowed to roll over, or continuously renew, their short-term loans, thereby making these loans, in effect, medium- or long-term loans. At the end of 1978 the share of short-term loans in total bank loans was about 78 per cent, including export-financing loans [1]. Excluding these, the share went down to 65 per cent. Given the prevailing roll-over and renewal policies, many of these loans should be classified as medium- or long-term loans.

Finally, there is the common belief among policymakers in most of the less developed countries that the only productive way of using financial resources is to invest them in durable capital goods and machinery. They attach little importance to the role of working capital as an essential input of production. According to Myint [15], this tendency has led policymakers to neglect both the development of short-term financial markets within the regulated financial market and the channeling of some of the commercial loans to financing short-term working capital requirements.

3. *Balance of payments*

The empirical results for Korea indicate that both domestic monetary disequilibrium and international price and interest rate arbitrage played significant roles in explaining the behavior of the overall balance of payments position during the sample period. The presence of both monetary and arbitrage effects reflects the

TABLE III

COMPARISON OF ROOT MEAN SQUARE PERCENTAGE ERRORS (RMSPE) AND THEIL'S INEQUALITY COEFFICIENTS (U_1) FOR WITHIN SAMPLE AND EX POST SIMULATIONS

Dependent Variable	Within Sample		Ex Post	
	RMSPE	U_1	*RMSPE*	U_1
$\ln(C/M)$	0.2097	0.8805	0.1242	0.2210
$\ln(T/M)$	0.2149	0.7059	0.2686	0.3616
$\ln(M/P)$	0.2062	0.7070	0.0149	0.0261
$\ln(B/P)$	0.2067	0.5890	0.1454	0.2694
$(XR/H)D\ln R$	24.3932	0.4745	1.2650	0.4750

Note: *RMSPE* is defined as:

$$RMSPE=\sqrt{\frac{1}{T}\sum_{t=1}^{T}[(\hat{Y}_t-Y_t)/Y_t]^2},$$

where T=the number of periods simulated, $\hat{Y}$=the simulated level of the variable at time period t, and Y_t=the actual level of the variable at time period t.

U_1 is defined as:

$$U_1=\sqrt{\frac{1}{T}\sum_{t=1}^{T}[(\hat{Y}_t-Y_{t-1})-(Y_t-Y_{t-1})]^2}\Bigg/\sqrt{\frac{1}{T}\sum_{t=1}^{T}(\hat{Y}_t-Y_{t-1})^2}\ \sqrt{\frac{1}{T}\sum_{t=1}^{T}(Y_t-Y_{-1})^2}.$$

fact, as is common in most developing countries, that the Korean economy was in a period of transition from a closed to an open economy, both in terms of the trade and capital accounts of the balance of payments.

IV. BASELINE SIMULATION OF THE MODEL

A. *Baseline Simulation*

Projecting the behavior of financial variables beyond the sample period based on relationships that existed within the sample period is difficult, to say the least. Table III reports within sample and ex post root mean square percentage errors (RMSPE) and Theil's inequality coefficients (U_1) for the nonfinancial sector's demand for financial assets, bank loans, and the overall balance of payments. The within sample RMSPE measures predictive accuracy of the model by comparing actual and predicted values for 1976–81 which correspond to the sample period used for estimating the model. The ex post RMSPE compares actual and predicted values for the twelve months in 1982 which are not incorporated in the original estimation of the model.

The RMSPE is a unit-free measure that has a lower limit of zero, with zero indicating a perfect tracking of actual values by the predicted values. That is, the smaller the error, the better the fit. The U_1 inequality coefficient ranges between zero and one with $U_1=0$ occurring when a perfect simulation exists. Both within sample and ex post RMSPE's for all dependent variables—$\ln(C/M)$, $\ln(T/M)$, $\ln(M/P)$, $\ln(B/P)$, and $(XR/H)D\ln R$—indicate that the predicted values accurately track actual values for the portfolio behavior of the nonfinancial sector's demand

for financial assets and bank loans, and with less accuracy the behavior of the overall balance of payments. Additionally, the smaller ex post RMSPE's and U_1's than within sample values for these measures imply that the projections beyond the sample period are reasonable.

B. *Policy Scenario*

This section reports the simulation results from an alternative policy scenario associated with the removal of interest rate ceilings in the Korean banking system. The market-determined time deposit and bank loan rates are assumed to be 25.0 per cent and 30.0 per cent, respectively, because from past experience these two interest rates are regarded as high enough to clear domestic time deposit and bank loan markets.[9] This scenario does not alter the parameter estimates but will affect the predicted values for the endogenous variables.

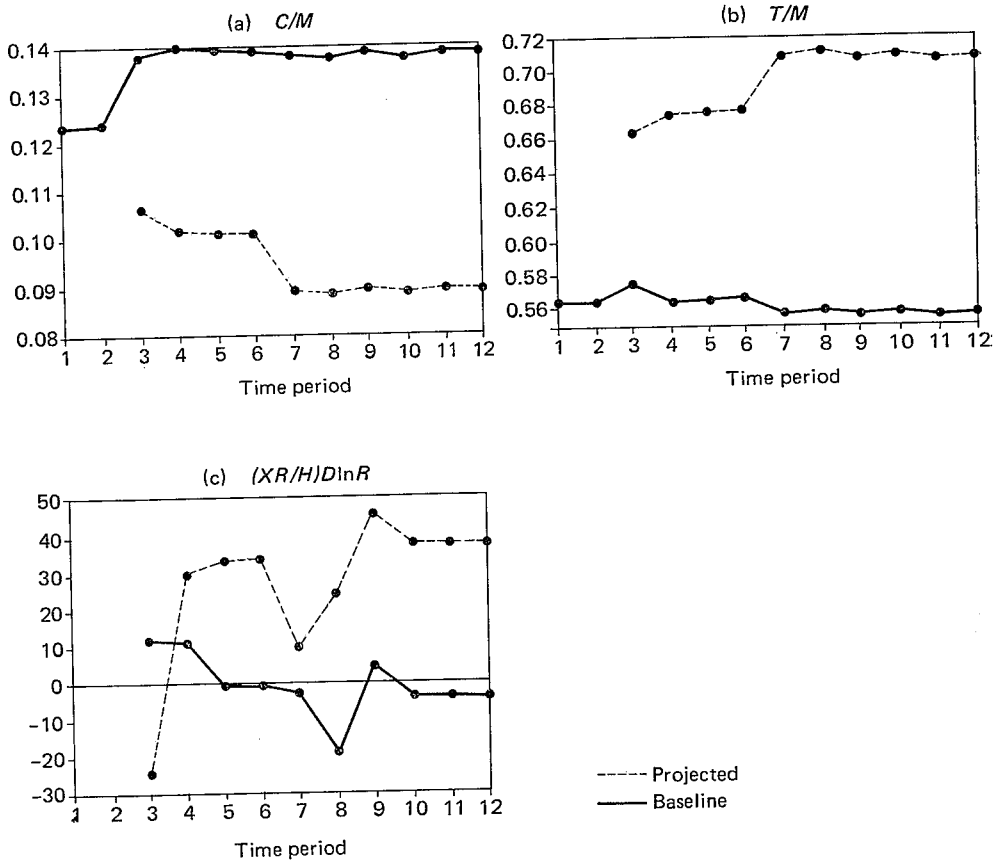
Figure 1 presents the projections under this policy scenario and, for comparison, the baseline forecast for the Korean nonfinancial sector's demand for currency holdings, time deposits, and the overall balance of payments. Through the estimated negative relationship between the nonfinancial sector's demand for currency holdings and bank time deposit rate, sharp increases in bank time deposit rate would lead to a decrease in the nonfinancial sector's currency holdings (C/M) and an increase in households' and firms' demand for bank time deposits (T/M). This implies that a high bank time deposit rate can attract short-term currency holdings circulating in the curb market to the official financial system.

In addition, in the short run, a high short-term bank loan rate set in the liberalized financial market may place upward pressure on costs and prices for the export sector, a beneficiary of cheap bank loans. This then would undermine the competitive edge export industries have in the world commodity market. However, the projected behavior of the overall balance of payments $[(XR/H)D\ln R)]$ in Figure 1 illustrates the possibility that the short-term trade deficits due to declining export performance will be offset by foreign capital inflows induced by higher interest rate differentials ($RB - RF'$) in the international money market.[10] However, these projections have limitations in that all other exogenous variables such as the price level and the nonbank financial institutions' interest rates are being held constant. Nevertheless, the simulation results imply that the liberalization of interest rates of both deposits and loans would work more effectively than the establishment of nonbank financial institutions to attract currency away from the curb market to the official financial system.

[9] As mentioned earlier, the loan rate charged by informal credit brokers has been around 30 per cent per annum since 1965.

[10] However, some caution is warranted. This improvement in the capital account would be followed with a lag by a deterioration in the trade account. This occurred in the Chilean financial liberalization where sustained capital inflows caused an excess money supply and, consequently created inflationary pressures. This then, given the fixed path of the exchange rate, resulted in an overvalued currency which caused further deterioration in current account deficits.

Fig. 1. Effects of the Removal of Bank Time Deposit and Loan Rate Ceilings on Portfolio Behavior of the Nonfinancial Sector's Demands for Selected Financial Assets and on the Overall Balance of Payments



V. CONCLUDING REMARKS

In many less developed countries (LDCs), the problems of low income and slow growth rates have often been associated with a shortage of physical capital. Many government policies in LDCs designed to promote fixed capital formation are frequently accompanied by regulation of the interest rates in official financial markets in order to ensure the availability of cheap credit. These rates are then administered at artificial, or below-equilibrium levels, while available credit is allocated by government-determined priorities to those industrial sectors deemed important to economic development.

Given this pattern of financial repression, the Korean partial financial reform undertaken in the early 1970s—the creation of new nonbank financial institutions

for the purpose of inducing money holdings from the curb market—was destined to be a failure insofar as these newly created financial institutions have themselves been subject to various forms of government intervention, regulation, and guidance.

While economic and financial development may eventually encompass the establishment of broader securities markets like those in industrialized countries, a critical first step is domestic financial liberalization within the existing institutions. The recent Korean, policy initiatives as a part of the Fifth Five-Year Plan (1982–86), stressed the need for liberalization in trade and finance, recognizing that the interventionist policies of the past have created artificial market distortions and imposed a loss of static allocative efficiency [10]. Despite the denationalization of the nationwide commercial banks during 1981–82, however, the banking system continued to be operated under government control. The appointment of bank directors and senior officers, for instance, was conducted by the government as before. Accordingly, denationalization only meant a privatization rather than a financial liberalization measure in the real sense.

The basic problem of financial liberalization in Korea is to determine the extent to which the autonomy of domestic financial system ought to be allowed. Complete removal of regulations cannot be introduced in the current stage of the Korean financial system in that the financial institutions in Korea have traditionally been operating under direct or indirect government controls and guidance. The direction of domestic financial liberalization thus should be considered to secure the autonomy of financial institutions with the full understanding of the present structure and characteristics of the Korean financial system.

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APPENDIX

DEFINITIONS AND SOURCES OF VARIABLES

Sources

MES = *Monthly Economic Statistics,* Bank of Korea.
IFS = *International Financial Statistics,* International Monetary Fund.

Definitions of Variables

B = Stock of bank loans to the private sector [Line 22d of IFS]
C = Stock of currency [MES]
CB = Central bank domestic credit [Line 32 of IFS]
H = Stock of base money [MES]
M = Stock of broad money [MES]
P = Price level (wholesale price index: all commodities) [MES]
Pd = Domestic component of price level (export price index: all commodities) (MES]
Pf = Foreign component of price level (import price index: all commodities) (MES]
R = Foreign exchange reserves (differences between central bank foreign assets and foreign liabilities) [MES]
RB = Bank loan rate (discount rates for commercial bills in deposit money banks) [MES]
RF = Nominal interest rate on foreign borrowing (Eurodollar deposit rate) [Line 60d of the United Kingdom in IFS]
RFL = Nonbank financial institution loan rate (loan rates in investment and finance companies) [MES]
RFT = Nonbank financial institution deposit rate (deposit rates in investment and finance companies) [MES]
RT = Time deposit rate (bank time deposit rate with maturity over a year) [MES]
T = Stock of time deposits [MES]
X = Exchange rate [Line ae of IFS]
Y = Real income (monthly industrial production index) [MES]