

The Structure, Growth and Equilibrium of the Money Market in Korea

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The money market has been existing in various forms for a long time. Until 1972, however, the market had supplied mainly short-term loans of commercial banks and loans of informal money lenders to business corporations. There was no market for notes and commercial papers of business corporations. Consequently, business corporations had to rely primarily upon commercial banks for short-term credit loans to supplement their working capital. The interest rate on loans of commercial banks had been set below a free market equilibrium rate and thereby, generated excess demands for the loans. Unsatisfied potential borrowers thus had to turn to informal money lenders for short-term credit loans of prohibitively high interest rate.

Since 1972 investment and finance companies have been operating in the money market and their role in mobilizing short-term loans is increasing. This paper aims at estimating the equilibrium size of the money market.

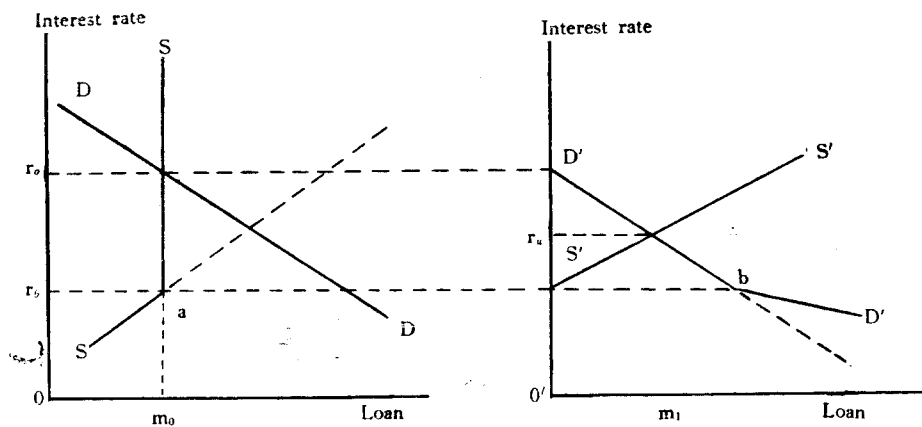
1. The Structure of the Money Market

Prior to 1972 when the first investment and finance company started business the money market had been made up by two submarkets, one for short-term bank loans and the other for short-term loans of informal

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money lenders. The latter called an unorganized money market has not only been very efficient in mobilizing rather sizable funds in a short time, but also contributed to financing business corporations as duly recognized in a brilliant treatise by Professor Seung Yoon Lee.¹⁾ It has, however, segmented the money market, charged unduly high interest, and demanded collaterals against the loans. Effects of these characteristics of the unorganized money market are clear: first, due to market segmentation blockade to information flow and differentials in interest rates between the segmented markets because of imperfect information are resulted and these must have caused inefficient resource allocation; second, the requirement of collaterals against the loans might have discriminated against starting businesses in favor of established ones; the high rate if it were not due to risk of default should have discouraged investments which otherwise would have occurred. Fig. 1 may picture the money market until 1972. The curve DD is a demand schedule for loans derived from marginal efficiency of investment and SS is a supply schedule of short-term loans of commercial banks in Fig. 1-A. Since interest rate on bank loans can be considered to be fixed for a period of time, say at r_b legally, below the free market equilibrium rate, the actual supply schedule of bank loans becomes SS. Given the demand schedule DD the total amount of bank loans om_0 is the equilibrium demand if the interest rate is r_0 . Thus the excess demand in Fig. 1-A, *i.e.*, the excess demand at interest rate below r_0 becomes amount of loan demanded at the rate in Fig. 1-B for the unorganized money market. The demand schedule in Fig. 1-B is kinked at point b because the supply schedule SS in Fig. 1-A is kinked at point a . The unorganized money market provides loans $o'm_1$ at an interest rate r_u which is certainly higher than r_b . The interest rate r_u of the unorganized money market clearly includes risk premiums if

1) Seung Yoon Lee, *Financial Institutions and Monetary Policy in Korea*, Seoul: Bubmoonsa 1974. (李承潤, 韓國의 金融制度와 政策, 서울: 法文社, 1974).



1-A. Market for Short-term Bank Loans

1-B. The Unorganized Money Market

Fig 1. The Structure of the Money Market

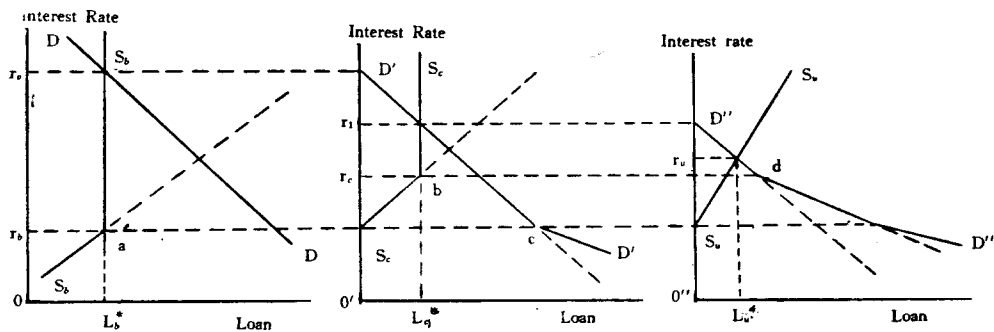
there are any. Though we cannot separate the premiums explicitly the supply schedule $S'S'$ has already taken care of them. It is, of course, rather oversimplified to assume only two markets for short-term loans. The above analysis, however, may clarify confusions about the unorganized money market.¹⁾

With an introduction of the investment and finance corporations in the money market since 1972 the structure of the money market has changed. Since business corporations are able to obtain short-term loans by selling commercial papers through investment and finance corporations, the money market comprises additional submarket, the open market for commercial papers. The supply schedule of this market is distinct from other supply schedules which we have considered. Fig. 2 may picture the structure of the money market with investment and finance corporations. Thus, under the current mode of operations investment and finance cor-

1) Bank of Korea, The Econometric Model of the Monetary Sector, Seoul: Bank of Korea, 1971. (한국은행, 금융계량「모델」결과보고, 서울: 한국은행, 1971).

porations have segmented the money market mainly by taking their market share away from the unorganized money market. The supply schedule $S_c S_c$ in Fig. 2-B is kinked at point b because the interest rate, *i.e.*, the discount rate of commercial papers is fixed in the short-run by the government. The demand schedule for loans $D'D'$ in Fig. 2-B represents the excess demand for loans of banks at interest rates below r_0 in Fig. 2-A. Likewise, the demand schedule for loans of the unorganized money market can be drawn from excess demands for loans of the open market for commercial papers at interest rates below r_1 in Fig. 2-B.

Since issue of commercial papers by business corporations offer more diversified financial assets to the households, the total amount of savings supplied to the money market may increase. Consequently, an introduction of investment and finance corporations into the money market may lower the interest rate of the unorganized money market, other things being equal: the demand schedule $D''D''$ will shift downward more than the supply schedule does.



2-A. The Market for Short-term Bank Loans

2-B. The Open Market for Commercial Papers

2-C. The Unorganized Money Market

Fig 2. The Structure of the Money Market since 1972

The unorganized money market takes care of not only the excess demands in the submarket for bank loans and commercial paper market but also those potential borrowers who have been excluded from these markets because of their lack of creditworthiness viewed by lenders. Therefore, the unorganized money market shall exist as long as informal money lenders are willing to supply loans at interest rates below r_1 and some of potential borrowers are excluded from the market for bank loans and for commercial papers due to lack of creditworthiness. The creditworthiness cannot be measured in absolutely objective terms. Thus, the evaluation of creditworthiness of those potential borrowers excluded from the organized money market may be different among banks, investment and finance corporations, and informal money lenders. While banks or investment and finance corporations may look at only formal financial position of potential borrowers, informal money lenders may be in a better position to be able to appreciate true creditworthiness of them; through personal contacts these informal money lenders may know potential borrowers' personal abilities, prospect of their businesses and other intangible factors as well as their formal financial situation better than the other suppliers of funds. Furthermore, the informal money lenders may be able to charge risk premiums of varying degrees. Therefore, it is quite questionable whether the unorganized money market will stop existing in near future regardless of the rapid growth of investment and finance corporations. Its size will, however, be squeezed by development of the organized money market as is illustrated in Fig. 2.

Given the structure of the money market shown in Fig. 1 the open market for commercial papers could exist and grow fast as long as discount rate is higher than bank rate but below than interest rate on loans of informal money lenders. It is, therefore, no wonder to observe a rapid growth of investment and finance corporations since 1972. Table 1 shows outstanding short-term loans of them to business corporations.

Table 1.

Outstanding Short-Term Loans of Investment and Finance Corporations

Year	Loan (bil. Won)	Growth Rate
1972	4.9	—
1973	67.2	1,257
1974	173.3	157
1975**	209.5	20

Source: DIFC, 1975.

**As of July, 1975.

Though growth rates are spectacular it seems that they are converging to an upper limit. This upper limit is precisely the equilibrium size of loans for the open market for commercial papers denoted by L_c^* in Fig. 2-B. This equilibrium size of loans should, of course, be changing with time. Thus, the question immediately raised is: what is the equilibrium growth path of the money market? We will analyse this problem in the following sections.

2. The Equilibrium Growth Path of the Money Market

Business corporations incur liabilities in the process of production and distribution of their products. Particularly, current liabilities are directly related to the level of business activities. Typical items included in current liabilities are note and bills payable, accounts payable in trade, short-term borrowings from banks and others. The magnitude of current liabilities is, however, closely related to current assets and current assets are in turn related to the level of business activities. The rationale for this is, first, due to the fact that the current ratio defined as the ratio between current assets and current liabilities has been regarded as an indicator of a businesses' creditworthiness by banks. This is why the current ratio is sometimes called the banker's ratio and is considered safe if it is main-

tained around 2.0 by business corporations. Secondly, the current assets comprising cash on hand, notes and bills receivable, accounts receivable from customers and securities as quick assets, and materials, goods in process, finished or semifinished goods, supplies and others as inventories, are quite closely related to the level of business activities. If business corporations try to maintain a certain level of current ratio when current assets increase with the level of business activities, then current liabilities will also rise with the level of business activities. Thus, we may generate the following model¹⁾:

$$Q_t = Q_o(1+r)^t \quad (1)$$

$$A_t = \alpha Q_t \quad (2)$$

$$L_t = \beta A_t \quad (3)$$

$$R_t = \xi_0 L_t + \xi_1 L_{t-1} + \xi_2 L_{t-2} + \dots + \xi_j L_{t-j} \quad (4)$$

$$\Delta D_t = L_t - R_t \quad (5)$$

$$\Delta D_t = \Delta T_t + \Delta F_t \quad (6)$$

$$\Delta T_t = \delta \Delta D_t \quad (7)$$

where Q_t : industrial production at current market price in time period t

Q_o : initial value of Q_t

r : rate of growth of industrial production

A_t : new current assets

L_t : new current liabilities

R_t : repayment of current liabilities

D_t : outstanding current liabilities

T_t : sum of notes and bills payable, accounts payable in trade and other current liabilities incurred in the process of transactions

F_t : short-term borrowings from banks, investment and finance corporation, the informal money lenders and other nonmonetary financial institutions

1) This model is an expanded version of A. Enthoven, "The Growth of Instalment Credit and the Future of Prosperity," *American Economic Review*, Vol. XLVII, No. 5 (Dec., 1957), pp. 913-29.

Equation (2) means that new current assets rise in proportion to industrial production and Equation (3) implies new current liabilities increase in proportion to new current assets. Note that new current liabilities are not equal to net increase in current liabilities. As shown by Equation (5) net increase in current liabilities ΔD_t is equal to new current liabilities minus repayment. Equation (4) means that repayment is done in different proportion to new current liabilities incurred for the past j time periods. Net increase in current liabilities comprises an increase in short-term borrowings from financial institutions and an increase in other liabilities. Since the latter T_t consists of notes and bills payable, accounts payable in trade and other liabilities incurred in the process of transactions, its increase may be closely related to the volume of business activities. It is our conjecture that net increase in current liabilities is also closely related to the volume of transactions. These two conjectures together establish Equation (7). It should be noted that we do not assume that outstanding T_t is a fixed portion of the outstanding current liabilities D_t ; only the changes are related.

From Equations (1) through (5) we get

$$\begin{aligned}
 \Delta D_t &= L_t - R_t \\
 &= \beta A_t - (\xi_0 L_t + \xi_1 L_{t-1} + \xi_2 L_{t-2} + \dots + \xi_j L_{t-j}) \\
 &= \alpha \beta Q_t - \alpha \beta (\xi_0 Q_t + \xi_1 Q_{t-1} + \xi_2 Q_{t-2} + \dots + \xi_j Q_{t-j}) \\
 &= \alpha \beta Q_0 (1+r)^t - \alpha \beta \{ \xi_0 Q_0 (1+r)^t + \xi_1 Q_0 (1+r)^{t-1} + \dots + \xi_j Q_0 (1+r)^{t-j} \} \\
 &= \alpha \beta Q_0 (1+r)^t \left\{ (1-\xi_0) - \frac{\xi_1}{1+r} - \frac{\xi_2}{(1+r)^2} - \dots - \frac{\xi_j}{(1+r)^j} \right\} \\
 &= \eta Q_0 (1+r)^t
 \end{aligned} \tag{8}$$

where $\eta = \alpha \beta \left\{ (1-\xi_0) - \frac{\xi_1}{1+r} - \frac{\xi_2}{(1+r)^2} - \dots - \frac{\xi_j}{(1+r)^j} \right\}$

By substituting Equation (8) into (7) we get

$$\begin{aligned}
 \Delta T_t &= \delta \Delta D_t \\
 &= \delta \eta Q_0 (1+r)^t
 \end{aligned} \tag{9}$$

Thus we get by substituting Equation (9) into (6)

$$\begin{aligned} \Delta F_t &= \Delta D_t - \Delta T_t \\ &= (1-\delta)\eta Q_0(1+r)^t \end{aligned} \quad (10)$$

Since outstanding short-term borrowings from financial institutions are sum of past net increases we get

$$\begin{aligned} F_t &= \sum_{j=0}^t \Delta F_{t-j} \\ &= (1-\delta)\eta Q_0 \left\{ \frac{(1+r)^{t+1} - (1+r)}{r} \right\} + (1-\delta)\eta Q_0 \end{aligned} \quad (11)$$

By taking a limit we get

$$\begin{aligned} \lim_{t \rightarrow \infty} \frac{F_t}{Q_t} &= \lim_{t \rightarrow \infty} \frac{(1-\delta)\eta Q_0 \left\{ \frac{(1+r)^{t+1} - (1+r)}{r} \right\} + (1-\delta)\eta Q_0}{Q_0(1+r)^t} \\ &= \frac{(1-\delta)\eta(1+r)}{r} \end{aligned} \quad (12)$$

Therefore, in the equilibrium the ratio of short-term borrowings from financial institutions to industrial output becomes a constant; hence, outstanding short-term borrowings from financial institutions will grow at the same rate as the rate of growth of industrial production. The equilibrium growth rate of the open market for commercial papers of business corporations and the unorganized money market of informal money lenders approaches the rate of growth of industrial production.

3. Empirical Estimation

As is shown in Equation (8) we know that η can be estimated by regressing ΔD_t on Q_t while suppressing the constant term. On the other, δ can be estimated by regressing ΔT_t on ΔD_t as shown in Equation (9). The data needed for estimation of these parameters are, however, rather limited. The only data available for our purpose are those shown in financial statements analysis for a sample of business corporations. The data used in estimation are shown in Table 2.

Table 2.

Net Sales, Current Liabilities and Sum of Notes and Bills Payable, Accounts Payable in Trade and Other Current Liabilities*

Year	Net Sales(Q_t)	Current Liabilities(D_t)	Other(T_t)
1962	34.0	11.5	6.7
1963	49.5	15.3	8.5
1964	64.7	22.0	11.0
1965	83.2	24.0	13.2
1966	148.0	54.0	30.8
1967	199.1	81.3	47.1
1968	345.5	145.3	80.0
1969	565.1	278.0	131.7
1970	699.7	401.8	206.0
1971	1007.9	579.6	283.7
1972	1431.8	626.0	357.8
1973	2166.6	921.2	504.0
1974	3561.8	1,571.9	802.2

Source: Bank of Korea, *Financial Statements Analysis*, Seoul, Korea.

*Short-term borrowings from financial institutions are excluded from here.

The estimated value of η is 0.1684 and that of δ is 0.2583. The rate of growth of industrial production rises 0.2414 per year for the period 1965-74. Thus, we get the equilibrium ratio between short-term borrowings of business corporations and industrial output.

$$\lim_{t \rightarrow \infty} \frac{F_t}{Q_t} = \frac{(1-\delta)\eta(1+r)}{r} = 0.6424 \quad (13)$$

Thus, the equilibrium size of the money market can be estimated from Equation (13), *i.e.*, by $F_t^* = 0.6424 Q_t$, where F_t^* stands for the equilibrium size. We are, however, particularly interested in the open market for commercial papers and the unorganized money market of informal money lenders. Since this submarket of the money market receives residual demands for short-term loans, its equilibrium size can be estimated by subtracting short-term borrowings of business corporations from commercial banks and other special banks from the equilibrium size of the money market,

F_t^* . Column 4 in Table 3 and Fig. 3 show the equilibrium growth path of this submarket comprising the open market for commercial papers and the unorganized money market of informal money lenders.

The estimated equilibrium size of the money market in 1974 is 2,039.9 bil. Won. Subtracting short-term borrowings of business corporations from banks from this we get the equilibrium size of the open market for commercial papers and the unorganized money market of informal money lenders. In 1972 the actual outstanding loans of informal money lenders to business corporations was estimated to be about 350 bil. Won based on reports of borrowers, while our estimation of the borrowings is 337.3 bil. Won. This may be interpreted that our estimation is slightly underestimated.

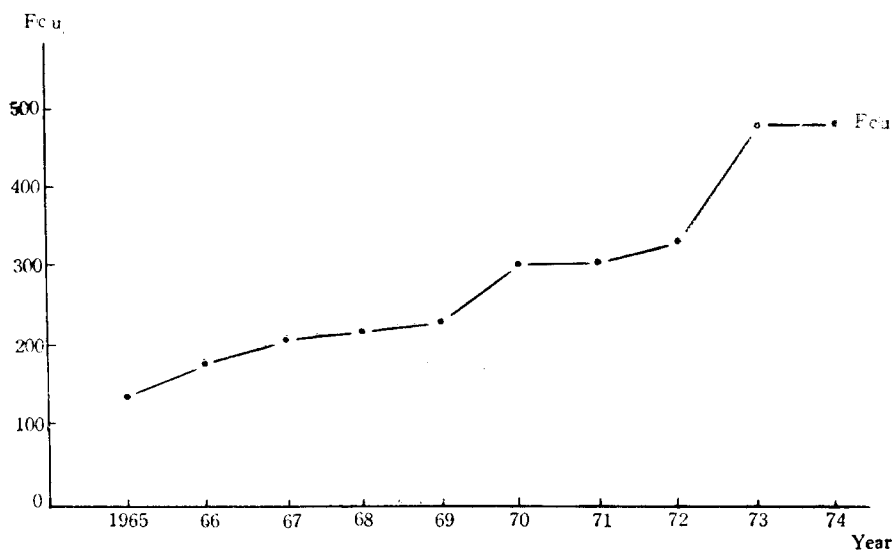


Fig 3. The Equilibrium Growth Path of Open Market for Commercial Papers and Unorganized Money Market

Table 3.

**The Equilibrium Growth Path of Open Market for Commercial Papers and
Unorganized Money Market**

Year	Q_t	F_t^*	B_t	$F_{cu}^* = F_t^* - B_t$
1965	271.92	174.65	31.77	142.88
1966	365.43	234.71	50.66	184.05
1967	473.65	304.22	93.68	210.54
1968	646.01	414.93	191.23	223.70
1969	855.40	549.42	315.69	233.70
1970	1,088.36	699.05	385.69	313.69
1971	1,309.98	841.40	531.48	309.92
1972	1,642.42	1,054.93	717.62	337.31
1973	2,223.83	1,428.37	942.00	486.37
1974	3,175.95	2,039.91	1,554.39	485.52

Source: *Economic Statistics Yearbook*, Bank of Korea.

Q_t : industrial production

F_t^* : the equilibrium size of the money market

B_t : the outstanding short-term loans of banks

F_{cu}^* : the equilibrium size of open market for commercial papers and the unorganized money market

However, we have to allow for other changes in environment peculiar to the year 1972.¹⁾

4. Conclusion

The structure of the money market in Korea has changed since 1972 when investment and finance corporations came into operation. It is, however, still dualistic: sizable short-term loans are provided by both the organized and the unorganized money markets. The estimated equilibrium size of the money market is 2,039.9 bil. Won in 1974. The open market for commercial papers and the unorganized money market have equilibrium

1) The government issued emergency order on Aug. 3, 1972 which was to discourage the informal money lenders.

size of 485.5 bil. Won in 1974. This is the size of potential open market for commercial papers of business corporations. Therefore, there exists still large room for investment and finance corporations to grow considering their size of short-term loans 209.5 bil. Won outstanding by the end of July, 1975.

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