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Will Bank Interest Rate Deregulation Jeopardize Economic Growth? A Case Study of South Korea*,+

by

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I. INTRODUCTION

It has been widely believed in many LDCs that a policy of maintaining low interest rates encourages investment and facilitates rapid economic growth. For this reason, bank interest rates are frequently controlled by government at levels which result in excess demand for bank credit, while the available supply of credit is allocated to those sectors deemed important to the country's overall development strategy. One sure sign that bank interest rates have been set at below-equilibrium levels is the existence of some dual credit market, legal or otherwise, outside the banking system (or regulated financial sector) where interest rates are substantially higher than bank rates (or regulated rates). Recent attention has turned to the implications of financial dualism, where an unregulated financial market exists alongside the regulated one.

In particular, it has been argued that this artificial market segmentation imposes an efficiency loss. Low bank interest rates provide a subsidy on the use of capital in those sectors which obtain the cheap bank credit. Capital is then used to the point where its marginal productivity is below that in other sectors. Removal of bank interest rate controls would allow interest rates to be equalized between the regulated and unregulated sectors of the financial market. This would provide an incentive to adjust capital-labour ratios so that the marginal productivity of capital was equated across productive sectors of the economy. This would then produce an overall gain in terms of static efficiency.

In response to this argument against the maintenance of bank interest rates at below-equilibrium levels, it is frequently argued that the resulting loss of static efficiency must be weighed against the dynamic or growth gains that are obtained by fostering those sectors strategic to the growth process. This argument presumes, however, that the goals of static efficiency and dynamic growth

conflict. It implies that, were bank interest rate controls to be removed, the resulting gain in static efficiency would come at the expense of output in those strategic growth sectors which previously received favourable treatment.

The first purpose of this paper is to demonstrate, as a theoretical proposition, that elimination of controls on bank interest rates would not necessarily lead to a decline in output in those sectors which were previously able to obtain cheap bank credit. The efficiency gains obtained by eliminating these controls need not, therefore, come at the expense of economic growth (or whatever other benefits were presumed to accrue by fostering particular sectors using credit controls). The key to this result lies in a proper understanding of the way in which credit price control and quantity rationing in the regulated sector affects resource allocation, given the existence of a dual, unregulated financial sector.

The second purpose of this paper is to present quantitative estimates of the macroeconomic and sectoral effects of the removal of bank interest rate controls in South Korea. In many ways the Korean experience is tailor-made for a study of this kind.

The existence of financial dualism in Korea has been well-documented.[1] Bank interest rates have been controlled, sometimes at "lower" levels, to encourage investment, sometimes at "higher" levels, to encourage saving, but generally at levels below those required to clear the market for bank credit. The allocation of bank credit to industry[2] has been at the direction of government.

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[1] For a recent, comprehensive study, see Cole and Park (1982).

[2] The amount of consumer credit extended by regulated financial institutions in Korea is negligible. Furthermore, bank credit is an important source of financing for Korean companies, as evidenced by debt-equity ratios averaging almost 5:1 in manufacturing in 1980.

In the 1960s and early 1970s, the only alternative credit source available to those unable to obtain bank loans was the curb market - an illegal market for credit whose lending rates were substantially above bank rates. More recently, some curb market functions have been taken over by official non-bank institutions, such as investment finance companies. Interest and discount rates from these sources, although still subject to some measure of government control, have also been above bank rates.[3]

In Korea, the beneficiaries of bank credit price control and quantity rationing are easily identified. They have in the past primarily been the export industries. Allocation of some operating funds has been tied directly and automatically to proof of export. Until recently, the interest on such funds was at a preferential rate even lower than the normal bank lending rate. Export performance has also given a firm or industry high priority in the allocation of long term funds for fixed investment purposes. Since 1977, import-competing intermediate industries such as chemicals have also received priority, as part of an effort to increase the domestic value added to exports. Industries producing for domestic consumption have always received lowest priority.

In the 1963-78 period, Korea was able to sustain an annual growth in real GNP of nearly 10%. While it may no longer be fashionable to refer to "export-led" growth, it is certainly true that the strong performance of Korea's export sector enabled the country to maintain growth at this rate without running into severe balance of payment difficulties or, so far, without jeo-

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[3] Flow-of-funds data from the Bank of Korea suggest that the size of the true curb market has declined dramatically, especially with the reduction in inflation and inflationary expectations since 1982. However, observers point to the relative ease with which curb market funds can be laundered through official non-bank financial institutions, or even through the banks themselves. If the persistence of the current policy means that bank interest rates would not be permitted to rise should inflation be rekindled, then the true curb market could again be expected to assume an important role.

pardizing its ability to meet the debt service payments on its substantial overseas borrowing. This freedom from balance of payments problems is particularly notable in view of the strong import dependence imposed by Korea's relative scarcity of natural resources. Finally, its overall growth record has been achieved without the severe inflationary pressure experienced in many of the Latin American NICs. Except for the periods immediately following the first and second oil price shocks, inflation has generally been in the 10-20% range.

For Korea, therefore, it is of vital interest whether the static efficiency gains to be had by deregulating bank interest rates and ending financial dualism would come at the expense of its traditional export sector or its newly emerging import-competing sector. Would cost-push pressures introduced by raising lending rates to these sectors erode Korea's international competiveness? Could the resulting output decline in these sectors be offset by output gains elsewhere? Alternatively, do the export and import-competing sectors have sufficient flexibility to absorb the cost increases through a reallocation of productive inputs? If so, then what again are the implications for total output in the economy? To date, all these possibilities have been discussed,[4] but little empirical work has been done.

The organisation of the remainder of the paper is as follows. The second section examines theoretically the effects that deregulation of bank interest rates would have on resource allocation. This section also lays the groundwork for the remainder of the paper, because it gives an indication of the sectoral and aggregate supply response to bank interest rate deregulation. The remainder of the paper combines sectoral and aggregate supply responses with sectoral and aggregate demand response, in a Korean

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[4] See Kim (1975), Hong (1979) and Cole and Park (1982).

context, so as to determine the overall effects on output, employment and prices. The third section of the paper therefore outlines the analytical framework of the full empirical study. The fourth section presents the estimated results on the effects of bank interest rate deregulation under several different environmental settings and time horizons. The final section draws some policy conclusions from the previous discussion.

II. BANK INTEREST RATE DEREGULATION AND RESOURCE ALLOCATION

In this section, it will be shown that the elimination of controls on bank interest rates would not necessarily lead to a decline in the supply of output from those sectors which previously obtained cheap bank credit. Nor need it lead to a reduction in the absolute quantity of capital employed in those sectors, even though it reduces the ratio of capital employed relative to other factors. The results of deregulation depend on how an increase in the cost of bank credit affects the demand for all factors of production in the preferred sector relative to other sectors, and on what the resulting equilibrium factor price adjustments are. In other words, the resource allocative effects operate through the induced price movements in other factors of production,while this resource reallocation then determines what the supply response will be.

To demonstrate that the allocative effects of an increase in bank interest rates operate primarily through pecuniary externalities, it is easiest to focus on a single sector. The results for two sectors, one of which receives preferred treatment in bank credit allocation, follow as a logical but tedious extension. The reason is that the result hinge not so much on the existence of sectoral differences as on the existence of an unregulated financial market alongside the regulated one.

Suppose that in an economy composed of a single sector, output is produced using labour L and capital K. Labour services are purchased at a wage w. Capital equipment is purchased with funds obtained either from the regulated financial sector at an interest rate r_B, or from the unregulated sector at a rate r_V. The units of capital can then be chosen so that these interest rates measure the rental price of capital. Sectoral output supply and input demands are chosen to maximize profit, measured by

$$\text{Profit} = PQ(L,K_B+K_V) - wL - r_BK_B - r_VK_V \qquad (1)$$

where Q gives output as a function of the inputs and K_B and K_V give the quantities of capital obtained by funds from the regulated and unregulated financial sectors respectively. With perfect competition, prices are taken as given. With the allocation of regulated finance controlled by government, K_B is also taken as given. The maximization is therefore by choice of quantities over which producers have control, namely L and K_V. The first order conditions, which determine the optimal capital-labour ratios, are:

$$PQ_L - w = 0 \qquad (2)$$

$$PQ_K - r_V = 0 \qquad (3)$$

Thus with financial dualism, price control and quantity rationing in the regulated sector have no direct effect on the optimal capital-labour ratio, although the marginal productivities Q_L and Q_K are those associated with the total amount of capital used, K_B+K_V. Cole and Park (1982) make the same point by noting that when firms have the opportunity to borrow from (or lend to) the unregulated financial sector, they will take r_V rather than r_B as the opportunity cost of capital, while the quantity they employ need not be exactly K_B. This does not imply, however, that an increase in r_B would have no effect on output or employment. The profit squeeze on marginal firms will force them

to close, temporarily releasing capital and labour. For equilibrium in the labour and unregulated financial markets to be reestablished, w and r_V must adjust, and these induced factor price changes cause adjustment of capital-labour ratios in the remaining firms.

More formally, the conditions for profit maximization determine the optimal capital-labour ratio, but they do not determine the optimal scale of output. Full supply-side equilibrium also requires that factor markets clear and that output adjust so that sectoral profits be driven to zero:

$$K_V = S(r_V, r_B) \qquad S_V > 0, \quad S_B < 0 \tag{4}$$

$$PQ(L, K_B + K_V) - wL - r_B K_B - r_V K_V = 0 \tag{5}$$

where the supply of funds by wealth holders to the unregulated financial sector $S(r_V, r_B)$ depends positively on r_V and negatively on r_B and where labour market equilibrium can be characterized by regarding either w or L as exogenously fixed. Full supply side equilibrium is therefore characterized by equations (2)-(5).[5] The effects of an increase in r_B can be examined using the usual methods of comparative static analysis. First take the total differential of each equation. The conditions for profit maximization themselves ensure that some terms in the total differential of the zero profit condition (5) disappear. Finally, assume that while r_B increases, K_B is held constant, say by an aggregate credit ceiling, so that $dK_B = 0$. This process gives:

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[5] The last two terms in equation (5) can also be written as $-[r_B K_B/(K_B+K_V) + r_V K_V/(K_B+K_V)](K_B+K_V)$. This emphasizes that unless $K_B/(K_B+K_V)$ is the same for all sectors, or unless $r_B = r_V$, different sectors will face different rental prices for capital.

$$PQ_{LL}dL + PQ_{LK}dK_V + Q_L dP - dw = 0 \quad (6)$$

$$PQ_{KL}dL + PQ_{KK}dK_V + Q_K dP - dr_V = 0 \quad (7)$$

$$dK_V - S_V dr_V = S_B dr_B \quad (8)$$

$$QdP - Ldw - K_V dr_V = K_B dr_B \quad (9)$$

We can then solve for dP, dK_V, dr_V and either dL or dw in terms of dr_B, to obtain the effects that an increase in bank interest rates would have on product prices, the volume and cost of unregulated sector credit, and on either employment or the wage rate. The effect on sectoral output can then be determined by noting that $dQ = Q_L dL + Q_K dK_V = Q_L dL + Q_K(S_V dr_V + S_B dr_B)$.

When any quantity of labour can be obtained at the going wage, as appropriate say in an economy with contractual or government-encouraged wage stickiness, the results are as follows:

(With dw=0) $$dr_V/dr_B = (1/D)[-P^2 S_B(Q_{KK}Q_{LL}-Q_{KL}^2)-P(Q_{LL}Q_K-Q_{KL}Q_L)K_B/Q] \quad (10)$$

$$dL/dr_B = (1/D)[(PS_B K_V/Q - PS_V K_B/Q)(Q_{KK}Q_L-Q_{KL}Q_K) + Q_L K_B/Q + PQ_{KL}S_B] \quad (11)$$

$$dQ/dr_B = (1/D)[(PS_B K_V/Q - PS_V K_B/Q)(Q_L^2 Q_{KK}+Q_K^2 Q_{LL}- 2Q_K Q_L Q_{KL}) + Q_L^2 K_B/Q + PS_B(Q_{KL}Q_L-Q_{LL}Q_K)] \quad (12)$$

where $$D = P^2 S_V(Q_{KK}Q_{LL}-Q_{KL}^2) + P(Q_{LL}Q_K-Q_L Q_{KL})K_V/Q - PQ_{LL} \quad (13)$$

If the second order conditions for profit maximization are satisfied, then Q_{KK} and Q_{LL} are negative while $Q_{KK}Q_{LL}- Q_{KL}^2$ is positive. If, in addition, we assume that Q_{KL} is positive but small enough

to be dominated by Q_{KK} and Q_{LL}, then D is likely to be positive, in which case dr_V/dr_B, dL/dr_B and dQ/dr_B are also likely to be positive.

By comparison, when wages adjust to keep the economy at or close to full employment, the results are as follows:

(With dL=0) $$dr_V/dr_B = (1/D')[PQ_{KK}S_B + Q_K K_B/Q + PS_B(Q_{KL}Q_K - Q_{KK}Q_L)L/Q] \quad (14)$$

$$dQ/dr_B = (1/D')[Q_K^2(S_V K_B/Q - S_B K_V/Q) - Q_K S_B(Q_L L/Q - 1)] \quad (15)$$

where $$D' = PS_V(Q_{KK}Q_L - Q_{KL}Q_K)L/Q - PQ_{KK}S_V - Q_K K_V/Q - Q_L L/Q + 1 \quad (16)$$

Given the same assumptions as earlier, D' is likely to be negative, in which case dr_V/dr_B and dQ/dr_B are also likely to be negative.

When government controls the allocation of bank credit, an increase in bank interest rates will affect factor proportions only by inducing changes in the prices of those factors whose quantity the firms can control, namely labour and capital obtained with funds from the unregulated financial sector. Because these effects are indirect, the outcome is difficult to pinpoint unambiguously and the above conclusions are only tentative. They do indicate, however, that an increase in bank interest rates may either raise or lower interest rates in the unregulated financial sector, and that the output of a sector which has at least potential access to both financial markets may either rise or fall. Intuitively, the results depend on whether firms can substitute away from

bank-financed capital towards either labour or capital from alternative sources, without also inducing large increases in the prices of those other factors of production. For this reason, the results depend crucially on the nature of the production process and the conditions of supply in other factor markets. Finally, when the above analysis is repeated for an economy comprising two sectors, the results are even more ambiguous, but depend, in addition, on the relative dependence of each sector on bank versus unregulated market finance.

III. MACRO AND SECTORAL EFFECTS OF BANK INTEREST RATE DEREGULATION - ANALYTICAL FRAMEWORK

The previous section examined the likely supply response to bank interest rate deregulation. Even in a simple model, the resource allocative effects are not easily identified unambiguously, since they depend on substitution possibilities in production and on factor market conditions. However, the overall effects also depend on demand side influences, particularly on the way that the changes in income and factor prices affect consumers' demand for output and their supply of factors. The remainder of this paper will examine these issues empirically, using South Korea as the focus of the study. Obviously, the analytical framework of such a study must pay careful attention to the specification of production possibilities, of sectoral output supplies and factor demands. It must also contain specifications of final demands for output and factor supply conditions. In a Korean context, the framework must include the international trade and capital flows appropriate to an open economy. Finally, it must properly specify the relationships between real physical assets and financial assets, between real capital use and the financing of real capital stocks. For this reason, we choose a comparative static general equilibrium model of commodity flows and asset stocks in which the neoclassical assumptions of maximizing behaviour and price-responsiveness play a central role.

A. The Real Side

The equations which explain all real commodity flows can be divided into five main types, and are shown schematically in Table 1.

The factor demand equations are derived[6] by assuming that producers choose their inputs of primary and intermediate factors so as to minimize costs subject to constant-returns-to-scale, nested production functions in which substitution possibilities are as follows. There is no substitutability between intermediate inputs of different commodities (e.g. between steel and textiles), nor between intermediates and primary factors as a group. It is possible, however, to substitute between domestic and imported sources for a single intermediate input (e.g. between domestic and imported steel). It is also possible to substitute between the primary factors, land, labour, fixed and working capital.[7] Estimates of the elasticities of substitution between pairs of primary factors are based on the study for Korea by Kim (1977), and are set at 1.4 for agriculture and 0.8 for all other sectors. Estimates of the elasticity of substitution between domestic and imported commodities are based on studies for other countries, studies which suggest values clustered around 2.0 for all end uses where domestic and imported commodities are in direct competition. Because Korea is relatively poor in natural resources, however, many of its imports (e.g. oil, cotton, rubber) are non-competing. For this reason, the benchmark elasticity of substitution is then scaled by the proportion of total imports that compete with domestic produc-

[6] The model of the real sector is based on Dixon et al. (1982) and a detailed algebraic derivation is given in Vincent (1981). For other examples of this type of model, see Taylor and Black (1974) and Adelman and Robinson (1978).

[7] Land enters the production functions only for agriculture and the primary sector, which includes mining.

Table 1 - The Real Sector of the Korean Model

Important Equations:

Description	Equation
Factor Demands:	
(1) Intermediate factors - domestic	$N_D = f_{ND}(Z,P_1,P_2)$
- imported	$N_M = f_{NM}(Z,P_1,P_2)$
(2) Primary factors (labour, fixed capital, working capital, land)	$F = f_P(Z,P_3)$
Final Demands:	
(3) Household demands - domestic	$C_D = f_{CD}(C,P_1,P_2)$
- imported	$C_M = f_{CM}(C,P_1,P_2)$
(4) Inputs to fixed capital formation	
- domestic	$I_D = f_{ID}(X,P_1,P_2)$
- imported	$I_M = f_{IM}(X,P_1,P_2)$
(5) Government demands - domestic	$G_D = f_{GD}(C)$
- imported	$G_M = f_{GM}(C)$
(6) Export demands	$E_D = f_E(P_1^*)$
Zero Profit Conditions:	
(7) In domestic production	$P_1 = w_1(P_1,P_2,P_3)$
(8) In capital creation	$\Pi = w_2(P_1,P_2)$
(9) In importing	$P_2 = \hat{P}_2^* T\phi$
(10) In exporting	$P_1 = \hat{P}_1^* S\phi$
Market Clearing Conditions:	
(11) For domestic production	$Z = N_D+C_D+I_D+G_D+E_D$
(12) For imports	$M = N_M+C_M+I_M+G_M$
(13) For primary factors	$F = F^*$
Other Equations:	
(14) Trade Balance	$B = (P_1^*)'E_D\phi - (P_2^*)'M\phi$
(15) Consumer goods price index	$\alpha_C = w_3(P_1,P_2)$
(16) Capital goods price index	$\alpha_I = w_4(\Pi)$

Note: ^ denotes a diagonal matrix.
' denotes a vector transposition.

Variables:

	Description	Dimension
N_D	Demands for domestic intermediate commodities	(gx1)
Z	Output levels in each industry	(hx1)
P_1	Local prices of domestic commodities	(gx1)
P_2	Local prices of imported commodities	(gx1)
N_M	Demands for imported intermediate commodities	(gx1)
F	Demands for primary factors	(mx1)
P_3	Prices for services of primary factors	(mx1)
C_D	Household demands for domestic commodities	(gx1)
C	Aggregate real consumption expenditure	scalar
C_M	Household demands for imported commodities	(gx1)
I_D	Demands for domestic commodities for capital creation in each industry	(gx1)
X	Aggregate real expenditure on capital creation in each industry	(hx1)
I_M	Demands for imported commodities for capital creation in each industry	(gx1)
G_D	Government current demands for domestic commodities	(gx1)
G_M	Government current demands for imported commodities	(gx1)
α_C	Consumer price index	scalar
E_D	Export demand for domestic commodities	(gx1)
P_1^*	Foreign currency prices for exports	(gx1)
Π	Prices of a unit of capital constructed for each industry	(hx1)
P_2^*	Foreign currency prices of imports	(gx1)
T	One plus ad valorem tariff on imports	(gx1)
ϕ	Exchange rate (won/foreign currency)	scalar
S	One plus ad valorem subsidy on exports	(gx1)
M	Total import levels of imported commodities	(gx1)
F^*	Primary factor employment levels	(mx1)
α_I	Capital goods price index	scalar
B	Trade balance	scalar

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tion. These values are also used to characterize substitution between domestic and imported commodities in other end uses such as household consumption.

In the final demand category, the household demand equations are derived by assuming that consumers divide their aggregate consumption expenditure between different commodities so as to maximize utility. Estimates of the degree of substitutability between different commodities are based on the budget studies of Korean households reported by Lluch et al. (1977). The final demands for inputs into capital creation are obtained by assuming that a unit of capital can be created for each industry by combining commodities in fixed proportions. Estimates of these proportions are obtained from the Korean capital coefficients reported by Han (1971) and Hong (1979). By contrast, no explicit account is taken of the way in which the "production" of working capital (e.g. cash balances, goods in process) uses real resources, although the financial side of the model recognizes that stocks of both fixed and working capital must be financed. Aggregate real government expenditure is assumed to bear a constant proportionate relationship to real consumer expenditure, while the breakdown by commodity is also fixed. Finally, export demands are assumed to be price responsive, where the price elasticities of foreign demand are based on estimates by Kwok et al. (1981). These values, ranging from zero for (mostly non-traded) services, 1.1 for primary industries, 3.2 for manufacturing and 8.0 for agriculture and food processing, suggest that Korea is not "small" in the markets for its exports. This has some significance for the current study, because it suggests that Korean industries do have some limited power to pass on cost increases in international markets. By contrast, we assume throughout that Korea is small in the markets for its imports, and can obtain any quantity at the going world price.

The remaining equations on the real side are relatively straightforward. The conditions of zero pure profits set revenue equal to cost in each activity and follow from the assumptions of constant returns to scale and perfect competition. As in the previous section, these conditions implicitly give commodity supplies in each industry.[8] Likewise, the market clearing conditions are straightforward. Those for imports and primary factors merely state that demands are satisfied by supplies. These supplies can either be fixed exogenously (as for land), assumed to adjust fully at the going price (as for imports), or specified further (as will be the case for capital). Finally, a number of miscellaneous equations can be specified to define useful concepts such as the consumer goods price index, the trade balance, and so on.

B. The Financial Side

In the same way that the real side of the model gives a neoclassical general equilibrium treatment of commodity and factor flows, the financial side gives a neoclassical general equilibrium treatment of asset stocks and asset stock adjustment. It is organized around the following balance sheet breakdown, which we feel captures the relevant features of the Korean financial system:

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[8] The condition of zero pure profits in capital creation essentially defines the price of a unit of each industry's fixed capital and is then used further on the financial side.

Table 2 - Asset Disposition

Banking System		Industries		Consumers	
Assets	Liabs	Assets	Liabs	Assets	Liabs
		Short Term:			
R	M	Working	B^{KX}	V^K } = V	
D_G	T	Capital	B^{KN}	V^F	
B^{KX}			V^K	M	
B^{KN} } = D_P		Long Term:		T	Net worth
B^{FN}		Fixed	B^{FN}		
		Capital	$B^{*\Phi}$		
			V^F		

The banking system's liabilities M (currency plus demand deposits) and T (time deposits) are held as assets by consumers. The assets of the banking system include net foreign assets R (reserves less foreign borrowing), domestic credit to the government D_G and domestic credit to private sector industry D_P. Bank loans to industries are divided into three types - short term loans B^{KX} to exporters at a preferential interest rate, normal short term loans B^{KN}, and long term loans B^{FN}, both at the normal bank interest rate. Industries can also borrow abroad, the amount in domestic currency denoted $B^{*\Phi}$. Such loans have generally been long term in nature.[9] Finally, industries can meet their remaining financing requirements V^K and V^F through the unregulated financial sector. In a Korean context, the amount V captures financing from three main sources - non-bank financial intermediaries, internal financing (where retained earnings are treated as a loan by an industry to itself), and the unofficial or curb money market.

[9] These loans have been subject to some degree of government control through the ease with which loan guarantees are granted, but the volume has still responded to interest rate differentials, as Wijnbergen (1982) finds. By contrast, Koreans have been forbidden by law to hold foreign assets, while foreign direct investment in Korea has been strictly controlled.

The equations which explain the relative sizes of these stocks, and the rate at which they change, can be divided into five main types. These are shown schematically in Table 3.

It is assumed that consumers choose the size and composition of their portfolios so as to maximize utility, and further, that these two sets of decisions can be decomposed to give asset demand functions and a separate consumption (or savings) function. All functions depend on expected real interest rates[10] and real income in the usual way. Estimates of the income and interest elasticities of consumption and asset demands are based on the study for Korea by Wijnbergen (1982).

The allocation of the different types of bank loans across industries is governed by credit allocation rules. Short term preferential export loans in Korea are granted in strict proportion to the value of exports. Normal short term loans are assumed fixed in real terms. An industry's total share of all private sector bank credit is then related to its total export share, but adjusted to cover additional assistance to infant industries. This formulation implicitly determines an industry's share of long term loans, while still allowing the total level of private sector credit to be set independently of its allocation.

In the industry balance sheets, the assets side reflects industry demands for fixed and working capital, as given on the real side of the model. On the liabilities side, foreign loans are assumed to be somewhat sensitive to interest rate differentials, but are otherwise related simply to the size of an industry's fixed capital stock, thus reflecting a combination of industry demand and government control. Industry bank loans are strictly

[10] Expected real interest rates are scaled to be always positive. The solution technique, to be discussed shortly, can handle variables that change sign only in a cumbersome fashion.

Table 3 - The Financial Sector of the Korean Model

Important Equations:

Description	Equation
Consumer Balance Sheet:	
(1) Aggregate asset demands	$V_d/\alpha_C = g_V(R_V, R_M, R_T, Y/\alpha_C)$
	$M_d/\alpha_C = g_M(R_V, R_M, R_T, Y/\alpha_C)$
	$T_d/\alpha_C = g_T(R_V, R_M, R_T, Y/\alpha_C)$
(2) Aggregate real consumption	$C = g_C(R_V, R_M, R_T, Y(1-t_R)/\alpha_C)$
(3) Aggregate nominal personal income	$Y = (P_3)'F - (d)'\hat{\Pi}F^F - (B^*)'J\Phi I^*$
(4) Real interest rates	$R_V = (1+I_V)/(1+\alpha_C^e)$
	$R_M = 1/(1+\alpha_C^e)$
	$R_T = (1+I_T)/(1+\alpha_C^e)$
Allocation of Bank Credit:	
(5) Short term preferential loans	$B^{KX} = A\hat{P}_1 E_D$
(6) Short term normal loans	$B^{KN}/\alpha_C = Q_N$
(7) Total loan share	$(B^{KX}+B^{KN}+B^{FN})/(B^{KX}+B^{KN}+B^{FN})'J$
	$= g_L(\hat{P}_1 E_D/P_1'E_D)$
Industry Balance Sheets:	
(8) Demand for foreign loans	$B^* = \Pi' g_B(I^*, I_V, \alpha_\phi^e, F^F)$
(9) Equilibrium for fixed capital	$\hat{R}\hat{\Pi}\hat{F}^F = B^{FN}I_N/\alpha_C + V^F I_V/\alpha_C + B^*\Phi I^*/\alpha_C$
(10) Industry real rates of return	$R = P_3^F\hat{\Pi}^{-1} - d$
(11) Relationship between industry returns	$R = QR^*$
(12) Industry fixed capital accumulation	$X = g_X(Q) + dF^F$
(13) Aggregate investment	$I = \Pi' X$
(14) Equilibrium for working capital	$P_3^K F^K = B^{KX}I_X/\alpha_C + B^{KN}I_N/\alpha_C + V^K I_V/\alpha_C$
(15) Units of working capital	$F^K = (B^{KX}/\alpha_C) + (B^{KN}/\alpha_C) + (V^K/\alpha_C)$
Asset Market Clearing:	
(16) Regulated financial sector	$\bar{R}+D_G+(B^{KX}+B^{KN}+B^{FN})'J = M_d+T_d$
(17) Unregulated financial sector	$(V^K+V^F)'J = V_d$
Other Equations:	
(18) Balance of payments	$BP = \Delta\bar{R}$
(19) Government budget	$G - t_R Y = \Delta D_G$
(20) Expectations	$\alpha_C^e = \Delta\alpha_C/\alpha_C$
	$\alpha_\phi^e = \Delta\Phi/\Phi$

Note: $\hat{}$ denotes a diagonal matrix.
$'$ denotes a vector transposition.

Table 3 (cont.) - The Financial Sector of the Korean Model

Variables:

	Description	Dimension
V_d, M_d, T_d	Aggregate demands for unregulated loans, money, time deposits	scalars
α_C	Consumer goods price index	scalar
R_V, R_M, R_T	Expected real rates of return on unregulated loans,money,time deposits	scalars
Y	Aggregate nominal personal income	scalar
C	Aggregate real consumption expenditure	scalar
t_R	Tax rate	scalar
P_3	Prices for services of primary factors	(mx1)
F	Demands for primary factors	(mx1)
d	Depreciation rates in each industry	(hx1)
Π	Prices of a unit of capital constructed for each industry	(hx1)
F^F	Employment of fixed capital in each industry	(hx1)
B^*	Foreign currency value of overseas loans to each industry	(hx1)
J	Unit vector	(hx1)
ϕ	Exchange rate (won/foreign currency)	scalar
I^*	Foreign interest rate	scalar
I_V	Nominal interest rate in unregulated financial sector	scalar
I_T	Nominal interest rate on time deposits	scalar
α_C^e	Expected rate of CPI inflation	scalar
B^{KX}	Short term preferential bank loans to each industry	(hx1)
A	Constant of proportionality	scalar
P_1	Local prices of domestic commodities	(gx1)
E_D	Export of domestic commodities	(gx1)
B^{KN}	Short term normal bank loans to each industry	(hx1)
Q_N	Shift term of short term normal bank loan allocation	(hx1)
B^{FN}	Long term bank loans to each industry	(hx1)
α_ϕ^e	Expected rate of exchange depreciation	scalar
V^F	Long term unregulated sector loans to each industry	(hx1)
R	Real rate of return on fixed capital in each industry	(hx1)
P_3^F	Rental price for services of fixed capital in each industry	(hx1)
R^*	Economy wide real rate of return on fixed capital	scalar
Q	Variable relating each industry's return to economy wide return	(hx1)
X	Aggregate real expenditure on net capital creation in each industry	(hx1)
I	Aggregate nominal investment expenditure	scalar
F^K	Employment of working capital in each industry	(hx1)
P_3^K	Rental price for services of working capital in each industry	(hx1)
V^K	Short term unregulated financial sector loans to each industry	(hx1)
$\bar{R}$	Net foreign assets of banking system	scalar
D_G	Domestic credit of banking system to government	scalar
BP	Balance of payments	scalar
G	Aggregate nominal government expenditure	scalar

set by credit allocation rules. Loans obtained in the unregulated financial sector are then determined as a residual, i.e. the difference between asset stock demand and loans from other sources. The equations describing balance sheet equilibrium for fixed and working capital reflect these adding up constraints, but also serve an additional purpose. They relate the rental prices for fixed and working capital to the cost of credit, along the lines suggested by Tobin (1969). The equilibrium condition for fixed capital serves to equate the real rate of return on capital with the real interest on long term borrowing.[11] In the short run, real rates of return can nevertheless vary between industries, as allowed by Tobin's Q-formulation. In the long-run, when Q=1, real rates of return are equalized across industries. The investment function ensures that investment occurs faster in those industries with higher rates of return (and despite higher borrowing costs), so as to increase their capital stocks and bring industry rates of return into line over time. The equilibrium condition for working capital equates its rental price to its interest cost. The real side of the model has no explicit treatment of the production of working capital, so its units of measurement must also be defined here. We assume throughout, however, that working capital is variable between industries, even in the short run, so no Q-formulation is necessary. Finally, estimates of the parameters for Korean investment and foreign borrowing are obtained from Wijnbergen (1982).

The remaining equations on the financial side impose asset market clearing conditions and define the "dynamic" concepts in the model. The way in which these "dynamic" concepts are handled in the comparative static framework is discussed shortly.

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[11] This equality presumes that fixed capital is mobile <u>within</u> industries, i.e. that there is a well-developed market for existing capital within each industry, even in the short run. For this reason, too, the investment function differs from the usual Keynesian formulation.

C. Solution Method

The full model is first converted into a form that is linear in percentage changes. This linear system can be written in matrix form as

$$A_1x_1 + A_2x_2 = 0 \tag{17}$$

where x_1 is a (px1) vector of percentage changes in endogenous variables, x_2 is a (qx1) vector of percentage changes in exogenous variables, and A_1 and A_2 are (pxp) and (pxq) matrices of numerical coefficients. The solution is then obtained by matrix manipulation:

$$x_1 = -A_1^{-1}A_2x_2 \tag{18}$$

The choice of which model variables to designate exogenous is determined by the particular experiment under consideration and the economic environment in which it is to be performed. The numerical coefficients in A_1 and A_2 involve not only the estimates of behavioural parameters mentioned earlier, but also a number of share parameters, e.g. cost shares, budget shares, and so on, which are assumed to be constant. Values for the share parameters occurring on the real side are obtained from the Bank of Korea's 1980 Input-Output table. Values for those occurring on the financial side are obtained from various other Bank of Korea financial publications, again taken for 1980.[12]

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[12] Estimates of industry loans from the unregulated financial sector are obtained by subtracting bank and foreign interest costs from the net payments to fixed and working capital, then capitalizing the results using the prime curb market rate, assumed to be the best available indicator of the return on all non-bank financing, including self-financing.

The solution method provides comparative static projections, showing how the Korean economy in the model's solution year would differ from its position in the base year, given only the exogenous changes under consideration. The time horizon required for all adjustments to take place is left open, but two to five years seems reasonable, depending on whether industry fixed capital stocks have been designated exogenous. The financial side of the model contains a few "dynamic" equations which relate explicitly to adjustment paths. These can be incorporated into the comparative static framework essentially by imposing a particular adjustment path for intervening years.[13] All results reported in the next section assume that stock adjustment in intervening years is zero so that, for example, all adjustment of foreign exchange reserves relevant for the balance of payments outcome occurs in the solution year. This dynamic assumption, although arbitrary, produces results which we feel are sufficiently revealing without having to resort to much more costly dynamic computational techniques.

IV. MACRO AND SECTORAL EFFECTS OF BANK INTEREST RATE DEREGULATION - EMPIRICAL RESULTS FOR SOUTH KOREA

Two kinds of bank interest rate deregulation are considered. Under partial liberalization, the interest rate on short term preferential bank loans to exporters is raised to equal the normal bank lending rate, while bank loan allocation continues to be determined by bank credit rationing rules. This measure was in fact instituted in South Korea in June 1982. Under full liberalization, the preferential and normal bank lending rates,

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[13] This relates to the balance of payments and government budget constraint. The percentage changes in expectations can be expressed as approximately linear functions of the percentage changes in the underlying variables. See Dee (1983) for a fuller discussion.

together with the bank rate on time deposits, are allowed to be determined by market forces. Since industries are indifferent between sources of finance, except with respect to cost, the bank lending rates will converge on the new lending rate in the unregulated financial sector. A priori, it is not obvious where this new common lending rate will be established - whether above, below, or in between the old regulated/unregulated interest rate spread. Consider the influences on the unregulated sector rate. As bank lending rates rise, the bank deposit rate also rises (so as to keep bank profits stable) and where the portfolio substitution effect dominates any income effect, deposits are attracted away from the unregulated sector, putting upward pressure on the unregulated sector rate. To the extent that industry demand for unregulated sector finance declines, this upward pressure is offset or reversed. Consider also the influences on bank interest rates. If the additional deposits attracted into the banking system were to be automatically translated into a greater aggregate supply of domestic credit to industry, then the increase in bank interest rates would be moderated. However, this has implications for government control of monetary aggregates. In the extreme, and ignoring for the moment the interest sensitivity of money demand, deregulation could be achieved with no movement whatsoever in bank rates if the government were willing to simply expand the money supply and domestic credit to industry by an amount sufficient to fill the existing excess demand for bank credit. However, since the Korean government has until recently targeted aggregate domestic credit as its monetary control variable, it is assumed, under both partial and full liberalization, that aggregate domestic credit to industry remains constant. This assumption rules out the possibility that the new common lending rate under full liberalization will settle at a level below the original normal bank lending rate. Nevertheless, it is still unclear whether it will be above or below the old unregulated sector rate.

Results on the effects of partial and full bank interest rate deregulation are generated under several different environmental settings. On one level, results are generated under short run and long run assumptions. In short run experiments, nominal wages are assumed to be fixed, reflecting Korea's government-encouraged wage stickiness. The level of aggregate employment therefore adjusts to maintain labour market equilibrium. In addition, industry fixed (but not working) capital stocks are held constant, since existing fixed capital is assumed to be industry-specific. In long run experiments, nominal wages are fully flexible, and adjust to maintain labour market equilibrium at the current level of aggregate employment. Labour can nevertheless still move between industries. In addition, industry fixed capital stocks adjust to equate real rates of return across industries, reflecting the assumption that asset holders are indifferent between the assets of different industries, except with respect to real returns. The capital stock adjustment itself reflects the effects of ongoing investment, which is assumed to occur faster in the short run in those industries with higher real rates of return.

Finally, results on the effects of partial and full bank interest rate deregulation, under either short run or long run assumptions, are generated assuming either fixed or flexible exchange rates.[14]

The model's projections for selected variables under these different sets of assumptions are presented in Table 4. We shall concentrate first on the results under fixed exchange rates.

Bank interest rate deregulation initially raises the price of capital services, particularly to those sectors which previously

[14] Korea's present exchange rate regime involves pegging to a basket of currencies, with continual peg adjustments according to a purchasing power parity formula. Recent evidence by Kim (1984), however, suggests that it is closer to the fixed than to the flexible end of the spectrum.

Table 4 - Projected Macro and Sectoral Effects of Bank Interest Rate Deregulation for South Korea

A. Fixed Exchange Rates*	Short Run		Long Run	
	Partial Dereg-ulation	Full De-regula-tion	Partial Dereg-ulation	Full De-regula-tion
Financial Variables:				
Bank interest rate - preferential	49.5	148.4	46.0	74.7
- normal	-3.8	95.0	-7.4	21.4
Unregulated sector interest rate	2.3	-0.2	-9.2	-37.8
Real money balances (M_1)	1.5	12.9	-0.5	-1.1
Real time deposits	0.9	37.4	2.1	18.6
Real unregulated sector lending	1.7	4.5	-1.8	-9.3
Macroeconomic Variables:				
Real GDP	0.8	8.0	0.9	3.5
Aggregate employment	2.2	17.0	-	-
Consumer price index	1.1	7.0	-4.5	-15.6
Trade balance	-.418	-3.143	.469	1.610
Balance of payments	.689	5.071	.249	.832
Sectoral Outputs:				
1. Agriculture and fishery	0.0	2.8	2.8	10.3
2. Food processing	0.6	6.8	1.1	4.4
3. Other primary	0.3	4.0	3.6	12.7
4. Iron and steel	-1.2	-6.5	8.2	28.6
5. Electrical, electronics	-0.8	0.7	7.1	26.4
6. Textiles, leather	-1.4	-9.5	6.5	22.2
7. Other manuf. - export	-0.4	-0.1	5.2	18.5
8. Other manuf. - import	0.3	4.7	4.8	17.0
9. Services	1.7	14.5	1.6	6.0
10. Services-govt., real estate	1.2	10.6	0.1	0.9

* All projections are expressed in percentage changes except for the trade and payments balances, which are absolute changes in trillions of won. For comparison purposes, the 1980 trade balance deficit (Input-Output measure) stood at 2.723 and the balance of payments deficit (change in net foreign assets of banking system) was .8188.

B. Flexible Exchange Rates*	Short Run		Long Run	
	Partial Dereg-ulation	Full De-regula-tion	Partial Dereg-ulation	Full De-regula-tion
Financial Variables:				
Bank interest rate - preferential	56.5	112.8	58.4	90.6
- normal	3.2	59.4	5.1	37.2
Unregulated sector interest rate	8.8	-18.4	34.1	-29.7
Real money balances (M_1)	16.8	-33.0	0.0	-1.2
Real time deposits	14.3	-7.3	-9.4	19.7
Real unregulated sector lending	17.8	-42.4	4.3	-9.5
Macroeconomic variables:				
Real GDP	9.1	-17.0	-3.1	2.8
Aggregate employment	11.6	-12.3	-	-
Consumer price index	-2.3	16.0	21.4	-8.5
Trade balance	-4.101	7.931	-1.383	1.233
Exchange rate	-21.6	62.6	11.0	4.7
Sectoral Outputs:				
1. Agriculture and fishery	-2.7	10.4	-7.2	8.8
2. Food processing	5.7	-8.9	-3.5	3.6
3. Other primary	0.2	3.8	-9.8	10.3
4. Iron and steel	-13.9	31.2	-21.6	23.3
5. Electrical, electronics	-12.1	33.2	-19.7	21.9
6. Textiles, leather	-19.3	43.8	-18.0	17.4
7. Other manuf. - export	-9.5	26.0	-13.9	15.2
8. Other manuf. - import	-2.3	11.6	-12.6	14.0
9. Services	14.8	-25.5	-4.8	4.9
10. Services-govt., real estate	12.5	-23.7	-1.4	0.6

received preferential treatment as regards the price and/or volume of bank credit.[15] The economy as a whole can substitute towards labour and other factors of production in one of two ways - either the sectors which are "intensive" in bank credit can themselves substitute towards other factors, or those sectors can simply contract in scale relative to sectors which are not intensive in bank credit. Both possibilities are demonstrated in the sectoral output projections under fixed exchange rates. In the long run, when more factors are variable, the economy-wide factor substitutions can be achieved by substitutions within each industry. The export and import competing sectors do not contract relative to the largely non-traded agriculture, food and service sectors. In the short run, however, the economy-wide factor substitutions are achieved in part precisely by a contraction of the export and import competing sectors relative to the other sectors.

The aggregate effects on output, employment and prices depend in addition on whether additional labour and other factors of production are forthcoming at the going wage. In the short run, aggregate employment can expand at the going wage, by assumption.It is partly this assumed availability of additional labour which allows the service sectors to expand in the short run, and their expansion leads to an aggregate increase in real GDP, although the cost-push pressures produced by these sectors' additional demand for non-bank finance are also passed on to consumers in the form of price increases. By contrast, in the long run, additional labour is not assumed to be forthcoming to support an expansion of the service sectors. Instead, the tradeable goods sectors, previously

[15] In Korea, these sectors have been the export sectors, particularly textiles, "Other Manufacturing - Export" (which includes mostly light manufacturing industries) and more recently the electrical industry, as well as the import-substituting primary sector, "Other Manufacturing - Import" (which includes heavy and chemical industries), and iron and steel which initially developed as an import substitution industry but has recently been competing on world markets.

relatively intensive in bank financed capital, increase their labour intensity by bidding labour away from services and food processing. This output expansion in the tradeable goods sector also leads to an aggregate increase in real GDP, though tending to be more modest than in the short run, while the released pressure on non-bank finance allows price declines in all sectors.

Finally, the effects under full liberalization are stronger than those under partial liberalization, but of the same type. Under either form of liberalization, there is a significant increase in at least one of the bank lending rates. Under full liberalization, the new common lending rate is established at a level in between the old bank and unregulated sector rates (the unregulated sector rate falls) and it is lower in the long run, when expansion of the tradeable goods sector leads to a greater relative decline in demand for non-bank finance.

In general, the sectoral and aggregate results under fixed exchange rates are dominated by the supply side responses analysed in the second section of this paper. Liberalization of bank interest rates has a beneficial effect on either output or prices, with the results depending on whether factor adjustments occur within or between sectors, and on whether cost-push pressures are created in other factor markets which are then passed on to consumers.

The results under flexible exchange rates are a little more complex, because they also require an understanding of the demand side responses. Consider the aggregate demand side under fixed exchange rates. In the short run, cost-push pressures produce a decline in the demand for exports and a deterioration in the trade balance, but this is more than offset by the increase in domestic

absorption.[16] In the long run, there is an increase in both domestic absorption and foreign demand for exports. Therefore, there is sufficient demand to support an expansion in real output, whichever sectors are responsible for that expansion. The crucial point, however, is that in the short run there is an increased demand for nominal money balances because both prices and real income increase, whereas in the long run nominal money demand falls, despite an increase in real income, because of the price decline. Under fixed exchange rates, these changes in the demand for money can be accommodated through the balance of payments - the money supply can increase (decrease), despite a deterioration (improvement) in the trade balance, via a capital inflow (outflow) that is encouraged by the rise (fall) in interest rates in the unregulated financial sector.[17]

By contrast, under flexible exchange rates, the channel of monetary accommodation through balance of payments adjustment is closed off, since by definition the balance of payments is zero. Monetary equilibrium, together with real equilibrium, must now be achieved by real domestic adjustment. Monetary equilibrium now requires that nominal income be kept approximately constant - increases (decreases) in real income must be offset by price declines (increases).[18] However, this conflicts with the price/output responses formerly required for real equilibrium under fixed

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[16] One important demand side influence is the increase in the rate of return on capital in the non-traded sectors, with a consequent increase in investment in those sectors.

[17] Cole and Park (1982) note that the effect of the Korean monetary reform of 1965, under which bank interest rates were raised, was precisely an increase in output, employment and foreign borrowing.

[18] The offset need not be complete since the money supply still adjusts via changes in domestic credit to the government, while real money demand is also responsive to interest rates.

exchange rates,at least in the short run. The exchange rate itself can partially resolve the conflict. With exchange rate adjustment, there is no longer a one-to-one correspondence between domestic prices and the terms of trade - domestic price increases, for example, need not erode the international competitiveness of the export sectors so long as the exchange rate also depreciates. Nevertheless, the results in Table 4 show that in some instances, not only the aggregate outcome, but also the entire pattern of sectoral adjustment, may differ from that under fixed exchange rates. Of more concern are those instances where deregulation now produces stagflationary results. Under partial liberalization in the long run or full liberalization in the short run, cost-push pressures which cannot be avoided by factor reallocation produce price increases, while the money supply cannot adjust sufficiently to support an increase in real income. Nevertheless, full liberalization of bank interest rates in the long run still produces benefits which show primarily in the form of price declines, in which case an increase in real income can also be supported.

V. POLICY CONCLUSIONS

Because there is a direct link between the rental price paid for the services of capital as a factor of production and the interest cost on credit used to purchase that capital, a full deregulation of bank interest rates which allows them to be set by market forces will produce an efficiency gain by ensuring that all sectors face the same rental price for the services of capital. In Korea, a full deregulation of domestic interest rates will not produce the maximum possible efficiency gain so long as international capital movements are still subject to government regulation - those sectors which have been able to obtain cheap foreign loans will still face lower factor prices for capital.

Nevertheless, the results of the previous section show that the benefits of full domestic bank interest rate deregulation can be sizable, while even partial deregulation - the elimination of preferential bank interest rates for some groups - can produce benefits which are not negligible.

The benefits of deregulation show primarily in output increases in the short run and price declines in the long run. The initial cost-push inflationary pressure of higher credit costs can be gradually overcome as the economy as a whole substitutes away from bank financed capital towards other factors of production. If the Korean government maintains sufficient flexibility in its exchange rate so as to have a reasonable degree of control over its money supply, then it may have to accompany a deregulatory measure by monetary expansion, at least in the short run, so that the cost-push inflationary pressure does not simply lead to stagflation. With fixed exchange rates, by comparison, monetary accommodation of the output gains from deregulation will be achieved automatically through the balance of payments.

The initial cost-push inflationary pressure can be overcome by appropriate factor substitution in one of two ways - either those sectors which were previously relatively intensive in bank financed capital can contract relative to other sectors, as has often been presumed in the past, or the sectors which previously benefited from bank interest rate control and credit rationing can themselves substitute towards other sources of financing and other factors of production, while maintaining or even expanding their output levels. The results of this paper confirm both theoretically and empirically that the benefits of deregulation need not come at the expense of Korea's export and import competing sectors, at least in the long run. They may suffer in the short run, however. In this regard, Korea has two choices. It can take the opportunity to expand its industries producing for domestic consumption, particularly its service sectors. This would possibly

result in slower growth in the short run, but would allow its consumers, as well as its savers, to begin to enjoy some of the substantial gains achieved to date. The empirical results suggest that, so long as the stagflationary possibility is avoided, real GDP can still expand, although at the cost of quite some short run deterioration in the trade balance. Alternatively, it can provide some sort of short run adjustment assistance to its export and import competing sectors, though with the risk that this assistance will delay the necessary long term factor substitutions.

The empirical results assume that the severity of bank interest rate control is measure purely by the size of the interest rate differential between the regulated and unregulated financial sectors of the economy. There are several features of financial systems, however, which have not been incorporated into the analysis. Virmani (1982) points out that a credit contract involves agreement on both the terms of repayment and the collateral to be provided. There is evidence that in Korea, as in many of the countries which control bank interest rates, the banks' collateral requirements are much more stringent than in the unregulated financial sector. When total interest plus collateral costs are taken into account, the existing degree of market segmentation may not be nearly as great as interest differentials alone would indicate, in which case the effects of bank interest rate deregulation need not be as great as those projected here.

Similarly, some portion of the existing interest rate differential between the regulated and unregulated financial sectors may be attributable to a risk premium rather than to market segmentation. To the extent that the risk derives from the illegality of some unregulated sector dealings, then the need for the risk premium will disappear once the need for the legal ban disappears. Some interest rate differential could be expected to persist after bank interest rate deregulation, however, if unregu-

lated sector clients have a higher default risk than others.

This leads to a final question, namely, whether deregulation of bank interest rates would have the effect of killing off the curb money market naturally. To the extent that deregulation attracts deposits away from the unregulated financial sector, the volume of loans in that sector will decline. Now whether this corresponds to the death of the curb portion of the unregulated financial sector depends on whether the banks and official non-bank financial intermediaries are also able to provide all the services formerly provided by the curb market. Official non-bank financial intermediaries in Korea have already taken over some of the short term financing formerly carried out in the curb market. Further encouragement of equity markets could also take some of the burden of long term industry financing off the banking system and allow the banks to enter the fields of consumer credit and mortgage finance. Without these institutional changes, however, the unofficial money market can be expected to remain, even after bank interest rate deregulation, in order to perform financial intermediation services that are not provided elsewhere.

More generally, the Korean experience suggests that when there is price control and quantity rationing in the regulated financial sector, the unregulated financial sector performs two functions - it provides an additional source of higher cost credit, and it mitigates against government attempts to control the end use of credit. This paper has examined the empirical implications of ending "price" segmentation. Financial markets may remain segmented in the sense that different sectors specialize in different functions. And so long as a demand for a particular financial intermediation service exists, there will generally be some market sector to serve it.

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