The Developing Economies, XXXIII-3 (September 1995)

LIBERALIZATION EFFECT IN FINANCIALLY REPRESSED ECONOMY: THE CASE OF INDONESIA, 1982–90

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I. INTRODUCTION

AT one time McKinnon and Shaw stated that rising interest rates promote saving and thus economic growth (McKinnon-Shaw hypothesis) [36][52]. Thereafter there was much discussion about how financial repression depresses the growth rates in many developing countries including some Latin American countries. Roubini and Sala-i-Martin actually showed that the introduction of the financial repression variable into the growth regression successfully explained the differences in growth rates of developing countries without using a Latin American dummy [50]. Recently financial liberalization has become a popular theme in the policy dialogues between developing countries and international organizations. On the other hand, Greene and Villanueva showed that the real deposit rate negatively influences private investment in developing countries, suggesting that a rising deposit rate might hinder accumulation [23]. Thus, McKinnon-Shaw hypotheses are still open for additional studies and debates.

The effects of financial liberalization may differ depending on the stage of development and the institutional schemes. At an early stage of development, the rising interest rates can induce the shift of wealth from unproductive goods to the loan market. If government expenditures do not financially crowd out private investment, this inflow could accelerate capital formation. Morisset constructed a model along these lines and applied his theory to Argentina [39]. However, financial repression also occurs in other situations even when we assume the presence of fixed normal saving and investment schedules. Clearly it is important to analyze the effects of financial repression within the context of the usual scheme of the loan market. This orientation was selected in this paper. The inflow of funds from unproductive activities can be treated as a further shift of the saving schedule at a later time. In this paper I do not discuss wider topics such as the complementarity between money and capital.

We must construct a model of the financial markets and test the McKinnon-Shaw hypothesis under the usual assumptions: saving (investment) is a positive (negative) function of interest rates. Also I want to explicitly reflect stylized facts such as the dual market structure in developing countries. Otherwise it is not intuitively clear whether financial repression depresses the average interest rate, or if the fund escapes by means of an informal market and raises the average cost of investment.

In this paper I constructed a model applying to the general case of financial repression to simulate the distortions caused by two governmental interventions, segmented market and enforced saving policies, and analyzed the effects of financial repression and financial liberalization in terms of interest rates, saving and public and private investments, and surplus of different groups. When necessary I adopted the linear approximation and assessed the effects quantitatively.

Some regression studies have been carried out to analyze the liberalization effects. Levine showed that three financial variables (the size of the banking sector, the fraction of credit issued to private enterprises, and *M3*/GDP) contributed positively to the GDP growth rate and the investment propensity by cross-sectional regression [33]. Gultom-Siregar assessed the liberalization effects in Indonesia based upon the investment function using firm data [24]. I present a structural model of the dual loan market which consists of savers as well as public and private firms. The model analysis here with other models can hopefully complement each other to deepen understanding of financial liberalization.

The structure of the paper is as follows. In Section II I examined the experiences of several countries. In Section III the basic model was outlined and the effects of financial repression were analyzed. In Section IV I applied the model to the financial liberalization in Indonesia in the 1980s. In Section V I analyzed the evaluation of public investment when it was politically enacted (weak assessment of benefit-cost effectiveness is important). Section VI contains a summary and conclusions.

II. COUNTRY EXPERIENCES

Market segmentation (*MS*) or the dual factor market occurs even in the industrialized countries. For example, Reich noted the persistence of labor market segmentation in the 1970s in the United States, although the financial market was fully integrated [46]. Fukuchi and Oguchi constructed a model for the dual productivity structure caused by the dual interest rates and wages in Japan in the 1950s [18]. A low interest rate policy persisted in Japan before the oil crisis and regulated the time deposit rate at city banks as 5 per cent, while the average contracted interest rates on loans were 3–4 per cent higher. Also the government collected funds from the postal saving scheme. These cheap funds were invested in the infrastructure and in the manufacturing industries through various channels. Undoubtedly this policy transferred a large surplus from savers to investors, although Horiuchi pointed out the higher profit rate in city banks than in all industries and cast a doubt about the effectiveness of this policy in industrial promotion [27].

In developing countries, market segmentation and related interest rate differentials are widely observed and deeply influence business behaviors. Nabi analyzed the financial dualism in Pakistan, and pointed out that "firms having access to the 'official' capital market behave according to the flexible accelerator model of investment while firms without such access rely mainly on past profits . . ." [40, p. 461]. According to Huang, Cheng, Chou, and Lin,"Taiwan's financial sector is still characterized by dualism, with the coexistence of both regulated and unregulated

(curb) markets. The ratio of financial loans from the unregulated market to those from the regulated market for the total private enterprise has been consistently large, averaging 27.5% for the period 1971–88" [28, p. 975]. Interest rate in the unregulated markets of Taiwan was 20–30 per cent whereas that in the regulated market was less than 10 per cent in 1982–88. Cho noted a remarkable dual structure of interest rates in Korea. The curb market rate changed from 44.9 per cent (1980) to 24.0 per cent (1985), while the bank loan rate changed from 20.0 per cent (1980) to 10.0–11.5 per cent (1985). There was a selective credit policy that was abandoned in 1982. (See [10, p. 103].) Leite and Vaez-Zadeh analyzed the effect of this policy upon the investments by large and small firms. They emphasized the different effects of the concessional interest rate and of the credit availability [32]. Cho analyzed the major liberalization effects through the development of non-banks and direct financing. The cost of borrowing for sixty-eight different manufacturing industries decreased from 20.47 per cent (1980) to 14.46 per cent (1984) [10, p. 107].

These examples show that: (1) the existence of dual financial markets is not atypical in developing countries, indicating that we need to explain the differential in interest rates and the volume shares of credits in dual markets simultaneously, (2) the average interest rate is not necessarily low, if we consider the average in two coexisting markets, (3) it is not certain that the financial liberalization lowers the average interest rate, and (4) in the case of liberalization, the share of public investment decreases.

As a basic financial repression model, Fry assumed a normal upward sloping saving curve and downward sloping investment curve, and considered financial repression as a disequilibrium caused by the low interest rate constraint [17, p. 733]. The institutional low interest rate dictates the lower-than-free-market level of saving, which in turn limits the investment level. In this setting, financial liberalization (elimination of an administrative scheme of concessional lending to public firms) would result in an increase of interest rates and also in a parallel increase of saving and investment. In such a single market setting, it is difficult to explicitly consider the four stylized facts mentioned above. As other examples of one-sector model, Molho and Kähkönen also constructed 2–3 period utility maximizing models to analyze the impact of liberalization on welfare, in which the deposit and loan rates act as important parameters in one-sector setting [38][29]. On the other hand, there are segmented market models. Roemer presented a model for the segmented credit market with different assumptions from mine [49], which I will discuss in the next section.

I present a model for dual financial markets and try to incorporate the four points presented above. I assume that: (1) the government adopts a public investment promotion policy, considering not only the internal benefit but also the external and wider benefit of public investment, and (2) the government adopts two measures for promotion: segmented market and enforced saving policies. The latter aims to promote total investment, and the former specifically aims at public investment promotion. The combination of the two creates a distortion in the financial market, which I designate as the general financial repression (*FRG*). It is interest-

ing to assess the effects of financial repression not only qualitatively but also quantitatively. Thus in the course of my discussion, I adopted a linear approximation of schedules, when necessary. I also tried to separate the short-term as well as the medium-term effects of a policy package for financial liberalization, which includes not only the elimination of distortion, but also positive action such as the promotion of free entry.

III. BASIC MODEL OF FINANCIAL REPRESSION

First I define the free loan market without the distortions, and then introduce the interventions one by one.

A. *Free Market Equilibrium in Integrated Market (FIM)*

The fully developed integrated financial market consists of savers with an upward sloping saving schedule (*S*) and investors with a downward sloping investment schedule (*IT*). There are two investor groups: (1) big enterprises, and (2) small and medium firms. In many developing countries, the former (latter) mainly consists of the public (private) firms. Thus we simply designate the two groups public and private firms. Then *IT* is the horizontal sum of the public investment (*IG*) and private investment (*IP*). The *IG* and *IP* schedules are supposed to be drawn solely according to the firm-based economic calculation or the internal cost and benefit. For simplicity we assume that the slope of each schedule is constant, and we write the interest rates on *IG*, *IP*, *IT*, and *S* schedules as *RG*, *RP*, *RT*, and *RS*. The interest rate is defined as the real rate, that is, the nominal rate minus the rate of inflation. After trying to describe the saving ratio based on cross-sectional data of developing countries, Giovannini estimated that: "the coefficient of the real rate of interest is always negative, but very seldom significant" [21, p. 204]. It is difficult to obtain a significantly positive slope of saving schedule based on cross-sectional data if financial repression occurs in many countries. Therefore, I assumed a normal saving schedule with a positive slope.

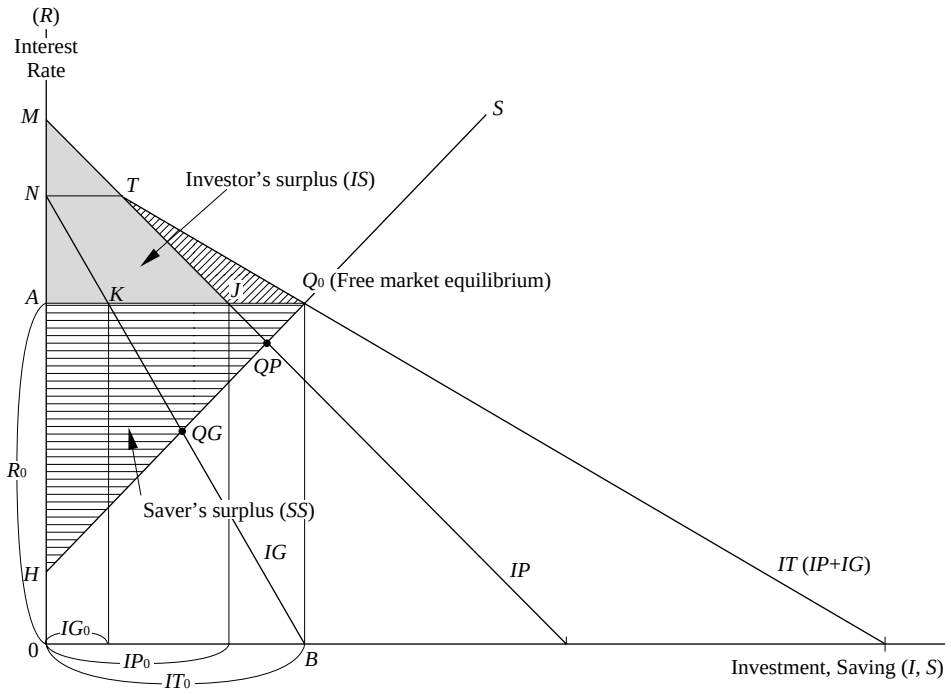
I neglected the commission fee (the difference between deposit and lending interest rates) of intermediaries or banks just for simplicity, assuming that the deposit and lending interest rates as an equal. In reality, the commission accounts for a non-negligible amount and results in a high profit for the banking sector, which was well documented by Horiuchi for Japan [27, p. 363], and implies that a part of the transfer of saver's surplus goes to banks.

We consider the case in which the financial intermediation operates smoothly without government intervention. Then investments (*IG*, *IP*), saving (*S*), and common interest rate (*R*) are simultaneously determined at the free market equilibrium point (Q_0) (Figure 1). For simplicity we assume linear schedules for calculations and compare the equilibrium values and surpluses. The suffix 0 is attached to the equilibrium values.

$$S_0 = IT_0 = IG_0 + IP_0, \quad RT_0 = RG_0 = RP_0 = RS_0. \tag{1}$$

In this case, The area $A.Q_0.H$ is the saver's surplus (*SS*). The area $M.T.Q_0.A$ is the

Fig. 1. Free Market Equilibrium in Integrated Market (*FIM*)



investor's surplus (*IS*), out of which *N.K.A* (or $T.Q_0.J$) and *M.J.A* stand for the public investor's surplus (*IGS*) and private investor's surplus (*IPS*), respectively. The sum of the two surpluses is defined as the social welfare (*SW*). Snowden designated the whole area as producer's surplus [54, p. 86], but I divided it into three: saver's, private investor's, and public investor's surpluses.

$$SW_0 = SS_0 + IS_0 = SS_0 + IGS_0 + IPS_0. \tag{2}$$

B. *Two Measures for Public Investment Promotion*

The internal rate of return of public investment may be relatively lower than the private investment, because the public investment projects are associated with not only economic but also various political and social targets like offering public services (running water, energy, transport, communication) at low prices, fostering of infant industries, securing necessary sources of employment, and others. So we assumed that the *IG* schedule lays lower than the *IP* schedule in Figure 1, but this assumption is not essential to validate the theorems.

Now the government wants to promote the public investment because it estimates that the social rate of return of public investment is essentially higher than the mere internal rate of return. Such a need occurs when (a) the size of the financial market is small (with a steeply rising saving schedule) and thus the absolute

public investment realized in the free market is very small, or (b) the size of the market is relatively large, but the investment falls short of the target. Type (a) corresponds to a starter of development with a very limited financial market, and type (b) to middle-income developing countries with a relatively well-developed financial market. The following discussions apply both to (a) and (b).

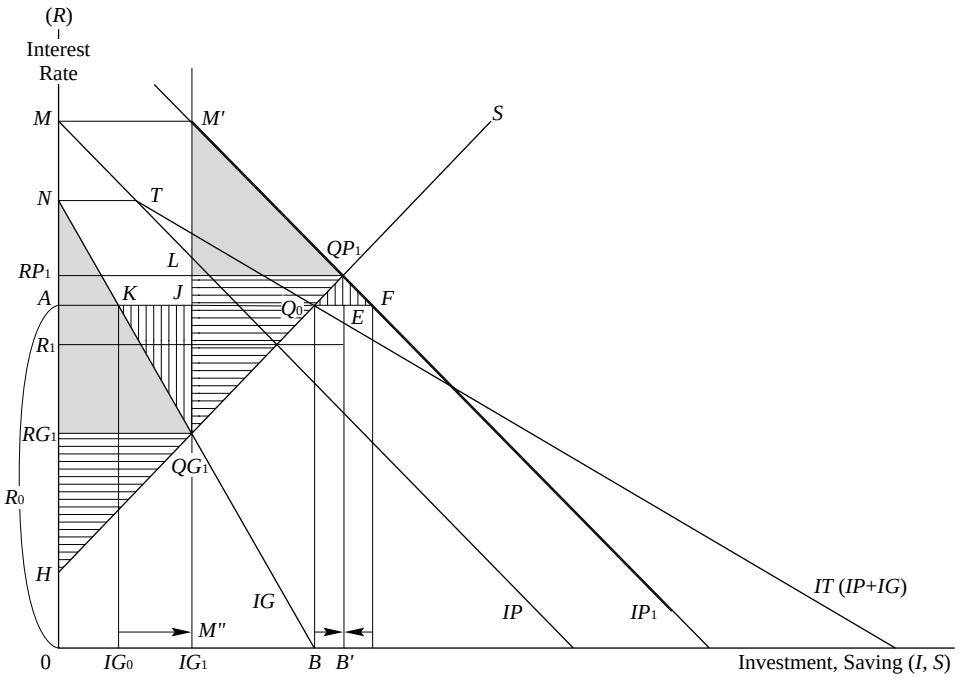
Basically there are two types of measures: (1) market segmentation policy through intervention in the investment schedule, and (2) enforced saving policy through intervention in the saving schedule. I discuss these one by one.

1. *Market segmentation*

The government gives privileged access to public firms, while the private firms can approach the market only later. Let us designate the change from an integrated to a segmented market as market segmentation (*MS*), and the opposite change from segmented market to an integrated market as market integration, and designate the market without intervention as integrated or consolidated market (*IM*) when necessary. The suffix 1 is attached to variable in segmented market (*SM*).

In Figure 2, first the public investment (IG_1) and interest rate for public firms (RG_1) are determined at the intersection point (QG_1). Then, the private investment schedule shifts to the new position ($M'.M''$) because IG_1 is set aside from the saving

Fig. 2. Segmented Financial Market (*SM*)



resource. The private investment (IP_1) and the corresponding interest rate (RP_1) are determined at QP_1. The amount of saving, $S(RP_1) - S(RG_1)$, is directed to the private investment.

$$RG_1 = RG(IG_1) = RS(IG_1). \quad (3)$$
$$RP_1 = RP(IP_1) = RS(IG_1 + IP_1). \quad (4)$$
$$R_1 = [(RG_1)(IG_1) + (RP_1)(IP_1)] / (IT_1). \quad (5)$$
$$IT_1 = IG_1 + IP_1 = S_1. \quad (6)$$

Lending to public firms is formally enforced by law or strict rules such as asking for a sufficiently large collateral, which the government does not intervene in the lending to private firms. Thus we can reasonably designate the first market as an organized or formal market and the second one as the unorganized or informal (curb) market. The interest rate for public firms (RG_1) and for private firms (RP_1) is lower and higher than the free market interest rate (R_0), respectively. Some authors like van Wijnbergen tend not to see the persistence of a wide interest rate differential as clear evidence of a segmented market in disequilibrium [59]. However, I consider that the interest rate differential actually reflects a different risk premium.

As the public investment increased by ($IG_1 - IG_0$), which was not financed earlier in the free market, the overall efficiency of investment decreased. This resulted in two losses: (a) a partial crowding-out of private investment, and (b) social distortion costs.

The saver's surplus decreased by $A.J.QG_1.RG_1$ and increased by $L.QP_1.Q_0.J$. The surplus for public firms increased by $A.K.QG_1.RG_1$, while that for private firms decreased by $L.QP_1.F.J$. By market segmentation, public firms gain and private firms lose, while saver's surplus increases (decreases) when the ex-post ratio of public to private investment is larger (smaller) than a critical value ($X1SS$). The social welfare decreased by $K.J.QG_1$ and $QP_1.F.Q_0$, which is the deadweight loss of market segmentation. We designate this phenomenon as strong distortion cost (*SDC*), where the cost is defined by changing the sign of surplus. We designate the sum of surplus transfer, $A.K.QG_1.RG_1$ from savers to public firms and $L.QP_1.Q_0.J$ from private firms to savers, as the weak distortion cost (*WDC*), because any transfer between different social groups causes some social frictions and resistance. Let us label the sum of strong and weak distortion cost as the total distortion cost (*TDC*).

Thus we derive Theorem 1. Validation is presented in the Mathematical Appendix.

THEOREM 1. *Effect of Market Segmentation:*
Based upon market segmentation favorable to public enterprises,

$$dIG, dIT, dRP, dIGS > 0. \quad (7)$$
$$dIP, dRG, dIPS, dWDC, dSDC, dTDC < 0. \quad (8)$$
$$sign\ dR = sign\ (X1R - IG_0 / IP_0) \quad (X1R > 0). \quad (9)$$
$$sign\ dSS = sign\ (X1SS - IG_0 / IP_0) \quad (X1SS > 0). \quad (10)$$

Theorem 1 basically confirmed that private investors lost through decreased investment and higher interest rate by market segmentation while public firms gained. But the theorem could not determine the direction of changes of average interest rate (R) and saver's surplus (SS). There are two ceiling values, $X1R$ defined in (A27) and $X1SS$ defined in (A31). The direction of change hinges upon the comparison between these ceiling values and the initial ratios of public to private investments. As further information like $A1 = B1$ can fix the sign, the average interest rate would decrease in this case.

$$\text{If } A1 = B1, \quad X1R < 0 \text{ and } R_1 < R_0.$$

Buffie constructed a model for the financial markets, where the curb market behaved as the marginal supplier, although the market in his model was not segmented [7]. Roemer analyzed segmented market models for credit, grain, and urban labor [49]. Roemer assumed two independent demand curves by big and small borrowers. The big lenders offer the credit in the formal market only to the large firms and wealthiest persons, then offer the remaining funds to the informal market but with a high premium to cover the risk. Then moneylenders, traders, and family members operate only in the informal sector. In the formal market, the big lender's supply curve intersects with the demand curve of big borrowers, and then a kinked supply curve, which represents the sum of the remaining fund of big lenders and small lenders, intersects with the demand curve of small borrowers. Thus a large risk premium perceived by the big lenders creates a dual market: "credit markets may well be segmented in the absence of government intervention or monopoly control" [49, p. 433]. In contrast, I assumed a smooth supply curve and two demand curves by public and private firms, and explained the creation of dual market through governmental intervention. In developing countries there are many unorganized markets especially in remote areas, which are not connected with the formal market. As Owen and Solis-Fallas commented, the relative efficiency of intermediation in formal and informal markets is important when we assess the liberalization effects [43]. But as Christensen stated, the full understanding of these informal markets is difficult [11]. My definition of unorganized market here naturally cannot cover all the unorganized markets. My model may fit to a developing country market, where the financial market already developed to a certain extent, while Roemer's discussion may be more relevant to an economy in the infant stage of financial development.

2. *Enforced saving*

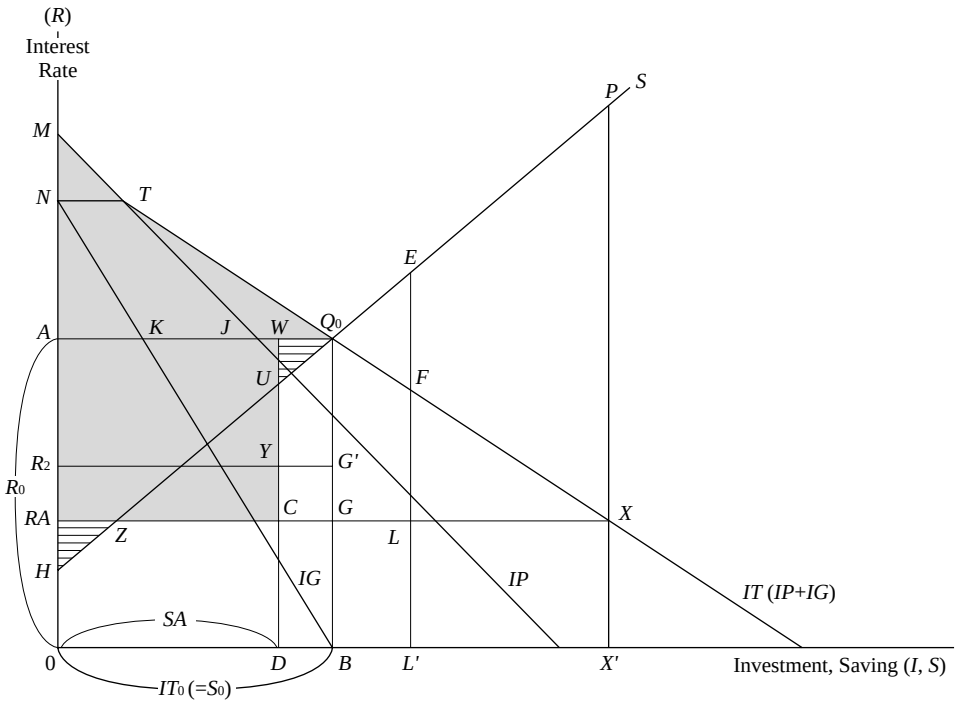
Another possible strategy to increase public investment is to provide an investment fund (SA) based on the administratively set interest rate (RA), which is lower than the free integrated market rate (R_0). The main objective is to reduce the cost of funds so that the total amount of investment largely increases. Several enforcement mechanisms can be applied to raise cheap funds: by collecting the tax revenue (actual taxation, seigniorage, or inflation tax), by issuing government bonds with low interest rate, or by controlling the deposit interest rate and socially persuading the people to save. By these actions the saving schedule will be hollowed down-

ward. I want to describe this change by assuming that the saving schedule will have a horizontal part (*SA*) at the height of *RA*. Let us designate such strategies as enforced saving (*ES*) or saving regulation and the elimination of control as the saving deregulation.

There may be two different interpretations of enforced saving depending on whether the government was actually able to enforce the interest rate (*RA*). If the government could enforce it completely, then this interest rate determines the volume of saving (by $RA = F(S)$), which in turn determines the level of investment and the remaining savers would bring the fund out of formal market. Here I assume that the government can control only the fixed amount, say *SA*, which may not cover the whole formal market. Thus the size of *SA* reflects the strength of the enforced saving policy.

In Figure 3 the concessional interest rate (*RA*) is set below the equilibrium market rate (R_0). When the amount (*SA*) does (not) exceed the investment level in the free market (IT_0), we designate the intervention as major (minor). In case of minor intervention the level of investment and saving does not change, while a fixed amount of transfer occurs from savers to investors. In Figure 3, *SA* is fixed as 0.*D* (or *RA.C*) and the amount *A.W.C.RA*, which is equal to the total interest rate subsidy, $(R_0 - RA)(SA)$, is transferred from savers to investors. In this case, that

Fig. 3. Integrated Market with Enforced Saving (*ES*)



amount represents the weak social distortion cost, and also the total distortion cost. This operation may be very painful to savers, because the transfer may exceed the original saver's surplus in the free market equilibrium.

In case of major intervention, since the investment fund with low administrative interest rate exceeds the original level of investment, the level of investment and saving is likely to increase. If *SA* is set as $0.L'$, the level of investment or saving would increase by *G.L.* In this case, the amount $A.Q_0.F.L.RA$ is transferred from savers to investors. Beyond that the triangular area, $Q_0.E.F$, represents the net social welfare loss or strong distortion cost. Thus the total distortion cost is given as $A.Q_0.E.L.RA$. At the extreme, since the investment fund can be set at $0.X'$ or $RA.X$, then the total distortion cost becomes $A.Q_0.P.X.RA$. This case may correspond to an emergency situation like internal or external war, where the government exploits the private savers (or consumers), and put all the social saving resources into the contemporary investment activities.

The average interest rate will decrease by the same amount as the average interest rate subsidy, $(R_0 - RA)(SA)/IT_0$. In the major intervention, the average interest rate may coincide with the concessional rate (*RA*).

There is no set rule to determine how the transfer to investors is divided among the private and public enterprises. Thus I assume that the transfer is distributed based upon the ratio in the free market equilibrium. We sum up the discussion in Theorem 2. The proof is straightforward.

In a major intervention case, the investment and saving would increase by $(SA - IT_0)$, while the average interest rate is equal to the concessional rate. The weak distortion cost and also the strong distortion cost would increase with *SA*. The total distortion cost exceeds the amount of the interest rate subsidy, as the savers incur additional losses.

THEOREM 2. *Enforced Saving:*
Enforced saving results in investors' gain while savers incur losses.

(*a*) *In a minor intervention case:*

$$dIG, dIP, dIT, dS, dSDC = 0. \quad (11)$$
$$dIGS, dIPS > 0. \quad (12)$$
$$dRG, dRP, dR, dSS, dWDC, dTDC < 0. \quad (13)$$

(*b*) *In a major intervention case:*

$$dIG, dIP, dIT, dIGS, dIPS > 0. \quad (14)$$
$$dRG, dRP, dR, dSS, dWDC, dSDC, dTDC < 0. \quad (15)$$

When the political purpose is to promote public investment, market segmentation is a direct measure to increase it, while enforced saving is an indirect measure through the increase of overall investment. Both measures commonly contribute to the formation of a dual financial market: a market with a low interest rate and another with a higher interest rate. Let us designate the former as the organized and official market since only limited enterprises can gain access to it; public firms can

have access in the case of market segmentation, while the selection of enterprises is implicit in enforced saving. Then the latter is the unorganized and unofficial market. Let us designate the existence of a dual interest rate structure and related dual market as financial repression. Thus when we observe financial repression in a developing country, it may originate from market segmentation or enforced saving or both. If both coexist we refer to the general financial repression (*FRG*).

Let us compare the relative usefulness of the two measures to promote public investment. If we assume that the two measures are in a sense of the same size, *SA* is equal to IG_1 and *RA* is equal to RG_1. The public investment increases with market segmentation but remains constant with enforced saving. The amount of interest rate subsidy to public enterprises can be larger with market segmentation, if the share of public firms is low in the free market equilibrium. However, the private investment is partially crowded out with market segmentation, and also the total distortion cost is definitely larger in market segmentation than enforced saving. Therefore, when the government needs to promote public investment, the selection between market segmentation and enforced saving policies depends upon the political weights of several components. The increase of public investment and the transfer to public firms will be evaluated positively, while the crowding-out of private investment and the total distortion cost will be evaluated negatively.

C. *Financial Repression and Liberalization*

1. *Financial repression (general case)*

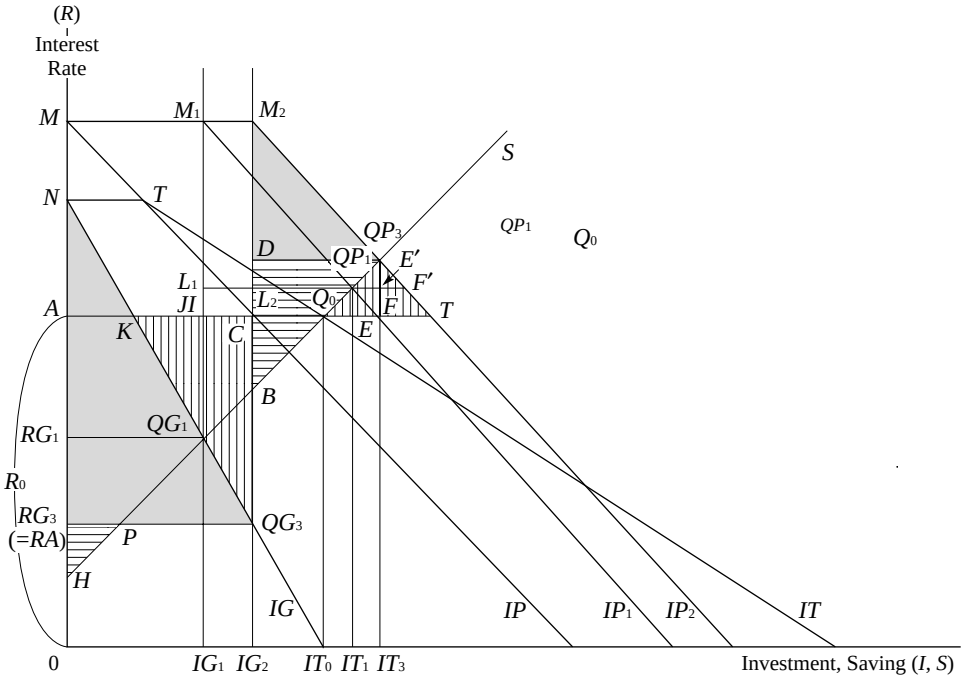
In many developing countries, the government combines market segmentation and enforced saving to promote or subsidize public firms. Let us consider this general case of financial repression. We confine enforced saving to a minor one. We consider two cases: case (a) addition of enforced saving to segmented market, and case (b) addition of market segmentation to enforced saving case.

Case (a): In Figure 4, the interest rate for public enterprises decreased from RG_1 to RG_3 (= *RA*), and increased the public investment by $dI\text{G}$ (= $IG_2 - IG_1$). Now the private investment schedule starts from M_2, and the new intersection point with the saving schedule is QP_3. The interest rate for the private sector increased by $D.L_2$. The private investment is further crowded out by $E'.F'$, while the total investment increases by $QP_1.E'$. The change in the weighted average interest rate depends upon the parameters. It tends to decrease when the ratio of public to private investment is large enough in the free market equilibrium.

The surplus of public firms increases by $RG_1.QG_1.QG_3.RG_3$, while the surplus of private firms decreases by $D.QP_3.F'.L_2$. The saver's surplus changes by $(-)RG_1.QG_1.L_1.L_2.QG_3.RG_3$ and $(+)D.QP_3.QP_1.L_2$. The area $RG_1.QG_1.QG_3.RG_3$ is transferred from savers to public firms, and $D.QP_3.QP_1.L_2$ is transferred from private firms to savers, and the sum represents the weak distortion cost. The net social loss is $L_1.L_2.QG_3.QG_1$ and $QP_3.F'.QP_1$.

Thus the addition of enforced saving to the segmented market, resulting in the creation of dead weight loss $L_1.L_2.QG_3.QG_1$, greatly damages the savers' welfare, as the new amount $L_1.L_2$ is extracted from the transactions with private firms and

Fig. 4. Financial Repression (General Case) (*FRG*)



supplied to public firms with an artificially low interest rate. As a result, inefficient allocation of resources is enhanced.

THEOREM 3A. *Financial Repression—Addition of ES to MS: Public investment increases while private investors are further repressed. When a minor intervention of enforced saving is added to market segmentation case and* $dRG < 0$,

$$dIG, dRP, dIT, dIGS > 0, \quad (16)$$

$$dIP, dRG, dIPS, dWDC, dSDC, dTDC < 0, \quad (17)$$

$$sign\ dR = sign\ (X2R - IG_0/IP_0), \quad (18)$$

$$sign\ dSS = (-)\ sign\ [(XA) - (XB)(dRG)], \quad (19)$$

where

$$XA = (IG_0) + [A1(B1 + C1)(B1 + C1) + C1D](IP_0) > 0, \quad (20)$$

$$XB = (1/A1)[1 - B1C1C1/A1/(B1 + C1)/(B1 + C1)]. \quad (21)$$

Some additional results can be obtained by further information. For example:

If $A1 = B1$, $dR < 0$. If $XB < 0$, $dSS < 0$. Only if $XB > 0$ and $(-)XB \cdot dRG$ exceeds XA, $dSS > 0$.

Thus there is a high probability that the average interest rate will decrease, and the saver's surplus will deteriorate.

Case (b): Now market segmentation is added to the enforced saving case. In Figure 4, by enforced saving the area $A.C.QG_3.RG_3$ is transferred from savers to investors, while the total investments and savings are determined at QP_3. After market segmentation is realized, savers get the additional surplus by $D.QP_3.Q_0.C$, while private investors lose $D.QP_3.T.C$. Therefore, $QP_3.T.Q_0$ is a new social loss. The public investors get a surplus $A.K.QG_3.RG_3$ in the new position. Therefore, if their share of interest rate subsidy under the enforced saving scheme is less than this area, their surplus will increase and the private investors incur a loss accordingly. The average interest rate will go up. Next two theorems state that widening of financial repression results in further gains for public firms and in further losses for private firms.

THEOREM 3B. *Financial Repression—Addition of MS to ES: When market segmentation corresponds to the case of a minor intervention of enforced saving,*

$$dIG, dRP, dIT, dR, dSS > 0, \quad (22)$$
$$dIP, dRG, dWDC, dSDC, dTDC < 0. \quad (23)$$

We compile the change between free market equilibrium in integrated market (*FIM*) and general financial repression (*FRG*):

THEOREM 4. *General Financial Repression: When the market changes from FIM to FRG,*

$$dIG, dIT, dRP, dIGS > 0, \quad (24)$$
$$dIP, dRG, dIPS, dWDC, dSDC, dTDC < 0. \quad (25)$$

The changes in average interest rate and saver's surplus depend upon the parameters.

Now we compare the changes of variables between various situations. In case (a), the economy changes from the free market equilibrium in integrated market (*FIM*) to segmented market (*SM*), then to general financial repression (*FRG*) by adding enforced saving (*ES*). In case (b), enforced saving is adopted first, then market segmentation is added. The changes of variables are given in Table I. The changes in the direct route from free market equilibrium to general financial repression are shown in the last column.

The effects of market segmentation (*MS*) (first and fourth columns) differ depending on the presence or absence of enforced saving (*ES*). Also the effects of enforced saving (second and third columns) are different in integrated market (*IM*) or segmented market (*SM*). If we define the deepening of financial repression as the addition of market segmentation or enforced saving policy to the current situation, the deepening of financial repression shows different effects at different stages. Conceptually we can strictly identify three cases: (1) *MS*, (2) *ES*, and (3) *FRG* (combination of *MS* and *ES*). In real world, each country combines two measures

TABLE I

CHANGES OF VARIABLES BETWEEN VARIOUS MARKETS

Route	*FIM* → *SM* → *FRG*			*FIM* → *ES* → *FRG*			Direct
Cases	(0)	(1)	(3)	(0)	(2)	(3)	(0) to (3)
	FIM	*SM*	*FRG*	*FIM*	*ES*	*FRG*	*FRG*
Market	*IM*	*SM*	*SM*	*IM*	*IM*	*SM*	*SM*
ES	No	No	*ES*	No	*ES*	*ES*	*ES*
IG	+	+		0	+		+
IP	–	–		0	–		–
IT	+	+		0	+		+
RG	–	–		–	–		–
RP	+	+		–	+		+
R	(–)	(–)		–	+		(–)
IGS	+	+		+	?		+
IPS	–	–		+	–		–
SS	?	?		–	+		?
WDC	–	–		–	–		–
SDC	–	–		0	–		–
TDC	–	–		–	–		–

Note: Signs of changes in *R* are determined assuming that *A*1 is equal to *B*1.

with different weights, and the current situation also differs. Therefore, in general, it is difficult to determine accurately the effects of financial repression.

2. *Financial liberalization and market expansion*

The general case of financial repression (*FRG*) is distorted by two policies: market segmentation and enforced saving. Therefore, the economy in general financial repression comes back to free market equilibrium in integrated market by the adoption of corresponding countermeasures: market integration and saving deregulation. Let us designate this process as financial liberalization. The effects of financial liberalization can be assessed by changing the signs of the effects of change from case (0) to case (3).

The policy package for restructuring the financial sector usually includes market integration and saving deregulation, and also the permission of free entry to promote the competition and to disseminate the financial services. The free entry strategy will trigger the establishment of new private financial institutions and the increase in the number of branches and facilitate the access of asset-holders to these institutions. In case of market integration and saving deregulation, the public firms must abandon the soft-budget-type management and increase the productivity, while the dynamism of private firms will be enhanced by identifying better business opportunities. Based upon these effects, the saving and investment schedules will shift to the east after a lapse of time.

The upward shifts of investment schedules are likely to increase the equilibrium investment and interest rate, while the shift of saving schedule to the east may

increase the investment but lower the interest rate. Thus the direction of change of average interest rate depends upon the relative speed of schedules. Let us designate the changes in variables through the shifts of saving and investment schedules as market expansion. While the effects of market integration or saving deregulation appear rather quickly, the effects of market expansion take time to materialize and reflect the medium-term effects of the liberalization process.

There were some popular concepts about the effects of financial liberalization and deepening: "positive real interest rates raise the saving rate," and "financial deepening and growth are positively correlated," and "increased real interest rates raise investment." De Melo and Tybout confirmed the first concept, but not the third one in the case of Uruguay [13]. After reviewing the literature, Dornbusch and Reynoso considered that these concepts were dubious [14]. Since our results outlined above showed that the effects of liberalization differ depending on the conditions and duration, generalization is difficult. Therefore, our findings are in accordance with the concept according to which generalization is difficult.

IV. CASE OF INDONESIA

Let us apply our model to the recent trend of liberalization in Indonesia from 1982 to 1990. Indonesia was recognized as a typical example of a financially repressed economy in the 1970s and 1980s, but the government enacted some drastic liberalization measures and the financial sector quickly modernized and expanded, along with a substantial financial and real estate boom. Appendix Tables I and II provide data relating to investment, loans, deposits, and interest rates during the 1980–92 period.

Financial Market in Indonesia before the 1980s: As Woo pointed out, the fixed exchange rate and inflation decreased the tradable-nontradable price ratio by 30 per cent during the 1974–78 period [61, p. 357]. The government raised the effective rate of protection from 65 per cent in 1971 to 98 per cent in 1975, and also adopted various financial schemes to foster the tradable sector. Out of the total credit allocation in 1974–83, 43 per cent was directed to the manufacturing sector [61, p. 373]. As Kuntjoro-jakti pointed out, since the Indonesian government maintained the balanced-budget policy after 1968, and the tax collection effort was relatively limited, concessional lending was an important tool for industrial promotion [31, pp. 201–2]. Against this background, prior to 1983, Indonesia had a repressed financial system characterized by: (1) interest rate ceilings mostly at very low levels, (2) high reserve requirements by the central bank (15 per cent), (3) concessional selective credit with subsidized interest rates by monopolistic state-owned banks and the central bank, and (4) lack of development of private capital market. The share of public investment stood high at 33 per cent in 1982–83. All the bank loans provided 75 per cent of the investment funds, and the loans' share of state banks was 63 per cent in 1982–83. The adoption of a concessional selective credit scheme was criticized. Bolnick quoted eight examples of criticism including the concessional credit scheme's income transfers to the economically advantaged [6, p. 591].

Financial Liberalization Process in the 1980s: The financial reforms in the 1983–91 period are well documented (see Halim [25] and Nasution [41]). Financial deregulation started in 1983 to eliminate interest rate ceilings and reduce the discretion in credit allocation of several sectors, followed by consecutive deregulation packages. Through the deregulation packages in 1988, lowering of barriers on entry and branching, and reduction of the minimum reserve requirement from 15 per cent to 2 per cent were implemented. In sectorial GDP, the banking/financial institutions recorded the highest real growth rate of 14.3 per cent in 1989 (Soesastro and Drysdale [55, p. 6]).

Based on these data, we can point out some of the characteristics of financial liberalization:

—*Decreasing (Increasing) Share of Public (Private) Loans.* The share of state bank loans increased to 70.9 per cent, while the share of other (private) loans decreased to 29.1 per cent in 1984. These figures suggest that the lending of concessional loans through state banks was strengthened before 1983. However, the share of state bank loans decreased to 62.2 per cent in 1989, and further to 55.2 per cent in 1992, while the share of other bank loans increased to 37.8 per cent in 1989, and to 44.8 per cent in 1992. These facts suggest that the trend to a segmented market was promoted until 1983, but was markedly attenuated after the deregulation period (1983–88). The financial market became thus gradually close to the integrated market.

—*Increasing Share of Private Investment.* The share of public investment exceeded one-third, and increased to 42.6 per cent in 1985. After the deregulation period, it decreased to 25–27 per cent, although it once again increased in 1992.

—*Realization of Positive Real Interest Rate.* The real interest rate was negative until 1983 (Appendix Table II). After the interest rate ceiling was abolished, it became positive after 1984, suggesting that the (average) interest rate increased due to the deregulation measures enacted after 1983. The difference between deposit and lending interest rates exceeded 5 per cent in 1986, but decreased to about 3 per cent in 1990. This fact may suggest that the increased competition in the banking industry resulted in an increased competitiveness in the intermediation business.

—*Outward Shift of the Saving Schedule.* The amount of total bank deposits which was 4.7 (1983) quickly increased to 20.9 (1988), and to 67.6 (1992) (in trillion rupiah) (Appendix Table I). These figures suggest that after the implementation of financial liberalization the number and the volume of depositors remarkably increased. The increase in the number of banks and the activities of the Subdistrict Credit Body contributed to this shift as shown by Riedinger [47]. The increase was also remarkable after 1988, suggesting that the saving schedule further shifted after 1988. Nasution showed that the private saving increased by 3.3 times in 1986–90, and the share in gross domestic investment increased from 62 per cent (1986) to 84 per cent (1990) [41, p. 289].

The liberalization policy was still maintained after 1990. The economic package

in 1990 and 1991 consisted of various measures to improve banking management including the prudential regulation on capital adequacy ratio. Private capital market has shown progress in that the Jakarta Stock Exchange was officially privatized in July 1992. This privatization has been accompanied with such recent measures as investor protection, revision of the pension law enabling pension funds to be invested in the stock market, a new trust fund law, and so on. MacIntyre and Sjahrir noted the trends of monetary indices: (i) interest rate for working capital loans was stable at 21–22 per cent in 1986–90, and climbed to 27 per cent in 1991 QII; (ii) the three-month time deposit rate was 15 per cent in 1986, 17 per cent in 1987–89, then it increased to 21 per cent in 1990, and 25 per cent in 1991 [35]. However, I limited my analysis up to 1990, because the impact of these packages is not immediate and due to the complexity of factors in the 1990s. The gross national saving rate once decreased to 17.4 per cent in 1986, but recovered to 22.2 per cent (1991). Therefore, the further public saving promotion needs more serious investigation.

Simandjuntak indicated that the overall saving promotion is still limited and stated that "the interest rate is no longer strong enough to stimulate the increase of savings to an adequate percentage" [53, p. 79]. As Pangestu pointed out, in 1990 the government adopted the Kredit Usaha Kecil (small-scale credit) scheme which required that all banks provide 20 per cent of their credit to small-scale businesses [45]. The financial deregulation caused a large expansion in the financial sector and real estate sector mainly in the Jakarta region. The overheating of consumption may influence negatively further promotion of savings.

I analyzed the trends of the Indonesian financial sector by employing the basic model discussed in Section III, and with the statistical background outlined above. For simplicity, I divided the development in 1980–92 into two periods: (a) implementation period of financial liberalization (1983–88), and (b) after financial liberalization (1988–). This division is in agreement with the definition by other scholars. For example, Pangestu classified the period 1973–81 as financially closed, 1982–85 as still closed but with increased competition, and after 1986 as open with increased competition [44, p. 220]. I summarize the overall situation for analytical convenience, and I consider that the financial market in Indonesia was repressed before 1983, but became integrated and deregulated in 1983–88. Finally, I shall try to make comparative analyses.

Basically I intend to compare the following three situations:

—Case (0): Free market equilibrium before 1983, for example, 1980. This is a counterfactual position when market segmentation and enforced saving were not implemented, and therefore the financial market was in a competitive equilibrium in an integrated market.

—Case (3): General financial repression with segmented market and enforced saving policies. I consider that this condition corresponded to the actual situation of the Indonesian financial market in 1982–83.

—Case (4): Expanded free market equilibrium after 1988, for example, 1990. The financial market first shifts from case (3) to case (0) by market integration and

saving deregulation, and then to case (4) through the new expansion of the market which occurs due to the outward shifts of saving and investment schedules.

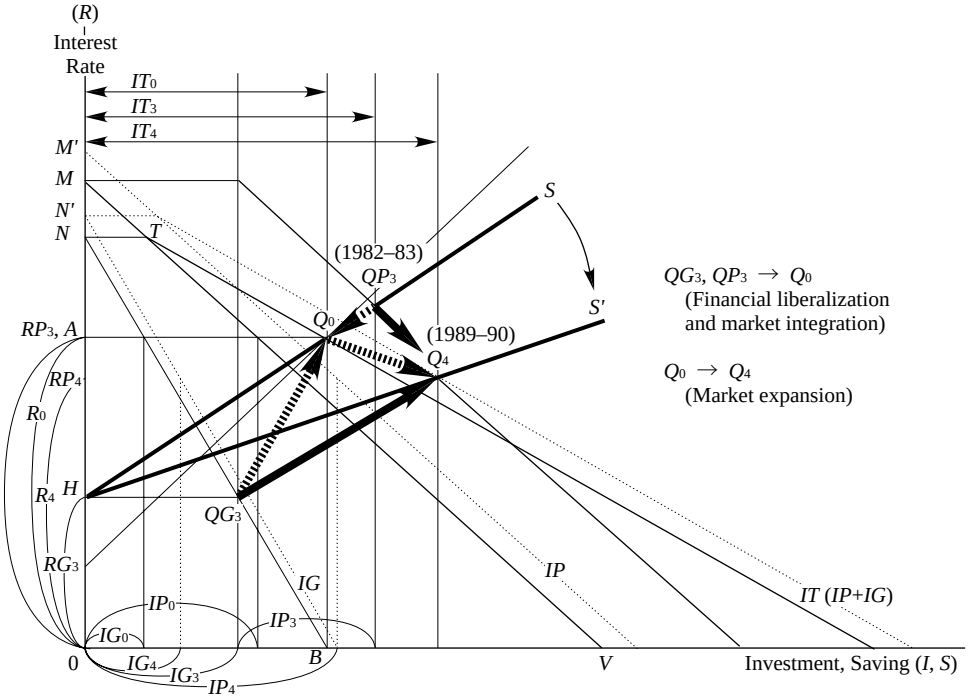
Based on the figures cited above, I calculated the average figures of variables for 1982–83 and 1989–90 as follows:

Case	Year	Investment (Trillion Rupiah)			Interest Rate (%)		
		IG	*IP*	*IT*	*RG*	*RP*	*R*
Case (3)	1982–83	6.5	12.9	19.4	1.2	15.0	10.37
Case (4)	1989–90	8.2	22.5	30.7	13.0	13.0	13.00

Note: *RG*(82–83) is the deposit rate plus 3 per cent (commission) minus inflation rate. *RP*(82–83) is *MMR*(82–83) plus lending rate (89–90) minus *MMR*(89–90) minus inflation rate. (*MMR* denotes money market rate.) *R*(82–83) is the weighted average of *RG* and *RP*.

I assumed that these figures corresponded to the actual points: QG_3 and QP_3 in 1982–83, and Q_4 in 1989–90 in Figure 5. I adopted a linear equation system as shown in the Mathematical Appendix. My next task is to explain the changes of variables by the assumed shifts of saving and investment schedules. I introduced certain assumptions for simplicity.

Fig. 5. Trend of Indonesian Financial Market Associated with Financial Liberalization and Market Expansion



1. The saving schedule starts from point (0, 1.2). The constant term cannot be smaller, as the *RG* in 1982–83 (1.2 per cent) was already very low.
2. I assumed that the public investment schedule passed the point (6.5, 1.2), and assumed that the slope was (–)2.0 so that IG_0 would be slightly positive. In this case, the interest rate elasticity of public investment at the point is (–)0.0923, which is a plausible value considering the insensitivity of public investment to interest rates.
3. I assumed that the private investment schedule passed the point (12.9, 15.0). I postulated that (i) the interest rate elasticity at this point did not exceed unity, and (ii) the private investment schedule was flatter than that of public investment. Then the slope must be found between (–)1.2 (0.9689) and (–)2.0 (0.5813). The figures in parentheses show the corresponding elasticities after changing signs. The estimate of interest rate elasticity of investment was very low for developing countries. According to the figures given by Teranishi, the elasticity for informal credit in prewar Japan was 0.7277 ($= 10.37 \div 0.057 \times 0.004$) [58].
4. The market expansion resulted in the parallel outward shifts of two investment schedules and a clockwise shift of the saving schedule.

These assumptions enacted to write three schedules as follows:

Assumption A ($B1 = 1.2$) (Appendix Tables III–V)	Assumption B ($B1 = 2.0$) (Appendix Tables VI–VIII)
(1982–83)	(1982–83)
$RG = 14.20 - 2.0\ (IG)$	$RG = 14.20 - 2.0\ (IG)$
$RP = 30.48 - 1.2\ (IP)$	$RP = 40.80 - 2.0\ (IP)$
$S = 1.20 + 0.7113\ (S)$	$S = 1.20 + 0.7113\ (S)$
(1989–90)	(1989–90)
$RG = 29.40 - 2.0\ (IG)$	$RG = 29.40 - 2.0\ (IG)$
$RP = 40.00 - 1.2\ (IP)$	$RP = 58.00 - 2.0\ (IP)$
$S = 1.20 + 0.3843\ (S)$	$S = 1.20 + 0.3843\ (S)$

According to Khatkhate, the average marginal rate of return to capital was about 12 per cent in 1971–80 for sixty-four developing countries. He computed a value of 37.53 per cent for Indonesia [30, pp. 581–82]. The constant terms of private interest rate schedules were 30.48 and 40.00 per cent for 1982–83 and 1989–90, respectively ($B1 = 1.2$). Therefore we can assume that these values are within a plausible range.

I calculated the values of variables based upon these two assumptions. The results based on Assumption A (B) are shown in Appendix Tables III–V (VI–VIII).

Figure 5 shows the process of financial liberalization from 1982–83 to 1989–90.

The Free Equilibrium Counterfactual Position before 1983 (Q_0)*:* In Figure 5, three lines (*HS*, *NB*, and *MV*) show the three schedules (*S*, *IG*, and *IP*). The initial equilibrium (Q_0) was determined by the free equilibrium in the integrated financial market before 1983, where the saving schedule and the total investment schedule (*IT*) intersect and determine saving, investment, and interest rate (R_0). The total investment schedule is expressed by the horizontal sum of the public investment schedule (*IG*) and private investment schedule (*IP*), and public and private investments were determined as IG_0 and IP_0 accordingly.

Actual Position before 1983 with General Financial Repression (QG_3 *and* QP_3*):* The financial authorities offered preferential lending to public firms by $H.QG_3$ with the concessional interest rate (RG_3) being less than the free market interest rate (R_0). As the private firms were only allowed to gain access to the remaining financial resources, the private investment schedule shifted to the east by IG_3. New equilibrium point was QG_3 for public investment and QP_3 for private investment.

Actual Position after Financial Deregulation (after 1988) (Q_4*):* Due to the liberalization policy package, the actual points moved from QG_3 and QP_3 to Q_4. This movement can be decomposed into two shifts: (a) from the actual position before 1983 to the free market equilibrium point before 1988, and then (b) the shift from Q_0 to Q_4.

(a) Short-Term Financial Liberalization Process: The financial authorities implemented the saving deregulation and market integration policies, including the abolition of interest rate regulation and of preferential access of public firms to concessional lending. These measures changed the market mechanism drasti-

TABLE II

CHANGES OF VARIABLES IN THE PROCESS OF LIBERALIZATION

Movement	Liberalization Effect		Historical Changes (Q_3 to Q_4)
	Short Term (Q_3 to Q_0)	Medium Term (Q_0 to Q_4)	
IG	(–) 5.64	(+) 7.34	(+) 1.70
IP	(+) 2.09	(+) 7.50	(+) 9.59
IT	(–) 3.54	(+) 14.84	(+) 11.30
RG	(+) 11.28	(+) 0.51	(+) 11.79
RP	(–) 2.51	(+) 0.51	(–) 2.00
R	(+) 2.10	(+) 0.51	(+) 2.61
IGS	(–) 41.51	(+) 66.51	(+) 25.00
IPS	(+) 35.13	(+) 168.78	(+) 203.91
SS	(+) 68.86	(+) 91.66	(+) 160.52
SW	(+) 62.49	(+) 326.97	(+) 389.46
WDC	(+) 76.64	( ) 0.00	(+) 76.64
SDC	(+) 62.49	( ) 0.00	(+) 62.49
TDC	(+) 139.14	( ) 0.00	(+) 139.14

cally. By these measures, the financial repression was eliminated and the separate positions (QG_3 and QP_3) were united and the economy returned to the original equilibrium point in the consolidated market (Q_0).

(b) Medium-Term Financial Liberalization Process: Thereafter, the liberalization measures should reveal some medium-term effects. During the deregulation period, 1983–88, the free entry resulted in a conspicuous increase in the number of banks, branches, and deposits. Therefore, the saving schedule shifted considerably outward (clockwise) from S (before 1983) to S' (after 1988). The investment schedule also shifted upward based upon the increase in productivity and the increase in the number of firms. Therefore, after 1988, the common interest rate (RP_4) and the total investment (IT_4) were determined at the new intersection point (Q_4).

I calculated the changes of variables in the process of liberalization in Appendix Table V assuming that $B1$ is 1.2. Results are summarized in Table II.

Thus the historical or actual change of variables could be divided into short-term and medium-term effects. The latter might include the effects of other factors than the liberalization package, which can be positive or negative, and their interaction effects with the liberalization package. We can therefore consider that the short-term effect is a pure and narrow effect of liberalization whereas the medium-term effect is only a rough approximation of the medium-term effect of liberalization.

Even the narrow effect of liberalization was remarkable. The ratios of various social costs to the value of interest rate payment ($IT \cdot R = 201.30$ in Case 3, $B1 = 1.2$) are as follows:

Case (3)	(1) (= X)	(2) (= $X/R/IT$)
WDC	76.64	0.3807
SDC	62.49	0.3104
TDC	139.14	0.6912

Thus due to the liberalization policy:

—The public investment shrank in the short term and increased in the medium term, while private investment continuously increased. The total investment decreased by 18.25 per cent in the short term, but increased by 58.25 per cent in the medium term.

—The interest rate for private investment decreased by about 2 per cent, while the interest rate for public investment increased by more than 11 per cent. The average interest rate continuously increased by 2.10 and 2.61 per cent in the short term and medium term, respectively.

—The surplus of public firms decreased in the short term but increased in the medium term by 59.17 per cent. The surplus of savers or of private firms increased steadily, and rose in the medium term to 3.13 or 8.80 times, respectively.

—The weak, strong, and total distortion costs amounted to 38, 31, and 69 per cent

of the interest rate payment of total investment when the market was financially repressed. These costs were basically eliminated in the short term by liberalization.

Gultom-Siregar estimated the investment functions for large and small firms which contain the cash flow and debt variables, and showed that the small firms heavily depended upon their own funds, but the access to external funds increased after the liberalization from 1984 onward [24]. The results shown above are consistent with such a firm-based study.

In the short run, the financial liberalization increases the surplus of savers and private firms while it decreases the surplus of public firms. Therefore, when we conceive financial liberalization as a social game, it is not Pareto-optimum in the short run, but in the medium term, financial liberalization is basically a plus-sum game in Indonesia. Such an over-time trade-off exists in various cases. In his model of financial liberalization and trade liberalization, Kähkönen also stated: "partial reforms that are beneficial in the long run may result in welfare losses in the short run and medium run if all markets are not likely to be liberalized simultaneously" [29, p. 543]. Thus, if the public firms are myopic, then they will resist the implementation of financial liberalization, because the public investment and the surplus of public firms are likely to decrease in the short term by financial liberalization.

Beyond that, if each group is concerned not only with the absolute increase of surplus, but also with the change of relative share, another social problem arises because the liberalization brings about a large surplus increase for savers and private investors, while the increase of the public firm's surplus is relatively negligible.

In recent years emphasis has been placed on "structural adjustment" including the recommendation of financial liberalization in many developing countries. The discussion above strongly suggests that one-period macro aggregate analysis including the possible increase of total savings and investments is not sufficient to support financial liberalization, and we need a careful analysis of the costs and benefits for different social groups in a multi-period setting to secure broad social understanding and support, which is a prerequisite for smooth implementation of the financial liberalization process.

V. EVALUATION OF FINANCIAL LIBERALIZATION

The discussion in the previous section shows that in general, financial repression is not socially desirable, because strong distortion cost (*SDC*) and total distortion cost (*TDC*) decrease (except for the addition of enforced saving to free market equilibrium in integrated market) and not everybody can be adequately compensated. Thus it is obvious that we cannot strongly support the public investment promotion. However, still in reality many governments in developing countries try to increase public investment even by financial repression. The public investment serves to prepare the hard and soft infrastructures, which are prerequisites for take-

off. However, it is usually difficult to restore the initial investment by collecting small fees from wide users. As a result, on many occasions, the internal rate of return of an infrastructure project is low, but the social rate of return can be quite high. If these infrastructure projects could result in external spillover to private firms, the public investment could be complementary to the private investment. Blejer and Khan empirically pointed out such a possibility [5]. Aschauer stated that public investment financially crowds out private investment, but crowds in by increasing the productivity of private investment [2]. Sundararajan and Thakur examined these dual effects in India and Korea [56]. I maintain that the two investment schedules are independent of each other, and do not follow such a formulation. However, I concentrate on the case in which the promotion of public investment could have a significant political and social value even if the internal benefit-cost ratio is low. The overall assessment of general financial repression can thus be quite different from those based upon the changes of surpluses of various groups.

In this section I suggest that the public investment promotion by interest rate subsidy is a political and social necessity. In this case, is there still a criterion based upon the cost-benefit concept to evaluate proper effectiveness? How can we define it? If the purpose of general financial repression is to promote the public investment by lowering the investment cost, we can compare the actual decrease of interest rate with the corresponding shadow price. Let us assume that the strong and total distortion cost is the adequate shadow price and let us define the next criterion.

DEFINITION. *The public investment promotion policy is weakly supported if the interest rate subsidy (decrease of interest rate to public investment) exceeds the social distortion cost per realized investment.*

When we adopt this criterion, the next theorem defines the conditions in which public investment can be weakly supported based upon various concepts to calculate the interest rate subsidies: strong distortion cost per public investment or per incremental public investment, and total distortion cost per public investment or per incremental public investment. The proof is given in the Mathematical Appendix.

THEOREM 5. *Evaluation of Public Investment Promotion Policy in Case of Change from FIM to MS:*
The critical value (XSW) is defined in (A61).

$$(\mathrm{i})\quad SDC_1/IG_1 \gtrless (R_0 - RG_1), \quad iff \quad XSW \gtrless IG_0/IP_0. \tag{26}$$

$$(\mathrm{ii})\quad SDC_1/(IG_1 - IG_0) \gtrless (R_0 - RG_1), \quad iff \quad D/[2A1(B1 + C1)] \gtrless 1. \tag{27}$$

$$(\mathrm{iii})\quad TDC_1/IG_1 > (R_0 - RG_1). \tag{28}$$

$$(\mathrm{iv})\quad TDC_1/(IG_1 - IG_0) > (R_0 - RG_1). \tag{29}$$

Thus, if $A1 \geqq C1$,

$$(-)TDC/IG_1 > (R_0 - RG_1) > (-)SDC/IG_1. \tag{30}$$

If $C1 < A1B1/(B1 - A1)$,

TABLE III

RESULTS OF APPLICATION OF WEAK CRITERION FOR PUBLIC INVESTMENT SUBSIDY

Movement	Appendix Tables III–IV ($B1 = 1.2$)		Appendix Tables VI–VII ($B1 = 2.0$)	
	(0 to 3)	(0 to 1)	(0 to 3)	(0 to 1)
(1) *dIG*	5.6403	3.9351	5.4658	3.7606
(2) (–) *dSDC*	62.4914	18.9423	63.1458	17.8516
(3) (–) *dTDC*	139.1410	66.2653	143.3790	67.0815
(4) (–) *dRG*	10.4005	7.8701	10.9316	7.5211
(5) (–) *dSDC/dIG*	11.0794	4.8136	11.5528	4.7470
(6) (–) *dTDC/dIG*	24.6690	16.8395	26.2320	17.8379
(7) (4) / (5)	0.9387	1.6349	0.9462	1.5843
(8) (4) / (6)	0.4216	0.4673	0.4167	0.4216

$$(-)TDC/dIG > (R_0 - RG_1) > (-)SDC/dIG. \tag{31}$$

In the shift from free market equilibrium in integrated market to general financial repression, by definition,

$$TDC/IG_3 > (R_0 - RG_3). \tag{32}$$

The comparison between SDC/IG_3 and $(R_0 - RG_3)$ depends upon the parameters.

I applied this criterion to general financial repression in Indonesia in 1982–83. The results are given in Table III.

Our observations are as follows:

1. (Actual Case): In the general financial repression case, the strong distortion cost per increased public investment slightly exceeds the subsidized interest rate. As the benefit-cost ratio is slightly less than unity, the financial repression policy is not supported by the weak criterion.
2. (Hypothetical Case): When financial repression was implemented only by the market segmentation policy, the interest rate subsidy was about 1.6 times higher than the necessary strong distortion cost. In this case, the promotion policy satisfied the weak criterion.

On the other hand, the management of public firms is sometimes not efficient. This may be due to the preferential acquisition of raw materials, lack of competition in the sales market, and to the soft budget constraint of public firms, and also due to the political need of offering employment opportunities to a large population.

We assumed an efficient management of the public firms. However, in reality, some public firms face soft budget constraints which easily leads to the X-inefficiency. Therefore, the overall judgment of public investment projects hinges upon the balance of these factors.

If the dynamic positive spillover is large enough, and the public firms readily offer the external economic effects to promote further investment and to improve

the productivity of private firms, the interest rate subsidy to public firms by general financial repression may still be profitable. However, if the X-inefficiency is so large and outweighs these positive effects, this policy package cannot be supported. Therefore, it is important to determine the possible X-inefficiencies and the positive spillover effects to make a suitable assessment of public investments.

Same caveats apply to the banking sector. As Villanueva and Mirakhor stressed, the liberalization does not imply the abolition of all public interventions [60]. New regulations will be necessary to protect the depositors and to secure the prudential management as the number of financial institutions increases. In this sense, the liberalization must be considered and evaluated within a wider framework of financial reform.

VI. SUMMARY AND CONCLUSIONS

Many governments in developing countries have attempted to promote public investment by adopting market segmentation and enforced saving policies and providing cheap investment funds to public firms. I presented a dual market model to describe these policy effects and to analyze the effects of financial repression and financial liberalization in developing countries.

I defined financial repression as the distortions to the integrated financial market caused by two governmental interventionist policies: market segmentation and enforced saving. Based upon this definition, there are three cases of financially repressed market caused (i) only by market segmentation, (ii) only by enforced saving, and (iii) by both market segmentation and enforced saving (general case). In the process of financial repression, main observations were as follows.

Effects of Financial Repression

—The interest rate for public investment and the distortion cost (weak and total) will decrease (their absolute value will increase).
—The changes in the public and total investment are non-negative; the changes in the private investment and the strong distortion cost are non-positive.
—The saver's, public firm's, and private firm's surpluses and the private investment's interest rate and average interest rate may increase or decrease.

Welfare Incidence of Financial Repression or Liberalization

—Thus financial repression lowers interest rates for public investment and decreases weak and total distortion costs. Except for the mere enforced saving case, financial repression enhances the public and total investment, while it decreases the private investment and strong distortion cost. That is all that we can clearly predict. As a result, there is no definite projection for the average interest rate and various surpluses either for financial repression or liberalization.
—This situation implies that (i) McKinnon-Shaw thesis whereby financial liberalization would raise the interest rate and saving is valid only in certain cases, and (ii) financial liberalization is not a simple Pareto-optimum social process.
—In the process of financial liberalization, (i) the surplus of public firms decreases in the short run, and (ii) the increase of saver's and private investor's surpluses

can be much larger than the increase of surplus of public firms in the long run. The public firms may resist the financial liberalization process, if they are myopic or relatively share-conscious.

Liberalization Effects in Indonesia (1982–90)

The empirical estimates of liberalization effects in Indonesia (1982–90) revealed that:

—The public and total investments decreased in the short run, but the public as well as private investments increased in the medium term.
—The average interest rate and interest rate for public firms increased steadily, while the interest rate for private firms decreased in the short run.
—The surplus increased steadily, except that for public firms which decreased in the short run.
—Financial liberalization eliminated the total distortion cost, which amounted to 69 per cent of the total interest payment.

Evaluation of Public Investment Promotion in Indonesia by Weak Criterion

I selected a weak criterion to determine the efficiency of interest subsidies by comparing them with relevant opportunity cost.

—In the case of financial repression in Indonesia, since the strong distortion cost per public investment exceeded the interest rate subsidy, the weak efficiency criterion was not satisfied.
—The overall assessment of financial repression thus critically hinges upon the external spillover effects of public investments.

There are various possible extensions:

(a) Persistent Dual Structure. Lower interest rate for big firms will increase the capital-labor ratio, and lead to the emergence of large groups. An extended model is necessary to treat these dynamic interactions between interest rate differential, investment behavior, and productivity differential. Fukuchi and Oguchi constructed such a simultaneous model for the Japanese dual structure [18][19]. Nugent and Nabli analyzed the influence of development of financial markets in the size distribution of firms [42]. The dual interest rate structure may persist even after the financial liberalization, and the small and medium firms pay a higher interest rate than big businesses because of higher risk premium. This persisting dual structure may deserve further studies.
(b) Comprehensive Financial Market Model. Christian and Pagoulatos constructed a model for the domestic savings and investments [12]. Tanzi analyzed the fiscal disequilibrium in developing countries [57]. As the deficit management of public enterprises is an important factor, the subsidy for public firms must be discussed in a broader framework. Roubini and Sala-i-Martin pointed out that financial repression is an efficient tool to increase the demand for money and to increase the seigniorage in some countries [50].
(c) International Openness. Edwards and Khan proposed a framework to this direction which was found to apply well to Colombia and Singapore [16]. Haque and Montiel revealed the presence of a relatively high capital mobility in Indo-

nesia among fifteen developing countries (1969–87) [26]. In Indonesia, the foreign exchange had been unregulated in a sense that Indonesia has adopted an open exchange rate system since 1971. Under this system, there is no surrender requirement for export proceeds and tax or subsidy on the purchase or sale of foreign exchange. The only obstacle of capital flows has been the ceilings on external borrowing of financial institutions. Gochocco estimated that the role of domestic policy for the Philippines was rather limited because of high openness [22]. When an economy is relatively open and the interest rate is depressed by general financial repression, there is a risk of capital flight (Balassa [4, p. 457]). Since my model is obviously a partial equilibrium model in a closed economy setting, it is important to consider an adequate combination with other aspects.

(d) Relation with International Division of Labor. Burkett suggested in a Marxist perspective that financial repression is a part of the whole strategy of developing countries to alter the international division of labor in favor of domestic capital [8]. The discussion can be extended to such a game-type situation.

(e) Sequence of Liberalization. There was an extensive debate about the sequence issue: should the liberalization measures be taken first in the real sector or in the financial sector? McKinnon offered a comprehensive discussion [37]. Edwards stressed the consistency and timing based upon the Latin American experiences [15]. Schweickert emphasized the interaction with the real exchange rate strategy [51]. Athukorala and Rajapatirana reported that the financial liberalization complemented trade liberalization in Sri Lanka [3]. Funke reviewed the conflicting opinions [20]. Cho emphasized the need for a well-developed equity market as a prerequisite for complete liberalization [9]. Amsden and Euh analyzed the process of mobilization of savings and provision of cheap funds for investment by a developing stock market in Korea [1]. Indonesia still lacks a well-developed equity market. When we conceive the financial liberalization as a part of the whole financial liberalization and development process of an economy, we need a wider framework to support a comprehensive analysis.

These various aspects tend to support the general equilibrium framework. Robinson and Lewis proposed a CGE model with financial variables as one of the possible generalizations [48][34].

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MATHEMATICAL APPENDIX

We deduce the conclusions based upon the linear versions of three schedules.

Free Market Equilibrium in Integrated Market: We write three schedules (*IG*, *IP*, and *IT*) as follows. All parameter values are positive.

$$RG = A0 - A1 \cdot IG. \tag{A1}$$
$$RP = B0 - B1 \cdot IP. \tag{A2}$$
$$RS = C0 + C1 \cdot S. \tag{A3}$$

We assume

$$C0 < A0 \text{ or } B0. \tag{A4}$$

We postulate

$$S_0 = IT_0 = IG_0 + IP_0, \quad RS_0 = RG_0 = RP_0 = R_0. \tag{A5}$$

From (A1)(A2)(A3)(A5) we have

$$\begin{bmatrix} -A1 & 0 & -C1 \\ -A1 & B1 & 0 \\ 1 & 1 & -1 \end{bmatrix} \begin{Bmatrix} IG \\ IP \\ S \end{Bmatrix} = \begin{Bmatrix} C0 - A0 \\ B0 - A0 \\ 0 \end{Bmatrix}. \tag{A6}$$

We obtain

$$IG_0 = [B1(A0 - C0) + C1(A0 - B0)]/D, \tag{A7}$$
$$IP_0 = [A1(B0 - C0) + C1(B0 - A0)]/D, \tag{A8}$$
$$IT_0 = [A1(B0 - C0) + B1(A0 - C0)]/D, \tag{A9}$$
$$R_0 = (B1C1A0 + A1C1B0 + A1B1C0)/D, \tag{A10}$$

where

$$D = (A1B1 + B1C1 + C1A1) \quad (>0). \tag{A11}$$

D is the determinant of LHS of (A6). We postulate that IG_0 and IP_0 are positive. The surpluses are calculated as follows:

$$IGS_0 = (A0 - R_0)\, IG_0 / 2. \tag{A12}$$
$$IPS_0 = (B0 - R_0)\, IP_0 / 2. \tag{A13}$$
$$SS_0 = (R_0 - C0)\, IT_0 / 2. \tag{A14}$$
$$SW_0 = IGS_0 + IPS_0 + SS_0. \tag{A15}$$

The distortion costs are zero by definition.

Market Segmentation: Formal regulated market is open only for big firms, and unregulated market is open for small and medium enterprises only afterwards. Solutions are marked by the suffix 1.

$$RG_1 = RG(IG_1) = RS(IG_1). \tag{A16}$$
$$RP_1 = RP(IP_1) = RS(IG_1 + IP_1). \tag{A17}$$
$$IT_1 = IG_1 + IP_1 = S_1. \tag{A18}$$
$$R_1 = (RG_1 \cdot IG_1 + RP_1 \cdot IP_1)/IT_1. \tag{A19}$$

Inserting (A1)(A2)(A3), we obtain

$$\begin{aligned} IG_1 &= (A0 - C0)/(A1 + C1), \\ &= IG_0 + C1 \cdot IP_0/(A1 + C1) && (> IG_0), \end{aligned} \tag{A20}$$
$$\begin{aligned} RG_1 &= (A1C0 + A0C1)/(A1 + C1), \\ &= RG_0 - A1C1 \cdot IP_0/(A1 + C1) && (< RG_0), \end{aligned} \tag{A21}$$
$$\begin{aligned} IP_1 &= [A1(B0 - C0) + C1(B0 - A0)]/E, \\ &= (D/E)\, IP_0 && (< IP_0), \end{aligned} \tag{A22}$$
$$\begin{aligned} RP_1 &= [B1C1A0 + C1(A1 + C1)B0 + A1B1C0]/E, \\ &= RP_0 + C1C1B1 \cdot IP_0/E && (> RP_0), \end{aligned} \tag{A23}$$
$$IT_1 = IT_0 + (B1C1/E)\, IP_0 \qquad (> IT_0), \tag{A24}$$

where

$$E = (A1 + C1)(B1 + C1) = D + (C1)(C1). \tag{A25}$$

$$\begin{aligned} R_1 &= (RG_1 \cdot IG_1 + RP_1 \cdot IP_1)/(IG_1 + IP_1), \\ &= C1 \cdot IP_0 [A1B1C1(B0 - C0) + B1C1C1(B0 - A0) \\ &\quad - A1(B1 + C1)(B1 + C1)(A0 - C0)], \\ &= R_0 + (A1C1)(IP_0)(IP_0)/(IT_1)/(A1 + C1)(X1R - IG_0/IP_0), \end{aligned} \tag{A26}$$

where

$$X1R = (C1C1)(B1B1 - A1B1 - A1C1)/A1E/(B1+C1). \tag{A27}$$

Therefore, if $A1 = B1$, $X1R < 0$ and $R_1 < R_0$.

The difference of each surplus is calculated as follows:

$$dIGS = (R_0 - RG_1)[IG_0 + (IG_1 - IG_0)/2] \quad (>0), \quad \text{(A28)}$$

$$dIPS = IPS_1 - IPS_0 = (R_0 - RP_1)[IP_1 + (IP_0 - IP_1)/2] \quad (<0), \quad \text{(A29)}$$

$$\begin{aligned} dSS &= SS_1 - SS_0 = (RG_1 - R_0)IG_1 + (RP_1 - R_0)[IP_1 - (IT_1 - IT_0)/2)], \\ &= [A1C1(B1 + C1)(IP_0)(IP_0)/E](X1SS - IG_0/IP_0), \end{aligned} \quad \text{(A30)}$$

where

$$\begin{aligned} X1SS = {} & [A1C1(B1 + C1)(B1 + C1) + B1C1D \\ & \times (D - B1C1/2)]/[A1E(B1 + C1)]. \end{aligned} \quad \text{(A31)}$$

The change of total surplus or social welfare (*dSW*) is as follows:

$$\begin{aligned} dSW &= dSS + dIGS + dIPS = SDC, \\ &= (RP_1 - RG_1)(IG_0 - IG_1)/2 \quad (<0). \end{aligned} \quad \text{(A32)}$$

This value is negative, and represents a strong distortion cost (*SDC*). The weak distortion cost (*WDC*) is expressed by the sum (with changing sign) of transfers between different social groups: from savers to public firms and from private firms to savers.

$$\begin{aligned} WDC = {} & (RG_1 - R_0)[IG_0 + (IG_1 - IG_0)/2] \\ & + (R_0 - RP_1)[IP_1 - (IT_1 - IT_0)/2]. \end{aligned} \quad \text{(A33)}$$

The total distortion cost (*TDC*) is the sum of these two items.

$$\begin{aligned} TDC = SDC + WDC = {} & (RG_1 - R_0)IG_1 \\ & + (R_0 - RP_1)(IP_1 + IP_0)/2 \quad (<0). \end{aligned} \quad \text{(A34)}$$

The expressions $(R_0 - RG_1)$ and $(RP_1 - R_0)$ can be interpreted as the interest rate subsidy or tax to public firms or private firms by market segmentation. Thus *TDC* is the weighted sum of the subsidy or tax with corresponding ex-post investment, and expresses the results validating Theorem 1.

Financial Repression (General Case): Market segmentation and minor enforced saving. We start from *MS* case, and postulate that the interest rate (RG_1) decreases further to *RA* ($< RG_1$). Then we derive the following equations. Suffix 3 denotes the new values ($dX = X3 - X1$).

$$RA = RG(IG_3). \quad \text{(A35)}$$

$$RP_3 = RP(IP_3) = RS(IG_3 + IP_3). \quad \text{(A36)}$$

$$R_3 = (RG_3 \cdot IG_3 + RP_3 \cdot IP_3)/IT_3. \quad \text{(A37)}$$

$$IT_3 = IG_3 + IP_3 = S_3. \quad \text{(A38)}$$

First we calculate the changes from segmented market to general financial repression by adding enforced saving.

$$dRG = RA - RG_1 \quad (<0). \quad \text{(A39)}$$

$$dIG = IG_3 - IG_1 = (-)(dRG)/(A1) \quad (>0). \quad \text{(A40)}$$

$$dIP = (-)(C1)(dIG)/(B1 + C1),$$

$$= [(C1)/(A1)/(B1+C1)](dRG) \qquad (<0). \quad \text{(A41)}$$

$$dRP = (B1)(C1)(dIG)/(B1+C1),$$
$$= (-)[(B1)(C1)/(A1)/(B1+C1)](dRG) \qquad (>0). \quad \text{(A42)}$$

$$dIT = dIP + dIG,$$
$$= (-)[(B1)/(A1)/(B1+C1)](dRG) \qquad (>0). \quad \text{(A43)}$$

$$(IT_1)dR = (IG_1)(dRG) + (RG_1)(dIG) + (IP_1)(dRP) + (RP_1)(dIP) - (R_1)(dIT).$$

Thus,

$$\begin{aligned}(A1)(B1+C1)(IT_1)(IT_1)(dR/dRG) &= (A1)(B1+C1)(IG_1) - (B1+C1)(RG_1) - (B1C1)(IP_1) + (C1)(RP_1)(IT_1) \\ &\quad + (B1)[(RG_1)(IG_1) + (RP_1)(IP_1)], \\ &= [A1(B1+C1)(IG_1) - (B1C1)(IP_1)](IT_1) \\ &\quad + [(C1)(IG_1) + (B1+C1)(IP_1)](RP_1 - RG_1), \\ &= [(A1)(B1+C1)(IG_0) \\ &\quad - (C1)(C1)(A1B1 + A1C1 - B1B1)(IP_0)/E](IT_1) \\ &\quad + [(C1)(IG_1) + (B1+C1)(IP_1)](RP_1 - RG_1). \qquad \text{(A44)}\end{aligned}$$

The second term at RHS is positive as $RP_1 > RG_1$. Thus if

$$IG_0/IP_0 > X1R, \qquad \text{(A45)}$$

then,

$$dR/dRG > 0, \qquad \text{(A46)}$$

where

$$X1R = (C1)(C1)(A1B1 + A1C1 - B1B1)/A1/E/(B1+C1). \qquad \text{(A47)}$$

When $A1$ is equal to $B1$, X is three times the product of $C1/(B1+C1)$. Thus if IG_0 is larger than IP_0, dR/dRG is positive.

$$dIGS = (-)[(IG_1)(dRG) + (dRG)(dIG)/2],$$
$$= (-)[IG_1 - (dRG)/2/(A1)](dRG) \qquad (>0), \quad \text{(A48)}$$

$$dIPS = [IP_3 + (IP_1 - IP_3)/2](dRP),$$
$$= [IP_1 - C1(dRG)/2/A1/(B1+C1)](dRG) \qquad (<0), \quad \text{(A49)}$$

$$dSS = (IG_1)(dRG) + (dIG)(dRG + RG_1 - RP_1) + (dRP)[IP_1 - (dRP)/B1],$$
$$= (dRG)[IG_0 + XA \cdot IP_0 - (XB)(dRG)], \qquad \text{(A50)}$$

where

$$XA = [A1(B1+C1)(B1+C1) + C1D] \qquad > 0, \quad \text{(A51)}$$
$$XB = (1/A1)[1 - B1C1C1/A1/(B1+C1)/(B1+C1)]. \qquad \text{(A52)}$$

If $XB < 0$, $dSS/dRG > 0$. Even if $XB > 0$, if $(-XB)\,dRG$ is smaller than

$(IG_0 + XA \cdot IP_0)$, $dSS/dRG > 0$. $dSS/dRG < 0$ only if $XB < 0$ and $(XB)\,dRG$ exceeds $(IG_0 + XA \cdot IP_0)$.

Secondly we calculate the changes from free market equilibrium in integrated market (*FIM*) to general financial repression (*FRG*). We put IG_3 as SA ($> IG_0$) and RG_3 as RA. Then

$$\begin{aligned} IP_3 &= 1/(B1 + C1)(B0 - C0 - C1 \cdot SA), \\ dIP &= IP_3 - IP_0, \\ &= [C1(B1 + C1)A0 - B1C1C0 - C1DSA]/D/(B1+C1) \\ &\qquad (<0), \quad \text{(A53)} \\ dRP &= B1C1[(B1 + C1)A0 + C1B0 + B1C0 + DSA]/D/(B1 + C1)\ (> 0). \end{aligned}$$

By definition, $dIGS > 0$ and $dIPS < 0$.

$$dSS = (R_0 - RA)SA + (RP_3 - RP_0)(IP_3 + IP_0)/2.$$

Market Expansion: We assume that the saving and investment schedules shift. Therefore, $C1$, $A0$, and $B0$ change to the new values: $C1N$, $A0N$, and $B0N$. We assumed that (i) $C0$ did not change, because the constant term of saving schedule is assumed to be quite low, and (ii) $A1$ and $B1$ did not change for the sake of simplicity. The suffix 4 denotes the values after the market expansion occurs to free market equilibrium.

We obtain

$$IG_4 = [B1(A0N - C0) + C1N(A0N - B0N)]/DN, \quad \text{(A54)}$$
$$IP_4 = [A1(B0N - C0) + C1N(B0N - A0N)]/DN, \quad \text{(A55)}$$
$$IT_4 = [A1(B0N - C0) + B1(A0N - C0)]/DN, \quad \text{(A56)}$$
$$R_4 = (B1A0C1N + A1B0C1N + A1B1C0)/DN, \quad \text{(A57)}$$

where

$$DN = (A1B1 + B1C1 + A1C1N) \qquad (> 0). \quad \text{(A58)}$$

The surpluses are calculated accordingly.

Evaluation of Public Investment Promotion: In case of change from free market equilibrium in integrated market (*FIM*) to market segmentation (*MS*),

$$\begin{aligned} dSW/(IG_1)/(R_0 - RG_1) &= (RP_1 - RG_1)(IG_1 - IG_0)/2/(IG_1)/(R_0 - RG_1), \\ &= C1(D/E)IP_0/2/A1[IG_0 + C1 \cdot IP_0/(A1 + C1)], \end{aligned} \quad \text{(A59)}$$

using (A20)(A21)(A23). The RHS of (A59) is larger than unity iff

$$XSW > IG_0/IP_0, \quad \text{(A60)}$$

where

$$XSW = C1(B1C1 - A1B1 - A1C1)/2/A1/E. \quad \text{(A61)}$$

From (A21)(A23)(A32)

$$(-)SDC_1/(IG_1 - IG_0) = C1D \cdot IP_0/(2E)$$
$$= D(R_0 - RG_1)/[2A1(B1 + C1)]. \quad \text{(A62)}$$

By (A34), $(-)TDC/IG_1 > (R_0 - RG_1)$. Thus we obtain Theorem 5.

LIST OF SYMBOLS

ES = enforced saving
FIM = free market equilibrium in integrated market
FRG = general financial repression
I = investment
IG = public investment
IGS = public investor's surplus
IM = integrated market
IP = private investment
IPS = private investor's surplus
IS = investor's surplus
IT = total investment
MS = market segmentation
R = interest rate
RA = concessional interest rate
RG = interest rate for public firms
RP = interest rate for private investment
RS = interest rate for savers
RT = average interest rate
S = saving
SA = concessional investment fund
SDC = strong distortion cost
SM = segmented market
SS = saver's surplus
SW = social welfare
TDC = total distortion cost
WDC = weak distortion cost

Ai, Bi, Ci, D, DN, E are specific parameters.
*XA, XB, X*1*R, X*1*SS* are specific critical values.

APPENDIX TABLE I

TREND OF INVESTMENT, LOANS, AND DEPOSITS

A. Real Investment

Year	Real Investment (Trillion Rupiah)			Share (%)	
	Public	Private	Total	Public	Private
1980	6.4	9.7	16.0	39.7	60.3
1981	6.1	12.0	18.1	33.5	66.5
1982	6.8	12.4	19.2	35.3	64.7
1983	6.1	13.3	19.5	31.5	68.5
1984	6.8	11.5	18.3	37.1	62.9
1985	8.3	11.3	19.6	42.6	57.4
1986	7.0	14.4	21.4	32.6	67.4
1987	5.8	16.8	22.6	25.6	74.4
1988	6.5	18.7	25.2	26.0	74.0
1989	7.9	20.7	28.6	27.6	72.4
1990	8.4	24.3	32.7	25.8	74.2
1991	9.6	25.4	35.0	27.4	72.6
1992	10.8	25.1	35.9	30.2	69.8

B. Trend of Loans and Deposits

Year	Loans				Deposits	
	State Bank Share (%)	Other Bank Share (%)	All Banks (Trillion Rupiah)	Real Growth (%)	Money Bank (Trillion Rupiah)	Real Growth (%)
1980	54.5	45.5	7.9	–4.8	1.5	–1.6
1981	57.9	42.1	10.2	16.5	2.0	23.9
1982	61.7	38.3	13.0	16.4	2.5	11.3
1983	64.0	36.0	15.3	2.3	4.7	64.1
1984	70.9	29.1	18.8	13.6	6.4	25.7
1985	69.4	30.6	22.2	11.8	9.6	42.8
1986	67.4	32.6	26.4	19.2	11.4	18.2
1987	66.0	34.0	32.9	7.4	16.2	23.4
1988	65.1	34.9	44.0	24.4	20.9	19.9
1989	62.2	37.8	63.6	32.0	30.5	33.1
1990	54.8	45.2	97.7	40.8	46.1	38.6
1991	52.7	47.3	113.6	7.6	52.6	5.5
1992	55.2	44.8	123.7	2.0	67.6	20.2

Sources: Deposits and loans: Bank Indonesia, *Statistik ekonomi-keuangan Indonesia* [Indonesian financial statistics], Vol. 17, No. 11–12 (November–December 1984); Vol. 18, No. 10 (October 1985); Vol. 22, No. 12 (December 1989); Vol. 23, No. 1–5 (January–May 1990); Vol. 26, No. 11 (November 1993). These figures were deflated by GDP deflator. GDP deflator and investment: Biro Pusat Statistik, *Pendapatan nasional Indonesia, 1986–1991* [National income of Indonesia, 1986–1991](Jakarta, 1992) and previous issues. The public investment was estimated from the state budget figures. Private investment was estimated as the residual from total.

APPENDIX TABLE II

TREND OF INTEREST RATE

Year	Interest Rate (%)			Inflation (Increase of %) CPI	Real Interest Rate (%)	
	Money Market Rate	Deposit	Lending		Deposit	Lending
1980	12.87	6.00	...	9.6	(–)3.6	...
1981	16.26	6.00	...	7.7	(–)1.7	...
1982	17.24	6.00	...	6.7	(–)0.7	...
1983	13.17	6.00	...	9.1	(–)3.1	...
1984	18.63	16.00	...	9.1	6.9	...
1985	10.33	18.00	...	4.5	13.5	...
1986	13.00	15.39	21.49	5.9	9.4	15.5
1987	14.52	16.78	21.67	9.7	7.0	11.9
1988	15.00	17.72	22.10	9.3	8.4	12.8
1989	12.57	18.63	21.70	8.1	10.5	13.6
1990	14.37	17.30	20.61	8.1	9.2	12.5
1991	15.12	23.27	...	13.2	10.0	...
1992	12.14	20.37	24.03	11.7	8.6	12.3

Sources: Interest rate for 1980–85, International Monetary Fund, *International Financial Statistics Yearbook, 1992*, pp. 408–9; for 1986–92, *International Financial Statistics*, October 1993, pp. 284–85.

APPENDIX TABLE III

EFFECTS OF FINANCIAL REPRESSION

Variable	Case (0)	Case (1)	Case (2)	Case (3)	Case (4)
IG	0.8597	4.7948	0.8597	6.5000	8.2007
IP	14.9995	13.5350	14.9995	12.9004	22.5011
IT	15.8592	18.3298	15.8592	19.4004	30.7018
RG	12.4806	4.6105	7.8572	1.2000	12.9987
RP	12.4806	14.2380	7.8572	14.9995	12.9987
R	12.4806	11.7196	7.8572	10.3761	12.9987
IGS	0.7391	22.9896	37.4011	42.2500	67.2508
IPS	134.9910	109.9180	171.6530	99.8523	303.7800
SS	89.4506	73.3302	16.1266	20.5866	181.1200
SW	225.1800	206.2380	225.1800	162.6890	552.1510
WDC	0.0000	–47.3230	–73.3241	–76.6492	0.0000
SDC	0.0000	–18.9423	0.0000	–62.4914	0.0000
TDC	0.0000	–66.2653	–73.3241	–139.1410	0.0000

APPENDIX TABLE IV

EFFECTS OF FINANCIAL REPRESSION

Variable	Case (0–1)	Case (1–3)	Case (0–2)	Case (2–3)	Case (0–3)
IG	3.9351	1.7053	0.0000	5.6403	5.6403
IP	–1.4645	–0.6346	0.0000	–2.0991	–2.0991
IT	2.4706	1.0706	0.0000	3.5412	3.5412
RG	–7.8701	–3.4105	–4.6235	–6.6572	–11.2806
RP	1.7573	0.7615	–4.6235	7.1423	2.5189
R	–0.7610	–1.3435	–4.6235	2.5189	–2.1046
IGS	22.2505	19.2604	36.6620	4.8489	41.5109
IPS	–25.0724	–10.0658	36.6620	–71.8003	–35.1383
SS	–16.1204	–52.7437	–73.3241	4.4600	–68.8641
SW	–18.9423	–43.5491	0.0000	–62.4914	–62.4914
WDC	–47.3230	–29.3262	–73.3241	–3.3252	–76.6492
SDC	–18.9423	–43.5491	0.0000	–62.4914	–62.4914
TDC	–66.2653	0.00000	–73.3241	–65.8166	–139.1410

APPENDIX TABLE V

DECOMPOSITION OF TREND, 1982–90

Variable	(1) (*FR*) 1982–83	(2) (*FIM*) 1982–83	(3) (*EXP*) 1989–90	(4)(*LIBER*) (2) – (1)	(5) (*HIS*) (3) – (2)
IG	6.5000	0.8597	8.2007	–5.6403	7.3410
IP	12.9004	14.9995	22.5011	2.0991	7.5016
IT	19.4004	15.8592	30.7018	–3.5412	14.8426
RG	1.2000	12.4806	12.9987	11.2806	0.5181
RP	14.9995	12.4806	12.9987	–2.5189	0.5181
R	10.3761	12.4806	12.9987	2.1046	0.5181
IGS	42.2500	0.7391	67.2508	–41.5109	66.5117
IPS	99.8523	134.9910	303.7800	35.1383	168.7890
SS	20.5866	89.4506	181.1200	68.8641	91.6695
SW	162.6890	225.1800	552.1510	62.4914	326.9700
WDC	–76.6492	0.0000	0.0000	76.6492	0.0000
SDC	–62.4914	0.0000	0.0000	62.4914	0.0000
TDC	–139.1410	0.0000	0.0000	139.1410	0.0000

Note: *FR* = financial repression; *FIM* = fully integrated market; *EXP* = market expansion; *LIBER* = liberalization; and *HIS* = historical change.

APPENDIX TABLE VI

EFFECTS OF FINANCIAL REPRESSION

Variable	Case (0)	Case (1)	Case (2)	Case (3)	Case (4)
IG	1.0342	4.7948	1.0342	6.5000	8.2007
IP	14.3342	13.3477	14.3342	12.9003	22.5007
IT	15.3684	18.1424	15.3684	19.4003	30.7014
RG	12.1316	4.6105	7.5081	1.2000	12.9986
RP	12.1316	14.1047	7.5081	14.9994	12.9986
R	12.1316	11.5955	7.5081	10.3760	12.9986
IGS	1.0696	22.9896	36.5972	42.2500	67.2518
IPS	205.4700	178.1600	240.9970	166.4170	506.2820
SS	84.0005	71.5388	12.9453	18.7267	181.1160
SW	290.5400	272.6880	290.5400	227.3940	754.6510
WDC	0.0000	−49.2299	−71.0552	−80.2328	0.0000
SDC	0.0000	−17.8516	0.0000	−63.1458	0.0000
TDC	0.0000	−67.0815	−71.0552	−143.3790	0.0000

APPENDIX TABLE VII

EFFECTS OF FINANCIAL REPRESSION

Variable	Case (0–1)	Case (1–3)	Case (0–2)	Case (2–3)	Case (0–3)
IG	3.7605	1.7053	0.0000	5.4658	5.4658
IP	−0.9866	−0.4474	0.0000	−1.4339	−1.4339
IT	2.7740	1.2579	0.0000	4.0319	4.0319
RG	−7.5211	−3.4105	−4.6235	−6.3081	−10.9316
RP	1.9731	0.8947	−4.6235	7.4913	2.8679
R	−0.5360	−1.2196	−4.6235	2.8679	−1.7556
IGS	21.9200	19.2604	35.5276	5.6528	41.1804
IPS	−27.3099	−11.7425	35.5276	−74.5800	−39.0524
SS	−12.4617	−52.8121	−71.0552	5.7814	−65.2738
SW	−17.8516	−45.2942	−0.0000	−63.1457	−63.1458
WDC	−49.2299	−31.0029	−71.0552	−9.1776	−80.2328
SDC	−17.8516	−45.2942	0.0000	−63.1458	−63.1458
TDC	−67.0815	0.0000	−71.0552	−72.3234	−143.3790

APPENDIX TABLE VIII

DECOMPOSITION OF TREND, 1982–90

Variable	(1) (*FR*) 1982–83	(2) (*FIM*) 1982–83	(3) (*EXP*) 1989–90	(4)(*LIBER*) (2) − (1)	(5) (*HIS*) (3) − (2)
IG	1.0342	6.5000	8.2007	−5.4658	7.1665
IP	14.3342	12.9003	22.5007	1.4339	8.1665
IT	15.3684	19.4003	30.7014	−4.0319	15.3330
RG	12.1316	1.2000	12.9986	10.9316	0.8670
RP	12.1316	19.9994	12.9986	−2.8679	0.8670
R	12.1316	10.3760	12.9986	1.7556	0.8670
IGS	1.0696	42.2500	0.0000	−41.1804	66.1822
IPS	205.4700	166.4170	506.2820	39.0524	300.8130
SS	84.0005	18.7267	181.1160	65.2738	97.1159
SW	290.5400	227.3940	754.6510	63.1458	464.1110
WDC	0.0000	−80.2328	0.0000	80.2328	0.0000
SDC	0.0000	−63.1458	0.0000	63.1458	0.0000
TDC	0.0000	−143.3790	0.0000	143.3790	0.0000

Note: See Appendix Table V.