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Liberalization and Unorganized Money Markets

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Abstract

An intertemporal optimizing model is used to study the welfare consequences of sequential liberalization programs in an environment where financial intermediation occurs not only in official money markets but also in unofficial(curb or grey money) markets. It is shown that raising the regulated official interest rate, which is often recommended in the financial repression literature as a measure to mobilize savings, can be welfare reducing if either trade is restricted or the fall in the unofficial interest rate caused by the reform has a very large effect on investment and future income. Similar nonstandard conclusions are shown to hold for other types of partial reforms.

I. Introduction

The effects of liberalizing markets have been the focus of intensive research since the early 1970s. At that time attention was devoted to the problems created by financial repression, in particular to the impacts of low officially regulated interest rates(McKinnon(1973) and Shaw(1973) ; for a review and summary, see Fry(1982, 1988). In the 1980's the research on liberalization has, inspired by the experiences of many Latin American countries, concentrated on analyzing the consequences of removing impediments to trade and capital movements(see Buffie(1984), Edwards(1984, 1986, 1987), Edwards and van Wijnbergen(1986, 1987), Khan and Zahler(1983, 1985), and Obstfeld (1985, 1987)).

These two strands of literature have developed quite independently of each other. Recently, however, Haaparanta(1988a, 1988b) and Kähkönen(1987), among others, have

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started to bridge the gap between these two lines of research. They have used a simple intertemporal trade theoretic framework to analyze sequential liberalization programs, in which some of the markets remain regulated when some other markets are deregulated. Most of the liberalization packages carried out in practice have been of this type. So far the analysis has, however, neglected the existence of unofficial credit markets or curb markets, which have developed to circumvent the official regulated credit markets. This is a potentially serious drawback, since these markets may account up to 70 percent of the total credit supply(see Park(1973)).[1]

In this paper previous work is extended to take into account the existence of these unofficial money markets. A simple intertemporal optimizing model is used to enable the analysis of welfare consequences of various liberalization packages. Thus, the study supplements the work of Buffie(1984) who used an ad hoc model to study the macroeconomics of financial repression, and extends it to connect financial repression to trade policy problems.

Ⅱ. The Model

There are four types of agents in a two period economy : households, firms, banks, and the government. In each period households consume two goods, one importable good (y) and one exportable good(x). The world market prices of these goods are given exogenously, that is, the economy is a small open economy. Consumption with weakly separable intertemporal preferences yields the welfare $u=u(z^1, z^2)$, where z^i=period i subutility=$z^i(c_x^i, c_y^i)$ with c_j^i= the amount of commodity j consumed in period i. The subutility functions are assumed to be homothetic. The utility function and the subutility functions satisfy all the usual properties. Households can place their savings in domestic bank deposits(s_D) earning the rate of interest r_D, in curb market loans(s_C) earning the rate of interest r_C, and in deposits in foreign banks(s_F) giving the rate of interest r^*. Investment abroad is, however, officially prohibited and controlled. It can

1. For a more recent experience in Taiwan, see Liang(1988). These type of markets have existed also outside the developing countries. For example, in all Scandinavian countries credit markets were regulated up to the mid 1980s, which led to the emergence of so called grey money markets where borrowing and lending occurred outside the banking system. Simultaneously controls were imposed on foreign lending and borrowing.

thus be called capital flight.[2] Households escape the controls with probability Φ ; if they get caught(with probability 1-Φ) they lose both the interest and the value of the investment. It is also assumed that investment abroad causes some costs. These are represented by the function $\sigma_F(s_F)$ which is the sum of the amount invested and the costs attached to the investment. The function has the following properties : $\sigma_F(s_F) > s_F$ if $s_F > 0$, $\sigma_F' > 1$, $\sigma_F'' > 0$[3]. These costs arise because the investor has to control the investments himself without the help of an organized financial system. The marginal costs are assumed to increase with the amount placed abroad. One reason for this may be that the investors may have to set up a machinery for hiding the investments and the marginal costs of hiding increase with the amount invested. Costs could arise also because of geographical distances and difficulties in monitoring because of them.[4] Similarly it is assumed that investment in curb markets creates gross costs(amount invested with the costs associated to the transaction) $\sigma_C(s_C)$ with $\sigma_C(s_C) > s_C$, $\sigma_C' > 1$, $\sigma_C'' > 0$[5]. The idea here is that the investor has to bear some costs of controlling her investment because of asymmetries of information between lenders and borrowers, for example. These costs may be large for the reason that loan contracts in the curb market in many cases are denied legal enforcement(see Liang(1988)).[6] Since the investments, in general, are dispersed among several borrowers it seems to be reasonable to assume that the marginal costs increase with the size of investments in the curb markets because the problems of monitoring increase when the dispersion increases. This monitoring has to be carried out again without the help of a well-organized financial system.

Since the return on foreign investment is uncertain the household's choices are made under uncertainty. It is assumed that households' risk preferences can be pre-

2. Giovannini(1987) studies the effects of capital income taxation on capital flight in a one-good, two-period model. In his model investment abroad is not controlled(or controls are completely inefficient). His main point is to compare two systems of capital income taxation : one in which earnings from foreign investment cannot be taxed and one in which all capital income is taxed.
3. Khan and ul Haque(1985) also rationalize the treatment of capital flight in this fashion.
4. Khan and ul Haque(op.cit) name this as one of the factors which give rise to increasing marginal cost of investment.
5. It is assumed that the difference $\sigma_C - s_C$ is not earned by any domestic sector but it represents net costs of disintermediation to the society.
6. Our formulation corresponds to the following set up with asymmetric information : The lender can control the project perfectly if he/she spends the amount $\sigma(\ )$. Otherwise he/she does not have any control over the project and her/his income would depend on the result announced by the borrower. Thus, without paying the control costs the lender would lose all the money invested, since the borrower could announce that he/she has lost the money. In equilibrium, thus, to lender(if any lending occurs) is willing to pay the cost of control.

sented by Selden's risk neutral Ordinal Certainty Equivalent preferences(Selden(1978)[7]). This means that welfare is given by $u = u(z^1, E_{z^2}^2)$ where E is the expectation operator. Since the subutilities are homothetic they can be solved from the following equations :

(1a) $\pi(p^1)z^1=y_1-s_D-\sigma_C(s_C)-\sigma_F(s_F)$,

(1b) $\pi(p^2)z^2=y_2+(1+r_D)s_D+(1+r_C)s_C+(1+r^*)s_F$, with probability Φ,

$=y_2+(1+r_D)s_D+(1+r_C)s_C$, with probability $1-\Phi$.

Here π is the unit expenditure function, $p^i=(p_x^i, p_m^i)$=vector of period i consumer prices, and y_i=exogenous net flow income of the household in period i[8]. Thus, the welfare of the household is

(2) $u = u[(y_1-s_D-\sigma_C(s_C)-\sigma_F(s_F))/\pi(p^1), (y_2+R_Ds_D+R_Cs_C+\Phi R^*s_F)/\pi(p^2)]$,

where $R_D \equiv 1+r_D$ etc. Expression (2) is to be maximized with respect to s_D, s_C, and s_F. The first order optimality conditions are :

(3a) $u_1/u_2 = R_D\pi(p^1)/\pi(p^2) \equiv R$

(3b) $\sigma_C'(s_C)u_1/u_2=R_C\pi(p^1)/\pi(p^2)$

(3c) $\sigma_F'(s_F)u_1/u_2=\Phi R^*\pi(p^1)/\pi(p^2)$.

Equations(3) imply that investment in the curb market and abroad are determined by the following equations :

(4) $\sigma_C'(s_C)=R_C/R_D$ or $s_C=s_C(R_C/R_D)$, $s_C' > 0$

(5) $\sigma_F'(s_F)=\Phi R^*/R_D$ or $s_F(\Phi R^*/R_D)$, $s_F' > 0$

Firms produce both of the goods taking the prices of the goods as given. To ensure that factor price equalization does not hold it is assumed that production utilizes three factors of production, labor, land and capital. Land and labor are in fixed supply, but firms can augment the capital stock through investment in period 1. Investment is assumed to have an effect on period 2 production only. Perfect competition ensures that

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7. Selden's OCE preferences have been applied in other contexts by Farmer (1984) and Hall (1985), among others.
8. In this competitive economy where the suply of labour is assumed to be fixed each individual regards his income stream as fixed. In the general equilibrium it is, of course, the case that the income stream of the representative individual is equal to the actual income stream produced in the economy, the GDP.
9. To get $s_C(s_F) > 0$ it must be the case that $R_C > R_D(\Phi R^* > R_D)$: otherwise $s_C(s_F)=0$.

all factors of production are allocated in each period in such a way that the value of total production is maximized. This maximized value is described by the revenue functions(see, for example, Dixit and Norman(1980) $G^1(p^1)$ and $G^2(p^2, k+i)$, where k=capital stock at the beginning of period 1 and i=investment made in period 1. Firms invest to maximize profits. Investment is financed by bank loans, by foreign borrowing, and by borrowing from the curb market. This conforms with the typical assumptions in the financial repression literature(see Fry(1982)). Banks give out as loans all the deposits and charge a low regulated rate of interest. For simplicity it is assumed that the bank loan rate is equal to the deposit rate r_D. At this rate the demand for bank loans is assumed to exceed the supply and, hence, there is rationing in the bank loan market. Similarly, it is assumed that the firms can borrow abroad at the rate r^*, but the amount of borrowing is strictly limited to i_F, which is below the amount the firms would like to borrow. Hence, the firms borrow in the curb market the amount $i-s_D-i_F$. The first-order condition for profit maximization equates marginal product of capital in period 2 to the marginal cost of financing capital formation : $G^2_3=R_C$[10], which gives investment as

(6) $i=i(R_C)$, $i' < 0$.

Banks collect deposits s_D from the households and lend them out as loans to firms, both at the rate r_D. Hence, the banks' profits are zero.

Government revenue consists of two components. First, it is assumed that the government imposes tariffs on imports in period 1 but in the long run trade is expected to be free. This paper is thus not interested in the effects of anticipated trade liberalization which could be easily analyzed in the present framework(see, for example, Edwards(1987b)).[11] The domestic prices of the goods are then $p_x^1=p_x^{*1}$, $p_y^1=p_y^*(1+t)$, and $p_y^2=p_y^{*2}$. The tariff revenue is thus $p^T=t(\pi^1_2 z^1-G^1_2)$[12]. The second component in government revenue is the revenue collected from households caught in investing

10. G^i_j denotes the derivative of G^i w.r.t. the j'th argument.
11. This paper follows the approach taken in Edwards and van Wijnbergen(1986) in modeling sequential policy reforms. The crucial assumption is that the target of totally free trade in the long run is independent of current policy reforms. This can be justified on the ground that long-run trade liberalization is an issue to be solved by multilateral organizations, such as the GATT, with the actions of individual small economies exerting little influence on the speed of liberalization.
12. π^i_j denotes the derivative of π^i w.r.t. the j'th argument. It is a property of the expenditure function that its derivative with respect to the price of a good gives the(compensated) demand function of the good. Likewise, the derivative of the GDP function with respect to the price of a good gives the total production of the good. See e.g. Dixit and Norman(1980).

abroad. In evaluating this component it is assumed that there exists a large number of identical households investing abroad a total amount of s_F. They act independently of each other. Hence, by the law of large numbers, the government collects a sure revenue of $(1-\Phi)\ R^*s_F$ in period 2. All government revenue is assumed to be handed back to consumers in a lump sum fashion.

The aggregate behavior of the economy is assumed to be characterized as a behavior of a representative individual. This individual receives as her income the revenues earned by all factors of production and the government revenue. Hence, aggregate welfare can be calculated from the following equations :

(7a) $\pi(p^1)z^1=G^1(p^1)+p^T-s_D-\sigma_C(s_C)-\sigma_F(s_F)$

(7b) $\pi(p^2)Ez^2=G^2(p^2,\ k+i)+R^*(s_F-i_F)$.

Equation (7a) gives, using the expression for p^T,

(8) $z^1=[G^1-tG^1_2-s_D-\sigma_C(s_C)-\sigma_F(s_F)]\ /A\pi(p^1)$,

where $A\equiv 1-t\pi^1_2\ /\pi(p^1)$; $A>0$ by the linear homogeneity of the expenditure function.

Equilibrium in the curb market is achieved when the supply of credit equals the demand for credit. The supply of curb market loans is s_C. The demand for curb market loans is equal to $i-i_B-i_F$, where i_B=official bank credit. Since the demand for bank credit exceeds the supply, i_B must equal the supply of bank credit which in turn is equal to s_D. Hence, the equilibrium condition for the curb market is

(9) $s_C(R_C\ /R_D)+s_D=i(R_C)-i_F$.

Savings in domestic banks are determined by

(10) $u_1(z^1,\ Ez^2)\ /u_2(z^1,\ Ez^2)=R$.

Finally, the welfare of the representative individual, which is identified with the welfare of the whole nation, is

(11) $u=u(z^1,\ Ez^2)$.

The behavior of the economy is determined by equations (4), (5), and (7b)-(11).

Ⅲ. Liberalization, Savings, and the Curb Loan Market

Consider first how savings in domestic banks are determined. s_D can be calculated

from equation(10) as a function of the various interest rates and other variables :

(12) $s_D=s_D[R, i, i_F, s_C, s_F, t]$,

where the impacts of the arguments on s_D are :
Consider first how an increase in the real rate of interest affects bank savings :

(12a) $\delta s_D/\delta R=1/B$,

where $B=[-(u_{11}u_2/A\pi(p^1))+(u_{12}u_1/\pi(p^2))]/(u_2)^2$. Hence, assuming that $u_{12}>0$, an increase in the real deposit rate increases saving.

Next, it is easy to compute from(10) that

(12b) $\delta s_D/\delta i<0$, $\delta s_D/\delta i_F>0$.

It is also the case that $\delta s_D/\delta i+\delta s_D/\delta i_F<0$ if $R_C>R^*$ which is assumed to ensure that firms want to borrow abroad. This effect is very important for the analysis in this paper and it has been ignored in much of the literature. An increase in investment raises future(period 2) income, since the marginal product of investment is above the shadow marginal cost of investment. This increase in future income is reflected in a decline in current savings.

Next, it can be calculated from(10) that

(12c) $\delta s_D/\delta s_C=-\sigma_C'$.

Thus, $\delta s_D/\delta s_C<-1$: investments in the curb market reduce, ceteris paribus, total savings in the economy. A similar result holds for investments abroad :

(12d) $\delta s_D/\delta s_F=-\sigma_F'-[(R^*/\pi(p^2))(u_{12}u_2-u_{22}u_1)]/(u_2)^2B$.

Finally, the impact of the change in a tariff on first period welfare is calculated from equation(8) :

(12e) $\delta z^1/\delta t=t(\pi^1_{22}z^1-G^1_{22})/A\pi^1$.

Since the expenditure function is concave in prices and the revenue function is convex the first period welfare declines when the tariff increases. With this the change in savings is

(12f) $\delta s_D/\delta t=[(R_D\pi^1_2/\pi^2)-(u_{11}u_2-u_{12}u_1)(\delta z^1/\delta t)/u_2^2]/B$.

This expression cannot be signed unambiguously. The intuition behind the ambiguity is

clear. An increase in the current period tariff, by raising the current price level, increases the real rate of interest which tends to enhance savings. But the decline in the first period welfare makes, ceteris paribus, consumers shift consumption to the first period in order to smooth intertemporally the loss in welfare. The net effect is thus ambiguous.

Equilibrium in the curb loan market is now

$$(13)\quad s_D[R, i(R_C), i_F, s_C(R_C/R_D), s_F(\Phi R^*/R_D), t]+s_c(R_C/R_D)=i(R_C)-i_F,$$

where the bank saving function s_D has the properties just derived.

Walrasian stability requires that an increase in the curb market rate increases the supply of funds in these markets relative to the demand. Assuming this, implicit differentiation of(13) gives

$$(14a)\quad \delta R_C/\delta i_F < 0,$$

that is , allowing firms to borrow more abroad reduces the curb market rate.

Consider next the reaction of curb markets when capital controls on households are relaxed, i.e. Φ is reduced. This increases investments abroad and, since $\delta s_D/\delta s_F < -1$, reduces savings in the domestic banks making the supply of bank loans contracts. Hence there is an increase in demand for curb market loans. The curb loan rate must increase,

$$(14b)\quad \delta R_C/\delta\Phi > 0.$$

As regards economic reform in financially repressed economies the most interesting aspect to analyze is the impact of increasing the deposit rate R_D. Both McKinnon(1973) and Shaw(1973) argue that an increase in the deposit rate would increase total savings in the economy. In the present framework it is clear that increasing R_D will reduce R_C. This is somewhat surprising, since one would think that the shift of savings from the curb markets to banks would reduce net investments in the curb market making the curb rate increase. Here, however, the savings in deposits(and bank credit) increase more than savings in curb markets decline, since$(\delta s_D/\delta R)(\delta R/\delta R_D) > 0$, $\delta s_D/\delta s_C < -1$, and $\delta s_D/\delta s_F < -1$. Thus

$$(14c)\quad \delta R_C/\delta R_D < 0.$$

This result also means that the increase in the deposit rate increases total savings in the economy *at any given level of investment i*, which is in the spirit of McKinnon and Shaw.[13]

The result can be contrasted to that obtained by Buffie(1984) who claims that the effect can go either way. His argument is based on the existence of reserve requirements on bank deposits. In this case a dollar taken out of the curb market and placed in a bank deposit does not increase bank loans by one dollar. This paper has abstracted from reserve requirements, and for that reason reached a more traditional conclusion. But it should be emphasized that an increase in savings need not be equivalent to an increase in welfare. Furthermore, one should also take into account the effect of the increase in investment on savings, as will be done in the analysis of the next section.

Ⅳ. Liberalization and Welfare

i) An Increase in the Interest Rate on Deposits

Using equation(9) the welfare of the representative individual is

$$(15)\quad u=u[(G^1-s_D-\sigma_C(s_C)-\sigma_F(s_F))/A\pi^1,\ (G^2(p^2,\ k+i)+R^*(s_D+s_C+s_F-i))/\pi^2],$$

where s_D, s_F, and s_C are given by equations (12), (5), and (4) respectively.
The change in welfare when the deposit rate is changed can be expressed as follows[14] :

$$\begin{aligned}(16)\quad du=(u_2/\pi^2)\{&(R^*-R_D/A)[ds_D/dR_D+(\delta s_D/\delta s_C)(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)\\&+(\delta s_D/\delta i)i'(\delta R_C/\delta R_D)]+(R^*-R_C/A)[\delta s_C/\delta R_D+(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)\\&+(R^*-\Phi R^*/A)\delta s_F/\delta R_D+(R_C-R^*)i'\delta R_C/\delta R_D\}dR_D,\end{aligned}$$

where

$$ds_D/dR_D\equiv(\delta s_D/\delta R)(\delta R/\delta R_D)+(\delta s_D/\delta s_C)(\delta s_C/\delta R_D)+(\delta s_D/\delta s_F)(\delta s_F/\delta R_D).$$

It is clear that $ds_D/dR_D>0$ and that $ds_D/dR_D>|\delta s_i/\delta R_D|$, i=C, F.

Consider equation (16) term by term. If the curb market rate were constant the first term would imply that a reduction in the degree of financial repression is beneficial if $R^*>R_D/A$. In this case savings would be initially below the optimal level, since the real rate of interest is too low, that is, the domestic real interest rate is below the world

13. Recently, Liang(1988) has noted, in an IS-LM-framework, that if unorganized credit markets exist then an increase in the officially regulated interest rate is an expansionary policy action, since it reduces the curb market rate.
14. See the appendix for the procedure how the welfare change is calculated. The same procedure is used in all the calculations below.

rate which is the proper shadow interest rate. Since an increase in the deposit rate increases savings, welfare tends to increase. If, however, trade is initially restricted to such an extent that $R^* < R_D/A$, the initial real interest rate would be too high, and hence, increased savings would reduce welfare. Thus, the existence of financinal repression does not allow us to infer that the level of savings is suboptimal.

When the reaction of the curb rate is taken into account, one cannot draw such a strict conclusion. Since the curb market rate declines when R_D is increased, savings will increase since there is a shift of investment by households from curb market to bank deposits. This effect strengthens the previous conclusion, but one must take into account the reaction of investment by firms in physical capital. Since this investment increases total savings decline, ceteris paribus, because future(period 2) income increases. Hence, the impact from the curb market can either raise or reduce savings. If the latter holds the interaction between trade regulation and control of financial markets cannot be analyzed in such a simple way as when the curb rate was assumed to be constant.

The second term in(16) is unambiguously positive. Since $R_C/A > R^*$ households have invested excessively in the curb markets. Since an increase in the bank deposit rate reduces this investment, welfare increases.

The third term has an ambiguous sign. If trade is very restricted the real rate of interest on foreign investment is above the shadow rate and the capital flight reduces welfare. Since an increase in the deposit rate reduces capital flight, welfare would increase, ceteris paribus, with the deposit rate.

The fourth term is positive. The return on investments by firms is above the shadow return, that is, investments are at a suboptimal level. Since financial repression reduces investment welfare can be increased, ceteris paribus, by increasing the deposit rate which in turn lowers the curb rate.

Consider finally the special case where trade has been liberalized completely, $A=1$. Now, all terms in(16) except the first are unambiguously positive. The first term can be of either sign, since it is not clear how financial liberalization affects total savings in the economy. It is clear that savings are below the optimal level, but deregulation in financial markets may reduce savings since it increases investment and there by future income. This result is in strong contrast with the analyses by Kähkönen(1987) and Haaparanta(1988).

All in all, one cannot say unambiguously how the reduction in the degree of financial repression affects welfare.

ii) Relaxation of the Capital Controls Imposed on Foreign Borrowing by Firms

When firms are allowed to increase their foreign borrowing i_F welfare changes by

$$(17)\ du=(u_2/\pi^2)\{(R^*-R_D/A)[\delta s_D/\delta i_F+(\delta s_D/\delta s_C)(\delta s_C/\delta R_C)(\delta R_C/\delta i_F)+(\delta s_D/\delta i)i'(\delta R_C/\delta i_F)]+(R^*-R_C/A)(\delta s_C/\delta R_C)(\delta R_C/\delta i_F)+(R_C-R^*)i'(\delta R_C/\delta i_F)\}di_F.$$

The last two terms in(17) are clearly positive. Households' savings in the curb market are excessive and firms' investment in productive capital too low. Since the curb market rate declines when firms are allowed to borrow abroad households' savings in the curb market declines and firms' investments increase. The first term, however, has an ambiguous sign for the reasons given above : there is the ambiguity relating to the pre-reform real deposit interest rate(that is, to whether R^* is smaller or larger than R^D/A) which determines whether the savings in deposits initially are too small or too large, and the ambiguity relating to the impact of the reform on saving in the form of deposits after the adjustment in the curb market rate.

There is by now a widely shared view that for sequential reforms to succeed capital controls should be abolished only after trade has been liberalized(see especially Edwards(1984)). In the present framework this view is not valid, in general. It is valid only if the reform increases the savings in deposits, because then severe restrictions on trade imply that the first term in(17) is negative. But even this is not necessary, since the signs of the other two terms in(17) are independent of the level of import protection. Furthermore, strict trade restrictions are sufficient to ensure a welfare improvement in case the abolition of capital controls reduces savings in bank deposits.

iii) Reduction in Capital Controls Facing Households

The reduction of the controls on households can be interpreted here as being equivalent to an increase in the probabiblity of not getting caught, Φ. The welfare impact of this reform is

$$(18)\ du=(u_2/\pi^2)\{(R^*-R_D/A)[(\delta s_D/\delta s_F)(\delta s_F/\delta\Phi)+(\delta s_D/\delta s_C)(\delta s_C/\delta R_C)(\delta R_C/\delta\Phi)+(\delta s_D/\delta i)i'(\delta R_C/\delta\Phi)]+(R^*-R_C/A)(\delta s_C/\delta R_C)(\delta R_C/\delta\Phi)+(R^*-\Phi R^*/A)(\delta s_F/\delta\Phi)+(R_C-R^*)i'(\delta R_C/\delta\Phi)\}d\Phi.$$

The curb market rate increases when Φ increases. Hence, the second and fourth terms in (18) are negative, since the reform increases the already excessive investments in curb markets and reduces the below-optimal investments by firms. The fir-

st and third terms have ambiguous signs by the reasons given above.

The reform leads to a decline in welfare if $R_D < AR^* < \Phi R^*$ and savings in bank deposits decline when controls are lifted. In this sense the claim that trade liberalization should preceed the abolition of capital controls holds. Note, however, that if trade is so restricted that $AR^* < R_D$ then welfare effect is ambiguous, since the decline in bank deposits would, ceteris paribus, increase welfare. Also in the case of free trade(A=1) the welfare change cannot be signed, since the increase in foreign investment would tend to make welfare increase thus counteracting all the other influences.

In the case where bank deposits increase with Φ welfare declines unambiguously if trade is very restricted, that is if $AR^* < R_D < \Phi R^*$.

iv) Removing the Current Tariff on Imports

When tariffs are reduced($dt < 0$) welfare changes by

$$(19)\quad du=(u_2/\pi^2)\{(R_D/A\pi^1)t(\pi_{22}^1 z^1-R_{22}^1)+(R^*-R_D/A)[\delta s_D/\delta t +(\delta s_D/\delta s_D)(\delta s_C/\delta R_C)(\delta R_C/\delta t)+(\delta s_D/\delta i)i'(\delta R_C/\delta t)] +(R_C-/R^*)i'(\delta R_C/\delta t)+(R^*-R_C/A)(\delta s_C/\delta R_C)(\delta R_C/\delta t)\}dt.$$

Consider first the case where an increase in the tariff would increase savings, that is where the substitution effect of a higher real interest rate outweighs the income effect. The last two terms in(19) are then positive : an increase in tariffs would raise firms' investment and reduce households' investment in the curb market. The first term, which represents the deadweight loss due to tariffs, is negative. The second term has an ambiguous sign for the reasons explained above in this section. With severe initial trade restrictions and assuming that savings in bank deposits increase with tariffs even when all the indirect impacts on them are accounted for the term would be negative. But at any rate the impact on welfare of a change in tariffs is ambiguous. If the first two terms are large enough welfare improves with trade liberalization. The perverse result of a deterioration in welfare cannot be ruled out by a priori reasoning, however.

If a reduction in current tariffs increased savings then the last two terms in(19) would be negative and the only term making the welfare impact ambiguous would be the second term. If the total impact of a tariff reduction on bank savings were positive then with severe initial trade restrictions($R^* < R_D/A$) it would be positive making the total impact of trade liberalization again ambiguous. Trade liberalization would succeed for sure only when trade restrictions are low enough to begin with.

V. Concluding Comments

The main conclusion is that in analyzing of sequential liberalization programs it is crucial to take into account the repercussions that come from the curb markets and that affect investment in physical capital. The dilemma posed by these interactions is that reforms that, ceteris paribus, increase total savings in the economy also reduce the curb market rate and thus make investment grow. This latter effect reduces savings(because households' future incomes grow), and thus the net total effect on savings is ambiguous. Hence, even if the economy is in a situation where savings are suboptimal, attempts to reduce financial repression may fail to increase savings. These considerations have been neglected in much of the literature. When they are added to the ambiguities arising from the interactions between trade and capital market policies, one must conclude that any simplistic view about partial economic reforms is likely to be misleading. For example, low official interest rates lead, ceteris paribus, to a reduction in savings, but current trade policies may be so strict that the real interest rate is too high. In this situation it is not even clear that an increase in savings is desirable.

One obvious shortcoming in the analysis of this paper is the neglect of macro issues that usually are emphasized when financial repression is discussed(see especially Fry(1988), van Wijnbergen(1983)). These will be treated in future work : here an attempt has been made to clarify the role and impact of unofficial credit markets in a choice theoretic framework which has not been done earlier.

Another promising line for future research is to borrow ideas from the current intensive research on the role of financial markets in developed countries. This literature has advanced the view that financial markets may be both a major source and a crucial intermediator of business fluctuations(see Gertler(1987) for a survery). If this is true for developed economies it could be more so for developing countries.

Appendix

This appendix will provide a detailed derivation for equation(16).

Total differentiation gives

$$du=u_1\{\{-ds_D/dR_D-(\delta s_D/\delta s_C)(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)-\sigma_C[\delta s_C/\delta R_D+(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)]$$
$$-\sigma_F\,\delta s_F/\delta R_D\}/A_x^1+u_2\{R^*[ds_D/dR_D+(\delta s_D/\delta s_C)(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)+\delta s_C/\delta R_D$$
$$+(\delta s_C/\delta R_C)(\delta R_C/\delta R_D)+\delta s_F/\delta R_D]+(G_3^2-R^*)(\delta i/\delta R_C)(\delta R_C/\delta R_D)\}/\pi^2\}dR_D.$$

Using now the condition for the determination of investments $\tilde{G}_3 = R_c$, the condition determining bank savings, equation(3a) and the equations determining savings placed abroad and in curb markets, equations (4) and (5), equation (16) can be reproduced.

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