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LIBERALIZATION AND CAPITAL FLIGHT

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Abstract

A two period trade theoretic model is used to analyze the effects of liberalization programmes in a financially repressed economy (where official bank loan and deposit rates are very low).Finan-cial repression creates incentives for households to overcome the capital controls and invest abroad (capital flight). It is shown that capital controls, financial regulation and trade policies are intimately related in the sense that some financial repression and capital controls are optimal if imports are subject to tariffs, and tariffs are optimal, if there is financial repression. Hence, sequential liberalization programmes may lead to a deterioration of welfare. It is shown, though, that the existence of capital flight improves the possibilities that financial deregulation succeeds even when trade has not been completely liberalized.

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I. Introduction

The literature on the effects of liberalizing markets can be divided in two parts. The earlier literature which was led by the contributions from McKinnon (1973) and Shaw (1973) analyzed the problems of the so called financially repressed economies. These are economies which among other things are characterized by regulated very low interest rates on both bank deposits and official loans even though the marginal loan rate (marginal cost of foreign borrowing or the curb market rate) may be much higher than the world market rate (see Fry (1982)). The early wisdom to reform these economies was that financial markets should be liberalized; later research has raised some doubts whether this is always reasonable (e.g. Buffie (1984) and van Wijnbergen (1983)).

The other part of the literature on liberalization was inspired mainly by the experiences of some Latin American countries in 1970's and 80's (e.g. Buffie (1985), Edwards (1986), Edwards (1987), Edwards and van Wijnbergen (1986), Haaparanta and Kähkönen (1986), and Obstfeld (1986)). This literature has mainly analyzed the consequences of liberalizing trade and capital movements but has not touched upon the issue of financial repression. Recently, however, Kähkönen (1987), has made an attempt to bring together these two strands of literature in an intertemporal general equilibrium optimization model. He is able to show that it is, indeed, important to consider these two issues jointly. He argues, for example, that liberalization of foreign trade and financial markets are intimately related. He concludes also that liberalization of capital movements has effects quite independently of the state of domestic financial markets.

A potentially serious drawback in Kähkönen's analysis is (as he himself notices) that he ignores the problems of capital flight. Recent research has shown that capital flight is in practice quite a sizeable problem (Cuddington (1986)). This has led to theoretical studies on capital flight based on the idea that the risk of expropriation of private investment in a country exceeds the risk of expropriation abroad (see Khan and ul Haque (1986) for an

exogenous risk, Eaton and Gersowitz (1987) for an endogenous risk). In this paper I shall try to explain and analyze the general equilibrium implications of the capital flight in a financially repressed economy where individuals are prohibited from investing abroad. Since the rate of return on domestic bank deposits (assumed to be the only available form of saving for individuals) is kept low there is an incentive to place funds abroad. The strictness of capital controls obviously affects these incentives. Hence, I shall be able to analyze the relations between liberalization programmes and capital flight.

II. The Model

The model I shall use is an extension of the two-period general equilibrium trade models used quite widely to analyze the impacts of liberalization programmes (e.g. Edwards (1987), Haaparanta and Kähkönen (1986), and especially Edwards and van Wijnbergen (1986), Kähkönen (1987)). In each period the economy produces two goods, an exportable (x) and an importable (y). There are four types of agents in the economy: households, firms, banks, and the government. In each period the households consume both of the goods giving the welfare $u = u(z^1(c_x{}^1, c_y{}^1), z^2(c_x{}^2, c_y{}^2))$, where $c_j{}^i$ = the amount of commodity j consumed in period i and z^i = period i subutility derived from that period's consumption assumed to be homothetic (i.e. I assume the intertemporal preferences to be weakly separable). The utility function and the subutility function satisfy the usual neoclassical properties. The households can place their savings either on domestic bank deposits (s_D) giving the rate of interest r_D or abroad (s_F) giving the rate of interest r*. Investment abroad is, however, officially prohibited and controlled,[1] and hence, it can be called capital flight. The household escapes

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[1] I could easily allow the case that households are allowed to invest abroad a fixed amount of money and are penalized only if they invest more than the allowed quota. The present analysis would go exactly through assuming only that individuals are willing to invest above the quota.

the controls with probability Φ; if it gets caught (with probability $1-\Phi$) then it looses both the interest and the value of the invest-ment. The expected return from foreign investment is $\Phi(1+r^*)sF$. Hence, the income available for period 1 consumption is $y_1-s_D-\sigma(s_F)$ and the income available for period 2 consumption is $y_2 + (1+r_D)s_D+(1+r^*)s_F$ with probability Φ and $y_2+(1+r_D)s_D$ with probability $(1-\Phi)$. Here I have assumed that investment abroad causes some costs and the function σ presents the gross costs associated with foreign investment (see Khan and ul Haque (1986) for a similar treatment and some rationalization). Hence $\sigma(s_F) > s_F$; I assume further that $\sigma' > 1$ and $\sigma'' > 0$ everywhere (again following Khan and ul Haque (1986)). y_i is the net flow income of the household in period 1 which it regards as exogenous.

The household's choice variables are the investment in domestic banks, s_D, and investment abroad, s_F. Since the returns on foreign investment are uncertain the choice is made under uncertainty. To analyze this choice I assume that the households' risk preferences are presented by Selden's risk neutral Ordinal Certainty Equivalent preferences (Selden (1978,1980)). This means that welfare is given by $w = u(z^1,Ez^2)$, where E is the expectation operator. Since I have assumed the subutilities to be homothetic they can be solved from the following equations:

$$(1a) \qquad \pi(p^1)z^1 = y_1 - s_D - \sigma(s_F),$$

$$(1b) \qquad \pi(p^2)z^2 = y_2 + (1+r_D)s_D + (1+r^*)s_F, \text{ with probability } \Phi,$$
$$= y_2 + (1+r_D)s_D, \qquad \text{with probability } 1-\Phi.$$

Here π is the unit expenditure function and p^i = period i prices. Hence, the welfare of the household is given by

$$(2) \qquad w = u[(y_1-s_D-\sigma(s_F)/\pi(p^1),(y_1+(1+r_D)s_D+\Phi(1+r^*)s_F)/\pi(p^2)],$$

which is to be maximized with respect to s_D and s_F. The first order conditions for the optimum are:

(3) $u_1/u_2 = R_D\pi(p^1)/\pi(p^2)$,

(4) $\sigma'(s_F)u_1/u_2 = \Phi R^*\pi(p^1)/\pi(p^2)$,

where $R_D \equiv (1+r_D)$, $R^* \equiv (1+r^*)$; fj denotes the partial derivative of function f with respect to the jth variable. Together (3) and (4) imply that investment abroad is determined by[2]

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

(6) $s_F = s_F(\Phi R^*/R_D)$, $s_F' > 0$.

Capital flight increases the larger is the expected yield on foreign assets relative to domestic assets.

Consider next the behaviour of firms. It is assumed that they produce both of the goods taking the prices of goods as given. The country cannot affect the world market prices of the goods p^{*i} but tariff policies can make domestic prices differ from the world market prices. Assume in particular that the economy has currently tariffs on the importable, but in the long run (period 2) there is free trade. Hence, $p_X^i = p_X^{*i}, i = 1,2$, $p_Y^1 = p_Y^{*1} + t$, $p_Y^2 = p_Y^{*2}$. Production of both of the goods requires the use of three factors of production, labour, capital, and land (to ensure that factor price equalization does not hold). In each period perfect competi-tion makes it sure that factors are allocated to maximize the value of production. This maximized value can be described by revenue functions (see e.g. Dixit and Norman (1980)): $R^1(p^1)$ is the value of first period production and $R^2(p^2,k+i)$ the value of period 2 production, where k is the capital stock in period 1 and i is the investment in physical capital made by the firms in period 1 which has an effect on capital stock in period 2. The firms make investments to maximize profits. These investments have to be financed by loans from domestic banks, as is usually assumed in the

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[2]Notice that for an interior solution I must have that $\Phi R^* > R_D$. If it does not hold then $S_F = 0$.

financial repression literature (see Fry (1982)). The interest rate charged by the banks, r_L, is higher than the world market rate of interest r* (because of capital controls on banks to be explained below)[3]. The first order condition for profit maximization is then that $R^2_3 = R_L$, where $R_L \equiv (1+r_L)p_x^1$. I assume that the exportable good is used as the capital good; were I to assume that the importable is the capital good then the marginal cost of investment would be affected by tariffs. But, as Buffie (1984) has noted, many imports of capital goods are exempt from tariffs and, hence, it may not be too simplified to ignore this tariff effect. Solving the first order condition gives the investment function

$$(7) \qquad i = i(R_L),\ i' < 0.$$

(In (7) I have suppressed the prices as arguments in the investment function since I shall not be concerned with the effects of changes in period 2 prices.)

Banks collect deposits s_D from the households at the rate of interest r_D and finance the firms' investment i. To be able to fulfill the financing task the banks borrow abroad the amount $i-s_D$ at rate r_L (which implies that the tax on capital movements is r_L-r^*). Hence the banks profits P^B in period 2 are

$$P^B = R_L i - R_D s_D - R_L(i-s_D) = (R_L-R_D)s_D.$$

Government revenue consists of three components. The first is the period 1 tariff revenue, the tax revenue from capital controls on banks, and the revenue collected from households caught from investing abroad. The first component is $P^T = t(\pi^1_2 z^1 - R^1_2)$, and the

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[3]The financial repression literature usually assumes that the interest on official bank loans is very low. But this leads to credit rationing in the official loan market and the demand for bank loans is satisfied by curb markets, where the interest rate is high (see Buffie (1984), Fry (1982), van Wijnbergen (1983)). The curb market rate then presents the marginal cost of investment. I have tried to capture this fact of high marginal interest rates with my assumptions.

second is $(R_L-R^*)(i-s_D)$. In assessing the third component I assume that private investment abroad consists of a continuum of indepen-dent projects totalling s_D. Hence, the government collects a sure revenue of $(1-\Phi)s_D$ in period 2.

I assume that the aggregate behaviour of the economy can be characterized as arising from the behaviour of a single individual. This individual receives as her income the revenue of all factors of production, the profits of banks, and the government revenue, each at the period when they arise. Hence, using (1a) and (1b)

$$(8a) \qquad \pi(p^1)z^1 = R^1(p^1) + P^T - s_D - \sigma(s_F),$$

$$(8b) \qquad \pi(p^2)Ez^2 = R^2(p^2,k+i)+R^*(s_D+s_F-i).$$

(8a) implies, using the expression for P^T, that

$$(8c) \qquad z^1 = [R^1(p^1)-tR^1{}_2-s_D-\sigma(s_F)]/A\pi(p^1),$$

where $A = 1 - t\pi^1{}_2/\pi^1$. $A > 0$ since is homogenous of degree 1 in prices.[4]

The aggregate behaviour in the economy can now be characterized by equations (6),(7),(8b,c), and by

$$(9) \qquad u_1(z^1,Ez^2)/u_2(z^1,Ez^2) = R_D\pi(p^1)/\pi(p^2) \equiv R^0,$$

$$(10) \qquad w = u(z^1,Ez^2),$$

where R^0 is the real rate of interest. When (6)-(8b,c) are substituted in (9) savings in domestic banks can be solved. After that (10) gives the welfare of the representative individual.

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[4] $\pi^1(p^1) = \pi^1{}_1p_x{}^1* + \pi^1{}_2(p_y{}^1*+t)$. Dividing this expression by π^1 on both sides gives the desired result.

III. The Effects of Liberalization Programmes

a) Liberalization and Saving

Consider first the impacts of liberalization programmes on savings in domestic banks (and then on total savings). From equation (9) one can calculate that

(11) $\quad \delta s_D/\delta R^0 = 1/B,$

where $B = \{u_2[-u_{11}/A\pi^1 + R^*u_{12}/\pi^2] - u_1[-u_{12}/A\pi^1 + R^*u_{22}/\pi^2]\}/(u_2)^2$. $B > 0$ by the properties of the utility function. Hence, an increase in the real rate of interest increases savings in domestic banks, $\delta s_D/\delta R^0 > 0$. This is in accordance with the financial repression view. The claim that an increase real rate of interest increases welfare is evaluated below.

A change in investment abroad affects saving in domestic banks by

(12) $\quad \delta s_D/\delta s_F = -C/B,$ where

$C = \{u_2[-u_{11}\sigma'/A\pi^1 + R^*u_{12}/\pi^2] - u_1[-u_{12}\sigma'/A\pi^1 + R^*u_{22}/\pi^2]/\pi^2\}/(u_2)^2$. $C > 0$ because of the properties of the utility function. Also, since $\sigma' > 1$, $C > B$, and thus $\delta s_D/\delta s_F < -1$: capital flight reduces <u>total savings</u>. (11) and (12) can be used to evaluate the effects of an increase in domestic deposit rate on savings:

(13) $\quad \delta s_D/\delta R_D = (\delta s_D/\delta R^0)\pi^1/\pi^2 + (\delta s_D/\delta s_F)(\delta s_F/\delta R_D).$

Since (from (6)) $\delta s_F/\delta R_D < 0$, it is clear that $\delta s_D/\delta R_D > 0$, and especially, since $\delta s_D/\delta s_F < -1$, $\delta s_D/\delta R_D > |\delta s_F/\delta R_D|$. Thus, an increase in domestic deposit rate increases both the savings in domestic banks and total savings. The increase in deposit rate increases savings directly because of the usual substitution effects and indirectly because it reduces the incentives to invest abroad.

An increase in domestic bank loan rate reduces the marginal rate of substitution u_1/u_2 since it reduces period 2 welfare: $\delta z^2/\delta R_L =$

$(R^2_3-R^*)i'/\pi^2 < 0$ (because $R^2_3 = R_L > R^*$). Hence, an increase in s_D is required to achieve equilibrium when RL increases:

(14) $\quad \delta s_D/\delta R_L > 0.$

A reduction in capital controls facing the households reduces savings in banks, since it increases investment abroad:

(15) $\quad \delta s_D\delta\Phi = (\delta s_D/\delta s_F)(\delta s_F/\delta\Phi) < 0.$

Besides reducing savings in domestic banks, the easening of controls reduce also total savings, since $\delta s_D/\delta s_F < -1$.

Finally we must study how changes in current tariffs affect savings. First, it is clear that period 1 welfare declines, if tariffs are increased:

$$\delta z^1/\delta t = t(\pi^1_{22}z^1 - R^1_{22})/\pi^1 A < 0,$$

because the expenditure function is concave and the revenue function convex in prices. This implies that the marginal rate of substitution u_1/u_2 increases. But simultaneously the real rate of interest R^0 also increases, since the current period consumer price index increases but future price index remains unchanged. It is not clear which of these increases more and, hence, it is not possible to say whether an increase in tariffs reduces or increases bank savings (and total savings, since s_F does not depend on t). Consequently, it is not possible to say anything about the effects of trade liberalization on savings; I shall, however, assume that the substitution effect outweighs the income effect:

(16) $\quad \delta s_D/\delta t > 0.$

b) Liberalization and Welfare

As the model stands, it is clear that the first best optimum in the economy can be achieved by abolishing all the distortions from the economy. But this is not the way the liberalization programmes proceed usually. On the world wide scene attempts to liberalize international trade have predeeded the liberalization of capital movements; some country examples about the sequencing of liberalization are particularly striking. E.g. in Chile tariffs were reduced substantially and domestic financial markets were liberalized before the capital controls were reduced (see Edwards (1986)). Thus, the liberalization programmes proceed in a distorted economy, and, hence, the general theory of second best should make one cautious about the welfare consequences of such programmes. Here I shall analyze the welfare consequences of liberalizing some markets while other markets remain distorted.

i) Liberalization of Domestic Financial Markets

The financial repression school emphasizes strongly the need to increase domestic deposit rates. The welfare consequences of increasing R_D are given by

$$\delta w/\delta R_D = [-u_1/\pi^1 A + u_2 R^*/\pi^2]\delta s_D/\delta R_D + [-u_1\sigma'/\pi^1 A + u_2 R^*/\pi^2]\delta s_F/\delta R_D$$

Using the first order conditions for the individual welfare optimum (3) and (4) allows us to write this expression as

$$(17) \qquad \delta w/\delta R_D = (u_2/\pi^2)\{R^*[1-(R_D/AR^*)]\delta s_D/\delta R_D + R^*[1-(\Phi/A)]\delta s_F/\delta R_D\}.$$

Consider first the case where international trade has been libera-lized, t = 0, i.e. A = 1. Then, since an increase in deposit rate increases both savings in domestic banks and total savings and $\Phi R^* > R_D$, it is clear that the expression in (17) is positive: as financial repressionists argue, increasing deposit rates increases welfare. An analogous result is derived in Kähkönen (1987) but

without regard to the existence of capital flight. This result depends crucially on the assumption that trade is free trade. Assume now that imports are regulated by tariffs at the time financial markets are deregulated, i.e. $A < 1$. Now, if tariffs are so extensive that $R_D/AR^* > 1$ the first term in (17) is negative: an increase in domestic savings reduces welfare, since they are excessive already due to the tariffs, and since an increase in deposit rate increases s_D, it reduces welfare, ceteris paribus. Changes in deposit rate affect, however, also capital flight: the second term in (17) is positive, since $\Phi R^* > R_D$ implies that $\Phi/A > R_D/AR^*$. Thus, the existence of capital flight makes it more likely that liberalization of domestic financial markets succeeds even in the presence of heavy import protection. This result is strongly at variance with Kähkönen (1987) who claims that large tariffs necessarily imply a welfare deterioration when domestic deposit rates are increased.

ii) Liberalization of Capital Controls on Households

Liberalization of capital controls can have two meanings in the present framework. One can ease the controls on households, i.e. take measures that increase Φ, the probability that the investor is not caught by the controls, or reduce R_L, the rate of interest the banks must pay for foreign loans. Consider first the former case. With the same methods as were used to obtain (17) one can derive

$$(18) \qquad \delta w/\delta\Phi = R^*\{[1-(R_D/AR^*)]\delta s_D/\delta s_F + [1-(\Phi/A)]\}\delta s_F/\delta\Phi.$$

If trade is liberalized ($A=1$) when capital controls are eased then welfare is reduced when capital controls are liberalized, if domes-tic financial markets are not liberalized. This is, since $\Phi > R_D/R^*$ and $\delta s_D/\delta s_F < -1$. The term in curly brackets is then negative, and since the reduction in capital controls increases foreign investment there is welfare loss: the financial repression has reduced savings below the optimal, and the reduction in controls causes an outflow of savings which reduces aggregate savings further. The presence of tariffs does not necessarily alter these

results. Consider e.g. the case where initially $\Phi/A = 1$. Since $\Phi/A > R_D/AR^*$ welfare is again reduced when controls are eased. The only situation where liberalization may be beneficial is when $\Phi/A > 1$ and $R_D/AR^* > 1$ since then savings are above the optimal level and reduction in them improves welfare.

The optimal degrees of capital controls and financial repression can be solved from (17) and (18): the first order conditions for the optimum $\delta w/\delta R_D = 0 = \delta w/\delta \Phi$ hold, when

(19) $$R_D = AR^*,$$

(20) $$\Phi \leq A$$

where, to remind, $A = 1 - t[\delta\pi^1(p_x^{*1}, p_y^{*1}+t)/\delta p_y^1 \pi^1]$. Hence, if trade is subject to tariffs, then both domestic financial markets and foreign investment should be regulated. (19) and (20) imply that at the optimum one should have $R_D \geq R^*$. This means that at the optimum no foreign investment occurs abroad.

The optimum rate of interest on deposits is below the world market rate and thus the optimum requires some financial repression. This result is quite analogous to the result reached in Kähkönen (1987). The new result here is that one should abolish foreign investment altogether. But all this depends on the fact that trade is subject to tariffs. Under conditions of free trade the optimal policy is to liberalize both the financial markets and controls on foreign investment.

iii) Liberalization of Capital Controls on Banks

The welfare consequences of changing the bank loan rate are

(21) $$\delta w/\delta R_L = (u_2/\pi^2)\{[R^*-(R_D/A)]\delta s_D/\delta i + (R^2_3-R^*)\}\delta i/\delta R_L,$$

where $\delta s_D/\delta i = -[(u_2u_{12}-u_1u_{22})/\pi^2 B](R^2_3-R^*)$; using the expression for B given above it is seen that the coefficient of $R^2_3-R^*$ in this

formula is less than 1 in absolute value. This implies, since $R^2_3 = R_L \geq R^*$, that reducing the bank loan rate towards the world market rate always increases welfare regardless of the presence of tariffs on imports or financial repression. Hence, quite unlike the controls on investment abroad, the welfare implications of reducing controls on banks are independent of the trade regime. This result, noted also in Kähkönen (1987), is in strong contrast to the views that controls on capital movements should be abolished only after trade has been liberalized (see e.g. Edwards (1983)). This view is correct with respect to the controls on households' investment abroad but not with respect to controls on banks' foreign borrowing.

iv) Liberalization of Trade

Welfare change with the tariff is as follows:

$$(22) \quad \delta w/\delta t = (u_2/\pi^2)\{tR_D(\pi^1_{22}z^1-R^1_{22})/A + [1-(R_D/AR^*)]\delta s_D/\delta t\}.$$

The first term within the curly brackets in (23) is negative and the second is positive. Hence, the welfare impact of changes in tariffs is ambiguous. Financial repression tends to reduce savings, but a positive temporary tariff tends to increase the real rate of interest. The problem is analogous to that found in Kähkönen (1987). (23) can be solved for the optimal rate of tariff. As in Kähkönen, it can be shown to be positive as long as the deposit rate is below the world market interest rate. The existence of capital flight does not affect these results.

IV. Concluding Comments

The main result reached above is that liberalization of trade, domestic financial markets, and capital controls on households are very much interrelated. The welfare consequences of sequential liberalization are thus uncertain, as is typical in the second best situations. It was shown that as long as imports are subjected to tariffs liberalization of domestic financial markets or capital controls on households may lower welfare and, indeed, the optimal

second best policy is to keep the domestic financial markets in financial repression and reduce capital flight, i.e. households' investment abroad. It was also shown that the presence of capital flight makes it more likely that liberalization of financial markets leads to a welfare improvement. Conversely, if trade liberalization is undertaken when financial markets are repressed welfare may decline.

In contrast to the control of capital flight, the liberalization of the control of foreign borrowing by banks improves welfare quite regardless of conditions in other markets. This conclusion may, however, be very much dependent on the fact that I have not modelled the curb loan markets explicitly, since one would expect that bank loan rates and curb market rates are interrelated. The modelling of curb loan markets in the framework used here is a subject of ongoing research.

The analysis here has neglected many important issues relating to economic reforms. Calvo (1986) has studied the reforms in an environment where the private sector does not necessarily believe that the reforms are long lasting. This is a special case of the problem of time inconsistency of policies. Another general problem is that the proper study of reforms may require the knowledge of why the policies that are currently used have been adopted in the first place, the policies have always an endogenous component. One could try to incorporate some of this by borrowing from the ordinary static trade theory e.g. some of the analysis of directly unproductive profit seeking activities.

Another problem with the present analysis is that it has consi-dered only distortions which are policy induced. The modern theory of credit markets would, however, suggest that credit markets are inherently incomplete due to the problems created by incomplete information (see e.g. Stiglitz and Weiss (1987). The incorporation of these ideas provides an interesting avenue for future research.

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