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International Financial Liberalization, Corruption and Economic Growth

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Abstract

This paper examines the effects of capital account liberalization on the long-run growth of a developing economy. A general-equilibrium, endogenous growth model is constructed in which corruption forms an integral part of the governance system of the country. By undermining the profitability of innovations, corruption reduces the rate of technological change, and lowers the rate of return to capital. The impact of international financial liberalization on long-run growth in this model can be either positive or negative. A drop in growth is obtained when the level of corruption is high enough to cause domestic rates of return to capital before liberalization to drop below those in the rest of the world. In this case, liberalization generates capital outflows, which act as a constraining force on innovation, reducing the rate of technological change and lowering output growth. On the other hand, if the level of corruption is sufficiently low, the capital account liberalization will serve as a boost to the country's technical change and growth.

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1. Introduction

The globalization of capital markets in recent years has led to a historical degree of financial integration in the world. As Obstfeld (1998, p. 11) remarks: "the worldwide trend of financial opening in the 1990s has restored a degree of international capital mobility not seen since this century's beginning." Associated with this globalization has been a worldwide process of capital account liberalization. In industrialized countries, the elimination of restrictions on capital flows accelerated in the 1980s and 1990s, beginning with Margaret Thatcher's reforms in the United Kingdom, continuing with Japan's liberalization of capital inflows and outflows in the early 1980s, and ending with the European Community' elimination of intra-community barriers to capital flows in the 1990s. Among developing countries, liberalization efforts accelerated in the nineties, with countries from Mexico to Korea eliminating major barriers to international trade in assets.[1]

The increased global financial integration has resulted in substantial capital inflows in emerging markets. But despite this overall expansion, many developing nations have not shared on the increased capital influx. For example, in 1998, the Latin America and Caribbean region together with the Europe and Central Asia region received $87 billion in net private capital inflows, excluding foreign direct investment (FDI). But in Sub-Saharan Africa, this balance was negative that year, with the region suffering a net private capital *outflow* of $1 billion. In fact, excluding FDI, private capital flows to Sub-Saharan Africa were either negative or negligible during the 1980s and 1990. As a result, massive amounts of the wealth owned by African residents lies invested elsewhere in the world. Collier, Hoeffler and Pattillo (1999) estimate that as much as 39 percent of the private wealth of the Sub-Saharan Africa region in 1990 was held abroad. In recent years, African countries from Cameroon and Nigeria to South Africa have experienced sustained capital outflows.

The experience of capital flight is not restricted to countries in Sub-Saharan Africa. The situation applies also to a number of countries in Latin America and the Caribbean as well as in transition economies.[2] For example, when both officially recorded and unrecorded capital flows are taken into account, capital flight from some former Soviet Republics has been extensive in the nineties. Some studies estimate Russian private capital flight to have totaled $150 billion between 1992 and 1999 [see Cooper and Hardt (2000) and Abalkin and Whalley (1999)]. These capital outflows have acted as substitutes for the massive capital inflows associated with international organizations, such as the IMF and the World Bank.

This paper provides a theoretical framework to examine how capital flight may be stimulated by the liberalization of a developing country's international financial transactions. It then studies the effects of the capital outflows on the long-run growth of the economy. A general-equilibrium, endogenous growth model is constructed in which corruption forms a part of the country's economic environment. Corruption is assumed to act as a tax on the firms and entrepreneurs innovating, designing and producing new goods in the economy. This reduces the economy's rate of technological change and lowers the domestic rate of return to capital. In this context, the paper shows that the impact of international financial liberalization on long-run growth can be either positive or negative. A drop in growth is obtained when the level of corruption is high enough to cause domestic rates of return to capital before liberalization to drop below those in the rest of the world. Opening the capital account in this case generates capital flight, which causes the economy's innovation sector to contract, reducing the rate of technological change and causing output growth to decline. On the other hand, if the level of corruption in the economy is sufficiently low, the capital account liberalization will act to boost the country's technological change and growth.

The next section of the paper presents the endogenous growth model in the presence of corruption. Initially, the economy is assumed to be closed to international financial transactions. Section 3 examines the growth effects of opening the country to international trade in assets. The last section discusses the conclusions and policy implications of the analysis.

2. A Model of a Small Open Economy in the Presence of Corruption

A substantial literature has developed over the past few years examining the sources and consequences of corruption. A wide array of variables have been linked to corruption, including the (low) salaries received by civil servants, the availability of economic rents from which bribes can be extracted, and the under-development of the country's legal system, among many other variables.[3] In addition, empirical work has emerged presenting cross-country data on the level of corruption and examining the impact of corruption on development. Most of these studies show a significant negative relationship between corruption and various measures of economic welfare, including per-capita income, income equality, and GDP growth.[4]

The model constructed in this paper seeks to capture the situation of a developing country where corruption forms an integral part of the economic system. Corruption is assumed to act as a tax on the firms and entrepreneurs innovating, designing and producing new goods in the economy. For each new good to be produced and sold, the government must approve it. Although this is technically a cost-less, paperwork activity, officials in charge of this government office are assumed to ask applicants for bribes in order to grant their approval. Government officials receive civil service income that is negligible compared to the bribes; for simplicity, this legitimate source of income is assumed to be zero.

The corrupt officials seek to maximize their expected income by setting a kick-back or bribery tax rate, t, expressed as a proportion of the revenues received by producers of new goods in the country. They are free to set this rate, subject to two constraints: the size of the revenue base, R, and a probability that the bribery scheme will be dismantled, θ. Both the revenue base and the probability of the corruption scheme breaking-down are assumed to depend on the bribery tax rate. The revenues made by producers are assumed to decline with higher bribery tax rates. The probability of the corrupt regime been dismantled rises with the rate, t. The latter may be the result of the fact that, as the bribery tax rates rise, those being taxed are more likely to find it in their interest to obtain the political capital to change the governance system in the country so as to eradicate corruption.

Under the assumptions, corrupt officials will seek to maximize their expected gain from bribes, G, which is equal to:

$$G = (1 - \theta)\, t\, R(t), \tag{1}$$

with all symbols as defined before (note that the expected gain to the officials if the system is dismantled is zero). The first-order condition for the maximization of G results in the following expression for the equilibrium bribe tax rate in the economy:

$$t^* = \frac{(1 - \theta)(1 - \varepsilon)}{\theta\rho} \tag{2}$$

where $\varepsilon = -(t/R)(\partial R/\partial t) > 0$ is the elasticity of producers' revenues with respect to the bribery tax rate, and $\theta\rho = d\theta/dt < 0$ is the derivative of the probability of the corruption regime been dismantled with respect to the bribery tax rate.

Equation (2) suggests that the bribery tax rate which maximizes the corrupt officials' gain, G, will increase when: (1) the producers' revenue function is relatively more inelastic with respect to the bribery tax rate, (2) when the probability that the corrupt regime will be dismantled drops, and (3) when a rise of the bribery tax rates has a smaller impact on the probability that the corrupt regime will me dismantled.

We now introduce the corruption module just discussed into a general-equilibrium, endogenous growth model. We consider a small open economy trading in final goods with the rest of the world.[5] Initially, the economy is assumed to be closed to international financial transactions. The next section examines the case when financial liberalization allows international trade in assets to occur.

The country is assumed to be a small open economy producing two final goods, X and Y, whose prices are exogenously-determined (P_x and P_y are exogenous). Sector X is assumed to be a human-capital intensive sector whose production function is of the Cobb-Douglas type, given by:

$$X = I_x^{\exists} H_x^{1-\exists}, \tag{3}$$

where X is the output of good X, H_x is the input of human capital, $\exists$ is a positive fraction, and I_x is a sub-production function given by:

$$I_x = \left(\sum_{i=1}^{n} Z_{ix}^{\forall} \right)^{1/\forall}, \tag{4}$$

where $\forall$ is a positive fraction and Z_{ix} represents the use of physical capital good i in sector X, where each Z_{ix} is assumed to be slightly differentiated from other capital goods, the total number of which is n at any given moment in time.

Note that each capital good enters symmetrically the sub-production function in equation (4). On the assumption that all Z_{ix}'s are identical, then:

$$I_x = n^{(1-\forall)/\forall} Z_x \tag{5}$$

Where $Z_x = nZ_{ix}$, that is, the total quantity demanded of capital goods by sector X.

Substituting equation (5) into (3) yields:

$$X = n^{(} Z_x^{\exists} H_x^{1-\exists} \tag{6}$$

where $(= \exists(1-\forall)/\forall$. This shows that production of good X is a function of the quantities of physical and human capital used in production, Z_x and H_x, and the number of capital goods available in the economy, n. This type of production relationship, where the parameter $A= n^{(}$ represents a technology parameter that increases with the number of capital goods available for production, is derived from Romer (1990) and endogenizes technological change by connecting it to the number of capital goods, n.

Sector Y produces a commodity that is intensive in unskilled labor and its production function is given by:

$$Y = I_y^{\exists} L_y^{1-\exists} \tag{7}$$

where Y is the output of good Y, L_y is the input of unskilled labor, $\exists$ is as defined earlier, and I_y is a sub-production function given by:

$$I_y = \left(\Gamma_{i=1}^{n} Z_{iy}^{\forall} \right)^{1/\forall}, \tag{8}$$

with $\forall$ as defined earlier, and with Z_{iy} representing the use of physical capital good i in sector Y. Following the same assumptions made in relation to equation (5), we can combine equations (7) and (8) into:

$$Y = n^{(} Z_y^{\exists} L_y^{1-\exists}, \tag{9}$$

where $L_y = n\, Z_{iy}$ is the total demand for capital in sector Y.

Both final goods sectors are assumed to function in perfectly competitive markets. Firms minimizing costs of production in these sectors will set price equal to unit costs, as given by:

$$P_x = n^{-(} C_x(W_H, P_Z) \tag{10}$$

$$P_y = n^{-(} C_y(W_L, P_Z) \tag{11}$$

Where C_x and C_y are the unit cost functions in sector X and Y, respectively, W_H is the wage rate of skilled labor or human capital, W_L is the wage rate of unskilled labor, and P_Z is the price of each capital good (all capital goods will have the same price, as determined from the symmetry of the demand for, and supply of, each capital good, to be established next).

The production function for each capital good is given by:

$$Z_i = H_{zi}^{a} L_{zi}^{1-a}, \tag{12}$$

where H_{zi} is the demand for human capital in the firm producing capital good i, L_{zi} is the demand for unskilled labor used by each firm, and the exponent ‘a’ is a positive fraction.

The profits of each capital goods producer is:

$$\pi_I = P_Z Z_i(1-t^*) - W_L L_{zi} + W_H H_{zi} \quad . \tag{13}$$

Assuming that each firm maximizes profits, the following first-order conditions are obtained:

$$a\forall(1\text{-}t^*)P_Z Z_i = W_H H_{zi} \qquad (14)$$

and:

$$(1\text{-}a)\forall(1\text{-}t^*)P_Z Z_i = W_L\, L_{zi}\ . \qquad (15)$$

From these two equations, one can derive that:

$$\forall P_Z(1\text{-}t^*) = C_Z(W_L, W_H)\ , \qquad (16)$$

where C_Z is the unit cost of production for each firm in the capital goods sector. Note that corruption acts as a tax on capital goods producers, reducing the effective price, P_Z, that they receive per unit of the good sold. The greater the level of corruption, as represented symbolically by an increase in t, the greater the tax.

In a small open economy trading in final goods (but not capital goods, which remain non-traded), then P_x and P_y are both fixed by world markets. Given the number of capital goods, n, and the prices of final goods, P_x and P_y, then equations (2), (10), (11) and (16) constitute a system of four equations in 4 variables, W_L, W_H, P_Z and t*.

In a dynamic economy, n will rise. We will discuss shortly the forces generating increases in n. But if we denote the steady state growth rate of the number of capital goods by g, then equations (10), (11) and (16) imply that the wages of skilled and unskilled labor, as well as the prices of capital goods, will all rise at the rate (g. In addition, since in a steady state, the usage of inputs will not be shifting across sectors X and Y, then X and Y will also grow at the steady-state rate (g. Consequently, the economy's aggregate output growth rate will also equal (g.

The increase in the number of capital goods, n., determines the long-run growth rate. How are new capital goods created? Following the literature [Romer (1990), Grossman and Helpman (1991a,1991b)], we assume that new capital goods are created by a research or technology sector that uses human capital and has the following production function:

$$dn/dt = \dot{n} = nH_n /a_n \ , \tag{17}$$

where H_n is the input of human capital in the technology sector, and a_n is an exogenous parameter that reflects the productivity of human capital in generating new capital goods, with higher values of a_H representing greater productivity. Given this productivity parameter, equation (17) suggests that the creation of new capital goods is positively related to the quantity of human capital used by the technology/research sector and to the existing number of capital goods, n. The latter represents the fact that, as the supply of capital goods, n, rises, the existing ideas available for innovators to generate new products increases, stimulating innovation and, as a result, the number of capital goods created (for more details, see Romer, 1990).

Note that, from equation (17):

$$g = (\dot{n}/n) = (H_n/a_n) \ . \tag{18}$$

This means that the rate of growth of new capital goods, which is directly related to the rate of growth of the economy, is determined by the amount of human capital allocated to the research/technology sector. The next step is to specify the equilibrium value of H_n.

The rate of return on producing a new capital good, r, is composed of the capital gain on the value of the capital good plus the dividend rate:

$$r = \dot{V}/V + B/V \ , \tag{19}$$

where V is the value of a new capital good and B denotes the profit obtained from the production of a capital good, so that B/V is the dividend rate.

The value of a new capital good is equal to the cost of producing the new capital good, which is given by:

$$V = (W_H H_n/\dot{n}) = (W_H a_n/n) \ . \tag{20}$$

From which one derives that the capital gain –the gain in the value of a new capital good—is given by:

$$\dot{V}/V = \dot{W}_H/W_H - \dot{n}/n \ . \tag{21}$$

Substituting equation (21) into (19) yields:

$$r = \dot{W}_H/W_H - \dot{n}/n + B/V. \tag{22}$$

But the profits in the production of each capital good are:

$$B \;=\; P_Z\, Z_i \; - C_Z Z_i \;=\; [1- \forall(1\text{-}t^*)]P_Z\, Z_i\ , \qquad (23)$$

where we have made use of equations (14) and (15). Using equations (20) and (23), we can then modify equation (22) into:

$$r \;= \dot{W}_H/W_H - \dot{n}/n + [1\text{-}\forall(1\text{-}t^*)]H_Z/a\forall(1\text{-}t^*)a_n$$

$$= \;(\gamma - 1)\, g \;+\; [1- \forall(1\text{-}t^*)]H_Z/[a\forall(1\text{-}t^*)]a_n \qquad , \qquad (24)$$

Where $H_Z = nH_{iz}$. Note also that, at the steady state, the wage rate of skilled labor rises at the rate γg and the number of capital goods at the rate g.

Equation (24) determines the rate of return on new capital goods. But this relationship includes as a variable the total amount of human capital used in the capital goods sector, H_Z. To solve the model we thus need to introduce the human capital endowment constraint:

$$H_n + H_x + H_Z = H\ . \qquad (25)$$

Using equations (14), (15) and (18) and some derivations, we can transform equation (25) into:

$$ga_H + bH_Z = H\ , \qquad (26)$$

where $b = [(1-\beta) + \beta a\alpha(1+\lambda)(1-t^*)] / \beta a\alpha(1+\lambda)(1-t^*)$, with $\lambda = Z_y/Z_x$, which is a fixed parameter under a steady state.

Combining equations (24) and (26), and some manipulation, yields an expression for the steady-state rate of growth of the economy:

$$g = \{[1-\alpha(1-t^*)]/\delta a_n\}H - [ba\alpha(1-t^*)/\delta]\, r \ , \tag{27}$$

where $\delta = 1 - \alpha(1-t^*) + b(1-\gamma)a\alpha(1-t^*)$, which is assumed to be positive in order to ensure a stable steady-state equilibrium.[6]

Equation (24) provides a positive connection between the growth rate and the rate of return to capital, as established by the supply side of the economy. In a nation that does not trade in assets with the rest of the world, domestic consumers determine a second relationship between the rate of return to capital and growth.

From the consumption side, the rate of return can be determined from the consumer maximization problem:

$$U = \int_t^{\infty} \exp[-\Delta(\vartheta-t)] \ \log U\, [C_x(\vartheta), C_y(\vartheta)]\, d\vartheta \tag{28}$$

subject to a budget constraint. The result is:

$$r = (\dot{E}/E) + \rho \ , \tag{29}$$

where E is aggregate consumption expenditure and ρ is the consumer rate of time preference. Now, in the economy's steady state, as noted earlier, consumption expenditure will grow at γg and therefore:

$$r = \gamma g + \rho \tag{29'}$$

Equations (27) and (29') constitute a system of two equations in two variables, g and H_Z. Solving results in:

$$g = [[(1-\alpha(1-t^*)]/a_n[1-\alpha(1-t^*) + ba\alpha(1-t^*)]H$$

$$- \rho\, [a\alpha(1-t^*)b]/ [1-\alpha(1-t^*) + ba\alpha(1-t^*)] \tag{30}$$

The rate of growth of the economy is thus determined by the endowment of human capital (first term) plus the rate of time preference (second term). Note that, the greater the endowment of human capital, H, the higher the growth rate, holding other things constant. In addition, the greater the degree of corruption, t*, the lower the rate of growth, other things constant.

3. The Impact of Capital Account Liberalization on Economic Growth

Consider now the situation when the economy described in section 2 is opened to international trade in assets. In this case, domestic firms and households can both borrow and lend at the world interest rate, r*. Under the assumption of perfect capital mobility, then the domestic rate of return to capital must equal the exogenously-given world interest rare, or:

$$r = r^* \qquad (31)$$

This condition replaces equation (29), which no longer becomes relevant because the economy's steady state equilibrium does not require that expenditure equal income at every moment in time (only an inter-temporal budget constraint must be satisfied).

Using equation (27), the equilibrium growth rate after capital account liberalization becomes:

$$g = \{[1-\alpha(1-t^*)]/\delta a_n\}H - [ba\alpha(1-t^*)/\delta]\, r^* \ , \qquad (32)$$

with all the variables as defined earlier. Under the assumption that δ is positive, equation (32) shows that the economy's growth rate is positively affected by increased human capital (rising H) but negatively affected by an increase in the world interest rate, r*.

How does opening the capital account affect the economy's growth rate? If the equilibrium rate of return on capital before the liberalization lies below r*, then equation (32) suggests that the growth rate will decline. The explanation is that, when the capital account is liberalized and $r<r^*$ then capital flight will occur, as domestic residents can find higher rates of return in the rest of the world. As households shift their investments from the domestic research sector to the foreign assets, which initially yield a higher rate

of return, domestic innovation collapses and the output growth rate (the number of new capital goods created) drops.

Note that the higher the rate of corruption, the greater the tax rate t*. This reduces the economy's rate of return to capital before the liberalization and makes it more likely that there will be capital flight from the economy after the liberalization, causing a drop in growth. On the other hand, the lower the level of corruption in the economy, the less likely that this event will occur and, instead, opening the capital account will result in capital inflows that will stimulate innovation, technological change and growth.

International financial liberalization has distributional effects as well. Consider, for example, the case where the opening leads to capital outflows. In this case, even though the country's output growth rate declines, asset holders will benefit from the higher interest rate. But the increased income received by asset-holders is matched by a fall both in the level and the rate of increase of the earnings of both skilled and unskilled workers. The drop in the level of real income of skilled and unskilled labor is associated with the reduction in the level of physical capital invested in the country as a result of capital flight. The reduction in the growth rate of labor earnings is directly related to the drop in the rate of growth of output since both are equal. Note that if the skilled and unskilled workers were not asset holders, their economic welfare would decline after the liberalization. If they are asset-holders, their welfare may increase, depending on the share of the country's assets that they own.[7]

4. Conclusions

The impact of the liberalization of the capital account on emerging markets has generated heated controversy in recent years. The empirical work of Beck, Levine and Loayza (1998), Levine (2001), Errunza (2001) and others suggests that international financial liberalization fosters economic development not only by allowing developing nations to accumulate physical capital but also by improving the domestic financial system and stimulating productivity growth. Others, such as Krugman (1973) and Rodrik (1998) find no evidence of a connection between increased financial liberalization and economic development. In fact, some have blamed the increased globalization of capital flows for the rash of emerging market crises in the 1990s, including the Mexican Peso crisis and its tequila effect, the East Asian crisis, and the Russian financial crisis and its severe contagion effects. [see Radelet and Sachs (1998) and Eatwell and Taylor (2000)].

This paper shows that international financial liberalization has ambiguous effects on the rate of growth of a developing economy. Whether gains or losses in growth are realized depends on whether the economy benefits from an influx of capital or suffers from a capital flight after the liberalization. If the rate of return to capital before liberalization is comparatively low compared to world rates of return, then an opening of the capital account will result in capital flight and a reduction of domestic growth. On the other hand, if the domestic rate of return is high, capital inflows will result that increase growth.[8]

The paper establishes a negative connection between domestic corruption and the rate of return to capital. As a result, countries where corruption is rampant, will suffer from low rates of return to capital before the liberalization of international financial transactions. When liberalization does occur, capital flight occurs and the economy's growth rate declines. In low-corruption countries, on the other hand, capital account liberalization generates positive growth effects.

Capital flight has induced policymakers in many poor countries to introduce capital and exchange controls, to block the outflows that would result if liberalization were to occur. This paper shows, however, that this is not the first-best policy. Insofar as corruption is behind the low relative rates of return to capital domestically, the first-best policy in this context is to intervene to reduce or eliminate corruption. Indeed, improved governance would result in a burst of growth since it would allow domestic entrepreneurs and innovators to be un-bound from the chattels imposed by a corrupt regime, even in a closed economy. As bribe requests are eliminated or controlled, the returns to research and development will boom, fostering technological change. But, even more importantly, a drop in corruption allows an opening of the capital account to further benefit the domestic economy. With a drop in corruption, the developing economy's natural shortage of capital will reveal itself in high rates of return to capital, which would result in capital inflows as a result of international financial liberalization. On the other hand, introducing capital account liberalization without the appropriate domestic policies in place to improve governance and control corruption may result in a magnification of domestic distortions and a decline of economic growth.

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Notes

1. A broad discussion of capital account liberalization in developing countries is presented in Lukauskas and Rivera-Batiz (2001), Ito and Krueger (1996), Edwards (1995), and Caprio, Atiyas and Hanson, (1994).

2. Theoretical and empirical models of capital flight are presented in Collier, Hoeffler and Pattillo (1999), Schineller (1997), Dooley and Kletzer (1994), Lessard and Williamson (1987), Rivera-Batiz (1987) and Cuddington (1986).

3. See Gray and Kaufmann (1998), Adam and O'Connell (1997), and Shleifer and Vishny (1993).

4. . See Kaufmann, Kraay and Lobaton (1999), Ehrlich and Lui (1999), and Mauro (1995).

5. The model is based on endogenous growth models of the open economy, such as Grossman and Helpman (1991a,b); see also Rivera-Batiz and Romer (1992), Rivera-Batiz (1996, 1997).

6. This requires that the exponent γ be small enough –or the parameter α in the capital goods sub-production function be large enough—to sustain a positive δ. This means that the increasing returns in the production of capital goods, which are directly related to α, are bounded.

7. See Romer (1990) for a discussion of this case.

8. In different models, the dangers of international financial liberalization in the presence of domestic distortions have been examined by Detragiache (2001) and Agenor and Aizenman (1999).