The Influence of Capital Controls on Long Run Growth: Where and How Much?*

Areendam Chanda

North Carolina State University

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Abstract

The recent financial crisis in East Asia generated a revival of interest in the merits of financial openness. The ensuing debate on the benefits of openness has focused more on short and medium run issues than on the long run effects. Within the empirical literature on economic growth, little or no attention has been paid to the effects of financial openness. Contrary to the orthodox position, the few results that exist suggest that capital controls have no effect on economic growth. This paper argues that this conclusion emerges from a failure to account for underlying differences across countries with similar degrees of capital controls. I show that the degree of ethnic and linguistic heterogeneity in a country plays a significant role in explaining the effects of controls on economic growth. For countries with relatively higher degrees of ethnic heterogeneity, the effects are particularly adverse whereas for countries with high degrees of homogeneity, capital controls actually have a net positive effect on economic growth. On balance, more developing countries suffered due to controls than not. Within the sample of 57 non OECD countries that did implement controls for the period 1975-95, as many as 39 saw a reduction in their growth rates. This result is robust to a number of variables commonly used in the economic growth regressions.

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1 Introduction

Market discipline is the best means the world has found to ensure that capital is well used.

-Lawrence Summers (1998)

We have no evidence that it [capital account convertibility] solves any of our problems, and some reason to think that it may make them worse

-Dani Rodrik (1998)

The East Asian financial crisis and the consequent conditionalities laid down by the International Monetary Fund generated a heated debate between economists on the merits and demerits of having an open capital account. Most of the debate has focused on short run issues and only a few have taken the effort to examine the long run effects. The economic growth literature, which has grown exponentially in the past decade, too has devoted little or no time on examining in detail the empirical relationship between capital controls and economic growth. This is even more surprising given the fairly large corpus of literature that now exists on international trade and economic growth.

Within the scarce literature, Dani Rodrik's finding that capital account openness generated no obvious benefit on long run growth, has attracted considerable attention amongst policy makers and those involved in the openness debate.[1] Based on a scatter plot of a measure of capital controls and the growth rate between 1975-89, after controlling for the initial income per capita and a few other variables, he clearly shows no perceptible correlation between the two. This has evoked sharp responses from others. Jeffrey Frankel refers to Rodrik's work as fail-safe econometrics: "The secret of empirical work is to define your hypothesis so that failure to find significant results can be interpreted as support." [2] Eichengreen (1998) accuses those, who argue that today's developing countries should resist capital account liberalization of adopting a double standard. All developed countries, he notes, opened their capital accounts- a logical culmination of the process of developing a deep financial system. While there might be valid arguments for developing countries to impose capital controls as transitional measures there are none for permanently pursuing such a policy.

[1] See Rodrik (1998)

[2] See Eichengreen (1998).

In defense of Rodrik, his results are in keeping with most of the preceding literature on capital controls and economic growth. Earlier, Alesina, Grilli and Milessi Feretti (1994) found, for the sample of OECD countries, that capital controls had positive but insignificant effects on economic growth. However, their study was based on annual data and therefore reflected short run effects. Grilli and Milessi Feretti (1995) reached a similar result for the sample of developing countries based on growth over the medium run (five-year periods). The only contrary result comes from Quinn (1997), who shows that capital account liberalization (and not openness per se) has had positive effects on economic growth.

The finding that capital controls seem to have had little or no effect on economic growth warrants further investigation. At the broadest level, capital controls can be viewed as a form of government intervention. In search of the effects of capital controls, a reasonable path to follow would be to first answer the question - what is it that allows some governments to undertake successful interventions and not others? One of the strongest messages that permeate the economic growth literature is the importance of having favorable conditions and institutions in place for successful and sustained growth. Examples of such conditions include the benefit of an ethnically and linguistically homogenous society, a relatively equal distribution of income, high levels of human capital, security of property rights, high social capital (based on subjective measures of trust and civic norms) and social arrangements that affect the incentive structure. [3] Pursuing policies that artificially boost investment rates has not been sufficient to generate consistent increases in income per capita. Further, there is increasing evidence that the direction of causality between investment and growth may be from the latter to the former. Summers' quote above notwithstanding, neither does it seem to be true that the East Asian Miracle happened because of free markets. Rather government intervention was pervasive, and in this they were aided by some of these favorable conditions.[4]

In addressing the role of capital controls in economic growth, I pose the question: Is it that

[3] A sample of references include Easterly and Levine (1997) for ethno-lingustic fractionalization, Persson and Tabellini (1994) for income distribution, Benhabib and Spiegel (1994) for human capital, Knack and Keefer (1995) for property rights, Knack and Keefer (1997) for social capital and Temple and Johnson (1998) for social capability.

[4] See Wade (1990) for an extensive discussion. Rodrik (1995) also addresses the question of what allows governments to get interventions right. He takes the case of two countries, South Korea and Taiwan (both of which incidentally had high rates of growth but very different policies in terms of capital openness). Both these countries, he argues, grew rich not because of outward orientation but because their governments managed to engineer a significant increase in the private return to capital.

the effect (both direction and magnitude) of capital controls on economic growth is subject to the underlying conditions and institutions that seem to be so important? By entertaining such a hypothesis can one bring out the effects of capital controls from hiding? In this paper, I assess the importance of having an ethnically and linguistically homogenous society. I show that ethnolinguistic homogeneity played a significant role in complementing capital controls and allowed a number of countries to have derive positive effects from controls on growth. On the other hand, countries with high degrees of heterogeneity experienced a decline in their growth rates because of controls. It is not surprising then, that earlier papers find no evidence of the effect of controls on growth. Simply entering capital controls as an independent variable in a growth regression is not the best way to search for its effects. In addition, I also briefly explore the effects of human capital and income distribution. The results point in the same direction: Having higher levels of human capital and a more equal income distribution help derive some positive effects from controls but the effects are not as strong compared to the degree of homoegneity.

The argument that ethnic heterogeneity can have a negative effect on capital controls is motivated by the political economy literature on rent seeking and common pool problems. A general reading of this literature suggests that for societies with a large number of distinct groups and insecure property rights, interventions generate opportunities for excessive appropriative behavior leading to inefficiencies.[5] Being a government intervention, capital controls are also prone to this problem. In countries with low capital labor ratios, though the marginal product of capital ought to be relatively high, distortions in the form of taxation often reduces the net return. Taxation may be necessary to finance public expenditures. If capital is mobile then such taxes will generate outflows and underinvestment in the economy. Usually it is more difficult to tax capital that earns returns abroad. Capital controls work not only to maintain the domestic tax base but simul-

[5]For example, Persson, Roland and Tabellini (1997) show that separation of powers between distinct groups can lead to common pool problems. Easterly and Levine (1997) use some of the arguments based on Shleifer and Vishny (1993) to suggest that having more ethnic groups can result in greater bribe taking and also lead to each group pursuing its own rent seeking policies independent of the actions of other groups. Not only does the existence of more ethnic groups lead to higher rent seeking and corruption but it may also delay stabilization as suggested by Alesina and Drazen (1991). Easterly and Levine have shown that high degrees of ethnic fragmentation go a long way in explaining Sub-Saharan Africa's poor growth performance. Mauro (1995) has already shown that high degrees of ethnic fragmentation can lead to higher corruption. Tornell and Velasco (1992) present a model of capital flight in which groups prefer to invest abroad even though the domestic return is higher. This will happen if property rights over the domestic investment is not well defined and is subject to a common pool problem. They argue that capital controls may not solve the problem but may make the situation worse, since openness implies an upper bound on what groups are willing to appropriate domestically, as there is always the option to move capital out and earn a safe return.

taneously ensures domestic savings are indeed forced towards domestic investments. Under such circumstances, though controls will reduce welfare they can be growth enhancing.

Even though governments preserve the tax base by enforcing controls, tax revenues may be appropriated rather than put to their intended use. In most poor economies, where property rights are not well defined this is likely to be the case. If the economy is characterized by a large number of groups the effects will be worse since these groups fail to internalize the results of their actions. For example, one can think of a situation where a government's main source of revenue is through taxation of production (or domestic capital). The government intends to use these revenues to finance infrastructure, which benefits all agents in the country. However if the control by the government over the revenue is not complete, beneficiaries of the revenue will try and appropriate more than what has been allocated to them. This leads to a tragedy of commons type of problem where each group fights to maximize its own allocation but society suffers as a whole. In an economy with a high degree of ethnic heterogeneity one might expect this kind of a situation to materialize. Consequently, having a more divided society can choke the growth augmenting effects of controls.

In addition to ethnic homogeneity, high levels of human capital stock relative to income and a high degree of equality of wealth and income can also be expected to help government interventions including capital controls work better. High levels of human capital imply the availability of a skilled labor force that allows the formation of a competent bureaucracy. A high degree of income inequality is symptomatic of an economy where powerful pressure groups, high degrees of social polarization, and the possibilities of conflict exist. In such a scenario, interventionist policies are required to undertake redistributive and more often than not, populist and growth retarding policies. Moreover, governments placed in such a scenario have to devote resources to managing conflicts and satisfying interest groups. This often comes at the cost of not being able to monitor the bureaucracy. Based on these arguments, one can hope that higher levels of human capital stock and more equal income distribution can mitigate some of the undesirable effects of capital controls. After looking at the effects of ethnic heterogeneity, I test for the roles of human capital and equal income distribution in influencing the effect of capital controls on growth. Compared to the effects of ethnic homogeneity, the benefits of having high levels of human capital seem to be less and suspect to robustness issues while income distribution empirically does not seem to be important. Of course, these findings could be a consequence of the well known problem that formal measures of human capital do not adequately reflect the true stock of human capital in an

economy. Existing income distribution measures are even more vulnerable to data quality issues and only a small number of countries actually have reliable data.

Though not discussed here, capital controls may affect growth through a number of other channels. Dooley (1995) presents an excellent survey of the theoretical and empirical literature. Even if there is a theoretical case for capital controls to improve welfare and growth, the issue of effectiveness of controls needs to be addressed. In his reading of the empirical literature, Dooley suggests that capital control programs in general have had measurable effects on economic variables. These programs have also generated large yield differentials but these tend to diminish over time as the private sector invests in techniques to avoid controls. While many developing countries are known to have put in place extensive capital controls over long periods of time, Dooley and Mathieson (1994) find that capital is quite mobile in these places. This finding is reinforced by Johnston and Ryan (1994) who show that for a seven year period (1985-92), capital controls have been less effective in developing countries compared to developed ones. If controls are not effective enough for a seven year period, they are even less likely to be so for twenty years- the length of time being studied in this paper. Finally, Edwards (1999) looks at the effectiveness of capital controls from a historical perspective. He suggests that controls on outflows have seldom worked. To the contrary they have only introduced major distortions and bred corruption. Controls based on inflows, such as in Chile, have worked in changing the composition of inflows towards those of longer maturity but have not helped achieve monetary independence.

The next section of this paper presents a theoretical model which shows how controls and polarization in society can interact to affect economic growth. Section 2 discusses the data and the empirical specification. Section 3 presents the results and Section 4 concludes the paper.

2 A model

In this section I develop a highly stylized political economy model which shows how an increase in the number of distinct groups in society affects the influence of capital controls on domestic production. The story is similar to the argument developed in the introduction. The government imposes a tax on domestic capital to finance a public good which is used in private production. For example, this may be some infrastructure such as roads or communication, or a service such as the judiciary . Without the existence of this public good, private production cannot take place

at all. However the possibility of taking capital out of the economy means that an alternative rate of return can be earned abroad. All else being equal arbitrage conditions imply that capital will flow abroad until the domestic post taxation rate of return is equal to the net international rate of return. To restrict the amount of capital that does flow out, the government also imposes capital controls which serves to lower the rate of return from international investments. However there is also a problem of ill defined property rights over the government revenue pool. This means that each group has an incentive to appropriate some of the revenue. Appropriation here is amenable to different interpretations. It can mean that each group evades taxes or it can mean that each group can recapture some of the amount that it paid as tax through a costless bribe. Since distinct groups in society do not internalize the effects of their appropriation, a tragedy of the commons problem develops- there is too much appropriation. This reduces the amount of public good that is eventually available to complement private production. As the number of groups increase in society this problem tends to get aggravated. To keep the model simple, government policy (i.e. the level of taxation and the degree of controls) is assumed to be exogenous and I have abstracted from the question of effectiveness of controls.

Consider a small open economy that faces a net world interest rate after capital controls. The degree of capital controls is measured by a parameter that affects the net world interest rate negatively i.e.:

$r = r(z) \qquad (r'(z) < 0)$

where z represents this degree of capital controls. If there were no capital controls, $r(0) = r*$, where $r*$ is the fixed world interest rate.

The economy's population is assumed to be normalized to 1 and is divided into n equal groups. For simplicity it is assumed that all groups are initially endowed with the same amount of wealth, $w^i = W_0/n$, where $i(= 1..n)$ represents a group, W_0 represents the economy wide initial endowment. There are three factors of production in this model: private capital stock, a public good financed through taxes on capital and labor.[6] The tax rate is given by $\tau < 1$.

The way the game is played out is as follows: The decision maker in this economy is a group.[7] There are two periods. Given an initial endowment of w^i in the first period, each group decides how

[6] An almost similar production structure is adopted in Barro (1990) except that output is taxed and not capital.

[7] Since the model builds upon the assumption that competing interest groups will want to appropriate government revenues to further their own interests, it is more convenient to view a group as an optimizing agent as well.

much to invest domestically and how much to invest abroad. In the second period given their capital stock and the tax rate, each group decides how much to appropriate. Whatever is appropriated is rolled back into group production. In deciding their strategies each group takes the strategy of other groups as given. The model and its assumptions are very similar to Tornell and Velasco (1992). Also strategies are assumed to be symmetric and linear. This is a useful assumption since otherwise one needs to solve first order conditions which involve partial derivatives of the unknown strategies of the other players making the problem more complex.

Group i maximizes its utility function,

$$U^i = \log(y^i_{t+1} + d^i_{t+1})$$

where y^i_{t+1} is the amount of group production that takes place in the second period and d^i_{t+1} is the income from investment abroad. Absent any appropriation, group production is characterized by,

$$y^i_{t+1} = \left(\frac{1}{n}\right)^{1-\beta} (G_{t+1})^{\gamma}((1-\tau)k^i_{t+1})^{\beta} \tag{1}$$

where $0 < \beta < 1,\ 0 < \gamma < 1,\ \gamma + \beta < 1$. This means that production exhibits increasing returns to scale in the three factors, but diminishing marginal returns to capital (public and private) and labor. The assumption of increasing returns (and the very specific nature of the exponent of labor) is necessary to rule out the possibility that simply dividing the population into more groups can lead to a change in the aggregate output level.

G_{t+1} is the amount of the government revenue financed through taxes on capital,

$$G_{t+1} = \tau \int^n k^i_{t+1} di$$

Since each group has the same initial endowment and in equilibrium will invest the same amounts abroad and domestically,

$$\int^n k^i_{t+1} di = n k_{t+1}$$

where k_{t+1} is the capital stock of each group. Further capital stock in period $t+1$ is equal to portion of wealth in the period t allocated to domestic investments$_t$,

$$k_{t+1} = s_t$$

d^i_{t+1}, the income from investment abroad is given by,

$$d^i_{t+1} = d_{t+1} = r(z)(w - s_t)$$

The first equality reflects the fact that all groups invest the same amount abroad and therefore get the same gross return. So far I have not incorporated appropriation. The assumption of symmetry and linearity means that in equilibrium each group appropriates, x^i_{t+1}, which will be a fraction of the government revenue,

$$x^i_{t+1} = \alpha G_{t+1} \qquad (0 < \alpha < 1)$$

Since each group takes the strategies of other groups as given, the production function from the viewpoint of each group looks like

$$y^i_{t+1} = \left(\frac{1}{n}\right)^{1-\beta} (G_{t+1}(1 - \alpha(n-1) - x^i_{t+1})^{\gamma}[(1-\tau)k^i_{t+1} + x^i_{t+1}]^{\beta} \tag{2}$$

This means that each group appropriates an amount x^i_{t+1} given that each of the other $n-1$ groups appropriate αG_{t+1}. Of course, as mentioned earlier, in equilibrium all groups appropriate the same share. Given the structure, the solution is derived through backward induction. First the optimal level of appropriation, x^i_{t+1} is derived given any level of group capital stock. Then, given the optimal level of x^i_{t+1}, the optimal allocation of initial wealth between domestic investment and foreign investment is derived. Due to the restriction that optimal strategies are linear functions of the government revenue, this two step method can actually be solved simultaneously. However I will follow the two step method for clarity.

After undertaking relevant substitutions, each group's maximization problem becomes[8]

$$\begin{aligned} \max U_{x_{t+1},k_{t+1}} &= \log\Bigg(\left(\frac{1}{n}\right)^{1-\beta} (G_{t+1}(1 - \alpha(n-1) - x_{t+1})^{\gamma}((1-\tau)k_{t+1} + \alpha G_{t+1})^{\beta} \\ &+ r(z)(w - k_{t+1})\Bigg) \end{aligned} \tag{3}$$

The first step is to choose x_{t+1} by setting

$$\frac{\partial U}{\partial x_{t+1}} = 0$$

[8] All superscripts are dropped from here on.

for given k_{t+1}. This implies

$$\gamma[(1-\tau)k_{t+1} + x_{t+1}] = \beta(G_{t+1}(1-\alpha(n-1) - x_{t+1})$$

Using the linearity restriction, $x^i_{t+1} = \alpha G_{t+1}$, this becomes

$$\gamma[(1-\tau)k_{t+1} + \alpha G_{t+1}] = \beta G_{t+1}(1-\alpha n)$$

Substituting $G_{t+1} = n\tau k_{t+1}$, I get,

$$\gamma[(1-\tau)k_{t+1} + \alpha n\tau k_{t+1}] = \beta n\tau k_{t+1}(1-\alpha n)$$

After some rearrangement this gives us the optimal value of the fraction that each group appropriates out of the government revenue pool:

$$\alpha^* = \left[\frac{1}{n} - \frac{\gamma}{n(\gamma\tau + \beta n\tau)}\right] \tag{4}$$

This means that group i appropriates an amount:

$$x^i_{t+1} \equiv \alpha^* G_{t+1} = \left[\frac{1}{n} - \frac{\gamma}{n(\gamma\tau + \beta n\tau)}\right] G_{t+1} \tag{5}$$

The total share of the government revenue that is appropriated is therefore:

$$\alpha^* n = 1 - \frac{\gamma}{\gamma\tau + \beta n\tau} \tag{6}$$

The above expression implies that the total fraction of government revenue appropriated by all groups combined increases as the number of groups increase.[9] As the number of groups rise, the total amount of goverment revenue does not change since that is simply nk_{t+1} which is fixed. Putting it another way -while n increases, k_{t+1} falls since the initial endowment is now divided across more groups and the product of the two remains unchanged. Faced with a lower private capital stock, it becomes more attractive for groups to steal from the common pool. Since groups do not internalize the effects of their appropriation, all groups appropriate more individually.

The second step is to choose the optimal level of k_{t+1}. This is arrived at by setting

$$\frac{\partial U}{\partial k_{t+1}} = 0$$

[9]Of course, for the above expression to make any sense, we need to assume that $\frac{\gamma}{\gamma\tau+\beta n\tau} < 1$.

given x^i_{t+1}. If the degree of capital controls were so high that in effect the economy becomes a closed economy, then this condition is not operative. In that case the optimal appropriation amount is still described by $\alpha*$ in equation (5) and the private capital stock per groups is simply the initial endowment w_i. More loosely, the optimization solution below applies for all $z < z_c$, where z_c is the degree of capital controls that makes it a closed economy. The first order condition above implies,

$$r(z) = \left(\frac{1}{n}\right)^{1-\beta} \beta(1-\tau)(G_{t+1}(1-\alpha(n-1)-x_{t+1})^{\gamma}[(1-\tau)k_{t+1}+x_{t+1}]^{\beta-1}$$

Making the relevant substitutions for G_{t+1} and x_{t+1} and rearranging, this reduces to

$$k_{t+1} = \left(\frac{1}{r(z)}\right)^{\frac{1}{1-\gamma-\beta}} \left(\frac{1}{n}\right)^{\frac{1-\beta}{1-\gamma-\beta}} \beta^{\frac{1}{1-\gamma-\beta}} (n\tau(1-\alpha^* n))^{-1} \left(\frac{\beta}{\gamma}\right)^{\frac{\beta-1}{1-\gamma-\beta}} \tag{7}$$

where α^* is the optimal value as derived above.

After substituting the optimal values of k_{t+1} and x_{t+1} in equation (2) and rearranging, the total value of output for a single group turns out to be:

$$y_{t+1} = \left(\frac{1}{r(z)}\right)^{\frac{\gamma+\beta}{1-\gamma-\beta}} \left(\frac{1}{n}\right)^{\frac{1-\beta}{1-\gamma-\beta}} \beta^{\frac{\gamma+\beta}{1-\gamma-\beta}} \frac{\beta}{\gamma}^{\frac{-\gamma(\gamma+\beta)}{1-\gamma-\beta}} \tag{8}$$

The above expression is for group output. What is of interest, is the aggregate production in the economy, ny_{t+1}. This turns out to be,

$$Y_{t+1} \equiv ny_{t+1} = \left(\frac{1}{r(z)}\right)^{\frac{\gamma+\beta}{1-\gamma-\beta}} \left(\frac{1}{n}\right)^{\frac{\gamma}{1-\gamma-\beta}} \beta^{\frac{\gamma+\beta}{1-\gamma-\beta}} \frac{\beta}{\gamma}^{\frac{-\gamma(\gamma+\beta)}{1-\gamma-\beta}} \tag{9}$$

One can now study the effects of capital controls and ethno-linguistic heterogeneity in the economy. From equation (9) above, one can make the following proposition:

Proposition 2.1 *An increase in the degree of capital controls z in period $t+1$ increases domestic output Y_{t+1}, i.e.* $\frac{\partial Y_{t+1}}{\partial z} > 0$

Proof.

$$\frac{\partial Y_{t+1}}{\partial z} = \frac{\gamma+\beta}{1-\gamma-\beta} \left(\frac{1}{r(z)}\right)^{\frac{\gamma+\beta}{1-\gamma-\beta}-1} \frac{-r'(z)}{r(z)^2} \left(\frac{1}{n}\right)^{\frac{\gamma}{1-\gamma-\beta}} \beta^{\frac{\gamma+\beta}{1-\gamma-\beta}} \frac{\beta}{\gamma}^{\frac{-\gamma(\gamma+\beta)}{1-\gamma-\beta}} > 0$$

In this model, increases in capital controls have clear positive effects on economic growth. This is true despite appropriation, because whatever the group steals is rolled back into its production. There could be alternative scenarios, where whatever is stolen is deposited in foreign banks or "hoarded" and does not enter national income but enters utility directly. The effects of capital controls on output then might be negative. The point of this paper is not to take an *a priori* stand on the direction in which capital controls work and then to show that the same holds true empirically. Rather, the aim is to suggest that the effects are less beneficial if there is increased heterogeneity in society. In other words what is of interest is the sign of $\frac{\partial^2 Y_{t+1}}{\partial z \partial n}$. Further, though capital controls lead to a higher domestic production, they do reduce welfare.

Proposition 2.2 *An increase in n, the number of groups in society reduces the beneficial effects of capital controls on domestic output, i.e.* $\frac{\partial^2 Y_{t+1}}{\partial z \partial n} < 0$.

Proof.

$$\begin{aligned} \frac{\partial^2 Y_{t+1}}{\partial z \partial n} &= \frac{\gamma(\gamma+\beta)}{(1-\gamma-\beta)^2}\left(\frac{1}{r(z)}\right)^{\frac{\gamma+\beta}{1-\gamma-\beta}-1}\frac{-r'(z)}{r(z)^2}\left(\frac{1}{n}\right)^{\frac{\gamma}{1-\gamma-\beta}-1}\left(\frac{-1}{n^2}\right)\beta^{\frac{\gamma+\beta}{1-\gamma-\beta}}\frac{\beta}{\gamma}^{\frac{-\gamma(\gamma+\beta)}{1-\gamma-\beta}} \\ &< 0 \end{aligned} \tag{10}$$

This is not a very surprising result. Proposition 2.1 suggests that as capital controls increase, domestic production goes up. The reason this happens is because the traditional capital controls argument is at work- higher capital controls lead to greater retention of domestic capital thus leading to higher domestic capital stock. Higher levels of domestic capital stock given a fixed tax rate further means that there is a greater amount of government revenue. Together these imply a greater amount of domestic production. However, equation (6) shows that as the number of groups increase in society the fraction of government revenue that is appropriated increases and this is independent of the amount of capital stock in the economy. This effect of increased appropriation from government revenues tends to diminish the positive effects of capital controls. Though the amount that is appropriated is rolled back into private production, it is not enough to compensate for the decrease that takes place. This is because of the fact that what is being stolen would otherwise have become a public good complementing private capital. Since each group steals a fraction $\alpha*$, it experiences a decline of a fraction $\alpha * n$ in the public good input. However each of them can only put back $\alpha* < \alpha * n$ into private capital. The net effect is to reduce each group's output as n increases. This results portrays, albeit in a very simplified manner, the problem of

having too many competing groups where they fail to internalize the effects of their appropriation strategies.

3 Model Specification and Description of the Data

The empirical exercise seeks to answer two questions: a) Do capital controls have any effect on economic growth? b) Are these effects influenced by the degree of ethnic homogeneity in a country? The model outlined above is a static one (though, with some exogenous technological change or adjustment costs one could easilly obtain dynamic versions) and in keeping with that one needs an empirical specification that tries to capture transitional effects rather than steady state effects. Based on the existing practice in the growth literature, the first question is then addressed by estimating equations of the following variety

$$g_i = a + b_y Y_i + B_x' X_i + b_c C_i + e_i$$

where i indexes countries, g_i is the average growth rate of per capita income (GDP per capita) for the period being investigated, y_i is the logarithm of the initial GDP per capita, X_i is vector of other variables that are believed to affect the growth rate in transition to the steady state and C_i is the capital control index. The specification here attempts at being as close as possible to Rodrik (1998) and therefore includes in X_i, a schooling variable, an indicator of institutional quality, and dummy variables for East Asia, Latin America and Sub-Saharan Africa. The list is later extended to include other variables to test for robustness.

To address the second question, based on the model above, another variable is added which is the interaction between capital controls and ethnic homogeneity: $C_i \times E_i$ where E_i is the measure of ethnic homogeneity. To ensure that this interaction term does not proxy for ethnic homogeneity per se, E_i is also added to the list of independent variables. Thus empirical specification is now,

$$g_i = a + b_y Y_i + B_x' X_i + b_c C_i + b_{ce} C_i \times E_i + b_e E_i + e_i$$

The measure of institutional quality that is used here is from the International Country Risk Guide published annually by *Political Risk Services*. The variable was introduced into the literature by Knack and Keefer (1995) and has been found to be a better indicator of the impact of property rights on economic growth than measures such as revolutions, coups, assassinations, etc. Further the model in section 2 does not account for the fact that changes in the level of enforceability

of property rights can lead to changes in the optimal appropriation amount. So at least such differences should be controlled for in the empirical specification. The ethno-linguistic homogeneity (ELH) measure used here is equal to one minus the ethno-linguistic fractionalization index, AVELF (ELH=1-AVELF), variable used in Easterly and Levine (1997). For the growth rate in GDP, and Real GDP per capita, the data was taken from the World Bank's Global Development Network Growth Database. The education variable used here is the average years of secondary schooling for the period 1975-95.[10]

Those familiar with the empirical literature are only too aware of the limitations of the data on capital controls. Unlike the variety of indices that are readily available or have been created to measure openness in international trade, there is only one widely used variable for financial openness.[11] The IMF's annual publication, *Exchange Arrangements and Exchange Restrictions*, has, since 1967, included a table that lists whether each country had in place various restrictions on exchange rates and payments on international transactions. The table also lists whether countries had restrictions on *payments for capital transactions*. The limitation is that this entry is completely binary. Countries are either deemed to have controls in place or they are not.[12] The obvious drawback of such data is that there is no indication of the degree of capital controls making it difficult to extract much information. Further there is no way one can distinguish between various types of capital controls. For example, one cannot distinguish between controls which some may consider desirable, such as those on short-term flows and those which may not be so, such as on foreign direct investment. Finally, there is no way to distinguish between restrictions on inflows and outflows. More recent issues of the same publication, beginning from 1996, carry a more disaggregated analysis of restrictions on capital transactions. While empirical analysis with the newer data set has begun to appear (see Johnston and Tamirisia (1998)), the span is much too short for any long run study.

The index of capital controls that I construct is a share based on the crude measure that is

[10]Originally introduced in Barro and Lee (1993), the data here is the updated version downloaded from http://www.cid.harvard.edu.

[11]Though the adequacy of these trade openness indices has recently been put to doubt by Rodrik and Rodriguez (1999).

[12]Other measures of capital mobility based on offshore interest rate differentials, black market premium and deviations from covered interest rate parity exist. However these measures are more endogenous rather than an explicit indication of policy.

available. A dummy variable is created with a country that had capital controls in place in a given year taking the value 1, and if it had no capital controls in place, taking the value 0. Then for the period of study (1975-95), the capital control index is calculated by dividing the number of years it had controls in place by the length of that period. This is, in principle, the same measure constructed by Rodrik (1999) and Klein and Olivei (1999). In order to maximize the number of countries in the sample, any country that has a dummy variable for more than 16 years (80%) was included. Clearly this is an imperfect measure of capital controls but seemingly one of the few options that are available. In the rest of the paper this index is referred to as CAPCON1.

In order to corroborate the results, I also used a similar variable published by the Fraser Institute in its *Economic Freedom of the World: 2000 Annual Report*.[13] The aim of the report "is to construct an indicator of economic freedom of nations around the world...The goal is to develop an objective measure of economic freedom rather than an index based on subjective assessments and judgement calls." The index is composed of seven sub-indices reflecting institutional arrangements and policies in major areas. The fourth such sub-index is the freedom to use alternative currencies. This index itself receives a weight of 14.6% in the final index based on principal component analysis. The ratings for freedom to use alternative currencies is further built on two other indices labeled "4A" and "4B" each having a 50% weight. The index under label 4A measures the freedom of citizens to own foreign currency bank accounts domestically and abroad. Index 4B measures the "Difference between the Official Exchange Rate and the Black Market Rate". Since the latter is similar to the black market premium used commonly in the growth literature, I left it out of the analysis. The former is based on information gathered from Currency Data and Intelligence Inc., World Currency Yearbooks (various issues) and the IMF Exchange Arrangements and Exchange Restrictions (various issues). When foreign currency bank accounts were permissible without restrictions both domestically and abroad, the rating was 10. When these accounts were restricted, the rating was zero. If foreign currency bank accounts were permissible domestically but not allowed abroad (or vice versa), the rating is 5. The data for this index is available quinquennially beginning from 1970. However there is a jump in the sample size from 1975 onwards. Though the index is not a considerable improvement over the share variable, nevertheless I used it to reconfirm the results. In the rest of the paper this index is labelled CAPCON2.

[13]See Gwartney, Lawson and Samida (2000).

It is instructive to see how both CAPCON1 and CAPCON2 have behaved over the past decades. Figure 1A charts the movement of capital controls over five year periods beginning with 1976. Out of a total of 111 countries, only 17 had no capital controls at all during 1976-80. These countries were Belgium, Bolivia, Canada, Germany, Honduras, Hong Kong, Indonesia, Kuwait, Lebanon, Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Saudi Arabia, United States and Venezuela. There were as many as 87 countries with a CAPCON1 value of 1 during the same period. A look at the graph shows in general the sample is mostly described by values of 0.8 or higher with very little variation. Though the sample of countries for which IMF has data increases to 157 in the period 1991-95, the description in terms of the values CAPCON1 takes remains pretty much the same. The number of countries with no capital controls rises to 29 while the number with a CAPCON1 value of 1 is now as high as 112. In percentage terms the number of countries with a value of 1 drops from 78% to 71%.

Figure 1B gives an idea of how the index CAPCON2 moves over the period 1975-1995. If the phenomenon of "globalization" was not apparent from the graphs in figure 1, it clearly does here. In 1975, almost half of the sample have a value equal to 1. A significant change occurs as we move from 1985 to 1990. For the latter year, about only half have a value of 1. By the time one reaches 1995, as much as two-thirds of the sample do not have a value of one and as many as 40% have a value of zero. Table 1 presents the correlations between the two variables. Both variables have a reasonably high correlation over time with the correlations being lower the further the variables are placed from each other in terms of the period of measurement. For the entire period, 1975-95, the correlation between the two indices is fairly high at 0.73. Even if all the OECD countries are dropped, the correlation remains more or less unchanged.

In order to further check the relevancy of these measures, I also looked at their correlations with actual magnitudes of movements of capitals across borders. Table 2 looks at some numbers from balance of payments data. The table includes foreign direct investment inflows, FDI outflows, portfolio capital inflows, portfolio capital outflows, gross private capital flows, the financial account balance and the current account balance - all as a share of GDP.[14] The correlations are listed for all

[14]Data for these come from the International Financial Statistics (IFS) and the World Bank Indicators (WBI). Portfolio capital inflows and outflows are respectively what the IFS more precisely calls Portfolio Investment Liabilities and Portfolio Investment Assets (note that any capital inflow is a liability for the recipient country). The financial account balance in the IFS is the sum of the balance of direct investment (mostly FDI), portfolio investment, other investment transactions and financial derivatives. Gross private capital flows (taken from WBI) are the sum of the absolute values of direct, portfolio, and other investment inflows and outflows recorded in the balance of payments

countries and for the restricted sample of non OECD countries. In terms of foreign direct investment it is clear that both inflows and outflows were significantly lower because of capital controls. As far as portfolio investment flows go there is strong evidence that capital controls restricted inflows but there is no evidence that outflows were restricted for non-OECD countries. This lack of correlation does not necessarilly imply that there were no controls on outflows. It is possible that countries which did not have controls simply did not experience large scale outflows while countries that did have controls by definition would not experience outflows as well. Further it is well known that if there are controls on outflows, it ends up being an implicit control on inflows as well. Therefore it is not surprising that more capital controls are associated with significantly lower inflows. This lack of correlation also shows up in the financial balance but that is less surprising. Even if one restricted attention simply to FDI, the fact that both inflows and outflows were lower because of controls means that the net balance may very well be uncorrelated with controls. Gross capital flows, on the other hand is clearly lower. Finally countries that did impose controls also had lower current account balances. Theoretically this would imply a net inflow of capital into the economy, suggesting that the restriction were on outflows and not on inflows. However care should be taken when making such a conclusion since the adjustment need not be taking place only on the financial account but could also be borne by drawing down on reserves.

4 Growth Regressions

The correlation between the growth rate for the period 1975-95 and the capital controls indices are -0.30 for CAPCON (Based on the maximum sample of 82 countries used in this study) and -0.25 for CAPCON2 (Based on a maximum sample of 82 countries). Though not particularly high they are indicative of some degree of a negative association. A simple regression of the growth rate on CAPCON1 after controlling for the initial income per capita produces a coefficient of -1.11- statistically significant at the 10% level. CAPCON2 also has a negative sign but the coefficient is not significant. In Table 3, results similar to the regression carried out by Rodrik are presented. Columns (3) and (4) reproduce the results using the same specification for all countries. The independent variables include the log of initial GDP per capita, average years of secondary schooling for the period 1975-95 (SYR7595), an institutional quality measure (INSTTN)

financial account, excluding changes in the assets and liabilities of monetary authorities and general government. Current account balance (WBI) is the sum of net exports of goods, services, net income, and net current transfers.

and regional dummies for East Asia, Latin America and Sub Saharan Africa. Columns (5) and (6) repeat the results with only non-OECD countries included in the sample. If there is any influence of capital controls on economic growth, it is not apparent here. In fact in the regressions that include all countries, it is the only variable that is not of any importance.[15]

As argued in section 2, the effects of capital controls on economic growth is a negative function of the number of appropriative groups that exist in society. The index of ethno-linguistic fractionalization popularized by Easterly and Levine (1997) is one rough measure of such division in society. Of course, it is not a sufficient measure of such groupism. It is possible that countries may have high degrees of ethnic plurality and yet be more unified than countries which are ethnically homogenous. However given that this is the only measure that has been shown empirically to have a significant negative effect on economic growth, it is the one I adopt. Columns (1) and (2) in Table 4 add the ethnic homogeneity indicator to the list of independent variables. The strong positive effects of homogeneity found be Easterly and Levine (1997) are clearly reproduced here. Both capital control variables still do not show any significant effect. In keeping with the results of the theoretical section, one needs to add an interaction term to the specification. Columns (3) and (4) add the terms ELH×CAPCON1 and ELH×CAPCON2 to the specification in Column (1) and Column (2). The change in the direct effects of capital controls are nothing if not dramatic. CAPCON1 now is significant at the 5% level and CAPCON2 does even better being significant at 1%. Since a lot of the variation in the data on controls can be attributed to OECD countries, Columns (4) and (5) repeat the results with those countries dropped. Again both indicators retain their strong significance. Finally I dropped Hong Kong and Taiwan from the sample as both of them were very high growth countries that have values of zero for CAPCON1 and CAPCON2. Results (5) and (6) clearly suggest that two countries are not driving the results. In addition to the CAPCON variables, the model in the earlier sections suggests that the interaction term should be significant. Indeed, in each of the results in Table 4 where it has been included, it is strongly significant.

A cursory look at the coefficients of CAPCON1 (and CAPCON2) and the respective interaction terms suggest that within countries that imposed complete capital controls, those with complete ethnic homogeneity (ELH=1) were in a position to offset the negative effects of capital controls. **For**

[15]The OECD countries for this paper are the "older" set and do not include newer members such as Mexico and Korea.

example, a country with complete homogeneity could move from complete openness to being completely closed and experience an absolute increase of 0.78% in its annual growth rate. Alternatively, if a country that was completely heterogenous (ELH=0) moved from being open to closed, it would experience a decrease of 3.77% in its annual growth rate. No country of course has complete heterogeneity. Looking at specific countries, as many as 34 countries managed to more than offset the pure negative effects of capital controls and had a net positive effect because of relatively high degrees of ethnic homogeneity. Of this 18 were non OECD countries. Of course this list does not include countries that were completely open (The sum of their coefficients for CAPCON and CAPCON×ELH is trivially zero). On the other hand as many as 39 developong countries suffered due to capital controls.

Table 5 lists the top ten developing countries that managed to derive a positive effect. Amongst developing countries that had a measure of CAPCON1 equal to 1, those emerging at the top of the list include Bangladesh, Korea, Dominican Republic, Jamiaca and Egypt. Not one of the sub-saharan African countries make it to the list. In fact, no sub-saharan African country derived a positive effect from capital controls. Easterly and Levine (1997) noted that the ethno-linguistic heterogeneity particularly adverse effects in the same region. These results reinforce their findings. Looking at negative effects of capital controls, a total of 40 countries ended up with an overall negative effect on economic growth. Table 4 shows that the ten worst affected were all sub-Saharan African countries. Included in the 40 are also the remaining South Asian countries -India, Pakistan and Sri Lanka. The only high income country in this group of 40 is Spain. Relatively similar results emerge when using CAPCON2. With CAPCON2, 31 countries managed to offset the negative effect while 34 countries experienced a net positive effect. The results were also checked for robustness with the 1960 measure of ethno-lingusitic homogeneity (ETHNIC in Easterly and Levine(1997)). Not surprisingly, the ETHNIC measure does much better when regressions were run for the 1967-95 period (i.e. the entire period for which information on capital restrictions (CAPCON1) is available from the IMF).

Another interesting observation one can make from the table is that the coefficient of ethnic homogeneity is now negative. This is in contrast to the results suggesting that ethnic diversity is bad for economic growth as in Easterly and Levine (1997). Though they tried to search for a non-linear relationship between their ETHNIC measure and growth, they were unable to do so. The results here suggest that having higher degrees of ethnic fragmentation is bad when economies are

completely open (since CAPCON is zero and the interaction term is also zero). Though this might seem strange at first sight, Tornell and Velasco (1992) have proposed this possibility. They show that in an open economy the individual appropriation rate must be lower in order to ensure that the domestic rate of return and the foreign one remain equal. However more groups appropriate from the same pie leading to a situation where economies with more interest groups will have a greater growth rate and less capital flight. Of course this argument is subject to the condition that poor property rights characterize the economy, which is not true of all economies that are completely open and have high degrees of ethnic homogeneity. An alternative intepretation could be that since most of these open countries are high income countries, the negative effects of such division are less or completely absent when the level of development is higher.

Figures 2 and 3 show scatterplots of the component of growth predicted by capital controls and the interaction of capital controls with ethnic homogeneity. On the basis of Column (3) in Table 4, the horizontal axis in figure 2 is therefore -3.77*CAPCON1 +4.45(CAPCON1×ELH). The vertical axis is of course the actual growth rate during the same period. The plot suggests a positive relationship with some interesting features. First, almost all OECD countries are cluttered at or around the predicted value of 0 in both figure. This is to be expected since most of them had approximately azero value of capital controls through the entire period. Looking at both the figures one clearly sees the so called "gang of four" East Asian nations (Hong Kong, Korea, Singapore and Taiwan) are grouped at the top right hand corner with Korea being placed at the extreme. The problem of the gang of four in growth regressions has been discussed earlier in Easterly (1995). To ensure the results are robust, I re-estimated the model but dropped these four nations from the sample. The results are reproduced in Columns (1) of Tables 6A and 6B. Again Capital Controls has a significant negative effect while the interaction term has a significant positive effect on growth.

Since Levine and Renelt (1992), there has been a growing awareness of the problem of robustness of growth regressions. Table 3 already included a fair number of important variables against which many so called determinants of growth fail. In particular continental dummies tend to reduce the significance of a number of determinants of growth considerably. However the capital controls story is not affected by these variables. Tables 6A and 6B present some further robustness results. For all these regressions the gang of four was dropped to rule out their role in driving the results. The first column of both tables include the log of the investment ratio. This variable is one of the few that is consistently significant in the multitude of growth regressions that now exist in the literature. Its

inclusion tends to diminish the significance of the interaction term in the case of CAPCON1 but does not affect the same for CAPCON2. The two capital control variables entered independently continue to remain significant.[16] The second column included two variables, the inflation rate for 1975-95 and life expectancy in 1975.[17] The inflation rate is included simply as an indicator of the macroeconomic siuation in the country, while the life expectancy variable is included as an indicator of non educational human capital. Further the latter was one of the few variables found consistently robust in the million regressions run in Sala-i-Martin (1997). Column (3) includes two indicators of political freedom in a country- the Gastil indices of political rights and civil liberties (both averaged for the 1975-95 period) published by Freedom House.[18] Column (4) includes a measure of openness in international trade- the volume of exports plus imports as a share of output (TRADEVOL) for the 1975-95 . CAPCON1 and the volume of trade index have a negative correlation of -0.28 for the sample of countries for which data is available. Further the latter index has a positive correlation of similar magnitude with the growth rate. There has been growing acceptance that well developed financial institutions are important in promoting economic growth in a country. King and Levine (1993) provide convincing evidence using a number of financial development indicators. Column (6) shows the robustness with respect to one of these indicators, LLY7590, the ratio of liquid liabilities to GDP. The variable itself has very little significance and does not affect the performance of capital controls.[19]

As argued earlier, the importance of ethno-linguistic homogeneity in growth might itself be a function of the level of development. At higher levels of development homogeneity might be less important. Further capital controls itself might be a negatively correlated with function of income per capita. Under such circumstances it is possible that the interaction between capital controls and homogeneity is really a measure of the interaction between income per capita and homogeneity. Another problem is the correlation between capital controls and institutional quality. If one looks at Table 5 which lists the countries that were worst hit by controls, one observes that these countries are in general, ones that are likely to rank low in terms of institutional quality. This suggests that

[16] All the robustness regressions and the regression presented in earlier tables were carried out with the investment ratio, and the results remain unchanged

[17] The inflation rate measure used here is the GDP deflator.

[18] The data can be downloaded from http://www.freedomhouse.org

[19] The regression was repeated with the three other indicators of financial development used in King and Levine (1993). While the indicators themselves varied in significance they had no effect on the importance of capital controls.

capital controls might be acting as a proxy for bad institutional quality. In fact, Easterly (2000) suggests that ethnic fragmentation might be less of a problem in economies with better institutions. To address these issues, column 6 in Tables 6A and 6B add interaction terms between homogeneity and a) income per capita and b) institutional quality . These do not affect the result on capital controls and economic growth. Column 7 drops all OECD countries in addition to the East Asian tigers. Though the sample size falls drastically, the results are still very strong.[20]

All these results suggest convincingly that indeed having an ethnically heterogenous society may have actually led capital controls to have adverse effects on economic growth. There are issues of endogeneity that I have not considered here. However, that is less likely to be a problem. One reason the whole exercise was undertaken was because of the observation that growth and capital controls do not have a direct significant correlation. Therefore the notion that capital controls were less in countries with higher growth rates is not a relationship that should pose a problem for the inferences arrived at here. Ethno-linguistic division is also one of the few variables that can legitimately be considered exogenous in growth regressions.[21]

4.1 Of Human Capital and Income Distribution

Countries with higher levels of human capital stock may benefit from having a more competent bureaucracy which can help in better policy implementation. Higher levels of human capital also means relatively higher returns to labor. One may then conjecture that in such an economy, the population can engage in more productive activities and the incentive to resort to rent seeking and appropriation might be lower.[22]. Further, the fact that a country has managed to achieve higher educational attainments can also itself be an indication that policy making is more successful. The fact that the correlation between average years of secondary schooling for 1975-95 (SYR7595) and ethno-linguistic homogeneity (ELH) is 0.46 for the 82 countries that were used in Table 4 lends some support to some of the arguments. This suggests that having higher human capital stock can

[20] A number of additional robustness exercises were conducted. These included estimating a SUR model with two periods (75-85, 85-95) and repeating everything shown in the tables, extending the time period further back to 1967 for CAPCON1, dropping all OECD countries for each of the results displayed,etc. These are all available upon request.

[21] However some additional estimation exercises were performed using lagged restrictions on current account and capital account as instruments. Klein and Olivei (1999) also suggest the use of a regrouping of continental dummies as instruments for controls. The results with all these instruments continued to be robust.

[22] This does not imply that countries with higher levels of human capital have less corrupt bureaucracies!

also ensure that the negative effects of capital controls might be lower. Table 7A and 7B presents some results for education and capital controls. The education measure used here is the same as in the early regressions, the average years of secondary schooling in population aged 15 and above for the period 1975-95. While there is some indication that human capital also might play a role in influencing the effects of controls, a look at the results suggest that the robustness of the influence is susceptible to sample size and control issues. Of course, it is possible that, as mentioned earlier, this is simply because formal measures of education do not capture well the contribution of human capital. Using the coefficients of Column (1) in Table 7A, as done with ethnic homogeneity, one can calculate the net effect of capital controls. It turns out that none of the developing countries in the sample had a level of human capital high enough to have a net positive effect on growth despite having capital controls. The country coming closest is Trinidad and Tobago which experienced a net reduction of 0.79% in its annual growth rate.[23]

Lower levels of income inequality can also have beneficial effects on government intervention. There is no doubt that the all the East Asian Tigers had very equitable income distributions while countries in Latin America and elsewhere which did not experience high growth rates were plagued with problems of inequality. Faced with high income inequality, politicians have an incentive to redistribute resources and adopt populist measures. Under these circumstances, capital controls is one of the many tools that governments have at their disposal to abuse. Countries that have high degrees of ethnic polarization may also exhibit high degrees of income inequality to the extent that the distribution of wealth is skewed with one group having a disproportionately higher share. Table 8 presents the results when ELH is substituted by income distribution. The variable for income distribution is the share of the middle class in 1975. Motivated by Perotti (1996), this is constructed by adding the shares of income going to the third and the fourth quintile of the population. The data for these measures come from the new dataset compliled by Deninger and Squire (1996). The number of countries for which "acceptable quality" income distribution data exists is very few. Following Barro (2000), I also included countries those that were excluded by Deninger and Squire but did have a national coverage. Despite this the sample of countries is extremely limited and regressions could be run for only 36 countries using CAPCON1 (37 using CAPCON2).

Columns (1) and (2) in Table 8 suggest that all three variables - capital controls, the interaction

[23]Though excluded from the sample in Tables 7A and 7B, using the estimated coefficient suggest that Korea had a high enough level of human capital to derive a net positive effect from capital controls.

term and MID75 are insignificant.[24] Further capital controls now has a positive sign and a larger middle class seems to imply a negative effect on growth. One reason why these perverse results could appear is because capital controls have a correlation of approximately 0.95 with their respective interaction terms. In Columns (3) and (4), the capital controls term is dropped. This improves the results somewhat. In the case of CAPCON1, higher income equality does improve the effects of capital controls on growth but it is not significant. For CAPCON2, the result is more encouraging with the interaction term significant at 10%. However this is not very robust. Also disturbing is the fact that a more equal income distribution seems to imply a negative effect on long run economic growth. This result is not new. Forbes (2000) has shown this to be true using Gini coefficients from the same data source in a panel estimation.[25] In conclusion, it is not surprising that effect of the interaction between income distribution and capital controls remains unconvincing given the limited sample size. In the sample of 37 countries there are only 2 sub-Saharan African nations, Gabon (with a per capita income not too different from Turkey) and Zambia, and as many as 15 OECD nations.

5 Conclusion

Existing empirical research suggests no significant relationship between capital account liberalization and economic growth. This has led to questioning the usefulness of opening the capital account. This paper shows that on deeper examination, capital controls do have an important effect on economic growth. As with any other government intervention the success or failure of capital controls depends crucially on some underlying factors. One such important condition turns out to be the level of ethnic and linguistic heterogeneity in society to that extent that it might proxy for a measure of the the number of interest groups in society. Depending on a country's degree of heterogeneity, capital controls can have negative or positive effects. For countries with high degrees of heterogeneity, capital controls leads to greater inefficiencies and lower economic growth. It is not therefore surprising that many economists and policy makers oppose controls because they tend to promote rent-seeking. At the same time, for countries which did not have

[24]The education variable is dropped from the set of independent variables because theoretically it has been shown that a more equal income distribution allows for higher levels of human capital accumulation.

[25]All the regressions in Table 8 were repeated using the Gini coefficient for 1975 from the Deninger and Squire dataset. The conclusions, including the negative effect of of a more equal income distribution, remained unaltered.

such heterogeneity, it was shown that capital controls worked to enhance economic growth. On balance, it turns out that within the sample of non OECD countries which were used for estimation and which had some capital controls in place, as many as 39 had a net negative effect of capital controls on growth and only 18 had a net positive effect.

If one uses the coefficients estimated in Table 4 and applies them to countries that could not be used for estimation but for which data on capital controls and ethno-linguistic homogeneity are available, the division becomes even more unbalanced. Another 32 non OECD countries experienced a net negative effect from capital controls taking the total number of countries with a net negative effect to 71 (out of 99).[26] Looking at education and income distribution there was some indication of similar results but not as robust.

These findings imply that one needs to take a more nuanced view of the way policies tend to work instead of expecting to find a direct negative or positive effect. The inferences are all the more interesting given the fact that the data that was used provided fairly limited information. Further, the applicability of the theoretical model adopted here and also the empirical specification, need not only be restricted to capital controls. It provides a useful method of looking at which underlying conditions help government intervention in achieving its results and which ones cause governments to fail.

[26]These 32 countries were not included in the estimation because either data on growth rates, initial GDP per capita, education or institutional quality were not available.

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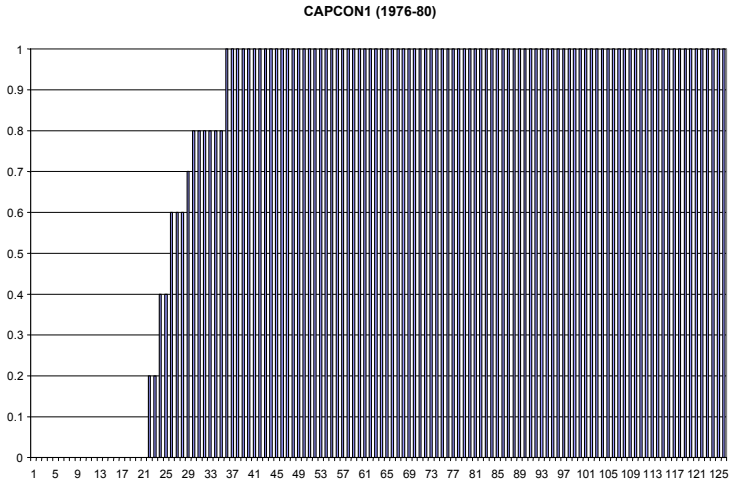
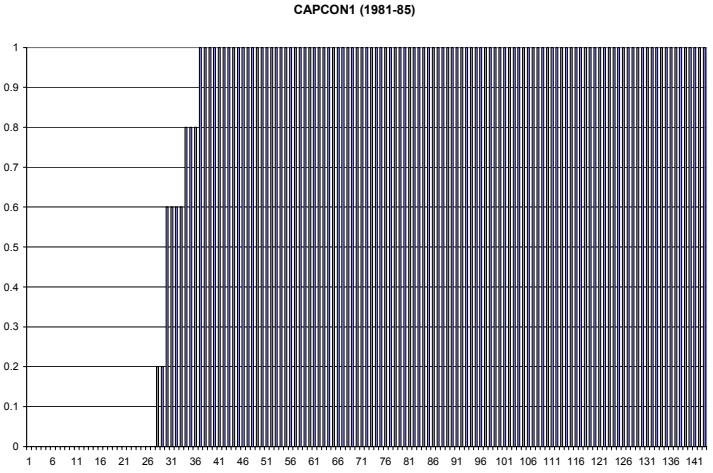
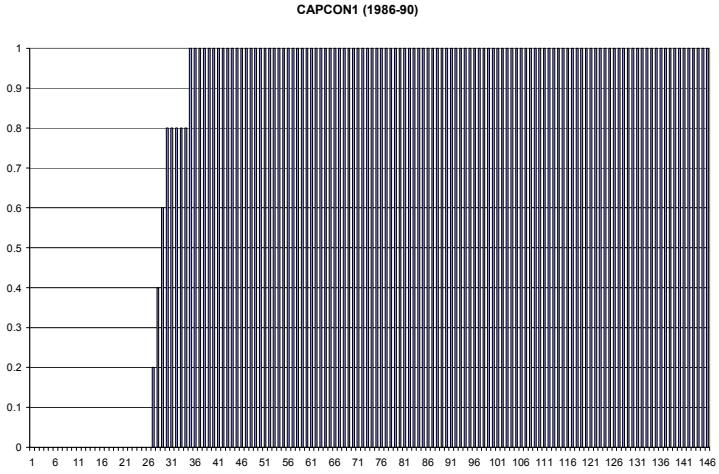
Figure 1A
CAPCON1







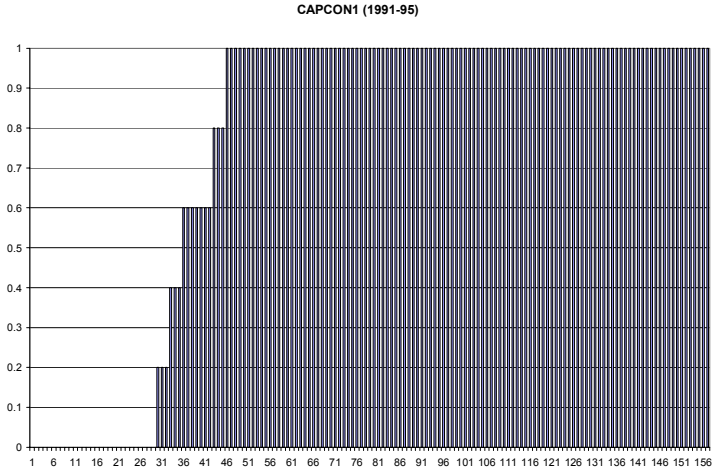
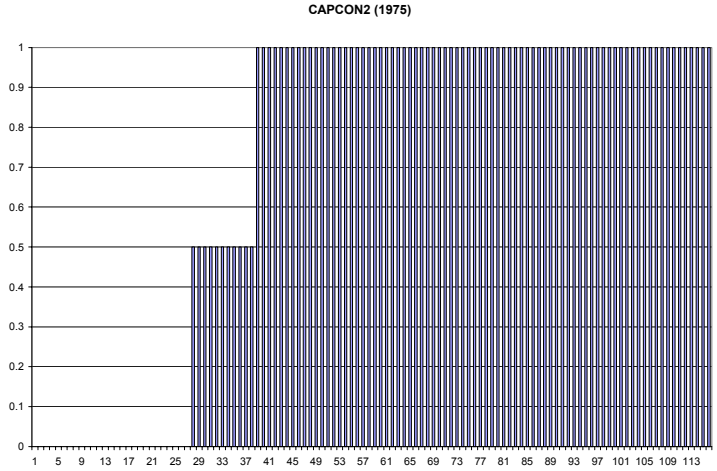
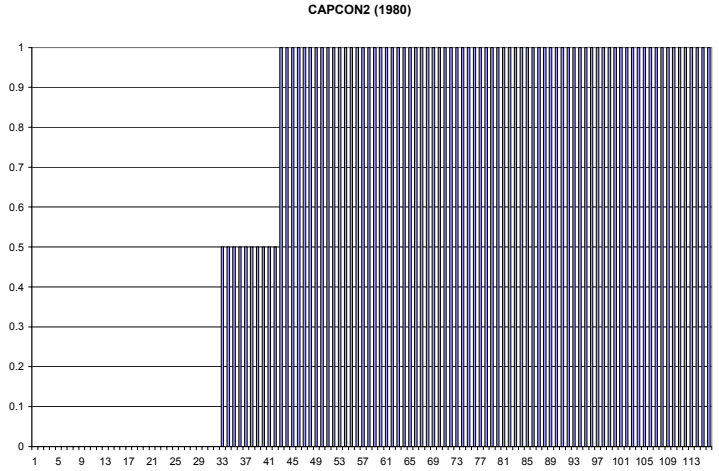
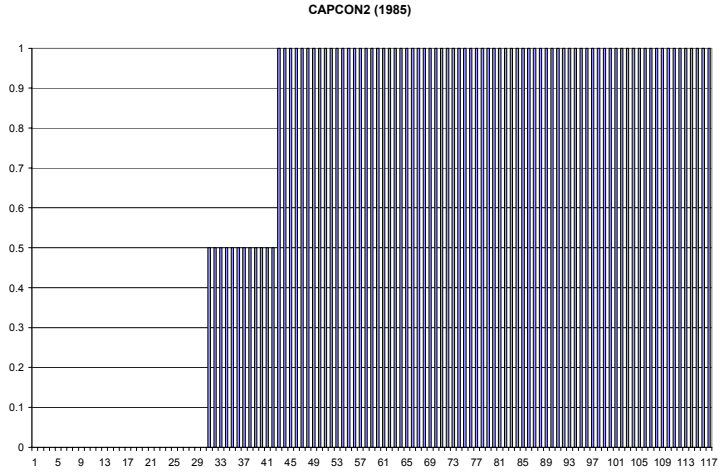
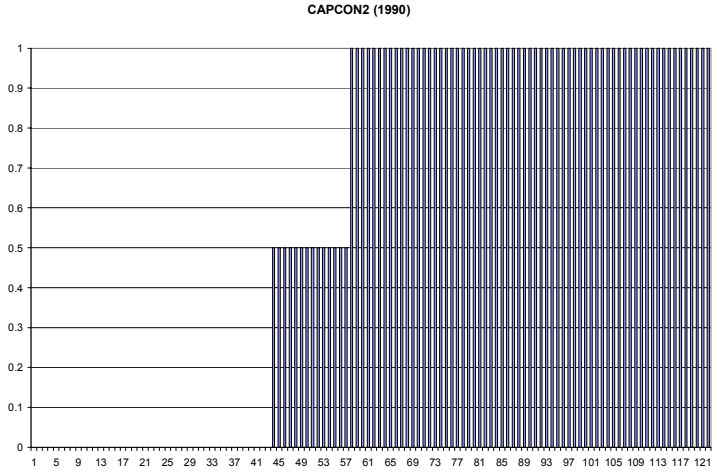


Figure 1B
CAPCON2









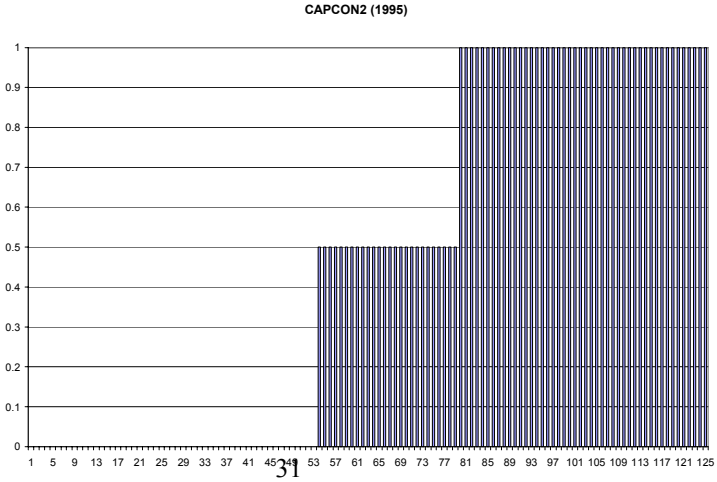


Table 1
Correlations between Capital Control Indices[28]

	C17680	C18185	C18690	C19195	C275	C280	C285	C290	C295	C17595	C27595
C17680	1										
	79										
C18185	0.7231	1									
	79	82									
C18690	0.6184	0.8354	1								
	79	82	83								
C19195	0.5823	0.6776	0.8422	1							
	79	82	83	84							
C275	0.718	0.5789	0.5052	0.5032	1						
	76	79	79	80	82						
C280	0.708	0.5259	0.4642	0.4733	0.9282	1					
	76	79	79	80	82	82					
C285	0.6102	0.6178	0.5077	0.5057	0.7617	0.8457	1				
	76	79	79	80	82	82	82				
C290	0.5317	0.5873	0.5709	0.6597	0.6155	0.6496	0.7233	1			
	76	79	79	80	82	82	82	82			
C295	0.3664	0.4268	0.4441	0.5852	0.4282	0.4107	0.4605	0.7276	1		
	76	79	79	80	82	82	82	82	82		
C17595	0.8212	0.9101	0.9315	0.8809	0.6593	0.6198	0.6411	0.6696	0.5249	1	
	79	81	81	81	79	79	79	79	79	82	
C27595	0.6965	0.6478	0.5909	0.6479	0.874	0.8985	0.89	0.8782	0.7136	0.7355	1
	76	79	79	80	82	82	82	82	82	79	82

[28] C1 refers to CAPCON1 and C2 refers to CAPCON2. The number below each correlation refers to the no. of observations

Table 2
Correlation between Capital Control Indicators
And Measures of International Flows[29].

	CAPCON1 (1980-90)	*CAPCON2 (1980-90)*	*CAPCON1 (1980-90)*	*CAPCON2 (1980-90)*
	All Countries	*All Countries*	*Non OECD*	*Non OECD*
FDI INFLOWS/GDP	-0.30	-0.37	-0.35	-0.43
	(0.00, 118)	(0.00, 102)	(0.00, 98)	(0.00,83)
FDI OUTFLOWS/GDP	-0.46	-0.61	-0.40	-0.35
	(0.00, 109)	(0.00, 93)	(0.00, 89)	(0.00, 74)
GROSS FDI FLOWS/GDP	-0.54	-0.59	-0.50	-0.49
	(0.00, 103)	(0.00,90)	(0.00, 84)	(0.00,72)
PORTFOLIO INVESTMENT	-0.33	-0.53	-0.31	-0.46
INFLOWS/GDP	(0.00, 108)	(0.00, 93)	(0.00, 88)	(0.00, 73)
PORTFOLIO INVESTMENT	-0.39	-0.63	-0.12	-0.13
OUTFLOWS/GDP	(0.00, 108)	(0.00, 93)	(0.25, 88)	(0.00, 73)
GROSS PVT CAPITAL FLOWS/GDP	-0.39	-0.35	-0.44	-0.39
	(0.00, 103)	(0.00, 95)	(0.00, 89)	(0.00, 72)
CURRENT ACCOUNT BALANCE/GDP	-0.20	-0.29	-0.17	-0.23
	(0.02, 113)	(0.02, 96)	(0.08, 93)	(0.04, 76)
FINANCIAL ACCOUNT BALANCE/GDP	0.16	0.09	0.10	0.01
	(0.08, 112)	(0.35, 97)	(0.32, 92)	(0.95, 77)

[29] Data for these come from the International Financial Statistics (IFS) and the World Bank Indicators (WBI). Portfolio capital inflows and outflows are respectively what the IFS more precisely calls Portfolio Investment Liabilities and Portfolio Investment Assets (note that any capital inflow is a liability for the recipient country). The financial account balance in the IFS is the sum of the balance of direct investment (mostly FDI), portfolio investment, other investment transactions and financial derivatives. Gross private capital flows (taken from WBI) are the sum of the absolute values of direct, portfolio, and other investment inflows and outflows recorded in the balance of payments financial account, excluding changes in the assets and liabilities of monetary authorities and general government. Current account balance (WBI) is the sum of net exports of goods, services, net income, and net current transfers.
The first number in the parentheses is the significance and the second number is the sample of countries for which this correlation was available.

Table 3
Capital Controls and Long Run Growth[30]
(Dependent Variable: Growth Rate per Capita 1976-95)

	1	2	3	4	5	6
	All Countries	**All Countries**	**All Countries**	**All Countries**	**Non OECD**	**Non OECD**
Log of GDP p.c. 1975	.076 0.33	0.20 0.78	-1.49 -3.62	-1.61 -3.98	-1.49 -3.28	-1.74 -3.99
SYR7595			0.55 1.77	0.53 1.78	1.17 2.86	1.28 3.21
INSTTN			0.39 2.80	0.43 3.09	0.57 3.372	0.62 3.62
CAPCON1	-1.11 -1.71*		-0.10 -0.17		-.94 -1.24	
CAPCON2		-0.79 -1.23		-0.24 -0.43		-0.94 -1.42
Latin American Dummy			-.094 -1.82	-0.81 -1.55	-1.52 -2.40	-1.26 -2.14
Sub-Saharan Africa Dummy			-3.01 -4.99	-3.04 -5.03	-2.93 -4.50	-2.71 -4.21
East Asian Dummy			1.74 2.76	1.84 -3.10	0.378 0.46	0.79 1.11
Observations	116	105	80	81	61	61
R-Square	0.04	0.04	0.56	0.56	0.64	0.65

[30] The first number in each cell is the coefficient and the second number is the t-ratio. * : significant at 10%, **: significant at 5%, ***: significant at 1%.

Table 4
Capital Controls (CAPCON), Ethnic Homogeneity and Economic Growth
(Dependent Variable: Growth Rate per Capita 1976-95)

	1	2	3	4	5	6	7	8
	All Countries	**All Countries**	**All Countries**	**All Countries**	**Non OECD**	**Non OECD**	**No HKG & TWN**	**No HKG & TWN**
Log of GDP p.c. 1975	-1.66 -4.31	-1.76 -4.57	-1.65 -4.38	-1.78 -4.89	-1.58 -3.80	-1.83 -4.63	-1.64 -4.34	-1.77 -4.80
SYR7595	0.41 1.438	0.50 1.77	.48 1.68	0.49 1.84	1.08 2.77	1.15 3.18	0.43 1.80	0.45 1.63
CAPCON1	-0.70 -1.25		-3.77 -2.33**		-4.78 -2.56**		-3.91 -2.41**	
*CAPCON1 *ELH*			4.45 2.02**		5.24 1.88*		4.76 2.13**	
CAPCON2		-0.48 -0.89		-4.92 -3.16***		-5.88 -3.4***		-4.94 -3.17***
*CAPCON2 *ELH*				5.96 3.02***		6.57 3.00***		6.06 3.06***
ELH	3.39 3.60***	2.85 3.13***	-0.34 -0.16	-1.01 -0.65	-1.50 0.56	-2.35 -1.31	-0.72 -0.34	-1.18 -0.76
INSTTN	0.36 2.73	0.41 3.06	0.38 2.99	0.44 3.48	0.58 3.72	0.63 4.06	0.39 3.04	0.45 3.52
Latin American Dummy	-1.23 -2.53	-1.00 -2.02	-1.20 -2.51	-0.99 -2.10	-1.72 -3.03	-1.36 -2.54	-1.21 -2.53	-0.99 -2.11
Sub-Saharan Africa Dummy	-1.25 -2.15	-1.61 -2.20	-1.08 1.52	-0.71 -0.93	-1.21 -1.611	-0.83 1.06	-1.18 -1.64	-0.82 -1.06
East Asia Dummy	2.40 3.93	2.55 4.21	2.16 3.54	2.30 3.97	0.75 0.97	1.04 1.45	1.95 2.98	2.11 3.38
Obsvns.	82	82	82	82	62	62	80	80
R-Square	0.63	0.62	0.65	0.66	0.71	0.72	0.63	0.64

Table 5
Net Effect of Capital Controls on Growth

Top Ten with Positive Effects

Name	*CAPCON1*	*Net Effect Based on CAPCON1*
Bangladesh	1	0.68
Korea, Rep.	1	0.68
Dominican Republic	1	0.63
Jamaica	1	0.62
Egypt, Arab Rep.	1	0.57
Jordan	1	0.54
Chile	1	0.45
El Salvador	1	0.45
Brazil	1	0.43
Colombia	1	0.43

Top Ten with Negative Effects

Name	*CAPCON1*	*Net effect Based on CAPCON1*
Tanzania	1	-3.28
Congo, Dem. Rep.	1	-3.20
Cameroon	1	-3.11
Guinea-Bissau	1	-3.10
Uganda	1	-3.03
South Africa	1	-3.01
Zambia	1	-3.01
Kenya	1	-2.99
Sierra Leone	1	-2.93
Senegal	1	-2.78

Name	*CAPCON2*	*Net Effect Based on CAPCON2*
Bangladesh	1	1.04
Korea, Rep.	0.8	0.83
Dominican Republic	0.8	0.78
Jamaica	0.8	0.77
Brazil	1	0.70
Jordan	0.8	0.69
Colombia	0.9	0.63
Tunisia	1	0.62
El Salvador	0.8	0.58
Syrian Arab Republic	0.6	0.28

Name	*CAPCON2*	*Net effect Based on CAPCON2*
Congo, Dem. Rep.	1	-4.15863
Cameroon	1	-4.03819
Guinea-Bissau	1	-4.026
Uganda	1	-3.94131
South Africa	1	-3.91265
Zambia	1	-3.90321
Tanzania	0.9	-3.83928
Mali	1	-3.77907
Papua New Guinea	1	-3.74425
Senegal	1	-3.60205

Table 6A
Robustness Results for CAPCON1 and Ethno-Linguistic Homogeneity
(Dependent Variable: Growth Rate of GDP per cap 1975-95)
(Hong Kong, Korea, Singapore and Taiwan Excluded from Sample)

	0	**1**	**2**	**3**	**4**	**5**
CAPCON1	-4.70 -2.98***	-3.82 -2.14**	-4.94 -3.68***	-5.55 -3.05***	-3.45 -4.04***	-4.65 -2.61**
*CAPCON1*ELH*	5.65 2.58**	4.57 1.78*	5.85 3.18***	7.23 2.81***	4.62 3.04***	5.40 2.19**
ELH	-2.65 -1.34	-1.85 -0.72	-3.62 -2.01**	-3.76 -1.48	-1.55 -2.59**	-1.73 -0.70
LogINV7595		1.18 1.62				
INF7595			-0.001 -4.22***			
Life Ex. 1975			0.11 3.25***			
RGHT 7595				0.07 0.09		
CIV 7595				0.02 0.72		
TRADEVOL					0.71 1.09	
LLY7590						5.80 0.68
Observations	78	69	73	58	76	61
R-Square	0.56	0.58	0.72	0.61	0.58	0.61

In each of these regressions, the following variables were also included : Log of GDP pc 1975, SYR7595, INSTTN, Latin America Dummy, Sub-Saharan Africa Dummy, East Asia Dummy.

Table 6B
Robustness Results for CAPCON2 and Ethno-Linguistic Homogeneity
(Dependent Variable: Growth Rate of GDP per cap 1975-95)
(Hong Kong, Korea, Singapore and Taiwan Excluded from Sample)

	0	**1**	**2**	**3**	**4**	**5**
CAPCON2	-5.12 -3.31***	-5.06 -3.07***	-4.99 3.75***	-6.3 -3.88***	-5.46 -3.48***	-6.12 -3.8***
*CAPCON2*ELH*	6.12 3.12***	5.78 2.71***	5.95 3.51***	7.41 3.61**	6.69 3.32***	7.58 3.6***
ELH	-1.81 -1.13	-1.9 -1.08	-2.71 -1.92**	-2.71 -1.56	-1.90 -1.18	-2.69 1.51
LogINV7595		1.05 1.48				
INF7595			-0.001 -3.95***			
Life Ex. 1975			0.08 2.40**			
RGHT 7595				0.02 0.23		
CIV 7595				-1.07 -0.49		
TRADEVOL					-0.01 -1.65	
LLY7590						0.40 0.54
Observations	0.58	0.59	0.7	0.63	0.60	0.66
R-Square	78	70	73	59	74	60

In each of these regressions, the following variables were also included : Log of GDP pc 1975, SYR7595, INSTTN, Latin America Dummy, Sub-Saharan Africa Dummy, East Asia Dummy.

Table 7A
Robustness Results for CAPCON1 and Education
(Dependent Variable: Growth Rate of GDP per cap 1975-95)
(Hong Kong, Korea, Singapore and Taiwan Excluded from Sample)

	0	1	2	3	4	5
CAPCON1	-2.15 -1.85*	-2.19 1.80*	-1.94 -2.01**	-4.30 -3.00***	-2.22 -1.85*	-2.88 -2.27**
CAPCON1 SYR7595*	0.91 1.80*	0.81 1.57	0.59 1.36	2.15 3.05***	1.01 1.94*	1.09 2.01*
SYR7595	-0.37 -0.83	-0.31	-0.61 -1.60	-0.72 -1.17	-1.00 -0.64	-0.57 -1.20
LogINV7595		1.52 2.06**				
INF7595			-0.001 -3.99***			
Life Ex. 1975			0.10 3.01***			
RGHT 7595				-0.04 -0.41		
CIV 7595				-0.0006 -0.003		
TRADEVOL					-0.005 -0.86	
LLY7590						0.96 1.07
Observations	78	69	73	58	74	61
R-Square	0.51	0.55	0.67	0.58	0.54	0.55

In each of these regressions, the following variables were also included: Log of GDP pc 1975, INSTTN, Latin America Dummy, Sub-Saharan Africa Dummy and East Asia Dummy.

Table 7B
Robustness Results for CAPCON2 and Education
(Dependent Variable: Growth Rate of GDP per cap 1975-95)
(Hong Kong, Korea, Singapore and Taiwan Excluded from Sample)

	0	**1**	**2**	**3**	**4**	**5**
CAPCON2	-1.73 -1.75*	-1.91 -1.92*	-0.82 -0.90	-2.07 -1.73*	-1.87 -1.84*	-2.58 -2.30**
CAPCON2 SYR7595*	0.83 1.51	0.79 1.39	0.16 0.31	1.01 1.35	0.96 1.68*	1.17 1.96*
SYR7595	-0.09	-0.09 -0.25	-0.20 -0.61	-0.14 0.26	-0.21 -0.55	-0.37 -0.94
LogINV7595		1.45 1.96*				
INF7595			-0.001 -3.77***			
Life Ex. 1975			0.09 2.47**			
RGHT 7595				-0.04 -0.39		
CIV 7595				-0.02 -0.06		
TRADEVOL					-0.005 -0.96	
LLY7590						0.79 0.97
Observations	78	70	73	59	74	60
R-Square	0.50	0.53	0.63	0.51	0.52	0.56

In each of these regressions, the following variables were also included : Log of GDP pc 1975, INSTTN, Latin America Dummy, Sub-Saharan Africa Dummy, East Asia Dummy.

Table 8
Capital Controls and Income Distribution
(Dependent Variable : Growth Rate of GDP per cap 1975-95)
(All countries)

	1	**2**	**3**	**4**	**5**
CAPCON1	1.92 0.57				
CAPCON1 MID75*	-1.97 -0.37		1.03 1.30		
CAPCON2		0.77 0.32			
CAPCON2 MID75*		0.15 0.03		1.44 1.74*	
MID75	-2.01 -0.46	-5.27 -1.62	-3.99 -1.52	-5.99 -2.52**	-5.26 -2.18**
Observations	36	37	36	37	37
R-Square	0.85	0.86	0.85	0.86	0.84

In each of these regressions, the following variables were also included: Log of GDP pc 1975, INSTTN, Latin America Dummy, Sub-Saharan Africa Dummy, East Asia Dummy. The high R-Squares are due to the very high significance of the dummy variables. The correlation between CAPCON1 (CAPCON2) and CAPCON1*MID75 (CAPCON2*MID75) is 0.94 (0.95).