Capital Controls: A Political Economy Approach

Laura Alfaro*

Harvard Business School

July 2002

Abstract

This paper examines the economic consequences of political conflicts that arise when countries implement capital controls. In an overlapping-generations model, agents vote on whether to open or close an economy to capital flows. The young (workers) receive income from wages only while the old (capitalists) receive income from savings only. We characterize the set of stationary equilibria for an infinite horizon game. Assuming dynamic-efficiency, when the median representative is a worker (capitalist), capital-importing countries will open (close) while capital-exporting countries will close (open). These predicted patterns are consistent with data on liberalization policies over time and across various countries.

JEL: F2, F4, C13
Key words: capital controls, worker/capitalists, non-cooperative game

---

*Harvard Business School, Morgan 263, Boston, MA 02163. Tel: 617-495-7981. Fax: 617-496-5985. E-mail lalfaro@hbs.edu. I thank Leornardo Bartolini who kindly allowed me to use his data and Luisa Lambertini, Costas Azariadis, Carlos Végh, Fabio Kanczuk for helpful discussions and suggestions. I am grateful to the participants of Harvard, LACEA and UCLA seminars for valuable comments.

1. Introduction

This paper examines a political economy approach to explain capital liberalization policies observed across countries for which I consider the distributional effects of opening and closing an economy to international capital flows.

Capital mobility facilitates an efficient global allocation of savings by channeling financial resources into their most productive uses, thereby increasing economic growth and welfare around the world. As noted by Obstfeld (1998) "economic theory leaves no doubt about the potential advantages of global financing trading." Developing countries with little domestic capital, for example, can borrow to finance investment and thereby attain economic growth without sharp increases in national savings rates. In addition, capital flows increase the opportunities for portfolio diversification and thus provide investors with potentially higher risk-adjusted rates of return.

However, economic policies adopted by different countries at different points in time are in discord with those proposed by economists. Between the middle of the nineteenth century and the outbreak of World War I controls over the international movement of capital were unusual: free capital market linked financial centers in Europe, the Western Hemisphere, Africa and the Far East.[1] During World War I, however, several countries restricted capital outflows to maintain a tax base for financing of military expenditures. By 1919, most of the countries involved in WWI had resorted to capital controls. After the war, international financial market recovered, but at the onset of the Great Depression soon they withered. As Obstfeld (1998) notes, "At that time, governments everywhere limited the scope of domestic financial markets as well….. World War II cemented the demise of the global capital market…" By 1945, global protectionist policies and currency inconvertibility essential destroyed international markets for goods, services and financial assets.[2]

The 1960s saw the return of private capital movements. However, the path towards greater globalization in the capital markets following World War II has not been uniform across nations. Figures 1-

5 show a capital control index from IMF's Annual Report on Exchange Arrangements and Exchange Restrictions data. The data covers exchange arrangements, restrictions on payments for current transactions and restrictions on payments for capital transactions. The capital control index for developing countries (Figure 1) shows an open-close-open-close-open cycle during the period of analysis. Figure 2 shows the index for industrialized countries. Since 1966, industrialized countries have followed a relatively constant liberalization policy, although Southern Europe displays an open-close-open cycle. Figure 3 shows the policies pursed by the so-called Asian Tigers and Japan. These countries also followed a constant liberalization approach, but the speed in their liberalization process seems more dramatic than for industrialized countries. Further breakdown for developing countries suggests some interesting patterns. Latin American countries followed a close-open-close-open cycle (Figure 4). Figure 5 plots the index for a sample of African countries. Although there is a weak close-open pattern, overall African countries have keep restrictions high.

Why do some countries open while others keep their economies closed? To address this question, this paper considers the distributional effects that result from opening and closing an economy to international capital movements.

In a one-good intertemporal model of trade, countries gain from borrowing or lending abroad when there is a difference between the economy's autarky interest rate and the world's interest rate. However, while an economy as a whole can benefit from opening to international markets, some groups within an economy may loose in the absence of necessary compensating transfers. These results become clearer under the light of an overlapping generation model, which allows for a dynamic setup where workers and capitalists can be identified with the young and old generation respectively.[3] If capital is mobile and labor is not, opening the economy will have different effects across agents. Capital exports, due to international rates higher than autarky rates, help capitalists and hurt workers (lower capital levels imply lower wages); capital imports however have the opposite results.

The effect of capital mobility indicates that allowing for international factor movements can create a sharp political division between generations. Rather than introducing compensatory schemes to mitigate conflicts, we model an open economy as the outcome of a non-cooperative game between players who wish to maximize their own utility. Instead of imposing a social welfare function, through an electoral process we allow the median representative, worker (young) or capitalist (old), to decide every period whether to open or not to the international capital market.

Other justifications for capital controls include fiscal considerations (retention of domestic saving, maintenance of the domestic tax base) and limitation of short-term capital flows due to price and/or wage rigidities and investment irreversibility. These considerations can imply slower real economy speed of adjustment and/or excess volatility in financial markets that may induce excess exchange rate volatility and negative effects on real economic activity.[4] Self-fulfilling attacks against fixed exchange rates not motivated by market fundamentals provide additional justification for imposing capital controls. Eichengreen and Wyplosz (1993) suggest that countries with credibility problems would be more likely targets of speculative attacks and therefore would be more likely to impose controls. However, the signaling literature cautions that countries that lift capital controls can signal "good behavior," whereas those that impose them could be perceived as following inconsistent policies that would reduce credibility.[5]

When explaining capital controls, Alesina and Tabellini (1989) consider distributional issues. In a two-period general equilibrium model with two government types with conflicting distributional goals, they show that left-wing government are more prone to restrict capital outflows than right-wing ones. Private capital flight is explained as an insurance against the risk of future taxation. However, in their model, capital controls always make capitalists worse off. In the model presented in this paper, the outcome depends on the characteristics of the economy.

Distributive arguments have long been evident in the trade literature. A simple Hecksher-Ohlin model with all the standard assumptions shows that when a country opens to trade, the remuneration to the

factor used intensively in the exporting sector will increase but the factor used in the importing sector will fall. The political economy of trade literature focuses on these issues and tries to explain prevailing policies by emphasizing distributional considerations.[6]

In the literature on capital movements, evidence form Checchi (1992) shows that preventing capital outflows shifts the distribution of income in favor of wage earners. Measuring the effectiveness of the controls in Great Britain, Japan and Australia with the differentials between domestic and off shore interest rates and testing for causality, Checchi provides empirical evidence that supports the argument that capital controls indeed affected income distribution.

In an OLG framework, Ruffin and Yoon (1993) show that the current old can compensate (or be compensated by) future generations via an improvement in the terms of trade (and consequently a movement from autarky to free trade) if and only if the economy is dynamically efficient. They devised a simple technique to compare welfare across different generations by setting up a trust in which the winner compensate losers. Thus they are able to identify whether an economy is better or worse off after opening. In practice, the existence of this type of compensation scheme is quite rare. Therefore, it is relevant to analyze whether an open or closed economy is the outcome of a non-cooperative game without compensating transfers.

This paper is organized as follows. Section 2 presents the basic model. Section 3 introduces the political model where each generation decides whether to open or close to capital flows. Section 4 and 5 review the estimation procedure and data. Section 6 shows the results of an empirical test on the determinants of capital controls across time in a sample of countries. Section 7 concludes.

2. The Model

Following Diamond (1965), consider a standard Overlapping Generations Model (OLG) in which agents live for only two periods. Agents are identical within generations and population growth, $n \geq -1$, is

constant. Young individuals are endowed with one unit of labor, which they supply inelastically when young and earn a wage w_t. They consume part of their wage income during the first period of life and save the rest. When old, agents consume the return and principal from savings. These savings bear an interest rate factor $R_{t+1} = 1+r_{t+1}$.

a. Preferences and Technology.

Each agent born at time t maximizes his lifetime utility function $U = u(c^t_t, c^t_{t+1})$, where c^t_t denotes consumption when young and c^t_{t+1} consumption when old. In order to simplify the analysis, we assume a logarithmic utility,

$$U = lnc^t_t + b\ lnc^t_{t+1} \tag{1}$$

Agents are subject to the budget constraint,

$$c^t_t + c^t_{t+1}/R_{t+1} = w_t \tag{2}$$

At any point in time, a single good is produced according to a Cobb-Douglas constant returns to scale production function, $f(k) = A_t k_t^a$, where k stands for capital labor ratio, $k = K/L$ and $\alpha \in (0,1)$. Output is either consumed or saved as capital. Capital depreciates at a rate d.

b. Economic Equilibrium

The Economic Equilibrium concept is "Walrasian Equilibrium." In each period, firms maximize profits and households maximize utility taking the prices, $w(k_t)$ and $R(k_t)$, as given. Let z_t represent the asset level available in the economy (and owned by the old) at the beginning of the period t. The resulting prices and law of motion are:

a) Firm's optimization problem: $w(k_t) = f(k_t) - kf'(k_t) = (1 - a)Ak_t^a$ (3)

$$R(k_t) = 1 - d + f'(k_t) = aA/k_t^{1-a}$$

(4)

b) Households' optimization problem: $c^t_t = w(k_t)/(1+b)$ (5)

$$c^t_{t+1} = b\ R(k_{t+1})\ w(k_t)/(1+b) \tag{6}$$

c) Market clearing: $z^t_{t+1} = b\, w(k_t)/(1+b)(1+n)$ (7)

Notice that under these assumptions, it is straightforward to show that increases in the remuneration to one factor are accompanied by reductions in the payments to the other one ($dw/dr = -k$).

To further simplify the solution of the model, let the population growth be equal to zero; the technology parameter (A) and the depreciation rate (δ) equal to one and define $s = b/(1+b)$. Additionally, both the home country and the rest of the world are assumed to be in a steady-state equilibrium. Then, the indirect utility of the young agent in terms of R_t is given by:

$$U\left[R_t, R_{t+1}\right] = \ln\left[\frac{R_{t+1}^{\ s}}{R_t^{\frac{a}{1-a}}}\right] + \ln\left((1-a)a^{\frac{a}{1-a}}\right) + (1-s)\ln(1-s) + s\ln s \qquad (8)$$

When political interactions are added to the model, two economic equilibria, the autarkic steady state and the trade state equilibria, will be of crucial importance. An autarkic steady-state equilibrium is simply the stationary equilibrium obtained when the economy does not receive or generate outflows of capital from other economies. In this case, the domestic capital level equals the asset level in the economy, $k^a = z$, and the autarkic interest rate,

$$R^a = \alpha A/k^{a\ \alpha-1} \qquad (9)$$

For simplicity, we assume a "small open economy" where capital is perfectly mobile but labor is not. This implies that, if open, our economy takes the international interest rate factor, R^i, as fixed by the world economy. If the economy is open, capital flows in or out, equating domestic returns immediately to international ones (no adjustment costs). We additionally assume that R^i is constant over time.

3. Political decision

This section analyzes the political interaction between members of subsequent generations who decide whether to keep the economy open or closed to capital flows. As Helpman (1995) notes there

exists no agreed upon theory of domestic politics since there are many channels through which residents convey their desire to policy makers which differ across issues and across concerned groups in society.

We assume that the government designs policies as to satisfy special interest groups, belonging either to the capitalist group or to the capitalist group. We label the government's favored group the "median representative."[7] Voting decisions are made at the beginning of each period.

Note that the combination of a logarithmic utility and a standard Cobb-Douglas production function, common assumptions in the literature, imply a unique asymptotically stable steady state, and allow for a simple closed-form solution, which facilitates the analysis. In addition, jointly with a zero second-period income assumption, once the wage is given, the first period consumption and savings are already determined independently of next period interest rates (R_{t+1}), and, therefore, independently of political decisions. For the political analysis discussed later, this does not seem to be an important drawback.[8]

3.1 Old/Capitalist Median Representative

The old generation worked last period. Therefore, changes in their utility are due to changes in the interest rate only. If the economy opens to international markets, and capital flows in (capital-importing economy) because of higher domestic returns ($R_a>R_i$), interests will fall, hurting the old. On the other hand, if capital flows out (capital-exporting economy) due to higher rates abroad ($R_a<R_i$), the old would be better off. Therefore, if the economy is capital exporting the old will vote to allow capital flows and if it is capital importing they will vote to stay closed.

Since the old generation maximizes utility when choosing the status of the economy that increases interest rate returns, they behave like capitalists. This interpretation will be used in the empirical analysis.[9]

3.2 Young/Worker Median Representative

Each generation is faced with the decision of whether or not to join international capital markets. Because, the median representative's decision has a measurable and acknowledged influence on other agents' payoffs (they do not behave "competitively"), to analyze political decisions, one should approach

this problem as a game among consecutive representatives. We consider open loop strategies - which are functions of calendar time only – and open-loop equilibria.[10]

There are four possible scenarios: capital importing or exporting, and dynamic efficient or inefficient economies. The difference between efficient and inefficient allocation hinges on the relationship between savings and capital accumulation or alternatively, between the interest rate and the growth rate. An allocation is defined as dynamic inefficient if the associated net interest rate is lower than the population growth (economy's growth), *1-d+f'(k) =R£ 1+ n*. Otherwise, the allocation is said to be dynamic efficient.[11] Since the seminal work by Abel, Mankiw, Summers and Zeckhauser's (1989) shows that most countries seem to be dynamic efficient, we discuss the dynamic efficient cases in the text and leave the discussion for the inefficient cases in Appendix 3.[12]

Case A.1: Capital Importer (R_a>R_i). Dynamic efficient

In this case, opening to international markets will imply a wage increase in the home economy. The lifetime utilities for the current generation t under all possible scenarios are given by:

i. $U(R_i, R_a) = \ln \frac{R_a^s}{R_i^{\frac{a}{1-a}}}$, if the economy is open when young and closed when old; (10)

ii. $U(R_i, R_i) = \ln \frac{R_i^s}{R_i^{\frac{a}{1-a}}}$, if the economy is open at his young and old age; (11)

iii. $U(R_a, R_a) = \ln \frac{R_a^s}{R_a^{\frac{a}{1-a}}}$, if the economy is closed at his young and old age; (12)

iv. $U(R_a, R_i) = \ln \frac{R_i^s}{R_a^{\frac{a}{1-a}}}$, if the economy is closed when young and open when old. (13)

Define $U(R_i, R_a)$ º a; $U(R_i, R_i)$ º b; $U(R_a, R_a)$ º c; $U(R_a, R_i)$ º d. In a dynamic efficient economy, given R_a>R_i, it is easy to show that: $a > b > c > d$. Given this ranking, voting "open" is a dominant strategy for player t. The young maximizes her/his utility by opening the economy, allowing capital to flow in and obtaining higher wages than in a closed one.

PROPOSITION 1: *"Always open" is an open-loop equilibrium for the economy. Moreover, the equilibrium is unique.*

Proof. See Appendix 2.

Case A.2: Capital Exporter ($R_a < R_i$) Dynamic efficient.

Analogously, wages will fall if a capital exporter economy opens to international markets. Define $U(R_a, R_i) \circ a$; $U(R_a, R_a) \circ b$; $U(R_i, R_i) \circ c$; $U(R_i, R_a) \circ d$. With $a>b>c>d$. Similarly, one can derive the following proposition.

PROPOSITION 2: *"Always closed" is an open-loop equilibrium for this economy. The equilibrium is unique.*

Notice from Propositions 1 and 2 that since the dominant strategy for members of the young generation is to vote for the status of the economy that maximizes wages, they behave like workers. Again, this parallelism will be used in the empirical analysis.[13]

Table 1 summarizes the main empirical predictions of the model.

4. Empirical Test

The intent of this section is to perform an empirical test on the determinants of capital controls following Alesina, Grilli and Milesi-Ferretti (1993) (AGM here after) and incorporating the predictions of the model presented in Section 3. AGM perform an empirical test on the determinants[14] of capital controls (not on the effectiveness) on a sample of OECD countries. They linked capital restrictions and economic and political institution variables based on various explanations that focused on medium-term aspects.[15] They find that capital controls are more likely in countries with lower income, a large government, and a central bank with limited independence. Other determinants include the exchange rate regime and current account imbalances. In their study, capital controls are associated with higher inflation and lower real interest rates.

According to the theoretical implications of the model presented in this paper, we should observe capital-importing nations governed by left parties (worker groups) and capital exporting nations with right-wing ruling parties (capitalists) opening to foreign capital. The opposite should be true for importing economies governed by right-wing parties and capital exporting economies with-left governments should close.

Before specifying the econometric model, we need to address the following issues: how to measure capital controls; how to characterize a country as a capital exporter/importer; how to characterize a country as democratic; who is the median representative of an economy.

4.1. Capital Controls Measurement

Since 1966, the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions includes a summary table that describes whether a country has adopted any of the following restrictions[16]: i. exchange arrangements: separate exchange rates for some or all capital transactions[17]; ii. restrictions on payments for current transactions[18]; iii. restrictions on payments for capital transactions.

Table 2 summarizes this information for the countries included in our sample.[19] By 1994, all 20 industrialized countries in our sample had eliminated the use of separate exchange rates on financial transactions and restrictions on payments for current transactions as forms of controlling capital flows and only 2 still used restrictions on capital transactions.

The information on capital controls was used to construct the dependent variable (y). y took the value *3* when restrictions (i), (ii), and (iii) were adopted for a given year in a given country; *2* if any two types of restrictions were in place; *1* if only one type of restriction was used, and *0* otherwise. Since the IMF definition does not include certain practices that might "reasonably be considered capital controls,"[20] we followed Epstein and Schor (1992) guidelines to correct for such practices in the United States, Germany and Switzerland. y' took the value *4* when restrictions (i), (ii), and (iii) and other practices were adopted

for a given year in a given country; 3 if any three restrictions were in place; *2* if two were used, 1 if only one, and *0* otherwise.

4.2. Characterization of Capital Exporting/Importing Countries

The model's predictions depend on whether the economy is capital exporting or capital importing. Theoretically, a capital exporting economy is one in which the autarky real interest rate is below the international real rate (in a capital importing country the autarky real rate is above the international rate). Empirically, it is complicated to interpret interest rate data to judge whether an economy is a capital importer or exporter. In economies that are even slightly open to international markets, interest rates reflect transaction, information and mobility costs, capital controls, political risk, devaluation expectations and default risk. Even if we consider onshore and offshore yields on the same instruments denominated in the same currency, the yields still will reflect restrictions on capital flows and country risk. In addition, real interest rate estimations require information on inflation expectations.

Rather than using interest rate data to identify capital exporting or importing countries, we used the capital account balance as a proxy variable. A country is taken to be capital exporter if the capital account is negative and a capital importer otherwise. This information was taken from the balance of payment accounts in the IMF International Financial Statistics data set. Figure 6 shows the capital account as a percentage of GDP for the subsample of industrialized countries. It is important to keep in mind that the size of the Error and Omissions account (the statistical discrepancies in the balance of payment accounts) is by no means negligible and there is no accurate way of comparing these magnitudes across countries. The discrepancies imply not only that the capital account magnitude measurement is inaccurate but also that the sign of the capital account might be incorrect. We assume that the sign of the capital account is more robust to statistical discrepancies than its absolute magnitude.

Note that capital controls influence the value of the balance of payment accounts. This, of course, could generate endogeneity problems. To address this problem and the fact that short-term fluctuations

might temporarily affect the balance of payment accounts, we calculated 5-year averages of the capital account balance (as percentage of gross domestic product).

4.3 Democratic Countries

The conclusions of the theoretical model rely on the assumption that government policies reflect the desires of the majority of the voting population.[21] Therefore, we need an index of political freedom for each country at each point in time in order to determine if the country was "democratic enough".

Freedom in the World, a Freedom House publication, contains annual surveys of political rights and civil liberties for all countries. Their rating of political and civil liberties range from 1 (representing the most free) to 7 (the least free). They average the civil and political liberties rating and categorize countries as free when the measurement is between [1, 3), partly free for [3, 5.5) and not free [5.5, 7]. For estimation purposes, only free countries were considered.[22]

4.4 Median Representative

The model's predictions depend not only on the status of the economy (whether it is capital exporting or importing and dynamic efficient or inefficient), but also on the identity of the median representative and the group to which he/she belongs. The effects of changes in the political franchise on policies have long been acknowledged in areas such as public spending, trade, and taxation.[23]

It is difficult to empirically determine the median representative of an economy because, among other factors, it depends on the actual participation of the electorate at each particular election. For example, younger people tend to be more indifferent towards political issues and voting in the United States than in European countries. Changes in the political system and regime, extension of political franchise, majority rule and electorate participation can change the identity of the median representative.

Therefore, to "proxy" the median representative we used a political variable for OECD countries constructed by Lambertini (1996) following Alesina and Roubini (1992) that ranks the political orientation of the political party or coalition in power. It takes values between [-2,2], where 2 represents the most

"right" government in the spectrum of that country and -2 the most "left". We assume that right wing governments follow policies that benefit the capitalists, whereas the left wing governments tend to benefit the workers.

5. Specification and Estimation of the Model

Let y^* be a latent variable that captures how restrictive the policy might be. Note, however, that we cannot observe y^*_{it}, but only a proxy of this, y_{it}. As described in Section 4.1, the dependent variable (y) incorporates information on the use of separate exchange rates regimes, restrictions on current transactions and restrictions on capital transactions. We exploited the ranking information y_{it} by using and ordered probit[24] model. The model specification is then:

$$y^*_{it} = x_{it}' b + z_{it}' g + u_{it}, \quad u_{it} \sim \text{logistic distribution}^{25} \tag{14}$$

z_{it}' = *additional variables that capture alternative rationales for capital controls* where,

$y^a_{it} = 3$	if $y_{it}^* > v_3$	(all three capital controls observed)
$y^a_{it} = 2$	if $v_3 \geq y_{it}^* > v_2$	(any two capital controls observed)
$y^a_{it} = 1$	if $v_2 \geq y_{it}^* > v_1$	(any capital controls observed)
$y^a_{it} = 0$	if otherwise $v_1 > y_{it}^*$	(no capital controls)

The probability of observing outcome i, where $i \in \{0, 1, 2, 3\}$, corresponds to the probability that the estimated linear function, plus random error, is within the range of the cut-off points, v_{i-1} and v_i, estimated for the outcome: $Prob\ (outcome_j = i) = P\ (v_{i-1} < b' x + u_i \leq v)$. One estimates the coefficients b and g along with the cut points v_1, v_2, v_3. Similarly, for the variable y', one estimates the coefficients b' and g'.

5.1 Specification 1

- Let A be the set of democratic and capital importing countries;

- Let B be the set of democratic and capital exporting countries;

Let $x_{A_{it}}$ be defined as the product of a dummy variable that takes the value 1 if a country belongs to group A and zero otherwise, and the political wing variable, i.e.,

$$x_{A_{it}} \begin{cases} 1 * \text{ political wing variable, if the observation at time } t \text{ for country } i \text{ belongs to group } A; \\ 0 \text{ otherwise, country } i \text{ at } t \text{ does not belong to } A \end{cases}$$

$x_{B_{it}}$ was defined similarly.

5.2 Specification 2

- Let A be the set of democratic and capital importing countries (5 year averages);
- Let B be the set of democratic and capital exporting countries (5 year averages);

The variables $x_{A\,it}$, $x_{B\,it}$ were defined analogously.

The additional variables *(z)* used in both specifications were: *Central Bank Independence variables:* the variable Legal captures central bank independence. Higher numbers correspond to more independence (which should be negatively correlated with the controls). *External Sector variables:* A dummy variable –Exchange Rate Regime - taking the value of one during periods of fixed or managed exchange rates and 0 otherwise, was included to capture how much countries rely on controls to assist them in managing the exchange rate (positive sign). *Tax System and size of government variables:* The log of real GDP per capita - Log (GDP)- which is assumed to be positively correlated with the sophistication of the tax system. Countries with higher real GDP per capita are expected to impose fewer controls. The (lagged) ratio of government consumption to GDP – Gl - is expected to have a positive sign.[26]

6. Results

Table 4 shows the results for the estimations under specification 1. The first set of estimates indicates that democratic, capital exporting countries under right wing governments or capital importing countries under a left wing authority tend to impose fewer capital controls (positive and significant coefficient for b_A and negative for β_B). Therefore, we cannot reject the hypothesis that distributive/social conflict issues do affect the decision to impose capital controls. Consistent with the previous research on capital controls, countries that relied on managed or fixed exchange rate regimes were more likely to introduce capital controls (significant and positive sign). Independent central banks (legal variable) tend to impose lower levels of controls. The level of development variable captured by the log of real GDP per capita had a negative and significant value. Bigger governments (government size variables) tend to impose more controls. Table 5 shows the estimates for the capital control variable that adjusts for other practices. The results are consistent with those predicted by the model.

Table 6 shows the results under specification 2. The estimations are robust to a capital account measure that considers five-year averages. Again, we cannot reject the hypothesis that distributive concerns affect the decision to impose capital controls. These findings, as shown in Table #7 are robust to a boarder measure of capital controls. Other variables significant at 5% include exchange rate regime dummy variable; the central bank independence variable and the development level variables.

7. Extensions and Conclusions

This paper addressed the political conflict involved around international capital controls in an environment where economic agents vote on whether to close or open the economy to capital flows. We characterized the equilibria of the infinite horizon model with overlapping players in a non-cooperative game between players who wish to maximize their own utility. We found that in dynamic efficient economies with a young/worker median representative capital-importing countries were inclined to be

open to international capital flows while capital-exporting countries tended to remain closed. If the median representative belongs to the old/capitalist group, the results are the opposite.

The empirical test shows that the exchange rate regime, government size, central bank independence, level of development, as well as distributive issues (according to the model specification) explain the existence of capital controls.

This analysis did not allow for transfers among generations. For example, the assumption that the median representative belonged to the worker group allowed no role for the capitalist. However, if under the implemented policy, one group loses more than what the other one wins, they might "bribe" to change their vote.[27] This analysis might shed some light in explaining compensation schemes that exist in some regions and the integration of countries to such areas where a priori important sectors of the economy seem to lose from such policy. However, because these transfer schemes usually are negotiated within a small group of regions or countries, we feel that large economy setup is probably more suitable.

Yet another direction is to focus on testing the political implications of the model in the developing world.

Alesina and Grilli [1988] present evidence that left-wing government in four Latin American Countries (Argentina, Chile, Peru and Uruguay) between 1967-1985, have generally increased the labor share of national income whereas the opposite holds for right-wing regimes. Most right wing dictatorships in Latin America in the late 1970s came to power following a period of capital liberalization, when the economy enjoyed large capital inflows and imposed capital controls as capital fled the region following the debt crises in the early 1980s. Similarly, in Spain (post Franco) controls were reduced under the new left-wing government in an economy that received a new wave of capital flows.

The relationships in African countries are hard to disentangle. In Africa, restrictions were imposed in almost every country during the 1970's and 1980's. Several variables, however, limit the analysis. First, political instability, capital flight and low private savings characterize this capital scarce region. In most

African countries, the capital account is sustained by foreign aid. Several countries have endured – or continue to endure – widespread civil conflict. For either days or decades, dictators or military/politico factions have governed these countries. In addition, most of these 'governing' groups are hard to classify as pro workers or capitalist even under self-imposed labels of right wing and left wing.

Unfortunately, there is no comprehensive political database that accounts for interest groups behind the government in developing countries. In industrialized countries, the political orientation of the party or coalition in power could be used as a proxy. In developing countries, this understanding is more difficult and requires knowledge of the political circumstances of each country that is beyond the scope of this paper. Naturally, future research in this direction and an empirical analysis of a sample of developing countries in this direction is required.

Appendix 1: Worker-Capitalist Problem

Define a worker as an agent that receives income solely from wages (assume he cannot participate in the credit market as a lender or as a borrower). Her/His decision problem is given by:

<u>Worker:</u> Max: $\sum_{s=t}^{\infty} b^{s-t} \, ln(c_s)$ s.t. $w_s = c_s$ (A1.1)

He/she will choose the state of the economy that maximizes the value of w_s, that being either to open the economy or to keep it closed.

Define a capitalist as an agent whose income derives exclusively from the ownership of capital. Then, his/her decision problem is:

<u>Capitalist:</u> Max $\sum_{s=t}^{\infty} b^{s-t} \, ln(c_s)$ s.t. $\sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} (c_s + k_{s+1} - k_s) = \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} (r_s k_s)$ (A1.2)

From first order conditions: $c_{s+1} = b(1+r)c_s$. If we assume $b(1+r)=1$, and from the budget constraint, hers/his optimal decision is then:

$$c_{s+1} = c_s = rk_t \qquad \text{(A1.3)}$$

Given the initial k_t, she/he maximizes her/his utility by choosing the state of the economy with higher interest rates ■

Appendix 2: Proof of Proposition 1. Case A.1: Capital Importer (R_a>R_i). Dynamic efficient

PROPOSITION 1: *"Always open" is an open-loop equilibrium for the economy. Moreover, the equilibrium is unique.*

Proof. Notice that voting "open" is a dominant strategy for player *t*.. In general, to play open is a dominant strategy for every generation. This is shown in the following normal form of the game that includes player *t*, *t*+1 and *t*+2. As a reminder, *a*> *b*> *c*> *d*, where *a*, *b*, *c*, *d* represent lifetime utilities.

t+2					*t*+2			
O					C			
t+1		O	C		*t*+1		O	C
t	O	b,b	a,d		*t*	O	b,a	a,c
	C	d,b	c,d			C	d,a	c,c

To prove the second part of the proposition, notice that the minmax value is *b*. Thus, agents do not need to accept payoffs with lifetime utility below *b*. Additionally, the players cannot obtain utilities above *b*. For them to obtain payoff *a*, the following generation would have to accept payoff *c*; but since *b* is the minmax, players always can guarantee themselves at least this payoff. Hence, closed-loop strategies are not able to support any other equilibrium outcome. The only possible outcome equilibrium is an economy always open ■

Appendix 3: Dynamic inefficient

Case B.1: Capital Importer (R_a > R_i) Dynamic inefficient.

$U(R_i, R_a)$ º a; $U(R_a, R_a)$ º b; $U(R_i, R_i)$ º c; $U(R_a, R_i)$ º d; With $a > b > c > d$, the young generation t's payoff in the normal form payoff table:

		t+1	
		O	C
t	O	c	a
	C	d	b

In this case, the minmax is c. Non-stationary outcomes can be ruled out because in economies that move from closed at t to open at t+1, generation t would receive payoff $d < c$. One would not observe either non-stationary outcome where economies move from open at t to close at $t+1$, because, in this case, generation $t+1$ would receive payoff $d<c$. This is shown in the normal form of the game that includes generations t, $t+1$, and $t+2$.

		t+2	
		O	
t+1		O	C
t	O	c,c	a,d
	C	d,c	b,d

		t+2	
		C	
t+1		O	C
t	O	c,a	a,b
	C	d,a	b,b

From the open-loop strategies:

PROPOSITION 3: *The unique open-loop equilibrium outcome is an economy that is always open.*

However, in this case, both stationary outcomes are, in principle, possible equilibria. The closed economy outcome, though Pareto superior to the open economy cannot be sustained with open loop strategies because each generation has an incentive to deviate and vote to open the economy. Using history dependent strategies we can find a closed-loop equilibrium.

PROPOSITION 4: *The equilibrium outcome "economy always closed" is sustainable by closed loop strategies.*

Proof: We can prove that there are no gains from deviating from this strategy. On the equilibrium path, the payoff from following the strategy is b and from deviating is $c < b$. In addition, off the equilibrium path,

the payoff from punishing a defector is equal to a, which is greater than the payoff of not punishing that is b ■

Case B.2: Capital exporter (R_a<R_i) Dynamic inefficient

$U(R_a, R_i)$ º a; $U(R_i, R_i)$ º b; $U(R_a, R_a)$ º c; $U(R_i, R_a)$ º d. Again with $a > b > c > d$.

Proposition 3 and 4 easily can be generalized to this case. Under open-loop strategies, c can be sustained. Using trigger strategies one can sustain the Pareto superior equilibrium b.

Appendix 4: Countries, variables definitions and Sources.

A4.1. Countries in Sample: Unites States, Canada, Japan, Australia, New Zealand, Austria, Belgium, Denmark, France, Germany, Ireland, Netherlands, Norway, Sweden, Switzerland, United Kingdom, Greece, Italy, Portugal, Spain.

A4.2. Variables and Definitions

y: dummy variable taking the value of three when capital all capital controls are in place, two, if any two are in place, one if only one was used and zero otherwise. Type of capital controls considered: i. multiple exchange rates for financial transactions; ii. restriction on payments for capital transactions; iii. restrictions on payments for current transactions. The variable y' includes other capital flow restrictions.

Source*:* IMF Annual Report on Exchange Rate Arrangements and Restrictions, and Epstein and Schor (1992)

Capital account: dummy variable taking the value of one 1 if country is capital importer, zero otherwise.

Capital account_5: dummy variable taking the value of one 1 if in the years, t, t-1, …t-4, the country, on average as a percentage of GDP has been importer, zero otherwise.

Source: IMF International Financial Statistics, various issues.

Political Regime: dummy variable taking the value of one if the country is classified as free by the Freedom House report, zero otherwise. Source: Freedom In the World, Freedom House. Various issues.

Log (GDP): Log of real GDP per capita.

Source: Penn World Tables and World Bank Development Indicators.

Gl: Ratio of government consumption to GDP (lagged).

Source: IMF International Financial Statistics, various issues

Legal: Central bank independence measure.

Source: Cukierman, A. and others.

Exchange rate regime: Dummy variable taking the value of one during periods of fixed or managed exchange rates.

Source: IMF Annual Report on Exchange Rate Arrangements and Exchange Restrictions,

Political Wing: Political orientation of political party or coalition in power. [-2, 2], 2 represents the most "right" government in the spectrum of such country; -2 the most "left". Source: Lambertini (1996)

References

Abel, A., Mankiw, G., Summers, L., and Zeckhauser. "Assessing Dynamic Efficiency: Theory and Evidence." *Review of Economic Studies* 56 (1989): 1-20.

Adams, Charles and Jeremy Greenwood. "Dual exchange rate systems and capital controls: an investigation". *Journal of International Economics* 18 (1985): 43-63.

Alesina, Alberto and Guido Tabellini, "External Debt, Capital Flight and Political Risk," *Journal of International Economics* 27 (November 1989): 199-220.

Alesina, Alberto, Vittorio Grilli and Gian Maria Milesi-Ferretti. "The Political Economy of Capital Controls." in *Capital Mobility: The Impact on Consumption, Investment and Growth*. Leiderman, Leonardo and Assaf Razin (eds.). Cambridge University Press, pp 289-321, 1994.

Alesina, Alberto and Nouriel Roubini. "Political Cycles in OECD Economies" *The Review of Economic Studies*, Volume 59, Issue 4 (Oct., 1992), 663-688.

Bartolini, Leonardo and Allan Drazen. "Capital-Account Liberalization as a Signal." *American Economic Review* 87 (March 1997): 138-54.

Checchi, Daniele. "Capital controls and Distribution of Income; Empirical Evidence for Great Britain, Japan and Australia" Weltwirtschaftliches Archiv 12-3 (1992): 558-87

Cukierman, Alex and others, "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes" *World Bank Economic Review* 6, (September 1996): 353-98.

Diamond, Peter "National Debt in a Neoclassical Growth Model." *American Economic Review* 55 (1965): 1026-50.

Dooley, Michael P.. "A Survey of Academic Literature on Controls over International Capital Transactions" NBER Working Paper 5352 (1995).

Edward, Sebastian. "Openness, Trade Liberalization and Growth in Developing Countries." *Journal of Economic Literature*. Vol. XXXI (September 1993).

Eichengreen, Barry, *Globalizing Capital* (Princeton, N.J.: Princeton University Press, 1996).

Eichengreen, Barry; Wyplosz, Charles. "The Unstable EMS" *Brookings Papers on Economic Activity* 0-1 (1993): 51-124.

Epstein, Gerald and Schor, Juliet, "Structural Determinants and Economic Effects of Capital Controls in OECD Countries". In *Financial openness and national autonomy: Opportunities and constraint*, edited by Banuri, Tariq and Juliet R; Oxford University Press, 1992.

Fudenberg, Drew and Jean Tirole. *Game Theory*. MIT Press, 1991.

Gastil, Raymond. *Freedom in the World.* Freedom House, various issues.

Grossman, Gene M. and Elhanan Helpman. "Protection for Sale." *American Economic Review* 84-4 (September 1994): 833-50.

Grilli, Vittorio and Gian Maria Milesi-Ferretti. "Economic Effects and Structural Determinants of Capital Controls." *IMF Staff Papers* 42-3 (September 1995): 517-551.

Helpman, Elhanan. "Politics and Trade Policy." *NBER Working Paper* 5309 (1995).

International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions*, issues from 1966 to 1994

International Monetary Fund, *International Financial Statistics, issues from* 1966-1994.

Mayer, Wolfgang. "Endogenous Tariff Formation." *American Economic Review* 74-5 (December 1984): 970-85

Obstfeld, Maurice. "The Global Capital Market: Benefactor or Menace?" *Journal of Economic Perspectives*. 12-4 (Fall 1998): 9-30.

Obstfeld, Maurice and Alan Taylor. *World Capital Markets, Integration, Crisis and Growth* Cambridge University Press. Book manuscript in progress 1998.

Ruffin, Roy J. and Young Deak Yoon, "International capital movements in the Solow and the overlapping generations growth models." *Review of International Economics*, 1993 (1): 123-35.

Sachs, Jeffrey and Andrew Warner. Economic Reform and the Process of Global Integration, *Brookings Papers on Economic Activity*, 1995(1):1-118.

Summers Robert and Alan Heston "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988." *Quarterly Journal of Economics* 106-2 (May 1991): 327-68.

Tornell, Aaron, "Real vs. Financial Investment, Can Tobin Taxes Eliminate the Irreversibility Distortion"? *Journal of Development Economics* 32 (1990): 419-444.

Woodford, Michael. "Expectations, finance constraints, and aggregate instability." in Meir Kohn and S.C. Tsiang (eds.), *Finance constraints, expectations and macroeconomics,* Oxford University Press, 1988.

World Bank. *Development Indicators*, 2000.

Endnotes.

[1] See Eichengreen (1996), Obstfeld (1998), Obstfeld and Taylor (1998).

[2] See Sachs and Warner (1995).

[3] See Woodford (1988).

[4] See Tornell (1990). Another second-best argument used in the stabilization/structural reform literature argues that in the presence of trade restrictions, capital flows can reduce welfare; see Edwards (1989).

[5] See Bartolini and Drazen (1997)

[6] See Mayer (1984), Helpman (1995), Grossman and Helpman (1995).

[7] There are two basic approaches to aggregating society's preferences. One alternative is to consider the capital control policy as the outcome of majority voting à la Mayer (1984). Another approach is to assume that the government designs policies as to satisfy special interest groups – (see Grossman and Helpman (1995)). We can reconcile both approaches by analyzing the preferred policies of the "median representative" who would be either the median voter or the median contributor depending on the political institutions of the country, eligibility rules and voter's participation.

[8] Similar results can be obtain with an isoelastic utility function as long as the substitution effect from changes in the interest rate dominates the income effect; all results need to be simulated due to the lack of closed form solutions.

[9] See Appendix 1.

[10] The terms closed-loop and open-loop are used to distinguish between two different information structures in multistage games. Under closed-loop information structures, players can condition their play at time t on the history of the game until that date. Open-loop strategies, on the other hand, are functions of calendar time only. Equilibria that use either type of informational structure are referred to, respectively, as closed-loop equilibria and open-loop equilibria. See Fudenberg and Tirole (1993).

[11]This is an over saving or over accumlation situation where the level of capital available to the economy is above the golden rule level, k*, defined by $d+n = f'(k^*)$. Another way to characterize dynamic inefficiency is a situation in which the government can effectively play a Ponzi game: the government can roll over both principal and interest on the debt. Since the growth rate is higher than the interest rate, new generations willingly hold the existing debt.

[12] Abel, Mankiw, Summers and Zeckhauser's (AMSZ here after) (1989) seminal paper shows that if gross returns to capital (gross profits on output) invariable exceed gross investment in a steady state, then the steady state is dynamically efficient. They construct empirical measures of annual gross profits and gross investments and find that, according to their criterion, the United States (1929-1985), England, France, Germany, Italy, Canada and Japan (1960-1984) are all dynamic efficient.

[13] See Appendix 2.

[14] See Dooley (1995) for a review on the rationales behind the imposition of capital controls.

[15] They mention that their analysis is not suitable to study interplay between foreign exchange, market instability and speculative attacks.

[16] Following Drazen and Bartolini (1995) and Alesina, Grilli and Milesi-Ferretti (1993), we constructed a capital control index with these data. Both studies acknowledge the limitations of the index in measuring the intensity or effectiveness of capital controls. However, it is difficult to find another measure "that is comparable across countries and that is available for sufficiently long periods of time."

[17] Adams and Greenwood (1985) show that the effects of a dual exchange rates regime are essentially identical to those of capital controls. The requirement that domestic financial transactions with the rest of the world be undertaken at a separate exchange rate is equivalent to levying a tax on those transactions.

[18] Restriction (ii) was included these controls can be used to evade restrictions on capital transactions through leads and lags in export billing, over invoicing of imports, and under invoicing of exports, see Grilli and Milesi-Ferretti (1995).

[19] For a list of the countries included in the estimation see Appendix 4.

[20] See Epstein and Schor (1992) for a brief history of controls in the OECD from 1950-1986 and further comments on the advantages and disadvantages of the IMF measures.

[21] In general, it can be argued that a dictator will also follow the policies preferred by his supporters. Unfortunately, this requires a case by case in depth study of these events, since data is not easily available.

[22] Thus eliminating the dictatorship periods in Spain, Portugal and Greece.

[23] See Meltzer and Richard (1981), Alesina and Tabellini (1990).

[24] Ordered logit was also used in the estimation, obtaining similar results.

[25] $\Pr ob(u_{it} < m) = \Lambda(m) = \frac{e^m}{1+e^m}$

[26] The predictions of the model are robust to the inclusion of variables that capture the degree of openness.

[27] Bribing might be thought of more generally as compensation or a compromise between generations (i.e., to open the economy in exchange for welfare transfers).

TABLE 1
Democratic and Dynamic Efficient Countries

Median representative	Capital Importer	Capital Exporter
Young / Workers	Open	Close
Old / Capitalists	Close	Open

TABLE 2
Percentage of Industrialized Countries with Restrictions on Capital Flows

	1966	1970	1975	1980	1985	1990	1994
(i) Separate Exchange Rates							
	15.0	20.0	20.0	10.0	5.0	0.0	0.0
(ii) Restrictions on Payments for Current Transactions							
	35.0	35.0	20.0	15.0	10.0	5.0	0.0
(iii) Restriction on Payments for Capital Transactions							
	70.0	75.0	75.0	60.0	45.0	45.0	10.0

Note: See Appendix 3 for a list of the countries included.
Source: International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions*, issues from 1966 to 1994.

TABLE 3
Model Predictions

Capitalist: Political Wing >0	Capital importer	↑ controls	(+)
	Capital exporter	↓ controls	(-)
Worker: Political Wing <0	Capital importer	↓ controls	(+)
	Capital exporter	↑ controls	(-)

Note: The Political Wing variable takes positive values when the political party or coalition in power belongs to the "right" and negative when it belongs to the "left." See Appendix 4 for further details.

Table 4: Capital Controls Determinants
Dependent Variable: Capital Control Dummy. Ordered Probit Estimation
Industrialized Countries Annual Data: IMF Index

	Coef.	Std. Err.	Z	P>|z|
b_A (Import.)	0.093	0.050	1.874	0.061
b_B (Export.)	-0.143	0.066	-2.168	0.030
Legal	-3.715	0.402	-9.240	0.000
Exch. Reg.	0.456	0.127	3.599	0.000
Log (GDP)	-2.785	0.222	-12.554	0.000
Gl	0.090	0.017	5.129	0.000

y	Probability	Observed
0.000	Prxb+u<_cut1)	0.321
0.333	Pr(_cut1<xb+u<_cut2)	0.171
0.667	Pr(_cut2<xb+u<_cut3)	0.423
1.000	Pr(_cut3<xb+u)	0.086

# of obs =	440.000	Prob>chi2 = 0.0000
LR chi2(8) =	283.700	LR =-404.529

Note: *A* denotes the set of democratic and capital importing countries; and *B* be the set of democratic and capital exporting countries. Legal is a measure of Central Bank Independence. Exch. Reg. is a dummy variable taking the value of one during periods of fixed or managed exchange rates. Log (GDP) is the log of real GDP per capital. Gl is the lagged value of the ratio of government consumption to GDP (lagged). See Appendix 4 for further details.

Table 5: Capital Controls Determinants
Dependent Variable: Capital Control Dummy. Ordered Probit Estimation
Industrialized Countries Annual Data: IMF Adjusted Index

	Coef.	Std. Err.	Z	P>|z|
b'_A (imp)	0.103	0.049	2.089	0.037
b'_B (exp)	-0.131	0.064	-2.055	0.040
Legal	-3.046	0.377	-8.074	0.000
Exch. Reg.	0.479	0.124	3.876	0.000
Log (GDP)	-2.642	0.213	-12.376	0.000
Gl	0.072	0.017	4.260	0.000

y'	Probability	Observed
0.000	Pr(xb+u<_cut1)	0.275
0.333	Pr(_cut1<xb+u<_cut2)	0.216
0.667	Pr(_cut2<xb+u<_cut3)	0.423
1.000	Pr(_cut3<xb+u)	0.086

Note: *A* denotes the set of democratic and capital importing countries; and *B* be the set of democratic and capital exporting countries. Legal is a measure of Central Bank Independence. Exch. Reg. is a dummy variable taking the value of one during periods of fixed or managed exchange rates. Log (GDP) is the log of real GDP per capital. Gl is the lagged value of the ratio of government consumption to GDP (lagged). See Appendix 4 for further details

Table 6: Capital Controls Determinants
Dependent Variable: Capital Control Dummy. Ordered Probit Estimation
Industrialized Countries 5- Years Average Data: IMF Index

	Coef.	Std. Err.	z	P>|z|
b_A (impav)	0.116	0.053	2.208	0.027
b_B (expav)	-0.286	0.078	-3.683	0.000
Legal	-3.797	0.446	-8.508	0.000
Exch. Reg.	0.502	0.137	3.653	0.000
Log (GDP)	-3.007	0.260	-11.543	0.000
Gl	0.067	0.019	3.622	0.000
y	Probability	Observed		
0.000	Pr(xb+u<_cut1)		0.295	
0.333	Pr(_cut1<xb+u<_cut2)		0.175	
0.667	Pr(_cut2<xb+u<_cut3)		0.448	
1.000	Pr(_cut3<xb+u)		0.082	
# of obs =	386			Prob>chi2 = 0.0000
LR chi2(8) =	227.080			LR =-336.569

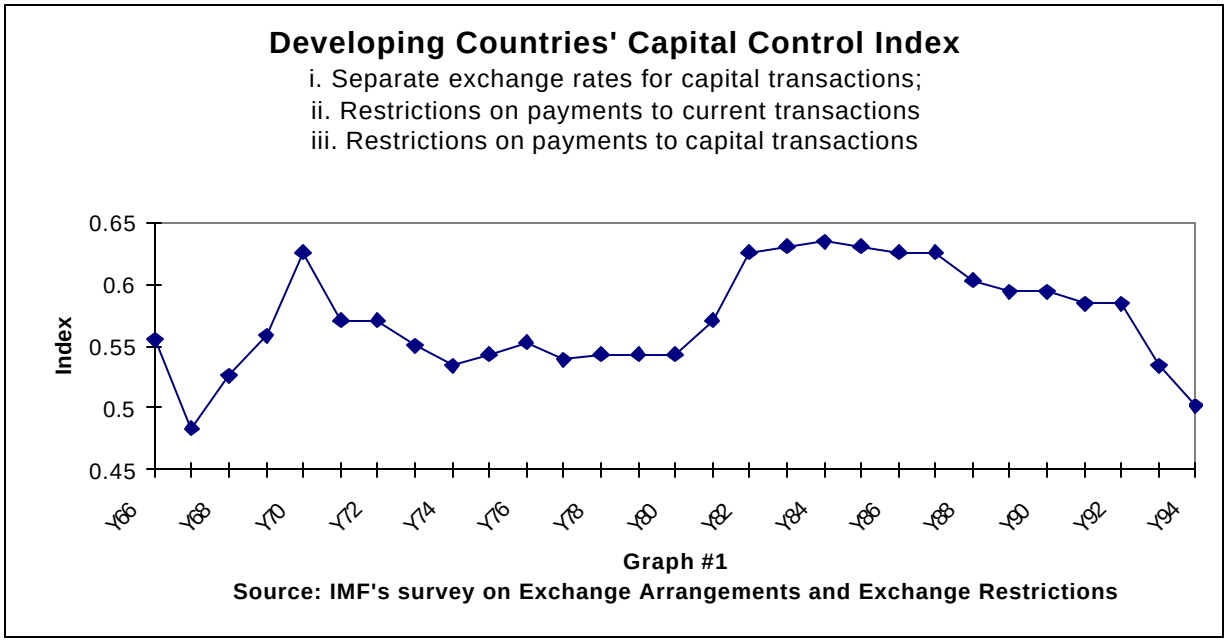
Note: *A* denotes the set of democratic and capital importing countries(5 years averages); and *B* be the set of democratic and capital exporting countries (5 years averages). Legal is a measure of Central Bank Independence. Exch. Reg. is a dummy variable taking the value of one during periods of fixed or managed exchange rates. Log (GDP) is the log of real GDP per capital. Gl is the lagged value of the ratio of government consumption to GDP (lagged). See Appendix 4 for further details.

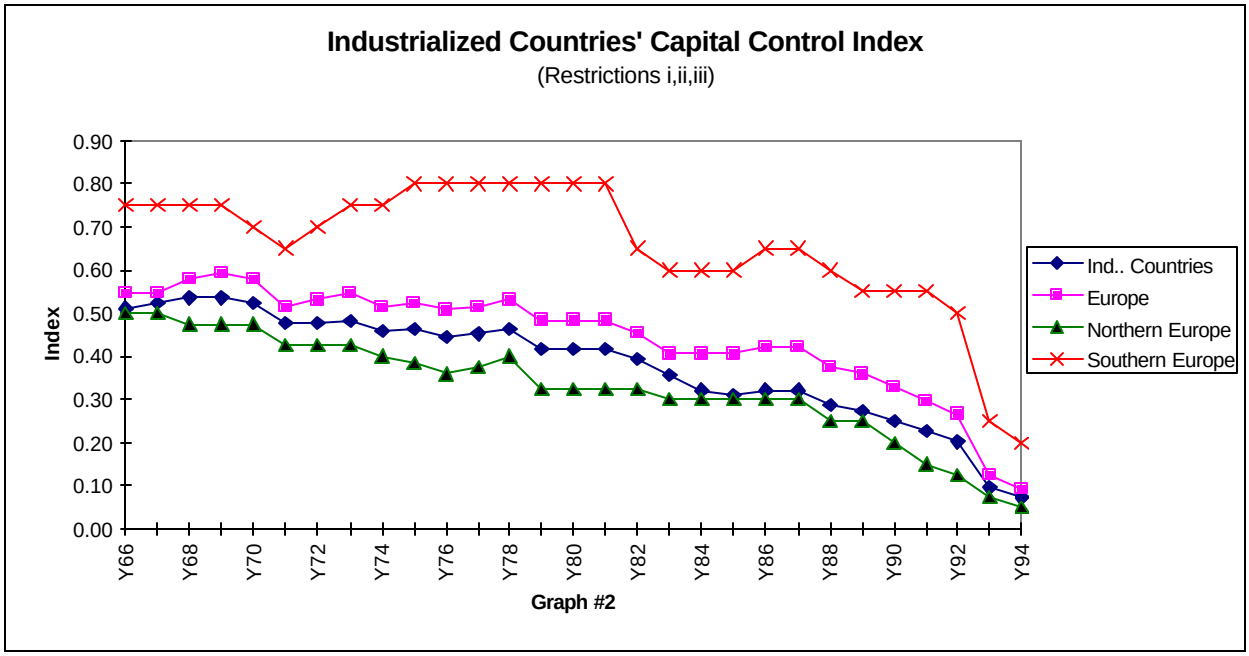
Table 7: Capital Controls Determinants
Dependent Variable: Capital Control Dummy. Ordered Probit Estimation
Industrialized Countries 5-Year Average Data: IMF Adjusted Index

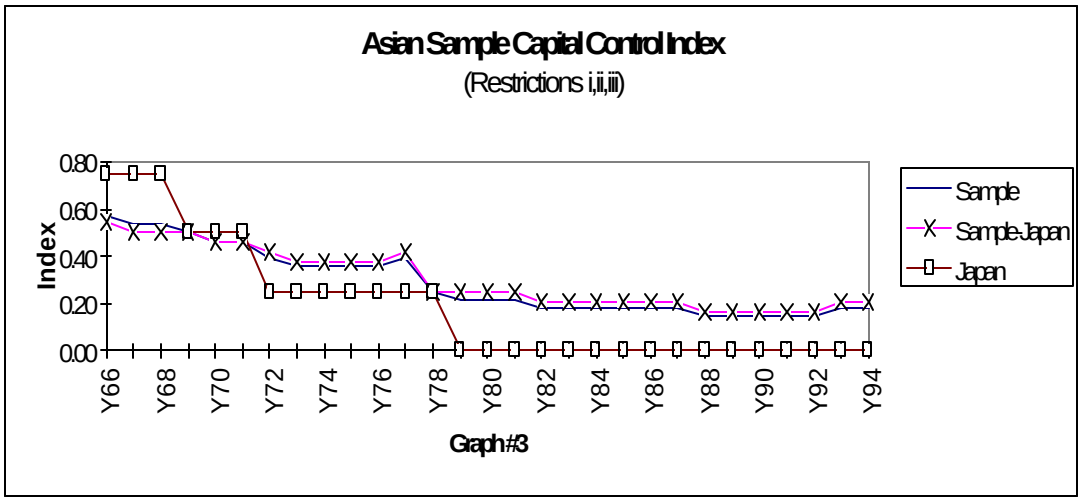
	Coef.	Std. Err.	z	P>|z|
b'_A (impav)	0.127	0.052	2.417	0.016
b'_B (expav)	-0.243	0.076	-3.213	0.001
Legal	-3.429	0.432	-7.937	0.000
Ed	0.573	0.136	4.203	0.000
Lrgdp	-2.979	0.258	-11.558	0.000
Gl	0.065	0.019	3.520	0.000
y'	Probability	Observed		
0.000	Pr (xb+u<_cut1)		0.273	
0.333	Pr(_cut1<xb+u<_cut2)		0.197	
0.667	Pr(_cut2<xb+u<_cut3)		0.448	
1.000	Pr(_cut3<xb+u)		0.082	
# of obs =	386			Prob>chi2 = 0.0000
LR chi2(8) =	220.830			LR =-343.098

Note: *A* denotes the set of democratic and capital importing countries(5 years averages); and *B* be the set of democratic and capital exporting countries (5 years averages). Legal is a measure of Central Bank Independence. Exch. Reg. is a dummy variable taking the value of one during periods of fixed or managed

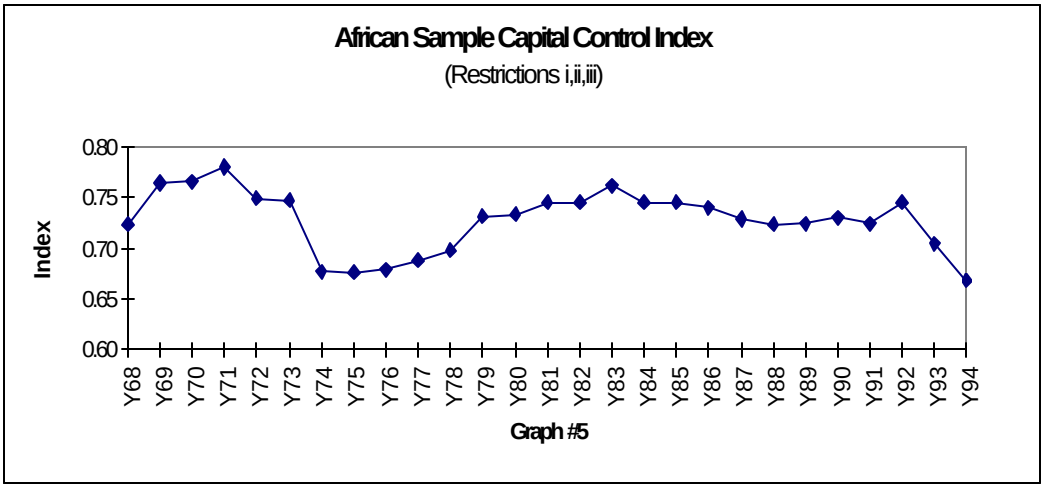
exchange rates. Log (GDP) is the log of real GDP per capital. Gl is the lagged value of the ratio of government consumption to GDP (lagged). See Appendix 4 for further details.

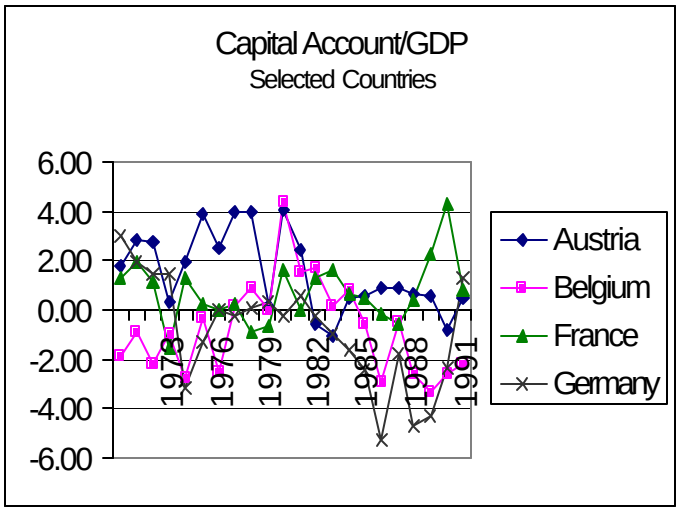


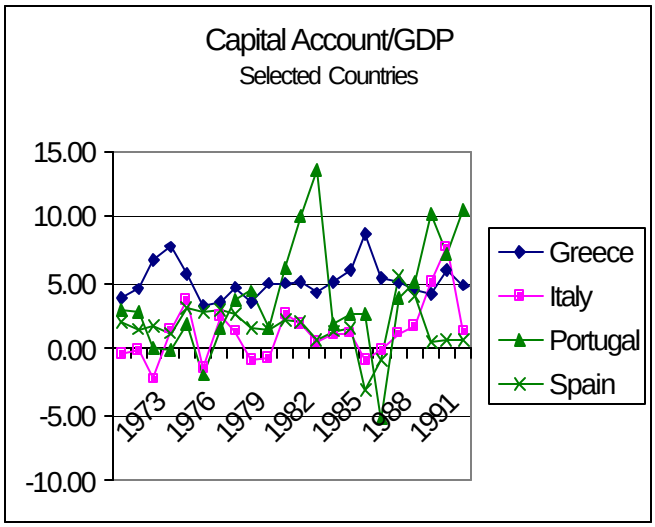


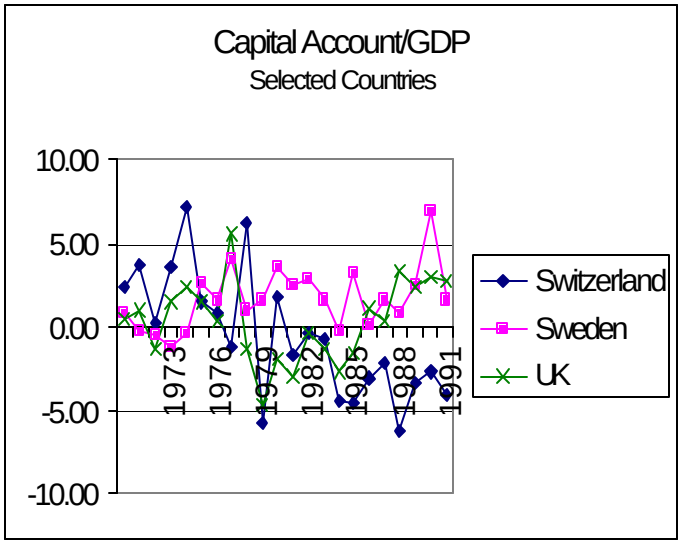

Asian Sample Capital Control Index
(Restrictions i,ii,iii)
Index
0.80
0.60
0.40
0.20
0.00
Y66
Y68
Y70
Y72
Y74
Y76
Y78
Y80
Y82
Y84
Y86
Y88
Y90
Y92
Y94
Sample
Sample-Japan
Japan
Graph #3

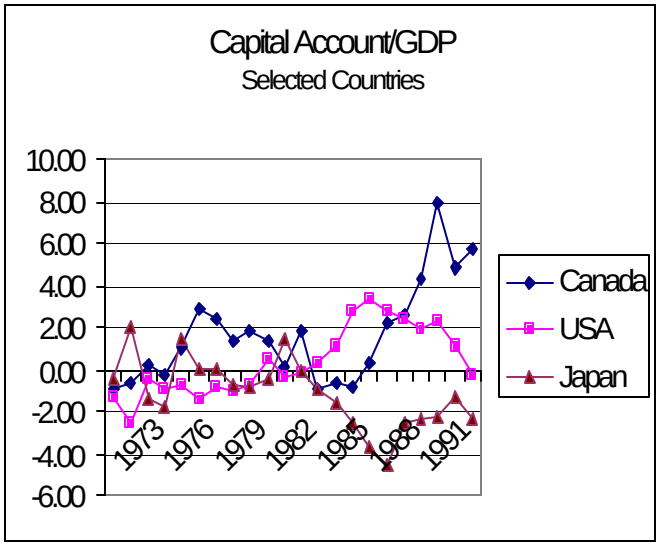
Latin America's Capital Control Index
(Restrictions i,ii,iii)
Index
0.90
0.80
0.70
0.60
0.50
0.40
Y66
Y67
Y68
Y69
Y70
Y71
Y72
Y73
Y74
Y75
Y76
Y77
Y78
Y79
Y80
Y81
Y82
Y83
Y84
Y85
Y86
Y87
Y88
Y89
Y90
Y91
Y92
Y93
Y94
Graph #4


African Sample Capital Control Index
(Restrictions i,ii,iii)
Index
0.80
0.75
0.70
0.65
0.60
Y68
Y69
Y70
Y71
Y72
Y73
Y74
Y75
Y76
Y77
Y78
Y79
Y80
Y81
Y82
Y83
Y84
Y85
Y86
Y87
Y88
Y89
Y90
Y91
Y92
Y93
Y94
Graph #5


Capital Account/GDP
Selected Countries
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
1973
1976
1979
1982
1985
1988
1991
Austria
Belgium
France
Germany


Capital Account/GDP
Selected Countries
15.00
10.00
5.00
0.00
-5.00
-10.00
1973
1976
1979
1982
1985
1988
1991
Greece
Italy
Portugal
Spain


Capital Account/GDP
Selected Countries
10.00
5.00
0.00
-5.00
-10.00
1973
1976
1979
1982
1985
1988
1991
Switzerland
Sweden
UK


Capital Account/GDP
Selected Countries
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
1973
1976
1979
1982
1985
1988
1991
Canada
USA
Japan

Graph #6

Capital Controls: A Political Economy Approach

Abstract

This paper examines the economic consequences of political conflicts that arise when countries implement capital controls. In an overlapping-generations model, agents vote on whether to open or close an economy to capital flows. The young (workers) receive income from wages only while the old (capitalists) receive income from savings only. We characterize the set of stationary equilibria for an infinite horizon game. Assuming dynamic-efficiency, when the median representative is a worker (capitalist), capital-importing countries will open (close) while capital-exporting countries will close (open). These predicted patterns are consistent with data on liberalization policies over time and across various countries.