Capital Controls and Foreign Direct Investment

ELIZABETH ASIEDU
University of Kansas, Lawrence, KS, USA

and

DONALD LIEN *
University of Texas at San Antonio, San Antonio, TX, USA

Summary. — This paper examines the effect of three types of capital control policies on FDI: (a) the existence of multiple exchange rates; (b) restrictions on capital account, and (c) restrictions on the repatriation of export proceeds. We find that the impact of capital controls on FDI varies by region and has changed over time. In the 1970s and 1980s, none of the policies had a significant impact on FDI. In the 1990s, all three were significant. Furthermore, capital controls have no effect on FDI to sub-Saharan Africa and the Middle East, but affects FDI to East Asia and Latin America adversely.
© 2003 Elsevier Ltd. All rights reserved.

1. INTRODUCTION

While the economic miracles of some East Asian countries highlight the benefits of open markets, the 1997 Asian crisis rejuvenated the discussion on the merits of capital controls. Indeed, the International Monetary Fund (IMF) almost reversed its long-time policy of pressuring countries to liberalize their investment framework. In addition, a growing number of prominent economists have argued against capital account liberalizations (e.g., Krugman, 1998; Rodrik, 1998). Proponents of capital controls assert that short-term flows (mainly foreign portfolio investment) can have a destabilizing effect on a country and that capital account liberalization encourages short-term flows or the *bad cholesterol*. [1] Liberalization could also affect long-term flows, i.e., foreign direct investment (FDI) or the *good cholesterol*. If liberalization promotes FDI, then the overall impact of liberalization is unclear: it encourages both the *good* and the *bad cholesterol*. [2] Thus, in order to comprehend the full implications of liberalization, we need to understand how capital controls affect both short-term and long-term investments. Surprisingly, research in this area has generally focused on the effects of liberalization on short-term flows. Another important point is that the negative effect of liberalization is experienced mainly by countries that have access to international capital markets (i.e., industrialized and emerging-market countries). The reason is that most developing countries receive very little portfolio investments. For such countries, the impact of liberalization on private foreign investment is determined solely by how it affects FDI. [3] Interestingly, these poor countries (mostly in sub-Saharan Africa and South Asia) are also the worst culprits when it comes to capital controls. Thus, an analysis of the

effects of capital controls on FDI will provide useful policy guidelines for such countries.

This paper considers three types of capital controls: (a) the existence of multiple exchange rates for capital account transactions, (b) controls on capital account transactions, and (c) the stringency of requirements for the repatriation and/or surrender of export proceeds. The paper is partly motivated by the wave of liberalizations that swept through developing countries in the 1990s. Using data from 96 developing countries over 1970–2000, we answer the following questions: (i) How has FDI responded to liberalization measures undertaken by countries? (ii) Has the impact of liberalization changed over time? (iii) Does the impact of liberalization vary by region? Has the experience of emerging markets been different?

Surprisingly, research on the impact of capital controls on FDI is scant. In addition, the literature has several limitations. First, most of the analysis is based on a small number of countries. Furthermore, the studies often focus on emerging-market or middle-income countries, and include only a few poor countries (i.e., the countries in dire need of FDI) in their analysis. For example, Desai, Foley, and Hines (2002) analyze how restrictions on capital account transactions affect the investment decisions of US firms abroad (such as asset allocation, transfer pricing, and dividend policies). The analyses focus on countries that have substantial US multinational presence, thereby excluding most of the countries in sub-Saharan Africa (SSA) and South Asia. Montiel and Reinhart (1999) and Carlson and Hernandez (2002) examine how restrictions on capital account affect the volume and composition of capital flows. The latter consider 15 emerging-market countries and the former employ data from 16 middle-income countries. An exception is Mody and Murshid (2002), where 29 out of the 60 countries are in SSA. Another limitation of the existing literature is that most of the papers either focus on one type of capital control policy, such as restrictions on capital account, or construct an index that combines different types of capital controls (e.g., Desai *et al.*, 2002; Mody & Murshid, 2002). One problem with using an index is that the impact of restrictions on FDI may vary by type of restriction. For example, some restrictions may bind whereas others may not. It is therefore important to include each policy variable separately. The third caveat of previous research is that most of the papers do not include enough

variables to control for country conditions. For example, a number of studies have shown that infrastructure availability, openness to trade and political instability affect FDI. Only Gastanaga, Nugent, and Pashamova (1998) however include some of these variables in their studies. Indeed, the omission of important variables may explain the large estimates obtained by Montiel and Reinhart (1999).

This paper contributes to the literature in several ways. To the best of our knowledge, it is the first study that systematically examines the impact of capital controls on FDI in a broad panel. Our analysis employs a more comprehensive dataset and spans a longer time period—the dataset covers 96 developing countries over the period 1970–2000. Over a third of the countries are from SSA and South Asia (38 from SSA and six from South Asia). An advantage of using a dataset that spans a large set of countries over a longer period is that it increases the degrees of freedom and therefore enhances the credibility of our results. It also permits us to examine whether the impact of capital controls on FDI has changed over time. Another contribution of the paper is that we consider three types of capital controls. In addition, we introduce all the three measures simultaneously since countries typically utilize these instruments conjunctively. This approach permits us to analyze the effect of each policy variable on FDI. Such an analysis is important for policy formulation. The paper also examines whether the impact of capital controls on FDI varies by region. Specifically, policymakers in SSA have complained that FDI to their countries has not increased in spite of the fact that they have liberalized their FDI regulatory framework. Finally, unlike previous studies, we control for relevant country conditions.

The remainder of the paper is organized as follows: Section 2 describes the various types of capital controls and analyzes trends in capital control liberalization across region and over time. Section 3 describes the variables included in the empirical analysis and Section 4 presents the empirical results. Section 5 discusses policy implications and Section 6 concludes.

2. CAPITAL CONTROLS: A BRIEF DESCRIPTION

Capital controls can be broadly classified into two categories: (a) administrative or direct controls and (b) market-based or indirect con-

trols. Direct controls restrict capital transactions and the transfer of funds through outright prohibitions, including restrictions on capital account transactions, restrictions on current account transactions, repatriation requirements, and restrictions on the use of funds. Market-based controls include multiple exchange rate systems, taxation of crossborder flows, and other indirect regulatory controls. These types of controls affect capital movements indirectly by increasing the costs associated with capital movements and associated transactions. [4]

For our empirical analysis, we consider two types of direct controls and one type of indirect control, namely: (i) controls on capital account, (ii) the stringency of requirements for the repatriation and/or surrender of export proceeds, and (iii) the existence of multiple exchange rates for capital account transactions. The data are collected from the International Monetary Fund (IMF) annual publication, *Exchange Arrangements and Exchange Restrictions*. [5] There are two reasons why we use the IMF data. First, they are the most widely used measures of capital controls. Second, the data have almost universal coverage—they are available for about 140 countries. [6] Thus the data permit us to achieve our goal of including many poor countries in our regressions. One limitation of the data is that it captures the *existence* but not the *severity* of restrictions. [7] Specifically, the measures of capital controls are coded as a dummy variable that takes on value one if the country is open and zero if restrictions exist. Thus, the measures do not provide exact information about the intensity of the restrictions.

Table 1 provides a summary of the data on capital controls for countries in our sample. The table reports the percentage of countries in each region that were open, disaggregated by the type of policy over three time periods: 1970–79, 1980–89 and 1990–2000. [8] For example, from 1990–2000, 87% (13%) of the countries in SSA had unitary (multiple) exchange rate systems, 11% (89%) had open (closed) capital accounts, and 16% did not have restrictions on the repatriation of export proceeds.

The data for the total sample indicate that overall, restrictions increased in the 1980s and declined in the 1990s. For example, the percentage of countries that had open capital accounts decreased from 19% in the 1970s to 15% in the 1980s, and increased to 22% in the 1990s. The data also show that for all the three subperiods, the least utilized type of capital control policy was the existence of multiple exchange rates. But, the most utilized type of policy tool has changed over time. In the 1970s and 1980s, the most frequently used policy tool was restrictions on the repatriation of export proceeds. In the 1990s, the most prevalently used policy tool was restrictions on capital account transactions. This observation follows from the fact that in the 1990s, the share of countries that had restrictions on capital account transactions (78%) was greater than the percentage of countries that had restrictions on the repatriation of export proceeds (72%). The opposite holds for the 1970s and 1980s.

The regional data show a wide variation in liberalization trends. With regards to capital account and export proceeds, Latin America and the Middle East tightened restrictions in

Table 1. *Percentage of countries in selected regions with open regimes, 1970–2000*[a]

Region	Number of countries	Exchange rate			Capital account			Export proceeds		
		1970s	1980s	1990s	1970s	1980s	1990s	1970s	1980s	1990
East Asia	7	100	90	94	26	46	31	7	40	52
Latin America	10	32	11	65	38	27	36	19	5	36
North Africa and Middle East	12	46	60	73	27	12	22	21	12	14
Sub-Saharan Africa	37	89	81	87	0	2	11	0	2	16
Total sample	96	68	65	84	19	15	22	14	9	28

[a] The data are from the IMF's annual report on the *Exchange Rate and Monetary Arrangements*. Countries in Latin America include Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru and Venezuela. East Asia includes China, Korea, Indonesia, Malaysia, Philippines, Singapore and Thailand. See Table 6 for a list of countries in other regions.

the 1980s and liberalized in the 1990s. The opposite is true for East Asia, where restrictions were eased in the 1980s but tightened in the 1990s. [9] Sub-Saharan Africa on the other hand eased restrictions in both the 1980s and the 1990s. The data also show that although liberalization was more widespread in SSA than in other regions, SSA remains more restrictive than other regions. For example, from 1980–89 to 1990–2000, the percentage of countries in SSA that had open capital accounts increased from 2% to 11%, an increase of about 450%. This compares with an increase of 33% for Latin America, 83% for North Africa and a decrease of 33% for East Asia.

In summary, the data show that overall, countries have liberalized over time. Furthermore, there is a variation in liberalization measures across region and over time. In Section 4 we empirically analyze how FDI has responded to these changes.

3. DESCRIPTION OF THE VARIABLES

The analysis covers 96 developing countries over 1970–2000. As is standard in the literature, the dependent variable is the ratio of net FDI flows to GDP. Note that the objective of this paper is not to find the factors that affect FDI flows to developing countries. Our goal is to determine whether capital controls has a significant impact on FDI after controlling for other important determinants of FDI. In choosing the non-capital-control independent variables we draw from the FDI literature. [10] Data on country risk are from *Cross-National Time Series Data Archive*. [11] Data for the remaining independent variables were obtained from the World Bank's *World Development Indicators* CD rom (2002). Below we describe the independent variables that displayed a consistent relationship with FDI for our sample of countries.

(a) *Capital controls*

As pointed out in Section 2, capital controls increase the costs associated with capital movements. We therefore hypothesize a negative relationship between capital controls and FDI.

In the literature, the impact of capital controls on FDI is not unanimous. Gastanaga *et al.* (1998), Desai *et al.* (2002) and Mody and Murshid (2002) find evidence that capital controls deter FDI, while Montiel and Reinhart (1999) conclude that capital controls have a positive impact on FDI. Carlson and Hernandez (2002), on the other hand, find no significant relationship between capital flows and FDI. There are three plausible explanations for the inconsistent empirical results. First, as pointed out earlier, the samples used vary across different studies. Second, the measures of capital controls vary across studies. Third, the studies cover different time periods. Indeed, the studies that cover a longer time period seem to find an inverse relationship between capital controls and FDI, suggesting that the impact of capital controls on FDI has changed over time. To reconcile the conflicting results, we examine the effect of various types of controls over three time periods: 1970–79, 1980–89 and 1990–2000.

(b) *Openness of the host country*

It is a standard hypothesis that openness promotes FDI (cf., Asiedu, 2002; Morrisset, 2000; Noorbakhsh, Paloni, & Yousseff, 2001). In the literature, the ratio of trade to GDP is often used as a measure of openness of a country. We therefore include trade/GDP in our regressions to examine the impact of openness on FDI.

(c) *Attractiveness of the host country market*

In the literature, the empirical relationship between real GDP per capita and FDI is conflicting. Edwards (1990), Jaspersen, Aylward, and Knox (2000) and Asiedu (2002) use the inverse of income per capita as a proxy for the return on capital and conclude that real GDP per capita is inversely related to FDI/GDP. In contrast, Schneider and Frey (1985) and Tsai (1994) find a positive relationship between the two variables. The argument here is that higher domestic income and higher growth rates imply a greater demand for goods and services and therefore make the host country more attractive for FDI. [12]

The above discussion suggests that the relationship between FDI and GDP per capita may be U-shaped. [13] That is, the positive impact of income per capita on FDI "kicks in" only when income exceeds some threshold. We test this hypothesis by including GDP per capita and the square of GDP per capita in our regressions.

(d) *Infrastructure development*

Good infrastructure increases the productivity of investment and therefore stimulates FDI flows (Asiedu, 2002; Loree & Guisinger, 1995; Wheeler & Mody, 1992). We employ two measures to capture the level of infrastructure development in host countries: (i) the number of telephones per 1,000 population and (ii) gross fixed capital formation as a share of GDP. [14] Both variables should be positively related to FDI.

(e) *Natural resource availability*

Natural resources generate macroeconomic uncertainty and thereby crowds out FDI. There are at least two reasons for this. First, an increase in natural resources increases demand in the nontradeable sector and generates inflation (Sachs & Warner, 1995). Second, natural resources (especially oil) are characterized by booms and bursts, leading to increased volatility in the exchange rate. Exchange rate volatility and higher inflation implies increased macroeconomic uncertainty and therefore less FDI. The inverse relationship between FDI flows and natural resources may also be explained by the fact that while natural resources exploration requires a large initial outlay, the continuing operations demand a small cash flow. Thus, after the initial phase, FDI may be staggered.

For these reasons, we hypothesize a negative relationship between FDI and resource intensity. Our hypothesis agrees with the empirical results of Gastanaga *et al.* (1998). Our hypothesis is also consistent with the literature on the "curse of natural resources," which stipulates that natural resources have an adverse impact on economic growth (Sachs & Warner, 1995). In this literature, one of the channels by which resource abundance impedes growth is that it crowds out foreign investment (Gylfason, 2001; Papyrakis & Gerlagh, 2003).

For our analysis, we use the share of fuel and oil in total exports as a measure of natural resource availability. This measure of natural resources has been employed in several studies including Sachs and Warner (1995) and Asiedu and Esfahani (2001). We also considered the share of mineral and ores in total exports, but, similar to Noorbakhsh *et al.* (2001), the estimated coefficient was not significant.

(f) *Country risk*

To measure country risk (or political instability), we use the number of strikes of 1,000 or more industrial workers that is aimed at national government policies. We argue that strikes can proxy for the stability of the government and therefore should have a negative impact on FDI flows. We tried other measures of political instability, such as number of assassinations, coups and civil war, however, none of the variables displayed a consistent relationship with FDI.

4. EMPIRICAL ANALYSIS

As pointed out earlier, our objective is to examine how capital controls (or the liberalization of capital controls) affect FDI flows. An appropriate framework for such an analysis is the fixed-effects panel estimation. This approach has three advantages. First, it allows the analyst to focus on changes *within* different units *over time*. Second, the estimates remain unbiased even when data are missing for some time periods for some cross-sectional units. [15] This advantage of fixed-effects estimation is particularly important for an analysis that includes countries from sub-Saharan Africa. The reason is that data are not available for some years for several countries in the region. The third advantage of this approach is that it addresses the problem of omission variable bias. An alternative to the fixed-effects model is the random effects model. But, we rejected the random effects specification based on the Hausman test.

We recognize that there is a possibility of endogeneity in the relationship between the independent variables and FDI. Finding reliable instruments can however be problematic. In addition, addressing endogeneity in a panel setting with dichotomous explanatory variables can be complicated (Gyimah-Brempong & Corley, 2002). One of the causes of endogeneity is simultaneity—where an independent variable is determined simultaneously along with the dependent variable. [16] Thus, although we do not completely address the endogeneity problem, we mitigate it by using the lagged values of the independent variables in our regressions. [17] The empirical analysis employs an unbalanced panel data for 96 countries over 1970–2000 (1,357 observations). A summary of the data is provided in Table 2.

Table 2. *Summary statistics, 1970–2000 (96 countries)*

Variables	Mean	Standard deviation	Minimum	Maximum
$100*$(FDI/GDP)	1.557	2.638	−8.52	31.319
$100*$(imports + exports)/GDP	70.481	50.023	6.320	439.03
Log(GDP per capita)	7.210	1.523	4.592	9.723
GDP growth	3.845	5.184	4.592	10.153
$100*$(fixed domestic investment/GDP)	21.445	7.458	1.931	59.732
Log(1 + phones per 1000 population)	3.230	1.439	0.182	6.411
OIL $=100*$ share of oil in total exports	17.881	29.132	3.83×10^{-6}	99.783
Number of strikes	0.235	0.694	0	7

Table 3. *Fixed-effects estimation*

Variable	(1)	(2)	(3)
Intercept	24.463*** (0.007)[a]	22.252*** (0.001)	15.067** (0.029)
lag[$100*$(imports + exports)/GDP]	0.011*** (0.007)	0.010** (0.013)	0.009** (0.015)
LGDPC $=$ lag[log(GDP per capita)]	−6.697*** (0.000)	−6.032*** (0.001)	−4.027** (0.024)
LGDPC $*$ LGDPC	0.366*** (0.001)	0.327*** (0.004)	0.212* (0.061)
Infrastructure: lag($100*$fixed domestic investment/GDP)	0.065*** (0.000)	0.057*** (0.000)	0.056*** (0.000)
Infrastructure: lag[log(1 + phones per 1000 population)]	1.326*** (0.000)	1.108*** (0.000)	0.716*** (0.000)
Natural resources: lag($100*$share of oil in total exports)	−0.028*** (0.000)	−0.027*** (0.000)	−0.020*** (0.000)
Political instability: lag(number of strikes)	−0.159** (0.040)	−0.148* (0.053)	−0.162** (0.032)
KA $=$ lag(dummy equals 1 if capital accounts is open)		0.576*** (0.005)	0.026 (0.950)
ER $=$ lag(equals 1 if exchange rate structure is unitary)		0.275* (0.068)	0.112 (0.613)
EX $=$ lag(equals 1 if there are no restrictions on export proceeds)		0.804*** (0.000)	0.510 (0.147)
KA $*$ dummy for 1980s			0.233 (0.627)
ER $*$ dummy for 1980s			0.081 (0.677)
EX $*$ dummy for 1980s			−0.311 (0.559)
KA $*$ dummy for 1990s			1.005** (0.015)
ER $*$ dummy for 1990s			0.334 (0.171)
EX $*$ dummy for 1990s			0.573 (0.141)
Number of countries	96	96	96
Number of observations	1,357	1,357	1,357

[a] *P*-values are in parenthesis.
*Significant at the 0.10 level.
**Significant at the 0.05 level.
***Significant at the 0.01 level.

We first examine the effects of the non-capital-control variables on FDI. These variables are chosen from the existing literature. Estimation results are displayed in the first column of Table 3. The estimated coefficients of the non-capital-control variables are significant and the signs are consistent with theoretical predictions. Openness to trade, good infrastructure and political stability promote FDI, whereas an increase in resource intensity (i.e., oil revenues) crowds out FDI. Table 3 also shows that the relationship between FDI and income per capita is non-linear: GDP per capita has a positive impact on FDI only if income per capita exceeds a certain threshold. [18] Column 2 of Table 3 displays estimation results when the capital control variables are included in the regressions. There are minor changes in the coefficients of the non-capital-control variables. The coefficient of each of the capital control variables is statistically significant. An open capital account increases the FDI ratio by 0.576%. A unitary exchange rate improves the ratio by 0.275%, and the removal of restrictions on export proceeds raises the ratio by 0.804%. Thus, over the whole sample period (1970–2000), imposing restrictions on export proceeds was the most damaging policy

and a multiple exchange rate system was the least damaging policy.

We next examine how the effects may vary over time. Specifically we allow each capital control variable to have different effects over the periods of 1970–79, 1980–89, and 1990–2000. We create dummy variables for each time period and interact it with the various capital control variables. Column 3 in Table 3 presents the estimation results. The coefficients of the non-capital-control variables retain their significance and sign. Table 4 summaries the temporal pattern of the effects of each capital control variable. [19] The results indicate that capital controls have become increasingly important. In the 1970s and 1980s, none of the policies had a significant impact on FDI, suggesting that foreign investors did not respond to liberalization measures undertaken in the 1970s and 1980s. This contrasts with the 1990s where each of the capital control policies had a significant impact on FDI. Removing restrictions on export proceeds was the most rewarding (liberalization increased FDI flows by 1.083%), followed by capital account liberalization (1.031%) and a unitary exchange rate system (0.446%).

To examine whether the impact on FDI varies by region, we interact the regional dummies with each of the capital control variables. The results are presented in Table 5. The non-capital-control variables remain significant and retain their predicted signs.

Table 6 presents the partial effect of each capital control variable for the various regions. [20] Clearly, the effect of policy varies substantially by region. None of the policies has an effect for sub-Saharan Africa or the Middle East. Capital account liberalization promotes FDI in East Asia, however, exchange rate structure and restrictions on export proceeds have no significant impact. The opposite is true for Latin America: capital account liberalization has no effect. In contrast, a unitary exchange rate and the liberalization of export proceeds promote FDI. For emerging-market countries, unitary exchange rate structure and a liberal capital account promote FDI whereas

the elimination of restrictions on export proceeds has no significant impact.

5. PLAUSIBLE EXPLANATIONS AND POLICY IMPLICATIONS

The results suggest that investors have become more discriminatory and punitive over time. In the 1970s and 1980s, countries were not rewarded (punished) for removing (imposing) capital controls. The situation changed in the 1990s. Thus, it is more rewarding (costly) to liberalize (to impose restrictions) in the 1990s than in the previous decades. Another important result is that capital controls have no impact on FDI to SSA and the Middle East. This may be explained by the fact that FDI in the two regions are resource seeking, mainly in fuel, oil and mineral resources. Such investments tend to be less sensitive to the policy environment or country conditions. For example, among African countries, Angola, an oil rich country ranked first in terms of FDI receipts in 1998. [21] That same year, the country was classified as the most unstable country in the region (UNTCAD, 1998). Another plausible explanation is that foreign investors do not consider government liberalization policies as credible. For example, in a survey organized by the World Bank, about 43% of foreign firms operating in Africa indicated that they "did not expect the government to stick to announced major policies" and about 57% reported that "changes in laws and policies were unpredictable." [22] In addition, 37% of the firms reported that the level of policy uncertainty has increased over the past 10 years. Thus, the survey results reflect the fact that in Africa, government polices are often reversed. As a result, government polices are not deemed credible by investors. Note that the risk of policy reversal has a profound impact on FDI because FDI is partially irreversible—much of the cost associated with FDI is sunk and therefore not reversible if disinvestment occurs. [23] Thus, the risk of policy reversal undermines the credibility of government

Table 4. *FDI gains from liberalization*

Variable	1970–79	1980–89	1990–2000	1970–2000
Capital account (KA)	0.026 (0.950)	0.259 (0.451)	1.031*** (0.000)	0.576*** (0.005)
Structure of exchange rate (ER)	0.112 (0.613)	0.193 (0.265)	0.446** (0.014)	0.275* (0.068)
Repatriation of export proceeds (EX)	0.510 (0.147)	0.199 (0.642)	1.083*** (0.000)	0.804*** (0.000)

Table 5. *Fixed-effects estimation: impact of liberalization by region*

Variable	(1)	(2)	(3)	(4)	(5)
Intercept	22.533*** (0.001)	20.625*** (0.002)	18.347*** (0.007)	20.441*** (0.003)	20.622*** (0.003)
lag[100 ∗ (imports + exports)/GDP]	0.010** (0.011)	0.010*** (0.008)	0.013*** (0.001)	0.009** (0.019)	0.011*** (0.005)
LGDPC = lag[log(GDP per capita)]	−6.095*** (0.001)	−5.684*** (0.001)	−5.179*** (0.003)	−5.534*** (0.002)	−5.686*** (0.001)
LGDPC ∗ LGDPC	0.329*** (0.003)	0.313*** (0.005)	0.277** (0.014)	0.294*** (0.009)	0.309*** (0.006)
Infrastructure: lag(100 ∗ fixed domestic investment/GDP)	0.056*** (0.000)	0.060*** (0.000)	0.055*** (0.000)	0.054*** (0.000)	0.057*** (0.000)
Infrastructure: lag[log(1 + phones per 1000 population)]	1.117*** (0.000)	1.089*** (0.000)	1.161*** (0.000)	1.131*** (0.000)	1.107** (0.000)
Natural resources: lag(100 ∗ share of oil in total exports)	−0.027*** (0.000)	−0.024*** (0.000)	−0.029*** (0.000)	−0.026*** (0.000)	−0.027*** (0.000)
Political instability: lag(number of strikes)	−0.145* (0.056)	−0.118 (0.120)	−0.149** (0.048)	−0.138* (0.069)	−0.134* (0.077)
KA = lag(equals 1 if capital accounts is open)	0.628*** (0.004)	1.048*** (0.000)	0.010 (0.651)	0.590*** (0.003)	0.351 (0.180)
ER = lag(equals 1 if exchange rate structure is unitary)	0.313* (0.062)	−0.150 (0.400)	0.220 (0.145)	0.278* (0.081)	0.006 (0.974)
EX = lag(equals 1 if there are no restrictions on export proceeds)	0.907*** (0.000)	0.485** (0.028)	1.034*** (0.000)	0.972*** (0.000)	0.928*** (0.000)
KA ∗ dummy for sub-Saharan Africa	−0.253 (0.728)				
ER ∗ dummy for sub-Saharan Africa	−0.185 (0.623)				
EX ∗ dummy for sub-Saharan Africa	−1.115* (0.099)				
KA ∗ dummy for Latin America		−1.276*** (0.003)			
ER ∗ dummy for Latin America		1.199*** (0.000)			
EX ∗ dummy for Latin America		0.896** (0.050)			
KA ∗ dummy for East Asia			3.764*** (0.000)		
ER ∗ dummy for East Asia			0.731 (0.449)		
EX ∗ dummy for East Asia			−1.053** (0.018)		
KA ∗ dummy for North Africa and Middle East				0.290 (0.692)	
ER ∗ dummy for North Africa and Middle East				−0.542 (0.261)	
EX ∗ dummy for North Africa and Middle East				−1.754*** (0.008)	
KA ∗ dummy for emerging markets					0.696 (0.115)
ER ∗ dummy for emerging markets					1.161*** (0.001)
EX ∗ dummy for emerging markets					−0.510 (0.199)
Number of countries	96	96	96	96	96
Number of observations	1,357	1,357	1,357	1,357	1,357

*Significant at the 0.10 level.
**Significant at the 0.05 level.
***Significant at the 0.01 level.

Table 6. *FDI gains from liberalization by region*

Region	Capital account (KA)	Structure of exchange rate (ER)	Repatriation of export proceeds (EX)
East Asia	3.774*** (0.000)	0.951 (0.321)	−0.019 (0.961)
Latin America	−0.228 (0.519)	1.049*** (0.000)	1.381*** (0.000)
Middle East and North Africa	0.880 (0.207)	−0.264 (0.565)	−0.782 (0.213)
Sub-Saharan Africa	0.375 (0.589)	0.128 (0.707)	−0.208 (0.747)
Emerging market[a]	1.047*** (0.003)	1.167*** (0.000)	0.418 (0.201)
Total sample	0.576*** (0.005)	0.275* (0.068)	0.804*** (0.000)

[a] Emerging-market countries are Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Venezuela, Indonesia, Malaysia, Philippines, Singapore and Thailand. Latin American countries include Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru and Venezuela. East Asia includes China, Korea, Indonesia, Malaysia, Philippines, Singapore and Thailand. See Appendix A for a list of countries in other regions.
*Significant at the 0.10 level.
***Significant at the 0.01 level.

polices and renders liberalization measures ineffective. A policy recommendation is for governments in SSA and the Middle East to develop mechanisms to enhance the credibility of their policies. A third explanation for the ineffectiveness of liberalization is that the restrictive policies did not bind in the first place. Here, a more effective way of attracting investment is for the government to implement policies that will make the host country more attractive for FDI. Such policies include openness to trade and improvements in physical infrastructure.

As indicated in Table 6, capital account liberalization promotes FDI in emerging-market countries. However, as pointed out earlier, capital account liberalization also implies increased short-term capital flows, which might be destabilizing to the economy. Thus emerging-market countries need to balance the trade off from the *benefits* that accrue from FDI, such as technology transfer and employment, with the *costs* associated with increased short-term flows. One plausible solution is to implement policies that will deter only short-term flows. But that is a tricky and difficult venture. The reason is that imposing controls on short-term capital sends a bad signal to *all* foreign investors. Furthermore, it creates uncertainty—which is a deterrent to both short-term and long-term of investments.

Finally, our results indicate that the effect of policy varies by region. As a consequence, policies that have been successful in one region should not be blindly replicated in other regions. Thus, a one-size-fits-all policy, as often recommended by some international agencies, is unlikely to be successful.

6. CONCLUSION

This paper has examined the effect of three types of capital control policies on FDI: (a) the existence of multiple exchange rates for capital account transactions; (b) controls on capital account, and (c) the stringency of requirements for the repatriation and surrender of export proceeds. To the best of our knowledge, this is the first study that examines the impact of various types of capital controls on FDI flows using a large panel dataset—the analysis covers 96 developing countries over 1970–2000.

We find that overall, capital controls deters FDI, however, the impact has changed over time. None of the policies had a significant impact on FDI in the 1970s and 1980s. In the 1990s however all three were significant, suggesting that it was more rewarding (costly) to liberalize (to impose restrictions) in the 1990s than in previous years. In addition, the impact of liberalization on FDI varies by region. Restrictions on capital accounts are the only significant policy for East Asian countries whereas exchange rate system and export restrictions are both important determinants of FDI in Latin America. None of the capital control policies has effects on FDI in Africa and the Middle East.

NOTES

1. Private foreign investment may be classified as short-term (mainly portfolio investment) or long-term (mainly foreign direct investment).

2. There are different types of FDI and the effect of capital controls may vary across them. In this paper, we consider only the aggregate FDI due to data availability.

3. Capital controls also help reduce the short-term capital outflows, but, most developing countries are concerned primarily with capital inflows.

4. Foreign investors may be able to overcome these problems through other channels such as transfer pricing. Thus, capital controls may be favored if the stabilization effect helps in reducing the occurrence of financial crisis. Our empirical results, however, do not support this conjecture.

5. We thank Antu Murshid for making the data available to us.

6. A few researchers have computed measures of capital controls based on data from other sources (Quinn, 1997; Shatz, 2000). The data are available however for only a few developing countries.

7. For a detailed discussion on the caveats of the IMF measure see Eichengreen (2002) and Quinn (1997).

8. The breakdown of the sample period by decades is natural but *ad hoc*. An alternative approach is to identify the liberalization date for each country. This approach has two limitations. First, each country may have a different liberalization date. Empirical analysis requires a subjective compromise. Second, the liberalization date is constructed on an *ex post* basis and easily subjected to the data mining criticism.

9. The more detailed data show that the increased restrictions in the 1980s in Latin America occurred during the debt crisis and the increased restrictions in East Asia in the 1990s occurred during the Asian financial crisis, suggesting that countries tend to be more restrictive when they undergo a crisis.

10. It is important to note that FDI takes three forms: market seeking (investments geared toward the host country's market), resource seeking (e.g., investments in natural resources) and efficiency seeking (mainly export-oriented investments), and therefore the factors that affect FDI will depend on the type of FDI. Unfortu-

nately, disaggregated data on FDI is not readily available for developing countries.

11. More information is available at http://www.data-banks.sitehosting.net/www/main.htm.

12. Several variables such as inflation, government consumption as a share of GDP and M2/GDP did not display a robust relationship with FDI for our sample of countries.

13. We thank Nickholas-Aris Charalambides for bringing this to our attention.

14. Gross fixed capital formation includes the construction of roads, railways, schools, commercial and industrial buildings and land improvements.

5. The unbalanced panel causes no problem if the missing data are not correlated with the idiosyncratic errors.

16. In applied econometrics, endogeneity usually arises in one of three ways: omitted variables, measurement error and simultaneity. For a detailed discussion on addressing endogeneity problems in a panel setting, see Baltagi (2001) and Woodridge (2002).

17. We also run regressions using current values of the independent variables. The results were qualitatively similar. While in some cases future values of the independent variables serve as good instruments for GMM estimation (e.g., Gyimah-Brempong & Corley, 2002), we apply the test from Woodridge (2002) and find that for our sample, the future values of the independent variables and the error term are uncorrelated. Finally, the use of lagged explanatory variables also mitigates concerns for the causality between FDI and capital controls.

18. This result reconciles the seemingly contradictory conclusions from previous studies.

19. This is how the partial coefficients for the various time periods were computed. The coefficient for the 1970s is equal to the coefficient of the generic term. The coefficient for the 1980s and the 1990s is equal to the sum of the coefficient of the generic term and the coefficient of the respective interaction term. For example, the coefficient of the capital account variable (KA) for the 1970s is 0.026; for the 1980s is $0.259 = 0.026 + 0.233$ and for the 1990s is $1.031 = 0.026 + 1.005$ (column 3 of Table 3).

20. This is how the partial coefficients for the various regions were computed. The estimated coefficient for countries outside a region is equal to the coefficient of the generic term, and the estimated coefficient for the region is equal to the sum of the coefficient of the generic term and the coefficient of the respective interaction term. For example, the coefficient of the capital account variable (KA) for non-SSA countries is 0.628 and the estimated coefficient for SSA is $0.375 = 0.628 - 0.253$ (column 1 of Table 5).

21. Oil accounts for about 45% of GDP and 95% percent of total exports in Angola.

22. The World Bank World Development Report Survey was conducted in 1996–97 and covered 3,600 firms in 69 countries. The sample for SSA included 540 foreign firms in 22 countries. For a detailed description of the survey see Brunetti, Kisunko, and Weder (1997).

23. For example, a multinational corporation that abandons its operations in a foreign country is less likely to completely recover the costs incurred from setting up the foreign subsidiary.

REFERENCES

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different? *World Development, 30*, 107–119.

Asiedu, E., & Esfahani, H. S. (2001). Ownership structure in foreign direct investment projects. *Review of Economics and Statistics, 83*, 647–662.

Baltagi, B. H. (2001). *Econometric analysis of panel data*. New York: Wiley.

Brunetti, A., Kisunko, G., & Weder, B. (1997). *Institutional obstacles to doing business: region-by-region results from a worldwide survey of the private sector*. World Bank Policy Research Working Paper 1759, World Bank, Washington, DC.

Carlson, M., & Hernandez, L. (2002). *Determinants and repercussions of the composition of capital inflows*. Board of Governors of the Federal Reserve System International Finance Discussion Paper Number 717, Federal Reserve System, New York.

Cross-National Time Series Data Archive. Available: http://www.databanks.sitehosting.net/www/main.htm.

Desai, M., Foley, C. F., & Hines, J. (2002). *Capital controls, liberalizations, and foreign direct investment*. Mimeo.

Edwards, S. (1990). *Capital flows, foreign direct investment, and debt—equity swaps in developing countries*. NBER Working Paper No. 3497, NBER, Cambridge, MA.

Eichengreen, B. (2002). Capital account liberalization: what do the cross-country studies tell us? *World Bank Economic Review, 15*, 341–365.

Gastanaga, V., Nugent, J. B., & Pashamova, B. (1998). Host country reforms and FDI inflows: how much difference do they make? *World Development, 26*, 1299–1314.

Gyimah-Brempong, K., & Corley, M. E. (2002). *Civil wars and economic growth in sub-Saharan Africa*. Mimeo.

Gylfason, T. (2001). *Natural resources and economic growth: what is the connection?* CESinfo Working Paper No. 530.

International Monetary Fund (various issues). *Exchange rate and monetary arrangements*. Washington, DC: IMF.

Jaspersen, F. Z., Aylward, A. H., & Knox, A. D. (2000). The effects of risk on private investment: Africa compared with other developing areas. In P. Collier & C. Pattillo (Eds.), *Investment and risk in Africa* (pp. 71–95). New York: St Martin's Press.

Krugman, P. (1998). *Malaysia's opportunity*. Available: http://www.pkarchive.org/crises/MalayasiaOpporunity.html.

Loree, D. W., & Guisinger, S. (1995). Policy and non-policy determinants of U.S. equity foreign direct investment. *Journal of Business Studies, 26*, 281–299.

Mody, A., & Murshid, A. P. (2002). *Growing up with capital flows*. IMF Working Paper WP/02/75, IMF, Washington, DC.

Montiel, P., & Reinhart, C. M. (1999). Do capital controls and macroeconomic policies influence the volume and composition of capital flows? Evidence from the 1990s. *Journal of International Money and Finance, 18*, 619–635.

Morrisset, P. (2000). Foreign direct investment to Africa: policies also matter. *Transnational Corporation, 9*, 107–125.

Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: new empirical evidence. *World Development, 26*, 1593–1610.

Papyrakis, E., & Gerlagh, R. (2003). *Natural resources: a blessing or a curse?* FEEM Working Paper No. 8.

Quinn, D. (1997). The correlates of change in international financial regulation. *American Political Science Review, 91*, 531–551.

Rodrik, D. (1998). *Who needs capital-account convertibility*. Mimeo. Available: http://ksghome.harvard.edu/~.drodrik.academic.ksg/papers.html.

Sachs, J. D., & Warner, A. M. (1995). *Natural resource abundance and economic growth*. NBER Working Paper 5398, NBER, Cambridge, MA.

Schneider, F., & Frey, B. S. (1985). Economic and political determinants of foreign direct investment. *World Development, 13*, 161–175.

Shatz, H. (2000). *The location of U.S. multinational affiliates*. Ph.D. Thesis, Harvard University, Cambridge, MA.

Tsai, P. (1994). Determinants of foreign direct investment and its impact on economic growth. *Journal of Economic Development, 19*, 137–163.

United Nations Center for Trade and Development (1998). *Foreign direct investment in Africa: performance and potential*. New York: United Nations Publication.

Wheeler, D., & Mody, A. (1992). International investment location decisions: the case of US firms. *Journal of International Economics, 33*, 57–76.

Woodridge, J. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: The MIT Press.

World Bank (2002). *World Development Indicators on CD-rom*.

APPENDIX A. COUNTRIES GROUPED BY REGION

Sub-Saharan Africa	Latin America and Caribbean	Middle East and North Africa	East Asia and Pacific	Other
Angola	Argentina	Algeria	Indonesia	Bangladesh
Benin	Brazil	Egypt, Arab Rep.	Malaysia	Bhutan
Burkina Faso	Chile	Iran, Islamic Rep.	Philippines	Cyprus
Burundi	Colombia	Israel	Singapore	India
Cameroon	Ecuador	Jordan	Thailand	Nepal
Central African Republic	Mexico	Kuwait	China	Pakistan
Chad	Peru	Malta	Fiji	Sri Lanka
Comoros	Venezuela	Morocco	Korea, Rep.	Turkey
Congo, Dem. Rep.	Bahamas, The	Oman	Mongolia	
Congo, Rep.	Barbados	Syrian Arab Republic	Papua New Guinea	
Côte d'Ivoire	Belize	Tunisia		
Ethiopia	Bolivia	Yemen, Rep.		
Gabon	Costa Rica			
Gambia, The	Dominican Republic			
Ghana	El Salvador			
Guinea	Grenada			
Guinea-Bissau	Guatemala			
Kenya	Guyana			
Madagascar	Haiti			
Malawi	Honduras			
Mali	Jamaica			
Mauritania	Nicaragua			
Mauritius	Panama			
Mozambique	Paraguay			
Niger	St. Kitts and Nevis			
Nigeria	St. Lucia			
Rwanda	St. Vincent and the Grenadines			
Senegal	Trinidad and Tobago			
Seychelles	Uruguay			
Sierra Leone				
South Africa				
Sudan				
Tanzania				
Togo				
Uganda				
Zambia				
Zimbabwe				