



## WHAT MAKES INTERNATIONAL CAPITAL FLOWS PROMOTE ECONOMIC GROWTH? AN INTERNATIONAL CROSS-COUNTRY ANALYSIS

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### ABSTRACT

*This paper re-examines the relationship between international capital flows and economic growth within the context of various 'conditional factors' that possibly have the potential to influence such relationships. It achieves this by employing panel data for 80 countries that cover 1976–2007. International capital inflow is broken down into foreign direct investments (FDI) and foreign portfolio investments (FPI). We find interesting evidence that only FDI has a positive effect on growth and that FPI has an unfavorable, if not negative, effect on growth. The conditional variables of banking liberalization, high-income level, twin crises, lower corruption, and human capital mitigate the positive impacts of FDI on growth. In contrast, the middle-income level and good shareholder protection have a positive effect. As concerns FPI, the level of financial liberalization, being in a Latin American region, the wealth of countries, and market governance all influence the way that FPI affects growth, whereas the conditional variables of twin crises and human capital do not influence the effect of FPI on economic growth.*

### I INTRODUCTION

The paper re-examines the role of international capital flows on economic growth, both unconditionally and conditioned, on a variety of economic and financial fundamentals such as the extent of the development of the host country's financial market, financial liberalization, the quality of institutions, twin crises, country wealth and region, or the level of human capital. Exploring the effects of international capital flows, i.e. foreign direct investment (FDI) and foreign portfolio investments (FPI), on economic growth has recently been front and center in growth studies, yet no clear-cut consensus has been reached. Theoretical and empirical works have not come to a conclusive finding on the relationship between international capital flows on economic growth. To cite a few examples, De Mello (1999) reported that for the first international capital flows, FDI, inflows appear to enhance economic growth in both developing and OECD

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countries, but Borensztein *et al.* (1998) found FDI makes a negative contribution to economic growth in countries with a low level of human capital. Carkovic and Levine (2005) concluded that FDI does not have an unconditional robust, positive effect on economic growth, but rather the effect is dependent on national income, school attainment, and so on. For a survey, see Prasad *et al.* (2003).<sup>1</sup>

The issue is equally indecisive when we consider the effects of second international capital flows, FPI, on growth. Edison *et al.* (2002) showed that neither FDI nor FPI affect economic growth, even when particular economic, financial, institutional, or policy characteristics are controlled for. Prasad *et al.* (2003) found that developing countries do not fully reap the potential benefits from FDI and FPI as claimed by other researchers. Similarly, Durham (2004) put his support behind the position that FDI and FPI do not have direct, unmitigated positive effects on economic growth, though at most, his empirical results provide evidence of only a fragile relationship. This leaves us with a puzzle: why does some uncertainty exist as to precisely which factors affect such a relationship?

Perhaps as a result of so many inconsistencies, researchers have typically pointed out that this fragile relationship may be explained in terms of certain 'conditional factors'. To elucidate the role of these conditional factors, one well-known hypothesis focuses on a country's absorptive capacity which can be broken down into three elements:<sup>2</sup> macroeconomic management, infrastructure, and human capital. The hypothesis postulates that a country with strong absorptive capacity can enhance a positive relationship; otherwise, it weakens the relationship. Prasad *et al.* (2003) claimed that the effect of FDI on growth depends on the level of human capital and there is a threshold effect between financial integration and economic growth. In a similar vein, Borensztein *et al.* (1998) argued that the higher productivity often associated with FDI only holds when the host country exceeds a certain threshold of human capital – that is, only when sufficient absorptive capacity with regard to advanced technologies is available in the host economy will FDI contribute to economic growth. The World Bank (2001, p. 62) demonstrated that countries with low absorptive capacities, such as Morocco, Uruguay, and Venezuela, failed to reap spillovers, whereas countries with higher absorptive capacities like Malaysia and Taiwan fared well.

Throughout much of the past decade, researchers have broadened the scope of the conditional factors to include financial markets, legal and institutional factors, and regions. Alfaro *et al.* (2004) determined that while international capital flows, FDI, alone play an ambiguous role in contributing to economic growth, countries with well-developed financial markets gain significantly from

<sup>1</sup> Using 23 developing countries, Basu *et al.* (2003) found that long-run causality appears unidirectional, running from GDP to FDI. Nair-Reichard and Weinhold (2001) conducted panel causality tests and persuasively argued that the effect of FDI on growth is highly heterogeneous across countries. Omran and Bolbol (2003) presented that Arab countries' FDI has a favorable effect on growth provided that it interacts with financial variables at a given threshold level of development. More research can be found in the extant literature.

<sup>2</sup> The World Bank (2001, p. 62) argued that absorptive capacity includes macroeconomic management (as captured by inflation and trade openness), infrastructure (telephone lines and paved roads), and human capital (share of labor force with secondary education and percentage of population with access to sanitation). It does not consider financial markets, however.

FDI. The influence of the financial sector aside, Durham (2004) stressed that the legal or institutional environment is important. Basu *et al.* (2003) found that the long-run relationship between FDI and economic growth is strengthened when a country is more open. Zhang (2001) also argued that FDI tends to be more likely to contribute to growth when host countries have adopted a liberalized trade regime and improved education, or in other words, have enhanced human capital. Blomstrom *et al.* (1996), on the other hand, found no evidence that education is a critical condition, agreeing with others that FDI has only a positive growth-effect when the country is sufficiently rich.

According to the past literature, the reason for the lack of conclusive evidence between FDI (or FPI) and economic growth is that little consideration has been given to the related factors that influence the relationship between the two. Thus, in our mind the issue regarding the association between the two concepts is not settled. Our study contributes to resolve this unsettled issue. To sum up, there remain two debatable issues regarding the relationship between international capital flows and growth cited in the literature. One is whether or not FDI or FPI exerts a positive effect on growth. The other concerns the conditional factors that are reportedly critical in affecting the relationship between FDI or FPI and growth. We implement a wider range of panel data that cover 80 countries from 1976 to 2007 and examine an extensive array of interaction terms, as opposed to a smaller set of countries and a shorter sample. We allow the relationship between international capital flows and economic growth to vary across countries with the extent of economic and financial fundamentals. Indeed, if related conditions play an important role in influencing the effects of FDI (or FPI) on growth, then one can expect countries with the same degree of international capital flows to have very different outcomes in terms of economic performance. An investigation of the impact of these conditions has profound implications as far as policy-making goes since it may reveal that a country should not just blindly follow the general consensus. Conducting these efforts enables us to resolve the puzzle of the extant literature.

With this in mind, the aim of this paper is to re-investigate these issues, but with a particular focus on the second issue, the conditional factors. We explore the influences of these conditional factors on the nexus between international capital flows (FDI and FPI) and economic growth using data for 80 countries (31 high-income countries (HIC), 25 middle-income countries (MIC), and 24 low-income countries) and employ data covering 1976–2007. We thoroughly investigate the conditional factors which include 21 variables referred to in the literature in order to account for the oft-cited fragility of such relationships. Shen and Lee (2006) conducted similar research on the effects of conditional factors upon the relationships between financial development and economic growth. The current research departs from this by focusing on the relationship between international capital flows and economic growth. The conditional factors that we select comprise those factors mentioned above as well those used by Shen and Lee (2006) – namely, financial liberalization, country income, region, twin crises (banking crisis (BC) and currency crisis (CC)), government governance, and corruption.

The remainder of this paper is organized as follows. Because our focus is more on the conditional factors that might affect the nexus between international capital

flows and growth, we skip the discussion of theoretical and empirical studies regarding the bivariate relationship between international capital flows and growth. Instead, immediately following the description of our empirical models, we discuss the possible impacts of our selected conditional factors. Accordingly, Section II outlines those empirical models and discusses the conditional factors. Section III summarizes the data and the descriptive statistics. Section IV provides a discussion of the empirical results, and Section V examines the robustness of the results. Finally, Section VI presents the conclusions drawn plus a few salient policy implications based on the empirical findings from this extensive research.

## II ECONOMETRIC MODEL

Similar to that of Borensztein *et al.* (1998) and Edison *et al.* (2002), our econometric model is as follows:

$$\text{GROWTH}_{it} = \beta_0 + \beta_{1it}ICF_{it} + \beta_2\text{INVESTMENT}_{it} + \beta_3\text{INFLA}_{it} + \beta_4\text{GCONSUMP}_{it} + \beta_5Y76_i + \beta_6\text{SCHOOLING}_i + \varepsilon_{it}, \quad (1)$$

$$\beta_{1it} = \gamma_1 + \gamma_2Z_{it}, \quad (2)$$

where  $i = 1, \dots, N$ ,  $t = 1, \dots, T$ ;  $N = 80$  is the number of countries; and  $T$  is the sample period covering 1976 to 2007. Table 1 lists the 80 selected countries. The dependent variable, GROWTH, is proxied by real per capita GDP growth. When only equation (1) is considered, it is referred to as the ‘benchmark model’, but when equations (1) and (2) are simultaneously considered, they are referred to as the ‘extended models’. The term ICF, denoting international capital flows, is proxied by FDI or FPI. The control variables are the investment ratio (INVESTMENT), the inflation rate (INFLA), government consumption expenditure/GDP (GCONSUMP), the initial amount of human capital as proxied by the initial-year level of the average years of the male secondary schooling (SCHOOLING), and the log of initial real GDP per capita (Y76) (see Borensztein *et al.*, 1998; Edison *et al.*, 2002; Sala-i-Martin *et al.*, 2004; Carkovic and Levine, 2005).

We take five broad conditional factors which encompass 21 variables, based on Carkovic and Levine (2005), Edison *et al.* (2002), Borensztein *et al.* (1998), and Shen and Lee (2006). These five broad conditional factors are summarized in  $Z$  in the following:

$Z = (\text{LIBERALIZATION, COUNTRY WEALTH \& REGION, TWIN CRISES, GOVERNANCE, and HUMAN CAPITAL})$

Although the conditional factors, except for twin crises, should in theory have a positive effect on such relationships, empirical studies as reported in the literature have yielded mixed, if not contradictory, results. We briefly highlight the expected impact of each of these factors and review the empirical results reported in the extant literature.

(1) **LIBERALIZATION:** The liberalization variables comprise financial liberalization and trade liberalization. The measure of financial liberalization is its date (FL), and Financial Market Depth here is comprised of various developments taking place in the banking and capital market sectors, where the

Table 1  
80 sample countries

Europe (17 countries)			America (25 countries)			Asia and Oceania (16 countries)			Africa and Middle East (22 countries)		
Country name	Abbreviation	Country name	Abbreviation	Country name	Abbreviation	Country name	Abbreviation	Country name	Abbreviation	Country name	Abbreviation
Austria	AUT	Argentina	ARG	Australia	AUS	Botswana	BWA	China	CHN	Cameroon	CMR
Belgium	BEL	Barbados	BRB	China	CHN	Cote d'Ivoire	CIV	Hong Kong	HKG	Egypt	EGY
Denmark	DNK	Bolivia	BOL	India	IND	Gabon	GAB	Indonesia	IND	Israel	ISR
Finland	FIN	Brazil	BRA	Indonesia	IND	Japan	JPN	Korea, South	KOR	Jordan	JOR
France	FRA	Canada	CAN	Japan	JPN	Malaysia	MYS	Kenya	KEN	Kenya	KEN
Germany	DEU	Chile	CHL	Korea, South	KOR	New Zealand	NZL	Kuwait	KWT	Kuwait	KWT
Greece	GRC	Colombia	COL	Malaysia	MYS	Pakistan	PAK	Malta	MLT	Malta	MLT
Iceland	ISL	Costa Rica	CRI	Malaysia	MYS	Philippines	PHL	Mauritius	MUS	Mauritius	MUS
Ireland	IRL	Dominica	DMA	New Zealand	NZL	Singapore	SGP	Morocco	MAR	Morocco	MAR
Italy	ITA	Dominican Republic	DOM	Pakistan	PAK	Philippines	PHL	Niger	NER	Niger	NER
Netherlands	NLD	Ecuador	ECU	Philippines	PHL	Singapore	SGP	Nigeria	NGA	Nigeria	NGA
Norway	NOR	Grenada	GRD	Singapore	SGP	Sri Lanka	LKA	Saudi Arabia	SAU	Saudi Arabia	SAU
Portugal	PRT	Guatemala	GTM	Sri Lanka	LKA	Taiwan	TWN	Senegal	SEN	Senegal	SEN
Spain	ESP	Honduras	HND	Taiwan	TWN	Thailand	THA	Seychelles	SYC	Seychelles	SYC
Sweden	SWE	Jamaica	JAM	Thailand	THA	Turkey	TUR	South Africa	ZAF	South Africa	ZAF
Switzerland	CHE	Mexico	MEX	Turkey	TUR			Swaziland	SWZ	Swaziland	SWZ
United Kingdom	GBR	Panama	PAN					Togo	TGO	Togo	TGO
		Peru	PER					Tunisia	TUN	Tunisia	TUN
		St. Kitts and Nevis	KNA					Zimbabwe	ZWE	Zimbabwe	ZWE
		St. Lucia	LCA								
		St. Vincent and the Grenadines	VCT								
		Suriname	SUR								
		United States	USA								
		Uruguay	URY								
		Venezuela	VEN								

former is proxied by LENDING (claims on the private sector by depository monetary banks/GDP)<sup>3</sup> and the latter is proxied by TURNOVER (the stock turnover ratio).<sup>4</sup> FL consists of the dates when governments liberalize their respective financial market, and the data are taken from Bekaert *et al.* (2005). Financial Market Depth data are taken from Beck's (2009) website. It is postulated that the more developed a financial market is, the more likely it is to efficiently make use of international funds. Thus, it is expected that Financial Market Depth compliments and further enhances the positive effects of international capital flows on economic growth. Hermes and Lensink (2003) lent their support to the view that FDI does indeed have a positive effect on economic growth, but they stipulated that this is only the case when financial development has reached a certain minimum level. Along similar lines, Alfaro *et al.* (2004) showed that FDI spurs growth in economies with highly developed financial markets.

Trade liberalization variable TRADE is the degree of trade liberalization, ranging from 0 to 10, with a larger number indicating that a country's trade policies are more deregulated. These data are taken from the *Economic Freedom of the World Annual Report* (2004), which constructs the index using taxes on international trade, regulatory trade barriers, international capital market controls, the difference between the official exchange rate and the black-market rate, and the actual size of the trade sector compared with expected size.<sup>5</sup>

While it has previously been predicted that the opening up of the local market enhances the efficient usage of international capital, in practice liberalization is often found to have the reverse effect. Tornell *et al.* (2004) advocated that trade liberalization enhances growth, but that financial liberalization does not necessarily have the same effect, at least in part because it might be accompanied by risky capital flows, lending booms or crises. Similarly, Balasubramanyam *et al.* (1996) and Basu *et al.* (2003) argued that trade openness is crucial for achieving the potential growth impact of FDI. Demirgüç-Kunt and Detragiache (1998) found that financial liberalization, as opposed to trade liberalization, has a very large and statistically significant effect on the probability of there being a BC. Thus, the overall impact of liberalization is uncertain.

(2) COUNTRY WEALTH & REGION: Country wealth includes two dummies – HIC and MIC. Low-income countries are taken here as the constant difference between HIC and MIC (Blomstrom *et al.*, 1996). The region component of the three variables consists of Latin American (LATIN),

<sup>3</sup>The use of LENDING can be found in Levine and Zervos (1998) who indicated that the ratio of claims in the private sector by banks to GDP improves the traditional financial depth measures of banking development, both by isolating the credit issued by banks, as opposed to the credit issued by the central bank or other intermediaries.

<sup>4</sup>Levine and Zervos (1998) empirically assessed the relationship between growth and both stock markets and banks. They used bank credit extended to the private sector as a share of GDP. They also studied an assortment of measures affecting stock market developments, including the overall size of the market (market capitalization/GDP), stock market activity (the value of trade/GDP), and market liquidity (the value of trade/market capitalization).

<sup>5</sup>Each component and sub-component are placed on a scale from 0 to 10, and this reflects the distribution of the underlying data. The component ratings within each area are averaged to derive ratings for each of the five areas. In turn, the summary rating is the average of the five area ratings.

Sub-Saharan African (SAHARAN), and East Asian (E\_ASIA) dummies (see Driffill, 2003; Hansen and Rand, 2006).

With differences in culture, language, and social structure, international capital flows could very well have different impacts in different regions. Blomstrom *et al.* (1996) argued that FDI has a positive growth effect when the host receiver country is relatively rich in terms of per capita income. Vita and Kyaw (2009) also claimed that investment inflows (FDI and portfolio inflows) contribute to economic growth only when a minimum level of wealth is available in the host countries. Hermes and Lensink (2003) showed that none of the regional dummies appear to have statistically significant coefficients, while Yang (2008) who argued that the effect of FDI on growth is not uniform over time and across regions documented a significantly positive growth effect of FDI in Latin America, but negatively in the Middle East from 1973 to 1987. Calderon and Liu (2003) found that ‘financial deepening’ contributes more to the causal relationships in developing countries than in industrialized ones.<sup>6</sup> It is also very well possible that the apparent effects of FDI on growth may actually capture regional differences rather than differences in the level of financial development. Edison *et al.* (2002) indicated that capital flows do not exert a positive influence on growth in countries with a suitably high level of GDP per capita or level of educational attainment. Those results suggest that capital flows only help trigger growth in sufficiently poor countries, i.e. the growth effect becomes neutral or negative as countries become comparatively rich. Johnson (2006) provided that FDI inflows have a positive effect on the host country’s economic growth for developing, but not for developed economies, but again the effect is uncertain. It cannot be overlooked that in their recent study, Hansen and Rand (2006) found there are no striking and measurable differences in the total impact across regions whatsoever, which signifies that the expected gain from FDI in an African region should in essence equal that in Latin American and East Asian regions.

(3) TWIN CRISES: We consider the effects of banking crises and currency crisis, where BC and CC, respectively, denote the dates of these. Bonfiglioli and Mendicino (2004) showed that while BC are harmful to growth, they are less detrimental in countries with open financial systems and good institutions. Kaminsky and Reinhart (1998) studied the occurrence of the twin crises in 80 countries and found that BC and CC are closely linked in the aftermath of financial liberalization when the BC precedes the CC. Such a currency collapse exacerbates a BC further, not surprisingly making twin crises a lot more severe than a crisis that occurs in isolation. This study therefore is unlike past studies on the financial and economic nexus since it considers the possibility that the occurrence of BC and CC may distort the nexus. It may be found, for example, that a positive effect exists between capital flows and growth, but a crisis may either enhance or mitigate this effect. In this regard, Lipsey (2001) demonstrated that the most consistent feature of U.S. manufacturing affiliates’ responses to crises is a rapid growth in their exports, with their sales shifting from the host

<sup>6</sup> De Gregorio and Guidotti (1995) determined there is a negative relationship between financial development and growth in 12 Latin American countries during 1975–1985. See Driffill (2003), Wachtel (2003), as well as Rioja and Valev (2004).

country to importing nations. Such shifts are a product of both the host country's currency devaluation and stagnation in its markets.

(4) **GOVERNANCE**: Two types of governance, market governance and government governance, are considered herein. Market governance includes the index of protection of creditors (**CREDITOR**), ranging from 0 to 4, and the index of protection of minority shareholders (**ANTIDIRECTOR**), ranging from 0 to 6, where a larger number denotes better governance. Both variables are taken from La Porta *et al.* (1998, hereafter **LLSV**).

Government governance contains seven indices. The first index of government governance is **CORRUPTION**, ranging from 1 to 10, with a higher number denoting less corruption. This index is also taken from **LLSV** (1998). The six remaining government governance dummies are taken from Kaufmann (2004). They include: the corporate illegal corruption component (**CICC**), measuring types of bribery, in which a private agent plays a key role, and the firm's own corporate ethics self-rating based on a question in the Executive Opinion Survey; the corporate legal corruption component (**CLCC**), measuring legal dimensions of undue influence, such as legal political finance and the particular influence of powerful firms on politicians and policy-making, etc; the corporate ethics index (**CEI**), representing the simple average of both the legal and illegal corporate corruption components in items **CICC** and **CLCC**; the public sector ethics index (**PSEI**), measuring the variables related to public integrity, bribery, and favoritism in the public sector; the judicial/legal effectiveness index (**JLEI**), focusing on questions regarding the effectiveness and integrity of the legal and judicial system; and the corporate governance index (**CGI**), based on standard questions (internal to the firm) regarding corporate governance, such as the relationship between the board and management. A value of unity of these dummies represents the highest ethical standard rating that a country's enterprise sector can award.

Levine *et al.* (2000) found that countries with better creditor rights, rigorous enforcement, and better accounting information tend to have more highly developed financial intermediaries. Habib and Zurawicki (2002) offered evidence of a negative effect that corruption has on FDI. Gliberman and Shapiro (2003) referred to country-specific political and legal institutions as constituting a government's infrastructure of a country which is part and parcel of its investment environment. On these premises, they claimed that growth prospects are enhanced by good governance in that a sound legal investment environment contributes to the development of financial intermediation. In sharp contrast, Asiedu (2006) showed the opposite influence of corruption and political instability on the effects of FDI in Africa.

(5) **HUMAN CAPITAL**: Human capital is proxied by the level of educational attainment (**SCHOOLING**; Borensztein *et al.*, 1998; Edison *et al.*, 2002; Alfaro *et al.*, 2004). Barro and Lee (1994) revealed that educational attainment is the one most significantly correlated with economic growth. Borensztein *et al.* (1998) found that FDI is an important vehicle for the transfer of technology, which has fortified growth considerably more than domestic investment. However, the higher productivity associated with FDI only holds when the host country has a



minimum threshold stock of human capital. Moreover, FDI contributes to economic growth as long as a sufficient absorptive capacity of advanced technology is available in the host economy. Somewhat parallel to this is Borensztein *et al.*'s (1998) claim that FDI fosters growth, but only in countries where the labor force has achieved a certain level of education. Not to be ignored, however, is the opposing position of Carkovic and Levine (2005) who held that the impact of FDI on growth does not robustly vary with the level of educational attainment. Edison *et al.* (2002) likewise indicated that capital flows do not exert a positive influence on growth in countries with a relatively high level of educational attainment. In sum, the findings do not reject the view that capital flows are unrelated to economic growth even when allowing this relationship to vary under different economic conditions, as measured by GDP per capita and the level of educational attainment.

Our conditional hypotheses center around the coefficients  $\gamma_1$  and  $\gamma_2$ . There are four possibilities as follows:

- (i) If  $\gamma_1 > 0$  and  $\gamma_2 > 0$ , then international capital flows have a positive impact on economic growth, and the conditional variables  $Z$  further enhance that positive impact.
- (ii) If  $\gamma_1 > 0$  and  $\gamma_2 < 0$ , then international capital flows have a positive impact on economic growth, but the conditional variables  $Z$  detract from that positive impact.
- (iii) If  $\gamma_1 < 0$  and  $\gamma_2 > 0$ , then international capital flows have a negative impact on economic growth, and the conditional variables  $Z$  alleviate that negative impact.
- (iv) If  $\gamma_1 < 0$  and  $\gamma_2 < 0$ , then international capital flows have a negative impact on economic growth, but the conditional variables  $Z$  aggravate that negative impact.

We explore the above four hypotheses individually.

### III DESCRIPTIONS AND SOURCES OF THE DATA

International capital flows have fluctuated substantially over the last three decades. Lipsey (1999) indicated that the share of direct investment in the world's total capital outflows has extended over the last 25 or 30 years. It is generally thought that the globalization process took off in the beginning of the 1980s when most countries eased restrictions on flows of international capital. In the 1990s, capital flows then took the form of FDI and FPI including bond and equity flows.

In this study, the sample covers 1976–2007,<sup>7</sup> and data for a total of 80 countries are used. The dependent variable GROWTH and the macro variables INFLA, INVESTMENT, and GDP per capita are taken from *International Financial Statistics* (IFS), published by the IMF. The two Financial Market Depth variables, LENDING and TURNOVER, are taken from the *Financial Structure and*

<sup>7</sup> This period covers that of most countries' financial liberalization.

*Economic Development Database* (FSEDD; see Beck's (2009) website), while FDI, FPI, and GCONSUMP are taken from the *World Development Indicators* (WDI, 2009), published by the World Bank. The market and government governance variables are taken from LLSV (1998) and Kaufmann (2004). The human capital variable SCHOOLING is constructed by Barro and Lee (1993). See Table 2 for the definitions and sources of the variables.

Our 80 sample countries comprise 31 HIC, 25 MIC, and 24 low-income countries. In alphabetical order, the HIC are Australia, Austria, Barbados, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Korea (South), Kuwait, Malta, the Netherlands, New Zealand, Norway, Portugal, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, Taiwan, the United Kingdom, and the United States. The MIC consist of Argentina, Botswana, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Gabon, Grenada, Jamaica, Malaysia, Mauritius, Mexico, Panama, Peru, Seychelles, South Africa, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Turkey, Uruguay, and Venezuela. The low-income countries are Bolivia, Cameroon, China, Côte d'Ivoire, Ecuador, Egypt, Guatemala, Honduras, India, Indonesia, Jordan, Kenya, Morocco, Niger, Nigeria, Pakistan, the Philippines, Senegal, Sri Lanka, Swaziland, Thailand, Togo, Tunisia, and Zimbabwe.

The sample countries are located on five continents, with 17 from Europe, 16 from Asia and Oceania, 25 from America, and 22 from Africa and/or the Middle East. Table 3 presents the average statistics of our dependent variables and two international capital flows for each of the 80 countries. The values for the dependent variable, GROWTH, are given in the first column. The highest growth rate in terms of real GDP per capita is enjoyed by China (8.25%), followed by Taiwan (5.98%), and Korea (5.70%), all in East Asia. We can contrast these with the lowest values which fall on Cote d'Ivoire (-1.72%), closely followed by Zimbabwe (-1.14%), and Saudi Arabia (-1.13%).

In the second column for the amount of FDIs to the GDP ratio received by a country, the highest ratios are in St. Kitts and Nevis (13.11%), followed by Singapore (11.17%), St. Lucia (10.64%), and Belgium (9.91%), whereas the lowest ratios in ascending order are in Suriname (-5.23%), Kuwait (0.05%), Japan (0.06%), and India (0.42%). It is found that the Asian countries attract more FDI than developed countries.

In the third column, for the amount of FDIs to the GDP ratio received by a country, the highest FPI ratios are in Iceland (7.07%), followed by Australia (2.40%), United States (1.76%), and Greece (1.74%), while the lowest in ascending order are in Kuwait (-8.41%), Malta (-7.75%), Switzerland (-5.95%), and Singapore (-5.08%). Both the high and low percentages of FPI occur in HIC. We conjecture that inflow FPI is probably not related to income level, but rather related to the performance of stock markets.

Panels A and B in Figure 1, respectively, illustrate the scatter plot of FDI and FPI with respect to the growth of GDP per capita. It is not easy to evaluate these relationships on account of the relatively high degree of heteroscedasticity. However, a relationship does indeed appear to exist, albeit in a non-linear form.

Table 2  
*Summary of variables, descriptions, and data sources*

Classification	Variable name	Description	Source
Dependent variables	GROWTH	Growth rate of real per capita GDP (%)	IFS
International capital flows variables	FDI	Foreign direct investment/GDP (%) (Foreign direct investment, net inflows (BoP, current US\$))	WDI
	FPI	Foreign portfolio investment/GDP (%)	WDI
Macro control variables	INVESTMENT	Investment to GDP (%)	IFS
	INFLA	Inflation rate (%), calculated from CPI	IFS
	GCONSUMP	Government consumption expenditures to nominal GDP (%)	WDI
	Y76	Logarithm of real GDP per capita in 1976	IFS
	SCHOOLING	Average years of secondary schooling in the population over the age for 15 for the initial year	BL
<i>Influential factors</i>			
LIBERALIZATION	LENDING	Claims on the private sector by deposit money banks to nominal GDP (%)	FSEDD
	TURNOVER	Turnover ratio (ratio of stock market value traded to market capitalization, %)	FSEDD
	FL	Financial liberalization; variable = 1 when the equity market is liberalized and zero otherwise.	BH and BHL
	TRADE	Free trade index from 0 to 10, with higher numbers indicating higher values	EFW
COUNTRY WEALTH	HIC	High-income countries = 1; otherwise = 0	World Bank Atlas
	MIC	Middle-income countries = 1; otherwise = 0	World Bank Atlas
REGION	LATIN	Latin American countries = 1; otherwise = 0	World Bank Atlas
	SAHARAN	Sub-Saharan African countries = 1; otherwise = 0	World Bank Atlas
	E_ASIA	East Asian countries = 1; otherwise = 0	World Bank Atlas
TWIN CRISES	BC	Dates of banking crises = 1 if a country experienced a banking crisis; otherwise = 0	GKR, GH, CK and LGS
	CC	Dates of currency crises = 1 if a country experienced a currency crisis; otherwise = 0	GKR, GH
GOVERNANCE	CREDITOR	Sum of different creditor rights. The index ranges from 0 to 4, with lower scores representing lower creditor protection	LLSV
	ANTIDIRECTOR	Anti-director rights measuring the protection of shareholder rights, on a scale of 0–6, with lower scores for lower shareholder protection	LLSV

Table 2 (Continued)

Classification	Variable name	Description	Source
	CORRUPTION	Corruption index, on a scale of 1–10, with higher scores for lower levels of corruption	LLSV
	CICC	Corporate illegal corruption component, on a scale of 0–1, with higher scores for lower levels of corruption	KF
	CLCC	Corporate legal corruption component, on a scale of 0–1, with higher scores for lower levels of corruption	KF
	CEI	Corporate ethics index, on a scale of 0–1, with higher scores for higher levels of ethical standards	KF
	PSEI	Public sector ethics index, on a scale of 0–1, with higher scores for higher levels of ethical standards	
	JLEI	Judicial/legal effectiveness index, on a scale of 0–1, with higher scores for higher levels of ethical standards	KF
	CGI	Corporate governance index, on a scale of 0–1, with higher scores for higher shareholder protection	KF

*Notes:*

BL: Barro and Lee (1996).

BH: Bekaert and Harvey (2000).

BHL: Bekaert, Harvey and Lundblad (2005).

CK: Caprio and Klingebiel (1996).

EFW: *Economic Freedom of the World: 2004 Annual Report*, The Fraser Institute.FSEDD: *Financial Structure and Economic Development Database*, from Beck website.

GH: Glick and Hutchison (2001).

GKR: Goldstein, Kaminsky and Reinhart (2002).

IFS: *International Financial Statistics*, IMF.

KF: Kaufmann (2004).

LLSV: La Porta *et al.* (1998).

LGS: Lindgren, Garcia and Saal (1996).

WDI: *World Development Index*, World Bank.WBI: *World Bank Indicator*, World Bank.

HIC & MIC: Taken from the *World Bank Atlas*. Based on the Gross National Income (GNI) in 2008. The GNI of high- and low-income countries are above and below \$11,906 and \$3855, respectively. The GNI of middle-income countries falls in-between the two figures.

## IV EMPIRICAL RESULTS

*Benchmark model*

Table 4 reports the estimated results from the OLS, the fixed effect and the random effect models, respectively. For each model, there are three specifications with international capital flows being replaced by FDI, FPI, or both (FDI and FPI),<sup>8</sup>

<sup>8</sup> Since FDI and FPI are different ‘animals’, it would be awkward to use the same specification here. The focus of this paper is regarding international capital flows which are mainly in the form of foreign direct and portfolio investments.

Table 3  
Average statistics by country from 1976–2007

No.	Country name	GROWTH (%)	FDI (%)	FPI (%)	No.	Country name	GROWTH (%)	FDI (%)	FPI (%)
1	Argentina	1.056	1.620	0.638	41	Kuwait	-0.828	0.058	-8.412
2	Australia	1.978	1.938	2.400	42	Malaysia	4.034	3.967	0.544
3	Austria	2.088	1.937	1.461	43	Malta	4.211	5.826	-7.751
4	Barbados	1.404	0.699	0.182	44	Mauritius	3.510	0.899	0.015
5	Belgium	1.992	9.917	-3.437	45	Mexico	1.475	1.876	0.760
6	Bolivia	0.148	2.885	-0.168	46	Morocco	2.091	0.905	0.067
7	Botswana	5.542	3.157	-1.069	47	Netherlands	1.821	3.837	-0.655
8	Brazil	1.426	1.517	0.952	48	New Zealand	1.125	3.187	0.405
9	Cameroon	0.685	0.994	-0.024	49	Niger	-0.916	0.665	0.052
10	Canada	1.779	2.073	1.199	50	Nigeria	0.411	2.587	0.758
11	Chile	3.842	3.750	-0.826	51	Norway	2.528	1.208	-2.008
12	China	8.253	2.206	-0.026	52	Pakistan	2.672	0.803	0.296
13	Colombia	1.832	1.983	0.118	53	Panama	1.831	3.586	0.523
14	Costa Rica	1.941	2.738	-0.033	54	Peru	0.665	1.794	0.457
15	Cote d'Ivoire	-1.723	1.180	-0.006	55	Philippines	1.201	1.226	0.897
16	Denmark	1.732	2.035	-0.666	56	Portugal	2.504	1.838	0.601
17	Dominica	2.831	6.635	0.645	57	Saudi Arabia	-1.132	0.551	-3.302
18	Dominican Republic	2.667	2.121	0.380	58	Senegal	0.118	0.805	-0.094
19	Ecuador	1.115	1.924	0.566	59	Seychelles	3.038	8.077	0.819
20	Egypt, Arab Rep.	3.300	2.412	0.122	60	Singapore	4.965	11.172	-5.083
21	Finland	2.378	1.642	0.461	61	South Africa	0.309	0.551	0.842
22	France	1.744	1.598	-0.217	62	Spain	2.005	2.076	1.519
23	Gabon	-0.965	0.465	0.185	63	Sri Lanka	3.582	0.981	0.148
24	Germany	1.825	0.910	0.456	64	St. Kitts and Nevis	4.266	13.113	1.209
25	Greece	1.962	0.902	1.746	65	St. Lucia	2.729	10.647	0.720
26	Grenada	3.363	7.774	1.493	66	St. Vincent and the Grenadines	4.523	8.894	0.486

Table 3 (Continued)

No.	Country name	GROWTH (%)	FDI (%)	FPI (%)	No.	Country name	GROWTH (%)	FDI (%)	FPI (%)
27	Guatemala	0.859	1.282	0.141	67	Suriname	0.165	-5.231	-0.024
28	Honduras	1.404	2.056	-0.089	68	Swaziland	2.211	4.380	0.023
29	Hong Kong, China	4.862	5.584	-2.453	69	Sweden	1.721	2.821	-1.400
30	Iceland	2.451	2.581	7.073	70	Switzerland	1.070	2.075	-5.952
31	India	3.728	0.426	0.349	71	Taiwan	5.986	0.597	-0.817
32	Indonesia	3.975	0.642	0.295	72	Thailand	4.763	2.107	0.748
33	Ireland	4.348	3.987	-1.943	73	Togo	-0.514	2.225	0.399
34	Israel	1.705	1.555	0.874	74	Tunisia	2.732	2.443	0.206
35	Italy	1.842	0.563	0.655	75	Turkey	2.340	0.612	0.393
36	Jamaica	0.462	2.597	-0.352	76	United Kingdom	2.162	2.780	0.408
37	Japan	2.310	0.067	-0.685	77	United States	2.041	1.001	1.762
38	Jordan	2.407	2.993	-0.240	78	Uruguay	1.746	1.374	1.285
39	Kenya	0.624	0.490	-0.039	79	Venezuela, RB	-0.020	1.276	1.060
40	Korea, South	5.702	0.484	0.762	80	Zimbabwe	-1.145	0.540	-0.096

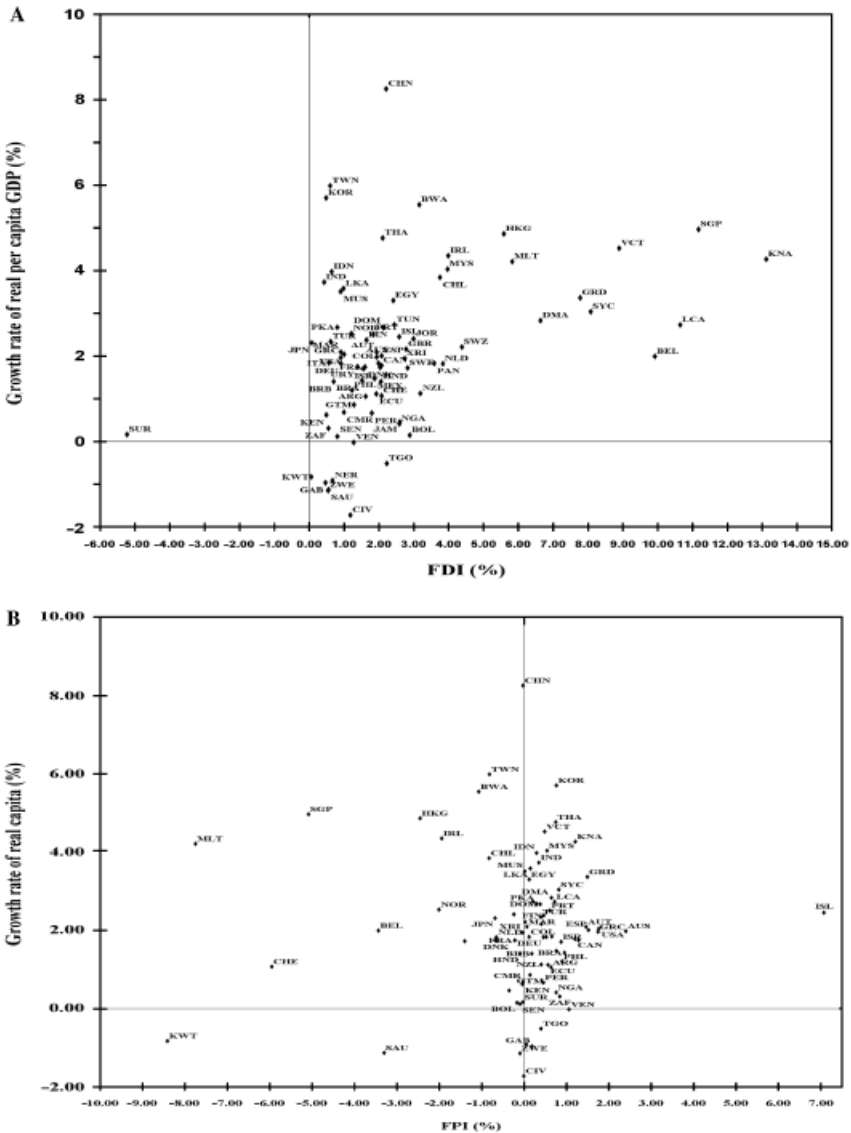


Figure 1. Scatter plots of international capital flows and economic growth, average 1976–2007.

resulting in nine specifications. When the OLS is employed, the coefficients of FDI are found overwhelmingly significantly positive – that is, increasing FDI promotes growth. This phenomenon underscores the potential gains associated with FDI in an increasingly global economy. FPI is found to have an unfavorable impact on growth. When both are considered, the results of FDI remain the same whereas the coefficients of FPI are insignificantly different from zero. Changing the estimation method from OLS to the fixed effect and random effect models does not seriously

alter the results. Görg and Greenaway (2004) suggested two possible explanations for the failure to find a positive relationship. For one, a short-run analysis here may not be able to explain the long-run effects, and secondly the spillover effects may be limited owing to the small number of firms. This paper suggests that another possible reason is that international capital flows may only be effective when they are in unison with the conditional variables.

The control variables display reasonable results. The coefficients of INVESTMENT and SCHOOLING are significantly positive regardless of specification or proxy for international capital flows. Thus, private investment and human capital are beneficial to growth. The coefficients of INFLA and GCONSUMP, however, are overwhelmingly negative, meaning that the inflation rate and government consumption are harmful to growth. The coefficients of Y76 are insignificantly negative with all models. As discussed shortly, our analysis is based on the random effect model, because of the Hausman test. As might be expected, countries with low initial income experience more rapid growth than those with high income, a finding that supports the convergence argument in growth theory.

The bottom of this table presents the test results from two specifications. The first null hypothesis is the null of no individual effects (the intercepts are the same across countries). The  $F$ -value is 2.33–2.55, thus rejecting the null and favoring the alternative of different intercepts. The second null hypothesis is the null of no relationship between the explanatory variables and the residuals (the random effect). The Hausman test yields values in the range of 6.49–9.66, which cannot reject the null hypothesis. Accordingly, we adopt the random effect model in the specifications that follow.

### *Extended model*

This subsection takes equations (1) and (2) into account simultaneously. Tables 5–9 use the same specifications as those in Table 4, but add the interaction variable between international capital flows and the conditional variables,  $Z$ . The random effect model is again adopted. Owing to space constraints, the coefficients of the control variables are not reported, but are available upon request.

Table 5 presents the estimated results when the interaction terms of the international capital flows and liberalization variables (financial and trade liberalization) are added. Recall that there are two financial market depth variables (LENDING and TURNOVER) here. The empirical results show that the coefficients of FDI remain significantly positive, whereas those of the interaction terms are significantly negative when LENDING is adopted. When TURNOVER is used, the interaction terms become insignificant. The results suggest that banking development may mitigate the positive effects of FDI on growth. In other words, while an increase in FDI increases growth, this positive effect is lessened in a country that is banking sector liberated. Next, we show the estimated results when the liberalization indices, FL and TRADE, are adopted as conditional variables. In contrast to the significant coefficients of the two international capital flows variables above, when FL is adopted, the FDI variables become insignificantly positive. Similarly, FDI coefficients are insignificant



Table 4  
Benchmark model

	1-FDI		2-FPI		3-FDI & FPI	
	OLS	Fixed effect model	OLS	Fixed effect model	OLS	Fixed effect model
CONSTANT	-1.329** (-2.293)	-1.701** (-2.648)	-0.756 (-1.295)	-1.073 (-1.622)	-0.770 (-1.321)	-1.090 (-1.642)
FDI	0.098** (3.755)	0.106** (4.791)			0.093** (3.550)	0.101** (4.092)
FPI			-0.046* (-1.893)	-0.049** (-2.267)	-0.029 (-1.139)	-0.034 (-1.533)
INVESTMENT	0.200** (11.826)	0.200** (13.354)	0.191** (11.149)	0.191** (11.297)	0.185** (10.788)	0.185** (11.731)
INFLA	-0.001** (-2.742)	-0.001** (-4.514)	-0.001** (-2.801)	-0.001** (-4.140)	-0.001** (-2.786)	-0.001** (-3.971)
GCONSUMP	-0.053** (-2.683)	-0.058** (-3.112)	-0.059** (-2.891)	-0.070** (-3.139)	-0.056** (-2.721)	-0.069** (-3.081)
Y76	-0.214 (-1.434)	-0.124 (-0.737)	-0.245 (-1.596)	-0.065 (-0.345)	-0.255* (-1.654)	-0.111 (-0.587)
SCHOOLING	0.316** (3.127)	0.373** (2.982)	0.359** (3.515)	0.495** (3.338)	0.324** (3.159)	0.483** (3.263)
R <sup>2</sup>	0.126	0.144	0.106	0.123	0.116	0.134
Obs.	1999	1999	1863	1863	1855	1855
F-test [p-value]	2.338** [0.000]	2.338** [0.000]	2.396** [0.000]	2.396** [0.000]	2.554** [0.000]	2.554** [0.000]
Hausman test [p-value]		6.493 [0.370]		8.005 [0.238]		9.665 [0.208]

Notes: *t*-values are in parentheses.  
 \* and \*\*Significance at the 10% and 5% levels, respectively.  
 The *F*-test:  $F(N-1, NT-N-K) = \frac{(\bar{e} - \bar{e}_i)/(N-K)}{\bar{e}^2/(NT-N-K)}$ , where  $\bar{e}$  is the residual sum of squares (RSS) from the OLS model and is RSS from the fixed effect model.  
 The Hausman test:  $H = (\beta_{FE} - \beta_{OLS})'(\sum_{FE} - \sum_{OLS})^{-1}(\beta_{FE} - \beta_{OLS})$ .

Table 5  
*Extension model: liberalization*

			Simultaneously	
	FDI	FPI	FDI	FPI
ICF	0.224** (3.629)	0.041 (0.791)	0.237** (3.790)	0.063 (1.204)
ICF × LENDING	-0.002** (-2.536)	-0.001 (-0.851)	-0.002** (-2.669)	-0.001 (-1.137)
ICF	0.038 (1.133)	-0.003 (-0.064)	0.040 (1.210)	0.021 (0.479)
ICF × TURNOVER	0.001 (1.391)	0.002 × 10 <sup>-2</sup> (0.031)	0.001 (1.475)	-0.001 × 10 <sup>-2</sup> (-0.025)
ICF	0.124 (0.650)	-0.303* (-1.669)	0.189 (0.982)	-0.273 (-1.473)
ICF × FL	0.018 (0.102)	0.393** (2.099)	-0.036 (-0.199)	0.376** (1.978)
ICF	0.211 (0.950)	0.331** (1.995)	0.220 (0.985)	0.308* (1.834)
ICF × TRADE	-0.016 (-0.624)	-0.042** (-2.023)	-0.017 (-0.659)	-0.036* (-1.767)

Notes: The random effect model is used; *t*-values are in parentheses.

\* and \*\*Significance at the 10% and 5% levels, respectively. Estimated results of other explanatory variables are not reported due to space constraints.

irrespective of whether the conditional variables are added when TRADE is taken into account. Thus, the effects of international capital flows remain mute when a country liberalizes its market no matter if it is financial or trade liberalization. One explanation is that liberalization may have long-run gains, but suffers short-run pain (Kaminsky and Schmukler, 2008).

Table 6 presents the estimated results when the wealth (HIC and MIC) of countries and three regions (LATIN, SAHARAN, and E\_ASIA) is considered. Three interesting results are worth noting. First, when FDI is employed, the coefficients of the interaction terms become significant when the conditional variables are proxied by the wealth of countries – that is, the positive effects of FDI in a HIC are somewhat worsened, whereas in a MIC they are further boosted, which is a finding that has most recently been confirmed by Johnson (2006) and Hansen and Rand (2006). Alternatively, when FPI is employed, the coefficients of the interaction terms are significantly positive when MIC and LATIN are adopted. Accordingly, FPI has a positive effect on the growth of both MIC and Latin American countries. The finding is also consistent with Yang (2008). Next, the coefficients of FPI × HIC are significantly negative, suggesting that FPI hinders growth in HIC. Finally, except for Latin American countries, there appears to be no regional effect as the coefficients of the interaction terms between foreign capital flows and SAHARAN and E\_ASIA are overwhelmingly insignificant.

Table 7 reports the estimated results using the twin crises, BC and CC. When FDI is employed, the coefficients of the interaction terms between FDI and either

Table 6  
*Extension model: country wealth and region*

			Simultaneously	
	FDI	FPI	FDI	FPI
ICF	0.193** (2.977)	0.145** (2.641)	0.196** (3.004)	0.148** (2.707)
ICF × HIC	-0.133** (-1.970)	-0.179** (-2.946)	-0.139** (-2.025)	-0.170** (-2.787)
ICF	0.067** (2.940)	-0.258 (-1.026)	0.066** (2.854)	-0.012 (-0.481)
ICF × MIC	0.172* (1.912)	0.201** (2.792)	0.176* (1.939)	0.198** (2.752)
ICF	0.072** (3.184)	-0.022 (-0.844)	0.072** (3.126)	-0.005 (-0.197)
ICF × LATIN	0.054 (0.571)	0.139** (2.086)	0.045 (0.470)	0.125* (1.880)
ICF	0.074** (3.303)	-0.004 (-0.172)	0.077** (3.378)	0.012 (0.487)
ICF × SAHARAN	0.061 (0.202)	0.244 (1.005)	0.513 (1.237)	0.290 (1.188)
ICF	0.068** (2.754)	-0.003 (-0.113)	0.069** (2.754)	0.010 (0.938)
ICF × E_ ASIA	0.041 (0.751)	0.006 (0.119)	0.052 (0.938)	0.023 (0.362)

*Notes:* The random effect model is used; *t*-values are in parentheses.

\* and \*\*Significance at the 10% and 5% levels, respectively. Estimated results of other explanatory variables are not reported due to space constraints.

Table 7  
*Extension model: twin crises*

			Simultaneously	
	FDI	FPI	FDI	FPI
ICF	0.126** (3.596)	0.019 (0.682)	0.136** (3.781)	0.040 (1.405)
ICF × BC	-0.559** (-3.600)	-0.108 (-0.821)	-0.567** (-3.571)	-0.017 (-0.127)
ICF	0.074** (3.243)	0.001 (0.032)	0.078** (3.333)	0.021 (0.779)
ICF × CC	-0.798** (-4.672)	-0.085 (-0.728)	-0.814** (-4.732)	-0.156 (-1.343)

*Notes:* The random effect model is used; *t*-values are in parentheses.

\*\*Significance at the 5% level. Estimated results of other explanatory variables are not reported due to space constraints.

BC or CC are significantly negative, indicating that a BC or a CC obstructs the relationship between FDI and growth. When FPI is employed, the coefficients of the interaction terms are insignificant. Thus, in countries without BC or CC, FDI has a beneficial effect on growth, but FPI does not.

Table 8  
*Extension model: governance of market and government*

			Simultaneously	
	FDI	FPI	FDI	FPI
ICF	0.081 (1.573)	0.030 (0.645)	0.099* (1.836)	0.050 (1.030)
ICF × CREDITIOR	-0.004 (-0.200)	-0.013 (-0.715)	-0.010 (-0.483)	-0.015 (-0.799)
ICF	0.026 (0.891)	0.034 (0.551)	0.026 (0.889)	0.023 (0.377)
ICF × ANTIDIRECTOR	0.027** (2.466)	-0.011 (-0.623)	0.031** (2.729)	0.001 (0.083)
ICF	0.360** (2.396)	0.347** (2.898)	0.378** (2.499)	0.357** (2.981)
ICF × CORRUPTION	-0.034* (-1.926)	-0.043** (-2.965)	-0.036** (-2.041)	-0.043** (-2.953)
ICF	0.111 (0.792)	0.225** (2.574)	0.100 (0.711)	0.220** (2.522)
ICF × CICC	-0.046 (-0.267)	-0.297** (-2.686)	-0.036 (-0.201)	-0.273** (-2.455)
ICF	0.118 (1.162)	0.132** (1.970)	0.140 (0.103)	0.145** (2.139)
ICF × CLCC	-0.080 (-0.448)	-0.264** (-2.125)	-0.117 (-0.646)	-0.261** (-2.068)
ICF	0.120 (0.951)	0.188** (2.355)	0.127 (0.994)	0.190** (2.384)
ICF × CEI	-0.069 (-0.373)	-0.300** (-2.482)	-0.079 (-0.426)	-0.280** (-2.319)
ICF	0.092 (0.928)	0.148** (2.169)	0.102 (1.001)	0.151** (2.214)
ICF × PSEI	-0.027 (-0.192)	-0.226** (-2.331)	-0.041 (-0.284)	-0.210** (-2.143)
ICF	0.052 (0.457)	0.164** (2.280)	0.047 (0.399)	0.160** (2.223)
ICF × JLEI	0.029 (0.195)	-0.232** (-2.431)	0.035 (0.224)	-0.205** (-2.122)
ICF	0.243** (2.051)	0.188** (2.270)	0.231* (1.951)	0.175** (2.118)
ICF × CGI	-0.213 (-1.453)	-0.268** (-2.383)	-0.201 (-1.370)	-0.234** (-2.064)

Notes: The random effect model is used; *t*-values are in parentheses.

\* and \*\*Significance at the 10% and 5% levels, respectively. Estimated results of other explanatory variables are not reported due to space constraints.

Table 8 presents the estimated results when the conditional variables involve governance. Two types of governance variables are employed here: market governance (CREDITIOR and ANTIDIRECTOR) and government governance (CORRUPTION, CICC, CLCC, CEI, PSEI, JLEI, and CGI). The results show that ICF is positively related to economic growth, especially for the case of FPI when government governance indices are adopted as conditional variables.

Table 9  
*Extended model: human capital*

	FDI	FPI	Simultaneously	
			FDI	FPI
ICF	0.275** (4.226)	0.005 (0.083)	0.321** (4.623)	0.051 (0.859)
ICF × SCHOOLING	-0.089** (-2.759)	-0.030 (-0.962)	-0.111** (-3.365)	-0.046 (-1.475)

*Notes:* The random effect model is used; *t*-values are in parentheses.

\*\*Significance at the 5% level. Estimated results of other explanatory variables are not reported due to space constraints.

Regarding market governance, when ANTIDIRECTOR is employed, for example, the coefficients of the interaction terms are significantly positive for FDI. Hence, FDI does stimulate growth if the country has larger shareholder protection. On the other hand, when government governance is considered, international capital inflow has a positive effect, but its interaction terms are found to have a negative effect, especially when CORRUPTION is adopted. This is puzzling because a high corruption index means less corruption, which as expected should exert a positive effect on growth. Our counter-intuitive results are not isolated as Edison *et al.* (2002) and Durham (2003) also reported the same results. To check the robustness of these results, we perform several tests for robustness by using various definitions of corruption and sample periods. However, the results remain the same. This is an area that is definitely worthy of further study.

Table 9 reports the estimated results when the conditional variables involve human capital. FDI evidently has a significantly positive effect on growth when human capital is considered, but the coefficient of the interaction term between FDI and SCHOOLING is significantly negative. This may in part be due to the interaction term capturing an important absorptive capacity that is human capital. In theory, according to Romer (1986, 1990) and Lucas (1988), human capital accumulation is one of the most important factors vis-à-vis economic growth, but empirically we cannot confirm this when these variables interact with international capital flows. Furthermore, it even has an adverse influence on the relationship between FDI and growth. Thus, the effect of absorptive capacity has a negative effect on the existence of absorptive capacity for FDI. Initially, we were troubled by these results, but once we discovered that Carkovic and Levine (2005) also reported on the lack of FDI impact, i.e., that growth does not depend on the stock of human capital, we were able to be rest assured. Edison *et al.* (2002) indicated that capital flows do not exert a positive effect on growth in countries with sufficiently high levels of educational attainment. This is also worth investigating further.

Alfaro *et al.* (2004) suggested the calculation of the 'conditional factor influence' (CFI) when there are conditional factors. CFI measures how much a one standard deviation increase in the conditional variable enhances the growth

Table 10  
*The conditional factor's influence by different conditional variables*

Conditional variables	International Capital Flows variables (%)	
	FDI	FPI
(1) Liberalization		
LENDING	- 15.23	0.28
TURNOVER	8.06	- 0.01
FL	0.43	- 0.34
TRADE	- 4.93	0.47
(2) Country Wealth and Region		
HIC	- 16.97	0.83
MIC	18.35	- 0.77
LATIN	5.35	- 0.50
SAHARAN	4.27	- 0.62
E_ASIA	4.06	- 0.02
(4) Twin Crises		
BC	- 15.62	0.11
CC	- 13.17	0.05
(5) Governance of Market and Government		
CREDITOR	- 1.38	0.16
ANTIDIRECTOR	8.93	0.13
CORRUPTION	- 19.70	0.90
CICC	- 2.84	0.66
CLCC	- 3.86	0.46
CEI	- 3.67	0.58
PSEI	- 1.79	0.54
JLEI	1.99	0.57
CGI	- 12.03	0.55
(6) Human Capital		
SCHOOLING	- 20.90	0.25

*Note:* We utilize the formulation such that  $\gamma_2 \times \text{mean}ICF_i^* \times \sigma_{Z_i}^*$ .

rate of a country receiving the mean level of FDI or FPI in the sample. Applying their concept to our model, CFI is defined as  $(\gamma_2 \times \text{mean}ICF_i^* \times \sigma_{Z_i}^*)$ , where  $\text{mean}ICF_i^*$  denotes the mean value for ICF in the 80 country sample and  $\sigma_{Z_i}^*$  is the standard deviation of conditional factor  $Z$ .

Table 10 presents the estimated results of CFI. When FDI is the proxy for international capital flows, the conditional factors of ANTIDIRECTOR and MIC have the highest positive influences on the relation (8.93% and 18.35%), respectively. Moreover, the financial liberalization factor of TURNOVER also has a very strong effect on the relation (8.06%). Twin crises and most governance variables (except for ANTIDIRECTOR) have negative conditional influences. When FPI is the proxy for international capital flows, HIC has the highest conditional influence factor (0.83%). The effect of conditional factors of liberalization for LENDING and TRADE also have larger positive effects on the relation (0.28% and 0.47%), respectively. All governance variables show the positive influence.

The second way to know how countries performed is to estimate coefficients for the sample of countries in order to calculate the effect of ICF on growth for

Table 11  
*The effect of ICF on growth*

Conditional variables	International Capital Flows variables					
	FDI			FPI		
	Ave.	Max.	Min.	Ave.	Max.	Min.
(1) Liberalization						
LENDING	0.229	1.304 BEL	-0.138 CHE	0.019	0.621 CHE	-0.069 ESP
TURNOVER	0.162	0.843 SGP	0.007 JPN	0.000	0.011 SGP	-0.005 AUS
FL	0.206	0.537 MYS	0.009 JPN	-0.026	0.140 NOR	-0.131 ZAF
TRADE	0.197	0.717 BEL	0.007 JPN	0.035	0.324 SGP	-0.044 NOR
(2) Country Wealth and Region						
HIC	0.231	0.766 MYS	0.004 JPN	0.037	0.202 CHE	-0.120 CHL
MIC	0.215	0.948 MYS	0.004 JPN	0.029	1.536 CHE	-0.619 AUS
LATIN	0.173	0.804 SGP	0.005 JPN	0.014	0.150 URY	-0.097 Chile
SAHARAN	0.164	0.827 SGP	0.005 JPN	0.007	0.202 ZAF	-0.023 ZWE
E_ASIA	0.168	1.218 SGP	0.007 JPN	-0.001	0.018 CHE	-0.015 SGP
(3) Twin Crises						
BC	0.108	1.213 SGP	-0.255 MEX	-0.005	1.213 SGP	-0.255 MEX
CC	-0.001	0.548 SGP	-0.244 ARG	-0.004	0.548 SGP	-0.244 ARG
(4) Governance of Market and Government						
CREDITOR	0.154	0.726 SGP	0.005 JPN	0.002	0.112 SGP	-0.101 CHE
ANTIDIRECTOR	0.228	1.497 SGP	0.009 JPN	-0.002	0.052 HKG	-0.117 BEL
CORRUPTION	0.226	0.900 SGP	0.005 JPN	0.047	0.494 CHE	-0.099 CAN
CICC	0.167	0.760 SGP	0.005 JPN	0.041	0.265 SGP	-0.116 AUS
CLCC	0.169	0.741 BEL	0.005 JPN	0.036	0.303 SGP	-0.038 IRL
CEI	0.168	0.745 BEL	0.005 JPN	0.041	0.309 SGP	-0.061 AUS
PSEI	0.162	0.748 SGP	0.005 JPN	0.038	0.313 SGP	-0.071 AUS
JLEI	0.154	0.872 SGP	0.005 JPN	0.032	0.273 CHE	-0.102 AUS
CGI	0.210	0.791 SGP	0.005 JPN	0.030	0.202 CHE	-0.117 AUS
(5) Human Capital						
SCHOOLING	0.238	1.054 SGP	-0.141 SWE	0.007	0.329 CHE	-0.219 AUS

*Note:* We utilize the formulation such that  $\gamma_1 \times ICF_i^* + (\gamma_2 \times ICF_i^* \times Z_i^*)$ .

each countries, i.e.,  $\gamma_1 \times ICF_i^* + (\gamma_2 \times ICF_i^* \times Z_i^*)$ , where  $ICF_i^*$  is the mean of ICF for country  $i$ . Table 11 presents the sample distribution of which countries have a beneficial influence on the relationship between ICF and growth and which countries hamper the relationship. As can be observed, countries in the Asia and Oceania region such as Australia, Japan, Malaysia, and Singapore play an important role in the process of economic growth. In addition, our results show that economic growth seems to experience positive effects due to ICF, except for a country which experienced the CC, when FDI is the proxy for international capital flows. As concerns FPI, ICF roughly benefits growth, but some negative effects do exist when a country has experienced the CC from FDI, and when a country has experienced financial liberalization (FL), East Asian (E\_ASIA), BC, CC for FDI, and market governance (ANTIDIRECTOR).

*Why financial liberalisation is more important?*

It is generally accepted that international capital inflows have a positive impact to economic growth. Under this argument, a worthwhile question is whether the same international capital inflow levels exhibit the same economic growth. If they do not, it is valuable to understand whether international capital inflow has an impact on economic growth under particular economic, financial, institutional, and policy environments. Therefore, a more general message that emerges from the literature is whether a positive effect of international capital inflows on growth materializes, depending on certain conditions (see Borensztein *et al.*, 1998; Edison *et al.*, 2002; Alfaro *et al.*, 2004; Carkovic and Levine, 2005). In a different view of policy, Campos and Kinoshita (2008, 2009) demonstrated that the important element of a country's development strategy is the consideration of attracting FDI. Therefore, an important policy question is what factors drive FDI. From previous empirical works, these considerations seem to matter considerably. In this regard, we implement a wider range of economic and financial fundamentals, such as the extent of the financial market development of the host country, financial liberalization, the quality of institutions, twin crises, country wealth and region, or the level of human capital to examine an extensive array of interaction terms. Most importantly, we find that financial liberalisation is more critical than other factors and offer some economic intuition with the following statement.

The literature has widely accepted that the growth effects of FDI are contingent upon the absorptive capacity of host countries. Financial liberalization and human capital are often cited as part of the absorptive capacity for countries. Furthermore, recent literature emphasizes financial liberalization as a critical element for the effective absorption of international capital inflows (Alfaro *et al.*, 2004; Durham, 2004). Kose *et al.* (2009) also noted that the benefits of financial openness are more apparent in terms of the effects on growth than human capital accumulation. Why does financial liberalization matter more for international capital inflow? In this regard, Ang (2008) provided an excellent review of the developments in the literature of financial development and economic growth. In this paper, two arguments of the complementarity hypothesis proposed by McKinnon (1973) and the debt-intermediation view proposed by Shaw (1973) suggest that an excellent financial system which can be the result of financial liberalization will lead to promoting economic growth.<sup>9</sup> Masten *et al.* (2008) pointed out that international capital inflow can stimulate growth through its effect on the development of national financial markets.

These positive effects can take place through a variety of channels. First, the increase of competition from foreign financial intermediaries can reduce the cost of intermediation and enhance efficiency. The second channel is by participating in a foreign financial market through the direct lending of foreign financial intermediaries and foreign stock markets. In this context, the impact of

<sup>9</sup>These arguments stress that the financial system boosts investment and growth through allocating capital efficiently.



international capital inflow upon financial liberalization is profound as well as comprehensive, as Campos and Kinoshita (2008, 2009) proposed some critical aspects. An excellent financial system is able to enhance the efficiency of capital allocation, favorable risk sharing, and ultimately mobilize savings.

Financial development may be a precondition to maximizing the benefits of spillover. Similarly, Masten *et al.* (2008) concluded that a well-developed financial market can help economies to trade, hedge, and pool risk, which by rising investment accelerates economic growth. In addition, the financial market can also promote the accumulation of human capital through facilitating borrowing for the accumulation of skills. If the accumulation of human capital is not limited to diminishing returns on a social level, then financial arrangements that mitigate human capital creation help enhance economic growth (Levine, 1997).

From the empirical aspect, there are some studies of international capital inflow and economic growth, which also cover the issues of relative importance of financial liberalization. For example, Alfaro *et al.* (2004) utilized the liquid liabilities of the financial system, commercial-central bank assets, private sector credit, bank credit, and stock market liquidity as proxies of financial development to find the fact that FDI promotes economic growth in economies with well-developed financial markets. Prasad *et al.* (2007) postulated that foreign capital inflows contribute to higher economic growth when an absorptive capacity of the financial development which is proxied by the ratio of domestic credit to GDP and the country index of the quality of corporate governance are available in the host economy. It also can be seen in Campos and Kinoshita (2008, 2009) that there is a strong relationship in particular from financial liberalization to FDI. Consequently, the effect of FDI should be reflected through financial liberalization – that is, financial liberalization does matter for international capital inflow.

## V ROBUSTNESS CHECKING

### *Outliers*

Panel data are frequently contaminated with outliers. In this regard, Cunningham (1999) and Manning (2003) contested the results of Levine and Zervos (1998) on the grounds that they are not robust when outliers are excluded or when regional variables are added. Choe (2003) showed a causal relationship between economic growth and FDI in 80 countries over the 1971–1995 period and discovered that some outliers seriously affected those estimated results.<sup>10</sup> At first glance, there seems to be several outliers in Figure 1, and so to deal with this problem we use the Minimum Absolute Deviation model (MAD) for outliers, the use of which can be traced as far back as Edgeworth (1887). It involves minimizing  $\sum_{t=1}^T |\varepsilon_t|$ , where  $\varepsilon_t$  denotes the residuals of the regression. Even though neither is often used in international capital flows and growth empirics,

<sup>10</sup>Choe (2003) excluded outliers defined as observations where the distance between individual residuals and the mean of the residuals exceeds the standard deviation of the residuals by more than a factor of three. He later indicated that the causality from FDI to growth disappears when the outliers are excluded.

Table 12  
*Outlier model: minimum absolute deviation model (MAD)*

Independent variable	1	2	3
CONSTANT	−0.871* (−1.897)	−0.426 (−0.917)	−0.449 (−0.964)
FDI	0.094** (2.341)		0.088** (2.962)
FPI		−0.030* (−1.773)	−0.013 (−0.687)
INVESTMENT	0.197** (14.889)	0.190** (14.427)	0.184** (13.819)
INFLA	−0.001** (−2.084)	−0.001** (−2.126)	−0.001** (−2.097)
GCONSUMP	−0.007 (0.015)	−0.075** (−4.903)	−0.074** (−4.871)
Y76	−0.155 (−1.197)	−0.168 (−1.265)	−0.171 (−1.284)
SCHOOLING	0.231** (2.821)	0.261** (3.174)	0.232** (2.818)
Obs.	1999	1863	1855

Notes: *t*-values are in parentheses.

\* and \*\*Significance at the 10% and 5% levels, respectively.

we apply the MAD method and present the estimated results in Table 12. There is no doubt that the effects of FDI and FPI on growth become weaker as the coefficients become smaller than those obtained from the OLS, which unquestionably remain significant. Therefore, after considering the influence of outliers, we conclude that the significant effects of international capital flows on economic growth do not change.

### *Endogeneity*

Simultaneity bias is likely present in the OLS estimates of the capital flows-growth relationship, which includes several explanatory variables that may be affected by the growth rate and are probably imprecisely measured (Borensztein *et al.*, 1998; Edison *et al.*, 2002; Durham, 2004; Alfaro *et al.*, 2004). Li and Liu (2005) found a significant endogenous relationship between FDI and growth in 84 countries over the 1970–1999 period. We therefore use a dynamic panel generalized method of moments (GMM) technique developed by Arellano and Bond (1991) to correct for potential endogeneity by using capital flows variables and macro variables with the lagged period as instruments. The economic growth process may be dynamic, with current realizations of the growth rate variable influenced by past ones. The general estimators are designed for situations with few time periods and many countries, with independent variables that are not strictly exogenous, with fixed effects, and with heteroskedasticity and autocorrelation within countries. As shown in Table 13, by way of comparison with the results from the OLS analysis, the effects of FDI and FPI

Table 13  
*Dynamic panel GMM model*

Independent variable	1	2	3
CONSTANT	− 1.329** (− 2.329)	− 0.756 (− 1.281)	− 0.769 (− 1.308)
FDI	0.098** (4.548)		0.093** (4.204)
FPI		− 0.046** (− 2.243)	− 0.029 (− 1.363)
INVESTMENT	0.201** (13.978)	0.191** (12.755)	0.185** (12.282)
INFLA	− 0.001** (− 4.565)	− 0.001** (− 4.683)	− 0.001** (− 4.538)
GCONSUMP	− 0.053** (− 3.130)	− 0.059** (− 3.384)	− 0.056** (− 3.191)
Y76	− 0.214 (− 1.418)	− 0.245 (− 1.626)	− 0.255* (− 1.691)
SCHOOLING	0.316** (2.860)	0.359** (3.237)	0.324** (2.922)
Obs.	2028	1880	1880

Notes: *t*-values are in parentheses.

\* and \*\*Significance at the 10% and 5% levels, respectively. Coefficient estimates are based on the system GMM estimator. The instruments are lagged levels for differences and lagged differences for levels.

are still significant. It therefore follows that our previous conclusion that international capital flows have a direct effect on economic growth is indeed independent of endogeneity.

#### *Dynamic influence of the lagged effect*

There may be a dynamic effect where lagged capital flows have effects, as suggested by Carkovic and Levine (2005) and Durham (2004), who used lagged FDI and FPI when they conducted stability tests. Table 14 indicates that focused coefficients do decrease slightly, but are still significant for FDI. As shown in Table 14, the use of lagged periods of capital flows simultaneously does not change the results. Thus, it seems reasonable to conclude that the relationship between international capital flows and economic growth is not affected by lagged capital flows.

#### *Eight-year averaged data*

To remove the effects of the business cycle, the literature often adopts multi-year averaged data. Rousseau and Wachtel (2000), for example, used 1960–1995 5-year averaged data to perform their analysis. By the same token, Choe (2003) employed 1971–1995 5-year averaged data to examine the relationship between FDI and growth. Hermes and Lensink (2003) tested for the relationships among FDI, financial development, and growth based on 1970–1995 5-year averaged data for 67 countries. In Table 15 for the 8-year averaged data GMM estimations, the FDI and FPI coefficients do increase, but are still significant.

Table 14  
*Random effect model: lagged one period for the ICF variables*

Independent variable	1	2	3
CONSTANT	-1.693** (-2.626)	-0.976 (-1.487)	-0.975 (-1.484)
FDI( $t-1$ )	0.056** (2.541)		0.048** (2.198)
FPI( $t-1$ )		-0.030 (-1.441)	-0.023 (-1.090)
INVESTMENT	0.204** (13.495)	0.192** (12.243)	0.187** (11.886)
INFLA	-0.001** (-4.529)	-0.001** (-4.456)	-0.001** (-4.392)
GCONSUMP	-0.058** (-3.130)	-0.065** (-3.418)	-0.064** (-3.339)
Y76	-0.125 (-0.741)	-0.172 (-1.044)	-0.179 (-1.079)
SCHOOLING	0.392** (3.121)	0.390** (3.096)	0.382** (3.017)
Obs.	1969	1833	1825

Notes: The random effect model is used;  $t$ -values are in parentheses.  
 \*\*Significance at the 5% level.

Table 15  
*Eight-year average data for dynamic panel model*

Independent variable	1	2	3
CONSTANT	-0.694 (-0.855)	-0.321 (-0.369)	-0.457 (-0.551)
FDI	0.108** (2.591)		0.080* (1.813)
FPI		-0.079* (-1.817)	-0.052 (-1.157)
INVESTMENT	0.182** (8.562)	0.187** (8.402)	0.178** (8.275)
INFLA	-0.001** (-3.342)	-0.002** (-2.403)	-0.002** (-2.459)
GCONSUMP	-0.021 (-0.925)	-0.023 (-0.934)	-0.248 (-1.063)
Y76	-0.401* (-1.906)	-0.467** (-2.104)	-0.389* (-1.827)
SCHOOLING	0.315** (2.169)	0.330** (2.204)	0.299** (2.083)
Obs.	239	239	239

Notes:  $t$ -values are in parentheses.  
 \* and \*\*Significance at the 10% and 5% levels, respectively. Coefficient estimates are based on the system GMM estimator. The instruments are lagged levels for differences and lagged differences for levels.

Furthermore, the coefficients of other variables become even smaller and more insignificant than those determined by the random effect model. Hence, we feel confident that the significant results are robust to the 8-year averaged data.

## VI CONCLUSIONS

This paper re-examines the relationship between international capital flows and economic growth using panel data for 80 countries over 1976–2007. Our focus is not only on the relationship between international capital flows and economic growth, but also on whether and to what extent this relationship can be recovered by ‘conditional factors’. This study seeks to determine why countries with the same level of international capital flows experience very different levels of economic performance. The empirical results are summed up as follows.

First, FDI and FPI directly affect economic growth unconditionally.

Second, among the conditional factors that affect the relationship between FDI and growth, those that strengthen the effects of FDI are MIC and good shareholder protection. By contrast, the conditional variables that weaken the effects of FDI on growth are the twin crises, banking liberalization, HIC, lower corruption, and human capital.

Third, turning to FPI, the conditional factors that revive the positive effects of FPI on growth are financial liberalization, being in a Latin American region, the wealth of countries, and market governances. Thus, financial liberalization is helpful in terms of its positive influence on the effects of FPI on growth. The conditional factors of Latin American location and middle-income economy also have a beneficial influence. A HIC economy, nevertheless, is found to dampen influence in the near future. The twin crises also do not affect the effects of FPI on growth.

Two important policy implications to enhance the effects of international capital flows on economic growth emerge from our estimated results. Countries should strive to develop sound financial markets, including the trading activities of capital markets. In addition, countries should make every effort to prevent a BC or CC from occurring in order to eliminate, or at least mitigate, the influence they would have on capital flows’ effect on growth.

The policy implications to strengthen the effect of FPI on economic growth are similar to those for FDI. However, while the financial market is also important, the focus should be directed more toward market capitalization than the trading of the market. MIC and Latin American countries should do their utmost to attract FPI as its effect is enhanced in these groups of countries. It is not urgent for HIC to attract more FPI in the sense that growth would not be affected as much.

Two counter-intuitive results are found, i.e. an increase in corruption and a decrease in human capital are found to be helpful in terms of the influence of FDI. These results are also found in Edison *et al.* (2002) and Durham (2003). We plan to further explore these counter-intuitive results in the very near future.

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