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Capital Flows to Least Developed Countries: What Matters?

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Abstract

This study analyzes capital flows to least developed countries (LDCs) to understand their determinants and persistence. The study finds that macroeconomic stability, trade openness and financial sector development are the key determinants of capital flows (both official and private) to LDCs. Regional variation and economic size also matter for capital flows. While economic size is positively associated with official capital flows (external loans and grants), it is negatively associated with FDIs. The study does not find any link between capital inflows and institutional quality or political environment in LDCs, as opposed to the findings of some recent studies on emerging and developed countries. The results suggest for appropriate policies aimed at improving macroeconomic and financial environment with further liberalization of trade policies in order to ensure more capital flows to LDCs.

Key Words: Capital flows, LDCs, GMM estimator, Financing for development

JEL Classification: E44; F20; F34

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1. Introduction

The Brussels Program of Action (BPoA) underscored the need and ways to enhance least developed countries (LDCs)¹ share in global trade, FDI and financial flows during 2001-2010 in order to foster economic growth and development in these countries (Commitment no. 5; May 2001). A review of performance of these countries in the external front has highlighted that LDCs commitments in the BPoA largely remains unfulfilled (BIDS, 2010; UNESCAP, 2000). Recent global financial crisis makes the LDCs vulnerable to external shocks because of their higher reliance on exports and dependence on aid and external debt. Even though developed countries committed to disburse more than 0.2 percent of their GNP as official development assistance (ODA) to developing countries during the decade, it was also not fulfilled (UNCTAD Report, 2006). Moreover, there is a fear that aid flows would shrink further in the face of recent recession in developed countries. It is therefore desirable for less developed countries to formulate proper policies and take actions to attract more capital flows (both private and official), which depends on understanding of the underlying factors influencing capital flows in these countries.

An important feature is that net and gross capital flows to LDCs is on a rising trend in the first half of 2000s as compared to the 1990s (Figure 1). How this rise of capital flows to LDCs can be explained? The rising trend of capital flows is supposed to be related to a country's underlying capital and financial structure. The objective of this article is therefore to identify the factors that influence capital flows to this group of developing countries, and examine how persistent they are.

A widespread view holds that foreign direct investment, portfolio equity, and external debt in a country's external finance are important determinants of economic performance, and to some extent, propensity to crises. Then, what are the determinants of capital flows? Recipient countries receive funds for investment which are not normally available from domestic sources, while investing countries receive a higher return than that of the developed world. In this context, interest rate differentials could explain capital flows. On the other hand, official funds from donor agencies or countries are available only when receiving

¹ Least Developed Countries (LDCs) are defined based on the following 3 criteria: (i) *Low-income criterion* based on a three-year average estimate of the gross national income (GNI) per capita (under \$750 for inclusion, above \$900 for graduation), (ii) *Human resource weakness criterion* involving a composite Human Assets Index (HAI) based on indicators of: (a) nutrition; (b) health; (c) education; and (d) adult literacy, and (iii) *Economic vulnerability criterion* based on indicators of the instability of agricultural production; the instability of exports of goods and services; the economic importance of non-traditional activities (share of manufacturing and modern services in GDP); merchandise export concentration; and the handicap of economic smallness. There are now 49 countries in the LDC group.

countries could fulfil certain conditions, such as improvement and liberalization of their financial sector, privatization, good governance and macroeconomic stability.

It is apparent in the empirical literature that while a set of studies focus on the determinants of capital flows, other sets of studies focus on the persistence of capital flows. From analytical perspective, these two issues imply dynamic characteristics of capital flows. Moreover, proper care is necessary to encounter endogeneity bias in explaining capital flows. If the dynamic capital flows are analyzed in a static model, it will not provide an unbiased assessment of the factors associated with capital flows. This study thus takes into account of these problems in estimation by applying the Arellano-Bond GMM dynamic panel regression model to capital flows to a panel of 48 LDCs (the list are given in the Appendix-II) for the period 1991-2006. The GMM estimator considers the explanatory variables and the difference of the lagged dependent variables as instrument in the level equation. The lagged dependent variable is the instrument in the first-difference equation. Hence, the Arellano-Bond GMM estimator provides unbiased estimates of coefficients by encountering both persistency and endogeneity issues in the model.

There are two important qualifications of this paper. *One*, it estimates the persistency effect of capital flows—whether capitals are temporary or irreversible as well as its determinants. Second, this study considers capital flows to a particular group of countries (LDCs), which need greater capital flows for enhancing their economic development. It is important to assess the determinants of capital flows to these countries as the group is diverse (e.g., natural-resource endowed, land-locked, island etc.) as well as level of economic development varies substantially among these countries. While some of the LDCs receive greater capitals, but others do not. Why? This study attempts to provide some answers to this question.

The findings of this study suggest that macroeconomic stability, trade openness and financial sector development are the general determinants of capital flows to LDCs. While FDI flows were natural resource seeking in LDCs in the 1990s, these have turned to efficiency-seeking in the 2000s. Results suggest that FDIs often goes to LDCs that are relatively less developed. On the other hand, official capital flows (loans and grants) are found to be associated with the relatively higher level of economic development of LDCs. The study does not find any link between capital inflows and institutional quality, as opposed to the findings of some recent studies for emerging and developed countries (see, for example, Faria and Mauro, 2009). The GMM estimators suggest that while gross capital inflows in LDCs are persistent with varying degrees, however, net capital flows are less

persistent (persistent effect is 0.14), implying limited capital flows for financing development activities in LDCs.

The rest of the paper is organized as follows. Section 2 reviews literature on capital flows. Section 3 describes the data, presents the empirical strategy, and reports the main results and the robustness tests. Section 4 concludes the paper.

2. Review of literature on capital flows

Capital flows to developing countries can be classified into four broad categories: (i) portfolio equity flows consisting of bond and equity (i.e. developing country company share purchase); (ii) commercial bank lending from developed to developing countries; (iii) FDI, physical investment by non-residents to developing countries; and (iv) Official flows consisting aid, grants, concessional and non-concessional credits given to developing countries by donor agencies and countries. Among these four types of capital flows, first two are less relevant to LDCs because of their underdeveloped financial sector and capital market. In the cases of most LDCs, there are restrictions in place on foreign commercial bank borrowing as well as portfolio investment, particularly from the fear of crisis due to sudden reversals. However, FDIs and official flows are two major sources of capital flows to developing countries.

Many previous studies have sought to identify the determinants of capital flows including FDI flows. Studies based on interest rate differentials provide evidence that such differentials could explain capital mobility only among developed countries (Montiel, 1993). In contrast, both net and gross capital flows to developing countries respond to economic fundamentals, official policies and financial market imperfections. In a cross-section of 40 advanced and developing countries, Alfaro et al. (2008) find that institutional quality is a key determinant of total capital flows. In a panel of advanced and developing countries, Albuquerque (2003) finds the share of FDI in total flows to be negatively and significantly associated with good credit risk ratings, but unrelated to indicators of institutional quality. Contrastingly, in a cross-section of advanced and developing countries, Hausmann and Fernández-Arias (2000) consider the determinants of the share of FDI flows in total flows, using averages for 1996–98, and find no relationship with institutional quality. In a gravity model of bilateral FDI stocks (drawn from OECD data) and bank loan stocks (drawn from BIS data) applied to a common sample of about 10 source countries and 20 recipient

countries, Wei (2001) finds that weaker institutions are associated with less FDI and more bank loans.

In a recent cross-section study, Faria and Mauro (2009) find that equity-like liabilities as a share of countries' total external liabilities are positively and significantly associated with indicators of educational attainment, openness, natural resource abundance, and institutional quality. Regarding the nature of capital flows, Sarno and Taylor (1999) show that equity, bond, official flows are relatively less persistent than bank credit and FDI flows. This finding is important from the perspective of sudden stops and reversals of capital flows.

Empirical investigation of the relationship between economic and institutional indicators and countries' capital flows has reached a variety of results. In a cross-section of countries (including advanced economies), Hausmann and Fernández-Arias (2000) document no relationship or a negative relationship between the ratio of FDI inflows to total private capital inflows and institutional quality. In contrast, Wei (2000a,b; 2001) and Wei and Wu (2002) find that weak institutions tilt capital inflows toward bank loans and away from FDI, consistent with their hypothesis that foreign direct investors are less likely to be bailed out than are foreign banks in the event of a crisis.

Other studies have identified a number of additional factors that may influence FDI. Such factors include human capital, natural resources, economic size, and openness. Human capital may act as a stronger "pull" factor for FDI (Borensztein et al., 1998) than other forms of capital such as portfolio equity or debt. Natural resources may also attract FDI to a greater extent (Hausmann and Fernandez-Arias, 2000; Lane and Milesi-Ferretti, 2001b). Larger economic size (proxied by measures such as total GDP) also attracts FDI, which provides an opportunity to better serve the local market (possibly circumventing trade barriers). Finally, openness may reduce the need for "tariff hopping" FDI, though countries having quota-free market access of products may be an attractive destination for FDI, which may be called 'efficiency-seeking' FDI.

3. Empirical analysis

This section briefly describes the data, presents the empirical strategy, and reports the results. Appendix-I describes the data sources and variables in greater detail.

3.1 Data sources and variables used

The objective of this study is to examine the determinants of external liabilities and capital flows to LDCs. Hence, the following three dependent variables are considered: (i) net

capital (credit) flows (also termed as official flows), (ii) net FDI inflows, and (iii) total external debt. Net financial flows are disbursements of loans and credits less repayments of principal. It included concessional, non-concessional and other types of financial flows. *Foreign direct investment (FDI)* is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. *Total external debt* is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars. The data covers the period 1991-2006. Therefore, external debt includes bank borrowing also. We could not analyze private equity flows due to lack of sufficient data.

This study considers the explanatory variables following Faria and Mauro (2009). The explanatory variables include the size of the economy (total GDP in U.S. dollars at constant 2000 prices), the level of economic development (GDP per capita in U.S. dollars at constant 2000 prices), openness (sum of imports and exports over GDP), the relative importance of natural resources (share of exports of fuels, metals, and ores as a ratio of merchandise exports), human capital (percentage of population over 25 that has attended some secondary schooling), financial development (private credit to GDP or M2 to GDP), an index of institutional quality and indices of political system and legislative electoral competitiveness (LIEC).

The institutional quality is the simple average of six institutional indicators drawn from the World Bank governance indicators developed by Kaufmann et al. (2006): voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. In the full country sample of Kaufmann et al. (2006), each index ranges between -2 and 2 for the vast majority of countries, with a mean of 0 and a standard deviation of 1. Instead of simple averaging of the six subcomponents, one could consider extracting a common component (for example, the first principal component obtained by applying principal components analysis to the six series). This yields essentially the same results in other studies.

Except institutional data, the source of data, in most cases, is the World Development Indicators of the World Bank. The sources and definitions are discussed in the Appendix-I in greater detail. Table 1 reports the descriptive statistics for the variables used in this study.

The focus of our analysis is on the least developed countries. Therefore, the whole

sample consists of 48 countries (out of 49) defined as LDCs by the United Nations². In addition, two groups of countries, namely African and Asian LDCs are analyzed separately. The reason for looking at both samples separately is twofold. First, LDCs in two regions are characterized by diverse geo-political and economic conditions. Some Asia-Pacific LDCs are land-locked and island countries, which are highly vulnerable to external shocks because of their dependence on highly concentrated exports and tourism. On the other hand, some African LDCs have been suffering from civil war, which are vulnerable to domestic real shocks. Second, the bulk of FDIs in Africa is of the resource-seeking type, while FDI directed towards Asian LDCs is mostly efficiency and quota-seeking. Hence, such grouping of countries will help control heterogeneity within developing countries of the same region in the analysis.

3.2 *Estimation techniques*

For estimating capital flows to LDCs, a dynamic panel GMM estimator has been applied. The reason is that a generalized method of moments (GMM, or difference GMM) estimator can encounter endogeneity problem as well as short-panel bias. Arellano and Bond (1991) make a first-difference to the panel data and then use the endogenous (or predetermined) lagged variables' levels to instrument for the transformed lagged dependent variable. The lagged levels provide little information about the first differences when the underlying series are relatively stationary and, therefore, are weak instruments (Arellano and Bover, 1995; Blundell and Bond, 1998). To overcome the problem, Arellano-Bover and Blundell-Bond GMM employs additional moment conditions based on the lagged variables' first differences (in addition to their levels) to increase the efficiency of the estimation. Therefore, to increase the efficiency of the estimates as well as to capture dynamics of capital flows, the Arellano-Bover/Blundell-Bond GMM model has been applied in the analysis.

3.3 *The results*

The determinants of capital flows—net FDI flows, external debt (gross capital flows) and net capital flows are reported in Tables 3, 4 and 5 respectively. The Arellano-Bond GMM estimates show a clear sign of persistence in capital flows to LDCs. Based on the Sargan (1958) test statistic, the optimal lag is found to be two years in most cases. The

² One LDC, Tuvalu has been dropped from the Sample because of unavailability of sufficient data.

explanatory variables and the difference of the lagged dependent variable are used as instruments in the level equation—the lagged dependent variable appears as instrument in the first-differenced equation. Thus, each explanatory variable appears in the instrument matrix. Arellano-Bond GMM estimator tests for AR(1) and AR(2) in first differences. The model introduces first order serial correlation. The test for no second-order serial correlation of the disturbances of the first-differenced equation is important for the consistency of the GMM estimator. In addition, the Sargan (1958) test for the joint validity of the moment conditions (the presence of over-identification) is crucial to the validity of GMM estimates. As the results show, there is first order serial correlation, but no second order serial correlation. Further, the Sargan (1958) test implies that the instruments used are orthogonal to the error term, that is, over-identification is rejected.

We begin by focusing on the determinants of the net FDI flows to LDCs in the whole sample for the whole period, and sub-periods: 1991-2000 and 2001-2006 (Table 3). The results show that net FDI flows are moderately persistent—the effect is 0.45 indicating that last year's net FDI inflows will amplify current FDI inflows by 45 percent. For the whole sample, financial development, proxied by domestic credit to GDP ratio, and trade openness (total export and import to GDP ratio) are positively and significantly associated with FDI inflows to LDCs. Inflation rate and per capita GDP are negatively and significantly associated with FDI inflows. Thus, FDI inflows are associated with macroeconomic stability and lower level of development. The results are consistent with Faria and Mauro (2009) and Hausmann and Fernández-Arias (2000).

Natural resource is positively and significantly associated with FDIs in the 1990s, but negatively and significantly associated in the 2000s. This result indicates that while FDIs were natural resource-seeking in the 1990s, it has turned to efficiency-seeking in the 2000s in the cases of LDCs. A separate analysis of African LDCs is done by separating natural resources into two sub-components: fuel export and ore & metal export. The result reveals that in addition to the significance of financial development, economic development, inflation and openness, the coefficient of ore and metal export (a proxy for natural resource) is also significant at 10 percent level implying its importance in determining FDI flows to African countries. However, for the Asian LDCs only economic size (measured in terms of real GDP) matters for FDI inflows. The persistent effect of FDI inflows in Asia is found to be lower than Africa, indicating that FDIs in Africa are more of physical investments type and largely irreversible. Thus, regional variation exists in the case of FDI inflows. No significant

association was found with FDI inflows and institutional quality and human capital, which is also consistent with Hausmann and Fernández-Arias (2000).

As expected, external debt or gross official capital flows are found to be highly persistent in all model specifications—the persistent effect is about 0.60 (Table 4) implying their effect is strong. While total gross capital flows is positively and significantly associated with economic size (GDP), it is negative and significant for Africa but positive and significant for Asia. Financial development is positively, significantly and fairly robustly associated with the total gross capital flows in all model specifications. Openness, inflation rate and real exchange rate volatility are significant, indicating that macroeconomic stability and trade liberalization policies may be crucial for receiving more external debts. Natural resource abundance is negative and significant to total external debt, indicating that countries having natural resources are relatively less reliant on external loans or grants. Official flows are pertinent to LDCs having no or less natural resources in contrast to FDI flows. Again, human capital, institutional quality and political institutions are not found to be significant to gross official capital flows.

Finally, persistence and determinants of net capital flows are examined (Table 5). While net capital inflows are significantly less persistent for the whole sample period (0.14), it is not found to be significantly persistent for the sub-periods. Thus, in net terms, the flows of capitals to LDCs are restrained implying limited scopes of external financing for development activities in these countries. It is therefore important for LDCs to understand the determinants of net total capital flows. Net capital flows are found to be significant to economic size (GDP), financial development, low RER volatility, and natural resource abundance. Trade openness, human capital and institutions are not significant to net capital flows. Comparing results between net FDI flows and net capital (official credit) flows, it is clear that net official flows, in contrast to FDI flows, are associated with sound macroeconomic environment and the relatively higher level of economic development of LDCs.

The robustness of the results is tested in a number of ways. Instead of considering levels of the dependent variables, we run regressions considering their ratios to GDP. However, results (significance of the variables) remain the same. The results remain almost the same even when some of the outlier cases are deleted. Alternative variables are used, particularly for human capital (proportion of people having tertiary education, or secondary enrolment rate), financial development as well as some interaction variables with governance indicators (institutional quality). These modifications have not changed the overall results.

To summarize the findings, although there is an evidence of sharp expansion of capitals to LDCs (more than 60% annually) in gross terms, it is only 14 percent in terms of net figures. The result indicates that LDCs are constrained by external financing for development, although official capital flows appear to have been more useful for the development of LDCs. The determinants of both gross and net capital flows are found to be the same—macroeconomic stability, financial sector development, and to a lesser extent, trade openness and natural resource abundance. Since all LDCs do not have the same level of natural resources, maintaining macroeconomic stability and continuous efforts for developing the financial sector could be an important policy options for LDCs in order to receive more capitals in a sustainable manner.

4. Conclusion

This study provides some explanations to the question of why some LDCs receive more capitals than the others. Although there is an evidence of sharp expansion of capitals (Official capitals such as external loans and grants plus FDI) to LDCs (more than 60% annually) in gross terms, it is only 14 percent in terms of net figures. The results indicate that LDCs are constrained by external financing for development. Relatively bigger LDCs receive more official capitals than the smaller LDCs. On the other hand, smaller LDCs receive relatively more FDI than the bigger LDCs. It is also observed that FDI to LDCs has turned to efficiency-seeking in the 2000s from its nature of natural resource seeking in the 1990s.

The determinants of both gross and net capital flows are found to be the same—macroeconomic stability, financial sector development, and to a lesser extent, trade openness and natural resource abundance. The study, however, could not find any relationship between capital flows and institutional quality in LDCs. Since all LDCs do not have the same level of natural resources, policies aimed at maintaining macroeconomic stability including viable balance of payment situation, and financial sector development with further liberalization of trade regime could be an important strategy for LDCs to receive more capitals for financing development.

The findings of this study reveal the fact that the determinants and nature of capital flows vary with the level of development, even among the LDCs. While some developing countries may have comparative advantage to attract some capitals for natural resource endowment, others attract due to their advantage on export potentials and market size. Particularly those are not natural resource-endowed, this paper suggests that they have to develop a sound macroeconomic environment with a reasonably good financial sector to

attract capitals in terms of FDIs or official assistance. Thus, it seems difficult to draw a “one-size-fits-all” policy solution for even developing countries in order to attract more international capitals.

Table 1: Descriptive Statistics: averages 1991-2006

	Maximum	Minimum	Mean	Median	Std. Deviation	Coeff. of Variation	N
Net Capital inflows (million US dollar)	678.00	-58.50	63.10	22.30	101.00	1.60	816
External Debt (million US dollar)	20500.00	29.10	3240.00	1750.00	4000.00	1.23	718
Net FDI inflows	3530.00	-1300.00	117.00	18.30	327.00	2.79	702
GDP (const., 2000, US\$)	65400.00	32.00	3720.00	1660.00	7240.00	1.95	689
GDP per capita growth	90.07	-47.08	1.63	1.78	8.27	5.07	705
Institutional Quality	0.66	-2.20	-0.59	-0.55	0.54	-0.92	816
Openness	275.23	1.53	69.27	59.89	38.05	0.55	665
Natural resource	99.69	0.00	24.12	8.02	30.61	1.27	251
Political System	2.00	0.00	0.42	0.00	0.76	1.81	782
LIEC	7.00	0.00	5.27	6.00	2.08	0.40	782
Financial Development (M2/GDP)(1)	753.98	2.07	33.78	23.99	51.15	1.51	672
Financial Development (Credit/GDP) (2)	1255.16	-27.34	33.21	15.94	95.50	2.88	669
Inflation rate	98.2	-9.62	11.9	7.32	15.5	1.30	549

Notes: The whole sample consists of 48 LDCs for the period 1991-2006; the classification of countries according to the United Nations. Net capital flows, net FDI flows and external debt data are from WDI CD ROM of the World Bank. Net financial flows are disbursements of loans and credits less repayments of principal. It included concessional, non-concessional and other types of financial flows. Foreign direct investment (FDI) is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars. The institutional quality index is the simple average of six governance indicators from Kaufmann et al.(2006), also known as World Bank Governance Indicators (WGI): voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. GDP (U.S. millions of dollars at constant 2000 prices) and GDP per capita (U.S. dollars at constant 2000 prices) are from the World Bank's World Development Indicators (WDI). Financial development is measured by domestic credit divided by GDP, from the WDI. Natural resource is the ore, metals and fuels export as percent of merchandise exports, from WDI. Openness is the sum of exports and imports divided by GDP, built using data from the WDI. Human capital is the share of population over 25 that attended at least some level of secondary schooling, from the World Bank's Education Indicators, EDSTATS.

Table 2: Pairwise correlations of variables: averages 1991-2006

	Net capital inflows	External debt	FDI	GDP	GDP per capita	Institutional quality	Openness	Natural Resource	Political System	LIEC	Financial Development (M2/GDP)(1)	Financial Development (Credit/GDP)(2)
External Debt	0.49***	1.00										
FDI	0.07**	0.36***	1.00									
GDP	0.67***	0.74***	0.25***	1.00								
GDP per capita	-0.19***	-0.17***	0.30***	-0.06	1.00							
Institutional Quality	0.02	-0.27***	0.21***	-0.12***	0.05	1.00						
Openness	-0.29***	-0.28***	0.18***	-0.22***	0.50***	0.08**	1.00					
Natural resource	-0.04	0.15***	0.22***	-0.02	0.16***	-0.45***	0.10	1.00				
Political System	0.07**	-0.02	0.04	-0.04	0.03	0.03	0.01	-0.42***	1.00			
LIEC	0.08***	-0.05	0.03	-0.07*	0.01	0.00	-0.05	-0.49***	0.81***	1.00		
Financial Development (1)	-0.09***	-0.09***	-0.08**	-0.04	0.00	-0.07*	0.20***	-0.14***	0.01	-0.02	1.00	
Financial Development (2)	-0.07*	-0.03	-0.06	-0.04	-0.08**	-0.21***	0.01	0.02	0.02	0.01	0.90***	1.00

Table 3: Determinants of net FDI inflows

	1991-2006				1991-2000	2001-2006
	All	Africa (1)	Africa (2)	Asia	All	All
Lagged FDI flows	0.45 (0.05)***	0.45 (0.06)***	0.45 (0.06)***	0.28 (0.12)***	-1.05 (0.08)***	0.37 (0.07)***
GDP	13.64 (10.16)	17.22 (21.5)	20.54 (21.53)	14.16 (5.76)***	51.31 (15.6)***	9.41 (21.98)
Per capita GDP	-3.78 (2.25)*	-4.27 (2.58)*	-4.62 (2.6)*	-2.24 (4.6)	-4.40 (1.79)***	-6.95 (5.06)
Inflation	-0.18 (0.06)***	-0.17 (0.07)***	-0.17 (0.07)***	1.85 (1.47)	-0.26 (0.04)***	0.42 (0.99)
RER volatility	-0.002 (0.06)	-0.01 (0.07)	-0.01 (0.07)	-0.15 (0.12)	-0.06 (0.10)	0.02 (0.09)
Financial Development	8.40 (3.96)**	10.94 (4.84)***	11.63 (4.84)***	2.01 (3.45)	-0.84 (3.7)	0.92 (5.7)
Openness	4.16 (1.18)***	4.52 (1.48)***	4.52 (1.48)***		5.08 (1.09)***	6.72 (2.7)***
Natural resource	0.68 (1.26)	0.96 (1.41)			2.20 (0.95)***	-8.35 (3.6)***
Human capital	4763.32 (4558)	8107 (7758)	9146 (7785)	2051 (2321)	-579.65 (5732)	-2091 (9372)
Fuel export			-1.62 (2.19)			
Ore and metal export			2.95 (1.8)*			
Institutional Quality	-22.41 (77.27)	-4.89 (99.37)	-4.89 (99.37)	14.62 (85.91)	53.97 (47.57)	-141.03 (214.8)
Political System	4.19 (66.1)	-11.54 (79.40)	-11.54 (79.40)		-10.84 (54.97)	114.47 (237.9)
LIEC	-6.75 (12.19)	-9.88 (13.99)	-9.88 (13.99)		-3.83 (9.76)	-26.88 (34.48)
Constant	-0.67 (5.8)	1.88 (7.67)	1.88 (7.67)	-0.26 (4.32)	13.53 (6.30)	20.54 (18.87)
Sargan Test [χ^2]	397.25***	319.35***	317.11***	134.46***	118.24***	181.36***
Autocorr. (1)	-10.24***	-9.18***	-9.23***	-4.89***	-6.20***	-7.49***
Autocorr. (2)	-0.29	-0.22	-0.15	0.49	-3.76***	-0.56
Autocorr (3)	-	-	-	-	3.61***	-
Autocorr (4)	-	-	-	-	-0.20	-
N	422	336	336	111	177	187

Notes: 1.***, **, * indicate significance at 1%, 5% and 10% level. 2. For Asia, some variables are dropped due to their sensitivity to over-identification of the model. 3. The whole sample consists of 48 LDCs for the period 1991-2006; the classification of countries according to the United Nations. Net capital flows, net FDI flows and external debt data are from WDI CD ROM of the World Bank. Net financial flows are disbursements of loans and credits less repayments of principal. It included concessional, non-concessional and other types of financial flows. Foreign direct investment (FDI) is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars. The institutional quality index is the simple average of six governance indicators from Kaufmann et al.(2006), also known as World Bank Governance Indicators (WGI): voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. GDP (U.S. millions of dollars at constant 2000 prices) and GDP per capita (U.S. dollars at constant 2000 prices) are from the World Bank's World Development Indicators (WDI). Financial development is measured by domestic credit divided by GDP, from the WDI. Natural resource is the ore, metals and fuels export as percent of merchandise exports, from WDI. Openness is the sum of exports and imports divided by GDP, built using data from the WDI. Human capital is the share of population over 25 that attended at least some level of secondary schooling, from the World Bank's Education Indicators, EDSTATS.

Table 4: Determinants of external debt (Gross capital inflows), 1991-2006

	1991-2006				1991-2000	2001-2006
	All	Africa (1)	Africa (2)	Asia	All	All
Lagged external debt	0.67 (0.05)***	0.62 (0.06)***	0.64 (0.06)***	0.25 (0.08)***	0.55 (0.08)***	0.69 (0.11)***
GDP	52.32 (19.03)	-72.50 (42.2)*	-85.09 (42.6)**	113.0 (16.26)***	-23.72 (40.45)	124.0 (51.65)***
Per capita GDP growth	-3.78 (2.25)*	4.28 (5.12)	6.77 (5.12)	1.83 (11.74)	-2.51 (5.41)	2.58 (9.94)
Inflation	-0.03 (0.14)	-0.15 (0.15)	-0.15 (0.15)	7.53 (3.8)**	-0.03 (0.12)	1.58 (2.14)
RER volatility	-0.31 (0.14)	-0.34 (0.12)***	-0.32 (0.12)***	-0.58 (0.32)*	-0.18 (0.35)	-0.22 (0.16)
Financial Development	13.68 (4.8)***	8.32 (5.16)*	8.40 (5.16)*	17.24 (4.4)***	-1.32 (5.15)	29.85 (11.58)***
Openness	4.16 (1.18)***	-1.82 (3.10)	-2.32 (3.05)		0.36 (2.82)	-7.50 (5.37)
Human capital	4763.32 (4558)	10989 (15213)	6507 (15103)		-421 (16536)	20745 (19414)
Natural resource	-5.24 (2.56)**	-3.99 (2.76)			-0.96 (2.77)	-17.61 (7.01)***
Fuel export			3.18 (4.29)			
Ore and metal export			-6.57 (3.5)**			
Institutional Quality	137.73 (164.02)	261.75 (199.5)	231.09 (200.58)	86.19 (22.34)	106.76 (149.92)	-48.65 (420)
Political System	-88.35 (135.7)	14.76 (153.7)	2.69 (154.02)		-81.65 (121.86)	-338.06 (409.6)
LIEC	18.48 (26.07)	24.18 (26.74)	20.44 (27.31)		-17.67 (28.79)	45.92 (65.91)
Constant	-31.6 (12.13)***	-22.26 (16.12)	-18.17 (16.30)	15.75 (11.13)	-8.54 (17.63)	-98.98 (36.71)***
Sargan Test [χ^2]	420.30***	358.12***	352.7***	118.02*	120.33	193***
Autocorr. (1)	-5.68***	-5.19***	-5.21***	-7.30***	-8.05***	-4.71***
Autocorr. (2)	-0.72	-0.25	0.16	0.54	-2.00**	1.02
Autocorr. (3)	-	-	-	-	-0.10	-
Autocorr. (4)	-	-	-	-	-	-
N	434	336	336	115	218	188

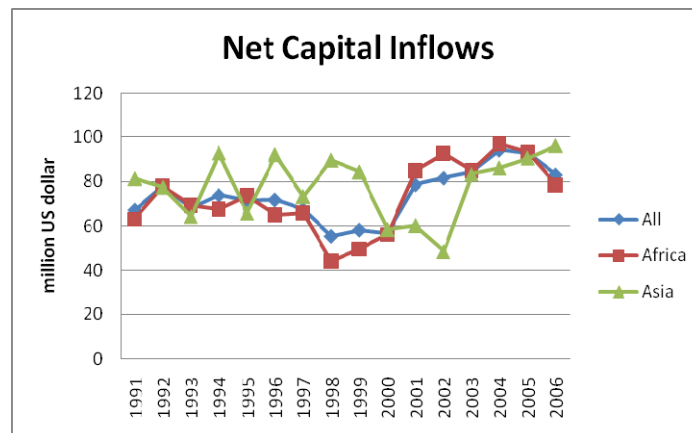
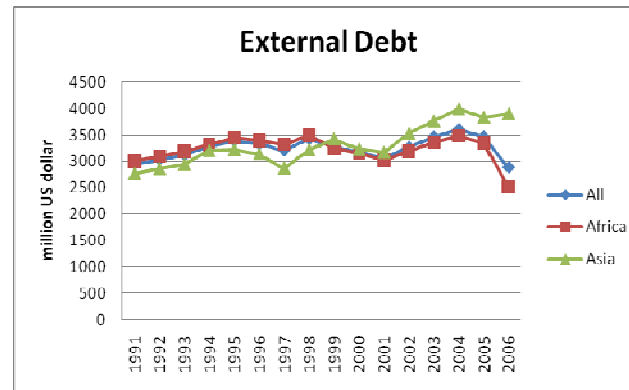
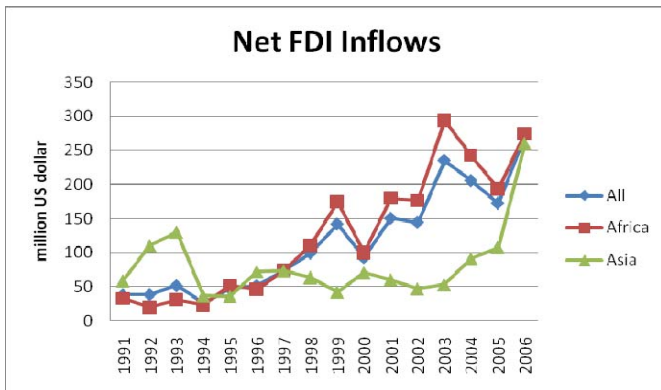
Notes: 1.***, **, * indicate significance at 1%, 5% and 10% level. 2. See footnotes of Table 3 for definitions of variables.

Table 5: Determinants of net capital inflows, 1991-2006

	1991-2006			1991-2000	2001-2006
	All	Africa (1)	Asia	All	All
Lagged net capital flows	0.14 (0.05)***	0.11 (0.06)***	0.15 (0.09)*	0.08 (0.08)	0.13 (0.08)
GDP	3.41 (1.95)*	14.93 (5.84)***	5.20 (1.8)***	-4.44(4.57)	14.89 (4.04)
Per capita GDP growth	0.53 (0.58)	0.41 (0.58)	0.86 (1.75)	0.51 (0.67)	0.26 (0.94)
Inflation	0.009 (0.02)	0.01 (0.02)	0.13 (0.56)	0.002 (0.02)	0.02 (0.33)
RER volatility	-0.02 (0.01)*	-0.02 (0.01)**	-0.04 (0.04)	-0.04 (0.04)	-0.04 (0.02)**
Financial Development	1.19 (0.54)***	1.64 (0.55)***	0.005 (0.63)	1.12 (0.64)*	0.74 (0.99)
Openness	0.06 (0.29)	0.25 (0.31)		-0.20 (0.33)	0.66 (0.53)
Human capital	-742.43 (1119)	680 (1534)		-1465 (1957)	-724 (1689)
Natural resource	0.86 (0.32)***	0.92 (0.33)***		1.04 (0.35)***	0.50 (0.64)
Institutional Quality	-21.72 (18.51)	-19.38 (21.3)	-11.6 (32.6)	-0.24 (18.59)	-55.08 (38.92)
Political System	-7.73 (13.7)	-5.01 (14.81)		-15.4 (13.7)	-24.55 (33.92)
Constant	1.31 (1.26)	-0.24 (0.32)	-1.90 (1.63)	-2.38 (2.03)	-1.29 (3.52)
Sargan Test [χ^2]	233.98***	176.03***	112.85*	65.25***	138.23***
Autocorr. (1)	-13.48***	-11.40***	-8.44***	-7.00***	-7.56***
Autocorr. (2)	0.66	0.63	1.02	0.08	0.25
N	400	308	115	218	182

Notes: 1. ***, **, * indicate significance at 1%, 5% and 10% level. 2. See footnotes of Table 3 for definitions of variables.

Figure 1: Average trend of capital inflows, 1991-2006



Appendix I:

A. Dependent variables:

Net FDI inflows, external debt and net capital inflows are used as dependent variables. Data are taken from World Development Indicators (WDI), the World Bank. The values of the variables are expressed in million dollars.

B. Independent variables:

Institutional quality index

Simple average of six institutional indicators (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption), drawn from Kaufmann et al. (2006), for all available years between 1991 and 2007. The institutional quality index in a given year is formed only for countries that have information for all governance indicators in that year. Each institutional indicator is modeled by the authors as a standard normal distribution (zero mean, and standard deviation one); <http://info.worldbank.org/governance/wgi2007/resources.htm>.

Gross domestic product

Constant 2000 U.S. dollars for all available years between 1991 and 2007. Rescaled to millions in the regressions to make results more legible. Source: World Development Indicators, World Bank.

GDP per capita

Constant U.S. dollars in 2000 for all available years between 1991 and 2007. Source: World Development Indicators, World Bank.

Financial development

Private credit divided by total GDP for all available years between 1991 and 2007. Source: World Development Indicators, World Bank.

Natural resources

Percentage of ore, metals and fuels in total exports for all available years between 1991 and 2007. Source: World Development Indicators, World Bank.

Openness

Sum of imports and exports divided by total GDP for all available years between 1991 and 2007. Source: World Development Indicators, World Bank.

Human capital

Percentage of total population over 25 that attended at least some secondary schooling. Sources: Barro and Lee (2001) available from World Bank Education Indicators (EDSTATS), <http://devdata.worldbank.org/edstats/td10.asp>.

C. Political Institutional Variables:

The following political institutional variables are taken from the data on political indices (DPI) of the World Bank (see Beck et al. 2001).

System

Codes:

Presidential	0
Assembly-elected President	1
Parliamentary	2

Systems with unelected executives get a 0. Systems with presidents who are elected directly or by an electoral college (whose *only* function is to elect the president), in cases where there is no prime minister, also receive a 0. In systems with both a prime minister (PM) and a president, the following factors are considered in order to categorize the system:

- a) *Veto power*: president can veto legislation and the parliament needs a supermajority to override the veto.
- b) *Appoint prime minister*: president can appoint *and* dismiss prime minister and/or other ministers.
- c) *Dissolve parliament*: president can dissolve parliament and call for new elections.
- d) *Mentioning in sources*: If the sources mention the president more often than the PM then this serves as an additional indicator to call the system presidential (Romania, Kyrgyzstan, Estonia, Yugoslavia).

The system is presidential if (a) is true, or if (b) and (c) are true. If no information or ambiguous information on (a), (b), (c), then (d). Countries in which the legislature elects the chief executive are parliamentary (2), with the following exception: if that assembly or group cannot easily recall him (if they need a 2/3 vote to impeach, or must dissolve themselves while forcing him out) then the system gets a 1.

Legislative Indices of Electoral Competitiveness (LIEC):

Codes:

No legislature	1
Unelected legislature	2
Elected, 1 candidate	3
1 party, multiple candidates	4
Multiple parties are legal but only one party won seats	5
Multiple parties DID win seats but the largest party received more than 75% of the seats	6
Largest party got less than 75%	7

Appendix-II: List of sampled 48 LDCs across regions

Africa (33)		Asia (14)*	Latin American and Caribbean (1)
Angola	Liberia	Afghanistan	
Benin	Madagascar	Bangladesh	Haiti
Burkina Faso	Malawi	Bhutan	
Burundi	Mali	Cambodia	
Central African Republic	Mauritania	Kiribati	
Chad	Mozambique	Lao PDR	
Comoros	Niger	Maldives	
Congo, Dem. Rep.	Rwanda	Myanmar	
Djibouti	Samoa	Nepal	
Equatorial Guinea	Senegal	Sao Tome and Principe	
Eritrea	Sierra Leone	Solomon Islands	
Ethiopia	Somalia	Timor-Leste	
Gambia, The	Sudan	Vanuatu	
Guinea	Tanzania	Yemen, Rep.	
Guinea-Bissau	Togo		
Lesotho	Uganda		
	Zambia		

*Tuvalu has not been considered due to lack of sufficient data.

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