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World Institute for Development Economics Research

Discussion Paper No. 2003/43

The 'Pull' and 'Push' Factors in North-South Private Capital Flows

Conceptual Issues and Empirical Estimates

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May 2003

Abstract

This paper is an attempt to rectify some of the problems that characterize most earlier studies that seek to explain private capital flows to developing countries or, at least, to examine the subject from a different and complementary perspective. To accomplish this, we propose a model framework that approaches the issue from the perspective of a capital-exporting developed country and which also takes cognizance of developments in other industrialized countries that could be competing with developing countries for private capital flows. The model is operationalized and estimated with annual panel data over 1970-2000 for 19 capital-exporting developed countries. Specifically, we estimate equations for total private flows, FDI, total portfolio capital flows (PCF) and various categories of PCF. We also test for the effects of a number of factors, each of which has its own 'push' and 'pull' components. The specific explanatory factors are the level of per capita income, interest rate, economic growth, the prevailing phase of economic cycle, the degree of openness of the economy in the balance-of-payment capital account, macroeconomic imbalances, and external debt burden. The empirical findings confirm the posited effects of the 'push' and/or 'pull' component of each of the above factors.

Keywords: private capital flows, foreign direct investment, portfolio capital flows, export credits, developed countries, developing countries

JEL classification: F21, F34

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This study has been prepared within the UNU/WIDER project on the Sustainability of External Development Financing, which is directed by Matthew Odedokun.

This paper was presented at the project meeting in Helsinki, 23-24 August 2002.

UNU/WIDER gratefully acknowledges the financial contribution to the project by the Ministry for Foreign Affairs of Finland.

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UNU World Institute for Development Economics Research (UNU/WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Camera-ready typescript prepared by Liisa Roponen at UNU/WIDER
Printed at UNU/WIDER, Helsinki

ISSN 1609-5774
ISBN 92-9190-468-6 (printed publication)
ISBN 92-9190-469-4 (internet publication)

1 Introduction

Attracting private capital, especially foreign direct investment (FDI), to developing countries has recently received much attention in international policy circles. For instance, it occupied a central place in the 2002 United Nations Summit on Finance for Development in Monterrey. From an essentially development perspective, it had earlier been considered the nexus of the OECD's Development Assistance Committee (DAC) which states in the *Development Cooperation* report (OECD 2001: 20):

> The time has therefore come to revisit development financing itself, to promote an overall coherent approach where each of the following aspects will have an important role: domestic resources; better distributed and guided expansion of private external flows for development in partner countries, including the poorest of them; and renewed role of development assistance, linked to increased efficiency and adequate volume.

The report (OECD 2001: 76) continues in the same vein:

> Looking at the future of development financing, the policy statement, *Partnership for Poverty Reduction: from Commitment to Implementation*, adopted at the DAC High Level Meeting in May 2000, notes that 'it is important that developing countries progressively rely on their own domestic resource mobilisation, complemented increasingly by sustained long-term private capital flows. A role of aid is to contribute to this process and to support efforts to diminish aid dependence, particularly in those countries, regions and sectors where access to private capital flows is still elusive or limited.

Similarly, from a less developmental but largely financial policy perspective, FDI and portfolio capital flows (PCF) have featured prominently in proposals for the reform of international financial architecture (see Zedillo 2000). The reverse flows of private capital to Latin American countries in the early 1990s, coupled with the financial crisis in Mexico in 1994 and particularly in South-east Asia in 1997, gave impetus to this issue of north-south private capital flows.

The central place of cross-border private capital flows has given rise to a number of academic studies on the subject seeking to empirically determine the factors that influence such flows. Several models of capital flows have been suggested and a number of the empirical studies undertaken—as evidenced by the edited books that sprang up, particularly in the wake of the East Asian crisis (e.g., Ito and Krueger 2001; Armijo 1999; Chang *et al*. 2001; Edwards 2000; and Griffith-Jones *et al*. 2001). But despite this, not all the issues have been addressed and many that have been addressed are still far from being resolved.

In particular, most of the existing studies approach the matter from the perspective of the destination or host country (i.e., the south) and thus focus mainly on 'pull-factors', or characteristics of the destination countries. Related to this is the confusion that may arise in interpreting results of a model based on host country perspective, as most studies understand the observed effects of the pull-factors to also mean those affecting foreign investors' aggregate supply responses, instead of merely those factors which affect allocation or distribution of (possibly, a given volume of) financial flows by

northern investors to host countries in the south (see Oxfam America, 2002). Also, the controversy still continues on the relative importance of pull- and push-factors (i.e., source country characteristics) on north-south capital flows. Many studies have addressed this issue (Hernandez and Rudolph 1995; Fernández-Arias 1996; Montiel and Reinhart 1999; Agenor 1998; Mody *et al*. 2001, etc.). While some studies (Fernández-Arias 1996) contend that push-factors are the major ones shaping the volume of capital flows, others (Hernandez and Rudolf 1995) argue differently.

Thus, many issues still need to be addressed, and the present paper attempts to address these gaps in the literature. Particularly, we propose a model framework which identifies the effects of various pull-factors on the volume of private capital flows and which also permits testing for the effects of various source country-specific or push-factors as well as those relating to the generality of developed countries. The model is then estimated with annual panel data over 1970-2000 for about 20 DAC members. We report not only separate equations for total private flows, FDI and aggregate PCF but also for the various PCF components. Again, this is another feature not common in most earlier studies.

The rest of the paper is organized as follows: section 2 highlights some stylized facts on private capital flows while section 3 presents a critique of the mainstream model framework and describes the framework adopted here. Operationalization of the suggested model framework is discussed in section 4. The empirical results are given in section 5 while section 6 presents the summary and conclusion.

2 Some stylized facts

There has been a general upward trend (in nominal US dollar terms) in the volume of net capital flows from the developed to the developing countries in the past three decades (see Table 1 and Figure 1). Total net flows increased from an annual average of US$ 22.28 billion in the 1970s to US$ 26.36 billion in the 1980s and finally to US$ 80.94 billion in the 1990s. FDI experienced a more rapid growth, increasing from just US$ 7.08 billion per annum in the 1970s to US$ 15.85 in the next decade and tripled in the 1990s to achieve US$ 49.95 billion annually. On the other hand, PCF during the same ten-year period decreased from US$ 15.20 per annum in the 1970s to just US$ 10.51 in the 1980s before it again rose, approximately at the same pace as FDI, in the 1990s to US$ 30.99 per year.

In relation to source country GDPs, however, total net capital flows have been declining, from 0.51 per cent of GDP in the 1970s to just 0.24 per cent in the 1980s before rising modestly to 0.39 per cent in the 1990s. But the FDI component actually recorded an upward trend to attain 0.24 per cent in the 1990s, after falling from 0.16 per cent of GDP in the 1970s to 0.14 per cent in the 1980s. PCF fell drastically from 0.35 per cent of GDP in the 1970s to a measly 0.09 per cent in the 1980s but compensated in the 1990s for some of this decline by rising to 0.15 per cent of GDP. Thus, private capital flows in relation to GDP were the lowest in the 1980s, and this trend applies to both FDI and PCF. Another remarkable feature of capital flows is the small magnitudes involved. After taking into account reverse transfers in the form of interest payments

Table 1
Sources and volatility of foreign net capital flows to developing countries, 1970-2000
(transition countries excluded)

	Total private flows			Foreign direct investment (FDI)			Portfolio capital flows			Volatility index (coefficient of variation), 1970-2000		
	1970-80	*1981-90*	*1991-2000*	*1970-80*	*1981-90*	*1991-2000*	*1970-80*	*1981-90*	*1991-2000*	Total capital flows	FDI	Portfolio capital
	Amount (annual average, US$ billion, current values)											
Australia	0.16	-0.05	0.53	0.09	0.35	-0.49	0.07	-0.41	1.01	1.74	1.91	2.06
Belgium	0.82	0.28	0.61	0.11	0.18	0.54	0.71	0.10	0.08	4.97	1.59	9.21
Canada	0.74	0.62	3.51	0.21	0.25	3.48	0.53	0.38	0.03	1.20	1.47	2.49
Denmark	0.14	0.06	0.12	0.04	0.06	0.13	0.10	0.00	-0.01	1.69	1.39	4.46
Finland	0.03	0.08	0.28	0.01	0.04	0.11	0.03	0.04	0.17	1.91	1.87	2.86
France	2.53	2.35	3.61	0.36	0.82	3.07	2.17	1.53	0.54	1.09	1.14	2.13
Germany	2.10	2.88	9.84	0.78	0.97	3.32	1.31	1.91	6.52	0.91	1.03	0.91
Greece	–	–	–	–	–	–	–	–	–	–	–	–
Ireland	–	–	–	–	–	–	–	–	–	–	–	–
Italy	1.34	0.65	3.87	0.21	0.45	0.79	1.13	0.20	3.08	1.63	1.04	1.89
Japan	2.63	5.84	10.58	0.69	3.52	5.91	1.93	2.32	4.67	1.04	0.97	1.59
Luxembourg	–	–	–	–	–	–	–	–	–	–	–	–
Netherlands	0.60	0.42	3.86	0.24	0.41	3.19	0.36	0.00	0.66	1.30	1.51	1.95
New Zealand	0.01	0.03	–	0.01	0.03	0.02	0.00	0.00	–	0.93	0.83	1.46
Norway	0.13	-0.01	0.23	0.02	0.02	0.16	0.11	-0.03	0.07	1.47	1.70	2.27
Portugal	–	–	0.93	–	–	0.85	–	–	0.08	1.71	1.69	3.06
Spain	–	0.11	7.24	–	0.20	7.32	–	-0.09	-0.08	1.99	2.06	5.15
Sweden	0.30	0.38	0.63	0.08	0.15	0.39	0.22	0.23	0.24	1.07	1.34	1.43
Switzerland	1.18	1.16	0.64	0.18	0.74	0.89	1.00	0.42	-0.25	1.66	1.91	2.96
UK	4.52	3.52	8.45	0.77	2.67	6.62	3.75	0.85	1.83	0.84	1.00	1.65
USA	5.06	7.54	33.94	3.29	4.98	20.70	1.77	2.56	13.24	1.17	0.92	1.88
Total*	22.28	26.36	80.94	7.08	15.85	49.95	15.20	10.51	30.99	1.57	1.41	2.74
Austria	0.14	0.23	-0.16	0.01	0.01	0.06	0.12	0.22	-0.22	na	na	na
Australia	0.38	-0.05	0.26	0.22	0.36	-0.24	0.16	-0.42	0.50	na	na	na
Belgium	1.23	0.23	0.26	0.16	0.15	0.22	1.07	0.08	0.03	na	na	na
Canada	0.43	0.16	0.59	0.12	0.06	0.58	0.31	0.09	0.00	na	na	na
Denmark	0.35	0.08	0.08	0.09	0.07	0.08	0.25	0.01	-0.01	na	na	na
Finland	0.12	0.10	0.24	0.02	0.06	0.10	0.11	0.05	0.14	na	na	na
France	0.70	0.31	0.26	0.10	0.11	0.22	0.60	0.20	0.04	na	na	na
Germany	0.40	0.28	0.47	0.15	0.09	0.16	0.25	0.18	0.31	na	na	na
Greece	–	–	–	–	–	–	–	–	–	na	na	na
Ireland	–	–	–	–	–	–	–	–	–	na	na	na
Italy	0.59	0.10	0.34	0.09	0.07	0.07	0.50	0.03	0.27	na	na	na
Japan	0.45	0.30	0.24	0.12	0.18	0.13	0.33	0.12	0.11	na	na	na
Luxembourg	–	–	–	–	–	–	–	–	–	na	na	na
Netherlands	0.62	0.22	1.05	0.25	0.22	0.87	0.37	0.00	0.18	na	na	na
New Zealand	0.06	0.10	–	0.04	0.08	0.04	0.02	0.01	–	na	na	na
Norway	0.40	-0.01	0.16	0.05	0.03	0.11	0.35	-0.04	0.05	na	na	na
Portugal	–	–	0.92	–	–	0.84	–	–	0.08	na	na	na
Spain	–	0.04	1.28	–	0.07	1.29	–	-0.03	-0.01	na	na	na
Sweden	0.41	0.26	0.27	0.11	0.10	0.17	0.31	0.16	0.10	na	na	na
Switzerland	1.98	0.83	0.25	0.30	0.53	0.34	1.67	0.30	-0.10	na	na	na
UK	1.78	0.56	0.71	0.30	0.43	0.55	1.48	0.14	0.15	na	na	na
USA	0.29	0.17	0.44	0.19	0.12	0.27	0.10	0.06	0.17	na	na	na
Total	0.51	0.24	0.39	0.16	0.14	0.24	0.35	0.09	0.15	na	na	na

Notes: * The numbers for the volatility index are averages (and not totals) across the 18 countries. (Australia's figure is excluded, being an outlier);
– = non-availability of data;
na = non-applicable.

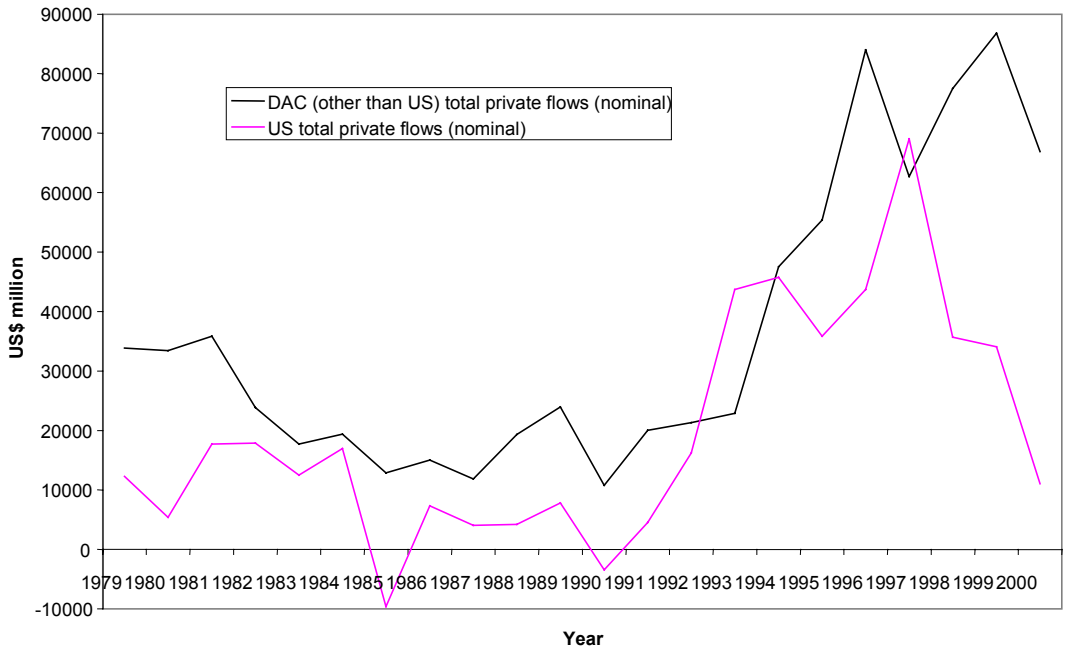
Source: Computed from DAC (online) and World Bank's GDP figures from International Development Statistics.

Table 2
Indicators of structure and trends of commercial capital flows from developed to developing countries,*
1975-2000

	1975-84	1985-94	1995-2000	1975-84	1985-94	1995-2000
	Amount (US$ billion, annual average)			% of total private flows		
Total private flows	37.45	34.65	163.05	100.00	100.00	100.00
FDI	11.46	26.13	102.64	30.61	75.43	62.95
Portfolio capital: total	25.99	8.51	60.41	69.39	24.57	37.05
Portfolio capital: banks	–	–	23.74	–	–	14.56
of which: banks' net export credits	–	–	0.37	–	–	0.22
Portfolio capital: non-banks	–	–	35.48	–	–	21.76
of which: Non-banks' net export credits	7.63	0.98	3.39	20.36	2.81	2.08
of which : Non-banks' securities & other	1.24	4.26	31.66	3.31	12.30	19.42
Memo: Net export credits (total)	8.48	0.81	3.75	22.64	2.33	2.30
	% of source countries' GDP			% of destination countries' GDP		
Total private flows	0.54	0.22	0.71	1.76	0.95	2.44
FDI	0.17	0.17	0.45	0.54	0.72	1.54
Portfolio capital: total	0.38	0.05	0.26	1.22	0.23	0.90
Portfolio capital: banks	–	–	0.10	–	–	0.36
of which: banks' net export credits	–	–	0.00	–	–	0.01
Portfolio capital: non-banks	–	–	0.15	–	–	0.53
of which: Non-banks' net export credits	0.11	0.01	0.01	0.36	0.03	0.05
of which : Non-banks' securities & other	0.02	0.03	0.14	0.06	0.12	0.47
Memo: Net export credits (total)	0.12	0.01	0.02	0.40	0.02	0.06

Note: * The developing countries also include countries in transition.
Source: Computed from the DAC (online) and the World Bank's GDP
Figures from *International Development Statistics* (online).

Figure 1
Total net capital flows from the US and DAC member countries, 1979-2000
(US$ million)



Source: DAC's International Development Statistics (online).

and profit remittances, amounts would probably be about the same as official development assistance (ODA) from the same DAC member countries. The latter averaged close to 0.30 per cent of donor GDP for the same decades.

The composition of capital flows, particularly PCF, is shown in Table 2. While non-bank and, hence, total export credits constituted in the 1975-84 decade a prominent component of PCF and of total capital flows, they have since become relatively insignificant. Instead, it is the securitized PCF that rose to prominence, particularly after 1995. As discussed above, PCF as a whole has been declining in relative importance, dropping from 69.39 per cent of total capital flows in 1975-84 to 24.57 per cent in 1985-94 before rising relatively to 37.05 per cent during 1995-2000 period.

Table 2 shows not only the flows in relation to source country GDPs but also in relation to the GDP of developing (or destination) countries. These accounted for 1.76 per cent of the GDP in destination countries in 1975-84 decade, fell by about half to just 0.95 per cent during the 1985-94 period, before rising to 2.44 per cent during the 1995-2000 period.

The trend movements in private capital flows from the US and other DAC member countries combined are shown separately in Figure 1, confirming the statistics given in Tables 1 and 2. In addition, Figure 1 shows that while net flows from the US are important, they have always (except for two isolated years) been less than flows from other developed countries combined, averaging about 70 per cent of the flows from other developed countries, or 40 per cent of the total (which includes the US itself). Thus, the almost exclusive attention and prominence given in the literature to flows from the US to developing countries seems to be unwarranted.

Table 1 also confirms the general notion that PCF is more volatile than the FDI. The coefficient of variation (a volatility indicator) is higher for PCF than for FDI for all source countries, except Germany.

3 Model framework

3.1 The existing or received framework: modelling from the perspective of destination countries

We start our exposition with the assumption that the developed countries are a single composite region called the 'north', which constitutes the source country of financial flows to the universe of *m* developing countries, collectively called the 'south'. The total—or envelope—of transferable resources (denoted by *S*) during each period from this composite north is, by definition, the country's excess saving over domestic investment spending which is also the same as its (current account) balance of payments (BOP) surplus.[1] This resource envelope *S* is to be allocated over its portfolio of potentially *n* foreign 'assets' or uses, as shown in Table 3. These could be net foreign direct investment, net portfolio investment, official loans, official unrequited transfers

[1] The concept of saving can be thought of as gross national income less gross national expenditure, and before net unrequited transfers, which, in turn, are 'below the line' items in defining the BOP surplus as excess of exports over imports of goods and services. This BOP definition is to include grants (official unrequited transfers) in the north-south financial flows.

or grants, private unrequited transfers, autonomous reduction in foreign reserves held by developing countries, etc. We denote the amount allocated to each type i by F_i ($i = 1, \ldots n$). Also, for each category of use, the source country has to decide on its allocation among m potential destination countries, each of which receives S_j ($j = 1, \ldots m$) in the form of a combination of n 'assets'. Ignoring the intra-destination countries' financial flows (which in real life are relatively few and small in amounts), the (current account) BOP deficit of each destination country j is the column total ($\sum y_{ij} = S_j$) for that country. The resulting m by n matrix of uses and destinations is shown in Table 3, which, therefore, constitutes a very disaggregated (mainly) capital account section of BOP record for the composite capital-exporting country. The relationship between the transferable resource envelope S and its uses is shown in equation (1) below, which is, in fact, an identity or BOP constraint.

$$S = \sum_{j=1}^{m} \sum_{i=1}^{n} y_{ij} = \sum_{i=1}^{n} F_i = \sum_{j=1}^{m} S_j \qquad (1)$$

Previous econometric studies typically seek to explain, from the perspective of the south, the variation in just a single element y_{ij} of the above matrix, i.e., net inflow to a given recipient country over time (or across countries at a point in time) of a particular category like foreign direct investment, portfolio investment or foreign aid. The typical equation specified, assuming a time-series approach, in the most elaborate studies takes the form:

$$y_{ijt} = f(x_{jt}, Z_t) \qquad (i = 1, 2, \ldots n; j = 1, \ldots m; t = 1, \ldots T) \qquad (2)$$

where:

y_{ijt} = net financial inflow of type i that is being explained (say, portfolio investment) to the destination country j in period t;

x_{jt} = a representative element of the vector of specific characteristics or factors relating to the destination country j during period t, which are popularly referred to as the pull-factors in such studies; and

Z_t = a representative element of the vector of specific characteristics or factors relating to the international community, especially the source country (the north) at time t, which are popularly called the push-factors.

If the x_j is found to have a negative causal effect on y_{ij}, the inference would be that high value of x_j deters foreign financial inflow of type i to country j, so that policies aimed at attracting y_i to country j should aim at reducing that particular factor. The reverse holds if that factor is found to have a positive causal effect on y_{ij}.

This type of econometric analysis can highlight much about certain types of foreign financial allocation policies. For instance, it is sometimes desirable to target a given volume of north-south financial flows to a particular country j, in the form of a specific productive type i (like, say, foreign direct investment), irrespective of how this increased allocation is financed and whether any additionality exists. From this type of analysis, one can infer whether the pull-factor x_j has the effect of bringing this about. This would be satisfactory if the manner of financing the resulting increase in y_{ij} (or utilization of its induced decrease, if that is the case) is of no concern.

Table 3
Hypothetical disaggregated balance of payments (BOP) capital accounts for the developed country

	Destination country				Total for each type of resource transfer
	1	2	…	*m*	
Financial asset:					
1 (say, FDI)	y_{11}	y_{12}	…	y_{1m}	$\sum y_{1j} = F_1$
2 (say, portfolio investment)	y_{21}	y_{22}	…	y_{2m}	$\sum y_{2j} = F_2$
3 (say, foreign grants)	y_{31}	y_{32}	…	y_{3m}	$\sum y_{3j} = F_3$
.	.	.	…	.	.
.	.	.	…	.	.
.	.	.	…	.	.
n (say, decrease in foreign reserve holdings by destination countries)	y_{n1}	y_{n2}	…	y_{nm}	$\sum y_{nj} = F_n$
Total transfers to (or BOP deficit for) each destination country	$\sum y_{i1} = S_1$	$\sum y_{i2} = S_2$	…	$\sum y_{im} = S_m$	$\sum\sum y_{ij} = \sum F_i = \sum S_j$

But this popular approach can also be defective or error-prone in addressing other forms of allocation policies while it can fail woefully when it comes to additionality or crowding-out issues. The pull-factor induced increase in y_{ij} (i.e., x_j-induced) could have been at the expense of any combination of the remaining nm-1 entries or cells of $y_{\kappa\tau}$'s ($\kappa = 1, \ldots -1$; $\tau = 1, \ldots m$-1; $\forall\ \kappa \neq i$ and $\tau \neq j$) given in Table 3. In other words, it could have been financed by reducing other forms of inflow (i.e., some other elements of S_j, other than y_{ij}) to that particular country, as would have been the case if the increased FDI is partially or wholly financed by a corresponding decrease in foreign portfolio capital. It also means that the x_j-induced increase in y_{ij} could have been at the expense of a reduction in foreign resource flows (whether of the same type i or of any other types) to other destination countries. The existing approach is not equipped to shed much light here.

One important policy area is the allocation of a given volume of north-south financial flows—not to a particular country j as such, but to all or a combination of the m destinations countries—for a particular type i (say, FDI) from a combination of other types. This has to do with additionality or crowding-out effect of the pull-factors on a particular type i of north-south resource flow, viewed from the perspective of the totality of the destination countries. As a representative example of a practical and real life situation, competing for foreign direct investment (FDI) through various fiscal or other incentives is often said to be a zero-sum game, where net inflows gained by the country providing the incentives equal the net inflows (of FDI and, probably, of other private investment) lost by other destination countries. This leads to cut-throat competition in the provision of such incentives. The approach has little light to shed on whether contentions like these are actually true, contrary to what previous studies often appear to claim.

The pull-factors identified through such studies indicate only the elements taken into consideration by source countries in allocating their net saving among the different types of foreign financial resource flows or among various potential destination countries. At best, they merely constitute the necessary conditions for changing the volume of a particular type of foreign transfer. The reason why they are necessary conditions is that, if the source country, in its allocation to the various types of financial flows and/or different destination countries, is observed not to have reckoned with a particular potential pull-

factor, then this factor can be considered irrelevant in influencing the total volume of that specific type of financial flow to a particular country. Thus, the approach can be useful in screening the pull-factors which need further investigation. But a more reliable econometric approach is needed for identifying the genuine pull-factors which affect not only the allocation of a given volume of net saving between different types of foreign financial flows and destinations, but also entail an additionality of net financial flows. In other words, a potential pull-factor that does not actually affect the allocation of financial flows would also not affect the supply or total volume of such flows. But the converse is not true because certain factors, although not affecting total supply, can affect the allocation or 'rationing' of a given volume. Generally, in as much as the analysis is still confined to the specification of equations from the perspective of destination countries, there will be the inherent problem of conclusively inferring whether an identified pull-factor influences the source country's allocation decision only, or whether it also affects its overall supply or volume behaviour.

3.2 Distinctions between modelling financial flows from the source and destination perspectives

This distinction in the perspectives between destination and source countries needs to be elaborated further before we describe our modelling, which is based on the latter perspective. As already pointed out, in modelling the north-south financial flows from a source-country perspective, equations do not need to be specified for each destination country and, hence, for any of the *nm* matrix of y_{ij} or even S_j entries depicted in Table 3, but rather for the aggregate of these. This entails specifying an equation for each financial type *i*, i.e. F_i in Table 2.[2]

Modelling equation for F_i is said to be from a source-country perspective. This is so because in this type of formulation (as further described in equation (5)), the *z* push-factor for individual source countries (i.e., if we relax the assumption of just a single composite source country) should now replace what in equation (2) constitute the composite *Z* push-factor for aggregate source country. Similarly, *X*, a composite aggregate for all the destination countries should now replace the *x* pull-factor for individual destination countries that features in equation (2). Otherwise, in principle, modelling from the source-country perspective does not necessarily entail a difference in the type of explanatory variables involved. But in practice, expediency often leads to testing for a different set of explanatory variables.[3]

Apart from this, a difference will also arise from normalizing or scaling the statistics used to estimate the model. Under the equation (2) format, the dependent variable is expected to be normalized or scaled by the price level (for the value, in real terms), by the

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2 Information on F_i can be obtained by aggregating y_{ij} over the *m* destination countries, which can be tedious and, therefore, hardly adopted in reality. Given the manner in which statistics are normally made available, an easier approach is to obtain the information in 'ready made' form from the source country, since it is simply the source country's transfer of type *i*, without concern about the receiving countries. For instance, statistics on FDI from a particular FDI-exporting country are more readily available at source than attempting to collate the same from several destination countries.

3 For example, information on some push-factors may now be available for each individual source country which may not be available (or feasible to compute) in composite form for all countries in estimating equation (2), just as some push-factors for individual destination countries in equation (2) may now cease to be available (or practicable to compute) in composite form for all.

population (for expressing it on a per capita basis) or by the GDP of the destination countries. But under the source-country perspective, it would now be normalized by similar source country indicators.[4] And this introduces another serious flaw in specifying equations from the perspective of the destination countries. In modelling cross-border private financial flows, it is generally assumed, based on the presumption that destination countries are being rationed somewhat, that the observed flows stand for supply (at the initiative of investors in capital-exporting countries) as opposed to demand. Therefore attempts are made to model the behaviour or reaction of foreign investors. The objective is to explain (either the supply or allocation) response, effort or decision of the source country and not to describe the resource needs or requirements of the recipients. This means that the variables (price level, population, GDP, etc.) to be used in normalization should be those of the source country. But this becomes difficult, and sometimes impossible, if the destination country perspective is adopted.[5]

But the difference arising from scaling with the destination country variables can often be so substantial as to seriously affect the results of the model estimates. For example, when the normalization variable is the population, using this indicator for the recipient country underestimates the source country's supply, allocation or effort over time because populations in destination countries often grow rapidly while typically the source-country population is almost stagnant. The converse may be true with price levels. Purchasing power parity does not always hold at every point in time—that is, if it holds at all. Generally in the recent past as a result of macroeconomic 'reforms', etc., nominal rates of foreign inflation-adjusted depreciation of domestic currency have been higher than domestic inflation rates. This means that a given amount of foreign resource flows, when converted into local currency and deflated by the price level, now appears larger, spuriously suggesting that the source country has become more 'generous'. Many destination countries (particularly the low-income ones) have been experiencing slower rates of real GDP expansion than the typical source country, so that using GDP as the normalization factor would have a similar effect. This problem becomes pronounced in cross-section and panel regression models, due to the usually great diversities among destination countries with regard to population growth, economic growth, inflation and currency depreciation. This problem, in conjunction with the low quality and scanty destination country data on GDP, population, prices and even BOP (or foreign resource receipts generally), suggests that the dependent variables in most existing studies are often not dependable, and the results should therefore be viewed with caution.[6]

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4 Ordinarily, if market clearing exists in international financial markets, observations on the nominal value of each type of resource flow can be described either as transfers or receipts, just as the observed market quantity (in the absence of rationing) can be called demand or supply. In this sense, a researcher that describes the cup as being half-full would be equally as right as the one describing it as half-empty. So, it is what we do with it (including whether we normalize it with variables from source or destination countries) that determines whether we model it from the source or destination country perspectives.

5 For instance, in practice, in equation (2), y_{ij} flow to destination country j could have come from several source countries, so that the resulting normalization would become extremely tedious and painstaking. Probably because of this statistical expediency, the adoption of destination country perspective (as in equation (2)) and normalization in terms of the destination country variables have always been going together.

6 Some of the issues here have to do with the relative attractions of using the DRS (debtor reporting statistics) typified by World Bank publications and CRS (creditor reporting statistics) typified by the OECD and BIS (Bank for International Settlements) publications.

Table 4
Hypothetical disaggregated (BOP) capital accounts for the representative developed country *k*

	Net resource flows from the representative developed country *k* to each (and total) of the *m* developing countries					Net resource flows from the representative developed country *k* to each (and total) of the remaining *q*-1 *developed* countries					
	Developing country					Developed country					
	1	2	…	*m*	Total	1	2	*k*	…	*q*	Total
Financial asset from country *k*											
1 (say, FDI)	y_{11k}	y_{12k}	…	y_{1mk}	$\sum y_{1jk=} F_{1k}$	w_{11k}	w_{12k}	$w_{1kk} = 0$	…	w_{1qk}	$\sum w_{1jk=} A_{1k}$
2 (say, portfolio investment)	y_{21k}	y_{22k}	…	y_{2mk}	$\sum y_{2jk=} F_{2k}$	w_{21k}	w_{22k}	$w_{2kk} = 0$	…	w_{2qk}	$\sum w_{2jk=} A_{2k}$
3 (say, foreign grants)	y_{31k}	y_{32k}	…	y_{3mk}	$\sum y_{3jk=} F_{3k}$	w_{31k}	w_{32k}	$w_{3kk} = 0$	…	w_{3qk}	$\sum w_{3jk=} A_{3k}$
.	.	.	…	.	.	.	.	.	…	.	.
.	.	.	…	.	.	.	.	.	…	.	.
.	.	.	…	.	.	.	.	.	…	.	.
n (say, decrease in foreign reserve holdings in country *k*'s currency)	y_{n1k}	y_{n2k}	…	y_{nmk}	$\sum y_{njk=} F_{nk}$	w_{n1k}	w_{n2k}	$w_{nkk} = 0$	…	w_{nqk}	$\sum w_{njk=} A_{nk}$
Total transfers from or BOP (current account) bilateral deficit with country *k*	$\sum y_{i1k} = S_{1k}$	$\sum y_{i2k} = S_{2k}$	…	$\sum y_{imk} = S_{mk}$	$\sum\sum y_{ijk=} \sum F_{ik} = \sum S_{jk}$						$\sum\sum w_{ijk=} \sum A_{ik}$

3.3 Modelling from the perspective of source countries

To further describe the source country-based framework, we relax the earlier assumption of a single conglomerate country (called 'north') and replace it with the existence of q source countries that now comprise the north.[7] For a typical developed country k ($k = 1, \ldots q$), its equivalent of Table 3 matrix would now look like Table 4, where the additional subscript k is added to indicate that the table is for the typical developed country k. The added element of Table 4 is the inclusion of financial flows $w_{\eta\tau}$ ($\eta = 1, \ldots n\text{-}1$; $\tau = 1, \ldots q\text{-}1$; $\forall\ \eta \neq i$ and $\tau \neq k$) between the typical country k and its other q-1 developed country counterparts (with country k's financial flow with itself being shown to be zero). While financial flows among developing countries are few and often relatively negligible, this is not the case for intra-developed country flows, as their financial markets are highly integrated. Consequently, it is desirable to recognize this type of financial flow. So, with this assumption of many developed countries and the new notations, the utilization of the available transferable resource envelope (S_k) at the disposal of developed country k is described in equation (3). There, S_k is divided between transfers to all the developing countries, given by $\sum F_{ik,}$ and the transfers to all the other q-1 developed countries, given by $\sum A_{ik}$ (where A_{ik} is the amount of financial transfer of type i from developed country k to all other developed countries).

$$S_k = \sum_{i=1}^{m} F_{ik} + \sum_{k=1}^{q-1} A_{ik} \tag{3}$$

Aggregating equation (3) over all the q developed countries yields equation (4), which corresponds (or should be equal in magnitude) to equation (1). By definition, the sum of the balances between developed countries ($\sum\sum A_{ik}$) should equal zero.

$$S = \sum_{k=1}^{q} S_k + \sum_{k=1}^{q} \sum_{i=1}^{m} F_{ik} + \sum_{k=1}^{q} \sum_{k=1}^{q-1} A_{ik} = \sum_{k=1}^{q} \sum_{i=1}^{m} F_{ik} + 0 \tag{4}$$

As mentioned earlier, the model specification from the perspective of the developed or source countries should be for the aggregate of each type of financial flow i, with the recipient developing countries' identity now no longer applicable. In other words, equations (assuming time-series approach) are now to be specified for F_{ik} so that for each developed country k, the supply function with respect to resource flow of type i is to be modelled, as shown in equation (5) below, which is equivalent to the earlier equation (2), i.e., from a recipient-country perspective.

$$F_{ik\,t} = f(z_{kt}, X_t) \qquad (i = 1, 2, \ldots n;\ k = 1, \ldots q;\ t = 1, \ldots T) \tag{5}$$

where:

$F_{ik\,t}$ = net financial inflow of type i that is being examined (say, portfolio investment) from developed country k to all developing countries combined in period t;

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[7] Henceforth, these are referred to as developed countries and destination countries as developing countries, so as to avoid confusion.

z_{kt} = a representative element of the vector of specific factors relating to developed country k during period t, referred to as push-factors; and

X_t = a representative element of the vector of specific factors relating to the totality of developing countries (being measured as a composite or weighted average of the factor for all the developing countries), so that it constitutes a vector of some sort of composite pull-factors.

In the above formulation, the additionality (or lack of it) of the representative pull variable X should no longer be ambiguous. If the coefficient of X is zero (in practice, if it is statistically insignificant), it follows that the element could at best only affect the distribution of F_{ik} among the various recipient countries but not its total volume, so that no additionality is involved. But if the coefficient of that element is non-zero (and, presumably, of the expected sign), it would imply that its effect on various recipient countries does not cancel or crowd-out each other, so that there is additionality in its effect. It would also suggest that it does affect each of the m elements in the ith row (i.e., in the row for F_{ik}) in Table 5; i.e., it could be deemed to have a similar effect on this type of flow to each of the m destination countries; consequently, there is little need for individually estimating equations for this particular type of transfer for each recipient country, as would have been the case in adopting a recipient-country perspective in the model specification. Both the necessary and sufficient conditions for the effect of that particular pull-factor in changing the volume of a specific type of financial flow to each developing country and the collectivity of developing countries would have been met.

As a practical illustration, let us assume that F_{ik} stands for total FDI flows from developed country k (say, Japan) and that X is the composite average of economic growth in all the developing countries. Also, let us assume that the coefficient of this composite economic growth is statistically insignificant in the FDI flow equation for Japan-to-developing countries. It means that even though economic growth in a particular developing country might be a potential pull-factor on FDI flows from Japan, this is entirely at the expense of its FDI flows to some other (presumably, non-growing) developing country. This follows from the observation that a simultaneous or average economic growth in all the developing countries does not affect Japan's FDI to these countries. But if the coefficient is positive and statistically significant, it follows that a simultaneous growth of all developing countries would induce a net addition to Japan's FDI inflow to developing countries. It also implies that Japanese FDI flow to each and every developing country is positively attracted or 'pulled' by the high growth performance in that country, making it conceptually superfluous to separately test for the effect of economic growth on Japan's FDI flows to each and every one of the countries.

But now if the effects of the push-factors (elements of vector Z_k) are to be properly determined, a different model specification problem has to be addressed. In equation (3) and Table 4, the presence of intra-developed country flows are highlighted so as to correspond to reality. It follows that there would be substitution between total financial flows from a particular developed country k to the m developing countries on one hand and to the rest of q-1 developed countries on the other. Thus, following from equation (3), the conditions in the q-1 developed countries, by affecting $\sum A_{ik}$ (net inflow from developed country k to other developed countries combined), would also affect $\sum F_{ik}$ (net inflow from developed country k to all developing countries), if the

identity between fixed S_k (developed country k's balance of payment surplus or saving-investment balance) and $\sum F_{ik} + \sum A_{ik}$ is to hold. This means that the push-factors in the remaining q-1 developed countries, by affecting $\sum A_{ik}$ in the particular developed country k, could have effects or, rather, cross-effects on financial flows from country k to the m developing countries, i.e., in addition to the effects they would have on the direct flows from the q-1 developed countries to developing countries. For example, the flow from Japan of FDI (or even totality of financial flows) should depend not only on the economic growth in developing countries (i.e., pull-factor) or even in Japan (push-factor), but also on the economic growth in other developed countries outside Japan (namely, USA, Germany, etc.). In other words, growth in these other developed countries has a direct effect on their respective bilateral FDI flows to developing countries, as well as an indirect effect through the volume of flows from Japan to the same developing countries. This arises from the complex interrelated cross-country flow-of-funds relationships, whereby events in one country have ripple effects on others.

Consequently, the model specification should take note of the ripple effect, and this can be accomplished within the framework of reduced-form equation (5) by including the composite push-factor equivalent of developed country k's z_k for other developed countries, (say, $\check{Z}_k$), as given in equation (6). This would be computed as weighted average of the factors for the q-1 developed countries (i.e. $\check{Z}_k =, \sum_{h=1}^{q-1} \pi_h Z_h$,where π_h is the weight for or relative importance of country h so that $\sum_{h=1}^{q-1} \pi_h = 1$, $\forall\ h \neq k$).[8] By this, the cross-effects of z factor in the remaining developed countries on F_{ik} would be controlled for in estimating the effect of z_k. Except in some exceptional or rather uncommon circumstances (e.g., degree of openness of economy, as discussed later), we expect the coefficients of both z_k and $\check{Z}_k$ to have the same sign. Using the example above, by adding (and, hence, controlling for the 'cross-push' effect of) the weighted average of economic growth in all other developed countries as an additional regressor in the equation for the Japan-to-developing country FDI flow, the estimate of (own-push) effect of Japan's economic growth on its FDI flows to developing countries would be purged of this specification bias. And if high economic growth in Japan has the effect of, say, reducing its FDI inflows to developing countries by enhancing, for example, profitable domestic investment opportunities, so would also be the case of high economic growth in the remaining developed countries, as Japanese investors would see these as more profitable outlets for their FDI vis-à-vis the developing countries.

$$F_{ik\,t} = f(z_{kt}, X_t, \check{Z}_{kt}) \qquad (i = 1, 2, \ldots n;\ k = 1, \ldots q;\ t = 1, \ldots T) \tag{6}$$

Based on the above model description, most of the problems associated with modelling from the recipient's perspective have been addressed. Also, even though our discussion has so far been based on a time-series framework, the same applies equally to panel and cross-sectional frameworks, with one exception, however. In the case of cross-section framework, the composite pull-factor X in equations (5) and (6) is likely to be inapplicable since all developed countries are confronted by the same developing-country pull-factor at each point in time.

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8 The variable to use in calculating the weights π_h's is an empirical issue.

In this study, we operationalize the above model of equation (6) type, using panel regression framework to explain the flows of FDI and PCF from the developed to the developing countries. The operational model employed is described in the next section.

4 Operationalization of foreign financial flow modelling from the perspective of the source country

4.1 Model of developed-developing country flows of FDI and portfolio capital

Fernández-Arias (1996) and Fernández-Arias and Montiel (1996) proposed a generalized equation framework for estimating capital flow equations, which has since been adopted in subsequent studies in more specific forms. We also find this general equation suitable for the present study.

According to Fernández-Arias (1996), three broad factors are involved in the international portfolio allocation involving developing countries. One of these is the expected returns on the domestic 'project' in a potential destination country, *D*; the second is the opportunity cost represented by expected returns in the developed or source countries, *R*; and the third is the creditworthiness factor of (destination) country, *C*. Unlike in the conventional portfolio allocation models, the model assumes a non-arbitrage condition for mean returns adjusted by country default risk (DC), so as to highlight the role of the risk factor, as shown in equation (7).

$$DC = R \tag{7}$$

Next, the functional relationships for the expected return, *D*, and creditworthiness, *C*, are specified. *F*, the current flow of foreign debt (or foreign capital generally) in that country, is posited to enter negatively in the equation for *D*, because it is assumed that domestic project-returns fall as foreign capital inflows increase due to the presence of diminishing returns. On the other hand, it is the existing or initial stock (*S*) of this foreign capital that enters the C equation negatively. These are expressed as follows:

$$D = D(d, F), \ D_1 > 0 \text{ and } D_2 < 0, \tag{8}$$

$$C = C(c, S), C_1 > 0 \text{ and } C_2 < 0, \tag{9}$$

where *d* and *c* are shift parameters, with the former reflecting the underlying economic climate regarding domestic investment returns and the latter reflecting the country's risk or ability to pay profile.

Through totally differentiating and then re-arranging the result of substituting equations (8) and (9) into (7), the author arrived at the reduced-form equation (10):

$$F = F(d, c, R, S), F_1, F_2 > 0 \text{ and } F_3, F_4 < 0 \tag{10}$$

Thus, the volume of capital flows positively depends on a positive investment climate (*d*) and ability to pay indicator (*c*) and negatively on foreign rate of return (*R*) and initial stock of foreign capital or external debt (*S*).

The above model by Fernández-Arias (1996) provides a good starting point for our study. Particularly, his departure from the orthodox arbitrage condition between domestic and foreign rates of return makes it adaptable to a development-oriented study, as opposed to just pure financial modelling exercise. The rationale given by Fernández-Arias (1996: 392) for the departure is as follows:

> In developing countries with substantial default risk and low creditworthiness the effect of shocks on mean returns is likely to be relatively more significant, and therefore dominate, the effect on variability. For these countries, first moments, as opposed to second moments, are likely to be a sufficient good approximation to describe changes in foreign investors' choices between investing in these countries or elsewhere. The standard mean-variance portfolio models based on the trade-offs between first and second moments facing risk-averse investors is less relevant when default risk is not negligible and country creditworthiness is low.

What remains is the methodology for operationalizing it, particularly by finding appropriate measures of *d*, *c*, *R* and *S* in the above relationship. We discuss this issue next.

4.2 Measures of returns on investment and risk in destination countries, initial debt and international rates of return

4.2.1 Initial stock of debt

As indicated in equation (10), the stock of initial debt is expected to be negatively related to the volume of private capital flows. In the underlying structural equation (9), this is because a high stock of debt impacts negatively on the creditworthiness perception of investors. Although it is a pull-factor because of its relation to destination-country characteristics, it is also influenced (as rightly argued by Fernández-Arias (1996)), by international conditions beyond the control of individual destination countries. Therefore, it also constitutes a push-factor.

In the study, the initial debt stock is broken down into two items: private debt, and public and publicly guaranteed debt. High level of private debt could encourage further (though rather involuntary) private inflows to service existing debts. This is hardly the case with public and publicly guaranteed debts. Because of the source-country perspective adopted in the study, we utilize the aggregate stock of each debt category for all developing countries combined. We express each in relation to the aggregate GDP of the same developing countries.

4.2.2 Domestic and international rates of return in the source country

This factor is also expected to have a negative relationship on capital flows to developing countries. It is the opportunity cost of funds being invested in developing countries. If funds are cheap in the developed countries, more funds are expected to flow to developing countries as FDI and PCF.

Following on the source-country modelling perspective adopted here, we simultaneously test for the effect of the two interest rates, proxied by discount rates:

interest rate in the specific source-country being analysed and domestic interest rates averaged over all other developed countries, except the one being examined. The former is expected to have a negative own-effect while the latter is expected to have negative cross-effect on capital flows to developing countries.

Similarly, we posit an anticipated economic growth (proxied by *ex post* growth) to enhance returns in the specific source country being examined and consequently to stem private flows to developing countries. A similar assumption is applied if the source economy is in a rising phase of its economic cycle. Economic growth in the remaining developed countries and the prevalence of a rising phase of their economic cycle are expected to have similar cross-effects on the specific source country's private flows because these other developed countries will now be host to more of the private flows that would have gone to developing countries. Anticipated economic growth should be particularly important in view of the inclusion of FDI in our private capital flows.

For the same reason, the level of per capita income in the source country should influence the volume of capital flows by affecting not only private net savings—with which net foreign flows are financed—but also by affecting returns on domestic investment opportunities. The two produce opposite-direction effects, and the overall impact on net private flows should be determined by an empirical study. The same applies to the cross-effect of the level of per capita income in other developed countries combined.

4.2.3 Returns on investments in the destination country

First, we consider the nominal rates of return on private debt flows to developing countries. This should have a positive effect on private capital flows, especially private debt flows. Second, we posit anticipated economic growth (proxied by actual or ex post growth) in developing countries also to be an indicator of expected returns, as also whether or not destination countries are going through a rising phase of economic cycle because expected returns might be less during economic depression than during an economic boom. The level of per capita income in the destination countries has often been posited in earlier studies to be a positive attraction of private capital flows, especially FDI; high income level is claimed to enhance returns on FDI. While we also maintain essentially the same position here, we are not oblivious to the theoretical possibility that high per capita income, by enhancing domestic net saving, could reduce demand for foreign finance which, if not supply-constrained, could lead to reduced private capital inflows.

4.2.4 Investment risks

Unlike the study by Fernández-Arias (1996), we do not limit our risk consideration to just creditworthiness, narrowly defined as the ability to pay. Instead, we broaden our concept of risk to include those elements which may, among others, impact on future rates of return. This is necessary especially since the present study is not limited to debt flows but also includes FDI. Also, unlike Fernández-Arias, we do not assume that investments outside developing countries are riskless. This follows from the broader definition of risks taken here. It is only if the risks are strictly limited to the ability to pay as assumed by Fernández-Arias, then it might be in order to assume absence of investment risks in the source countries.

One risk indicator we recognize here is the macroeconomic environment, particularly macroeconomic instability (alternatively proxied by inflation rate and monetary growth). This affects not only future repayment possibility (in the case of debts) but also the risks surrounding expected returns. We expect high inflation rate (or monetary growth) in the domestic economy of the specific source country under consideration to discourage domestic investment locally and thereby lead to enhanced capital flows to developing countries, just as the cross-effect of high inflation (or monetary growth) in other developed countries. High inflation (or monetary growth) in destination countries should have an opposite effect of retarding the volume of private capital flows received from developed countries.

Another indicator of risk is the existence of capital restrictions or controls (see Montiel and Reinhart 1999). These affect the prospect of capital repatriation, profit remittance, etc. The existence of capital controls in destination countries should have an unambiguous effect of reducing the volumes of private flows received. The effect of the existence of capital controls in a source country should similarly reduce capital flows to the destination countries. By reducing capital inflow and outflows to other countries, net inflows to developing countries can hardly be unaffected negatively. But the cross-effect of capital controls in other industrialized countries should, instead, have a positive effect on the flow from the particular source country under consideration to developing countries because the alternative of going to these other developed countries would be less attractive now. Instead of using qualitative capital control indicators as Montiel and Reinhart (1999) do, we proxy the lack of capital controls by the degree of openness in the balance-of-payments capital account, measured as the sum of private inflows and outflows in relation to the GDP.

4.3 Specific model specification adopted in the study

We specify a regression equation of the form given in equation (6), reproduced as equation (11):

$$F_{ik_t} = f(z_{kt}, X_t, \tilde{Z}_{kt}) \qquad (i = 1, 2, \ldots n;\ k = 1, \ldots q;\ t = 1, \ldots T) \tag{11}$$

where:

F_{ikt} is the flow of ith type of private capital from source (developed) country k during year t to developing (destination) countries. Equations are estimated for different types and combinations of private capital flows, namely, total private capital flow; FDI; and PCF, with the latter decomposed, as determined by data availability, into non-bank PCF, non-bank securities, total export credit, and non-export credit;

z_{kt} is the vector of source country k's specific or push-factors that make local investors seek cross-border investment opportunities (or desist from doing so, as the case may be);

$\tilde{Z}_{kt}$ is the average of corresponding elements of z_{kt} for all developed countries other than country k. The cross-effects of $\tilde{Z}_{kt}$ on net flows from country k to the developing countries are supposed to be broadly the same as those of z_{kt} (with the exception of the degree of openness of capital account), as already explained. Every element of

this vector is in aggregate form, being a weighted average for all developed countries except the one under consideration;

X_t is the vector of destination (developing) countries' specific or pull-factors that attract or repel private capital flows from the developed countries. Every element of this vector is in aggregate form, being a weighted average for all developing countries.

Although not explicitly indicated, the above specification is for estimation with time-series data that are pooled across the countries to form a panel data. Specifically, annual data over 1970 to 2000 period are pooled across the 19 donor countries with private capital flow statistics in Table 1.9 But the resulting panel data are unbalanced in the sense that there are missing values for countries in a non-uniform manner with respect to both countries and variables. Also, because of this unbalanced nature of the data and due to the fact that some of the explanatory variables (e.g., inflation and monetary growth) are alternative proxies for essentially the same factor, we include only a few variables at a time. By doing so, not only is the incidence of multicollinearity minimized, but also the number of observations available to estimate the equation with fewer variables is maximized, as the inclusion of all or most explanatory variables in a particular equation would drastically reduce the usable data points. For each variable included for the source country, we also include the corresponding aggregate for all other source countries combined as well as for the destination countries. We employ a fixed-effect method that permits the intercept to vary across countries in the derivation of the panel data estimates.[10] Evidence on the existence (or lack) of stability of the parameter estimates is obtained indirectly: as pointed out above, the various equation estimates reported cover different periods, as dictated by data availability, with a number of regressors (such as per capita income and interest rates) featuring in many equations. By this, the temporal stability of parameter estimates of these regressors that feature in many equations can be inferred.

We expect some right-hand variables, particularly, interest rates and, possibly, the stock of external debt, to be endogenous. So, we use a form of instrumental variable method to cater for this. The 'instrument' is taken to be the fitted value of interest (discount) rate obtained by regressing the discount rate on its past value and past value of each of money market rate, economic growth, and inflation. For the source countries, this is done on the basis of annual time-series regression for each source country before pooling the data and before aggregating the data into composite interest rate. But for all the destination countries, the fitted value used as the instrument is generated by regressing the composite interest rate on private debt to developing countries on similarly aggregated past value of each of external debt/GDP ratio, inflation rate, and economic growth. Concerning the private debt/GDP and public debt/GDP ratios, their 'instruments' are simply taken to be their respective 1-year lagged values. We take care of any existence of heteroscedasticity with covariance matrix correction method suggested by White (1980).

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9 This means Greece, Ireland and Luxembourg are excluded.

10 The random-effect alternative also gives practically the same results. But to save space, we do not report these.

4.4 Data sources and how the variables are measured

Each of the dependent variables (from the DAC's International Development Statistics, online) referred to above is expressed as a fraction of the source country's GDP. Per capita income is the GDP per capita at the 1995 US dollar value; and the phase of economic cycle is computed as the residuals generated from regressing logarithm of real GDP index on a trend variable, so that the positive value of the residuals represents rising phase of the cycle. Degree of openness in the capital account is the sum of private capital inflows and outflows in relation to GDP. Public and private debt burden of developing countries is expressed in relation to GDP. Inflation rate is the growth of GDP implicit deflator. Domestic interest rate (obtained from IMF's *International Financial Statistics*, online) is the discount rate. All statistics, except where otherwise indicated, are from the World Bank's *World Development Indicators* (online) and *Global Development Finance* (online). All the aforementioned non-monetary figures are pure fractions, not percentages.

Concerning the composite variables, the average interest rate on current private lending to developing countries is available, already so computed, from the data source. The same applies to the following other composite variables for all developing countries: economic growth (real), degree of openness in the BOP capital account, private debt/GDP ratio, public debt/GDP ratio, inflation rate, and monetary growth. While similar composite variables are also similarly published for the developed (source) countries, these could not be utilized, as we are interested in the composite for all developed countries except one. So, we compute these ourselves from the individual source country statistics and this requires choosing appropriate choice of weights in aggregating and averaging across the countries. For the rate of interest, we use the sum of exports and imports of goods and services as the weight (the sum of private capital inflows and outflows give practically the same results but they are dropped due to existence of missing values for some years). For per capita income, we use population while we use GDP as weight for all others.

5 Empirical results

The empirical results are reported in Tables 5 to 10. These show that the explanatory power of the equations is only modest, judging by the corresponding modest values of the adjusted R^2. We examine next the effects of each explanatory variable on the different categories and combinations of foreign capital flows.

Table 5
Effects of per capita income levels and interest rates

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Nonbank securities	Total export credit	Total non-export credit
Per capita income (log):								
Specific donor under consideration	0.007 (1.6)	0.008 (2.2)	0.002 (0.6)	0.003 (0.7)	0.0004 (0.3)	0.001 (0.4)	0.001 (0.9)	0.001 (0.3)
Average for other donors	-0.035 (-3.6)	0.003 (0.9)	-0.036 (-3.8)	-0.020 (-2.9)	-0.014 (-3.7)	-0.002 (-0.4)	-0.009 (-2.0)	-0.030 (-3.6)
All developing countries	0.028 (2.6)	-0.009 (-1.7)	0.033 (3.2)	0.017 (2.5)	0.011 (2.7)	0.003 (0.6)	0.005 (1.0)	0.031 (3.3)
Interest rate:								
Specific donor under consideration	-0.032 (-3.0)	-0.019 (-2.3)	-0.017 (-2.3)	-0.003 (-0.3)	0.002 (0.6)	-0.012 (-2.1)	0.004 (1.1)	-0.023 (-3.4)
Average for other donors	-0.080 (-3.5)	-0.045 (-3.9)	-0.029 (-1.6)	-0.052 (-3.0)	-0.032 (-5.0)	-0.020 (-1.2)	-0.040 (-5.2)	0.010 (0.5)
Average for all developing countries	0.012 (4.1)	0.060 (3.2)	0.060 (2.7)	0.052 (2.3)	0.033 (3.4)	0.019 (1.0)	0.056 (4.5)	0.006 (0.3)
Adjusted R^2	0.224	0.287	0.159	0.183	0.224	0.110	0.166	0.099
Total no. of obs	553	544	538	287	515	292	531	489

Notes: The dependent variables, indicated on top of each column, are fractions of source country's GDP;

The numbers in parentheses are the t-values. A parameter estimate is statistically significant at 1%; 5%; and 10% levels if its t-value in absolute sense is not less than 2.6; 2.0; and 1.6, respectively.

Table 6
Effects of economic growth, per capita income levels and interest rates

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Nonbank securities	Total export credit	Total non-export credit
Per capita income (log):								
Specific source country under consideration	0.007 (1.6)	0.007 (2.1)	0.002 (0.6)	0.002 (0.4)	0.0003 (0.2)	0.0004 (0.1)	0.001 (0.7)	0.001 (0.4)
Average for other source countries	-0.040 (-3.8)	0.002 (0.4)	-0.040 (-3.9)	-0.023 (-3.1)	-0.015 (-3.5)	-0.004 (-0.9)	-0.010 (-2.1)	-0.031 (-3.6)
For all developing countries	0.032 (2.8)	-0.008 (-1.2)	0.035 (3.3)	0.019 (2.7)	0.011 (2.6)	0.005 (1.1)	0.005 (1.0)	0.030 (3.4)
Interest rate:								
Specific source country under consideration	-0.034 (-3.1)	-0.019 (-2.2)	-0.018 (-2.4)	-0.004 (-0.5)	0.002 (0.6)	-0.013 (-2.2)	0.003 (1.1)	-0.023 (-3.5)
Average for all other source countries	-0.097 (-3.8)	-0.053 (-4.1)	-0.036 (-1.6)	-0.068 (-3.3)	-0.038 (-5.3)	-0.030 (-1.5)	-0.048 (-5.3)	0.011 (0.5)
Average for all destination (developing) countries	0.117 (3.7)	0.060 (2.8)	0.056 (2.4)	0.051 (2.2)	0.035 (3.4)	0.016 (0.9)	0.057 (4.5)	0.001 (0.03)
Economic growth:								
Specific source country under consideration	0.002 (0.2)	0.011 (1.8)	-0.002 (-0.3)	0.009 (0.8)	0.001 (0.3)	0.008 (1.1)	0.001 (0.2)	-0.003 (-0.3)
Average for other source (developed) countries	-0.014 (-0.8)	-0.021 (-2.9)	0.004 (0.2)	-0.018 (-1.7)	-0.011 (-1.8)	-0.011 (-1.4)	-0.012 (-1.7)	0.017 (1.0)
Average for all destination (developing) countries	-0.030 (-1.2)	-0.003 (-0.2)	-0.025 (-1.3)	-0.031 (-1.6)	-0.003 (-0.4)	-0.023 (-1.2)	-0.006 (-0.7)	-0.022 (-1.1)
Adjusted R^2	0.216	0.288	0.156	0.189	0.225	0.114	0.165	0.097
Total no. of observations	553	544	538	287	516	292	532	516

Notes: See Table 5.

Table 7
Effects of phase of economic cycle, interest rates and degree of capital account openness

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Nonbank securities	Total export credit	Total non-export credit
Rising phase of economic cycle:								
Source country under consideration	0.007 (0.7)	0.018 (2.4)	-0.008 (-0.9)	-0.013 (-1.0)	0.001 (0.4)	-0.015 (-1.5)	0.002 (0.5)	-0.010 (-1.4)
Average for other source countries	0.044 (2.2)	0.009 (1.0)	0.041 (2.2)	0.059 (2.5)	0.020 (2.7)	0.036 (2.1)	0.018 (2.2)	0.025 (1.6)
For all developing countries	-0.007 (-0.3)	-0.013 (-1.0)	0.001 (0.1)	-.004 (-0.3)	0.002 (0.3)	-0.001 (-0.1)	-0.005 (-0.6)	0.008 (0.4)
Interest rate:								
Specific source country under consideration	-0.045 (-3.0)	-0.026 (-2.2)	-0.021 (-2.4)	0.013 (1.4)	0.000 (0.8)	-0.003 (-0.4)	0.004 (0.9)	-0.027 (-3.5)
Average for all other source countries	-0.141 (-4.0)	-0.008 (-0.5)	-0.128 (-3.9)	-0.124 (-4.6)	-0.070 (-5.5)	-0.031 (-1.8)	-0.073 (-4.5)	-0.059 (-2.2)
Average for all destination (developing) countries	0.226 (6.4)	0.035 (1.8)	0.189 (6.3)	0.127 (4.3)	0.090 (6.8)	0.021 (1.2)	0.102 (6.1)	0.090 (3.7)
Degree of capital A/C openness:								
Source country under consideration	-00.002 (-1.2)	0.002 (1.3)	-0.004 (-1.4)	0.001 (0.1)	-0.002 (-2.0)	0.003 (0.7)	-0.001 (-1.0)	-0.003 (-1.1)
Average for other source countries	-0.024 (-2.7)	0.006 (0.9)	-0.030 (-4.4)	-0.028 (-4.2)	-0.015 (-5.3)	-0.012 (-2.4)	-0.014 (-4.7)	-0.018 (-2.8)
Average for all destination countries	0.039 (1.4)	0.002 (0.1)	0.031 (1.5)	0.057 (3.6)	0.021 (2.8)	0.038 (2.9)	0.018 (1.9)	0.018 (0.8)
Adjusted R^2	0.218	0.296	0.166	0.250	0.221	0.192	0.171	0.121
Total no. of observations	446	441	435	210	411	215	427	413

Notes: See Table 5.

Table 8
Effects of phase of economic cycle, degree of capital account openness and monetary expansion

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Nonbank securities	Total export credit	Total non-export credit
Rising phase of economic cycle:								
Source country under consideration	0.001 (0.1)	0.013 (2.1)	-0.011 (-1.2)	-0.010 (-0.9)	0.002 (0.4)	-0.017 (-1.9)	0.002 (0.6)	-0.014 (-1.8)
Average for other source countries	0.021 (1.1)	0.006 (0.8)	0.020 (1.1)	0.038 (1.7)	0.007 (0.9)	0.036 (2.4)	-0.001 (-0.1)	0.024 (1.5)
Average for all developing countries	0.018 (1.1)	-0.013 (-1.7)	0.028 (2.0)	0.016 (1.7)	0.014 (3.0)	-0.005 (-0.9)	0.018 (3.1)	0.009 (0.6)
Degree of capital A/C openness:								
Source country under consideration	-0.002 (-0.9)	0.002 (1.3)	-0.004 (-1.3)	0.001 (0.3)	-0.001 (-1.5)	0.003 (0.8)	-0.0001 (-0.1)	-0.003 (-1.0)
Average for other source countries	-0.003 (-0.4)	0.012 (1.9)	-0.016 (-2.4)	-0.018 (-2.6)	-0.007 (-3.0)	-0.007 (-1.4)	-0.007 (-2.7)	-0.010 (-1.5)
Average for all destination countries	0.087 (3.4)	0.017 (1.0)	0.066 (3.2)	0.077 (4.1)	0.035 (4.7)	0.045 (2.8)	0.036 (3.7)	0.035 (1.7)
Monetary growth:								
Source country under consideration	0.001 (0.4)	0.001 (0.8)	0.001 (0.1)	0.001 (0.4)	0.002 (2.0)	-0.002 (-1.0)	0.002 (1.7)	-0.002 (-0.8)
Average for other source countries	0.056 (3.0)	0.019 (1.6)	0.035 (2.3)	0.014 (0.9)	0.014 (3.1)	0.013 (1.0)	0.013 (2.6)	0.026 (1.7)
Average for all destination countries	-0.010 (-2.4)	-0.001 (-0.1)	-0.010 (-3.0)	-0.004 (-1.2)	-0.004 (-3.0)	0.001 (0.4)	-0.003 (-2.4)	-0.007 (-2.0)
Adjusted R^2	0.204	0.282	0.158	0.215	0.193	0.195	0.126	0.124
Total no. of observations	447	441	427	210	410	215	426	394

Notes: See Table 5.

Table 9
Effects of per capita income and inflation rates

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Nonbank securities	Total export credit	Total non-export credit
Per capita income (log):								
Specific source country under consideration	0.007 (1.7)	0.008 (2.3)	0.003 (1.0)	0.001 (0.3)	0.001 (0.4)	0.0001 (0.1)	0.001 (0.7)	0.002 (0.6)
Average for other source countries	-0.032 (-3.7)	0.005 (1.2)	-0.037 (-4.4)	-0.010 (-1.5)	-0.011 (-3.4)	0.006 (1.5)	-0.012 (-2.9)	-0.025 (-3.3)
For all developing countries	0.034 (3.9)	-0.008 (-1.7)	0.037 (4.5)	0.013 (2.3)	0.011 (3.5)	-0.002 (-0.6)	0.012 (2.9)	0.026 (3.5)
Inflation rate:								
Source country under consideration	0.004 (0.3)	-0.087 (-0.2)	0.005 (0.4)	0.002 (0.3)	0.005 (1.2)	-0.007 (-1.6)	0.005 (1.0)	0.0001 (0.01)
Average for other source countries	0.0002 (1.2)	0.009 (1.1)	0.015 (1.0)	0.019 (1.8)	0.007 (1.2)	0.015 (2.2)	0.005 (0.6)	0.012 (0.8)
Average for all destination countries	-0.009 (-4.7)	-0.005 (-4.0)	-0.004 (-2.7)	-0.005 (2.9)	-0.003 (-5.4)	-0.003 (-1.9)	-0.003 (-4.7)	-0.002 (-1.1)
Adjusted R^2	0.202	0.272	0.155	0.191	0.235	0.112	0.153	0.090
Total no. of observations	558	544	530	287	515	292	531	489

Notes: See Table 5.

Table 10
Effects of per capita income and initial external debt burden

			Portfolio capital flows (PCF)					
	Total flows	FDI	Total	Total for non-bank	Non-bank export credit	Non-bank securities	Total export credit	Total non-export credit
Per capita income (log):								
Specific source country under consideration	0.008 (1.5)	0.009 (2.3)	0.005 (1.4)	0.001 (0.3)	0.001 (0.8)	-0.0005 (-0.1)	0.001 (0.9)	0.003 (0.8)
Average for other source countries	-0.020 (-2.5)	0.008 (2.0)	-0.028 (-3.8)	0.004 (0.5)	-0.006 (-2.2)	0.012 (2.2)	-0.007 (-1.9)	-0.021 (-2.9)
For all developing countries	0.035 (4.7)	-0.009 (-2.4)	0.041 (6.1)	0.016 (3.5)	0.014 (5.4)	-0.002 (-0.6)	0.015 (4.5)	0.027 (4.2)
Public debt stock/GDP ratio:								
Average for all destination countries	-0.042 (-4.2)	-0.013 (-2.6)	-0.032 (-3.4)	-0.038 (-4.7)	-0.020 (-6.6)	-0.014 (-2.2)	-0.020 (-4.7)	-0.015 (-1.6)
Private debt stock/GDP ratio:								
Average for all destination countries	0.051 (2.4)	0.051 (3.0)	-0.004 (-0.3)	-0.008 (-0.4)	-0.007 (-1.3)	0.010 (0.5)	-0.004 (-0.6)	-0.002 (-0.1)
Adjusted R^2	0.234	0.302	0.172	0.234	0.265	0.116	0.178	0.098
Total no. of observations	536	528	514	275	498	280	514	474

Notes: See Table 5.

5.1 Effects of per capita income levels

Per capita income of the specific source country: As reported in Tables 5, 6, 9 and 10, this has a positive and statistically significant coefficient in all equations (except that of non-bank securities in Table 10) but the coefficient is statistically significant in the FDI equation only. Since the dependent variables are expressed as fractions of the source country's GDP, the coefficients could plausibly take any sign. A negative coefficient (depending on its magnitude) could mean that capital flows, in monetary terms, increase with the source country's income but simply do not keep up proportionally. A zero or statistically insignificant coefficient would mean that capital flows simply rise in more or less strict proportionality to the per capita income level, suggesting that the average (income) propensity to invest abroad is constant. On the other hand, a positive and statistically significant coefficient, as observed here in the case of FDI, suggests that capital flows from the source country rise faster than the country's per capita income so that marginal (income) propensity to invest in developing countries is positive. Similar evidence seems to exist for PCF and its various components, but in a weak form due to statistical insignificance of the rather consistently positive coefficients. Thus, while there is strong evidence that source countries' FDI rise faster than their per capita income levels, the evidence of this effect for PCF and its various components is rather weak.

Per capita income (aggregate) of other developed countries: The coefficient of this is not significant in the FDI equation nor in the equation for non-bank securities, suggesting that a source country's investment in these two items is largely immune from the level of per capita income in other developed (or source) countries (see Tables 5, 6, 9 and 10). On the other hand, its coefficient is negative and statistically very significant in the equations for all other PCF components (and the equation for total PCF, as well). This evidence suggests that a capital-exporting developed country's PCFs (with the exception of non-bank security investment) to developing countries are diverted away by rising per capita income levels in other developed countries.

Per capita income (aggregate) of the destination countries: Its coefficient is not statistically significant in the equations for FDI (where it even has the rather implausible negative sign) nor for non-bank securities (see Tables 5, 6, 9 and 10). On the other hand, its coefficient is positive and statistically very significant in equations for all other components of PCF (and the equation for total PCF also). Thus, the evidence suggests that a rising level of per capita income in developing countries 'pulls' or attracts all PCF components (except non-bank securities) but, surprisingly, no evidence of this effect is recorded for the FDI.

5.2 Effects of interest rates

Interest rate in the specific source country under consideration: The coefficient is not statistically significant in the equations for total and non-bank export credits and for non-bank PCF as a whole (see Tables 5 to 7). But it is consistently negative (as expected) and statistically significant in all FDI equations and those for the non-export credit and the non-bank security components of total PCF, as well as those for total PCF itself and, indeed, all private flow equations. Thus, except for export credits, all components of private capital flows tend to be 'pushed' to developing countries as a result of low interest rates in the specific capital-exporting country. This finding is in

agreement with some earlier studies, e.g. Montiel and Reinhart (1999) who report that interest rates in the US and Japan negatively affected the allocation of capital flows to the selected developing countries covered in their study. Conversely, Hernandez and Rudolph (1995), for example, find no evidence of statistically significant interest rate effect on long-term capital flows. The short span and a particular episode-specific coverage of most of the earlier studies could be a likely reason for their generally contradictory findings.

Interest rate (aggregate) in other developed countries: This exerts the same effect as the interest rate in the specific source country, as discussed above, except that its coefficient in the equations for non-bank and total export credits is now negative and statistically significant. Furthermore, the statistical significance of its coefficient in the total non-export credit and non-bank security equations is now less (see Tables 5 to 7). But on the whole, the same broad picture also emerges here of the deterring effects of high interest rates on private flows to developing countries, as discussed above. FDI and practically all PCF components from a particular capital-exporting developed country are found to be diverted away from developing countries by high interest rates in other developed countries.

Interest rate (aggregate) on private lending to developing countries: As expected, the coefficient of this variable is positive in all equations and also statistically significant in all, except in some of the equations for total non-export credit and non-bank securities (Tables 5 to 7). Thus, interest rate (as a proxy for returns on private capital flows) is a significant pull-factor for flows to developing countries.

5.3 Effects of economic growth

Economic growth in the specific source country under consideration: The coefficient of this factor is not statistically significant in any equation (Table 6). Hence, there is no evidence that economic growth in the capital-exporting country in fact affects net private capital flows.

Economic growth (aggregate) in other developed countries: The coefficient is negative (as expected) and statistically significant in the FDI equation, with marginal significance in the equations for both total and non-bank export credits and for the non-bank component of PCF (Table 6). But the coefficient is statistically insignificant in all other equations. Thus, high economic growth in other developed countries could be said to divert each capital-exporting developed country's FDI (and, to some extent, the export credit component of PCF) away from developing countries while other PCF components are hardly affected.

Economic growth (aggregate) in the destination countries: The coefficient of this factor is not statistically significant in any equation (Table 6). Hence, there is no evidence that economic growth in destination countries has any pull on net private capital flows.

5.4 Effects of phase of economic cycle

Phase of economic cycle prevailing in the specific source country under consideration: The positive coefficient of the rising phase of economic cycle in the FDI equation is the only one that is statistically significant (see Tables 7 and 8). Its coefficient in other

equations are either significant (marginally) in only Table 8 or not significant at all in any of the tables. Thus, what can be inferred is that the rising phase of economic cycle in a capital-exporting developed economy appears to have 'pushed' FDI to developing countries. This rather unexpected effect on FDI is probably due to the fact that net savings—and hence domestic availability of funds—increase with an economic upswing. But there is no evidence that PCF or any of its components is affected by the phase of economic cycle.

Phase of (aggregate) economic cycle prevailing in other developed countries: The unexpectedly positive coefficient of the rising phase of economic cycle in the equation for the non-bank security component of PCF is the only one that is statistically significant in Tables 7 and 8. Its coefficient in other equations, while mostly positive and significant in Table 7, is not significant in Table 8, thereby making the evidence non-robust. The unexpectedly positive coefficient in non-bank securities equation is not unlikely to be caused by the fact that the sudden attraction to investors (especially, since 1995 as reviewed in section 2) of this type of PCF merely coincides with the rising phase of economic cycles in major developed countries. The total picture emerging is that the phase of economic cycle prevailing in other developed countries does not have much influence on the magnitude of net private flows from a particular capital-exporting developed country.

Phase of (aggregate) economic cycle prevailing in the destination countries: The coefficient of this variable, although broadly positive (as expected) and statistically significant in most equations in Table 8, is not significant in Table 7, thereby making the evidence non-robust. In totality, the picture seems to indicate that the phase of economic cycle collectively prevailing in the developing countries does not pull foreign private capital to them as such.

5.5 Effects of openness of the economy regarding BOP capital account transactions

Openness in the BOP capital account of the specific source country under consideration: The coefficient of this factor is not statistically significant in the equations (see Tables 7 and 8). Thus, the removal of capital controls in a capital-exporting developed country is observed not to have pushed net capital flows to developing countries.

Openness (aggregate) in the BOP capital account of other developed countries: The coefficient of this variable is not significant in the FDI equation. But it is negative, as earlier posited, in the equations for total private flows and PCF, as well as for all PCF components. It is also statistically significant in almost all these (Tables 7 and 8). This suggests that net flows of all PCF components from a particular capital-exporting developed country are being diverted away from developing countries as a result of the removal of capital controls (or increased BOP capital account openness) in other developed countries.

Openness (aggregate) in the BOP capital account of destination countries: As expected, the coefficient of this variable is positive in all equations. And although it is not statistically significant in the FDI ones, it is significant in almost all equations for PCF and its components (see Tables 7 and 8). This evidence suggests that the elimination of

capital controls by developing countries is a significant pull-factor for foreign private flows, particularly, PCF.

5.6 Effects of unstable macroeconomic environment

Macroeconomic environment in the specific source country under consideration: Neither of the two alternative proxies of macroeconomic imbalances, inflation rate and monetary growth, has a coefficient that is statistically significant in any of the equations. This suggests that resident investors in a capital-exporting country do not see domestic macroeconomic imbalances as a major issue that would push them to invest in developing countries. Alternatively, it is possible that macroeconomics imbalances in each capital-exporting country were not sufficiently severe to make investors consider them a serious disincentive.

Macroeconomic environment (aggregate) in other developed countries: In line with expectations, the coefficients of both inflation rate and monetary growth, the two alternative proxies for macroeconomic imbalances, are positive in all equations (see Tables 8 and 9). Although the coefficients are rather insignificant in the equations for FDI and some components of PCF, the broad evidence emerging is that net private flows, especially PCF, from a particular capital-exporting developed country are diverted to developing countries as a result of macroeconomic problems and imbalances in other developed countries.

Macroeconomic environment (aggregate) in the destination countries: As expected, the coefficients of the two alternative proxies of this factor, inflation rate and monetary growth, are negative and statistically significant in practically all the equations. It can therefore be inferred that stable macroeconomic environment, in the form of low inflation and low monetary expansion, is an important factor that pulls or attracts foreign private capital to developing countries.

5.7 Effects of existing level of external debt burden

The coefficient of the size of public and publicly guaranteed external debt in relation to GDP is, as expected, negative and statistically significant in all equations (see Table 10). Thus, foreign private investment of all categories appears to be consistently deterred from highly indebted developing countries. Foreign private investors seem to regard it as a high-risk indicator.

The coefficient of the size of private external debt in relation to GDP, on the other hand, is unexpectedly positive and statistically significant in the FDI equation while in the equations for PCF and its various components, it is not statistically significant (see Table 10). That the coefficient is positive in the FDI equation is probably a coincidence arising from the fact that countries with high private external debt are mostly in Latin America and also happen to be, for different reasons, among those receiving much FDI. Thus, on the balance of evidence, private debt seems to have little impact on net private capital flows in general. The opposing forces (including involuntary lending to re-finance maturing debts might neutralize the risk implied by high debt level) which could give rise to this were discussed earlier.

6 Summary and conclusion

The study reported in this paper is an attempt to rectify some problems that characterize most earlier studies seeking to explain private capital flows to developing countries—or, at least to examine the subject from a different and complementary perspective. To accomplish this, we propose a model framework that approaches the issue from the perspective of a capital-exporting developed country and which also takes cognizance of developments in other developed countries that could be competing with developing countries for private capital flows from that source. The model is operationalized and estimated with annual panel data over 1970-2000 for 19 capital-exporting developed countries. Specifically, we estimated equations for total private flows, FDI, total portfolio capital flows (PCF) as well as the various categories of PCF. We tested for the effects of a number of factors, each of which has its own push- and pull-components. The main highlights of our findings include the following:

Effects of per capita income levels

First, while there is strong evidence that source countries' FDIs rise faster than their per capita income levels, the evidence of this effect on PCF and its various components is rather weak. Second, a capital-exporting developed country's PCF (with the exception of non-bank security investment) is diverted from developing countries by rising per capita income levels in other developed countries. And, third, rising level of per capita income in the developing countries pulls or attracts all PCF components (except non-bank securities) but, surprisingly, there is no evidence of this effect for the FDI.

Effects of interest rates

First, except for export credits, all components of private capital flows tend to be pushed to developing countries as a result of low interest rates in the specific capital-exporting developed country. Second, FDI and practically all PCF components from a particular capital-exporting country are noted to veer away from developing countries as a result of high interest rates in other developed countries. And, third, interest rate (as a proxy for return on private capital flows) is a significant pull-factor for flows to developing countries.

Effects of economic growth

First, there is no evidence that economic growth in the capital-exporting country truly affects net private capital flows. Second, high economic growth in other developed countries could be said to divert the FDI—and, to some extent, the export credit component of PCF—of each capital-exporting developed country away from developing countries while other PCF components are hardly affected. Finally, there is no evidence that economic growth in destination countries has any pull on net private capital flows.

Effects of phase of economic cycle

First, the rising phase of economic cycle in a capital-exporting developed economy appears to have 'pushed' FDI to developing countries, while there is no evidence that PCF or any of its components are affected by economic cycles. Second, the phase of economic cycle prevailing in other developed countries did not matter much in determining the magnitude of net private flows from a particular capital-exporting developed country to the developing countries. Finally, the phase of economic cycle

collectively prevailing in developing countries did not pull foreign private capital to them as such.

Effects of openness of the economy regarding BOP capital account transactions

The removal of capital controls in a capital-exporting developed country is observed not to have pushed net capital flows to developing countries. But net flows of all PCF components of a particular capital-exporting developed country are being diverted away from developing countries by the removal of capital controls (or increased BOP capital account openness) in other developed countries. Also, elimination of capital controls by developing countries is a significant pull-factor for foreign private flows, particularly, PCF.

Effects of unstable macroeconomic environment

Resident investors in a capital-exporting country appear not to view domestic macroeconomic imbalance (as alternatively proxied by high inflation and monetary growth) as a major issue that would push them to invest in developing countries. But the net private flows, especially PCF, of a particular capital-exporting developed country are diverted to developing countries as a result of macroeconomic problems and imbalances in other developed countries. Also, stable macroeconomic environment in the form of low inflation and low monetary expansion is an important factor for attracting foreign private capital to developing countries.

Effects of existing level of external debt burden

Foreign private investments of all categories appear to be consistently deterred from highly indebted developing countries. Foreign private investors seem to regard severe indebtedness as a high-risk indicator, while private debt seems to have little effect on net private capital flows in general.

Despite measurement or data aggregation difficulties entailed by the adopted approach, it seems to have advantages in terms of conceptual clarity and policy relevance. Our findings corroborate those of a number of existing studies that have investigated the pull- versus push-factors in foreign private capital flows and also go beyond this to shed light on additional issues, including cross-effects of factors prevailing in the developed countries other than the one being studied.

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