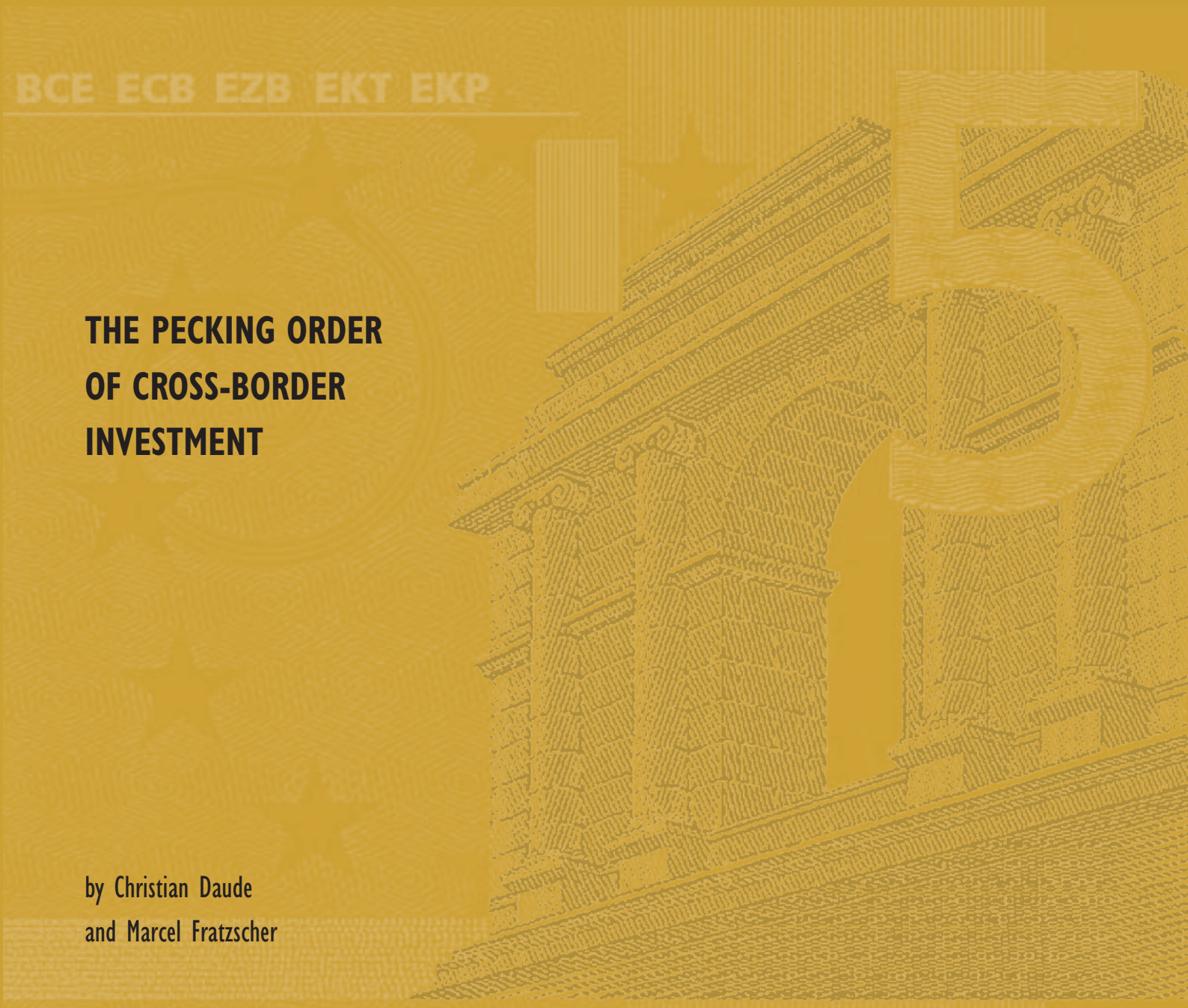
EUROPEAN CENTRAL BANK

WORKING PAPER SERIES
NO. 590 / FEBRUARY 2006



THE PECKING ORDER OF CROSS-BORDER INVESTMENT

by Christian Daude
and Marcel Fratzscher

EUROPEAN CENTRAL BANK

WORKING PAPER SERIES

NO. 590 / FEBRUARY 2006

THE PECKING ORDER OF CROSS-BORDER INVESTMENT [1]

by Christian Daude [2]
and Marcel Fratzscher [3]

In 2006 all ECB publications will feature a motif taken from the €5 banknote.

1 We would like to thank Michael Fidora and Elias Papaioannou for their help in compiling the data, and participants at an ECB seminar and at the University of Navarra's conference on emerging markets, in particular our discussant Enrique Alberola, and also Laura Alfaro and Carmen Reinhart for comments. This paper presents the authors' personal opinions and does not necessarily reflect the views of the European Central Bank.

2 Department of Economics, University of Maryland at College Park, 3105 Tydings Hall College Park, MD 20742, USA; e-mail: daude@econ.bsos.umd.edu

3 European Central Bank, Kaiserstrasse 29, D-60311 Frankfurt, Germany; e-mail: Marcel.Fratzscher@ecb.int

Address
Kaiserstrasse 29
60311 Frankfurt am Main, Germany

Postal address
Postfach 16 03 19
60066 Frankfurt am Main, Germany

Telephone
+49 69 1344 0

Internet
http://www.ecb.int

Fax
+49 69 1344 6000

Telex
411 144 ecb d

ISSN 1561-0810 (print)
ISSN 1725-2806 (online)

CONTENTS

Abstract

Is there a pecking order of cross-border investment in that countries become financially integrated primarily through some types of investment rather than others? Using a novel database of bilateral capital stocks for all types of investment – FDI, portfolio equity securities, debt securities as well as loans – for a broad set of 77 countries, we show that such a pecking order indeed exists. Motivated by the theoretical work on the capital structure of firms, the paper focuses on two key determinants of this pecking order: information frictions and the quality of host country institutions. Overall, we find that in particular FDI, and to some extent also loans, are substantially more sensitive to information frictions than investment in portfolio equity and debt securities. We also show that the share as well as the size of FDI that a country receive are largely insensitive to institutional factors in host countries, while portfolio investment is by far the most sensitive to the quality of institutions. This provides new evidence in favor of some hypotheses but contradicts others put forward in the theoretical literature on trade in financial assets.

JEL classification: F34; G11; F21.
Keywords: foreign investment; pecking order; capital flows; information frictions; institutions; home bias; gravity.

Non-technical summary

The perceived wisdom is that certain types of capital inflows are more beneficial for receiving countries than others. In particular, foreign direct investment (FDI) is generally seen as a "good" type of capital because it may promote growth in host countries by encouraging a transfer of technology and knowledge and by opening market access abroad. Moreover, portfolio investment flows are considered to be more volatile, may exacerbate the magnitude of business cycles and also induce or at least worsen financial crises. But other papers have challenged the view of considering FDI necessarily as "good cholesterol" and show that actually the richest and least volatile economies, and countries with good institutions and well functioning markets, receive more foreign portfolio investment (FPI) and relatively less FDI from abroad as a fraction of total capital inflows.

Is there a pecking order of cross-border investment in that countries become financially integrated primarily through some types of investment rather than others? The main intended contribution of the paper is to test for the existence of such a pecking order of cross-border investment and to identify its determinants in a bilateral country setting. We concentrate on two determinants that have been central in the literature on trade in financial assets in recent years: the role of information frictions, and the role of institutions as drivers of cross-border investment. Both are based on the theory of the capital structure of the firm, which goes back to the seminal work by Modigliani and Miller (1958) and Myres (1984), allowing us to formulate the hypotheses for our empirical analysis.

The paper tests the pecking order hypothesis of cross-border investment by developing and using a novel dataset on bilateral holdings of capital that covers all types of investment in the capital account – distinguishing between FDI, portfolio equity securities, portfolio debt securities and loans – for a broad set of 77 industrial and emerging market economies. One novelty of our approach is that it uses bilateral stocks, rather than flows, as we argue that stocks are the relevant concept for understanding the overall exposure and capital structure of countries and its composition. For our empirical model, we use a gravity-type model in a seemingly unrelated regression (SUR) framework to test our hypotheses.

Two important overall results emerge from the empirical analysis. First, information frictions reduce the volume of capital inflows significantly for all types of capital. But they also have a substantial effect on the pecking order as we find that FDI and loans are the most sensitive and FPI equity and FPI debt securities the least sensitive types of investment to information frictions. For instance, a change in the distance among country pairs has a 1.5 to 2 times larger impact on FDI stocks and the holdings of loans than compared to FPI equity securities and debt securities. We use various proxies for information frictions – distance, the volume of bilateral telephone traffic, bilateral trade in newspapers and periodicals, and the stock of immigrants from the source country in the host – and find that this result is highly robust to all specifications. Moreover, these findings are robust to alternative specifications, such as including various other controls.

Second, the degree of market development has a substantial impact on the pecking order of financial integration. We find that portfolio investment is substantially more sensitive to the degree of market openness and development as well as to the quality of host country institutions than FDI or loans. For instance, capital account liberalization and financial development change the *composition* of financial liabilities of a country by raising the share of portfolio investment substantially. Moreover, we find that the *volume* of FDI and loans is relatively insensitive to market developments as, for instance, capital account liberalization does not have a statistically significant effect on the volume or stock of FDI or loans.

Third, also the quality of economic and political institutions has a substantial impact on the composition of cross-border investment positions. We focus on three broad types of institutional indicators: the degree of transparency, investor protection and corruption. We find that portfolio investment is much more sensitive than FDI or loans to a broad set of institutional indicators, such as the degree of information disclosure in local credit market regulations, as well as accounting standards in the host country. Portfolio investment also reacts much more strongly to the risk of expropriation and repudiation costs, confirming the hypothesis put forward by Albuquerque (2003). Other hypotheses of the literature are, however, not confirmed by our analysis. For instance, portfolio investment in particular, but also loans, change substantially with the degree of corruption. By contrast, the stock of FDI is found to be less sensitive to corruption, which is contrary to some findings in the literature, which are however using different country samples and usually focus on capital flows rather than stocks (e.g. Wei 2000b). Overall, portfolio investment, and in particular equity securities, appear to be the most sensitive type of investment to market conditions and institutional factors. Our results prove robust to using various alternative proxies of markets and institutions and to changing country samples.

The findings of the paper have a number of policy implications. The paper underlines the role of information frictions as a barrier to financial integration, and in particular for FDI and loans. More importantly, the paper emphasizes that FDI should not necessarily be seen as an unconditional blessing for host countries. We present evidence that the share of inward FDI and also foreign loans is highest for countries with weak institutions and poorly developed or badly functioning capital markets. Therefore, although FDI may have beneficial effects on the economy, a composition of foreign investment that is heavily tilted towards FDI is likely to be a signal of some fundamental weaknesses of the host country economy. By contrast, a large share of foreign investment that comes through portfolio equity or debt securities is likely, at least in part, to signal well-functioning domestic financial markets and the trust of foreign investors in domestic institutions.

1. Introduction

The perceived wisdom is that certain types of capital inflows are more beneficial for receiving countries than others. In particular, foreign direct investment (FDI) is generally seen as a "good" type of capital because it may promote growth in host countries by encouraging a transfer of technology and knowledge and by opening market access abroad (e.g. Aitken, Hanson and Harrison 1997; Borensztein, De Gregorio and Lee 1998). On the other hand, portfolio investment flows are considered to be more volatile, may exacerbate the magnitude of business cycles and also induce or at least worsen financial crises (e.g. Claessens, Dooley and Warner 1995; Chuhan, Claessens and Mamingi 1998; Sarno and Taylor 1999).

But other papers have challenged the view of considering FDI necessarily as "good cholesterol" (e.g. Hausmann and Fernandez-Arias 2000, Albuquerque 2003). Hausmann and Fernandez-Arias show that actually the richest and least volatile economies, and countries with good institutions and well functioning markets, receive more foreign portfolio investment (FPI) and relatively less FDI from abroad as a fraction of total capital inflows. Using a novel database of bilateral capital stocks, we confirm and extend this evidence in the present paper. Figure 1, for instance, shows for a broad set of developed and emerging market economies (EMEs) that the poorest countries have the highest shares and the richest the lowest shares of FDI in total capital stocks. This difference is substantial and also robust to alternative country samples.

This stylized fact – as well as several others discussed in detail in the paper – makes the important point that the type of foreign financing of cross-border investment does not pursue a random pattern, but follows a certain "pecking order". The main intended contribution of the paper is to test for the existence of such a pecking order of cross-border investment and to identify its determinants in a bilateral country-pair setting. We concentrate on two determinants that have been central in the literature on trade in financial assets in recent years: the role of information frictions, and the role of institutions as drivers of cross-border investment. Both are based on the theory of the capital structure of the firm, which goes back to the seminal work by Modigliani and Miller (1958) and Myres (1984), allowing us to formulate the hypotheses for our empirical analysis.

Turning to the first of the determinants, information frictions have been at the core of the recent debate on international financial integration (e.g. Froot and Stein 1991; Razin, Sadka and Yuen 1998; Klein, Peek and Rosengren 2002; Portes and Rey 2005; Goldstein and Razin 2005). Much of the literature (e.g. Froot and Stein 1991) argues that FDI should be more information intensive than other types of capital because it implies also a transfer of ownership and management responsibilities. By contrast, other papers claim that it is portfolio equity and to a certain extent also debt that should be more sensitive to information frictions rather than FDI or bank loans due to a lack of ownership control of the former (e.g. Razin, Sadka and Yuen 1998). Hence the theory linking the pecking order of cross-border investment and information frictions is not clear-cut, and it is ultimately an empirical question which of these hypotheses holds. As discussed in detail in section 2, the existing empirical literature has so far focused mostly on the effect of information frictions on one particular type of asset, rather than a comparison across assets. Our paper extends the analysis beyond individual assets and provides a systematic comparison between all the four different asset types of the capital account, thereby allowing us to formulate and test the pecking order hypothesis with regard to information frictions.

The existence and functioning of markets is a second important determinant of foreign investment, and which is closely linked to the effects of information asymmetries. If markets are absent or are functioning poorly, firms may have no other choice than to use FDI to carry

out an investment project (Hausmann and Fernandez-Arias 2000). In this sense, FDI may function as a substitute for a functioning market mechanism. Thus, portfolio investment or bank loans may be preferred options for firms in an environment in which markets function well. In a broader sense, the quality of economic and political institutions is an analogy to the functioning of markets. In a country where property rights are poorly enforced and the risk of expropriation is high, firms may prefer FDI as it is harder to expropriate due to its information intensity and its inalienability (Albuquerque 2003). Moreover, different types of investment may react differently to factors such as the degree of corruption, the functioning of the legal system and transparency (e.g. Wei 2000a; Faria and Mauro 2004; Alfaro, Kalemli-Ozkan and Volosovych 2005; Papaioannou 2005).

The paper tests the pecking order hypothesis of cross-border investment by developing and using a novel dataset on bilateral holdings of capital that covers all types of investment in the capital account – distinguishing between FDI, portfolio equity securities, portfolio debt securities and loans – for a broad set of 77 industrial and emerging market economies. One novelty of our approach is that it uses bilateral stocks, rather than flows, as we argue that stocks are the relevant concept for understanding the overall exposure and capital structure of countries and its composition. For our empirical model, we use a gravity-type model in a seemingly unrelated regression (SUR) framework to test our hypotheses.

Two important overall results emerge from the empirical analysis. First, information frictions reduce the volume of capital inflows significantly for all types of capital. But they also have a substantial effect on the pecking order as we find that FDI and loans are the most sensitive and FPI equity and FPI debt securities the least sensitive types of investment to information frictions. For instance, a change in the distance among country pairs has a 1.5 to 2 times larger impact on FDI stocks and the holdings of loans than compared to FPI equity securities and debt securities. We use various proxies for information frictions – distance, the volume of bilateral telephone traffic, bilateral trade in newspapers and periodicals, and the stock of immigrants from the source country in the host – and find that this result is highly robust to all specifications. Moreover, these findings are robust to alternative specifications, such as including various other controls.

Second, the degree of market development has a substantial impact on the pecking order of financial integration. We find that portfolio investment is substantially more sensitive to the degree of market openness and development as well as to the quality of host country institutions than FDI or loans. For instance, capital account liberalization and financial development change the *composition* of financial liabilities of a country by raising the share of portfolio investment substantially. Moreover, we find that the *volume* of FDI and loans is relatively insensitive to market developments as, for instance, capital account liberalization does not have a statistically significant effect on the volume or stock of FDI or loans. This is in line with the evidence for capital flows of previous studies that use a different empirical strategy (see e.g. Montiel and Reinhart 1999).

Third, also the quality of economic and political institutions has a substantial impact on the composition of cross-border investment positions. We focus on three broad types of institutional indicators: the degree of transparency, investor protection and corruption. We find that portfolio investment is much more sensitive than FDI or loans to a broad set of institutional indicators, such as the degree of information disclosure in local credit market regulations, as well as accounting standards in the host country. Portfolio investment also reacts much more strongly to the risk of expropriation and repudiation costs, confirming the hypothesis put forward by Albuquerque (2003). Other hypotheses of the literature are, however, not confirmed by our analysis. For instance, portfolio investment in particular, but also loans, change substantially with the degree of corruption. By contrast, the stock of FDI is found to be less sensitive to corruption, which is consistent with some findings in the literature (see Daude and Stein, 2004) but contrary to others (e.g. Wei 2000b), who are

however using different country samples and usually focus on capital flows rather than stocks. Overall, portfolio investment, and in particular equity securities, appear to be the most sensitive type of investment to market conditions and institutional factors. Our results prove robust to using various alternative proxies of markets and institutions and to changing country samples.

The findings of the paper have a number of policy implications. The paper underlines the role of information frictions as a barrier to financial integration, and in particular for FDI and loans. More importantly, the paper emphasizes that FDI should not necessarily be seen as an unconditional blessing for host countries. We present evidence that the share of inward FDI and also foreign loans is highest for countries with weak institutions and poorly developed or badly functioning capital markets. Therefore, although FDI may have beneficial effects on the economy, a composition of foreign investment that is heavily tilted towards FDI is likely to be a signal of some fundamental weaknesses of the host country economy, thus providing support for the argument of Hausmann and Fernandez-Arias (2000).

The remainder of the paper is organized in the following way. The next section provides a brief and selective overview of the literature on the determinants of capital flows and the pecking order of financial integration. Section 3 then outlines the empirical methodology and presents the data, together with a number of stylized facts on cross-border investment. The empirical results are discussed in sections 4 and 5, including various robustness and sensitivity tests. Section 6 concludes and offers a short discussion of policy implications.

2. Literature on determinants of foreign investment and the pecking order

In this section, we review the related literature. It is not our intention to give a detailed survey, but rather to discuss the relevant research questions and theories as guidance for our empirical analysis. Therefore, at the end of the section we point at the existing gaps in the empirical literature the present paper tries to fill.

From a theoretical viewpoint the relevance of the composition of the foreign investment position is closely linked to the theory on the capital structure of the firm. The classic work by Modigliani and Miller (1958) shows that in an environment of perfect information and in the absence of bankruptcy costs and taxes, the value of a firm is unaffected by how it is financed. Thus, much of the subsequent theoretical and empirical studies in the corporate finance literature have tried to identify which of these conditions is violated and leads to the empirical failure of the irrelevance theorem.

In particular asymmetric information has been a key explanation in the finance literature for the capital structure of the firm for the last twenty years. In their seminal papers Myres and Majlauf (1984) and Myres (1984) show that if external investors are less informed than insiders, new equity will be underpriced by the market. Thus, from the firm's viewpoint it would be more costly to raise funds using equity than internal funds. This establishes a "pecking order" theory of financing, where firms rank financial instruments according to the degree of information asymmetry and its subsequent extent of mispricing. There is a large empirical literature on information frictions and asset markets (for an excellent survey, see Harris and Raviv, 1991). For example, Coval and Moskowitz (1999, 2001) show that mutual fund managers earn significantly more on investments in firms with headquarters located geographically near to the mutual fund's offices.

Information asymmetries are also the centre of attention of Gordon and Bovenberg (1996) who focus on understanding the home bias in international capital markets and analyze issues

of capital taxation. In particular, in their model foreign investors face a proportional output cost - due to information asymmetries - compared to domestic investors, which reduces significantly the cross-border mobility of capital. Razin, Sadka and Yuen (1998) present a similar model that extends the pecking order argument to international capital flows to analyze issues of capital taxation. In particular, they assume that FDI circumvents the informational problems completely, while portfolio debt and equity are subject to informational asymmetries where domestic investors observe the real productivity of the firm, while foreign investors do not. Therefore, FDI is the preferred form of financing in the presence of information frictions, followed by portfolio debt and then equity. Neumann (2003) presents a version of lending with moral hazard model by Gertler and Rogoff (1990) that focuses on the differences between international debt and equity financing. In contrast to Razin, Sadka and Yuen (1998), she assumes that ownership, even in the form portfolio equity, conveys some control and therefore information on the investment. Assuming that monitoring costs are decreasing in ownership, the implied pecking order is that FDI and equity are less costly ways of financing domestic investment than instruments that do not convey some degree of ownership and therefore information, like loans or debt.

Goldstein and Razin (2005) present a model that tries to explain the differences in volatility of FDI versus FPI through information asymmetries. Again the key assumption is that FDI implies ownership control of the firm and therefore more information than FPI. In addition, FDI is subject to a fixed cost in contrast to FPI. They assume that foreign investors are subject to privately observed liquidity shocks which drive down the price of selling the asset before maturity due to a standard "lemons" problem. Thus, there is a trade-off between efficiency and liquidity for foreign investors. Under these conditions, they show that in equilibrium, if production costs are higher in developed countries, developed countries will receive more FPI that developing countries, given that it would be less profitable to pay the fixed cost associated to FDI. Mody, Razin and Sadka (2003) present a similar model that predicts also that more countries with good corporate governance attract more FPI.

Focusing on transaction costs, Martin and Rey (2004) analyze the effect of transaction costs in asset trade in a two-country model with financial assets. While their theory concentrates on the role of economies of scale and coordination failures in explaining financial market incompleteness, transaction costs are motivated to reflect information frictions between foreign and domestic investors. Although they do not focus on differences between types of foreign investment, the model gives a theoretical foundation to the application of "gravity" equations in the context of asset trade and therefore a helpful guidance for our empirical formulation.

On the empirical side, there is a fast growing empirical literature that tests the relevance of information frictions in international capital markets. Kang and Stulz (1997) show that non-Japanese investors hold disproportionately large shares in large firms in the tradable sector, with good accounting performance and low leverage. They argue that for this type of firms information frictions are the lowest. Similar results are obtained by Dahlquist and Robertsson (2001) for the case of Sweden. Hau (2001) shows that investors based in Germany and in German speaking cities within Europe have higher profits on German stock. Informational advantages of domestic investors are also found by Choe, Khoe and Stulz (2004) for the case of Korea and Dvorak (2005) for Indonesia.

Froot and Stein (1991) study the relationship between real exchange rate movements and foreign investment in a model where financial frictions are caused by costly information. They show that the link between exchange rate movements and foreign investment should be stronger in assets that are intensive in information. When testing this prediction empirically for gross inflows into the United States, they find a significant link for FDI, while there is no significant link for treasury securities and equity. Thus, this evidence points at FDI being more sensitive to information asymmetries than FPI.

Two closely related papers, are Portes, Rey and Oh (2001) and Portes and Rey (2005). Portes, Rey and Oh (2001) analyze the impact of information frictions on different types of cross-border portfolio flows in the United States, while the second analyzes only the determinants of equity flows. Both papers use the volume of telephone calls as well as the distance between the source and the host countries as proxies for information frictions.[1] They find a large negative and significant impact of distance and a positive impact of the volume of telephone traffic on asset trade. In addition, Portes, Rey and Oh (2001) find that in some specifications for more standardized financial assets like treasury bonds – assumed to be relatively less intensive in information – information frictions matter less than in the case of equity or corporate bonds. Related evidence for loans versus portfolio debt in a gravity model framework is presented in Buch (2002).

The role of expropriation risk for the pecking order of cross-border investment is analyzed by Albuquerque (2003). In his model, FDI is harder to expropriate than FPI because it contains more intangible assets. Therefore, countries with a higher expropriation risk and those that are more likely to face financial constraints, will receive more FDI than FPI. He presents some empirical evidence on overall gross capital inflows consistent with this theory. A similar argument has been provided by Hausmann and Fernández-Arias (2000). In contrast, Wei (2000b) argues that FDI is more sensitive than portfolio and bank loans to corruption due to the need of permanent interaction with local officials and greater sunk costs. Using bilateral data of FDI flows and bank loans and a modified gravity model that includes source-country fixed effects, he finds that the ratio of bank lending to FDI is higher in countries with higher levels of corruption. Clearly, this is in contradiction with the evidence discussed previously. This underlines the difficulty of testing simultaneously hypotheses related to host country effects, like institutions, capital controls or financial development and hypotheses related to the bilateral dimension, as information frictions. Therefore, a contribution of the present paper is to test in two steps these hypotheses, in order to assure consistent estimates in each step. We also contribute to resolving the controversy on the effects of institutions and other host factors of the composition of capital positions.

Summing up, the discussion so far indicates several directions in which our paper extends the analysis. First, while the pecking order or sensitivity to information frictions is an important underlying assumption in several models that analyze the welfare consequences of the volume and composition of capital flows, it has not been tested systematically using all the different components of the capital account. As discussed above, most empirical studies focus on the determinants of one particular asset class or the difference between two classes. Therefore, one contribution is that we analyze also FDI and bank loans in addition to portfolio equity and debt securities. Second, we use a larger sample than most studies and also include a wide range of bilateral variables that reflect transaction costs and are most likely correlated positively with information frictions omitted in most empirical studies. This omission might cause severe biases in the estimates, as well as conduct to false conclusions on the relevance or irrelevance of informational asymmetries. Third, we use foreign investment positions instead of flows. Portes, Rey and Oh (2001) use panel data of flows, but they recognize that most of the identification comes from the cross-sectional dimension. In addition, for any portfolio theory of foreign investment, like Martin and Rey (2004), the relevant decision investors make is regarding the position they take in each country in their portfolio, given the cross-sectional distribution of information frictions they face. Therefore, using stocks instead of flows follows the theory more closely.

[1] Telephone traffic has also been used by Loungani, Mody and Razin (2002) to model FDI determinants.

3. Methodology, data and some stylized facts

This section gives an outline of the methodology and the main hypotheses for the empirical analysis (section 3.1). The subsequent presentation of our data (section 3.2) is then followed by a discussion of some key stylized facts of the pecking order of financial integration derived from our data (section 3.3).

3.1 Methodology and hypotheses

The empirical analysis consists of two parts. In the first part, we attempt to understand the role of information frictions as a determinant of the pecking order of cross-border investment. The effects of information frictions are likely to be different across country pairs, i.e. one particular source country *i* may face a very different degree of information costs and asymmetries vis-à-vis host country *j* than other source countries. For this purpose, we use a pseudo-fixed effects model of bilateral capital stocks held by residents of source country *i* in host country *j*:

$$\log\left(1 + y_{ij}^{k}\right) = \alpha_{i}^{k} + \alpha_{j}^{k} + \beta^{k} X_{ij} + \varepsilon_{ij}^{k} \quad (1)$$

with y_{ij}^{k} as the holdings in US dollars of asset type k – where k = FDI, portfolio equity, portfolio debt securities, or loans – of residents of source country i in host country j; X_{ij} is a proxy of bilateral information frictions and additional controls; and α_{i}^{k} and α_{j}^{k} as source country and host country fixed effects.

Given that in our first step we want to identify consistently the effect of information frictions – a pair-effect variable – we also need to control for all other relevant factors that affect the volume of bilateral investment from a particular source country by including source and host country dummies as well as other bilateral controls that are likely to affect the level of bilateral investment. In the second step, we then try to explain the country fixed effects in order to understand which factors make host countries attractive places for investment.[2]

The vector of coefficients of interest to us in this first step is β^{k}, i.e. we want to test whether different types of asset holdings have a different degree of sensitivity to various proxies of information frictions X_{ij}. Note that we are interested in two separate hypotheses, one relating to the *volume effect* of information frictions (H_1) and the second one to the composition or *pecking order effect* (H_2), i.e. that one type of financial asset holdings (k_1) reacts differently to information frictions than other types of assets (k_2):

$$\text{Volume effect hypothesis} \quad H_1: \quad \beta^{k} = 0$$
$$\text{Pecking order effect hypothesis} \quad H_2: \quad \beta^{k1} = \beta^{k2}$$

Our empirical analysis is cross-sectional, mainly as capital stocks change little from one year to the next and due to data availability. Hence the explanatory power of the model comes purely from the cross-section, which is sensible given the focus on capital stocks and the fact that the independent variables on information frictions and institutions are mostly changing little over time.

[2] See Cheng and Wall (2005) for the relevance of such a two-step approach in the case of trade. Lane and Milesi-Ferretti (2004) use a very similar approach to ours for the case of bilateral portfolio positions.

Note also that we estimate the model using y_{ij}^k as the stocks in US dollars of asset type k. More precisely, we take the log value of the value in million US dollars and add one in order to be able to keep observations that are zero.[3] As there are several observations with a value of zero, it may raise the problem of censoring at zero. Although we use a tobit estimator and a two-step Heckman procedure to show that the results are largely robust to this specification, our preferred estimation technique is via seemingly unrelated regressions (SUR). This means that we estimate the four equations for each type of capital k simultaneously. The advantage of the SUR estimator is that it improves the efficiency of the estimates by allowing for cross-correlations of the residuals of the four equations. Moreover, it allows us to directly test our pecking order hypothesis H_2 in the model.

Note that we do not "normalize" the dependent variable by dividing by host country GDP for H_1 on the volume effect or by dividing by total asset liabilities of host country j for H_2 on the pecking order effect, as is frequently done in the literature. The reason is that each of these "normalizations" imposes restrictions on the parameters of model that are unlikely to hold.[4]

More generally, although it may seem appealing to exclude the fixed effects from the model in order to explicitly allow for including vectors of source country-specific variables X_i and of host country-specific variables X_j, this would imply excluding important unobserved components of relevant fixed effects and is likely to bias the estimators of interest β^k. We show below that β^k indeed mostly change substantially when excluding the fixed effects.

In the second part of the analysis, our aim is to understand the factors that explain the host country fixed effects. More precisely, we want to understand the *role of markets and institutions in host countries as determinants of the pecking order of financial integration*. As these factors are symmetric, i.e. investors in all source countries face the same conditions in a particular host country, we use the fixed effects obtained from the gravity model (1) to test for the role of host country institutions and market conditions X_j on the pecking order and volume effects of financial integration:

$$\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k, \tag{2}$$

where μ_j^k is an error term.

Analogously to model (1), this specification allows us to formulate and test the two hypotheses with regard to the *volume effect* (H_3) and the *pecking order effect* (H_4) of markets and institutions:

$$\text{Volume effect hypothesis} \quad H_3: \quad \lambda^k = 0$$
$$\text{Pecking order effect hypothesis} \quad H_4: \quad \lambda^{k1} = \lambda^{k2}$$

Our preferred estimator is again the SUR, and the same caveats and discussion apply to this second stage as to the estimation of model (1).

---

[3] However, in our final sample the number of zeros is relatively small. Out of the final 1116 observations, FDI values are all strictly positive, FPI portfolio has 187 zero observations, FPI debt 125, and Loans 84, respectively. Our results do not change if we drop these observations. While not reported here these regressions are available upon request.

[4] To illustrate this point, assume we decomposed the host country fixed effect in model (1) as follows: **Error! Objects cannot be created from editing field codes.**, where NORMj is the normalization variable, such as e.g. host-country GDP. In order for the normalization to be permissible, i.e. for NORMj to be moved to the left-hand-side of model (1), it would need to hold that $\eta = 1$. In reality, this may rarely be the case and we will show below that the empirical results change in some cases substantially when using such normalizations.

3.2 Data

As the focus of the paper is on the pecking order of cross-border investment, our data is on *stocks* of various types of foreign investment, rather than capital flows per se. We use three different data sources to construct a comprehensive database that covers all four categories of the financial account – or what is still often referred to as the capital account; two terms which we use interchangeably throughout the paper – i.e. for FDI, for portfolio investment – distinguishing also between equity and debt securities – and for loans.

For FDI, we use the UNCTAD database on bilateral FDI stocks. A database that is often employed in studies on FDI is the one provided by the OECD. However, the UNCATD database is more comprehensive as it includes both industrialized countries and developing countries. The UNCTAD data has annual entries in US dollars for around 90 reporting countries vis-à-vis most countries in the world from 1980 to 2003. Unfortunately, there are many missing entries, so that we do not have bilateral stocks for all country pairs. Moreover, country pairs are excluded from the analysis if there are no entries for the past ten years.

For portfolio investment, we use the Consolidated Portfolio Investment Survey (CPIS) by the IMF. It provides bilateral assets of portfolio equity securities and portfolio debt securities for 69 reporting countries.[5] We use the average figures of the CPIS data for equity securities and for debt securities for 2001, 2002 and 2003. The CPIS also provides a breakdown between short-term and long-term debt securities. We have conducted several tests but did not find systematic differences with this distinction, and thus ignore this additional dimension in the remainder of the paper.

For loans, we use the International Locational Banking Statistics (ILB) data provided by the Bank of International Settlement's (BIS). The database comprises aggregate assets as well as aggregate liabilities of banks in 32 reporting countries vis-à-vis banking and non-banking institutions in more than 100 partner countries. The reported assets and liabilities capture mostly loans and deposits, but may also include other transactions that fall under portfolio or direct investment (see BIS 2003). To minimize this overlap, we use inter-bank claims, i.e. the data for assets and liabilities of banks in reporting countries vis-à-vis banks in partner countries. Although the number of reporting countries is smallest for this database, the fact that it includes data not only for assets but also for liabilities allows us to obtain a proxy also for asset holdings of non-reporting countries vis-à-vis reporting countries.

There are several caveats that are present for the various data sources. A first potential caveat is that the data stems from different sources, thus raising the issue of how comparable they are, though the definitions used are the same across sources. Moreover, one potentially important issue is that the data collection is generally based on the residence principle. This may imply that countries may report their asset holdings vis-à-vis their direct counterpart country but not vis-à-vis the country where the financial asset is ultimately invested. This of course would give enormous importance to financial centers as a lot of capital is channeled through these, but do not reflect the true bilateral holdings of financial assets. Hence we exclude financial centers from our analysis.

Moreover, note that our empirical analysis is purely cross-sectional for two reasons: due to the fact that capital stocks obviously change little from one year to the next and also due to data availability. Due to the potential importance of valuation changes and other special factors affecting the size of capital stocks in individual years, our cross-section is the average size of capital stocks over the five-year period of 1999-2003.

[5] In fact, there has been a slight change in the country coverage of the CPIS as the number of reporting countries increased from 67 to 69 between 2001 and 2003.

It is important to emphasize that we include in our empirical analysis only those country pairs for which all four types of financial asset holdings are available. This reduces the sample size to 77 countries. Appendix A shows the countries that are included in the analysis. It reveals that the sample includes 22 richer, industrialized countries and 55 mainly emerging markets, but also some poorer developing countries. The country sample for the EMEs is roughly balanced across regions with 12 in Africa/Middle East, 13 in Central and Eastern Europe, 13 in Asia and 17 in Latin America. The exclusion of many of the poorer developing countries is required by the fact that they do not have stock markets and/or bond markets. Thus the results on the pecking order are not driven by the absence of stock and bond markets in less developed countries. Further tests focusing only on industrialized countries and only for emerging market economies (EMEs) are conducted below and show the robustness of the findings to different country samples.

3.3 Some stylized facts on the pecking order

Table 1 presents some summary statistics for the different types of financial liabilities, i.e. the table shows the total stocks of different types of capital held by foreigners in the host countries implied by the data described in the previous subsection. There are clear, systematic differences in the composition and volume of capital stocks across countries. First, developing countries receive on average a higher *share* of FDI and loans than developed countries. For example, the average share of FDI in total foreign capital for developing countries is 44% while in the case of the developed countries FDI amounts only to 22%. In contrast, the share of portfolio equity and portfolio debt holdings is significantly higher for developed countries. Second, in terms of the *volume* of investments, developed countries receive significantly higher volumes of all types of capital. Developed countries receive on average – as a ratio of their GDP – around 2.5 times more FPI portfolio, 6.6 times more FPI debt, 2 times more loans, and 1.3 times more FDI than developing countries.

Table 2 shows the correlation coefficients and their significance of investment shares with regard to selected indicators of income, market development and institutions. First, there is a large negative correlation of -0.38 between the share of FDI instocks in total capital stocks and per capita income of a country. Loans are also negatively correlated, though the correlation coefficient is not statistically significant. The same finding applies to domestic financial market development – as proxied by the degree of capital account liberalization and by the ratio of credit to the private sector as percent of GDP: the more developed financial markets are, the lower the shares of FDI and loans a country receives. Figure 2 illustrates in more detail the relationships between these different types of capital and per capita GDP. Moreover, countries with a higher risk of expropriation receive a significantly higher share of FDI and loans.[6]

By contrast, both equity security and debt security holdings are strongly positively correlated with GDP per capita. Moreover, countries that have a large share of portfolio equity and debt stocks also have more developed domestic financial markets and better institutions. Moreover, when considering the correlation of the shares of different types of assets with the average growth rate of GDP per capita over the period 1980 – 2003, the correlations show that there is a positive and significant correlation only for portfolio investment.

[6] Note that a higher value of this variable indicates a lower risk of expropriation.

Figures 3 and 4 illustrate these points in more detail by showing the distributions of the shares of individual types of capital by quintiles of the variable of interest, e.g. starting with the quintile of countries with the lowest GDP per capita on the left and leading up to those with the highest GDP per capita (top left panel of Figure 3). The top right panel of Figure 3 shows that countries that had the highest volatility in GDP growth rates – as measured as the standard deviation of annual real GDP growth rates over the period 1980-2003 – also experienced the highest degree of output volatility.

Figure 4 shows corresponding charts for market development and various institutional indicators. For instance, countries with the least developed domestic financial markets – as proxied by credit to the private sector to GDP – have the highest share of the inward investment from abroad in the form of FDI and loans, which both fall as domestic financial development improves. Moreover, the bottom left panel of Figure 4 indicates that countries with higher corruption receive relatively more FDI and loans, and substantially less portfolio investment. Finally, also countries with a worse protection of property rights – as indicate by a rise in the indicator shown – have a larger share of FDI and loans and relatively fewer equity and debt securities.

Overall, these stylized facts provide some first, descriptive evidence that there is indeed a significant pecking order in cross-border investment, as the various types of foreign capital stocks are strongly correlated with indicators of market development and institutions. A detailed analysis of the causality underlying these relationships is provided in the subsequent sections.

4. The pecking order and the role of information frictions

We now turn to our empirical results. We start with the analysis of the role of information frictions (section 4), before presenting the findings with regard to the role of markets and institutions (section 5).

4.1 Benchmark results

What is the role of information frictions in explaining the pecking order of financial integration? A first important issue is how to measure information frictions. We start by following the common practice in the literature both on trade in goods and on trade in financial assets and proxy information frictions through the log geographic distance between country pairs. We then proceed by using various alternative measures for information.

Table 3 shows the results of our benchmark model (1), which includes in addition to distance a set of standard gravity variables, including dummy variables on whether or not the two countries have a common language, have a common legal origin, colonial links, and whether they have a trade agreement or a joint investment treaty to facilitate cross-border investment. The results are compelling both with regard to our hypothesis H_2 about the pecking order of financial integration as well as with regard to the volume effects hypothesis H_1.

Distance is substantially more important for FDI and for loans than for portfolio equity and portfolio debt investment. The differences in the effects are sizeable as the coefficients for FDI and loans are both around -1.2 as compared to point estimates of -0.67 and -0.80 for portfolio equity and debt. And these differences are highly statistically significant as shown in the right-hand-side columns of the table.

It is interesting to point out that the size of the estimated coefficients for distance is in line with the empirical literature on trade in assets, e.g. Portes and Rey (2005) report a coefficient of -0.89. In addition, the effect of distance on asset trade is greater than its effect on trade in goods, which according to Leamer and Levinsohn (1995) is mostly around -0.6. In the case of goods, Grossman (1998) shows that for sensible values of transportation costs, the distance elasticity should be around -0.03.[7] Thus, he concludes that information costs must be behind the empirical result that the effect is around 20 times larger. For trade in assets it therefore seems that the case for distance reflecting information rather than trade costs is even more compelling. Thus, we explore this information hypothesis in more detail below.

The point estimates for the variables on what is often referred to as "familiarity" effects are sensible as they have the correct sign and are mostly statistically significant. Like for the distance variable, FDI reacts much more strongly to these familiarity effects than this is the case for portfolio equity and debt investment. For instance, when both countries speak the same language FDI stocks in host countries are 54 percent higher and portfolio equity investment 38 percent larger, whereas portfolio debt investment and loans are not statistically significantly different.[8]

4.2 Robustness: alternative proxies for information frictions

How robust are these findings to different proxies for information frictions? Clearly it may seem odd to proxy information frictions for trade in financial assets through geographic distance as one would expect that geography should have little to do with financial transactions. However, the literature on capital flows has repeatedly found distance to be highly significant, see e.g. Portes and Rey (2005) for equity investment flows. Nevertheless, it is useful to employ alternative and ideally more direct proxies for information frictions. We use three such proxies: the amount of telephone traffic between two countries, the trade in newspapers, and bilateral stock of immigrants from the source country that live in the host country and vice versa.

The intuition for the use of these variables as proxies for the degree of information frictions is straightforward. The volume of telephone call traffic was proposed first by Portes and Rey (2005) and has been used extensively in the most recent empirical literature.[9] Telephone traffic is a proxy of the amount of information that flows between both countries and it is assumed that a larger volume of information flows – controlling additionally for the size of both economies – implies less informational frictions. A similar rationale has been put forward to use trade in newspapers and periodicals by Nicita and Olarreaga (2000) to study information spillovers in goods markets. They report a high correlation of trade in newspapers with telephone traffic (a simple correlation of 0.77), but prefer their measure due to a greater data availability. Finally, Gould (1994) analyzes the impact of the stock of immigrants in the U.S. on trade between the U.S. and the immigrants' country of origin. The intuition is that immigrants have better information on the markets and institutions in their home country which would lower transaction costs.

Table 4 shows the results when adding telephone traffic to the benchmark model. One important result is that when adding telephone traffic it is not only highly significant, but distance becomes insignificant for FDI and portfolio equity and debt investment. Distance

[7] For a recent survey on the importance of trade costs see Anderson and van Wincoop (2004).
[8] Note that the coefficients for the dummy variables are not strictly elasticities. The calculation of the elasticity, for instance for the former variable can be done by using: exp(0.43) – 1 = 0.537.
[9] See Portes, Rey and Oh (2001) for the case of equity flows; Loungani, Mody and Razin (2002), as well as di Giovanni (2005) for FDI; and Mody, Razin and Sadka (2003) for FDI and equity, among others.

retains its significance for loans, albeit with a much smaller coefficient of -0.34 as compared to -1.23 in the benchmark model of Table 3. It is important to point out that this result is not driven by multicollinearity problems between telephone traffic and distance, given that the simple correlation between both variables in our sample is just -0.13. In addition, although the sample is reduced due the availability restrictions on telephone traffic, if we re-estimate the regression from Table 3 for this sub-sample, the distance coefficients are negative, significant, and not different from the estimates for the whole sample. Therefore, distance seems to be a proxy for overall information frictions in asset trade. When comparing the pecking order effect of information frictions, telephone traffic is again significantly larger for FDI and also loans than for equity and debt.

Table 5 gives the estimates for the other two alternative information proxies as well as for a model that instead includes the first principal component of the three proxies. We include the principal component of all three alternative proxies because it may help alleviate measurement errors related to each individual variable.[10] The results confirm that FDI and loans are more sensitive to information frictions. However, distance remains significant in most of these specifications, and with the same order as before as information generally has the largest effects on FDI and loans and the smallest impact on portfolio equity and debt.

4.3 Robustness: Alternative model specifications and controls

Finally, we conduct a battery of sensitivity tests by using alternative econometric specification and by adding various controls to the empirical specification of the model. A first test is to ask whether the results are robust to taking ratios, of GDP or of total capital stocks, as dependent variables, which is a commonly done in the literature, despite the controversial underlying assumptions behind such a specification, as discussed in section 3.1. Table 6 shows the estimates for the benchmark model where the dependent variable is measured as a percentage of source and host country GDP and as a percentage of total capital flows from source country *i* to host country *j*. The results indicate that although the coefficients are very different, our overall results with regard to the pecking order still hold: FDI and loans are in both specifications significantly and substantially larger than portfolio equity and portfolio debt investment.

As the next step, we investigate the robustness of the results to using alternative econometric estimators. Table 7 provides the results for a Tobit estimator and for an OLS estimator without source and host country fixed effects. The estimates of the Tobit model are in line with those obtained from our OLS benchmark although the coefficients of the tobit model are not directly comparable with those of the OLS estimator. Recall that the tobit model is a non-linear estimator that uses a mixture of a continuous distribution over the non-censored observations and a discrete distribution for the censored ones. The point estimates shown in the table are the marginal effects evaluated at the mean of the independent variables. Hence a comparison of the marginal effects across capital types is not so meaningful, and a clear-cut test of the pecking order hypothesis not possible.

[10] About 81 percent of the total variation in the three alternative proxies is explained by their first principal component. The factor loadings are high for all three variables, so that they seem to be well represented by the first factor.

There are some interesting differences between the models with and without fixed effects. The model without fixed effects is estimated by including nominal GDP (in US dollar) and population of both the source country and of the host country instead of the fixed effects. There are two important points to note from the results. First, almost all point estimates for the proxies of information frictions are substantially different from those of the benchmark fixed-effects model. This lends support to our point made above that it is important to estimate the model by including fixed effects as otherwise the point estimates are biased due to omitted variables. Nevertheless, even without the fixed effects our pecking order hypothesis is confirmed. Second, note that the hypothesis that the point estimates of the GDP variables are equal to one is rejected in almost all equations. This is a noteworthy fact because it stresses that a "normalization" of the model, i.e. including the dependent variables as ratios of GDP imposes incorrect restrictions on the parameters of the model.

In Table 8 we explore an alternative way to deal with observations that are zero. Razin, Rubinstein and Sadka (2005) argue that in the presence of fixed costs, the correct way of dealing with the censoring problem is to use Heckman's (1979) two-step procedure. It might be that fixed costs are much higher for one particular type of investment and therefore our previous results could potentially be biased. In order to explore this possibility, we proceeded in the following way. We estimated the first-step "selection" equation using probit. Our dependent variable in each case is a dummy of whether investment is greater than zero or not. The explanatory variables in this step are all of our baseline variables, including the source and host country dummies. In the second step, we considered the log of the different types of investment positions, rather than log $(1+y_{ij})$, and estimated the equation correcting for the potential selection bias.[11] The necessary exclusion restrictions in each equation were selected based on the insignificance of these variables in the respective regressions in Table 3. While the point estimates for portfolio debt and equity are slightly higher than under our baseline specification, it is clear that the previously found pecking order still holds.

One set of explanations that we have not analyzed so far is *risk sharing or risk diversification* as a driver of cross-border investment. As discussed in section 2, there is a large literature on the determinants of risk sharing and home bias. Thus the motivation for the type and direction of cross-border capital flows may not only be information frictions and institutions but also the attempt to diversify idiosyncratic, home-country risk. Obstfeld and Rogoff (2000), Lane and Milesi-Ferretti (2004) and Aviat and Courdacier (2005) argue that a source country that receives a high share of its imports from a particular host country will want to acquire more capital in this specific host country in order to ensure itself against terms of trade shocks to this country. Extending this argument to risk diversification, it may be optimal for investors to invest relatively more in those countries with the lowest or even a negative degree of output correlation to its own.

We therefore add to our benchmark model imports of source country *i* from host country *j* (see left panel of Table 9) and GDP correlation between the two countries for 1960-2003 (right panel of Table 9) to investigate whether the findings for information frictions change when controlling for proxies of risk sharing. The table shows that trade is indeed positively correlated with all four types of capital investment. GDP correlation, by contrast, is significant and positive only for cross-border investment in debt securities. It is important to stress that trade and GDP correlations are obviously likely to be endogenous to financial integration and one would need to find suitable instruments if one wanted to investigate the link between risk sharing and financial integration. However, the important point to note for the objective of this paper is that information frictions as proxied by distance (or other information proxies when substituted for distance) retain their significance and the pecking

[11] Given that we do not have zero observations for FDI in our sample, the Heckman two-step procedure does not apply. Therefore, we report the OLS estimate using the log of FDI as dependent variable.

order of FDI and loans to be the most sensitive to information frictions and portfolio investment the least sensitive is confirmed.

Finally, we check the robustness of the results to using alternative country samples. Table 10 shows the results when estimating the benchmark model (1) separately for when only industrialized countries and when only EMEs are the host countries. Overall, the results confirm our pecking order hypothesis in that FDI and loans are most sensitive to information frictions, independent of whether the host country is an emerging market or an industrialized country. Moreover, some interesting differences across country groups emerge. In particular, capital stocks are much more sensitive to information and familiarity effects when the host country is an emerging market economy. The elasticity for FDI, for instance, is -1.54 for EMEs but only -0.89 for industrialized countries. Investment in EMEs also appears to be more sensitive to the common language and the colonial links. By contrast, for industrialized countries cross-border financial asset holdings react more strongly to whether or not both countries have the same legal origin. Taken together, these findings seem sensible and strengthen our overall hypothesis on the pecking order of financial integration.

Overall, the first key result that we take from this section is that there is a clear pecking order with regard to information frictions. FDI and loans are substantially more sensitive to information frictions than portfolio investment. The differences are large and statistically significant. These findings are also robust to several alternative proxies for information frictions, in particular when using telephone traffic. Moreover, various robustness tests confirm the specification of the model and underline the robustness of the results on the pecking order hypothesis to alternative specifications and different econometric estimators. Thus, the results indicate that FDI and loans are more sensitive to information frictions – or more information-intensive – than portfolio investment, equity and debt. A possible explanation for this fact is that FDI and loans in general require frequent interaction and a deeper knowledge of the markets where they operate. Also, especially for the case of FDI, once an asset has been acquired, direct ownership makes the asset less liquid given that lemon problem in case of a re-sale as Goldstein and Razin (2005) point out. Thus, FDI becomes partially irreversible or costlier to liquidate, and therefore more sensitive to information in the first place.

5. The pecking order and the role of institutions and financial market development

We now turn to the role of financial markets and institutions. The central focus is on the question of whether we can identify a pecking order of financial integration with regard to the degree of development and openness of markets and the quality of institutions in the host country. For this purpose, we extract the host country fixed effects from model (1) and then estimate model (2), i.e. we attempt to explain the host country fixed effects through market conditions and institutions. Note that given the specification of model (1) where the dependent variable is measured in value terms, we need to control for size effects in model (2). We do so by including host country GDP in each of the specifications below, though we omit showing the point estimates for this variable for brevity reasons. All variables used are described in more detail in Appendix B.

We start with the role of *market development and openness*. We use three different proxies. First, we employ a capital account openness dummy. This dummy takes the value of one if the country had fully liberalized its capital account by the mid-1990s, and is zero otherwise. Data for this variable comes from the IMF's Annual Report of Exchange Arrangements and

Exchange Restrictions (AREAER). The finding is remarkably strong as portfolio equity and portfolio debt investment react strongly to capital account openness, whereas the coefficients for FDI and loans are positive but only marginally statistically significant (see Table 11). The magnitude of the effects is large: a country that is open receives about 80% more equity capital and 80% more debt investment compared to an economy with a closed capital account.[12]

Second, we investigate the effect of the development of the domestic financial sector on the pecking order. We include credit to the private sector as a proxy for financial development. Table 11 shows that the elasticities are by the far the largest for equity investment, which is about twice as large as that for debt securities and FDI. These differences are statistically significant, while in the case of FDI investment appears to not react to changes in the degree of financial market development in the host country.

Third, we analyze the role of the development of the local stock market, and proxy this through stock market capitalization. The bottom panel of Table 11 indicates again that equity investment is most strongly related to changes in market capitalization but nevertheless also cross-border investment in debt securities, loans and FDI react, though to a lesser extent.

As a next step, we analyze the role of institutions for the pecking order of financial integration. As discussed in detail in section 2, there have been a number of studies arguing that different types of capital should react differently to various institutional features. For instance, Albuquerque's (2003) model implies that FDI is harder to expropriate as the information required for and obtained by FDI is inalienable. Various other studies have focused on individual types of capital flows and how they are linked to other institutional elements such as e.g. corruption, transparency and political risk etc. (e.g. Wei 2000b, Papaioannou 2005, Gelos and Wei 2005).

We test the effect of various institutional features. While it is hard to determine which institutional factors to focus on, we are guided in our choice of institutional variables by the mostly theoretical literature discussed in section 2. The sources for these variables are manifold, partly stemming from the work by La Porta et al. (1998), Djankov et al. (2002) and partly from the databases by the World Bank Doing Business and by the International Country Risk Guide (ICRG).

Tables 11 and 12 show the findings for three sets of institutional variables. First, we look at the role of *transparency*. For this, we employ both a measure on the quality of information disclosure and on the quality of the accounting standards required by law in the host country – with higher values indicating a better quality. For both measures, portfolio equity investment reacts the strongest to changes in these transparency measures, while in the case of accounting standards the coefficient for debt securities and loans are also significant at a 10% level. FDI and loans are the least responsive. In fact, the elasticity of equity investment is about three times larger than that for FDI and for loans.

Second, we analyze the role of *investor protection* (last regression in Table 11 and Table 12). In particular, a lower risk of *expropriation* – indicated by a higher value of the variable in the table – has a highly significant impact mainly on portfolio investment. By contrast, the elasticity of loans is only about one half of that of portfolio investment, while FDI does not

[12] Recall that only countries with existing stock and bond markets are included in the analysis so that the results are not driven by an absence of such markets in closed economies.

react at all to differences in expropriation risk. This finding thus provides strong support for the hypothesis formulated by Albuquerque (2003) and is line with the stylized facts presented above in section 3.

Moreover, Table 11 shows that an improvement in the quality of property rights – indicated by a decline in the variable in the table – has a significant and the largest impact on portfolio equity and debt investment, a lower effect on loans, but no effect on FDI. An almost identical picture emerges for repudiation costs and for the quality of enforcement of laws and regulations – which is measured in the days it takes to enforce a particular ruling, so that a higher number for the latter indicates a worse system of enforcement. Overall, all three measures therefore indicate that investor protection has the largest effect on portfolio investment but does not appear to have any significant effect on FDI stocks.

Third, we analyze the importance of *corruption* for the pecking order. We use three alternative proxies for corruption; a first one from Transparency International, a second one from the World Development Report of the World Bank and the third one from a survey of German manufacturing firms. All three indicators have been used previously by Wei (2000b). In all cases, a higher value indicates a higher degree of corruption. Overall, the same finding emerges for all three of the proxies: corruption has the strongest negative effect on portfolio investment and some, though smaller effect on loans. Importantly, corruption does not appear to have any significant effect on FDI, and this result holds for all three measures of corruption. This finding is in line with Daude and Stein (2004) who do not find a robust relation between different corruption indicators and FDI in contrast to other institutional indicators.

We conduct various sensitivity tests to check for the robustness of these findings. For instance, we find very similar results when controlling also for GDP per capita in model (2). The stylized facts of section 3 underline that there is a high correlation between per capita GDP and the pecking order of financial integration. However, the fact that the results hold also when controlling for GDP per capita stresses that market development and institutions have a large and significant effect on the pecking order independent of the level of development of a country.

As a further important sensitivity test, we use an IV estimator to take into account the possibility that institutional arrangements and market development may be endogenous to financial integration. We estimate the system using a three-stage least square estimator (3SLS), which in essence implies instrumenting the institutional variables. An additional advantage of this approach is that we also address potential measurement errors in the institutional variables with our estimation technique. We draw our instruments from the literature on law and finance and the literature on institutions and economic development. Specifically, we use legal origin dummies and dummies for religion which have been found to be important determinants of financial markets development and regulations (see La Porta et al. 1997, 1998). In addition, we test the absolute latitude, from Hall and Jones (1999), as an alternative instrument for institutions.[13]

The results for the 3SLS estimates are given in Tables 13 and 14. Overall, the key point is that the results are highly robust to those without instrumenting the institutions. All the results described above are qualitatively identical when using 3SLS, underlining that portfolio

[13] Using as alternative instruments the mortality rates of settlers from Acemoglu, Johnson and Robinson (2001) or ethnolinguistic fragmentation from Easterly and Levine (1997) does not alter the qualitative results of our analysis, While not presented here, the regressions using these instruments as well as OLS regressions are available upon request.

investment is substantially more sensitive to institutions and market development than FDI, and to some extent also than loans. Moreover, the fact that the size of the coefficients and their significance increase somewhat also helps to stress the robustness of the results.

Finally, we test whether the findings are fundamentally different for emerging markets as compared to industrialized countries. Tables 15 and 16 thus show the results for the effects of market development and institutions only for EMEs. The results for debt securities are somewhat less significant in some cases. Moreover, some interesting, finer differences emerge. For instance, corruption has a negative effect on the volume of FDI for EMEs, though not for the whole country that includes developed countries. This finding seems sensible as it suggests that corruption tends to be more detrimental in developing countries as compared to industrialized countries. Overall, the tables largely confirm our pecking order hypotheses in that the results are robust also when only analyzing emerging markets/developing countries.

In summary, we find that market development and institutions are strongly related to the pecking order of cross-border investment. The key finding of this section is that portfolio investment, in particular in equity securities, is the type of capital that is the most sensitive to differences in market development/openness and the quality of host country institutions. A second key result is that FDI appears to be the type of capital that is most immune to the quality of domestic institutions. We find that FDI is least sensitive in all institutional categories, including with regard to transparency, investor protection, to the degree of corruption and to expropriation risk.

6. Conclusions

Is there a pecking order of cross-border investment in that countries become financially integrated primarily through one type of investment rather than others? The perceived wisdom in much of the debate on financial integration and trade in financial assets is that FDI constitutes a type of investment that is desirable from a host country perspective because it brings about a transfer of know-how, creates access to foreign markets and reduces the risks of financial distress. However, the facts of financial integration also show that countries that are richer, have higher growth and better institutions receive a higher share of their foreign investment in the form of portfolio investment and a much lower share through FDI and loans.

The objective of this paper has been to analyze whether there is a natural pecking order in cross-border investment. We focus on the role of two key determinants for the trade in financial assets that have been central in this literature in recent years: the importance of information frictions, and the role of institutions. Both are based on the theory of the capital structure of the firm that goes back to the seminal work by Modigliani and Miller (1958) and Myres (1984). Recent theoretical contributions to this literature emphasize the importance of differences in the ownership structure of different forms of investment. In particular, FDI has stronger ownership implications and thus tends to be more information sensitive than portfolio equity or debt investment. A second strand of the literature has focused on the implications of this theory for the role of institutions. One line of reasoning is that due to the larger information sensitivity of FDI, it is also harder to expropriate and thus it may be more immune to differences in the quality of institutions and market development.

The intended contribution of the paper is to test these hypotheses empirically for a broad set of countries. To our knowledge, this is the first paper that provides a comprehensive comparison of all four types of cross-border investment – distinguishing between FDI, portfolio equity securities, debt securities as well as loans. We develop and use a unique, combined data source of the capital stocks, rather than capital flows, for 77 countries.

The empirical results are compelling and confirm our hypotheses on the pecking order of cross-border investment. First, information frictions across countries are an important determinant of the pecking order of financial integration. In line with the theory on the capital structure of the firm, we find that FDI, and to some extent loans, are the most sensitive types of capital to information frictions, whereas portfolio investment is much less responsive. The magnitude of these pecking order effects is large: FDI and loans are about 1.5 to 2 times more sensitive to information frictions than equity and portfolio investment. This finding is robust to several sensitivity tests, including the use of alternative proxies for information frictions; various specifications of the econometric model; controlling for other determinants, such as risk diversification; and across country samples, both for industrialized and for emerging market economies.

The second key result of the paper is that the degree of market development and the quality of host country institutions are important determinants of the pecking order of cross-border investment. We find that portfolio investment is substantially more sensitive than FDI and loans to both market development – such as the openness of the capital account and the development of the domestic financial sector – and to domestic institutional features. We use three proxies for the quality of institutions – the degree of transparency, investor protection and corruption – and show that this result is robust across all these different elements of host country institutions. These results confirm some hypotheses formulated in the literature but contradict others. For instance, in line with the argument by Albuquerque (2003), we find that FDI does not react to differences to the risk of expropriation, whereas portfolio equity and debt investment is highly sensitive to this risk. Similarly, we do not find that corruption has a more detrimental effect on FDI, as hypothesized in the literature, but that the magnitude of FDI is not sensitive to corruption, whereas portfolio investment is. This implies that in fact corruption tilts the composition of foreign investment significantly towards FDI, and to a lesser extent towards loans.

The findings of the paper have a number of important policy implications. In particular, the empirical results indicate that a large share of foreign investment that takes the form of FDI – despite the various benefits FDI may ultimately entail – may not necessarily be a blessing, but may in fact also be a signal of some underlying weaknesses – either in terms of weak institutions or in terms of the poor functioning or underdevelopment of domestic financial markets – of the host country. By contrast, a large share of foreign investment that comes through portfolio equity or debt securities is likely, at least in part, to signal well-functioning domestic financial markets and the trust of foreign investors in domestic institutions.

References

Acemoglu, Daron; Johnson, Simon and Robinson, James A. 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review* 91(5): 1369-1401.

Aitken, B., Hanson, G.H. and Harrison, A.E. 1997. Spillovers, Foreign Investment and Export Behavior. *Journal of International Economics* 43(1-2): 103-32.

Albuquerque, Rui. 2003. The Composition of International Capital Flows: Risk Sharing Through Foreign Direct Investment. *Journal of International Economics* 61: 353 – 383.

Alfaro, Laura; Kalemli-Ozkan, Sebnem and Volosovych, Vadym. 2005. Why Doesn't Capital Flow from Rich to Poor Countries? An Empirical Investigation. NBER Working Paper 11901, December 2005.

Anderson, James E. and Eric van Wincoop, 2004. Trade Costs. *Journal of Economic Literature* 42: 691 – 751.

Aviat, Antonin and Coeurdacier, Nicolas. 2004. The Geography of Trade in Goods and Assets." DELTA (Paris, France) Working paper 2004-10, May 2004, forthcoming in *Journal of International Economics*.

Bank of International Settlements, 2003. Guide to International Banking Statistics. BIS Papers No. 16, April 2003.

Borensztein, E., De Gregorio, J. and Lee, J-W. Lee. 1998. How Does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics*. 45 (1): 115-135.

Buch, Claudia M., 2002. Are Banks Different? Evidence from International Data. *International Finance* 5(1): 97–114.

Choe, H., Kho, B.-C., and Stulz, R., 2004. Do Domestic Investors Have An Edge? The Trading Experience of Foreign Investors in Korea. *Review of Financial Studies*.

Cheng, I-Hui and Howard J. Wall, 2005. Controlling for Heterogeneity in Gravity Models of Trade and Integration, Federal Reserve Bank of St. Louis Review, January/February, 49 – 64.

Chuhan, P., Claessens, S. and Mamingi, N. 1998. Equity and Bond Flow to Latin America and Asia: The Role of Global and Country Factors. *Journal of Development Economics.* 55(2): 441-465.

Claessens, S., Dooley, M.P., and Warner, A. 1995. Portfolio Capital Flows: Hot or Cool? *World Bank Economic Review* 9 (1): 153-179.

Coval, J. D. and Moskowitz, T. J. 1999. Home bias at home: local equity preference in domestic portfolios. *Journal of Finance* 54 (6): 2045 – 2073.

Coval, J. D. and Moskowitz, T. J. 2001. The geography of investment: informed trading and asset pricing. *Journal of Political Economy* 109(4): 811 – 841.

Dahlquist, M. and Robertsson, G., 2001. Direct foreign ownership, institutional investors, and firm characteristics. *Journal of Financial Economics* 59: 413 – 440.

Daude, C. and Stein, E., 2004. The Quality of Institutions and Foreign Direct Investment, mimeo Inter-American Development Bank.

Di Giovanni, Julian, 2005. What drives capital flows? The case of cross-border M&A activity and financial deepening. *Journal of International Economics* 65: 127 – 149.

Djankov, S., Glaeser, E., La Porta, R., Lopez-de-Silanes, F., and A. Shleifer, 2002. The Regulation of Entry. *Quarterly Journal of Economics* 117(1): 1-37.

Dvorak , Tomas, 2005. Do Domestic Investors Have an Information Advantage? Evidence from Indonesia. *Journal of Finance* 60(2): 817 – 839.

Easterly, William and Ross Levine. Africa's Tragedy: Policies and Ethnic Divisions. *Quarterly Journal of Economics*,112(4): 1203 – 1250.

Faria, Andre and Mauro, Paolo. 2004. Institutions and the External Capital Structure of Countries. IMF Working paper 04/236, December 2004.

Froot, K. A., and Jeremy Stein, 1991. Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach. *Quarterly Journal of Economics* 106 (November 1991): 1191-1217.

Gelos, Gaston, and Shang-Jin Wei. 2005. Transparency and International Investors' Behavior, *Journal of Finance* (forthcoming).
Gertler, Mark, and Kenneth Rogoff, 1990. North-South Lending and Endogenous Domestic Capital Market Inefficiencies. *Journal of Monetary Economics* 26: 245 – 266.
Goldstein, Itay, and Assaf Razin, 2005. Foreign Direct Investment vs. Foreign Portfolio Investment. NBER Working Paper 11047.
Gordon, Roger H. and A. Lars Bovenberg, 1996. Why Is Capital So Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation. *American Economic Review* 86(5): 1057 – 1075.
Gould, David M., 1994. Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows. *Review of Economics and Statistics*, Vol. 76, No. 2: 302 – 316.
Hall, Robert, E. and Charles I. Jones, 1999. Why Do Some Countries Produce So Much More Output per Worker than Others? *Quarterly Journal of Economics*, 114: 83 – 116.
Hau, Harald. 2001. Location Matters: An Examination of Trading Profits. *Journal of Finance* 56 (5): 1959 – 1983.
Hausmann, R., and E. Fernandez-Arias. 2000. Foreign Direct Investment: Good Cholesterol? IADB Working Paper 417.
Harris, Milton and Artur Raviv, 1991. The Theory of Capital Structure. *Journal of Finance* 46(1): 297 – 355.
Heckman, James J., 1979. Sample Selection Bias as a Specification Error. *Econometrica* 42: 153 – 168.
Kang, J.-K. and Stulz, R. M., 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. *Journal of Financial Economics* 46: 3 – 28.
Klein, Michael, Joe Peek and Eric Rosengren, 2002, Troubled Banks, Impaired Foreign Direct Investment: The Role of Relative Access to Credit, *American Economic Review* 92(3): 664-682.
La Porta, R., López de Silanes, F., Shleifer, A. 1997. Legal Determinants of External Finance. *Journal of Finance*. 52(3): 1131-1150.
La Porta, R., López de Silanes, F., Shleifer, A. 1998. Law and Finance. *Journal of Political Economy*. 106(6): 1113-1155.
Lane, Philip R. and Gian Maria Milesi-Ferretti, 2004. International Investment Patterns. Institute for International Integration Studies (IIIS) Discussion Paper No. 24, June 2004.
Leamer, Edward and Levinsohn, James, 1995. International Trade Theory: The Evidence, in Gene M. Grossman and Kenneth S. Rogoff, (Eds.), The Handbook of International Economics: Vol. III, North Holland, Amsterdam ; New York, 1339 – 1394.
Loungani, Prakash, Ashoka Mody, and Assaf Razin, 2002. The Global Disconnect: The Role of Transactional Distance and Scale Economies in Gravity Equations. *Scottish Journal of Political Economy* 49(5): 526 – 543.
Lucas, Robert E. 1990. Why Doesn't Capital Flow From Rich to Poor Countries? *American Economic Review* (Papers and Proceedings) 80(2): 92-96.
Mauro, Paolo, 1995. Corruption and Growth. *Quarterly Journal of Economics*, 110: 681 – 713.
Modigliani, Franco and Merton H. Miller, 1958. The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review* 48(3): 261 – 297.
Mody, Ashoka, Assaf Razin, and Efraim Sadka, 2003. The Role of Information in Driving FDI Flows: Host-Country Transparency and Source-Country Specialization. NBER Working Paper 9662.
Montiel, Peter and Carmen M. Reinhart, 1999. Do capital controls and macroeconomic policies influence the volume and composition of capital flows? Evidence from the 1990s. *Journal of International Money and Finance* 18: 619 – 635.
Myers, Stewart C., 1984. The Capital Structure Puzzle. *Journal of Finance* 39: 575 – 592.
Myers, Stewart C. and Nicholas S. Majlauf, 1984. Corporate financing and investment decisions when firms have information investors do not have. *Journal of Financial Economics* 5: 147 – 175.

Martin, Philippe and Hélène Rey, 2004. Financial super-markets: size matters for asset trade. *Journal of International Economics* 64: 335 – 361.

Neumann, Rebecca M., 2003. International capital flows under asymmetric information and costly monitoring: implications of debt and equity financing. *Canadian Journal of Economics* 36(3): 674 – 700.

Obstfeld, Maurice and Kenneth Rogoff, 2000. The Six Major Puzzles in International Economics: Is there a Common Cause? In: *NBER Macroeconomics Annual 2000,* University of Chicago Press, Chicago.

Papaioannou, Elias, 2005. What drives international bank flows? Politics, institutions and other determinants. ECB Working Paper No 417.

Portes, Richard, Hélène Rey and Yonghyup Oh, 2001. Information and Capital Flows: The Determinants of Transactions in Financial Assets, *European Economic Review* 45: 783–96.

Portes, Richard and Hélène Rey, 2005. The determinants of cross-border equity flows. *Journal of International Economics* 65: 269 – 296.

Razin, Assaf, Yona Rubinstein and Efraim Sadka, 2005. Fixed Costs and Bilateral FDI Flows: Conflicting Effects of Country Specific Productivity Shocks, mimeo.

Razin, Assaf, Efraim Sadka and Chi-Wa Yuen, 1998. A pecking order of capital flows and international tax principles. *Journal of International Economics* 44: 45 – 68.

Santos, Silva, J.M.C. and Tenreyro, Silvana. 2005. The Log of Gravity. Federal Reserve Bank of Boston Working Paper No. 03-1, revised version December 2004. CEPR Discussion Paper 2005.

Sarno, Lucio and Mark Taylor, 1999. Hot Money, Accounting Labels and the Permanence of Capital Flows to Developing Countries. *Journal of Development Economics.* 59 (2): 337-64.

Shleifer, Andrei and Wolfenzon, Daniel. 2002. Investor Protection and Equity Markets. *Journal of Financial Economics* 66(1): 3-27

Wei, Shang-Jin, 2000a. How Taxing is Corruption on International Investors. *Review of Economics and Statistics* 82(1): 1-11.

Wei, Shang-Jin, 2000b. Local Corruption and Global Capital Flows. *Brookings Papers on Economic Activity*, 2000(2): 303-354.

Appendix

A: Country Sample

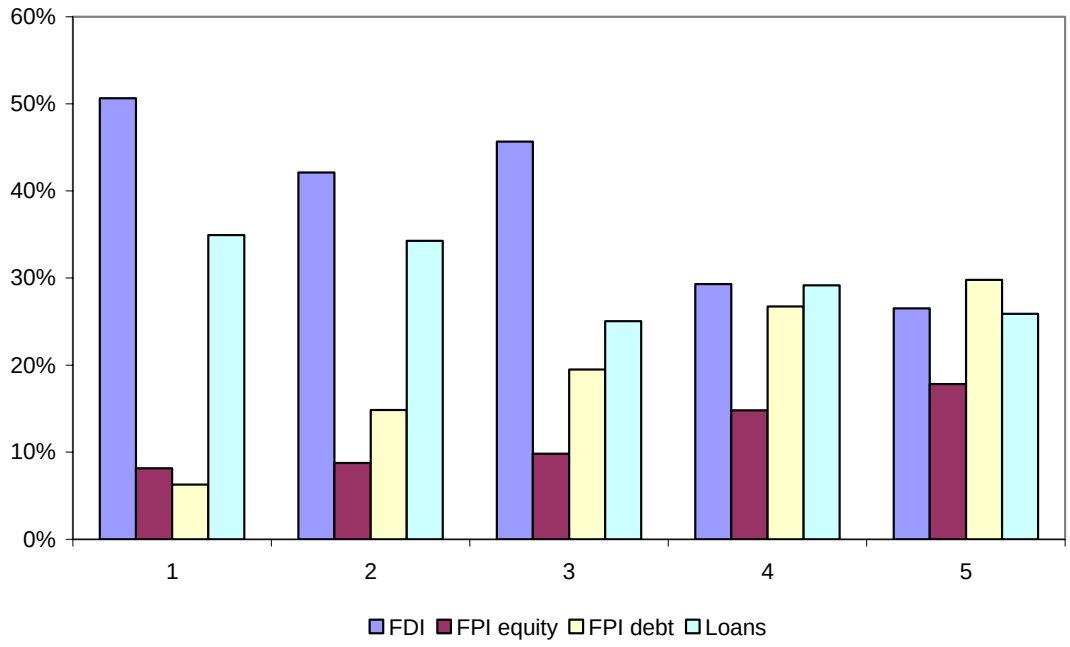
EMEs and Developing Countries				Developed Countries	
Latin America	**Asia**	**Eastern Europe**	**Africa/Mid.East**	**Europe**	**Other**
Argentina	Bangladesh	Bulgaria	Cote d'Ivoire	Austria	Australia
Bolivia	China	Croatia	Egypt	Belgium	Canada
Brazil	Hong Kong	Cyprus	Ghana	Denmark	Japan
Chile	India	Czech Republic	Israel	Finland	New Zealand
Colombia	Indonesia	Estonia	Kenya	France	United States
Costa Rica	Kazakhstan	Hungary	Morocco	Germany	
Ecuador	Korea	Latvia	Namibia	Greece	
El Salvador	Malaysia	Lithuania	Nigeria	Iceland	
Guatemala	Pakistan	Poland	South Africa	Ireland	
Honduras	Philippines	Romania	Tanzania	Italy	
Jamaica	Singapore	Russia	Tunisia	Netherlands	
Mexico	Sri Lanka	Slovenia	Zambia	Norway	
Paraguay	Vietnam	Turkey		Portugal	
Peru				Spain	
Trinidad & Tob.				Sweden	
Uruguay				Switzerland	
Venezuela				United Kingdom	

B: Variable definitions and sources

Variable definition:	Source:
Bilateral FDI stocks – FDI asset holdings of source country *i* in host country *j* in million US dollar	UNCTAD
Bilateral portfolio equity and portfolio debt stocks – average 2001-2003 holdings of source country *i* in host country *j* in million US dollar	Coordinated Portfolio Investment Survey (CPIS), IMF
Bilateral loans – aggregate assets and aggregate liabilities of banks in reporting countries vis-à-vis banking and non-banking institutions in host countries	International Locational Banking Statistics (ILB), BIS
Distance – log bilateral great circle distance in miles between economic centers of source country and host country	Andy Rose's website
Telephone traffic – volume of telephone call traffic between source and host country	ITU Directions of Trade
Trade in newspapers and periodicals – Exports from country *i* to country *j* plus exports from *j* to *i* in million US dollar	UN Comtrade database Exports of item 8922 SITC Rev.2
Bilateral stock of foreigner – sum of foreigners born in country *i* currently living in country *j* and vice-versa.	OECD Database on Foreign-born and Expatriates
Common language – dummy equal to one if both countries speak the same language and zero otherwise	Andy Rose's website; CIA World Factbook
Common legal origin – dummy equal to one if both countries have legal system with same origin and zero otherwise	La Porta et al (1998)
Colonial links – dummy equal to one if both countries have	Andy Rose's website; CIA

been linked through colonization	World Factbook
Trade agreement – dummy equal to one if both countries have a bilateral trade agreement or are part of a common agreement and zero otherwise	Andy Rose's website
Investment treaty – dummy equal to one if both countries have a bilateral investment treaty and zero otherwise	UNCTAD
Bilateral trade – the imports of goods and services of host country from and source country in US dollar million	IFS, IMF
GDP correlation – bilateral correlation of annual real GDP growth rates between host and source countries over the period 1960-2003	IFS, IMF and OECD
Capital account openness – dummy equal to one if the host country had fully liberalized its capital account by 1996 and zero otherwise	Annual Report of Exchange Arrangements and Exchange Restrictions (AREAER), IMF
Financial development – credit to the private sector in USD million	IFS, IMF
Stock market capitalization – average stock market capitalization in USD million over the period 1999-2003	Datastream and national sources
Quality of information disclosure – index that goes from 0 to 7 with higher values indicating that regulation requires more disclosure of information (see source for more details)	World Bank – Doing Business Database
Accounting standards – rating of companies in seven different categories in 1990. The index goes from 0 to 100, with higher values representing better standards	La Porta et al (1998)
Property rights – index that goes from 0 to 5, with higher values representing bad protection of property rights	Heritage Foundation
Expropriation risk – index goes from 0 to 10, with high values representing low risk	ICRG – PRS
Repudiation risk – index goes from 0 to 10, with high values representing low risk	ICRG – PRS
Days of enforcement –the time of dispute resolution—in calendar days—counted from the moment the plaintiff files the lawsuit in court until settlement or payment.	World Bank – Doing Business Database
TI corruption – value of index goes from 0 to 10, with higher values indicating higher levels of corruption	Transparency International (Wei, 2000b)
WDR corruption – index goes from 1 to 8, with higher values indicating higher levels of corruption	World Bank (Wei, 2000b)
German exporters' corruption index – survey based index that goes from 0 to 10. Higher values represent higher levels of corruption	Wei (2000b)

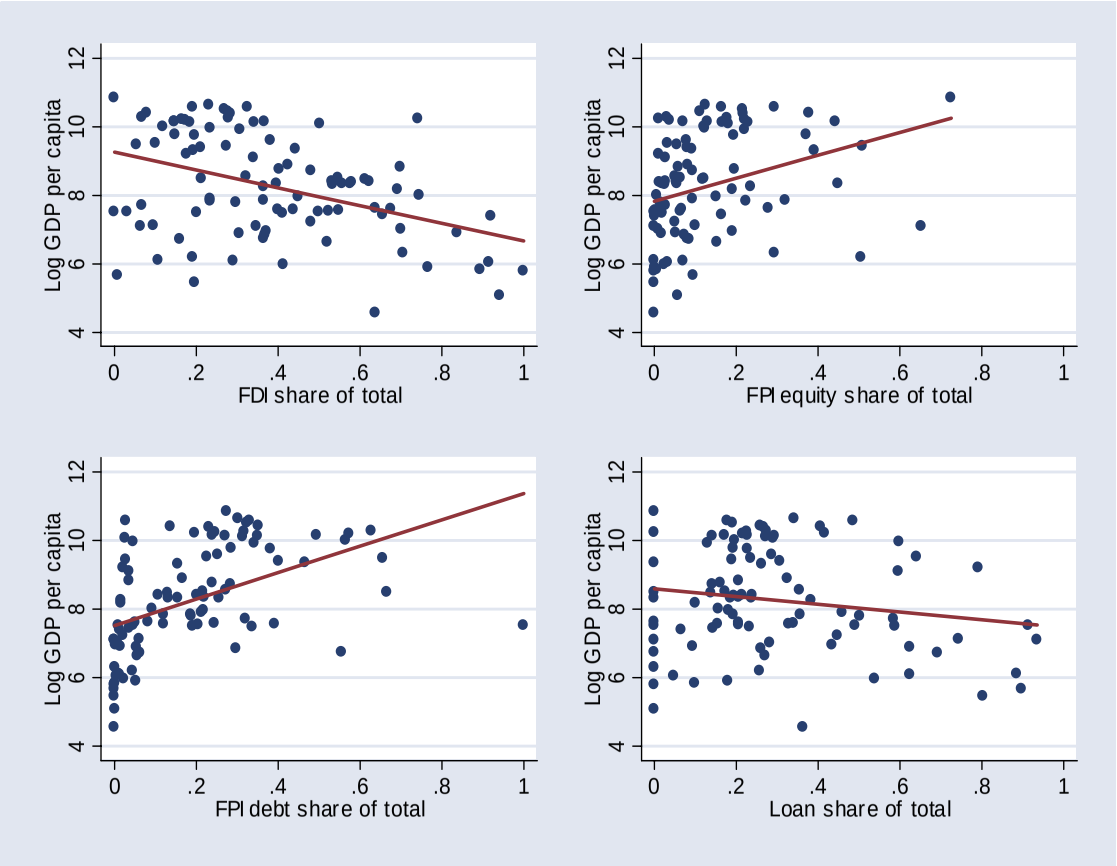
Figure 1: Composition of foreign investment by per capita country groups



Note: GDP per capita is measured as the average PPP GDP per capita over the period 1999-2003.

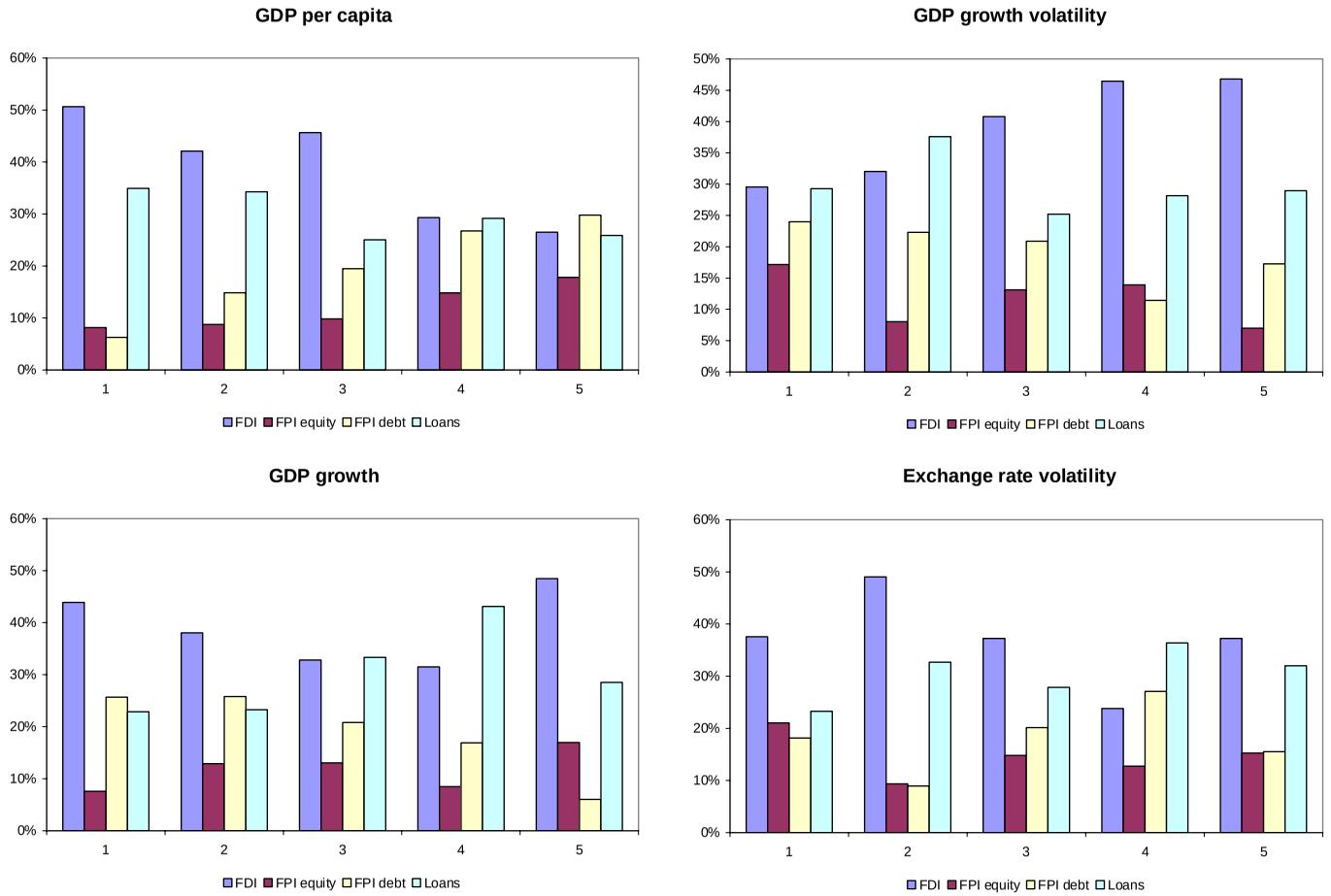
Sources: IMF CPIS and IFS; UNCTAD; BIS; authors' calculations.

Figure 2: Stylized facts of pecking order: GDP per capita



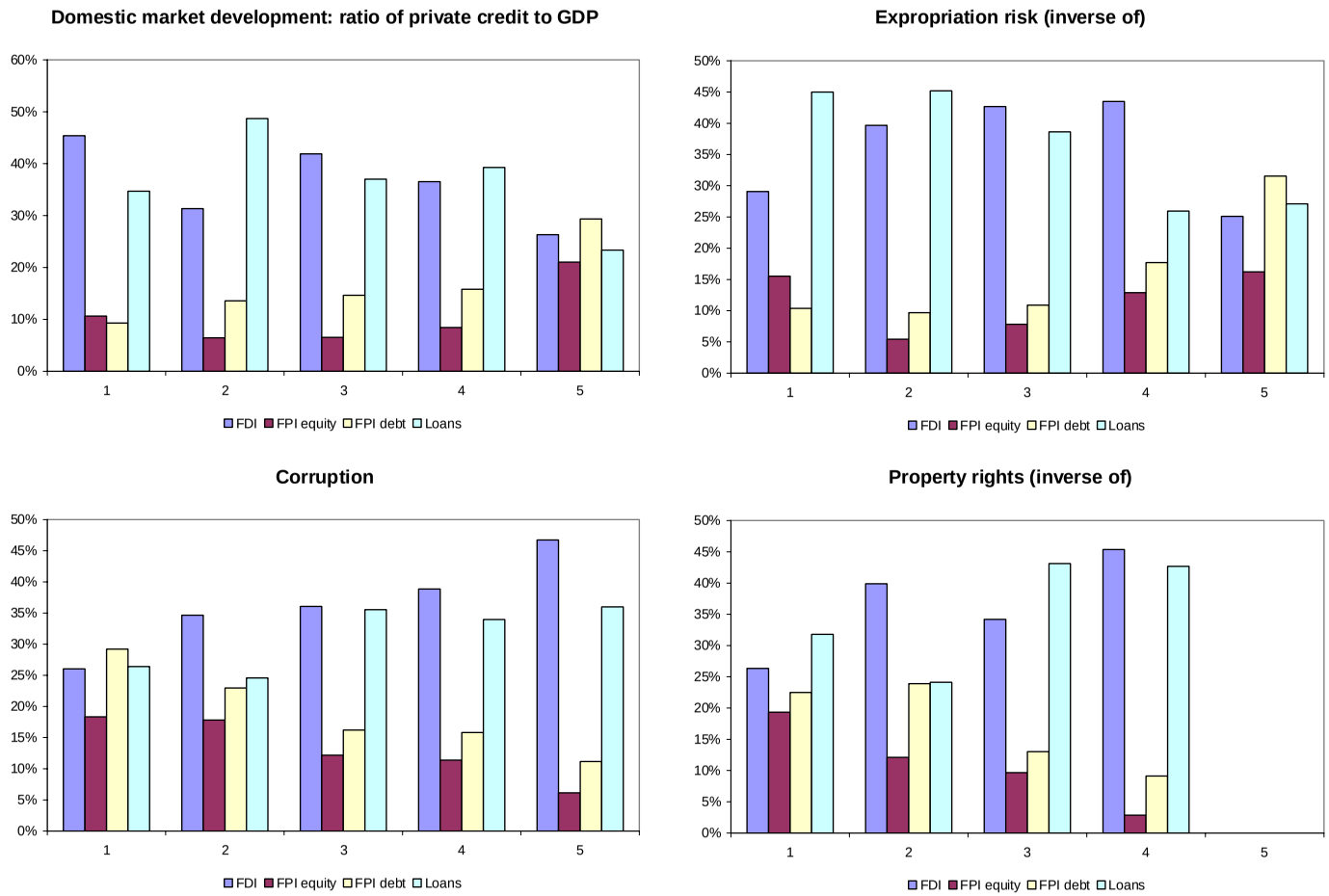
Sources: IMF CPIS and IFS; UNCTAD; BIS; authors' calculations.

Figure 3: Stylized facts of pecking order: macro and exchange rate variables



Notes: GDP growth volatility is the standard deviation of annual real GDP growth rates over the period 1980-2003. Exchange rate volatility is defined as the standard deviation of the monthly nominal exchange rate changes vis-à-vis the US dollar over the period 1980-2003.
Sources: IMF CPIS and IFS; UNCTAD; BIS; authors' calculations.

Figure 4: Stylized facts of pecking order: market development and institutions



Notes: A higher value of the expropriation risk indicator means a lower degree of risk, and a larger indicator for property rights indicates a worse protection of property rights.
Sources: IMF CPIS and IFS; UNCTAD; BIS; authors' calculations.

Table 1: Summary statistics

Variable	Observat-ions	Mean	Std. Dev.	Min	Max
EMEs / Developing Countries					
FDI share	55	0.46	0.22	0.1	0.9
Loans share	55	0.30	0.18	0	0.7
FPI debt share	55	0.14	0.11	0	0.4
FPI portfolio share	55	0.10	0.11	0	0.5
FDI/GDP	55	0.42	0.48	0	2.7
Loans/GDP	55	0.34	0.91	0	6.8
FPI debt/GDP	55	0.13	0.14	0	0.5
FPI equity/GDP	55	0.11	0.22	0	1.4
Developed Countries					
FDI share	22	0.22	0.10	0.05	0.38
Loans share	22	0.26	0.09	0.13	0.49
FPI debt share	22	0.35	0.16	0.03	0.66
FPI equity share	22	0.17	0.11	0.03	0.44
FDI/GDP	22	0.56	0.59	0.03	2.44
Loans/GDP	22	0.65	0.51	0.11	1.65
FPI debt/GDP	22	0.86	0.86	0.05	3.17
FPI equity/GDP	22	0.40	0.43	0.05	1.45
Total					
FDI share	77	0.394	0.23	0.05	0.92
Loans share	77	0.292	0.16	0.05	0.74
FPI debt share	77	0.198	0.16	0	0.66
FPI portfolio share	77	0.117	0.11	0	0.51
FDI/GDP	77	0.462	0.51	0.03	2.66
Loans/GDP	77	0.424	0.82	0.01	6.79
FPI debt/GDP	77	0.339	0.57	0	3.12
FPI equity/GDP	77	0.190	0.32	0	1.43

Sources: IMF CPIS and IFS; UNCTAD; BIS; authors' calculations.

Table 2: Correlation matrix

	FDI share	Loans share	FPI debt share	FPI equity share
FDI share	1.000			
Loans share	**-0.514**	1.000		
FPI debt share	**-0.427**	**-0.338**	1.000	
FPI equity share	**-0.281**	**-0.296**	-0.057	1.000
GDP per capita (log)	**-0.405**	**-0.170**	**0.475**	**0.319**
Private Credit/GDP	**-0.357**	-0.106	**0.246**	**0.471**
KA Openness	-0.137	-0.152	**0.208**	**0.202**
Property Rights	**0.347**	0.147	**-0.342**	**-0.449**
GDP per capita growth	0.030	-0.144	-0.097	**0.287**

Note: Significant correlations at the 95% level are shown in bold.

Table 3: Information frictions: distance

	FDI	FPI equity	FPI debt	Loans	Significance for pecking order: FDI vs. equity	FDI vs. debt	FDI vs. loans	Equity vs. debt	Equity vs. loans	Debt vs. loans
distance	-1.180 *** (0.068)	-0.676 *** (0.057)	-0.808 *** (0.063)	-1.231 *** (0.068)	**0.00**	**0.00**	0.52	**0.07**	**0.00**	**0.00**
common language	0.433 *** (0.160)	0.324 ** (0.135)	0.111 (0.149)	0.247 (0.161)	0.54	0.11	0.32	0.22	0.67	0.46
common legal origin	0.713 *** (0.112)	0.568 *** (0.094)	0.395 *** (0.104)	0.438 *** (0.113)	0.24	**0.02**	**0.04**	0.15	0.31	0.74
colonial links	0.924 *** (0.216)	0.333 * (0.182)	0.198 (0.200)	0.321 (0.217)	**0.01**	**0.01**	**0.02**	0.56	0.96	0.62
trade agreement	-0.167 (0.175)	-0.336 ** (0.147)	0.617 *** (0.163)	0.230 (0.176)	0.38	**0.00**	**0.06**	**0.00**	**0.00**	**0.05**
investment treaty	0.260 ** (0.113)	0.027 (0.095)	0.094 (0.105)	0.429 *** (0.113)	**0.06**	0.24	0.20	0.58	**0.00**	**0.01**
# observations	1116	1116	1116	1116						
R-squared	0.828	0.907	0.881	0.847						

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$, with the right-hand columns showing the p-values for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$. ***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 4: Information frictions: distance versus telephone traffic

	FDI	FPI equity	FPI debt	Loans	Significance for pecking order:					
					FDI vs. equity	FDI vs. debt	FDI vs. loans	Equity vs. debt	Equity vs. loans	Debt vs. loans
distance	-0.072	-0.091	-0.071	-0.341 **	0.90	1.00	**0.10**	0.90	0.12	**0.09**
	(0.130)	(0.112)	(0.131)	(0.134)						
telephone traffic	0.721 ***	0.447 ***	0.399 ***	0.595 ***	**0.00**	**0.00**	0.23	0.63	0.15	**0.06**
	(0.083)	(0.072)	(0.084)	(0.086)						
common language	-0.016	0.130	0.126	-0.144	0.49	0.56	0.57	0.98	0.22	0.22
	(0.181)	(0.157)	(0.184)	(0.187)						
common legal origin	0.505 ***	0.448 ***	0.327 **	0.402 ***	0.70	0.30	0.52	0.42	0.77	0.63
	(0.126)	(0.109)	(0.128)	(0.130)						
colonial links	0.353	-0.055	-0.177	-0.357	0.13	**0.10**	**0.01**	0.66	0.30	0.53
	(0.233)	(0.201)	(0.236)	(0.240)						
trade agreement	-0.106	-0.299 *	0.845 ***	0.304	0.37	**0.00**	**0.07**	**0.00**	**0.01**	**0.02**
	(0.184)	(0.159)	(0.186)	(0.190)						
investment treaty	0.078	0.314 **	0.313 *	0.591 ***	0.21	0.29	**0.01**	1.00	0.17	0.16
	(0.162)	(0.140)	(0.164)	(0.167)						
# observations	595	595	595	595						
R-squared	0.873	0.928	0.884	0.850						

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$, with the right-hand columns showing the p-values for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$. ***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 5: Information frictions: alternative information proxies

	FDI			FPI equity			FPI debt			Loans		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
distance	-1.021 *** (0.073) E,D	-0.736 *** (0.115) E,D	-0.225 (0.148) L	-0.602 *** (0.062) F,L	-0.521 *** (0.085) F,D,L	-0.258 ** (0.111)	-0.722 *** (0.069) F,L	-0.345 *** (0.095) F,E,L	-0.073 (0.124)	-1.062 *** (0.074) E,D	-0.855 *** (0.122) E,D	-0.438 *** (0.163) F
trade in newspapers	0.064 *** (0.012) E,D			0.030 *** (0.010) F,L			0.035 *** (0.011) F,L			0.069 *** (0.012) E,D		
stock of foreigners		0.180 *** (0.050)			0.105 *** (0.037)			0.107 ** (0.041)			0.127 ** (0.053)	
principal component			0.498 *** (0.087) E,D			0.298 *** (0.065) F			0.209 *** (0.073) F,L			0.406 *** (0.096) D
common language	0.364 ** (0.159)	0.244 (0.207)	0.066 (0.229)	0.292 ** (0.135)	0.146 (0.153)	0.128 (0.172)	0.073 (0.148)	-0.069 (0.172)	0.097 (0.191)	0.173 (0.159)	-0.089 (0.220)	0.082 (0.252)
common legal origin	0.665 *** (0.111) D,L	0.767 *** (0.166) E	0.759 *** (0.186) E	0.545 *** (0.094)	0.451 *** (0.123) F,L	0.418 *** (0.139) F,D,L	0.368 *** (0.104) F	0.654 *** (0.138) L	0.712 *** (0.155) E	0.386 *** (0.112) F	1.012 *** (0.176) E,D	0.967 *** (0.204) E
colonial links	0.778 *** (0.215) E,D,L	-0.274 (0.357)	-0.380 (0.370)	0.265 (0.182) F	-0.279 (0.264)	-0.358 (0.278)	0.118 (0.201) F	-0.071 (0.296)	-0.324 (0.309)	0.166 (0.216) F	-0.577 (0.378)	-0.597 (0.407)
trade agreement	-0.162 (0.173) D,L	0.241 (0.197) D	0.171 D (0.205)	-0.333 ** (0.147) D,L	-0.037 (0.146) D,L	0.022 (0.154) D,L	0.620 *** (0.162) F,E,L	0.917 *** (0.163) F,E,L	0.693 *** (0.172) F,E	0.235 (0.174) F,E,D	0.438 ** (0.209) E,D	0.446 ** (0.226) E
investment treaty	0.218 * (0.112) E	-0.026 (0.225) D,L	-0.435 (0.279) E,D,L	0.007 (0.095) F,L	0.334 ** (0.167)	0.318 (0.209) F	0.071 (0.105) L	0.617 *** (0.187) F	0.698 *** (0.233) F	0.385 *** (0.112) E,D	0.483 ** (0.239) F	0.766 ** (0.307) F
# observations	1116	474	332	1116	474	332	1116	474	332	1116	474	332
R-squared	0.832	0.864	0.876	0.908	0.928	0.938	0.882	0.904	0.913	0.851	0.842	0.839

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$. The superscripted letters indicate for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L]. ***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 6: Information frictions: Ratios as % of GDP and total capital stocks

	FDI	FPI equity	FPI debt	Loans	FDI	FPI equity	FPI debt	Loans
	Ratio as % of GDP				Ratio as % of total capital stocks			
distance	-0.005 *** (0.000) E,D	-0.001 *** (0.000) F,D,L	-0.002 *** (0.000) F,E,L	-0.005 *** (0.000) E,D	-0.282 *** (0.065) E,D	0.086 (0.062) F,L	0.051 (0.062) F,L	-0.339 *** (0.050) E,D
common language	0.004 *** (0.001) E,D,L	0.001 (0.000) F,L	0.000 (0.000) F,L	-0.003 * (0.001) F,E,D	0.097 (0.150) L	0.012 (0.142)	-0.238 * (0.143)	-0.286 ** (0.115) F
common legal origin	0.000 (0.000) D	0.001 ** (0.000) D	0.002 *** (0.000) F,E	0.001 (0.000)	0.246 ** (0.104)	0.212 ** (0.098)	0.021 (0.099)	0.109 (0.080)
colonial links	0.003 ** (0.001)	0.002 *** (0.000) L	0.003 *** (0.000)	0.005 *** (0.001) E	0.457 ** (0.204) E,L	-0.100 (0.193) F	0.009 (0.194)	-0.102 (0.157) F
trade agreement	0.001 (0.001) D	0.000 (0.000) D	0.005 *** (0.000) F,E,L	-0.001 (0.001) D	-0.219 (0.159) D	-0.335 ** (0.151) D	0.482 *** (0.151) F,E,L	-0.117 (0.122) D
investment treaty	-0.003 *** (0.000) E,D	-0.001 ** (0.000) F,L	-0.001 (0.000) F,L	-0.003 *** (0.000) E,D	-0.058 (0.121) L	-0.002 (0.115) L	-0.081 (0.115) L	0.293 *** (0.093) F,E,D
# observations	1027	1027	1027	1027	842	842	842	842
R-squared	0.323	0.499	0.549	0.369	0.985	0.932	0.937	0.756

Notes: The underlying econometric model is that of (1): $\log\left(y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$.
The superscripted letters indicate for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L].
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 7: Information frictions: Alternative estimators

	FDI	FPI equity	FPI debt	Loans	FDI	FPI equity	FPI debt	Loans
	Without fixed effects				Tobit estimator			
GDP - source country	1.985 *** (0.065) E,D,L	2.167 *** (0.062) F,D,L	1.821 *** (0.069) F,E,L	1.100 *** (0.074) F,E,D				
GDP - host country	0.854 *** (0.045) E,D,L	1.647 *** (0.043) F,D,L	1.386 *** (0.048) F,E,L	1.137 *** (0.051) F,E,D				
Population - source cty	-1.108 *** (0.071) E,L	-1.543 *** (0.067) F,D,L	-1.100 *** (0.075) E,L	-0.106 (0.080) F,E,D				
Population - host cty	-0.093 * (0.051) E,D,L	-0.650 *** (0.048) F,L	-0.619 *** (0.054) F,L	-0.326 *** (0.058) F,E,D				
distance	-0.462 *** (0.064) E,L	-0.181 *** (0.061) F,D,L	-0.460 *** (0.067) E,L	-0.717 *** (0.073) F,E,D	-1.072 *** (0.051)	-0.988 *** (0.056)	-0.954 *** (0.057)	-1.445 *** (0.054)
common language	0.949 *** (0.179) E,D,L	1.263 *** (0.169) F,D,L	0.309 (0.188) F,E	0.307 (0.202) F,E	0.641 *** (0.134)	0.556 *** (0.125)	0.425 *** (0.127)	0.183 (0.114)
common legal origin	0.940 *** (0.146) E,D	0.603 *** (0.138) F	0.574 *** (0.154) F	0.805 *** (0.165)	0.704 *** (0.092)	0.547 *** (0.090)	0.380 *** (0.091)	0.271 *** (0.080)
colonial links	1.181 *** (0.282)	0.729 *** (0.267) D	0.889 *** (0.297) E	1.370 *** (0.319)	1.096 *** (0.167)	0.917 *** (0.168)	0.456 ** (0.176)	0.898 *** (0.146)
trade agreement	0.486 *** (0.181) E	0.723 *** (0.172) F,D	1.576 *** (0.191) E,L	0.837 *** (0.205) D	0.592 *** (0.146)	0.453 *** (0.146)	0.929 *** (0.153)	0.011 (0.152)
investment treaty	0.310 ** (0.125) E	-0.153 (0.119) F,L	0.048 (0.132) L	0.504 *** (0.142) E,D	-0.129 (0.086)	-0.039 (0.087)	0.002 (0.088)	0.579 *** (0.074)
# observations	1030	1030	1030	1030	1116	1116	1116	1116
(Pseudo) R-squared	0.651	0.757	0.679	0.589	0.357	0.486	0.418	0.369

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$.
The superscripted letters indicate for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L]. Note that no such tests are possible for the tobit specification because it is not estimated as a system of equations.
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 8: Heckman two-step estimation

	FDI OLS	**FPI equity** Heckman	**FPI debt** Heckman	**Loans** Heckman
distance	-1.323 ***	-0.840 ***	-0.900 ***	-1.297 ***
	(0.094)	(0.070)	(0.069)	(0.070)
common language	0.469 **	0.253	-0.020	-
	(0.199)	(0.159)	(0.153)	
common legal origin	0.779 ***	0.663 ***	0.415 ***	0.503 ***
	(0.141)	(0.115)	(0.110)	(0.109)
colonial links	0.882 ***	0.269	-	0.408 #
	(0.312)	(0.214)		(0.211)
trade agreement	-0.203	-0.554 ***	0.374 **	-
	(0.219)	(0.173)	(0.175)	
investment treaty	0.506 ***	-	-	0.567 ***
	(0.164)			(0.125)
# observations	1116	1116	1116	1116
Inverse Mill's ratio	-	0.392 #	-0.467 #	-0.683
		(0.231)	(0.262)	(0.656)

Notes: The estimates reported are the second stage estimates for the equation: $\log\left(y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \hat{\lambda}_{ij} + \varepsilon_{ij}^k$, where $\hat{\lambda}_{ij}$ is the inverse Mill's ratio obtained from the first-step probit estimation. The first-step dependent variable is a dummy that takes the value of 1 when a positive investment is observed and 0 otherwise. The explanatory variables are the same as in the second step, including the source and host dummies. Instruments are the excluded variables in the second step, based on the results of Table 3.

Table 9: Information frictions: Robustness tests with trade and GDP correlation as controls

	FDI	FPI equity	FPI debt	Loans	FDI	FPI equity	FPI debt	Loans
	With control for trade				With control for GDP correlation			
distance	-0.692 *** (0.088) E	-0.362 *** (0.074) F,D,L	-0.689 *** (0.083) E	-0.773 *** (0.088) E	-0.987 *** (0.079) E,D	-0.536 *** (0.065) F,L	-0.661 *** (0.072) F,L	-1.100 *** (0.081) E,D
trade - imports	0.384 *** (0.047) E,D	0.247 *** (0.040) F,D,L	0.119 *** (0.044) F,E,L	0.382 *** (0.047) E,D				
GDP correlation					-0.182 (0.221) D	-0.043 (0.184) D	0.739 *** (0.203) F,E,L	0.040 (0.227) D
common language	0.384 ** (0.161) D	0.334 ** (0.136) D	0.037 (0.152) F,E	0.176 (0.162)	0.275 * (0.165)	0.400 *** (0.137) D	0.041 (0.151) E	0.086 (0.169)
common legal origin	0.603 *** (0.113) L	0.500 *** (0.095)	0.390 *** (0.106)	0.330 *** (0.113) F	0.722 *** (0.116) D,L	0.551 *** (0.097)	0.384 *** (0.107) F	0.476 *** (0.120) F
colonial links	0.811 *** (0.216) E,D,L	0.208 (0.183) F	0.135 (0.203) F	0.209 (0.218) F	0.757 *** (0.234) E	0.191 (0.194) F	0.404 * (0.214)	0.284 (0.240)
trade agreement	-0.075 (0.173) D	-0.283 * (0.147) D,L	0.632 *** (0.163) F,E,L	0.267 (0.175) E,D	0.199 (0.186) D,L	0.015 (0.154) D,L	0.861 *** (0.170) F,E	0.600 *** (0.191) F,E
investment treaty	0.042 (0.118) L	-0.038 (0.100) D	-0.010 (0.111) E,L	0.297 ** (0.119) F,E,D	0.165 (0.143) L	0.120 (0.119) L	0.005 (0.131) L	0.487 *** (0.147) F,E,D
# observations	1027	1027	1027	1027	782	782	782	782
R-squared	0.841	0.911	0.883	0.851	0.845	0.920	0.895	0.849

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$.
The superscripted letters indicate for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$, that the respective coefficient is different to that of FDI for ^{F}, different to that of equity portfolio investment for ^{E}, different to that of debt securities for ^{D} and different to that of loans for ^{L}.
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 10: Information frictions: Developed countries versus emerging market economies

	FDI	FPI equity	FPI debt	Loans	FDI	FPI equity	FPI debt	Loans
	Developed Countries				Emerging Market Economies			
distance	-0.893 *** (0.097) E,D	-0.693 *** (0.076) F,D,L	-0.513 *** (0.076) F,E,L	-1.047 *** (0.096) E,D	-1.543 *** (0.106) E,D	-0.589 *** (0.095) F,D,L	-1.019 *** (0.097) F,E,L	-1.595 *** (0.100) E,D
common language	0.097 (0.203)	0.153 (0.158)	0.175 (0.159)	-0.091 (0.200)	0.942 *** (0.260) E,D	0.444 * (0.232) F,L	0.336 (0.238) F,L	0.975 *** (0.244) E,D
common legal origin	0.975 *** (0.144) E,D	0.655 *** (0.112) F,D	0.393 *** (0.113) F,D,L	0.853 *** (0.142) D	0.550 *** (0.177) L	0.543 *** (0.158) L	0.411 ** (0.162) L	-0.104 (0.167) F,E,D
colonial links	0.681 ** (0.294) L	0.326 (0.229)	0.397 * (0.231) L	-0.218 (0.291) F,D	0.998 *** (0.330) E	0.083 (0.294) F,L	0.387 (0.302)	0.851 *** (0.310) E
trade agreement	0.206 (0.218) D	-0.183 (0.170) D,L	1.099 *** (0.171) F,E,L	0.441 ** (0.216) E,D	0.212 (0.748)	1.226 * (0.667)	0.808 (0.684)	0.663 (0.702)
investment treaty	0.150 (0.224) L	0.079 (0.175) L	0.374 ** (0.176) L	0.879 *** (0.222) F,E,D	0.238 * (0.140) D	0.016 (0.125)	-0.065 (0.128) F	-0.006 (0.132)
# observations	573	573	573	573	543	543	543	543
R-squared	0.872	0.928	0.917	0.848	0.780	0.857	0.842	0.854

Notes: The underlying econometric model is that of (1): $\log\left(1+y_{ij}^{k}\right) = \alpha_i^k + \alpha_j^k + \beta^k X_{ij} + \varepsilon_{ij}^k$.
The superscripted letters indicate for the pecking order hypothesis: $H_2: \beta^{k1} = \beta^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L].
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 11: Role of market development and transparency

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Market openness and development:					**Transparency:**			
capital account openness	0.262 (0.232)	0.825 ** (0.354)	0.803 ** (0.372)	0.387 (0.288)	**quality of disclosure**	0.137 * (0.074) E	0.389 *** (0.111) F,D,L	0.191 (0.121) E	0.134 (0.093) E
# observations	69	69	69	69	# observations	65	65	65	65
R-squared	0.7556	0.8184	0.6801	0.7019	R-squared	0.7449	0.8355	0.6968	0.7079
financial development	0.462 (0.321) E,D,L	2.270 *** (0.424) F,D,L	1.396 *** (0.469) F,E	1.344 *** (0.366)	**accounting standards**	0.019 (0.011) E	0.067 *** (0.014) F,D,L	0.033 ** (0.015) E	0.024 ** (0.012) E
# observations	64	64	64	64	# observations	37	37	37	37
R-squared	0.7311	0.8693	0.7537	0.7575	R-squared	0.5543	0.8117	0.6446	0.6261
stock market capitalisation	0.435 *** (0.126) E,L	1.104 *** (0.131) F,D,L	0.560 ** (0.219) E	0.743 *** (0.133) F,E	**property rights**	-0.139 (0.118) E,D,L	-0.847 *** (0.158) F,L	-0.904 *** (0.156) F,L	-0.570 *** (0.133) F,E,D
# observations	46	46	46	46	# observations	63	63	63	63
R-squared	0.6589	0.888	0.6045	0.7349	R-squared	0.741	0.868	0.7992	0.7684

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for ^{F}, different to that of equity portfolio investment for ^{E}, different to that of debt securities for ^{D} and different to that of loans for ^{L}.
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 12: Role of investor protection and corruption

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Investor protection:					Corruption:			
expropriation risk	0.054 (0.125) E,D,L	0.913 *** (0.166) F,L	0.952 *** (0.175) F,L	0.492 *** (0.143) F,E,D	**TI**	-0.048 (0.049) E,D,L	-0.407 *** (0.059) F,L	-0.372 *** (0.061) F,L	-0.198 *** (0.052) F,E,D
# observations	66	66	66	66	# observations	61	61	61	61
R-squared	0.7497	0.8644	0.7562	0.7326	R-squared	0.7508	0.8835	0.7896	0.7618
repudiation costs	0.078 (0.093) E,D,L	0.781 *** (0.115) F,L	0.701 *** (0.132) F,L	0.445 *** (0.103) F,E,D	**WDR**	-0.146 (0.099) E,D,L	-0.583 *** (0.137) F,L	-0.434 *** (0.143) F	-0.335 *** (0.107) F,E
# observations	66	66	66	66	# observations	56	56	56	56
R-squared	0.7516	0.8832	0.7528	0.7542	R-squared	0.733	0.8372	0.7109	0.7382
days of enforcements	-0.103 (0.147) E,D	-0.626 *** (0.222) F,L	-0.573 ** (0.229) F	-0.277 (0.182) E	**German survey**	-0.025 (0.036) E,D,L	-0.254 *** (0.048) F,L	-0.242 *** (0.048) F,L	-0.113 ** (0.044) F,E,D
# observations	65	65	65	65	# observations	57	57	57	57
R-squared	0.7335	0.8258	0.7127	0.7091	R-squared	0.712	0.8477	0.763	0.7051

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L].
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 13: Role of market development and transparency – 3SLS estimator

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Market openness and development:					Transparency:			
capital account openness	0.828 * (0.460) E,D	1.796 ** (0.717) F,D	2.953 *** (0.850) F,E,L	1.112 * (0.572) D	**quality of disclosure**	-0.035 (0.136) E	0.548 *** (0.199) F,D,L	0.117 (0.215) E	0.147 (0.165) E
# observations	65	65	65	65	# observations	65	65	65	65
R-squared	0.7162	0.8015	0.5682	0.6843	R-squared	0.7238	0.8303	0.695	0.7079
financial development	0.898 * (0.538) E,L	2.376 *** (0.700) F	1.491 * (0.775)	2.207 *** (0.630) F	**accounting standards**	0.019 (0.015) E	0.069 *** (0.018) F,D,L	0.039 * (0.019) E	0.022 (0.015) E
# observations	64	64	64	64	# observations	37	37	37	37
R-squared	0.7233	0.8692	0.7535	0.7364	R-squared	0.5543	0.8117	0.6434	0.6256
stock market capitalisation	0.520 *** (0.199) E,L	1.036 *** (0.205) F	0.595 * (0.341)	1.027 *** (0.218) F	**property rights**	0.008 (0.154) E,D,L	-1.017 *** (0.204) F,L	-1.015 *** (0.201) F,L	-0.690 *** (0.171) F,E,D
# observations	45	45	45	45	# observations	63	63	63	63
R-squared	0.6374	0.8793	0.6017	0.697	R-squared	0.7347	0.8656	0.7976	0.7654

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for F, different to that of equity portfolio investment for E, different to that of debt securities for D and different to that of loans for L. The estimator is a three-stage least-square (3SLS) one, where the instruments are legal origin dummies; religion dummies; absolute latitude. ***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 14: Role of investor protection and corruption – 3SLS estimator

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Investor protection:					Corruption:			
expropriation risk	-0.407 (0.259) E,D,L	1.397 *** (0.328) F,L	1.430 *** (0.352) F,L	0.273 (0.277) F,E,D	**TI**	0.108 (0.068) E,D,L	-0.371 *** (0.078) F,L	-0.346 *** (0.080) F,L	-0.145 ** (0.069) F,E,D
# observations	63	63	63	63	# observations	61	61	61	61
R-squared	0.6678	0.8488	0.7279	0.7228	R-squared	0.7096	0.8828	0.7889	0.7579
repudiation costs	-0.128 (0.160) E,D,L	0.957 *** (0.197) F,L	0.802 *** (0.223) F,L	0.434 ** (0.172) F,E,D	**WDR**	0.133 (0.151) E,D,L	-0.825 *** (0.200) F,L	-0.755 *** (0.213) F,L	-0.450 *** (0.155) F,E,D
# observations	63	63	63	63	# observations	56	56	56	56
R-squared	0.709	0.8758	0.7506	0.7551	R-squared	0.6955	0.8281	0.6849	0.7329
days of enforcements	0.184 (0.243) E,D,L	-0.954 *** (0.363) F	-0.602 (0.368) F	-0.628 ** (0.300) F	**German survey**	0.106 (0.064) E,D,L	-0.272 *** (0.076) F,L	-0.204 *** (0.077) F,L	-0.050 (0.072) F,E,D
# observations	65	65	65	65	# observations	57	57	57	57
R-squared	0.718	0.82	0.7126	0.6925	R-squared	0.647	0.8473	0.7603	0.6945

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L]. The estimator is a three-stage least-square (3SLS) one, where the instruments are legal origin dummies; religion dummies; absolute latitude.
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 15: Role of market development and transparency: Emerging market economies (EMEs) sample

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Market openness and development:					**Transparency:**			
capital account openness	0.291 (0.282)	0.440 (0.427)	0.154 (0.441)	0.222 (0.381)	**quality of disclosure**	0.104 (0.082)	0.280 ** (0.118) D,L	0.067 (0.128) E	0.085 (0.108) E
# observations	47	47	47	47	# observations	44	44	44	44
R-squared	0.6933	0.7202	0.4374	0.4851	R-squared	0.6886	0.7516	0.4546	0.4979
financial development	0.673 (0.471) E,L	2.685 *** (0.580) F,D,L	0.700 (0.707) E	1.544 *** (0.582) F,E	**accounting standards**	0.024 (0.018) E	0.071 *** (0.024) F,D,L	0.021 (0.022) E	0.033 * (0.019) E
# observations	43	43	43	43	# observations	17	17	17	17
R-squared	0.6603	0.8124	0.5039	0.5561	R-squared	0.4237	0.6798	0.2295	0.3323
stock market capitalisation	0.454 *** (0.151) E,L	1.073 *** (0.130) F,D	0.461 * (0.260) E	0.753 *** (0.165) F	**property rights**	-0.202 (0.150) E,D,L	-0.737 *** (0.199) F	-0.703 *** (0.205) F	-0.576 *** (0.180) F
# observations	25	25	25	25	# observations	43	43	43	43
R-squared	0.6192	0.89	0.3261	0.5844	R-squared	0.6941	0.7925	0.5828	0.5946

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for ^{F}, different to that of equity portfolio investment for ^{E}, different to that of debt securities for ^{D} and different to that of loans for ^{L}.
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

Table 16: Role of investor protection and corruption: Emerging market economies (EMEs) sample

	FDI	FPI equity	FPI debt	Loans		FDI	FPI equity	FPI debt	Loans
	Investor protection:					Corruption:			
expropriation risk	0.183 (0.150) E,D,L	0.641 *** (0.216) F	0.648 *** (0.225) F	0.458 ** (0.194) F	**TI**	-0.166 ** (0.081) E,L	-0.493 *** (0.108) F,L	-0.293 ** (0.116)	-0.284 *** (0.099) F,E
# observations	44	44	44	44	# observations	40	40	40	40
R-squared	0.6997	0.7687	0.5157	0.5252	R-squared	0.7258	0.8168	0.5461	0.6021
repudiation costs	0.229 ** (0.115) E,L	0.682 *** (0.155) F	0.479 *** (0.178)	0.473 *** (0.145) F	**WDR**	-0.294 ** (0.139)	-0.518 ** (0.206) D	-0.126 (0.203) E	-0.382 ** (0.171)
# observations	44	44	44	44	# observations	35	35	35	35
R-squared	0.7152	0.8073	0.5052	0.5687	R-squared	0.7049	0.7613	0.5153	0.5625
days of enforcements	-0.040 (0.211)	-0.436 (0.311)	-0.301 (0.323)	-0.112 (0.276)	**German survey**	-0.043 (0.053) E,D	-0.278 *** (0.068) F,L	-0.202 *** (0.071) F	-0.102 (0.070) E
# observations	44	44	44	44	# observations	37	37	37	37
R-squared	0.6775	0.732	0.4618	0.4928	R-squared	0.6647	0.7743	0.5197	0.4959

Notes: The underlying econometric model is that of (2): $\alpha_j^k = \kappa^k + \lambda^k X_j + \mu_j^k$. The superscripted letters indicate for the pecking order hypothesis: $H_4: \lambda^{k1} = \lambda^{k2}$, that the respective coefficient is different to that of FDI for [F], different to that of equity portfolio investment for [E], different to that of debt securities for [D] and different to that of loans for [L].
***,**,* show statistical significance of the coefficients at the 99%, 95% and 90% levels, respectively.

European Central Bank Working Paper Series

For a complete list of Working Papers published by the ECB, please visit the ECB's website (http://www.ecb.int)

539 "Inflation persistence and monetary policy design: an overview" by A. T. Levin and R. Moessner, November 2005.

540 "Optimal discretionary policy and uncertainty about inflation persistence" by R. Moessner, November 2005.

541 "Consumer price behaviour in Luxembourg: evidence from micro CPI data" by P. Lünnemann and T. Y. Mathä, November 2005.

542 "Liquidity and real equilibrium interest rates: a framework of analysis" by L. Stracca, November 2005.

543 "Lending booms in the new EU Member States: will euro adoption matter?" by M. Brzoza-Brzezina, November 2005.

544 "Forecasting the yield curve in a data-rich environment: a no-arbitrage factor-augmented VAR approach" by E. Mönch, November 2005.

545 "Trade integration of Central and Eastern European countries: lessons from a gravity model" by M. Bussière, J. Fidrmuc and B. Schnatz, November 2005.

546 "The natural real interest rate and the output gap in the euro area: a joint estimation" by J. Garnier and B.-R. Wilhelmsen, November 2005.

547 "Bank finance versus bond finance: what explains the differences between US and Europe?" by F. de Fiore and H. Uhlig, November 2005.

548 "The link between interest rates and exchange rates: do contractionary depreciations make a difference?" by M. Sánchez, November 2005.

549 "Eigenvalue filtering in VAR models with application to the Czech business cycle" by J. Beneš and D. Vávra, November 2005.

550 "Underwriter competition and gross spreads in the eurobond market" by M. G. Kollo, November 2005.

551 "Technological diversification" by M. Koren and S. Tenreyro, November 2005.

552 "European Union enlargement and equity markets in accession countries" by T. Dvorak and R. Podpiera, November 2005.

553 "Global bond portfolios and EMU" by P. R. Lane, November 2005.

554 "Equilibrium and inefficiency in fixed rate tenders" by C. Ewerhart, N. Cassola and N. Valla, November 2005.

555 "Near-rational exuberance" by J. Bullard, G. W. Evans and S. Honkapohja, November 2005.

556 "The role of real wage rigidity and labor market frictions for unemployment and inflation dynamics" by K. Christoffel and T. Linzert, November 2005.

557 "How should central banks communicate?" by M. Ehrmann and M. Fratzscher, November 2005.

558 "Ricardian fiscal regimes in the European Union" by A. Afonso, November 2005.

559 "When did unsystematic monetary policy have an effect on inflation?" by B. Mojon, December 2005.

560 "The determinants of 'domestic' original sin in emerging market economies" by A. Mehl and J. Reynaud, December 2005.

561 "Price setting in German manufacturing: new evidence from new survey data" by H. Stahl, December 2005.

562 "The price setting behaviour of Portuguese firms: evidence from survey data" by F. Martins, December 2005.

563 "Sticky prices in the euro area: a summary of new micro evidence" by L. J. Álvarez, E. Dhyne, M. M. Hoeberichts, C. Kwapil, H. Le Bihan, P. Lünnemann, F. Martins, R. Sabbatini, H. Stahl, P. Vermeulen and J. Vilmunen, December 2005.

564 "Forecasting the central bank's inflation objective is a good rule of thumb" by M. Diron and B. Mojon, December 2005.

565 "The timing of central bank communication" by M. Ehrmann and M. Fratzscher, December 2005.

566 "Real versus financial frictions to capital investment" by N. Bayraktar, P. Sakellaris and P. Vermeulen, December 2005.

567 "Is time ripe for a currency union in emerging East Asia? The role of monetary stabilisation" by M. Sánchez, December 2005.

568 "Exploring the international linkages of the euro area: a global VAR analysis" by S. Dées, F. di Mauro, M. H. Pesaran and L. V. Smith, December 2005.

569 "Towards European monetary integration: the evolution of currency risk premium as a measure for monetary convergence prior to the implementation of currency unions" by F. González and S. Launonen, December 2005.

570 "Household debt sustainability: what explains household non-performing loans? An empirical analysis" by L. Rinaldi and A. Sanchis-Arellano, January 2006.

571 "Are emerging market currency crises predictable? A test" by T. A. Peltonen, January 2006.

572 "Information, habits, and consumption behavior: evidence from micro data" by M. Kuismanen and L. Pistaferri, January 2006.

573 "Credit chains and the propagation of financial distress" by F. Boissay, January 2006.

574 "Inflation convergence and divergence within the European Monetary Union" by F. Busetti, L. Forni, A. Harvey and F. Venditti, January 2006.

575 "Growth in euro area labour quality" by G. Schwerdt and J. Turunen, January 2006.

576 "Debt stabilizing fiscal rules" by P. Michel, L. von Thadden and J.-P. Vidal, January 2006.

577 "Distortionary taxation, debt, and the price level" by A. Schabert and L. von Thadden, January 2006.

578 "Forecasting ECB monetary policy: accuracy is (still) a matter of geography" by H. Berger, M. Ehrmann and M. Fratzscher, January 2006.

579 "A disaggregated framework for the analysis of structural developments in public finances" by J. Kremer, C. Rodrigues Braz, T. Brosens, G. Langenus, S. Momigliano and M. Spolander, January 2006.

580 "Bank interest rate pass-through in the euro area: a cross country comparison" by C. K. Sørensen and T. Werner, January 2006.

581 "Public sector efficiency for new EU Member States and emerging markets" by A. Afonso, L. Schuknecht and V. Tanzi, January 2006.

582 "What accounts for the changes in U.S. fiscal policy transmission?" by F. O. Bilbiie, A. Meier and G. J. Müller, January 2006.

583 "Back to square one: identification issues in DSGE models" by F. Canova and L. Sala, January 2006.

584 "A new theory of forecasting" by S. Manganelli, January 2006.

585 "Are specific skills an obstacle to labor market adjustment? Theory and an application to the EU enlargement" by A. Lamo, J. Messina and E. Wasmer, February 2006.

586 "A method to generate structural impulse-responses for measuring the effects of shocks in structural macro models" by A. Beyer and R. E. A. Farmer, February 2006.

587 "Determinants of business cycle synchronisation across euro area countries" by U. Böwer and C. Guillemineau, February 2006.

588 "Rational inattention, inflation developments and perceptions after the euro cash changeover" by M. Ehrmann, February 2006.

589 "Forecasting economic aggregates by disaggregates" by D. F. Hendry and K. Hubrich, February 2006.

590 "The pecking order of cross-border investment" by C. Daude and M. Fratzscher, February 2006.

ISSN 1561081-0