

EKONOMI OCH SAMHÄLLE

Skrifter utgivna vid Svenska handelshögskolan  
Publications of the Swedish School of Economics  
and Business Administration

Nr 114

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ESSAYS ON THE DETERMINANTS OF  
INTERNATIONAL PORTFOLIO INVESTMENTS

Helsingfors 2003

## Essays on the Determinants of International Portfolio Investments

Key words: EMU; Financial Markets; Foreign Direct Investment; Gravity Model;  
Information Asymmetry; International Portfolio Investments; International  
Trade; Multinational Firms

JEL Classification Codes: F10; F21; F23; G10; G11; and G15.

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<http://www.hanken.fi/biblioteket/eng/page903.php>  
<http://www.hanken.fi/biblioteket/swe/page903.php>

ISBN 951-555-774-7 (printed)  
ISBN 951-555-775-5 (PDF)  
ISSN 0424-7256

Yliopistopaino, Helsingfors 2003

*To my father*



## **Acknowledgments**

I thank Professors Eva Liljebloom and Anders Löflund (my thesis advisors) for helpful comments and discussions. I would also like to thank Anders Ekholm, Daniel Pasternack, Matts Rosenberg and Alexander V. Nandelstadh for their friendship and support; and Kajsa Fagerholm, our department secretary, for help throughout my stay at Hanken. A special mention goes to Hanken's library for providing superb research resources. I would especially like to thank Ulf Sonnerstam and Barbara Cavonius for their much-appreciated help.

I am especially indebted to Professor Tom Berglund (my thesis advisor and co-author of the second essay) for his support, encouragement, and extensive constructive comments on every aspect of this thesis. The privilege of his insights on financial research, his enthusiasm and interest in discussing my ideas, and the benefits I gained from a number of joint research projects have had the biggest positive impact on my academic experience at Hanken. The comments and suggestions of the thesis pre-examiners, Professor Bruno Gerard from the Norwegian School of Management BI, and professor Clas Wihlborg from the Copenhagen Business School are gratefully acknowledged.

My greatest debt is to my family. The love and unfailing support from my late father, my mother, my wife Sirpa, my son Jassim, my daughter Lina, my sister Mayada, my brother Ziad, and my best friend Hakim were instrumental in motivating me to pursue and complete this project.



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## **PART A: OVERVIEW OF THE THESIS**



## **I. Introduction**

A large volume of literature documents substantial potential gains from diversification of investment portfolios across national boundaries. Grubel (1968), Levy and Sarnat (1970), Solnik (1974 b) and more recently Grauer and Hakansson (1987), Harvey (1991), and De Santis and Gerard (1997) point to the risk reduction benefits from holding foreign securities. Still, the literature documents substantial evidence that investors hold too little of their wealth in foreign assets, a behavior that the finance and economics literature refers to as "home bias". Levy and Sarnat (1970), Cooper and Kaplanis (1986, 1994), French and Poterba (1991) and Tesar and Werner (1995) show that mean variance framework implies a substantially higher (lower) fraction of foreign (domestic) assets than what investors actually hold in their portfolios.

A growing segment of the "home bias" literature suggests information asymmetry between domestic and foreign investors introduces a significant indirect barrier that leads investors' to overweighing their domestic equities. This literature suggests the decimation of information on investment targets strongly relate to their distance from investors, the attributes of investment targets, as well as characteristics that are common to both investors and investment targets. Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide strong evidence that geography, language and culture induces a "home bias" even within a country's borders. Huberman (2001) shows that the "home bias" is a consequence of investors' preferences for holding equities that they are more familiar with. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find foreign investors to exhibit preference for large and more visible firms.<sup>1</sup>

This thesis contributes to this segment of the "home bias" literature. A common theme of the four essays in this thesis is to empirically explore the influence of real goods trade and direct investments (FDI) on international equity portfolio investments.

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<sup>1</sup> Further sections of this chapter present a more comprehensive review of this literature. Lewis (1998) and Karolyi and Stulz (2002) provide recent surveys of this literature.

Briefly, essay number (1) applies insights from the international economics literature to the analysis of the determinants of the country allocations of portfolio investments. The empirical section uses new data on aggregate country allocations of Finnish investors and empirically investigates the relationship between trade in real goods, which we use as proxy for information flow, and portfolio investments. We present evidence that confirms this association and show that this finding is not due to export hedging motives or variables that are common determinants of both portfolio share and trade. Overall, our evidence indicates a substantial role for trade in reducing the information cost relating to portfolio investments.

Essay number (2) addresses the impact of the EMU on the country allocation of Finnish investors' international portfolio investments. The essay documents that the EMU induced reduction in transaction costs led to an increase in the volume of real goods trade between Finland and other members. The data on portfolio flows supports the explanation that the corresponding increase in the intensity of information flow also produced an increase in the flow of portfolio investments.

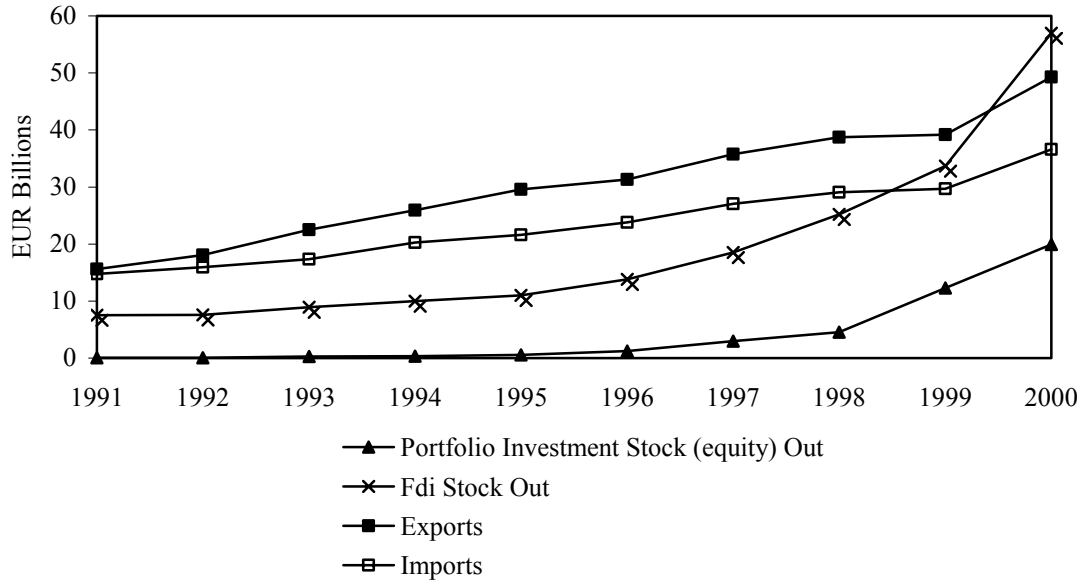
Essay number (3) uses comprehensive data on the aggregate international portfolio investments of investors from a large number of countries and provides new evidence on how different country attributes influence portfolio investments in a country. We decompose these attributes into two categories, one that relate to the characteristics of an investment receiving country and another that is unique to a particular investment receiving and investment sending country pair. We divide the investment receiving country attributes into two groups. The first includes the financial market size and performance; and corporate governance variables that provide proxies for financial development, legal structure, and information availability on the firms in the investment receiving country. The second category of country attributes, those that are unique to an investment sending and investment receiving country pairs, includes distance, common language, and the intensity of their trade in real goods. Our results indicate that an information flow medium with breadth and richness directly linked to the bilateral commitment of resources between countries, that we measure by their trading intensity in tangible goods, is consistent with the prevailing country allocation in investors' international portfolios. We also find the incremental impact of trade,

and especially trade with technology content, to have a higher impact on portfolio allocations in developing countries. These results are consistent with trade providing important information especially on firms in countries in which the corporate governance structure and the information environment of firms generate less reliable information.

Essay number (4) addresses the impact of direct international investments by locally listed firms, on the country allocation of local investors' international portfolio investments. The essay presents two competing explanations, for the potential interaction between these two types of investment. The first explanation centers on the proposition that an FDI will increase the flow of information between the home and the target country leading to an increase in portfolio investments as well. The second explanation builds on the idea that an FDI provides investors with an opportunity to attain international diversification benefits via the purchase of the shares in a locally listed firm making the target country somewhat less attractive for portfolio investments. Using a four-year annual panel of Finnish international portfolios and Foreign Direct Investments in twenty-five countries, we provide evidence consistent with the first explanation.

The remainder of the introduction chapter of this thesis is organized as follows. Section II provides a summary of the development of the international portfolio investments of Finnish investors. Section III presents a brief review of the literature from the perspectives of both the finance and the international economics literature. Section IV provides a summary of the contributions of the four essays.

**Figure 1** The development of Finland's balance of payments.<sup>2</sup>



**Table 1** The international portfolio investments (Equities) of Finnish residents in the European Union, European Monetary Union and the top ten countries.<sup>2</sup>

1997		1998		1999		2000	
Region / country	% of total portfolio	Region / country	% of total portfolio	Region / country	% of total portfolio	Region / country	% of total portfolio
EU	66.2	EU	68.0	EU	64.7	EU	69.5
EMU	34.9	EMU	39.1	EMU	30.2	Sweden	30.6
Sweden	15.6	US	13.1	Sweden	21.4	EMU	26.2
US	14.2	Sweden	12.7	US	16.6	US	17.9
UK	12.4	UK	12.2	UK	10.3	UK	10.6
Luxembourg	11.9	France	9.5	France	8.6	France	8.2
Japan	6.4	Germany	8.4	Japan	7.1	Netherlands	5.3
France	6.2	Luxembourg	7.5	Germany	7.0	Germany	4.7
Netherlands	6.0	Netherlands	6.3	Netherlands	5.4	Japan	4.5
Germany	5.6	Switzerland	6.0	Luxembourg	4.3	Switzerland	4.3
Norway	4.1	Japan	5.0	Norway	4.2	Luxembourg	3.4
Switzerland	4.1	Denmark	4.0	Switzerland	3.7	Denmark	2.0
Total: Millions EURO	2,844	Total: Millions EURO	4,894	Total: Millions EURO	12,539	Total: Millions EURO	21,934

<sup>2</sup> Portfolio and FDI investments are for the total holdings at the end of the period. "Out" refers to the Finnish investments in foreign countries.

## **II. The Development of Portfolio Investments of Finnish Residents**

Finnish investors appetite for international investments only took shape during the second half of the nineties, with the average stock position during 1996-2000 about 3000 % higher in value than the average aggregate stock during 1991-1995 (Figure 1). The growth during the second half of the nineties is just as impressive. The total value of the Finnish international portfolio investments increased from 2.8 billion Euros at the end of 1997 to 21.9 billion Euros at the end of the year 2000.

Table 1 shows the top twelve destinations of Finnish portfolio investments for the period of 1997 to 2000. Finnish investors show a marked preference towards investments in European Union countries. These countries receive more than four times the investment in the US market, even though the former has the same gross domestic product and about a third of the market capitalization of the US. In the year 2000, Sweden took a resounding 30.6 % of the total Finnish investment surpassing the value of the total investment in the European Monetary union countries, 26.2%.

## **III. Literature Review**

This section presents a summary of the literature relating to “home bias”. Section III.1 presents a brief exposition of the international asset pricing models and summarizes the empirical evidence on the performance of these models as well as some of the more recent literature on “home bias”. Section III.2 provides a brief review of the evidence in the literature on the Geographical Diversification Benefits of Multinational Corporations. Finally, Section III.3 summarizes the literature on Gravity models and some empirical results from the international economics literature.

### **III.1. The Home Bias Research in the Finance Literature**

Markowitz (1959) pioneering work on Mean-Variance portfolio optimization and the Capital Asset Pricing Model (CAPM) by Sharpe (1964), and extensions by Black (1972), among many others, are the corner stone of the modern theory of Finance. The theory assumes that all investors are rational mean-variance optimizers, have homogeneous expectations (i.e. have the same information), are price takers, are able to short sell the assets, and are not faced with any barriers, taxes and transaction costs. The central premise of this theory is what is known as separation theorem. This theorem states that all investors' portfolios can be decomposed into two portfolios, the market portfolio and the risk free asset, irrespective of investors' level of risk aversion. Black (1972) shows that in a CAPM with no lending and borrowing at the risk free rate, a zero beta minimum variance portfolio replaces the risk free asset fund. The CAPM builds on the pillars of the normative assumption that all investors hold the same portfolio of risky assets, i.e. the market portfolio.

Under somewhat strong assumptions, the one country CAPM also applies in an international context. With no barriers to international investments, perfectly integrated capital, and goods markets, and all investors having similar investment and consumption opportunity sets with purchasing power parity holding exactly. In this setting, investors from all countries continue to have homogenous expectations of the distribution of asset returns and all the results of the one country CAPM apply. Specifically, all investors, irrespective of their risk aversion, and country of residence distribute their wealth between the risk-free asset of their country of residence and a common portfolio of risky assets.<sup>3</sup>

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<sup>3</sup> For recent surveys of International asset pricing, see Uppal (1992), Stulz (1994), Lewis (1999), and Karolyi and Stulz (2002).



Extensions of the one country CAPM to an international setting addresses the influences of country specific factors as well as capital and goods market regularities, and model their consequential impact on investors' country allocations. The Solnik-Sercu model is an extension of the basic international CAPM that looks at the country allocations resulting from modification of two key assumptions. Specifically Solnik (1974 a) and (1977) and Sercu (1980) allow investors from different countries to differ in their consumption and investment opportunity sets.<sup>4</sup> A number of empirical research shows that purchasing power parity does not hold in the very short run either due to differences in consumption preferences or due to the breakdown of the law of one price of investors' consumption opportunity set.<sup>5</sup> This heterogeneity in the national consumption tastes leads to heterogeneity in their expectations of the distributions of real returns on assets (including bonds) from the foreign currency zones.<sup>6</sup> In this setting, investors from different countries no longer face the same efficient frontier. Solnik and Sercu show that with the additional assumptions of non-stochastic home inflation, the availability of risk-free domestic bonds in real terms and with interest rates and exchange rates determined exogenously, investors will continue to hold a portfolio of two funds. The first is the global 'log' risky assets fund that includes domestic and foreign equities as well as foreign bonds. This fund is the same for all investors and is independent of investors' home currency. The second is the domestic risk-free bond and is unique to investors from each currency zone. Similarly to the CAPM and the simple international CAPM, the fraction of these two funds in the portfolios of investors depends on the level of their risk aversion.

Adler and Dumas (1983) extend the above model by allowing for different inflation rates (stochastic) across countries meaning that there is no longer a riskless domestic bond. This assumption still results in the same log global portfolio that is the same for investors from all countries but the hedge portfolio now includes domestic equities as well as domestic bonds. More importantly, Adler and Dumas note that as long as the

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<sup>4</sup> See also Stulz (1981).

<sup>5</sup> See Adler and Dumas (1983), and Froot and Rogoff (1995) for recent surveys on the empirical results of purchasing power parity tests.

<sup>6</sup> The Solnik-Sercu model assumes that there is no inflation in any country. This assumption implies that changes in the exchange rate represent pure deviations from purchasing power parity (Sercu (1980)).

variability of inflation is lower than that for equities, domestic bonds will continue to constitute the largest portion of this portfolio.

Empirically, there is a large volume of literature that documents substantial potential gains from diversification of investment portfolios across national boundaries. Grubel (1968), Levy and Sarnat (1970), Solnik (1974 b) and more recently by Grauer (1987), Harvey (1991), and De Santis and Gerard (1997) point to the risk reduction benefits from holding foreign securities.

Still the literature documents substantial evidence that investors exhibit a negative bias towards holding cross-border investments, a behavior that the finance and economics literature refers to as "home bias".<sup>7</sup> Cooper and Kaplanis (1986, 1994), French and Poterba (1991) and Tesar and Werner (1995) provide evidence showing that investors include too little of their wealth in foreign assets relative to the proportion modern finance theory stipulates.

Cooper and Kaplanis (1986 and 1994) find that the bias towards domestic stocks is not reconcilable with investors' need for hedging the domestic inflation.<sup>8</sup> They also show that the fraction of domestic and foreign stock in investors' portfolios implies "a dead weight cost" on foreign investment that is too high to reconcile with existing barriers to cross-border investments.

French and Poterba (1991) use investors aggregate equity portfolio allocations in the domestic and a number of foreign markets and show that a simple mean-variance model imply returns that substantially deviates from the ex-post returns of these markets.<sup>9</sup> They suggest that the home bias of investors' portfolios can only be justified if investors have higher expectations of the returns in their domestic equity market returns.

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<sup>7</sup> The pervasiveness of this behavior has also captivated the attention of a large number of articles in the business press. For example an article in Business Week (September 6, 1993), "A 'home bias' is inhibiting global diversification" notes: "far less capital is directed abroad by U.S. and foreign investors than would be predicted by optimal portfolio strategies based on such considerations as risk, rate of return and diversification".

<sup>8</sup> Cooper and Kaplanis (1994) apply the Adler and Dumas version of the CAPM.

<sup>9</sup> French and Poterba (1991) assume fully integrated capital and goods markets.

Tesar and Werner (1995) find that portfolio turnover rates are higher on foreign than on domestic portfolios leading them to conclude that transaction cost is an unlikely explanation of home bias. They suggest that “other factors such as geographic proximity, strong trade linkages and the lack of language barrier may matter potentially even more than the diversification motive per se for international portfolio choice”.

However, there is some evidence that shows that the portfolio weights from mean variance optimization are not statistically different from zero, Britten-Jones (1999) and Gorman and Jorgensen (1998). Britten-Jones (1999) constructs a regression procedure for testing the statistical significance of mean-variance efficient portfolios and empirically shows that the large size of the standard errors of these weights implies a confidence interval that also includes a zero weight. Britten-Jones (1999) shows that this procedure is unable to reject zero weight restrictions for an international equity portfolio as well as the total international allocations of a US investor.

Overall, the literature concludes that while international financial markets have been witnessing a higher degree of integration in recent years, there still remain a number of considerations that prevent investors from taking advantage of the large diversification that simple mean-variance suggest. The evidence also suggests that at least some fraction of the home bias may be the result of the inability of simple mean-variance theory to capture other sources of risk. International investing introduces additional risk arising from different currencies, political, legal and institutional difference across countries that complicates information gathering on the equities of these markets.

Recent research emphasizes on these informational considerations and provides evidence that they have a large impact on the deviations in investors’ domestic and international portfolios from the weights that portfolio theory prescribes. For example, Brennan & Cao (1997) construct and empirically test a model where differences in the informational endowments between foreign and domestic investors,

influence the cross border equity portfolio flows.<sup>10</sup> The model assumes domestic investors' possess informational advantages over the foreign investors. When investors revise their portfolios in response to a positive (negative) public signal, the less well informed foreign investors sell (purchase) more of the domestic market portfolio to (from) the better informed domestic investors prior to the price increase (decrease). Their empirical results are mixed, however. In line with what the model predicts, they find that U.S. investors do face informational disadvantages about the other developing, and to a lesser extent, developed markets.<sup>11</sup>

Other literature provides substantial evidence that seems to indicate that the decimation of information on investment targets strongly relates to their distance from investors as well as characteristics that are common to both investors and investment targets. Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide strong evidence that geography, language and culture induces a "home bias" even within a country's borders.

Coval and Moskowitz (1999) use a domestic setting to quantify the effect of distance on investment portfolio choice. They find that the average U.S. mutual fund manager is about 9 to 11% closer to her U.S. holdings than the average firm in their sample. Their finding for the importance of distance in a domestic setting with little or no variation in regulation, taxation, political risk, language, and culture, emphasizes the potentially important role of distance, and geography, as an important determinant of international portfolio investment. They also report a strong relation between three firm characteristics: size, leverage, and tradability of output, and the preference for local equity. They find that the average locally held firm tends to be small, highly leveraged and producing non-tradable goods, characteristics that are linked to scarcity of available information. They suggest that this "points directly towards an information-rooted explanation for the local equity preference". Grinblatt and

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<sup>10</sup> Gehrig (1993) constructs and empirically tests a similar (one-period) model.

<sup>11</sup> Brennan and Cao (1997) also provide examples that show that organizational structures of financial institutions substantially limits their ability to circumvent these informational asymmetries through efficient technological communication resources or by hiring local, and thus more informed, managers. They note that, "While it is true that institutions will often have individuals assigned to monitor various foreign countries, we believe that it is rare for these informed individuals to have sole responsibility for country allocation".

Keloharju (2001) show that in addition to distance, the language of the annual reports and the culture of the CEO's of Finnish corporations play an important role in the equity selection of Finnish investors.

Other literature attempts to reconcile the home bias with investors' preferences for holding equities that they are more familiar with. Huberman (2001) examines the geographical distribution of shareholders of the seven U.S. Regional Bell Operating Companies (RBOCs) at the end of 1996, and observes that a typical RBOC customer holds more of its' share, in terms of both quantity and value, than in the other RBOCs. He draws a parallel between this observation and people's preference to invest in the familiar.<sup>12</sup> He suggests, "It seems that the bias favoring the familiar does not reflect the exploitation of the informational advantage – real or imagined. Rather, it reflect people's tendency to be optimistic about and charitable toward what they feel affinity with, the comfortable, and the familiar." concluding that "the paucity of international diversification is only one of the implications of this tendency to invest in the familiar".

There is also some evidence showing that geographic proximity seems to imply an informational advantage that show up in returns. Coval and Moskowitz (2001) examining U.S. mutual funds show that fund managers' bias their investments towards nearby equities and in the process earn substantial abnormal returns. Hau (2001) analyzing data from the electronic trading system Xetra of the German Security Exchange show that German professional traders obtain a significantly higher return than foreign traders do.

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<sup>12</sup> Huberman (2001) provide a number of examples showing that this behavior is not just limited to the average investor, but is also displayed by the most sophisticated of investors. . He notes that "for instance, the presumably financially sophisticated employees of J.P. Morgan invest 19% of their 401(K) plan money in Morgan's stock, although the firm offers no incentive to make this particular choice". In other examples, he notes that 16% of the Coca-Cola stock is held in the Georgia area and that Texans have large holdings of Texas municipal bonds. These examples lead him to observe, "It seems that the bias favoring the familiar does not reflect the exploitation of the informational advantage – real or imagined. Rather, it reflect people's tendency to be optimistic about and charitable toward what they feel affinity with, the comfortable, and the familiar." concluding that "the paucity of international diversification is only one of the implications of this tendency to invest in the familiar".

### **III.2. Foreign Direct Investment, The Geographical Diversification Benefits of Multinational Corporations, and The Influence of FDI on Portfolio Investment**

A strand of the finance literature attempts to explain the observed low levels of cross border portfolio investments by recognizing the opportunities available to investors to achieve geographical diversification through domestically listed equities. This literature points to the increasing role of multinational corporations in cross border transactions and argues that given this multinational dimension of domestically listed multinational firms, this international exposure allows domestic investors to use these vehicles to indirectly obtain substantial international diversification benefits.

The relationship between the international activity of firms and the potential indirect diversification benefits for investors has been the subject of a considerable research. The early approach in resolving this issue mainly addresses the relationship between international involvement on the exposure to the domestic and international indexes, and the risk reduction benefits. Agmon and Lessard (1977), using a sample of 217 securities, find that the higher the degree of a firm's international activity, the higher is the exposure of the firm's return to the international (excluding US) market index and the lower is the exposure to the US index. They associate this finding with investors' recognition of corporate international diversification. Jacquillat and Solnik (1978) provide contradicting evidence finding that multinational firms betas do not differ from purely domestic firms. Fatemi (1984) relates the extent of international involvement of firms to their risk adjusted abnormal returns around the period of the initiation of these activities. Using event study methodology, this study shows that abnormal returns rise by 18% during the 14 months that precede the initial international diversification of firms.<sup>13</sup>

The proposition that is applied in the more recent research relates to investors' recognition of the extent of the multinational activities of firms as reflected by their relative valuation. Researchers have applied a number of different approaches to test this proposition. One approach has been to test the implications of the internationalization theory of FDI on the valuation of multinational firms. The

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<sup>13</sup> The results are based on data for 18 firms only.

internalization theory of FDI stipulates that FDI takes place as a mode for leveraging a firm's intangible assets through geographic expansion leading to an increase in the value of the firm.<sup>14</sup> These firm-specific intangible assets include brands, patents, managerial skills, research and development advantages, economies of scale in manufacturing and advertising. The economics of information arising from the proprietary aspect of these assets elevates opportunistic behavior that hinders their exchange at arm's length and induce firms to internalize the markets for their cross border leveraging.<sup>15</sup>

Morck and Yeung (1991) find strong evidence in favor of the internationalization theory in that the degree of the multinationality of firms is positively correlated with excess firm value. They find that their proxy of FDI investments of firms, the number of foreign subsidiaries, is positively related to the firms' excess valuation as measured by Tobin q. When they specifically associate the degree of internationalization with firms' intangible assets, R&D spending, and advertising, they find that the former is only related to a positive Tobin q in the presence of the latter.

Errunza and Senbet (1981, 1984) provide evidence that investors are aware of the diversification benefits as reflected by the excess valuation of US internationally diversified firms. These authors argue that multinational firms offer investors the opportunity to gain international diversification exposure via their FDI investments because of the presence of barriers that investors face in achieving direct international diversification. Multinational firms, through their international business engagement and foreign operations maybe better placed to circumvent capital market segmentation, in the form of e.g. constraints on capital flows and complicated taxation issues.

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<sup>14</sup> The definition of foreign direct investment (FDI), OECD 1996, encompass investments that reflect investors (direct investor) objectives of obtaining "a lasting interest" in the entity of the foreign economy ... "The lasting interest implies the existence of a long term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise, as evidenced by an ownership of at least 10 %" of the ordinary shares or voting power in the enterprise.

<sup>15</sup> For more detailed explanation, see Caves (1997), pages 3-5 and 144-147.

The most recent evidence on investors' valuation of the multinational dimension of firms is mixed at best. Denis, Denis, and Yost (2002), find that globally diversified US firms are valued at a discount relative to domestic single segment firms. On the other hand, Bodnar, Tang, and Weintrop (1998) use similar data and provide evidence that investors show preference to geographic diversification by US multinationals as reflected in excess valuations of these firms. Using a large sample of industrially and geographically diversified firms for the period from 1987 through 1993, and controlling for possible business activity segment classification, industry effects, self selection, and multinationality, they find that internationally diversified firms are valued at a 2.2 percent higher level than a single activity domestic firm. Furthermore, a recent paper by Campa and Kedia (2002) shows that any analysis of the impact of diversification on valuation must account for the of the self-selection decision of these firms to diversify. They show that once accounting for this endogeneity, the industrial diversification discount, that is well documented in the literature, for example Lang and Stulz (1994) and Berger and Ofek (1995), disappears.

Direct evidence also shows that investors can achieve a considerable level of international diversification without having to trade in financial markets outside their borders. Errunza, Hogan, and, Hung (1999) show that, for U.S. investors, domestically traded assets that include multinational corporations provide investors with internationally diversified portfolios that mimic the performance of foreign equities.<sup>16</sup>

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<sup>16</sup> These results imply substantial short positions in ADR and MNC stocks and should be interpreted with caution.



### III.3. The Home Bias, Learning from International Economics

As in the finance literature, proximity considerations are more established in the empirical side of the international economics literature. For example, the international trade literature documents that distance has a substantial impact on the patterns of international trade in addition to the impact of the size of the economy. This robust empirical specification, called the gravity model, explains bilateral linkages by the mass of the two bodies and the distance between them (in a log-linear form). Since its inception in the sixties, the gravity model has gone from being an empirical regularity to a popular framework of all the main theories of international trade.<sup>17</sup> The gravity model formulation has been successfully reconciled with the generalized expenditure share model (Anderson, 1979), differentiated products models of trade (Bergstrand, 1985 and Helpman, 1984), and within the context of the classical framework coupled with the assumption that countries produce differentiated goods (Deardorff, 1995).

Similarly to the home bias in financial assets, there is substantial empirical evidence in the international economics literature of home bias in the real goods market. McCallum (1995) uses a basic form of the gravity model to evaluate the determinants of the volume of trade between ten Canadian provinces and thirty American states. After controlling for size and direct distances he finds that trade between provinces is about twenty times the trade with American states. Helliwell (1996) uses a larger data set and confirms McCallum's basic findings. Wei (1996) studies the overall home bias in the goods market among nineteen OECD countries over the period between 1982 and 1994.<sup>18</sup> He finds that after controlling for size and distance, an OECD country import two and a half time more from itself than from an otherwise identical country.

The international economics offers a number of examples that establishes a direct linkage between trade in tangible goods, commitment of resources between the trading pair, trade volumes and institutional quality of the trading partners, and search

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<sup>17</sup> Tinbergen (1962), Pullianen (1963), Pyhönen (1963), and Linnemann (1966) are some of the first literature on gravity models, cited in Leamer and Levinsohn (1995).

<sup>18</sup> Wei (1996) defines home bias as "a country's import from itself in excess of its import from other countries after taking into account an exporter's and importer's size, bilateral distance, locations relative to the rest of the world and whether sharing a common border or language".

for and deliberation influences on the trading relationship. For example, empirical research on the determinants of foreign banking cross-border expansion documents a significant link between foreign location expansion and trade (and exports) between the home country and the host country. Grosse and Goldberg (1991) study foreign bank activity in the United States and find that foreign investment in the U.S., foreign trade with U.S., and the size of the banking sector in the foreign country are positively correlated with that country's bank presence in the U.S. On the international level, Brealey and Kaplanis (1996) using branches location data of the top 100 banks in the world find that foreign branch location of banks is closely linked to the trade and foreign direct investment of the home country, implying that banks follow their customers. They also show that foreign branching increased very rapidly from 1960 to the mid 1980s paralleled the substantial growth of international trade and foreign direct investment. Buch (2000) studying the determinants of German banks foreign activities finds that foreign trade and foreign direct investments of German companies exhibit a strong and positive correlation to the foreign branch pattern. She also concludes that the German banks follow their customers' abroad.

The international economics literature also provides evidence on linkages between trade volumes and institutional quality of the trading partners. For example, Anderson and Marcouiller (1999), using data on institutional quality compiled by the world economic forum provide strong empirical evidence that "transaction costs associated with insecure exchange significantly impede international trade". They show that insecurity arising from imperfect contract enforcement exposes exporters to the holdup problem<sup>19</sup>, leading to price markup that translates into reduced exports and lower import demand. They also show that cross-country variations in the effectiveness of institutions offer a simple explanation to the observed pattern of trade, in which high-income capital-abundant countries trade disproportionately with one another. These results indicate that trade volume is an important indicator for the institutional efficiency of the exporting and importing country that also tends to have a substantial impact on cross border trade in equities.

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<sup>19</sup> The holdup problem arises when fixed costs are associated with entry into the international market and contract enforcement is random.

## **IV. Contribution of the Essays**

### **IV.1. Essay 1: The Determinants of International Portfolio (Equity) Investments of Finnish Based Investors**

This Essay relates to the growing literature on “home bias”, the observation that investors exhibit a strong bias towards domestic and near-by stocks. Particularly to the segment of this literature emphasizing information asymmetry as a significant indirect barrier that leads to large distortions in investment patterns that significantly deviates from the predictions of portfolio theory.<sup>20</sup>

We contribute to this literature in two ways. First we apply the gravity model, a popular empirical model from international trade in real good, to analyze the determinants of international portfolio investments. The basic specification of the gravity model depicts bilateral linkages by the mass of the two bodies and the distance between them. It is consistent with a substantial volume of literature that documents a propensity of investment allocation to both market size and distance. For example, Tesar and Werner (1995) suggest that the geographic proximity seems to have a higher impact on the international country allocations of investors than the diversification motive. Coval and Moskowitz (1999) show that the average U.S. mutual fund manager is about 9 to 11% closer to her holdings than the average firm in their sample. Kang and Stulz (1997), among others, find that foreign investors show a preference towards large domestic stocks.

Secondly, the paper examines the role of information asymmetry on Finnish investors' allocations in these markets. To the extent that information is the principal input in the investment process, Finnish institutions will possess a relative advantage in those countries where information stock, collection and analysis is necessary for the functioning of the domestic (Finnish) economy. This information contributes to the reduction in information cost of transactions with a country. To capture this information pool, we propose two proxies, the domestic media coverage of news on the investment receiving country and the Finnish bilateral trade in real goods with

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<sup>20</sup> See Lewis (1998) and Karolyi and Stulz (2002) for recent surveys of this literature.

these countries. Recent literature provides support for this association. For example, Baker, Nofsinger and weaver (2002) find that coverage of foreign stocks cross listing in the US and the United Kingdom leads to a significant increase in news on these firms by the Wall Street Journal and the Financial Times. Falkenstein (1996) shows that investors tend to avoid stocks with little information. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find that foreign investors show preference for domestic companies with high exports. Portes and Rey (1999) find that variables that measure information transfer between bilateral pairs such as telephone call volume, number of bank branches in one of the other pair, substantially reduces the elasticity of distance.

We use new data on the aggregate international portfolio investments of Finnish investors to examine the determinants of country allocations in these portfolios. We find that a basic gravity model formulation explains a large fraction of the variance of these allocations. Both estimates of the elasticity of portfolio share with respect to the market capitalization of the investment receiving country, and direct distance between Helsinki and the financial capital of the investment receiving country is substantial in size and have statistically significant coefficient estimate. Since distance at least to some extent measures information costs this finding tends to support the role of information asymmetry on investors' country allocation.

We investigate the sources of the apparent information asymmetry and propose two proxies to capture their influence on the Finnish investors' allocation in a particular country. The first is the news coverage relating to each of the investment receiving countries by the financial press in Finland. The second is the bilateral trade in real goods between Finland and each of the investment receiving countries. We show that the introduction of these variables as a proxy of information asymmetry into the regression substantially reduces the significance of other variables that proxy this class of information. Our results indicate that the share of portfolio allocation in a particular country parallels that of trade in real goods.

Furthermore we show that our results are not due to export hedging motives, variables that are common to both portfolio share and trade regressions, and the construction of

the portfolio share measure. Overall, our results indicate a substantial role of trade in reducing the information cost relating to portfolio investments.

#### **IV.2. Essay 2: The impact of EMU on international portfolio Investments**

This essay analyses the impact of the launch of the European Monetary Union (EMU) on the allocation of international portfolio investments. The initiation of the EMU provides an opportunity for comparison of competing theoretical explanations for investment behavior. Models stressing the diversification motive would predict that the increased dependence between countries participating in the EMU should reduce the attractiveness of portfolio holdings in other EMU countries. Models based on asymmetric information would instead emphasize the increased intensity in the flow of information resulting from an increase in cross border transactions between the EMU countries. The consequent decline in information asymmetry should increase, rather than reduce portfolio holdings in other EMU countries.

Our empirical analysis focuses on Finnish foreign portfolio holdings. Finland, being a small country with relatively high foreign exchange related transaction costs in the pre EMU era, should be well suited for this study. Any impact that the EMU will have should be easier to identify for Finland than for a larger country where foreign exchange related transaction costs are of less importance.

Our results reveal that if anything the EMU seems to have increased the attractiveness of investing in countries that joined the monetary union. A closer analysis furthermore, revealed that the impact on the allocation of portfolio investments was significantly related to the impact on trade flows.

Over all our results can thus be taken to lend support for the hypothesis that considerations related to the flow of information between countries tend to have substantially more power than hedging motives in explaining the distribution of foreign portfolio investments at the introduction of the EMU.

### **IV.3. Essay 3: International portfolio investments and the informational value of trade**

This Essay relates to the growing literature on “home bias”, the behavior of investors to overweigh domestic, and near-by stocks. For example, Cooper and Kaplanis (1986 and 1994), French and Poterba (1991), and Tesar and Werner (1995) show that the fraction of international investments in investors national equity portfolios is substantially lower than what standard international finance models prescribe.

A segment of this literature strives to explore the root causes of the home bias by examining the attributes of investors and their investments. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find foreign investors to exhibit preference for large firms, particularly those with high exports. Another segment of this literature relates the levels of cross-border portfolio investments in the firms of a country with the information availability on these firms, and thus their visibility to investors, as consequence of the country’s legal, institutional, and financial market characteristics, for example Shleifer and Vishny (1997), La Porta et al. (1998), and Lang, Lins, and Miller (2002). A third segment of this literature take a more direct approach in examining information asymmetry between investors and their investments in a particular country. Portes and Rey (1999) and Aba Al-Khail (1999) find that proxies for information flow between countries strongly relate to the level of transactions and investments of one country in the other. Overall this literature suggests that informational asymmetries of investors on potential investment targets constitute an important indirect barrier that contributes to the home bias.

We use data on the aggregate international portfolio investments of investors from a large number of countries to examine how different country attributes influence portfolio investments in a country. We decompose these attributes into two categories, one that relate to the characteristics of an investment receiving country and another that is unique to a particular investment receiving and investment sending country pair.

The literature suggests two groups of investment receiving country attributes. These are: financial market size and performance; and corporate governance variables that

provide proxies for financial development, legal structure, and information availability on the firms in the investment receiving country. The first group includes the share of the market in the world market portfolio as well as other pull factors such as the market growth potential and its risk-return characteristic. The second group includes per capita GDP, percent of its market that is closely held, as well as a number of indices, from La Porta et al. (1997), that proxy the country's investor protection and corporate governance structure.

We find a dominating influence of the capital market size of the receiving country on country allocations of outgoing investments. Our results indicate that once we control for the size of the financial market our proxies of corporate governance parameters have only a marginal influence on the level of foreign investments. In line with the existing literature, we interpret this as evidence that the level of information disclosure that is closely related to prevailing corporate governance structures is largely reflected in the size of the market.

For the second category, attributes that are unique to a particular investment receiving and investment sending country pair, we include distance, common language, and the intensity of their trade in real goods. Our results indicate that distance between an investment sending and an investment receiving country has a large negative impact on the level of these investments. Since distance to some extent provide a proxy for transaction cost (and information cost) this results provide evidence for the important role of information asymmetry on international portfolio allocations.

In the other contribution of this paper, we strive to deepen our understanding of the interaction between trade in real goods and the reduction of information cost relating to portfolio investments. By definition, the intensity of tangible goods trading between two countries is a proxy for the level of commitment of resources, financial and otherwise to activities that requires transmission of information. The fact that international trade requires effective channels of communication to facilitate the trading activity implies an association between trade and the quantity and quality of information on market conditions, and the functioning of organizations and institutions. These factors also channel reliable cross-border transmission of asset

specific information. In this line of argument, information, knowledge, and experience gained through the interactions of trading in tangible goods have a significant impact on reducing the wedge of information asymmetry relating to portfolio investments.

Merton (1987) notes that “Although the types of costs underlying the signaling and differential information models would surely be an important part of a more-detailed information-cost structure..., there is another type of cost that logically proceeds them: namely, the cost of making investors aware of the firm. That is for party A to convey useful information to party B, requires not only that Party A has a transmitter and sends an accurate message, but also that Party B has a receiver.” Using this terminology an expansion of international trade between two countries usually imply the establishing of new active receivers on both sides of the transaction.

The information flow in connection to trade in tangible goods also includes information on potential investment objects in the other country. The experience gained through trade allows for proper calibration of individual pieces of information, e.g. which pieces of information can be considered trustworthy and which not. The higher the intensity of trade between two countries, the more intense is the day to day information flow between them and the more will the relative local information advantage be decimated. Increased information flow will also expose the foreign investor to a larger pool of potential investment opportunities. Other things equal, more trade should thus lead to an increase in the weight for that country in the foreign investor’s international portfolio allocation.

The results show that the bilateral trading intensity in tangible goods apparently contributes to a substantial reduction in information cost relating to portfolio investments between countries. We demonstrate that this finding is not due to investors demand to hedge the risks of the foreign revenues and expenses of the firms in their domestic portfolio. We further separate investments into developing countries and investments into developed countries and examine the impact of trade on these investments. We find trade to have a higher incremental impact on portfolio allocations in developing countries. These results are consistent with trade being more



important in providing information on firms in countries in which the corporate governance structure and the information environment of firms generate less reliable information. Finally, we present some evidence that the higher informational content of technology trade seems to imply reduced information costs for portfolio investments, especially in developing countries.

#### **IV.4. Essay 4: The impact of FDI on international portfolio investment**

A popular explanation for the home bias in portfolio investments centers on the wedge of asymmetric information that is driven by the spatial separation between investments and investors. Tesar and Werner (1995), Coval and Moskowitz (1999), and Grinblatt and Keloharju (2001) show that domestic and international portfolios of investors exhibit strong bias towards domestic and near-by stocks. This literature suggests that informational asymmetries between the local and non-local investors constitute an important indirect barrier that prevents investment patterns from conforming to modern finance theory.

Another strand of the finance literature attempts to explain the observed low levels of cross border investments with opportunities available to investors in achieving geographical diversification via domestically listed equities. This literature points to the increasing role of multinational corporations in cross border transactions and argues that this multinational dimension of some domestically listed firms allows domestic investors to use these firms as vehicles to indirectly obtain substantial international diversification benefits. Errunza, Hogan, and, Hung (1999) and Bodnar, Tang and Weintrop (1998) document support for this explanation.

This essay attempts to discriminate between these two explanations. The essay addresses the impact of the international activities of locally listed firms, on the country allocation of domestic investors' international portfolio investments. Investors' holdings in locally listed firms imply a certain international exposure that is related to those firms' international activities. This international component of the domestic portfolio should have implications for how domestic investors choose to

allocate their international portfolio investments. Interestingly, different strands of economic literature produce contradictory predictions. The first alternative is based on the role of asymmetric information. According to this explanation, FDIs provides an additional information channel between countries that contributes to the reduction of information related transaction costs. This drop in transaction costs implies an increase in portfolio investments. The second alternative is based on the idea that FDI provides investors with a device to attain international diversification benefits. Investors that hold shares in domestically listed firms will receive diversification benefits through the FDIs conducted by those firms. Portfolio investments into countries that receive a disproportionate share of FDIs should become less attractive for domestic investors.

Empirical results using a new four-year annual panel of Finnish international portfolio and FDI investments in twenty-five countries provide evidence consistent with an information asymmetry explanation. The results indicate that the international activities of locally listed firms in investors' domestic portfolios have a substantial impact on the country allocations in their direct international portfolios. In other words, an over (under) exposure to the market fundamentals of a country in the direct international portfolio is further increased (decreased) by the indirect exposure through the international activity of the domestic firms in that country. These results are consistent for both firms' investment intensity as well as the income it generates in a country.

Overall the results lend support to the hypothesis that considerations related to the flow of information between countries have an impact on how investors allocate their international portfolio investments. More FDIs imply an increase in information flow that contributes to the reduction of information asymmetry resulting in an increased flow of portfolio investments as well.

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## **PART B: THE ESSAYS**



# **The Determinants of International Portfolio (Equity) Investments of Finnish Based Investors**

## **Abstract**

This paper examines the determinants of country allocations in the international portfolio of Finnish investors. We find that a basic gravity model formulation explains a large fraction of the variance of these allocations. This model yields a sizable and statistically significant estimate of the elasticity of portfolio share with respect to distance implying a large role for transaction costs. We further show that the share of portfolio allocation in a particular country parallels that of trade in real goods. This finding is not due to export hedging motives or variables that are common to both portfolio share and trade regressions. Overall, our results indicate a substantial role of trade in reducing the information cost relating to portfolio investments.

JEL Classification Codes: F10; G11; and G15.

Key Words: Gravity Model; Financial Markets; Information Asymmetry; Portfolio Investment.



## **I. Introduction**

This paper uses new data on aggregate international portfolio investments of Finnish investors to examine the determinants of country allocations in these portfolios. The paper relates to the growing literature on “home bias”, the observation that investors exhibit a strong bias towards domestic and near-by stocks. Particularly to the segment of this literature emphasizing information asymmetry as a significant indirect barrier that leads to large distortions in investment patterns that significantly deviates from the predictions of portfolio theory.<sup>21</sup>

We contribute to this literature in two ways. First we apply the gravity model, a popular empirical model from international trade in real good, to analyze the determinants of international portfolio investments. The basic specification of the gravity model depicts bilateral linkages by the mass of the two bodies and the distance between them. It is consistent with a substantial volume of literature that documents a propensity of investment allocation to both market size and distance. For example, Tesar and Werner (1995) suggest that the geographic proximity seems to have a higher impact on the international country allocations of investors than the diversification motive. Coval and Moskowitz (1999) show that the average U.S. mutual fund manager is about 9 to 11% closer to her holdings than the average firm in their sample. Kang and Stulz (1997), among others, find that foreign investors show a preference towards large domestic stocks.

Recently, Martin and Rey (1999) provide a theoretical foundation for gravity formulations in the analysis of investment flows. They demonstrate that even though trade in their model is initiated for the purpose of diversification, a large enough friction can have an influence on shaping the geographical distribution of equity flows. Portes and Rey (1999) apply gravity like regressions for the analysis of the determinants of cross border equity transactions. They document an overwhelming success of the gravity formulation, significant and sizable coefficients estimates for the elasticity of the cross border transaction volume with respect to distance, and market capitalization.

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<sup>21</sup> See Lewis (1998) and Karolyi and Stulz (2002) for recent surveys of this literature.

Secondly, the paper examines the role of information asymmetry on Finnish investors' allocations in these markets. To the extent that information is the principal input in the investment process, Finnish institutions will possess a relative advantage in those countries where information stock, collection and analysis is necessary for the functioning of the domestic (Finnish) economy. This information contributes to the reduction in information cost of transactions with a country. To capture this information pool, we propose two proxies, the domestic media coverage of news on the investment receiving country and the Finnish bilateral trade in real goods with these countries. Recent literature provides support for this association. For example, Baker, Nofsinger and Weaver (2002) find that coverage of foreign stocks cross listing in the US and the United Kingdom leads to a significant increase in news on these firms by the Wall Street Journal and the Financial Times. Falkenstein (1996) shows that investors tend to avoid stocks with little information. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find that foreign investors show preference for domestic companies with high exports. Portes and Rey (1999) find that variables that measure information transfer between bilateral pairs such as telephone call volume, number of bank branches in one of the other pair, substantially reduces the elasticity of distance.

Our results show that a gravity specification is able to explain a large fraction of the variance of these investments. The estimates of the elasticity of portfolio share with respect to the market capitalization of the receiving country, and direct distance between Helsinki, the financial capital of Finland, and that of the receiving country is substantial in size and have statistically significant coefficient estimate. Since distance at least to some extent measures information cost this finding tends to support the role of information asymmetry on investors' country allocation.

Further we show that the introduction of proxies that capture the information stock of Finnish institutions on the investment receiving countries have a substantial impact on country allocations. Our results indicate that portfolio allocation in a particular country parallels that of trade in real goods. We further show that this result is not due to export hedging motives or variables that are common to both portfolio share and trade or the construction of the portfolio share measure. Overall, our results indicate

a substantial role of trade in reducing the information cost relating to portfolio investments.

The remainder of this paper is organized as follows. Section II summarizes the literature relating to home bias from both the finance and international economics literature. Section III describes the data and presents the regression model. Section IV presents the empirical results. Section V provides robustness check of the results. Finally, section VI concludes the major findings of the paper.

## **II. Review of the Literature**

Markowitz (1959) pioneering work on Mean-Variance portfolio optimization and the Capital Asset Pricing Model (CAPM) by Sharpe (1964), and extensions by Black (1972), among many others, are the corner stone of the modern theory of Finance.<sup>22</sup> The CAPM builds on the pillars of the normative assumption that all investors hold the same portfolio of risky assets, i.e. the market portfolio.

Under somewhat strong assumptions, the one country CAPM also applies in an international context. With no barriers to international investments, perfectly integrated capital, and goods markets, and all investors having similar investment and consumption opportunity sets with purchasing power parity holding exactly. In this setting, investors from all countries continue to have homogenous expectations of the distribution of asset returns and all the results of the one country CAPM apply. Specifically, all investors, irrespective of their risk aversion, and country of residence distribute their wealth between the risk-free asset of their country of residence and a common portfolio of risky assets.<sup>23</sup>

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<sup>22</sup> The theory assumes that all investors are rational mean-variance optimizers, have homogeneous expectations (i.e. have the same information), are price takers, are able to short sell the assets, and are not faced with any barriers, taxes and transaction costs. The central premise of this theory is what is known as separation theorem. This theorem states that all investors' portfolios can be decomposed into two portfolios, the market portfolio and the risk free asset, irrespective of investors' level of risk aversion. Black (1972) shows that in a CAPM with no lending and borrowing at the risk free rate, a zero beta minimum variance portfolio replaces the risk free asset fund.

<sup>23</sup> For recent surveys of International asset pricing, see Uppal (1992), Stulz (1994), Lewis (1999), and Karolyi and Stulz (2002).

Extensions of the one country CAPM to an international setting addresses the influences of country specific factors as well as capital and goods market regularities, and model their consequential impact on investors' country allocations. The Solnik-Sercu model is an extension of the basic international CAPM that looks at the country allocations resulting from modification of two key assumptions. Specifically Solnik (1974 a) and (1977) and Sercu (1980) allow investors from different countries to differ in their consumption and investment opportunity sets. A number of empirical research shows that purchasing power parity does not hold in the very short run either due to differences in consumption preferences or due to the breakdown of the law of one price of investors' consumption opportunity set.<sup>24</sup> This heterogeneity in the national consumption tastes leads to heterogeneity in their expectations of the distributions of real returns on assets (including bonds) from the foreign currency zones.<sup>25</sup> In this setting, investors from different countries no longer face the same efficient frontier. Solnik and Sercu show that with the additional assumptions of non-stochastic home inflation, the availability of risk-free domestic bonds in real terms and with interest rates and exchange rates determined exogenously, investors will continue to hold a portfolio of two funds. The first is the global 'log' risky assets fund that includes domestic and foreign equities as well as foreign bonds. This fund is the same for all investors and is independent of investors' home currency. The second is the domestic risk-free bond and is unique to investors from each currency zone. Similarly to the CAPM and the simple international CAPM, the fraction of these two funds in the portfolios of investors depends on the level of their risk aversion.

Adler and Dumas (1983) extend the above model by allowing for different inflation rates (stochastic) across countries meaning that there is no longer a riskless domestic bond. This assumption still results in the same log global portfolio that is the same for investors from all countries but the hedge portfolio now includes domestic equities as well as domestic bonds. More importantly, Adler and Dumas note that as long as the

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<sup>24</sup> See Adler and Dumas (1983), and Froot and Rogoff (1995) for recent surveys on the empirical results of purchasing power parity tests.

<sup>25</sup> The Solnik-Sercu model assumes that there is no inflation in any country. This assumption implies that changes in the exchange rate represent pure deviations from purchasing power parity (Sercu (1980)).



variability of inflation is lower than that for equities, domestic bonds will continue to constitute the largest portion of this portfolio.

Empirically, there is a large volume of literature that documents substantial potential gains from diversification of investment portfolios across national boundaries. Grubel (1968), Levy and Sarnat (1970), Solnik (1974) and more recently by Grauer (1987), Harvey (1991), and De Santis and Gerard (1997) point to the risk reduction benefits from holding foreign securities. Still the literature documents substantial evidence that investors exhibit a negative bias towards holding cross-border investments, a behavior that the finance and economics literature refers to as "home bias".<sup>26</sup> Cooper and Kaplanis (1986, 1994), French and Poterba (1991) and Tesar and Werner (1995) provide evidence showing that investors include too little of their wealth in foreign assets relative to the proportion modern finance theory stipulates.

Cooper and Kaplanis (1986 and 1994) find that the bias towards domestic stocks is not reconcilable with investors' need for hedging the domestic inflation.<sup>27</sup> They also show that the fraction of domestic and foreign stock in investors' portfolios implies "a dead weight cost" on foreign investment that is too high to reconcile with existing barriers to cross-border investments.

Tesar and Werner (1995) find that portfolio turnover rates are higher on foreign than on domestic portfolios leading them to conclude that transaction cost is an unlikely explanation of home bias. They suggest that "other factors such as geographic proximity, strong trade linkages and the lack of language barrier may matter potentially even more than the diversification motive per se for international portfolio choice".

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<sup>26</sup> The pervasiveness of this behavior has also captivated the attention of a large number of articles in the business press. For example an article in Business Week (September 6, 1993), "A 'home bias' is inhibiting global diversification" notes: "far less capital is directed abroad by U.S. and foreign investors than would be predicted by optimal portfolio strategies based on such considerations as risk, rate of return and diversification".

<sup>27</sup> Cooper and Kaplanis (1994) apply the Adler and Dumas version of the CAPM.

French and Poterba (1991) use investors aggregate equity portfolio allocations in the domestic and a number of foreign markets and show that a simple mean-variance model imply returns that substantially deviates from the ex-post returns of these markets.<sup>28</sup> They suggest that the home bias of investors' portfolios can only be justified if investors have higher expectations of the returns in their domestic equity market returns.

However, there is some evidence that shows that the portfolio weights from mean variance optimization are not statistically different from zero, Britten-Jones (1999) and Gorman and Jorgensen (1998). Britten-Jones (1999) constructs a regression procedure for testing the statistical significance of mean-variance efficient portfolios and empirically shows that the large size of the standard errors of these weights implies a confidence interval that also includes a zero weight. Britten-Jones (1999) shows that this procedure is unable to reject zero weight restrictions for an international equity portfolio as well as the total international allocations of a US investor.

Overall, the literature concludes that while international financial markets have been witnessing a higher degree of integration in recent years, there still remain a number of considerations that prevent investors from taking advantage of the large diversification that simple mean-variance suggest. The evidence also suggests that at least some fraction of the home bias may be the result of the inability of simple mean-variance theory to capture other sources of risk. International investing introduces additional risk arising from different currencies, political, legal and institutional difference across countries that complicates information gathering on the equities of these markets.

Recent research emphasizes on these informational considerations and provides evidence that they have a large impact on the deviations in investors' domestic and international portfolios from the weights that portfolio theory prescribes. For example, Brennan & Cao (1997) construct and empirically test a model where differences in the informational endowments between foreign and domestic investors,

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<sup>28</sup> French and Poterba (1991) assume fully integrated capital and goods markets.

influence the cross border equity portfolio flows.<sup>29</sup> The model assumes domestic investors' possess informational advantages over the foreign investors. When investors revise their portfolios in response to a positive (negative) public signal, the less well informed foreign investors sell (purchase) more of the domestic market portfolio to (from) the better informed domestic investors prior to the price increase (decrease). Their empirical results are mixed, however. In line with what the model predicts, they find that U.S. investors do face informational disadvantages about the other developing, and to a lesser extent, developed markets.<sup>30</sup>

Other literature provides substantial evidence that seems to indicate that the decimation of information on investment targets strongly relates to their distance from investors as well as characteristics that are common to both investors and investment targets. Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide strong evidence that geography, language and culture induces a "home bias" even within a country's borders.

Coval and Moskowitz (1999) use a domestic setting to quantify the effect of distance on investment portfolio choice. They find that the average U.S. mutual fund manager is about 9 to 11% closer to her U.S. holdings than the average firm in their sample. Their finding for the importance of distance in a domestic setting with little or no variation in regulation, taxation, political risk, language, and culture, emphasizes the potentially important role of distance, and geography, as an important determinant of international portfolio investment. They also report a strong relation between three firm characteristics: size, leverage, and tradability of output, and the preference for local equity. They find that the average locally held firm tends to be small, highly leveraged and producing non-tradable goods, characteristics that are linked to scarcity of available information. They suggest that this "points directly towards an information-rooted explanation for the local equity preference". Grinblatt and

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<sup>29</sup> Gehrig (1993) constructs and empirically tests a similar (one-period) model.

<sup>30</sup> Brennan and Cao (1997) also provide examples that show that organizational structures of financial institutions substantially limits their ability to circumvent these informational asymmetries through efficient technological communication resources or by hiring local, and thus more informed, managers. They note that, "While it is true that institutions will often have individuals assigned to monitor various foreign countries, we believe that it is rare for these informed individuals to have sole responsibility for country allocation".

Keloharju (2001) show that in addition to distance, the language of the annual reports and the culture of the CEO's of Finnish corporations play an important role in the equity selection of Finnish investors.

Other literature attempts to reconcile the home bias with investors' preferences for holding equities that they are more familiar with. Huberman (2001) examines the geographical distribution of shareholders of the seven U.S. Regional Bell Operating Companies (RBOCs) at the end of 1996, and observes that a typical RBOC customer holds more of its' share, in terms of both quantity and value, than in the other RBOCs. He draws a parallel between this observation and people's preference to invest in the familiar.<sup>31</sup> He suggests, "It seems that the bias favoring the familiar does not reflect the exploitation of the informational advantage – real or imagined. Rather, it reflect people's tendency to be optimistic about and charitable toward what they feel affinity with, the comfortable, and the familiar." concluding that "the paucity of international diversification is only one of the implications of this tendency to invest in the familiar".

There is also some evidence showing that geographic proximity seems to imply an informational advantage that show up in returns. Coval and Moskowitz (2001) examining U.S. mutual funds show that fund managers' bias their investments towards nearby equities and in the process earn substantial abnormal returns. Hau (2001) analyzing data from the electronic trading system Xetra of the German Security Exchange show that German professional traders obtain a significantly higher return than foreign traders do.

As in the finance literature, proximity considerations are more established in the empirical side of the international economics literature. For example, the international trade literature documents that distance has a substantial impact on the patterns of international trade in addition to the impact of the size of the economy. This robust empirical specification, called the gravity model, explains bilateral linkages by the mass of the two bodies and the distance between them (in a log-linear form). Since its

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<sup>31</sup> Huberman (2001) provide a number of examples showing that this behavior is not just limited to the average investor, but is also displayed by the most sophisticated of investors.

inception in the sixties, the gravity model has gone from being an empirical regularity to a popular framework of all the main theories of international trade.<sup>32</sup> The gravity model formulation has been successfully reconciled with the generalized expenditure share model (Anderson, 1979), differentiated products models of trade (Bergstrand, 1985 and Helpman, 1984), and within the context of the classical framework coupled with the assumption that countries produce differentiated goods (Deardorff, 1995).

Similarly to the home bias in financial assets, there is substantial empirical evidence in the international economics literature of home bias in the real goods market. McCallum (1995) uses a basic form of the gravity model to evaluate the determinants of the volume of trade between ten Canadian provinces and thirty American states. After controlling for size and direct distances he finds that trade between provinces is about twenty times the trade with American states. Helliwell (1996) uses a larger data set and confirms McCallum's basic findings. Wei (1996) studies the overall home bias in the goods market among nineteen OECD countries over the period between 1982 and 1994.<sup>33</sup> He finds that after controlling for size and distance, an OECD country import two and a half time more from itself than from an otherwise identical country.

In finance, Martin and Rey (1999) provide a theoretical foundation for gravity formulations in the analysis investment flows. They show that in a model with assumptions that assets are imperfect substitutes, the presence of cross border transaction cost and some assumptions of the risk behavior of traders will lead to gravity like formulation. They demonstrate that even though trade in their model is initiated for the purpose of diversification, a large enough friction can have an influence on shaping the geographical distribution of equity flows.

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<sup>32</sup> Tinbergen (1962), Pullianen (1963), Pyhönen (1963), and Linnemann (1966) are some of the first literature on gravity models, cited in Leamer and Levinsohn (1995).

<sup>33</sup> Wei (1996) defines home bias as "a country's import from itself in excess of its import from other countries after taking into account an exporter's and importer's size, bilateral distance, locations relative to the rest of the world and whether sharing a common border or language".

### III. Data and Methodology

The data for outward international portfolio investment for Finnish residents is from the Bank of Finland. The data covers the stock positions of equity in 28 countries as of 31 December 1997. These are: Australia, Austria, Belgium-Luxembourg, Canada, China, Denmark, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Malaysia, Netherlands, New Zealand, Norway, Philippines, Portugal, S. Korea, Singapore, Spain, Sweden, Switzerland, Thailand, United Kingdom, and the United States.

The Finish merchandize exports and imports data is from the database of the Organization of Corporation and Development (OECD) and the World Trade Organization.<sup>34</sup> Financial data is from FIBV, Datastream, and International Monetary Fund. Cities latitudes and longitudes are from the CIA web site and NBER.<sup>35</sup>

We use multivariate (gravity model) regressions to examine how country characteristics relate to Finnish investors equity portfolio allocation in that country. As we describe in the previous section, gravity-type models depict the gravitational force between two economies in a direct relationship to their economic mass and an inverse relationship to the distance between them. The structure of this regression is consistent with a large volume of literature that documents a propensity of investment allocation to both market size and distance. Tesar and Werner (1995) suggest that the geographic proximity seems to have a higher impact on the international country allocations of investors than the diversification motive. Coval and Moskowitz (1999) show that the average U.S. mutual fund manager is about 9 to 11% closer to her holdings than the average firm in their sample. Kang and Stulz (1997), among others, find that foreign investors show a preference towards large domestic stocks.

We also add to the regression per capita GDP to proxy the development of the investment receiving country financial institutions as well as how well it protects the rights of investors. La Porta et al. (1997) show that the correlation between the per capita GDP and their measure of rule of law is 0.87. Moreover, La Porta et al. (1998)

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<sup>34</sup> Both the OECD and WTO combine Belgium and Luxembourg into one entity.

<sup>35</sup> Panel A of table 1 provides description of all the variables that we use in this paper.

report that per capita GDP accounts for more than half the variation in their law enforcement and accounting standards measures.<sup>36</sup>

The regressions also include the receiving country equity market specific attributes. We include the Sharpe ratio, as a measure of the risk-adjusted performance of the equity market. Further, we include the market's idiosyncratic risk, the variance of the residual from a regression of the returns of the market on the return of the value weighted world market portfolio, as a measure of the country's diversifiable risk.

The regression model also includes variables that proxy the information cost on firms in the investment receiving countries. To the extent that information is the principal input in the investment process, Finnish institutions will possess a relative advantage in those countries where information stock, is necessary for the functioning of the domestic (Finnish) economy. The intuition here is that the more is the information on a particular country, the less are informational obstacles resulting from the physical separation, our crude proxy for transaction costs.

We construct two variables to proxy this information. The first is the news coverage relating to each of the investment receiving countries by the financial press in Finland. We use the number of citations of a country in *Kaupparehti*, the leading Finnish daily financial newspaper, as a proxy for the information on foreign countries that are of interest to Finnish businesses and the Finnish economy. The necessary commitment of the domestic financial press to news relating to domestic businesses and the domestic economy implies an association between the intensity of news coverage and the information pool on each of the investment receiving countries. A number of recent articles in the financial literature provide support for this association. For example, Baker, Nofsinger and Weaver (2002) find that coverage of foreign stocks cross listing in the US and the United Kingdom leads to a significant increase in the news of these firms by the *Wall Street Journal* and the *Financial Times*. There is also evidence that directly relates the financial media coverage of news on the activities and performance of firms and the holdings of these firms in

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<sup>36</sup> Market capitalization relative size also contains information on the legal and corporate structure of the country. See for example, La Porta et al. (1998).

investors' portfolios. Falkenstein (1996) shows that investors tend to avoid stocks with little information. He uses news stories as a proxy for the cost of information on a particular stock and shows that more frequent citations makes it more likely for the stock to attract the interest of US mutual funds.

The second is the bilateral trade in real goods between Finland and each of the investment receiving countries. The literature provides evidence that suggests a role for trade information on investments. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) document that firms with large exports are likely to be more familiar to foreign investors. Merton (1987) argues that investors hold shares in firms in which they are more familiar.

On the country level, trade generates intensive information flow. This information leads to more Knowledge of firms in the country of the trading partner. Thus, the availability of more information on a country eventually makes that country more attractive for equity portfolio investment.

Table 1 presents the measurement (panel A), descriptive statistics (panel B) and the correlation (panel C) of the dependent and independent variables that we use in our analysis.



**Table 1** Measurement, descriptive statistics and correlations of variables.

**Panel A: Measurement of variables**

Portfolio share: the aggregate portfolio equity investments (millions of Finnish Marks) of Finnish investors at the end of 1997, in the investment receiving country, in natural logarithmic form.

Distance: the direct circle distance (kilometers) between Helsinki and the financial center of the investment receiving country, in natural logarithmic form.

Market capitalization: the market capitalization (US\$ millions) of the investment receiving country at the end of 1997, in natural logarithmic form.

Per capita GDP: the Per capita gross domestic product (US\$ billions) of the investment receiving country, average for 1992 through 1996, in natural logarithmic form.

Sharpe Ratio: the annual equity market return (US\$) of the investment receiving county, average of the monthly returns for 1993 through 1997, divided by the standard deviation of the returns for the same period.

Idiosyncratic risk: the variance of residual from the world market model, using monthly returns for 1993 through 1997. The market model is the regression of the country market index return (US\$) on the world value weight portfolio (US\$).

Number of citations in news: the number of citations of the investment receiving country in Kauppalehti, the leading daily financial newspaper in Finland, total for 1996 and 1997, in natural logarithmic form.

Bilateral trade with Finland: total Finnish exports and imports of real goods (US\$ millions) to and from the receiving country, average for 1995 and 1996, in natural logarithmic form.

Finland's trade balance: Finnish real goods exports to the investment receiving country divide by Finnish real goods imports from the country, average for 1995 and 1996, in natural logarithmic form.

Trade not explained by determinants: the residual from the regression of the Bilateral trade with Finland on a constant, distance, gross domestic product (average for 1992 through 1996), per capita GDP, total trade with the world to GDP, and year on year GDP growth (average for 1992 through 1996) of the investment receiving country. Except for GDP growth, all variables are in natural logarithmic form.

**Table 1** Measurement, descriptive statistics and correlations of variables.

**Panel B:** Descriptive statistics

	Portfolio share	Distance	Market capitalization	Per capita GDP	Sharpe ratio	Idiosyncratic risk	Number of citations in news	Bilateral trade with Finland	Finland's trade balance	Trade not explained by determinants
Average	4.9139	8.2013	12.0903	9.3354	0.8133	0.0040	6.2981	13.8752	0.4539	0.0000
Median	5.0520	8.3405	11.7080	9.8968	0.9182	0.0017	6.2896	13.6953	0.2918	0.0165
Std. Dev.	2.1107	0.9762	1.5465	1.3439	0.7721	0.0069	1.1326	1.1746	0.5805	0.4039
Minimum	0.6931	5.9872	10.0342	5.8895	-0.8173	0.0005	3.6889	11.2921	-0.5073	-0.9227
Maximum	7.8759	9.7459	16.1886	10.5556	1.9808	0.0353	8.3163	16.0568	1.7366	0.6433

**Panel C:** Correlations

	Portfolio share	Distance	Market capitalization	Per capita GDP	Sharpe ratio	Idiosyncratic risk	Number of citations in news	Bilateral trade with Finland	Finland's trade balance
Distance	-0.61								
Market capitalization	0.74	-0.15							
Per capita GDP	0.61	-0.45	0.51						
Sharpe ratio	0.54	-0.59	0.43	0.58					
Idiosyncratic risk	-0.28	0.30	-0.27	-0.59	-0.31				
Number of citations in news	0.71	-0.66	0.60	0.47	0.54	-0.13			
Bilateral trade with Finland	0.89	-0.65	0.69	0.51	0.46	-0.13	0.85		
Finland's trade balance	-0.50	0.58	-0.36	-0.46	-0.47	0.12	-0.66	-0.53	
Trade not explained by determinants	0.40	0.00	0.17	0.00	0.00	0.05	0.00	0.34	0.22

#### IV. Empirical Results

Columns 2.1 of table 2, presents the results of the basic regression for the Finnish portfolio share. What is most remarkable in this regression is its high explanatory power of the overall variance (about 78%), especially considering that the data consists of only 28 unilateral portfolio (equity) stock observations. All the parameters have significant coefficient estimates and appear in the regressions with the expected signs.<sup>37</sup> The estimate of the elasticity of portfolio share with respect to the market capitalization of the receiving country, and direct distance between the financial capital of the sending country and the receiving country is, -1.10 and 0.9 respectively. Since distance at least to some extent measures information costs this finding tends to support the role of information asymmetry on investors' country allocation.<sup>38</sup>

As a robustness check, we run the same regression without Sweden and the United State.<sup>39</sup> This basically has a negligible effect on all the characteristics of the results using all twenty-eight countries. Further, the tax haven status of some countries makes them likely candidates as a transit for channeling investments into other equity markets. Excluding these countries, Belgium-Luxembourg and Switzerland also have no effect of the results.

Columns 2.2 and 2.3 of table 2 present the results of regressions with Per capita GDP, the Sharpe ratio, and idiosyncratic risk. What is clear from these regressions is that these additional variables do not seem to have any incremental information on portfolio share. Further, the exclusion of distance from the regression (Column 2.4 of table 2) has a strong negative impact on the explanatory power of the regression. The result that dominates table 2 is the significance of distance and market capitalization in the investment allocation decision.

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<sup>37</sup> We use White (1980) heteroscedasticity consistent standard errors throughout this paper.

<sup>38</sup> We also run, but do not report, regressions using the 5-year average (1993 through 1997) market capitalization and the gross domestic product as alternative proxies for the economic mass of the investment receiving country. The results of these regressions are inferior to the one that we report.

<sup>39</sup> Sweden is the nearest investment receiving country to Finland, 398 km, and receives the highest share of its international equity portfolio investment, 15.6%. This bias is even more pronounced when considering that Sweden's market capitalization is only a small fraction, 1.3%, in the world market portfolio. The United States is one of the furthest investment receiving countries from Finland, 7130 km, is the by far the largest equities capital market, 45.5% of the world market portfolio. Still the US receives a smaller share of Finland's international portfolio investment, 14.2%.

**Table 2** Regression of country characteristics on portfolio share.

This table reports parameter coefficients, white corrected standard error (in parenthesis) and adjusted  $R^2$  for the regressions in which the dependent variable is the portfolio equity investments (millions of Finnish Marks) of Finnish based investors at the end of 1997, in the investment receiving country, in natural logarithmic form. Description of the independent variables is as per Table 1, Panel A.

	(2.1)	(2.2)	(2.3)	(2.4)
Constant	3.0552 (2.0378)	2.1618 (2.5940)	1.3396 (2.4488)	-8.6561 <sup>***</sup> (2.0204)
Distance	-1.1054 <sup>***</sup> (0.1609)	-1.0521 <sup>***</sup> (0.1886)	-1.1727 <sup>***</sup> (0.1988)	
Market Capitalization	0.9036 <sup>***</sup> (0.0894)	0.8639 <sup>***</sup> (0.1140)	0.8921 <sup>***</sup> (0.1103)	0.7413 <sup>***</sup> (0.1976)
Per capita GDP		0.1003 (0.1814)	0.2684 (0.1834)	0.4402 <sup>***</sup> (0.1504)
Sharpe ratio			-0.3161 (0.3443)	0.4786 (0.3296)
Idiosyncratic risk			39.4111 <sup>*</sup> (22.9351)	27.3296 (17.0730)
Number of observations	28	28	28	28
Adjusted $R^2$	0.783	0.777	0.776	0.579

<sup>\*\*\*</sup>, <sup>\*\*</sup>, <sup>\*</sup> Significant at the 1, 5, and 10 percent level.

The substantial size and statistical significance of our proxy of transaction (information) costs, distance, is in line with the existing literature that documents investors' preferences for near-by stocks. The literatures, and our results, indicate that this behavior is likely the result of loss of the quantity and quality of investment relevant information that is a function of the spatial separation between investors and potential investments. The dependence of information on this spatial separation induces asymmetry in information, that is essential in identifying potential investments, leading to the overweighing of the domestic and near-by stocks in investors portfolios.

There is also empirical evidence that factors such as language, culture, and familiarity with the investment country institutions facilitate the collection and analysis of information necessary for international portfolio allocations. This evidence indicates that the role of such factors mitigates the extent of the influences of distance on the flow of information between investors and investments. Therefore, the extent of the influence of these obstacles on the level of Finnish cross-border investments should also depend on how well Finnish financial institutions can mitigate these disadvantages in the different investment receiving countries.<sup>40</sup>

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<sup>40</sup> We acknowledge the crudeness of distance as a measure of information costs. Distance also encompasses the influences of many other factors such as historical linkages, regional ties, cultural characteristics between countries, and so forth. For example, one would expect that the typical Finnish investor to be more familiar with European markets than with the Far Eastern Markets, and in this context, one can certainly link distance to the transaction cost relating to these two regions. The unilateral feature and the small size of the data limits us from using dummy variables to attempt to further untangle the effects that are captured by the distance parameter. For example, casual inspection of the data clearly shows a bias towards investing into regional financial centers, equity investment centers, and tax heavens, like Belgium-Luxembourg, United Kingdom, United States, and Hong Kong. For the same reason, common border, common language, and other regional, cultural and financial dummies are not within the reach of our data.

Column 3.1 Table 3, presents the results of the regression with number of citations of the investment receiving country in Kauppalehti and its bilateral trade with Finland. The apparent informational content of these variables is very pronounced. What is noteworthy here is the large reduction of the magnitude of the elasticity of portfolio share with respect to distance. The elasticity of the portfolio share with respect to bilateral trade appears in the regression with a sizable magnitude and is statistically significant at the 5% level. On the other hand, the coefficient estimate of the number of citations of the investment receiving country in Kauppalehti [kli] enters the regression with the wrong sign, but is still statistically significant at the 1% level. There are a number of potential explanations of these results. The negative sign of this variable can be a consequence of the construction of this variable is that it only considers the frequency of country citations in Kauppalehti without any regards to its context. The result is also likely if this variable is only able to capture the net effect of positive and negative news on a country, with the net effect, in terms of frequency, being that most news is bad news.<sup>41</sup>

Again, we check the robustness of these results by running additional regressions, without Sweden and the United States, and also without Belgium-Luxembourg and Switzerland. The results of these regressions are not significantly different from the one that we report.

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<sup>41</sup> I thank Tom Berglund for pointing out this possibility.

**Table 3** Regression of country characteristics and trade relationship on portfolio share.

This table reports parameter coefficients, white corrected standard error (in parenthesis) and adjusted R<sup>2</sup> for the regressions in which the dependent variable is the portfolio equity investments (millions of Finnish Marks) of Finnish based investors at the end of 1997, in the investment receiving country, in natural logarithmic form. Description of the independent variables is as per Table 1, Panel A.

	(3.1)	(3.2)	(3.3)	(3.4)
Constant	-10.4881 ** (5.0993)	-10.6718 ** (5.0222)	1.9686 (1.5065)	1.2815 (2.5080)
Distance	-0.5708 * (0.3052)	-0.5423 * (0.3149)	-1.0725 *** (0.1675)	-1.2795 *** (0.2300)
Market capitalization	0.4986 ** (0.2455)	0.4878 * (0.2515)	0.7692 *** (0.0984)	0.9208 *** (0.1140)
Per capita GDP	0.1373 (0.1410)	0.1256 (0.1595)	0.2808 *** (0.0921)	0.3103 (0.1972)
Sharpe ratio	0.1143 (0.3442)	0.1234 (0.3634)	-0.2516 (0.2441)	-0.3143 (0.3458)
Idiosyncratic risk	2.6098 (25.0762)	0.5842 (27.0263)	28.8823 *** (9.4166)	46.7999 * (24.5420)
Number of citations in news	-0.5414 *** (0.1921)	-0.5657 ** (0.2411)		
Bilateral trade with Finland	1.1588 ** (0.4574)	1.1862 ** (0.4754)		
Finland's trade balance		-0.0783 (0.3134)	-0.1997 (0.2296)	0.3642 (0.3006)
Trade not explained by determinants			1.6199 *** (0.2881)	
Number of observations	28	28	28	28
Adjusted R <sup>2</sup>	0.821	0.811	0.867	0.773

\*\*\*, \*\*, \* Significant at the 1, 5, and 10 percent level.

## V. Other Robustness checks

However, there are still a number of other caveats that may have an influence on our results. The first of these relates to the possibility that the country allocation in the international portfolio of Finnish investors provides a hedge to the risks of the foreign revenues and expenses of the firms in their domestic portfolio. In achieving this natural hedge, Finnish investors will decrease (increase) their investments in countries with which they have a trade surplus (deficit). Including this variable in the regression, column 3.2 of table 3, clearly indicates that country portfolio shares cannot be due to Finnish investors' motivation to hedge the trade balance with that country. Trade balance enters the regression with a negative but statistically insignificant coefficient estimate. Most importantly, the bilateral trade coefficient estimate retains its positive sign, magnitude, and statistical significance.

Another potential caveat of the results is the high correlation between trade and distance and other variables in the portfolio share regression. Furthermore, a large volume of literature documents that distance between countries and their gross domestic product (GDP), per capita GDP, and GDP growth are significant determinants of the volume of bilateral trade.<sup>42</sup> This commonality between some of the variables in our portfolio share regression model and the standard empirical trade model complicates the interpretation of information that we attribute to trade. For example the contribution of trade to the reduction in information cost of transactions with a country may simply be just a consequence of these variables capturing a country's economic and financial importance on a global level.

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<sup>42</sup> Leamer and Levinsohn (1995) provide a recent survey and a comprehensive list of reference on the empirical literature of gravity models.



To provide credence to information conjectures relating purely to trade, a central claim of this paper, the fraction of bilateral trade after controlling for distance, size of the economy and other trade determinants should continue to have a significant and positive effect on the portfolio share regressions. In order to purge these influences, we extract the residual from a standard regression for the bilateral trade between Finland and each of the investment receiving countries.<sup>43</sup> The residual from this regression, that we call, trade not explained by determinants, is by construction orthogonal to distance, and per capita GDP, two variables that we also use in the portfolio share regressions. This residual is also orthogonal to GDP, which is somewhat highly correlated with market capitalization a principal variable in our portfolio share regression.

In regression 3.3 of table 3, we substitute trade not explained by determinants for bilateral trade with Finland. Trade not explained by determinants, enters the portfolio share regression with a positive and statistically significant coefficient estimate. Further the overall variance that is it explains (adjusted  $R^2 = 0.867$ ) is substantially higher than regressions 3.2 (adjusted  $R^2 = 0.811$ ) and 3.4 (adjusted  $R^2 = 0.773$ ) (see table 3).

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$$\begin{aligned}
 {}^{43} \text{Log (Trade)} = & \alpha_1 + \alpha_2 \log(\text{distance}) + \alpha_3 \log(\text{GDP}) + \alpha_4 \log(\text{per capita GDP}) \\
 & [14.138]^{***} \quad [-0.753]^{***} \quad [0.659]^{***} \quad [0.201]^{**} \\
 & (1.273) \quad (-0.117) \quad (0.084) \quad (0.090) \\
 & + \alpha_5 \log(\text{total trade / GDP}) + \alpha_6 \text{GDP growth} \quad \{\text{Adjusted } R^2 = 0.855\} \\
 & [14.138]^{***} \quad [-0.753]^{***} \\
 & (1.273) \quad (-0.117)
 \end{aligned}$$

In this regression the dependent variable, Log (Trade), is the trade volume (US\$) between Finland and the investment receiving countries, in natural logarithmic form. The independent variables are, a constant, log(distance) is the direct great circle distance between Helsinki and the economic center of the investment receiving country, in natural logarithmic form, log(GDP) is the gross domestic product of the investment receiving country, in natural logarithmic form, log(per capita GDP) is the per capita gross domestic product of the investment receiving country, in natural logarithmic form, log(total trade / GDP) is the total trade of the investment receiving country with the world with respect to its gross domestic product, in natural logarithmic form, and GDP growth is the year on year gross domestic product growth of the investment receiving country. Ordinary least square parameter coefficients [ ]<sup>\*\*\*</sup> are significant at the 1% level and the standard errors ( ) are white corrected. The form of this regression conforms to standard gravity model formulations. Leamer and Levinsohn (1995) provide a brief survey of this literature.

These regressions indicate that trade that is not explained by determinants contributes considerable information to the portfolio share regressions in explaining the country allocations in Finnish investors' portfolios. Investment receiving countries that trade more (less) with Finland, after controlling for fundamental trade determinants, distance from Helsinki, and size, development and growth potential of their economies, receive a higher (lower) fraction of the Finnish international portfolio investments than what their financial market size and other characteristics warrant. These findings are consistent with our conjecture on the relevance of information of trade in real goods on equity portfolio investments. Specifically, more (less) trade with an investment receiving country implies a higher (lower) supply and demand of information on these countries that in turn implies a relative informational advantage (disadvantage) of Finnish institutions on these countries.<sup>44</sup>

The next robustness check addresses the construction of the portfolio share measure. In conforming to the general form of the gravity model, all previous regressions impose a log-linear relationship between the portfolio share and market capitalization. It is also of interest to verify that the informational value of trade, the main result of this paper, conforms to other specifications of portfolio share that are more in line with the main stream home bias and mean-variance literature. Furthermore the results of regression 3.3 (table 3), measuring deviations of trade from a fundamental level, trade not explained by determinants, are more easily interpretable with a portfolio share measure that also deviates from a fundamental level. Theory suggests that an allocation conforming to the weight of the country in the world market portfolio is an appropriate fundamental measure for portfolio share.<sup>45</sup> Accordingly we construct the new measure as follows:

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<sup>44</sup> As a further robustness check we run, but do not report, regressions 2.2 through 2.4 without the distance variable. The results of these additional regressions are similar to the regressions that we report.

<sup>45</sup> See for example Kang and Stulz (1997) and Dahlquist and Robertsson (2001).

**Table 4** Regression of country characteristics and trade relationship on portfolio share relative to market capitalization.

This table reports parameter coefficients, white corrected standard error (in parenthesis) and adjusted  $R^2$  for the regressions in which the dependent variable is the investment receiving country weight in the total international Finnish portfolio investment relative to the weight of the investment receiving country in the world market portfolio. All variables are measured at the end of 1997. Description of the independent variables is as per Table 1, Panel A.

	(4.1)	(4.2)	(4.3)	(4.4)
Constant	20.6573 <sup>*</sup> (11.3942)	14.2753 (11.7097)	-23.4979 <sup>**</sup> (10.0320)	-22.3736 <sup>**</sup> (9.2546)
Distance	-3.2188 <sup>***</sup> (0.8481)	-2.6905 <sup>***</sup> (0.7259)		
Market capitalization	-0.5829 (0.4232)	-0.9509 <sup>**</sup> (0.4750)	-1.6026 <sup>***</sup> (0.5651)	-1.8630 <sup>***</sup> (0.5041)
Per capita GDP	0.6732 <sup>**</sup> (0.3142)	0.6191 (0.4057)	0.7625 (0.5117)	0.6733 (0.6203)
Sharpe ratio	0.4176 (1.2243)	0.5496 (1.1302)	1.6003 (1.3139)	1.5196 (1.1843)
Idiosyncratic risk	64.0084 <sup>*</sup> (38.1717)	23.6555 (53.6880)	-36.1314 (64.1326)	-67.1724 (76.9550)
Number of citations in news	-0.2471 (0.8960)	-0.0418 (0.9050)	1.6226 (1.1529)	1.4907 (0.9671)
Finland's trade balance	0.8217 (1.2511)	-0.1767 (1.3620)	0.1324 (1.5721)	-1.0167 (1.5683)
Trade not explained by determinants		3.1124 <sup>**</sup> (1.3102)		4.0398 <sup>***</sup> (1.5669)
Number of observations	28	28	28	28
Adjusted $R^2$	0.203	0.234	0.089	0.168

\*\*\*, \*\*, \* Significant at the 1, 5, and 10 percent level.

Portfolio investments deviation:  $((\rho^F / \rho^W) - 1)$ , where  $\rho^F$ , and  $\rho^W$  is the weight of the investment receiving country in the total international portfolio of Finnish investors and the world market portfolio respectively. A positive (negative) deviation implies that Finnish investors allocate disproportionately more (less) investment to a country relative to its weight in the world market portfolio.

Table 4 presents the results of the portfolio investments deviation regressions. The interpretation of the results of these regressions is straightforward. Portfolio investment deviation in a country parallels Finland's trade not explained by determinants with these countries. Furthermore deviations have a negative relationship with market size and do not relate to trade balance-hedging motives. Overall, these results conform to the results of the regressions of Table 3 and provide substantial evidence that the main finding for the value of trade, and more specifically trade not explained by determinants, is not a result of the log-linear restriction of the gravity model.

## **VI. Summary**

The paper relates to the growing literature on “home bias”, the observation that investors exhibit a strong bias towards domestic and near-by stocks. We use new data on the aggregate international portfolio investments of Finnish investors to examine the determinants of country allocations in these portfolios. We find that a basic gravity model formulation explains a large fraction of the variance of these allocations. Both estimates of the elasticity of portfolio share with respect to the market capitalization of the investment receiving country, and direct distance between Helsinki and the financial capital of the investment receiving country is substantial in size and have statistically significant coefficient estimate. Since distance at least to some extent measures information costs this finding tends to support the role of information asymmetry on investors' country allocation.

We investigate the sources of the apparent information asymmetry and propose two proxies to capture their influence on the Finnish investors' allocation in a particular country. The first is the news coverage relating to each of the investment receiving countries by the financial press in Finland. The second is the bilateral trade in real goods between Finland and each of the investment receiving countries. We show that the introduction of these variables as a proxy of information asymmetry into the regression substantially reduces the significance of other variables that proxy this class of information. Our results indicate that the share of portfolio allocation in a particular country parallels that of trade in real goods.

Furthermore we show that our results are not due to export hedging motives, variables that are common to both portfolio share and trade regressions, and the construction of the portfolio share measure. Overall, our results indicate a substantial role of trade in reducing the information cost relating to portfolio investments.

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# **The Impact of the EMU on International Portfolio Investments**

**Co-authored with Tom Berglund\***

## **Abstract**

This paper analyses the impact of the launch of the European Monetary Union (EMU) on the allocation of international portfolio investments. The initiation of the EMU provides an opportunity for comparison of competing theoretical explanations for investment behavior. Models stressing the diversification motive would predict that the increased dependence between countries participating in the EMU should reduce the attractiveness of portfolio holdings in other EMU countries. Models based on asymmetric information would instead emphasize the increased intensity in the flow of information resulting from an increase in cross border transactions between the EMU countries. The consequent decline in information asymmetry should increase, rather than reduce portfolio holdings in other EMU countries. Our results based on the allocation of Finnish foreign portfolio investment support the information-based explanation against predictions based on the diversification motive.

JEL code: G15.

Key words: EMU, Portfolio Diversification, and Home Bias.

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## I. Introduction

A large volume of literature documents that national portfolios are more concentrated in the home country than what optimal portfolio diversification would imply, a behavior that the finance and economics literature refers to as "home bias".<sup>46</sup> Cooper and Kaplanis (1986, 1994), French and Poterba (1991) and Tesar and Werner (1995) provide evidence showing that investors include too little of their wealth in foreign assets relative to the proportion modern finance theory stipulates. Baxter and Jermann (1997) show that the puzzle imposed by this lack of diversification deepens when we include return on human capital in asset in the portfolios of individual investors.<sup>47</sup> Lewis (1999) provides a recent survey of the literature on the "home bias" not only in asset markets but also in consumption.

Explanations that have been proposed for this phenomenon fall into two different categories. The first one refers to the fact that foreign investments not that long ago were subject to severe institutional restrictions, and to inertia that exists even in financial markets. Institutions that handle international transactions do not adjust to drastic changes like abolishment of restrictions on international investments overnight. Building up institutions able to properly channel those investments takes time. Once the adjustment has taken place, however, we would expect to see an allocation that is close to what the international capital asset pricing model would predict.

According to the alternative explanation the lack of international diversification is due to more deeply rooted informational problems. The fact that a distant foreign investor is less informed about local stocks makes this investor more susceptible to adverse selection, and moral hazard, which adds to expected investment costs for this investor.

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<sup>46</sup> Empirically, there is a large volume of literature that documents substantial potential gains from diversification of investment portfolios across national boundaries. Grubel (1968), Levy and Sarnat (1970), Solnik (1974) and more recently by Grauer (1987), Harvey (1991), and De Santis and Gerard (1997) point to the risk reduction benefits from holding foreign securities. However, there is also some evidence showing that the portfolio weights from mean variance optimization are not statistically different from zero, Britten-Jones (1999) and Gorman and Jorgensen (1998).

<sup>47</sup> A recent paper by Kocherlakota (1998), however, outlines the moral hazard based argument for why complete diversification would not be optimal. Selling claims on too large a part of ones future income would simply reduce ones incentives to produce that income.

A number of recent papers emphasize the role of information on the composition of investors' portfolios. Tesar and Werner (1995) document that Canadian investors hold a significantly larger share in US securities than in securities from other countries, like Germany and Japan, although the diversification benefits would have been significantly higher from investing in Germany and Japan. Grinblatt and Keloharju (2001) show that in addition to distance, the language of the annual reports and the culture of the CEO's of Finnish corporations play an important role in the equity selection of Finnish investors. Huberman (2001) examines the geographical distributions of shareholders of the seven U.S. Regional Bell Operating Companies (RBOCs) and observes that an RBOC's customer holds more of its' share, in terms of both quantity and value of shares, than in the other RBOCs. He interprets this as a cognitive bias for the familiar.

There is also some evidence showing that geographic proximity seems to imply an informational advantage that show up in returns. Coval and Moskowitz (1999 and 2001) examining U.S. mutual funds show that fund managers bias their investments towards nearby equities and in the process earn substantial abnormal returns. Hau (2001) analyzing data from the electronic trading system Xetra of the German Security Exchange show that German professional traders obtain a significantly higher return than foreign traders do.

This paper takes a different approach to the home bias puzzle. In this paper we take the launching of the EMU as an experiment that allows us to discriminate between the above two categories of explanations. While "inertia" could explain why things are changing slowly in the direction predicted by the diversification motive, it can hardly explain investors' active portfolio allocation decisions.

According to portfolio theory, investors should dislike the increase in correlation between stock returns, which should occur with the advent of the EMU, and consequently we should observe a drop in the relative share of portfolio investments from EMU countries that flow into the EMU area.<sup>48</sup>

The information-based explanation, on the other hand, holds that the increase in trade and related information flow that follow from the drop in transaction costs due to the EMU should increase the share of portfolio investments that flow into that area. That the launch of the EMU will increase trade between the included countries is further supported by the evidence in Rose (1999) who uses panel and cross sectional methods to study international trade between 186 countries for the period between 1970-1990. He finds that countries that share the same currency trade three times as much as they would with different currencies.

A third potential explanation that seems to have popular support is that the EMU is making portfolio investments into the area more attractive because it is reducing the foreign exchange risk of investments into these countries. However, based on literature on the international capital asset pricing model by Solnik (1974), Sercu (1980), and Adler & Dumas (1983) we know that for the hedging motive to justify a bias towards home currency denominated holdings these holdings should provide a hedge against domestic inflation. Empirically stock returns tend to be negatively rather than positively correlated with domestic inflation, though. Since the introduction of the monetary union will increase the correlation in country specific inflation rates the fact that the FX-risk is eliminated should again make portfolio holdings in the other EMU less, not more attractive.

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<sup>48</sup> Please note that EMU countries membership of the Exchange Rate Mechanism of the European Monetary System has had a substantial impact on lowering currency related volatility between these countries prior to the initiation of the EMU.

In the following we will analyze data on the country allocation of Finnish portfolio investments at the launch the EMU to see which of the two competing hypotheses is better in explaining the data. The outline of this paper is the following: In next section we discuss the expected impact of the EMU on trade flows and the consequent impact on portfolio investments based on our two competing hypotheses. We then go on to present the data. The fourth section reports the results and section five concludes.

## **II. The EMU Impact**

The main argument in favor of the EMU has been its impact on cross-border transaction costs within the area<sup>49</sup>. The adoption of the common currency eliminates all costs from the use of different currencies in cross-border transactions within the area. In addition to any commissions and bid-ask-spreads charged by brokers these costs include costs for hedging any exchange risks between currencies. Estimates for the size of the savings produced by the EMU in this respect have been 0.5 - 1 % of the GDP in the area. Comparing different countries within the EMU these savings are higher for smaller countries with more exotic currencies than for countries like Germany and France.

The fact that transaction costs are reduced for trades between countries within the EMU should affect trade flows in two respects. Firstly, there should be trade creation. Some trades that were not considered worthwhile previously will now become profitable. Secondly, there will be some redistribution of trade. That is, some trade that was previously done with countries outside of the EMU area will now be redirected towards EMU countries. Both of these factors will contribute to an increase in the share of the trade that goes to countries within the EMU, and consequently reduce the share of the trade with the rest of the world. Furthermore we would expect this redistribution to be stronger in relative terms for a small country like Finland than for larger countries simply because the transaction costs that are eliminated were higher.

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<sup>49</sup> For a survey see e.g. Gross & Thygesen 2<sup>nd</sup> ed. (1998).



Next we turn to the impact on portfolio investments. In the case of these investments the reduction in transaction costs will also be relevant. However, compared to total transaction costs incurred when buying shares the additional transaction cost produced by the fact that the stock is quoted in another currency is small.<sup>50</sup>

Portfolio theory, as pioneered by Markowitz in 1952, and first applied on international portfolio holdings by Grubel (1968) and Levy & Sernat (1970), would lead us to expect that the correlation between returns on stocks listed in the foreign EMU country and returns on domestic stocks should be of decisive importance. If this correlation increases more than the correlation with stocks in other countries, then portfolio investments into the EMU area should become less attractive.

The crucial question then is: how is the EMU expected to affect the correlation between the stock returns for the countries included in the monetary union? Taking for granted that stock prices can be taken as the discounted sum of expected future earnings of the firm, the question translates into a question concerning expected future earnings. Will changes in expectations concerning future earnings become more, or possibly less, correlated between firms in the countries that decided to join the EMU than they were in the pre EMU era?

The earnings of a firm are roughly the difference between its sales and its costs. If foreign trade will shift towards other EMU countries, then the launch of the Union should increase the part of total sales of EMU-based firms that go to other EMU countries. An increase in the cross-border correlation between sales of the firms within the union should result.

The same conclusion applies to the costs of EMU based firms. The Union is likely to enhance the exploitation of arbitrage between different countries in the market for input factors, meaning that costs will also become more correlated across borders. A higher correlation between sales as well as costs means a higher correlation in

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<sup>50</sup> The fact that we analyze the changes only up till the end of 1998 means that securities could not be traded in euros in our data period. Increases in investment spurred by a drop in transaction costs due to the euro should occur from the beginning of 1999. Since the date for the start of the Euro was known well in advance there might even have been an incentive to postpone planned acquisitions of securities within the area over the year-end into 1999.

average future earnings, and thus stock prices, between firms residing in different Euro countries.<sup>51</sup>

Empirical support for the conjecture that stock returns do tend to correlate more strongly for countries which have strong economic ties than for those that have weak ties, is reported on an independent set of data in Chen and Zhang (1997). They investigate a number of stock markets in Pacific-basin area, and find that the flow of trade between countries is strongly related to the corresponding correlation coefficient between stock market returns.

In the information-based explanation trade also matters. In that explanation what makes trade important is the fact that more trade means more flow of information between the countries.<sup>52</sup> The importance of information in explaining the country allocation of portfolio investments is supported by results reported by Portes and Rey (1999) who find strong support for a gravity model in explaining bilateral equity flows between 14 countries. They find a highly significant coefficient for distance in addition to obvious controlling variables like market capitalization of the receiving country. Since distance at least to some extent measures information costs this finding tends to support an explanation based on asymmetric information. Further support for the asymmetric information explanation is obtained from the fact that the variable "distance" in their regression drops in significance when other information related variables, like the phone call volume, are included in their regression equation.

Explicitly for Finnish investors Aba Al-Khail (1999) finds that the basic form of a gravity equation explains about 80 percent of the variance in the dispersion in Finnish foreign portfolio holdings between countries that received Finnish foreign portfolio investments in 1997. Sizeable and statistically significant parameter estimates were found for the market capitalization of the receiving country and the direct distance between the financial capitals of the sending country and the receiving country. Aba Al-Khail (1999) demonstrates that the introduction of bilateral trade between the

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<sup>51</sup> Please note that an empirical analysis of the actual impact of the EMU on the correlation between stock returns is subject to a substantial measurement problem in the period prior to 1999. Any news that affected the likelihood that the EMU might fail should have affected stock returns in the EMU countries in the same direction producing an upward bias in the correlation.

sending country, Finland, and the receiving country, into the regression equation substantially reduces the significance of other variables that can be interpreted as proxies for information asymmetries.

On the basis of these results it seems that the information-based explanation has some support in the data. However, the problem is that most of these results also are consistent with an inertia augmented portfolio theory based explanation. This makes the experiment provided by the EMU of considerable interest. Using data on Finnish portfolio investments seems to be a reasonable choice since the changes implied by the EMU are expected to be stronger for small countries that joined the union than for the major ones. Below we will thus focus on how the Finnish investors changed their portfolio allocation decisions in response to the birth of the EMU.

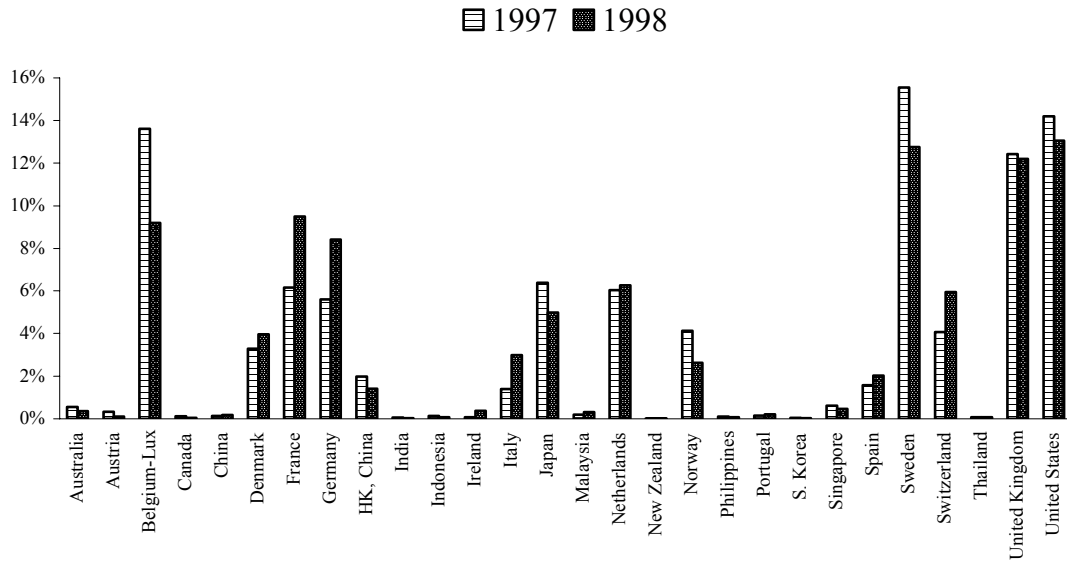
### **III. Data and Stylized Facts**

Our data on outward international portfolio investment for Finnish residents (Finnish International Portfolio Investments, FIPI) is from the Bank of Finland. The data covers the stock positions as of 31 December 1997 and 31 December 1998. Since the Euro was introduced in the beginning of 1999 our data does not reflect the full change by the introduction of the monetary union. However, the most important step in actually creating the Union was when the exchange rates of the countries that joined the Union were unequivocally fixed in the beginning of May in 1998. A substantial part of the adjustments to the Union were made in the period between this event and the 1998 year-end. It thus seems safe to assume that investors took the EMU into account throughout most of 1998, and that firms in the area started to plan for the new environment even before that. A direct advantage of not including the first year of the EMU is that any change that will be detected will not simply reflect the drop in tangible transaction costs at the introduction of the common currency.

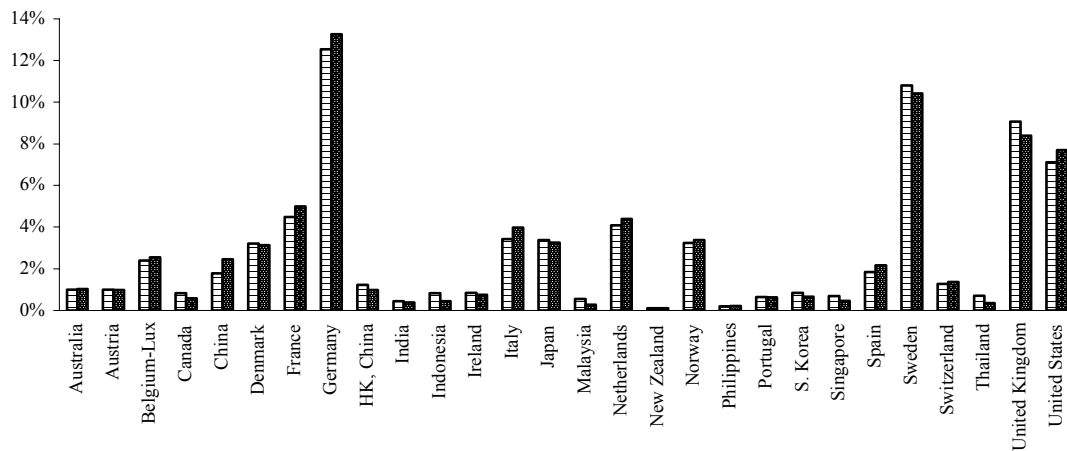
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<sup>52</sup> See Gehrig (1993), and Kang & Stulz (1997).

**Figure 1A** The allocation of Finnish portfolio holdings of foreign equity at the end of the years 1997, and 1998.



**Figure 1B** The allocation of Finnish trade with foreign countries in 1997, and 1998.



The data covers Finnish stock positions of equities in 29 countries.<sup>53</sup> It includes 15 European (13 EU members<sup>54</sup>, Norway and Switzerland), 2 North American (United States and Canada), 10 Asian (China, Hong Kong, India, Indonesia, Japan, Malaysia, Philippines, South Korea, Singapore, and Thailand), and finally Australia and New Zealand. We use bilateral trade (BT) data from the Finnish customs authority and Market capitalization values (MC) from the World Bank publications. Figure 1A shows the relative holdings of the Finnish international portfolio investment.

What clearly stands out is that the bulk of the investment holdings are in European countries. In 1998 investment levels were increasing in European markets and most notably in the Euro area, while decreasing in the remaining world regions. The five largest Euro countries, Germany, France, Italy, the Netherlands, and Spain experienced a surge in investment of 158.5%, 165.6%, 270.2%, and 78.6% that propelled the Euro countries to a 39% proportion of the FIPI, an increase of more than 4 %-units from their weight at the end of 1997. This should be contrasted with a decrease of 2.4%, in relative terms, in the allocation of investments in the EU countries that did not participate in the EMU, and a decrease of 1.2% and 2.3% in the allocation of investments into North America and Asia.<sup>55</sup>

The other important set of data used in this study is on trade flows. Finland's most important trading partners are naturally European countries. In 1998 Europe's share of total Finnish foreign trade was 60.4%, an increase of 1.5%, in percentage units, relative to the previous year. The largest increase was with the Euro countries, 2.5% in percentage units, relative to the 1997 period, resulting in a share of 33.7%. As in the case of FIPI, the largest drop of 1.2%, in absolute terms, was with EU countries that did not join the EMU, reducing their relative share to 22%. For the five largest EMU countries 1998 brought an increase in bilateral trade of 17.8%. Figure 1B shows the relative importance of our sample countries as Finnish trading partners in 1997, and 1998.

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<sup>53</sup> We combine the data for Belgium and Luxembourg. This leaves us with 28 observations in our analysis.

<sup>54</sup> FIPI survey does not show any investment in Greece.

<sup>55</sup> Asia, for the purpose of this exposition, also includes Australia and New Zealand.

Finally looking at changes in market capitalization during the 1997-1998 period, with the exception of Italy, all the other major Euro countries lagged behind the United States in market capitalization development and growth, while smaller countries like Ireland and Portugal outpaced the United States. The less developed markets like Italy, Spain, and Portugal outperformed the more developed markets like Germany and France.

#### **IV. Results**

To find out what the crude data tells us about the reallocation of Finnish portfolio holdings in 1998, the year when the final decision on launching the EMU was taken, we ran a regression of the change in the relative share of Finnish holdings for all countries in our data on an EMU dummy. A dummy value of one stands for a country that joined the union and a zero for those that did not. As a robustness check we ran the regression on a corresponding EU-dummy as well as on a Europe dummy. To control for the fact that more rapidly increasing share prices in any country automatically add to the weight of the holdings in that country the change in the market capitalization is also included as a controlling variable. Specifically, we use the relative change in the share of the market capitalization measured as the change in the foreign country's relative share in the world market capitalization at the end of 1998 from the end of 1997. As shown in Aba Al-Khail (1999), on Finnish data at the end of 1997, market capitalization of the country that receives the investment is an important determinant of the observed country allocation.

Our first results do not allow us to reject the null hypothesis that the EMU had no impact on the distribution of Finnish portfolio holdings in foreign countries. Looking at the sign of the coefficient for the dummy variable the results seem to be somewhat more in line with our asymmetric information related explanation than with our portfolio theory based explanation. Also note, though, that our results do not allow us to reject the claim that it is a Europe-wide rather than an EMU related change that is being observed.

**Table 1** The impact of the EMU on Finnish international portfolio investments.

This table reports parameter coefficients, standard errors (heteroscedasticity-consistent, White 1980), in parentheses, and adjusted  $R^2$  for the regression in which the dependent variable is the relative change in the allocation of Finnish international portfolio investments (equity) between foreign countries, measured as change in the relative foreign country's share of Finnish international portfolio investments from the end of 1997 to the end of 1998. The independent variables are a constant, the change in the share of the global market capitalization of this foreign country ( $\Delta MC$ ), measured as the difference of the foreign country's relative share in the world market capitalization from the end of 1997 to the end of 1998, and a foreign country dummy, column (1): European Monetary Union (EMU) membership dummy (1 if the foreign country belong to the EMU, 0 otherwise), column (2): European Union (EU) membership dummy (1 if the foreign country belong to the EU, 0 otherwise), and column (3): European dummy (1 if the foreign country is situated in Europe, 0 otherwise).

	(1)	(2)	(3)
Constant	-0.003 (0.002)	-0.002 (0.002)	-0.003 (0.001)
$\Delta MC$	0.044 (0.115)	0.046 (0.125)	0.044 (0.119)
EMU dummy	0.007 (0.007)		
EU dummy		0.003 (0.006)	
Europe dummy			0.004 (0.005)
Adjusted $R^2$	-0.015	-0.063	-0.057

The results of the simple regression reported in Table 1 are, however, biased against our information-based hypothesis. The reason is that the use of the dummy variable assumes that the impact of the EMU will be exactly the same for all countries that joined the monetary union. If information were the driving force we should instead observe an impact, which is strongly related to the EMU's impact on trade flows. We would not expect the EMU impact on Finnish foreign trade flows to be the same for all the EMU-countries.<sup>56</sup>

In order to investigate this link a little closer we use data on bilateral trade flows between Finland and the countries included in our sample. In congruence with the regressions reported in Table 1 we regressed the relative share of Finnish foreign trade for all countries in our sample on the EMU dummy. Again regressions on an EU-dummy as well as on a Europe-dummy are included as a robustness check. The results are reported in Table 2. In order to control for any mechanical consequences stemming from the fact that more rapidly growing economies tend to increase their share of total trade, relative growth in the country's GNP was also included in the regression.

The results clearly support the prediction that Finnish foreign trade was reallocated towards EMU countries. It is also clear that this is not an EU encompassing impact. On the contrary a detailed look at the data indicates that there was as substantial reallocation within the EU towards EMU-countries.

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<sup>56</sup> The impact on trade flows will depend on the price elasticities of cross-border demand in addition to the size of the reduction in transaction costs.



**Table 2** The impact of the EMU on Finnish international trade.

This table reports parameter coefficients, standard errors (heteroscedasticity-consistent, White 1980), in parentheses, and adjusted  $R^2$  for the regression in which the dependent variable is the change of the relative share of Finnish international trade for each foreign country in our sample, measured as the change in the foreign country's relative share of total Finnish international trade from 1997 to 1998. The independent variables are the relative change of the gross national product of the foreign country ( $\Delta$ GNP), measured as the difference in the foreign country's relative share of the world GNP from 1997 to 1998, and a foreign country dummy, column (1): European Monetary Union (EMU) membership dummy (1 if the foreign country belong to the EMU, 0 otherwise), column (2): European Union (EU) membership dummy (1 if the foreign country belong to the EU, 0 otherwise), and column (3): European dummy (1 if the foreign country is situated in Europe, 0 otherwise).

	(1)	(2)	(3)
Constant	0.0010 (0.0007)	-0.00049 (0.00072)	-0.007 0.0008)
$\Delta$ GNP	0.1081 (0.1473)	0.1014 (0.1378)	0.0996 (0.1452)
EMU dummy	0.0041 *** (0.0011)		
EU dummy		0.0018 (0.0014)	
Europe dummy			0.0020 (0.0013)
Adjusted $R^2$	0.262	0.015	0.033

\*\*\* Significant at the 1 percent level.

The final step in our argument is to find out whether the change in the allocation of Finnish portfolio holdings traced the change in trade flows as the information related explanation would predict. As a first step in this direction we regressed the change in the country allocation of Finnish portfolio investments on the corresponding change in Finnish foreign trade flows and our controlling variable,

$$\Delta \text{FIPI}_m = \alpha + \beta_1 \Delta \text{BT}_m + \beta_2 \Delta \text{MC}_m + \varepsilon_m \quad (1)$$

where,  $\alpha$ ,  $\beta_1$  and  $\beta_2$  are constants, ( $\beta_1$  and  $\beta_2 > 0$ ), and

$\Delta \text{FIPI}_m$  = the change in the relative allocation of Finnish international portfolio investments into foreign equities, measured as the foreign country's [m] relative share of Finnish international portfolio investments at the end of 1998 from the end of 1997.

$\Delta \text{BT}_m$  = the change in the relative allocation of Finnish trade with [m], measured as the change in the foreign country relative share of the total Finnish trade in 1998 from 1997.

$\Delta \text{MC}_m$  = the change in the relative market capitalization of the foreign country [m], measured as the change in the foreign country's [m] relative share in the world market capitalization at the end of 1998 from the end of 1997.

$\varepsilon_m$  = Error term.

The coefficient of the  $\Delta \text{BT}$  parameter is a measure of the sensitivity of the Finnish investors country allocation to the change in trade related dependence with that country. Our results in panel A confirm the presence of a significant reallocation of FIPI towards the trading partners that increased in attractiveness in the year that led to the start of the EMU (Table 3).

**Table 3** The reallocation of the Finish international portfolio investments and the change in international trade flows.

This table reports coefficient estimates, standard errors (heteroscedasticity-consistent see White 1980), in parentheses, and adjusted  $R^2$  for the regression in which the dependent variable is the relative change in the allocation of Finnish international portfolio investments (equity) between foreign countries, measured as change in the relative foreign country's share of Finnish international portfolio investments from the end of 1997 to the end of 1998. The independent variables are in column (1): the change in the market capitalization of the foreign country ( $\Delta MC$ ), and the change in the allocation of Finnish international trade with each of the foreign countries ( $\Delta BT$ ).  $\Delta MC$  is measured as the difference of the foreign country's share of the world market portfolio from the end of 1997 to the end of 1998.  $\Delta BT$  is measured as the relative change in the foreign country's share of total Finnish international trade from 1997 to 1998. In columns (2) & (3) we add  $\Delta BTEMU$ , the product  $\Delta BT_m \times I_m(EMU)$ , where  $I_m(EMU)$  is an indicator function taking the value 1 if country  $m$  is part of the EMU, 0 otherwise.

	(1)	(2)	(3)
Constant	-0.001 (0.002)	-0.004 * (0.003)	-0.004 * (0.002)
$\Delta MC$	-0.047 (0.182)	0.041 (0.102)	0.039 (0.101)
$\Delta BT$	1.536 ** (0.752)	-0.018 (0.641)	
$\Delta BT \times I_m(EMU)$		3.736 *** (1.114)	3.715 *** (0.880)
Adjusted $R^2$	0.060	0.176	0.209

\*\*\*, \*\*, \* Significant at the 1, 5 and 10 percent level.

In order to explicitly test for an EMU impact we then augmented equation (1) with a multiplicative dummy:

$$\Delta FIPI_m = \alpha^* + \beta_1^* \Delta MC_m + \beta_2^* \Delta BT_m + \beta_3^* \Delta BT_m I_m (EMU) + \varepsilon_m \quad (2)$$

where  $\alpha^*$ ,  $\beta_i^*$  ( $i=1, 2, 3$ ) are constants and  $I_m$  an indicator function taking the value 1 if country  $m$  joined the EMU, 0 otherwise.

The results of this regression are reported in Table 3, Panel B. Interestingly the multiplicative dummy absorbs all the explanatory power of the change in bilateral trade variable as such, and is highly statistically significant. The last set of results, Panel C, in Table 3 further confirms that the original trade variable obtained its explanatory power from changes related to the EMU, and not to a more general shift towards European countries.<sup>57</sup>

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<sup>57</sup> We run (but do not report the results in a separate table) regression 3.3 (panel 3 of table 3) for a number of different scenarios to check the robustness of these results. First we exclude Belgium-Luxembourg, considering Luxembourg's tax haven status. The result of this regression is not significantly different than the one that we report. Second, we check possible bias of OLS resulting for the apparent shifting of portfolio investments from Belgium-Luxembourg towards other EMU countries. To control for this, we run regression 3.3 (panel 3 of table 3) using Weighted Least Square, with the initial portfolio allocations, at the end of 1997, as the weighing matrix. The result of this regression does not alter the conclusions that we report.

## **V. Summary and Concluding Comments**

This paper looks at the impact of the EMU on the allocation of foreign portfolio investments. The paper argues that the launch of the EMU allows us to discriminate between different theories for what drives international portfolio investments. The reason is that the EMU is expected to simultaneously increase the correlation in cross border stock returns and reduce information asymmetries between included countries. Portfolio theory thus implies that expected increase in correlation between stock returns should make stock market investments in the rest of the countries in the EMU less attractive. Information based theories, on the other hand, imply that reduced information asymmetries should make portfolio investments into those countries more rather than less attractive.

Our empirical analysis focuses on Finnish foreign portfolio holdings. Finland, being a small country with relatively high foreign exchange related transaction costs in the pre EMU era, should be well suited for this study. Any impact that the EMU will have should be easier to identify for Finland than for a larger country where foreign exchange related transaction costs are of less importance.

Our results reveal that if anything the EMU seems to have increased the attractiveness of investing in countries that joined the monetary union. A closer analysis furthermore, revealed that the impact on the allocation of portfolio investments was significantly related to the impact on trade flows. Over all our results can thus be taken to lend support for the hypothesis that considerations related to the flow of information between countries tend to have substantially more power than hedging motives in explaining the distribution of foreign portfolio investments at the introduction of the EMU.

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# **International Portfolio Investments and The Informational Value of Trade**

## **Abstract**

A large volume of literature suggests that information asymmetry resulting from the spatial separation between investors and investments have a significant impact on the composition of investors' domestic and international portfolios. We show that an information flow medium with breadth and richness directly linked to the bilateral commitment of resources between countries, that we measure by their trading intensity in tangible goods, is consistent with the prevailing country allocation in investors' international portfolios.

We also find the incremental impact of trade, and more specifically trade with technology content, to have a higher impact on portfolio allocations in developing countries. These results are consistent with trade providing important information especially on firms in countries in which the corporate governance structure and the information environment of firms generate less reliable information.

JEL Classification Codes: F10; G10.

Key words: Information Asymmetry; International Portfolio Investments.



## I. Introduction

This paper relates to the growing literature on “home bias”, the behavior of investors to overweigh domestic, and near-by stocks.<sup>58</sup> For example, Cooper and Kaplanis (1986 and 1994), French and Poterba (1991), and Tesar and Werner (1995) show that the fraction of international investments in investors national equity portfolios is substantially lower than what standard international finance models prescribe.

A segment of this literature strives to explore the root causes of the home bias by examining the attributes of investors and their investments. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find foreign investors to exhibit preference for large firms, particularly those with high exports. Another segment of this literature relates the levels of cross-border portfolio investments in the firms of a country with the information availability on these firms, and thus their visibility to investors, as consequence of the country’s legal, institutional, and financial market characteristics, for example Shleifer and Vishny (1997), La Porta et al. (1998), and Lang, Lins, and Miller (2002). A third segment of this literature take a more direct approach in examining information asymmetry between investors and their investments in a particular country. Portes and Rey (1999) and Aba Al-Khail (1999) find that proxies for information flow between countries strongly relate to the level of transactions and investments of one country pair in the other. Overall this literature suggests that informational asymmetries of investors on potential investment targets constitute an important indirect barrier that contributes to the home bias.<sup>59</sup>

This paper contributes to this literature in a number of ways. First, using rich and comprehensive data on the aggregate international portfolio investments of investors from a large number of countries we provide new evidence on how different country attributes influence portfolio investments in a country. We decompose these attributes into two categories, one that relate to the characteristics of an investment receiving

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<sup>58</sup> The “home bias” behavior is counter intuitive to the literature that shows substantial benefits from international diversification of investors portfolios. For example, Grubel (1968), Levy and Sarnat (1970), Grubel and Fadner (1971), Solnik (1974a, 1974b), and more recently by Grauer and Hakansson (1987), Harvey (1991), and De Santis and Gerard (1997). However, there is some evidence that showing that the portfolio weights from mean variance optimization are not statistically different from zero, Britten-Jones (1999) and Gorman and Jorgensen (1998).

<sup>59</sup> See also Brennan and Cao (1997), and Gehrig (1993).

country and another that is unique to a particular investment receiving and investment sending country pair.

The literature suggests two groups of investment receiving country attributes. These are: financial market size and performance; and corporate governance variables that provide proxies for financial development, legal structure, and information availability on the firms in the investment receiving country. In the first group, the most prominent variable is the size of the capital market. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find foreign investors to exhibit preference for large firms, particularly those high exports. We also include other pull factors such as the market growth potential and its risk-return characteristic. The literature suggests a number of variables as proxies for the second group. Shleifer and Vishny (1997) and La Porta et al. (1998) argue that the frequency of concentrated ownership and the degree of respect for minority shareholder rights determine the extent to which information is made available to minority (portfolio) shareholders. Lang, Lins, and Miller (2002) conjecture that higher extraction of private benefits by insiders will reduce the firm's willingness to disclose relevant and accurate information. This leads investors to ignore such security or at least substantially limit its weight in their portfolio.<sup>60</sup> Dahlquist, Pinkowitz, Stulz, and Williamson (2003) empirically demonstrate that a substantial amount of the observed home bias in U.S. investor's portfolios is a consequence of the presence of controlling local shareholders in foreign markets. Consistent with this literature we proxy the information availability on firms in a country with its per capita GDP, percent of its market that is closely held, as well as a number of indices, from La Porta et al. (1997), that proxy the country's investor protection and corporate governance structure.

For the second category of country attributes, those that are unique to an investment sending and investment receiving country pairs, Portes and Rey (1999) and Aba Al-Khail (1999) find that proxies for information flow between countries strongly relate to the level of transactions and investments of one country pair in the other. These authors use distance as a general proxy for transaction costs (including information

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<sup>60</sup> Lang, Lins, and Miller (2002) argue that a higher fraction of controlling owners leads to a poor information environment that will make it costly for investors to acquire and analyze information.

costs) in gravity model regressions and find it to have a large influence on investments across countries. Furthermore, Portes and Rey (1999) find that variables that measure information transfer between bilateral pairs such as telephone calls volume, number of bank branches in one of the other pair, substantially reduces the elasticity of distance. Aba Al-Khail (1999) shows that the Finnish investors share of portfolio allocation in a particular country parallels that of trade in real goods. Aba Al-Khail (1999) suggests a substantial role for trade in reducing the information cost relating to portfolio investments.<sup>61</sup>

In the other contribution of this paper, we strive to deepen our understanding of the interaction between trade in real goods and the reduction of information cost relating to portfolio investments. By definition, the intensity of tangible goods trading between two countries is a proxy for the level of commitment of resources, financial and otherwise to activities that requires transmission of information. The fact that international trade requires effective channels of communication to facilitate the trading activity implies an association between trade and the quantity and quality of information on the market conditions, the functioning of organizations and institutions. These factors also channel reliable cross-border transmission of asset specific information. In this line of argument, information, knowledge, and experience gained through the interactions of trading in tangible goods have a significant impact on reducing the wedge of information asymmetry relating to portfolio investments.

Merton (1987) notes that “Although the types of costs underlying the signaling and differential information models would surely be an important part of a more-detailed information-cost structure..., there is another type of cost that logically proceeds them: namely, the cost of making investors aware of the firm. That is for party A to convey useful information to party B, requires not only that Party A has a transmitter and sends an accurate message, but also that Party B has a receiver.” Using this terminology an expansion of international trade between two countries usually imply the establishing of new active receivers on both sides of the transaction.

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<sup>61</sup> Aba Al-Khail (1999) demonstrates that the informational value of trade is not due to export hedging motives or variables that are common determinants of both portfolio share and trade.

The information flow in connection to trade in tangible goods also includes information on potential investment objects in the other country. The experience gained through trade allows for proper calibration of individual pieces of information, e.g. which pieces of information can be considered trustworthy and which not. The higher the intensity of trade between two countries, the more intense is the day to day information flow between them and the more will the relative local information advantage be decimated. Increased information flow will also expose the foreign investor to a larger pool of potential investment opportunities. Other things equal, more trade should thus lead to an increase in the weight for that country in the foreign investor's international portfolio allocation.

Our results are summarized as follows. We find the capital market size to be the dominant investment receiving country attribute on portfolio country allocations. Our results indicate that once we control for the size of the financial market our proxies of corporate governance parameters have only a marginal influence on the level of foreign investments. In line with the existing literature, we interpret this as evidence that the level of information disclosure that is closely related to prevailing corporate governance structures is largely reflected in the size of the market. We argue that, at least to some extent, the size of the financial market is a consequence of the interplay between the quality of corporate governance structures, the informational environment, and the valuation of firms. A good corporate governance structure implies a more reliable information production by the firms in a country. The availability of more relevant and timely information implies smaller spreads and higher liquidity that in turn triggers more investors' interest in the share of these firms. This eventually feeds back in the form of better corporate governance and a higher interest of investors in the shares of these firms.

We also show that bilateral trading intensity in tangible goods apparently contributes to a substantial reduction in information cost relating to portfolio investments between countries. We demonstrate that this finding is not due to investors demand to hedge the risks of the foreign revenues and expenses of the firms in their domestic portfolio. We also find trade, and especially trade with technology content, to have a higher incremental impact on portfolio allocations in developing countries. These

results are consistent with trade providing more important information especially on firms in countries in which the corporate governance structure and the information environment of firms generate less reliable information.

The remainder of this paper is organized as follows. Section II presents a brief description of the data and acknowledges their sources. Section III describes and presents the results of the regression model for the receiving country attributes. Section IV describes and presents the results of the regression that also includes attributes relating to transaction and information cost for investors from different countries and their investments in a particular investment receiving country. Finally, section V provides a summary of the main results.

## **II. Data Description**

The data for the international portfolio (equity) investment positions for twenty-nine countries is from the International Monetary Fund.<sup>62</sup> With the exception of Germany, the data covers outward portfolio (equity) investment of investors residing in all major financial centers and 19 (nineteen) industrialized countries as of 31 December 1997.<sup>63</sup> Exhibit A presents the countries included in our data set.

The bilateral tangible goods (merchandise) export and import data are from the Center for International data. From the same data set, we extract SITC 7 exports and imports as representing technology based bilateral trade flows.<sup>64</sup> Country total merchandise exports and imports data are from The World Trade Organization. Market capitalization and other financial figures are from the International Monetary Fund publications, Datastream<sup>®</sup>, and World Bank publications.

Our data for cities latitudes and longitudes are from the CIA web site. The Linguistic tie dummies (countries that share common languages) are from the National Bureau of Economic Research. The fraction of closely held shares is from Dahlquist,

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<sup>62</sup> IMF (1999 a).

<sup>63</sup> We use the IMF (1999b) industrialized country classification.

<sup>64</sup> Feenstra (2000) provides a comprehensive description of this data.

Pinkowitz, Stulz, and Williamson (2003). They define closely held shares as those held by officers, directors and their immediate families, trusts, other firms (except shares held in a fiduciary capacity in financial institutions), pension benefit plans, and large stakes (5% or more of outstanding shares) held by individuals. Corporate governance and accounting efficiency proxy variables is from La Porta et al. (1997).

### **III. Investment Receiving Country Attributes and International Portfolio Investments**

To examine the relationship between portfolio investments and country attributes, we run the following regression:

$$I_{ij} = \alpha + \gamma \log Y_i + \beta' X_j + \varepsilon$$

where  $I_{ij}$  is the aggregate portfolio investment of investors from the investment sending country (i) in the equities of the investment receiving country (j) as a fraction of total international equity portfolio investments of investors from the investment sending country (i),  $Y_i$  is the per capita GDP of the investment sending country (i), and  $X_j$  is a vector of attributes that relate to the characteristics of the of the financial market, legal, and informational environment of the investment receiving country (j).<sup>65</sup> These are:

(a) Weight in the world market portfolio: the fraction of market capitalization of the country in the world market portfolio, measured on December 31, 1997. Merton (1987) argues that investors hold shares in firms in which they are more familiar and investors are more likely to be familiar with large firms. Kang and Stulz (1997), and Dahlquist and Robertsson (2001) find foreign investors to exhibit preference for large firms, particularly those with low leverage and high exports. On a national level, Falkenstein (1996) using data on the holdings of US mutual funds finds that in addition to conventional risk proxies, these funds prefer liquid and large stocks. He equates these preferences with asymmetry in information availability

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<sup>65</sup>  $\alpha$  and  $\varepsilon$  are the usual intercept and error term, respectively.



between the large stocks and the small stocks. Aba Al-Khail (1999) shows that the equity market size of the investment receiving country is an important determinant of the country allocations in the international portfolio investments of Finnish investors.

(b) Sharpe ratio: the annual equity market return (US\$) of the investment receiving county, average of the monthly returns for 1993 through 1997, divided by the standard deviation of the returns for the same period. This variable provides a measure of the risk-adjusted performance of the equity market.

(c) Idiosyncratic risk: the variance of residual from the world market model, using monthly returns for 1993 through 1997. The market model is the regression of the country market index return (US\$) on the world value weight portfolio (US\$).

(d) GDP growth: The 1990-1997 growth of the gross domestic product. We include this variable to control for the relationship between growth and valuation (exogenously and endogenously) and market breadth, La Porta et al. (1997).

(e) Per capita GDP: The per capita gross domestic product, US\$ thousands, average for 1993 through 1997, in natural logarithmic form. This variable controls for the rule of law, law enforcement, and quality of accounting influence on the share of portfolio (equity) investment of the sending country [s] to the receiving country [r]. La Porta et al. (1997) show that the correlation between the per capita GDP and their measure of rule of law is 0.87. La Porta et al. (1998) show that per capita GDP accounts for more than half the variation in their law enforcement and accounting standards measures. Morck et al. (2000) show that the per capita GDP is highly correlated with their proxy measuring government respect for private property. They show that government respect for private property is the main driver of the more asynchronous stock prices observed in higher income countries.

(f) % of market closely held: the ratio of the closely held shares of firms in the investment receiving country as a measure of ownership concentration. Shleifer and Vishny (1997) and La Porta et al. (1998) observe that an important aspect of the efficiency of the corporate governance system in a country is the availability and credibility of information. They argue that the frequency of concentrated ownership

and the degree of respect for minority shareholder rights determine the extent to which information is made available to minority shareholders. Lang, Lins, and Miller (2002) argue that minority investors' ability to monitor (and discipline) the management is a function of both the governance structure of the firm and the amount of information that is made available to them. They argue that the higher is the insiders' private benefits, the more reluctant they are to disclose relevant and accurate information to minority shareholders. Substantial private benefits consequently lead to a poor information environment that will have an adverse effect on investors' interest in directing their resources for acquiring and analyzing information and ultimately the ability to predict cash flows, and monitor management actions. The lack of accurate information on a security will lead investors to ignore or at least limit the amount of investment in that security. Dahlquist, Pinkowitz, Stulz, and Williamson (2003) empirically demonstrate that a substantial amount of the observed home bias in U.S. investor's portfolios is a consequence of the presence of controlling local shareholders in foreign markets.

(g) We employ a number of proxies for the legal environment and the corporate governance structure of the investment receiving country that is widely used in financial research. La Porta et al. (2000) show that countries with higher investor protection have the more developed financial markets. Bradshaw, Bushee, and Miller (2002) document a direct link between the accounting system, the firms' informational environment, and the home bias. Therefore investors may neglect equities of countries in which they have less protection of their investment and are less able to gather reliable information on its firms. These variables, from La Porta et al. (1998), are:

- (1) Anti-director rights. This index provides an aggregate measure of minority shareholders rights. This scale ranges from 0 (countries with the lowest anti-director rights) to 6.

- (2) Efficiency of the judicial system. This variable assesses the “efficiency and integrity of the legal environment”. This variable scale ranges from 0 (lowest efficiency) to 10.
- (3) Corruption. A variable that measures the level of corruption in a government. The variable scale ranges from 0 (the highest level of corruption) to 10.
- (4) Risk of Expropriation. An index that measures the risk of “outright confiscation” and “forced nationalization” that investors face in a country. The index scale ranges from 0 (the highest risk) to 10.
- (5) Rating of accounting standards. A variable that provide a percentile rating of the accounting system and its disclosure features of firms in a country. The variable scale ranges from 0 (the worst) to 100.

We also include the per capita GDP of the investment receiving country to control for a country’s financial market development and sophistication. This variable captures the feature that richer countries are more investment savvy, have more resources to gather information on international markets, and are more aware of the benefits of international diversification.<sup>66</sup>

Table 1 presents the measurement (panel A), descriptive statistics (panel B) and the correlation (panel C) of the dependent and independent variables that we use in our analysis.

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<sup>66</sup> Per capita GDP (ISC): The per capita gross domestic product of the investment sending country, US\$ thousands, average for 1993 through 1997, in natural logarithmic form.

**Table 1** Measurement, descriptive statistics, and correlations of variables.

**Panel A: Measurement of variables**

**[Portfolio investment]:** The aggregate portfolio investment of investors from the investment sending country in the equities of the investment receiving country as a fraction of total international equity portfolio investments of investors from the investment sending, at the end of 1997.

**[Per capita GDP (ISC)]:** The per capita gross domestic product of the investment sending country, US\$ thousands, average for 1993 through 1997, in natural logarithmic form.

**[Share of world market portfolio]:** the fraction of market capitalization of the investment receiving country in the world market portfolio, measured on December 31, 1997.

**[Sharpe ratio]:** the annual equity market return (US\$) of the investment receiving county, average of the monthly returns for 1993 through 1997, divided by the standard deviation of the returns for the same period.

**[Idiosyncratic risk]:** the investment receiving country variance of residual from the world market model, using monthly returns for 1993 through 1997.

**[GDP growth]:** The 1990-1997 growth of the gross domestic product of the investment receiving country.

**[Per capita GDP]:** The receiving country per capita gross domestic product, US\$ thousands, average for 1993 through 1997, in natural logarithmic form.

**[% of market closely held]:** the ratio of the closely held shares of firms in the investment receiving country.

**[Anti-director rights]:** an index that provides an aggregate measure of minority shareholders rights in an investment receiving country, with a scale ranging from 0 (countries with the lowest anti-director rights) to 6.

**[Efficiency of the judicial system]:** an index that measures the “efficiency and integrity of the legal environment” with a scale ranging from 0 (lowest efficiency) to 10.

**[Corruption]:** a variable that measures the level of corruption in the government of an investment receiving with a scale ranging from 0 (the highest level of corruption) to 10.

**[Risk of Expropriation]:** an index that measures the risk of “outright confiscation” and “forced nationalization” that investors face in an investment receiving country with a scale ranging from 0 (the highest risk) to 10.

**[Rating of accounting standards]:** a variable that provide a percentile rating of the accounting system and its disclosure features of firms in an investment receiving country with a scale ranging from 0 (the worst) to 100.

**[Distance]:** The distance between the financial capitals of the investment receiving and sending countries, kilometers, in natural logarithmic form.

**[Common language]:** a dummy variable that equals one if the investment receiving and sending countries share a common language, zero otherwise.

**[Trade balance]:** The investment receiving country real goods exports to the investment receiving country divide by its real goods imports from the country, average for 1995 and 1996

**[Trade]:** Trade in real goods between the investment sending and the investment receiving countries as a fraction of the total trade of the investment sending country.

**[Technology trade]:** Trade in technology goods between the investment sending and the investment receiving countries as a fraction of the total technology trade of investment sending country.

**[Non-technology trade]:** Trade in non-technology goods between the investment sending and the investment receiving countries as a fraction of the total non-technology trade of the investment sending country.

**Table 1, Panel B: Descriptive statistics**

	Minimum	Maximum	Average	Median	Std Div.
Portfolio investment	0.000006	0.60	0.03	0.004	0.06
Per capita GDP (ISC)	20.73	24.32	23.68	23.83	0.54
Share of world market portfolio	0.00	0.52	0.04	0.01	0.10
Sharpe ratio	-0.82	1.88	0.77	0.63	0.66
Idiosyncratic risk	0.00	0.03	0.00	0.00	0.00
GDP growth	0.00	0.09	0.03	0.02	0.02
Per capita GDP	19.76	24.37	23.19	23.70	1.09
% of market closely held	0.08	0.77	0.42	0.41	0.17
Anti-director rights	0	5	3.10	3	1.37
Efficiency of the judicial system	3.25	10	8.16	9	2.00
Corruption	2.92	10	7.74	8.52	1.98
Risk of Expropriation	5.22	9.98	8.68	9.35	1.34
Rating of accounting standards	24	83	63.84	64	11.25
Distance	5.16	9.90	8.50	8.97	1.05
Common language	0	1	0.17	0	0.38
Trade balance	0.06	15.90	1.58	1.12	1.63
Trade	0.0003	0.80	0.03	0.01	0.06
Technology trade	0.00009	0.82	0.03	0.01	0.06
Non-technology trade	0.0002	0.77	0.03	0.01	0.06

**Panel C: Correlations**

	Portfolio investment	Per capita GDP (ISC)	Share of world market portfolio	Sharpe ratio	Idiosyncratic risk	GDP growth	Per capita GDP	% of market closely held	Anti-director rights	Efficiency of the judicial system	Corruption	Risk of Expropriation	Rating of accounting standards	Distance	Common language	Trade balance	Trade	Technology trade
Per capita GDP (ISC)	-0.09																	
Share of world market portfolio	0.73	-0.10																
Sharpe ratio	0.32	-0.03	0.34															
Idiosyncratic risk	-0.18	0.04	-0.18	-0.36														
GDP growth	-0.11	0.02	-0.11	-0.58	0.28													
Per capita GDP	0.25	-0.04	0.24	0.63	-0.34	-0.42												
% of market closely held	-0.43	0.10	-0.47	-0.46	0.25	0.38	-0.40											
Anti-director rights	0.25	-0.05	0.32	0.00	-0.15	0.31	-0.05	-0.09										
Efficiency of the judicial system	0.28	-0.04	0.26	0.55	-0.52	-0.20	0.71	-0.40	0.23									
Corruption	0.20	-0.01	0.16	0.73	-0.40	-0.43	0.83	-0.36	0.15	0.80								
Risk of Expropriation	0.28	-0.03	0.28	0.64	-0.38	-0.41	0.84	-0.52	0.00	0.72	0.81							
Rating of accounting standards	0.24	-0.06	0.20	0.25	-0.15	-0.08	0.45	-0.42	0.34	0.56	0.58	0.51						
Distance	-0.16	-0.06	0.06	-0.33	0.14	0.29	-0.26	0.16	0.25	-0.16	-0.26	-0.29	-0.05					
Common language	0.18	-0.11	0.07	-0.07	-0.09	0.13	-0.13	0.02	0.24	0.08	-0.03	-0.08	0.12	0.07				
Trade balance	-0.11	0.06	-0.08	-0.16	0.10	0.08	-0.24	0.20	0.00	-0.21	-0.23	-0.31	-0.20	0.10	-0.03			
Trade	0.65	-0.14	0.49	0.24	-0.16	-0.15	0.27	-0.30	0.07	0.22	0.19	0.30	0.18	-0.39	0.13	-0.12		
Technology trade	0.68	-0.14	0.54	0.22	-0.16	-0.14	0.27	-0.30	0.08	0.23	0.18	0.30	0.18	-0.33	0.12	-0.13	0.98	
Non-technology trade	0.63	-0.13	0.44	0.25	-0.16	-0.16	0.26	-0.29	0.06	0.21	0.19	0.29	0.17	-0.43	0.13	-0.12	0.99	0.94

Table 2 presents the results of this regression. Column 2.1 of this table reports the results of impact of the financial market size and performance (variables a through d) of the investment receiving countries on portfolio allocation of the investment sending countries. The results of this regression show that the fraction of investment in a country has a positive relationship with the country's weight in the world market portfolio and its Sharpe ratio, and a negative relationship to idiosyncratic risk. An increase of 1% in the share of the world market portfolio of an investment receiving country, all else equal, leads to an increase of about 0.5% in the fraction of the overall international portfolio of the investment sending country allocation. It is also interesting to note that the financial market size and performance variables explain a considerable portion of portfolio country allocations (adjusted  $R^2 = 0.54$ ).

Column 2.2 of table 1 reports the results of impact of the corporate governance variables (e through g) of the investment receiving countries on portfolio allocation of the investment sending countries. The results of this regression show that the fraction of investment in a country has a positive relationship with the country's financial development (that we proxy with per capita GDP) and the level of protection it provides minority (portfolio) investors. Furthermore, our proxy of the informational environment of firms in a country, the percent of the market closely held, has a strong negative correlation with the fraction of portfolio allocation in the country.

Column 2.3 of table 1 reports the results of the regression that includes the financial market size, and performance variables, as well as the corporate governance variables. The results of this regression shows that the fraction of investment in a country is positively related to the country's weight in the world market portfolio, Sharpe ratio, efficiency of the judicial system, and the quality of the accounting standards. It is also clear from the results the fraction of closely held shares has a negative impact on investments in a country. Moreover, regression 2.3 shows that adding the corporate governance variables to the financial market size and performance variables (regression 2.1) has a negligible effect on the adjusted  $R^2$ . This result indicates that the corporate governance variables do not add any additional

**Table 2** Investment receiving country attributes and international portfolio investments.

This table reports parameter coefficients, white corrected standard errors (in parenthesis) and adjusted R2 for the regressions in which the dependent variable is the aggregate portfolio investment of investors from the investment sending country in the equities of the investment receiving country as a fraction of total international equity portfolio investments of investors from the investment sending, at the end of 1997. All independent variables are defined in Table 1 panel A.

	(2.1)	(2.2)	(2.3)
Constant	0.0497 (0.1204)	-0.3003*** (0.0673)	-0.0425 (0.1011)
Per capita GDP (ISC)	-0.0020 (0.0051)		-0.0010 (0.0050)
Share of world market portfolio	0.4683*** (0.0548)		0.4388*** (0.0590)
Sharpe ratio	0.0087*** (0.0020)		0.0085*** (0.0032)
Idiosyncratic risk	-0.3444** (0.1565)		-0.1665 (0.1975)
GDP growth	0.0854 (0.0997)		0.0761 (0.1048)
Per capita GDP		0.0157*** (0.0033)	0.0027 (0.0021)
% of market closely held		-0.1250*** (0.0196)	-0.0206** (0.0089)
Anti-director rights index		0.0126*** (0.0021)	0.0002 (0.0013)
Efficiency of judicial system		0.0039*** (0.0012)	0.0014* (0.0007)
Corruption index		-0.0112*** (0.0023)	-0.0034** (0.0014)
Risk of expropriation		0.0046** (0.0019)	-0.0002 (0.0011)
Rating of accounting standards		-0.0001 (0.0002)	0.0005*** (0.0001)
Number of observations	718	718	718
Adjusted R <sup>2</sup>	0.542	0.256	0.549

\*\*\*, \*\*, \* Significant at the 1, 5, and 10 percent level.

information that is not already captured by financial market size and performance variables.

In summary, these results lead us to conclude that the dominant investment receiving country attribute is its capital market size. We argue that, at least to some extent, the size of the financial market is a consequence of the interplay between the quality of corporate governance structures, the informational environment, and the valuation of firms. A good corporate governance structure implies more reliable information production by the firms in a country. The availability of more relevant and timely information implies smaller spreads and higher liquidity that in turn triggers more investors' interest in the share of these firms. This eventually feeds back in the form of better corporate governance and a higher interest of investors in the shares of these firms.

#### **IV. Investment Receiving and Investment Sending Countries Common Attributes, The Informational value of Trade, and International Portfolio Investments**

In this section we extend our analysis to the attributes common to both the investment sending and the investment receiving countries. These are:

(a) Distance: The distance between the financial capitals of the investment receiving and sending countries, kilometers, in natural logarithmic form. We use distance as a general proxy for transaction costs arising from geographically induced information asymmetry. Portes and Rey (1999) and Aba Al-Khail (1999) show that distance perform as a reasonable proxy for transaction costs in modeling international portfolio investments. Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide strong evidence that geography, language and culture induces a "home bias" even within a country's borders. Coval and Moskowitz (1999) show that domestic portfolios of U.S. based mutual funds are skewed towards near-by firms with the average U.S. mutual fund manager being about 9 to 11% closer to her holdings than the average firm in their sample. They further find that this bias is



larger for smaller, more leveraged and more localized firms. Grinblatt and Keloharju (2001) show that distance plays an important role in the equity selection of Finnish investors. This literature suggests that distance provides a good proxy that captures the information asymmetry between the near-by and the distant investor.

(b) Common language: a dummy variable that equals one if the investment receiving and sending countries share a common language, zero otherwise. We include this variable to control for the fact that common language picks up cultural and political factors that may reduce transaction costs and encourage bilateral trading and information flows.<sup>67</sup> Also, since language is not independent of culture, nations that share a common language often share, to some extent, common history, institutions, and values. Platteau (1994) argues that shared values and institutions are likely to reduce the cost of making and enforcing contracts. Grinblatt and Keloharju (2001) show that culture and language are important factors in investors' selection of equities even within national boundaries. Grinblatt and Keloharju (2001) show that the language of the annual reports and the culture of the CEO's of Finnish corporations play an important role in the equity selection of Finnish investors.

(c) Trade balance: The investment receiving country real goods exports to the investment receiving country as a fraction of its real goods imports from the country, average for 1995 and 1996. We include this variable to control for the possibility that the country allocation in the international portfolio of investors from the investment sending country provides a hedge to the risks of the foreign revenues and expenses of the firms in their domestic portfolio. In achieving this natural hedge, investors of the investment sending country will decrease (increase) their investments in countries with which they have a trade surplus (deficit).

(d) Trade: Trade in real goods between the investment sending and the investment receiving countries as a fraction of the total trade of investment sending country. Trade in tangible goods is a significant medium for information transfer between countries. By definition, the intensity of tangible goods trading between two

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<sup>67</sup> For example see Frankel and Wei (1993).

countries is a proxy for the level of commitment of financial and other resources to activities that requires transmission of information.

Trade influences the mode, intensity, and richness of information transfer between trading partners in a number of ways. The literature provides a volume of evidence on the vital role of Banks and financial institutions in supporting the flow of international trade. Grosse and Goldberg (1991) study foreign bank activity in the United States and find that foreign investment in the U.S., foreign trade with U.S., and the size of the banking sector in the foreign country are positively correlated with that country's bank presence in the U.S. On the international level, Brealey and Kaplanis (1996) using branches location data of the top 100 banks in the world find that foreign branch location of banks is closely linked to trade and foreign direct investment of the home country, implying that banks follow their customers. They also document a parallel between the rapid increase of banks foreign expansion during the 1960s to the 1980s and the substantial growth of international trade and foreign direct investment.

Buch (2000) studying the determinants of German banks foreign activities finds that foreign trade and foreign direct investments of German companies exhibit a strong and positive correlation to the foreign branch pattern. She also concludes that the German banks follow their customers' abroad. These results point towards the importance of trade in directing the real activity, strength, and experience of the local banks towards their customers (exporters and importers) foreign markets. In addition to the physical presence in the foreign markets, the volume and frequency of trade transactions creates foreign information gathering opportunities for banks through correspondence agreements and other arrangements.<sup>68</sup> Furthermore the complex procedures of purchasing and trading foreign securities present several advantages, in

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<sup>68</sup> Portes and Rey use the number and location of foreign branching as a proxy of the banking activities. This proxy does not provide any dimension of the level of activity or the type of services offered by the foreign branch. Examples of these activities are letters of credits, bank guarantees, and performance bonds.

absolute and relative terms, for a well-developed banking and financial linkages between the investment sending and investment receiving country.<sup>69</sup>

Furthermore, a recent paper by Anderson and Marcouiller (2002) provides evidence that directly links trade volume with the institutional quality of the trading partner. Using data on institutional quality compiled by the world economic forum they show that transaction costs associated with insecure exchange significantly impede international trade. Anderson and Marcouiller (2002) show that insecurity arising from imperfect contract enforcement exposes exporters to the holdup problem, leading to price markup that translates into reduced exports and lower import demand. They also show that cross-country variations in the effectiveness of institutions offer a simple explanation to the observed pattern of trade, in which high-income capital-abundant countries trade disproportionately with one another. These results indicate that trade volume reveals important information concerning the institutional efficiency of the exporting and importing country.

The literature also documents that potential problems encountered in search for and deliberation of new trading partners will offer information advantages to more established bilateral social and business networks, Rangan and Lawrence (1999). This in turn translates into an advantage in identifying and assessing the potential profitability of portfolio investments. The slow and incremental development of trust is what above all makes finding and evaluating exchange partners (i.e. foreign markets analysts, foreign country fund investment managers) so costly. Therefore it is reasonable to assume that the progress of a country in resolving the search and deliberation problems with its trading partners, which is reflected in the growth of bilateral trading volumes, will serve a similar purpose when applied to portfolio investment decisions.

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<sup>69</sup> For example Callaghan, Kleinman and Sahu (1996) outline a number of problems associated with owning a foreign security. These include inefficient and unreliable settlement procedures, complex rules, and restrictions on foreign investments and withholding taxes and others.

In addition, the information contained in bilateral trade, such as historical linkages, industrial structure and similarity in tastes between the investment sending country and the investment receiving country will have an important effect on reducing frictions (transaction cost) that are captured by the distance parameter. One role of bilateral trade is thus to increase the awareness of investors in the sending country with the equity assets and the cultural, financial, political, legal environment and the institutions of the investment receiving country.<sup>70</sup> It is also possible that the trading sector acts as a source of superior and specific knowledge transfer to the investing sector. The information screening through the frequency of trade contacts, the expertise of the local import and export sectors, each in their respective business area, is a potential important source of information to the financial community. The knowledge about the asset(s) of a foreign country gained by the business community through trading ties and contacts spills over to the financial community and becomes an important component of the foreign asset information gathering and selection process. Thus bilateral trade can convey potential equity investing information on both the individual equity asset level and on a countrywide level.

In summary, the information flow in connection with trade in tangible goods provides a medium for information on potential investment objects in the other country. The experience gained through trade also allows for proper calibration of individual pieces of information, e.g. which pieces of information can be considered trustworthy and which are not. Specifically, the intensity of the bilateral trading relationship provides a measure of the breadth and the richness of the information. The higher the intensity of trade flows between two countries, the more intensive is the day to day information flow between them and the more will the relative level of the local information advantage be decimated. Increased information flow exposes the foreign investor in the counter part to a larger pool of potential investment opportunities and leads to an increased weight for this country in the investor's international portfolio allocation.

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<sup>70</sup> For example, Bartram and Dufey (2001) note, "Sometimes existing or perceived cultural differences represent more of a psychological barrier than a barrier of a real nature."

**Table 3** Country attributes, the Informational value of trade, and international portfolio investments.

This table reports parameter coefficients, white corrected standard errors (in parenthesis) and adjusted  $R^2$  for the regressions in which the dependent variable is the aggregate portfolio investment of investors from the investment sending country in the equities of the investment receiving country as a fraction of total international equity portfolio investments of investors from the investment sending, at the end of 1997. All independent variables are defined in Table 1 panel A.

	Panel A: Investments in all countries		Panel B: Investments in developing countries		Panel C: Investments in developed countries	
	(3A.1)	(3A.2)	(3B.1)	(3B.2)	(3C.1)	(3C.2)
Constant	0.0324 (0.1049)	-0.0882 (0.1041)	0.4198*** (0.1306)	0.2604** (0.1062)	0.4392* (0.2528)	-0.1227 (0.2626)
Per capita GDP (ISC)	-0.0008 (0.0046)	0.0033 (0.0045)	-0.0104** (0.0048)	-0.0073* (0.0043)	0.0122** (0.0053)	0.0195*** (0.0055)
Share of world market portfolio	0.4568*** (0.0566)	0.3351*** (0.0518)	1.6089*** (0.5777)	0.3765 (0.7006)	0.4462*** (0.0638)	0.2912*** (0.0577)
Sharpe ratio	0.0024 (0.0037)	0.0077** (0.0038)	-0.0030 (0.0067)	-0.0012 (0.0060)	-0.0070 (0.0084)	0.0180** (0.0082)
Idiosyncratic risk	0.1095 (0.1939)	0.1930 (0.1798)	-0.1943 (0.4575)	0.3357 (0.2534)	-5.7726*** (1.6922)	-3.0182* (1.7179)
GDP growth	0.0917 (0.0990)	0.1109 (0.0966)	0.2522 (0.1715)	0.0610 (0.1501)	-0.6694*** (0.2595)	-0.9041*** (0.2397)
Per capita GDP	0.0050** (0.0021)	0.0026 (0.0019)	0.0031 (0.0031)	-0.0002 (0.0031)	-0.0281*** (0.0088)	-0.0129 (0.0085)
% of market closely held	-0.0203** (0.0087)	-0.0264*** (0.0077)	0.0102 (0.0104)	0.0039 (0.0132)	-0.0556*** (0.0137)	-0.0389*** (0.0120)
Anti-director rights index	0.0015 (0.0012)	0.0015 (0.0011)	-0.0023 (0.0026)	-0.0010 (0.0020)	-0.0005 (0.0031)	0.0057** (0.0029)
Efficiency of judicial system	0.0006 (0.0008)	0.0011 (0.0008)	0.0014 (0.0014)	0.0035*** (0.0012)	0.0051 (0.0041)	0.0097** (0.0038)
Corruption index	-0.0028** (0.0014)	-0.0020 (0.0012)	-0.0002 (0.0020)	0.0006 (0.0015)	-0.0047 (0.0051)	-0.0109** (0.0047)
Risk of expropriation	-0.0016 (0.0011)	-0.0037*** (0.0009)	-0.0057* (0.0033)	-0.0062** (0.0026)	0.0044 (0.0028)	-0.0033 (0.0026)
Rating of accounting standards	0.0004*** (0.0001)	0.0003*** (0.0001)	0.0003* (0.0002)	0.0002* (0.0001)	0.0005* (0.0003)	0.0000 (0.0003)
Distance	-0.0136*** (0.0027)	-0.0038* (0.0022)	-0.0267*** (0.0100)	-0.0092 (0.0069)	-0.0087*** (0.0019)	0.0020 (0.0020)
Common language	0.0223*** (0.0065)	0.0150*** (0.0056)	0.0063 (0.0049)	0.0008 (0.0048)	0.0304** (0.0120)	0.0179* (0.0103)
Trade Balance		-0.0001 (0.0004)		-0.0004 (0.0004)		-0.0007 (0.0009)
Trade		0.3854*** (0.0540)		0.7503* (0.4371)		0.3778*** (0.0473)
Number of observations	718	718	299	299	419	419
Adjusted $R^2$	0.604	0.670	0.360	0.530	0.651	0.717

\*\*\*, \*\*, \* Significant at the 1, 5, and 10 percent

In regression 3A.1 of table 3, we augment the receiving country attributes (regression 2.3 of table 2) with the common language and distance variables. The results of this regression clearly show that these bilateral variables have a substantial incremental contribution in explaining the patterns of international portfolio allocation. The coefficient estimate for distance (in natural logarithmic form) is  $-0.0136$  and is highly statistically significant. Common language coefficient estimate is positive and highly statistically significant reflecting the importance of the attributes of this variable on portfolio country allocations. The coefficient estimates (and sign) of share of the world market portfolio, % of market closely held, and the rating of accounting standards are similar to those in regression 2.3 (table 2).

In regression 3A.2 of table 3, we also include trade balance and bilateral trade in real goods between the investment sending and the investment receiving countries. Trade enters the regression with a positive and a highly statistically significant coefficient estimate. The results indicate that, all else equal, an increase of 1 percent in trade between an investment sending and the investment receiving country leads to an increase of 0.38 percent of the allocation of the international portfolio investments of the former in the later. It is also apparent from this regression that the inclusion of these variables has a substantial impact on the adjusted  $R^2$ . The addition of trade to regression 3A.1 (table 3) increases  $R^2$  from 0.60 to 0.67, an increase of more than 11 percent. Furthermore, an examination of the coefficient estimates for distance and trade balance from this regression provide evidence consistent with the value of trade in reducing the information cost relating to portfolio investments. The magnitude of the coefficient estimate from this regression is about 30 percent of its magnitude in regression 3A.1 (table 3), indicating that trade substantially mitigates the information cost relating to distance.<sup>71</sup> Furthermore, the insignificant coefficient estimate of trade balance clearly indicates that country allocations do not provide a hedge for trade flows between an investment sending and an investment receiving country pairs.<sup>72</sup>

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<sup>71</sup> Aba Al-Khail (1999) demonstrates that the substantial role of trade in reducing the information cost of portfolio investments is not due to variables that are common to both portfolio share and trade regressions.

<sup>72</sup> We have also run, but do not report, regression 3A.2 (table 3) without the trade variable. Trade balance continues to be statistically insignificant and of the same magnitude as in regression 3A.2.

To gain a further insight into the role of trade, as well as the informational value of the investment receiving country attributes, in reducing information cost relating to portfolio investments, we evaluate regressions 3A.1 and 3A.2 (table 3) for investments into developing countries and developed countries separately. Panels B and C of table 3 reports the results of these regressions. Examination of regressions 3B.1 and 3C.1 reveals a number of interesting observations. First, the information cost relating to the spatial separation between investors and their investments, that we proxy with distance, is substantially larger for portfolio allocations in developed countries. Second, the market size of the investment receiving country has a substantially higher influence on portfolio allocations in developing countries. These results are consistent with more information availability on firm of the more developed markets. Third, investors negative bias towards holding equities of the countries in which they have less protection of their investment, that we proxy with the risk of expropriation index, is apparent for investments into developing countries. Fourth, our proxy for the investment sending country financial market development and sophistication enter regression 3B.1 with a negative sign and 3C.1 with a positive sign indicating that richer countries bias their international investments towards more developed and information rich markets. Overall the results of these regressions provide evidence that is supportive of a higher transaction (and information) costs for investing in developing versus developed markets.

Regressions 3B.2 and 3C.2 also include trade balance and bilateral trade in real goods between the investment sending and the investment receiving countries. It is apparent from these regressions that trade has a substantial impact on country allocation, especially in developing markets. In light with the earlier results, it seems plausible that trade has a higher impact on the reduction of information costs in those market were firm specific information is more scarce.

The literature also documents a number of regularities for the pattern of trade between countries. For instance, international trade flows exhibit a large volume of intra-industry trade, resulting from product differentiation, economies of scale, and

other factors, between industrialized (rich) countries.<sup>73</sup> This sector is generally perceived as one with high entry barriers resulting from technology, economies of scale in manufacturing, branding, distribution, and marketing.

Furthermore, international trade pattern shows persistence in bilateral trade relationships. For example, even when the relative exchange rates cause large and permanent shifts in relative prices, bilateral trade volume changes very slowly and with long lags. Rangan and Lawrence (1999) show that information asymmetries arising from identifying potential exchange partners "search" and the process of assessing their reliability and trustworthiness "deliberation" plays an important role in the empirically observed stickiness of bilateral trade.

There is also empirical support showing that production of capital goods, a technology based differentiated product, is highly concentrated in a small group of R&D intensive countries with trade following a highly regional pattern. The developing countries import much of their equipment, each relying on a few large exporters.<sup>74</sup> In addition to the other barriers for differentiated products, this sectors also entails added entry barriers arising from a more intensive exporter involvement in terms of adapting goods to foreign conditions, training foreign workers to use the equipment and provide continuous after sales service. Therefore the nature of this trade elevates the problem of search and deliberation. When buyers and sellers think that deliberation is important but problematic, they will tend to act reluctantly and progressively. In such circumstances economic actions are unlikely to be influenced by relative prices alone.<sup>75</sup>

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<sup>73</sup> Helpman (1998) provides a brief summary of international trade theory and empirical findings.

<sup>74</sup> See Eaton and Kortum (2001).

<sup>75</sup> See Rangan and Lawrence (1999).



**Table 4** Technology and non-technology trade and international portfolio investments

This table reports parameter coefficients, white corrected standard errors (in parenthesis) and adjusted R2 for the regressions in which the dependent variable is the aggregate portfolio investment of investors from the investment sending country in the equities of the investment receiving country as a fraction of total international equity portfolio investments of investors from the investment sending, at the end of 1997. All independent variables are defined in Table 1 panel A.

	Panel A: Investments in all countries		Panel B: Investments in developing countries		Panel C: Investments in developed countries	
	(4A.1)	(4A.2)	(4B.1)	(4B.2)	(4C.1)	(4C.2)
Constant	-0.0747 (0.1028)	-0.0919 (0.1054)	0.2946*** (0.0953)	0.2571** (0.1157)	-0.1229 (0.2696)	-0.1157 (0.2562)
Per capita GDP (ISC)	0.0033 (0.0045)	0.0031 (0.0046)	-0.0077* (0.0041)	-0.0073 (0.0046)	0.0191*** (0.0056)	0.0196*** (0.0054)
Share of world market portfolio	0.3176*** (0.0501)	0.3538*** (0.0526)	0.7166 (0.6013)	0.2782 (0.8242)	0.2703*** (0.0560)	0.3107*** (0.0584)
Sharpe ratio	0.0091** (0.0038)	0.0065* (0.0038)	-0.0026 (0.0053)	-0.0003 (0.0069)	0.0207** (0.0087)	0.0157** (0.0079)
Idiosyncratic risk	0.1803 (0.1793)	0.1931 (0.1810)	0.3133 (0.2513)	0.2647 (0.2731)	-3.1529* (1.7553)	-2.9810* (1.6729)
GDP growth	0.1135 (0.0959)	0.1132 (0.0978)	0.0860 (0.1421)	0.0790 (0.1577)	-0.8890*** (0.2389)	-0.9201*** (0.2395)
Per capita GDP	0.0025 (0.0019)	0.0028 (0.0019)	0.0002 (0.0029)	0.0001 (0.0031)	-0.0120 (0.0088)	-0.0137 (0.0084)
% of market closely held	-0.0287*** (0.0077)	-0.0246*** (0.0078)	0.0030 (0.0126)	0.0047 (0.0129)	-0.0382*** (0.0122)	-0.0395*** (0.0120)
Anti-director rights index	0.0019 (0.0011)	0.0012 (0.0011)	-0.0006 (0.0019)	-0.0015 (0.0022)	0.0064** (0.0029)	0.0051* (0.0028)
Efficiency of judicial system	0.0010 (0.0008)	0.0011 (0.0008)	0.0030*** (0.0011)	0.0035*** (0.0013)	0.0101*** (0.0039)	0.0092** (0.0038)
Corruption index	-0.0021* (0.0012)	-0.0019 (0.0012)	0.0006 (0.0015)	0.0006 (0.0016)	-0.0122** (0.0048)	-0.0097** (0.0047)
Risk of expropriation	-0.0038*** (0.0010)	-0.0035*** (0.0009)	-0.0067*** (0.0025)	-0.0059** (0.0028)	-0.0032 (0.0027)	-0.0029 (0.0026)
Rating of accounting standards	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0001 (0.0001)	0.0003** (0.0001)	0.0000 (0.0003)	0.0000 (0.0003)
Distance	-0.0049** (0.0022)	-0.0036 (0.0023)	-0.0118* (0.0062)	-0.0105 (0.0071)	0.0006 (0.0021)	0.0028 (0.0019)
Common language	0.0159*** (0.0055)	0.0149*** (0.0057)	0.0029 (0.0043)	0.0004 (0.0051)	0.0190* (0.0101)	0.0176* (0.0103)
Trade Balance	0.0000 (0.0004)	-0.0002 (0.0004)	-0.0003 (0.0003)	-0.0004 (0.0004)	-0.0005 (0.0009)	-0.0007 (0.0009)
Technology trade	0.3586*** (0.0545)		0.6287* (0.3687)		0.3482*** (0.0504)	
Non-technology trade		0.3859*** (0.0518)		0.7331 (0.4587)		0.3899*** (0.0466)
Number of observations	718	718	299	299	419	419
Adjusted R <sup>2</sup>	0.670	0.667	0.531	0.488	0.715	0.719

\*\*\*, \*\*, \* Significant at the 1, 5, and 10 percent

One can also argue that technology based product flows, for example capital equipment, will necessary afford the exporter a relative informational advantage on the financial health, growth potential and strategies of the exporting and importing partners.<sup>76</sup> Further, the nature of technology products, especially capital goods, entails and requires a larger amount of monitoring and evaluation of the financing banks to insure the viability of the investment. In contrast, low-technology products are usually commodity classified, standardized, and have large homogeneous aspects. The standardization and the availability aspects of the products results in relatively low switching costs, insuring price competitiveness and flexibility in sourcing.<sup>77</sup>

As a robustness check for the information content validity of the trade intensity variables, we segregate bilateral trade into two components. The first component measures the intensity of technology based bilateral trade (level 7)<sup>78</sup>, and the second measuring the low-technology bilateral trade measured as the aggregate trade less (level 7) trade. Table 4 presents the results of technology and low-technology trade variables for the full data set as well as for investments into developing and developing markets. There is some support in the results, albeit weak, that especially for developing markets, technology trade seems to have a higher influence on allocations in these countries. These results are also consistent with our earlier findings. That is potentially higher incremental informational content of technology trade on the financial health, growth potential and strategies of firms in an investment receiving country is more valuable for investments in developing countries in which information on its firms are more scarce.

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<sup>76</sup> For example, financing, purchase scheduling and implementation can reveal very important information on a number of organizational, strategic and financial aspect of both trading organizations.

<sup>77</sup> The standardization of the product substantially reduces, but does not eliminate the search and deliberation problem and the insecurity arising from contract enforcement.

<sup>78</sup> Level 7 trade is described in the data section.

## V. Summary

We use rich and comprehensive data on the aggregate international portfolio investments of investors from a large number of countries to examine how different country attributes influence portfolio investments in a country. We decompose these attributes into two categories, one that relate to the characteristics of an investment receiving country and those that are unique to a particular investment receiving and investment sending country pair.

The literature suggests two groups of investment receiving country attributes. These are: financial market size and performance; and corporate governance variables that provide proxies for financial development, legal structure, and information availability on the firms in the investment receiving country. The first group includes the share of the market in the world market portfolio as well as other pull factors such as the market growth potential and its risk-return characteristic. The second group includes per capita GDP, percent of its market that is closely held, as well as a number of indices, from La Porta et al. (1997), that proxy the country's investor protection and corporate governance structure. We find the capital market size to be the dominant investment receiving country attribute on portfolio country allocations. Our results indicate that once we control for the size of the financial market our proxies of corporate governance parameters have only a marginal influence on the level of foreign investments. In line with the existing literature, we interpret this as evidence that the level of information disclosure that is closely related to prevailing corporate governance structures is largely reflected in the size of the market.

For the second category, attributes that are unique to a particular investment receiving and investment sending country pair, we include distance, common language and the intensity of their trade in real goods. Our results clearly show that distance between an investment sending and an investment receiving country has a large negative impact on the level of these investments. Since distance to some extent provide a proxy for transaction cost (and information cost) this results provide evidence for the important role of information asymmetry on international portfolio allocations.

More importantly, we find that the bilateral trading intensity in tangible goods apparently contributes to a substantial reduction in information cost relating to portfolio investments between countries. We demonstrate that this finding is not due to investors demand to hedge the risks of the foreign revenues and expenses of the firms in their domestic portfolio. We further separate investments into developing countries and investments into developed countries and examine the impact of trade on these investments. We find trade to have a higher incremental impact on portfolio allocations in developing countries. These results are consistent with trade providing more important information especially on firms in countries in which the corporate governance structure and the information environment of firms generate less reliable information. Finally, we present some evidence that the higher informational content of technology trade seems to imply a higher impact on information cost relating to portfolio investments, especially in developing countries.

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## **The Impact of FDI on International Portfolio Investments**

### **Abstract**

Some empirical research argues that part of the reason for the observed “home bias” is that investors are able to indirectly achieve internationally diversified portfolios via domestically listed multinational firms. Another branch of this research attributes the “home bias” and country allocations to more deeply rooted informational causes. Using a four-year annual panel of Finnish international portfolios and Foreign Direct Investments in twenty-five countries, we provide evidence consistent with the first explanation.

JEL Classification: F21; F23; G11.

Key Words: Portfolio Choice; International Investments; Multinational Firms; Information Asymmetry.



## I. Introduction

In recent years it has been well documented that investors exhibit a negative bias towards holding cross-border investments. This behavior, usually dubbed “home bias”, is at odds with the long established benefits of international diversification as implied by conventional theories of international finance. Previous research shows that the magnitude of the home bias is too large to be explained by differential taxation, transaction costs, PPP hedging, human capital hedging, and a number of other plausible remaining legal and institutional barriers to cross border investments.<sup>79</sup>

A popular explanation for this phenomenon suggests that the spatial separation between investments and investors induce an informational asymmetry between local and distant investors. Tesar and Werner (1995), Coval and Moskowitz (1999), and Grinblatt and Keloharju (2001) show that domestic and international portfolios of investors exhibit strong bias towards domestic and near-by stocks. These studies suggest that informational asymmetries between the local and non-local investors constitute an important indirect barrier that prohibits investment patterns conforming to modern finance theory.

Research that specifically address the country allocation bias in investors international portfolios attributes the observed country allocation in investors international portfolios to the intensity of information flow between the investment sending and the investment receiving country. Portes and Rey (1999) present support for the gravity model in explaining bilateral equity flows between fourteen (14) countries. They find a highly significant coefficient for distance in addition to obvious controlling variables like market capitalization of the receiving country. Since distance at least to some extent measures investment costs (including information costs) this finding tends to support an explanation based on asymmetric information. Further support for the asymmetric information explanation is obtained from the fact that the variable "distance" in their regression drops in magnitude and

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<sup>79</sup> See Adler and Dumas (1983), Baxter and Jermann (1997), Cooper and Kaplanis (1994), French and Poterba (1991), Lewis (1999), Stulz (1994, 1981), Tesar and Werner (1995) and Uppal (1992).

significance with the addition of other information related variables, like telephone traffic volume to the gravity model formulation.<sup>80</sup>

In a recent paper, Aba Al-Khail (2002) shows bilateral trading intensity in tangible goods between countries seem to provide a good proxy for the intensity of the information flow channel of cross border equity investing. He finds that the bilateral trading intensity in tangible goods apparently contributes to a substantial reduction in information cost relating to portfolio investments between countries. The paper also finds trade to have a higher incremental impact on portfolio allocations in developing countries. These results are consistent with trade providing more important information on the firms in countries in which the corporate governance structure and the information environment of firms generates less reliable information on these firms. Finally, we present some evidence that the higher informational content of technology trade seems to imply a higher impact on information cost relating to portfolio investments, especially in developing countries.

Another strand of the finance literature attempts to explain the observed low levels of cross border portfolio investments by recognizing the opportunities available to investors to achieve geographical diversification through domestically listed equities. This literature points to the increasing role of multinational corporations in cross border transactions and argues that this multinational dimension of some domestically listed firms allows domestic investors to use these firms as vehicles to indirectly obtain substantial international diversification benefits.

The role of multinational corporations in the international production activity, through foreign direct investments (FDIs), has exploded in recent decades. In the year 2000 FDIs grew by some 18%, surpassing the growth of other economic aggregates like world GDP and trade. Specifically for Finland, the development of the FDI

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<sup>80</sup> Explicitly for Finnish investors Aba Al-Khail (1999) finds that the basic form of a gravity equation explains about 80 percent of the variance in the dispersion in Finnish foreign portfolio holdings between countries that received Finnish foreign portfolio investments in 1997. Sizeable and statistically significant parameter estimates were found for the market capitalization of the receiving country and the direct distance between the financial capitals of the sending country and the receiving country. In addition, the introduction of bilateral trade between the sending country, Finland, and the receiving country, into the model substantially reduces the significance of other variables that can be interpreted as proxies for information asymmetries.

activities of firms is no less dramatic. During the last decade, Finland's outbound FDI stock has grown from 7.5 billion Euro in 1991 to 57 billion Euro in 2000, an average annual growth rate of 27 %. These figures become even more remarkable when compared to the simultaneous growth of Finnish exports (15.6, 49.2, 14 %), and imports (14.7, 36.6, 11 %).

This paper uses a panel (1997 through 2000) of Finnish allocation of international equities and the outward FDIs of Finnish firms in an attempt to discriminate between these two explanations. According to investors' diversification via Finnish multinationals explanation, portfolio theory would predict that portfolio country allocation show an inverse relationship to FDI country allocation. On the other hand, the information asymmetry explanation stipulates that FDI increases the information flow between the investment sending and the investment receiving countries, and hence increase of FDI contribute to the reduction of information asymmetry and yield increases in portfolio allocation in the investment receiving country.

The evidence supports the information asymmetry explanation. The results indicate that, in addition to trade in tangible goods, FDIs are an important component of commercial trading transactions providing a proxy for the intensity of the information flow channel between countries. These channels of information contribute to the reduction of information asymmetry resulting in an increase in country portfolio allocation.

The paper proceeds as follows. The next section presents a brief review of the literature on the value of geographic diversification by multinational corporations. Section III describes the data and acknowledges their sources. Section IV describes the methodology of evaluating the relationship between FDIs and portfolio investments. Section V presents the results and section VI summarizes the major finding of this paper.

## **II. Foreign Direct Investment, The Geographical Diversification Benefits of Multinational Corporations, and The Influence of FDI on Portfolio Investment**

The relationship between the international activity of firms and the potential indirect diversification benefits for investors has been the subject of a considerable research. The early approach in resolving this issue mainly addresses the relationship between international involvement on the exposure to the domestic and international indexes, and the risk reduction benefits. Agmon and Lessard (1977) use a sample of 217 securities and find that the higher the degree of a firm's international activity, the higher are the exposure of the firm's return to the international (excluding US) market index and the lower is the exposure to the US index. They associate this finding with investors' recognition of corporate international diversification. Jacquillat and Solnik (1978) provide contradicting evidence finding that multinational firms behave very much like purely domestic firms. Fatemi (1984) relates the extent of international involvement of firms to their risk adjusted abnormal returns around the period of the initiation of these activities. Using event study methodology, this study shows that abnormal returns rise by 18% during the 14 months that precede the initial international diversification of firms.<sup>81</sup>

The proposition that is applied in the more recent research relates to investors' recognition of the extent of the multinational activities of firms as reflected by their relative valuation. Researchers have applied a number of different approaches to test this proposition. One approach has been to test the implications of the internationalization theory of FDI on the valuation of multinational firms. The internalization theory of FDI stipulates that FDI takes place as a mode for leveraging a firm's intangible assets through geographic expansion leading to an increase in the value of the firm.<sup>82</sup> These firm-specific intangible assets include brands, patents, managerial skills, research and development advantages, scale economies in

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<sup>81</sup> The results are based on data for 18 firms only.

<sup>82</sup> The definition of foreign direct investment (FDI), OECD 1996, encompass investments that reflect investors (direct investor) objectives of obtaining "a lasting interest" in the entity of the foreign economy ... "The lasting interest implies the existence of a long term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise, as evidenced by an ownership of at least 10 %" of the ordinary shares or voting power in the enterprise.

manufacturing and advertising. The economics of information arising from the proprietary aspect of these assets elevates opportunistic behavior that hinders their exchange at arm's length and induce firms to internalize the markets for their cross border leveraging.<sup>83</sup> Morck and Yeung (1991) find strong evidence in favor of the internationalization theory in that the degree of the multinationality of firms is positively correlated with excess firm value. They find that their proxy of FDI investments of firms, the number of foreign subsidiaries, is positively related to the firms' excess valuation as measured by Tobin q. When they specifically associate the level of multi-nationality with firms intangible assets, R&D spending and advertising, they find that the former is only related to a positive Tobin q in the presence of the latter.

Errunza and Senbet (1981, 1984) provide evidence that investors are aware of the diversification benefits as reflected by the excess valuation of US internationally diversified firms. These authors argue that multinational firms offer investors the opportunity to gain international diversification exposure via their FDI investments because of the presence of barriers that investors face in achieving direct international diversification. Multinational firms, through their international business engagement and foreign operations maybe better placed to circumvent, among other things, capital market segmentation, constraints on capital flows and complicated taxation issues. Direct evidence also shows that investors can achieve a considerable level of international diversification without having to trade in financial markets outside their borders. Errunza, Hogan, and, Hung (1999) show that, for U.S. investors, domestically traded assets that include multinational corporations provide investors with internationally diversified portfolios that mimic the performance of foreign equities.<sup>84</sup>

Recent evidence on investors' valuation of the multinational dimension of firms is mixed at best. Denis, Denis, and Yost (2002), find that globally diversified US firms are valued at discount relative to domestic single segment firms. On the other hand, Bodnar, Tang, and Weintrop (1998) use similar data and provide evidence that

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<sup>83</sup> For more detailed explanation, see Caves (1997), pages 3-5 and 144-147.

<sup>84</sup> It should be noted that the mimicking portfolios involve large short positions.

investors show preference to geographic diversification by US multinationals as reflected in excess valuations of these firms. Using a large sample of industrially and geographically diversified firms for the period from 1987 through 1993, and controlling for possible business activity segment classification, industry effects, self selection, and multinationality, they find that internationally diversified firms are valued at a 2.2 percent higher level than a single activity domestic firm. Furthermore, a recent paper by Campa and Kedia (2002) shows that any analysis of the impact of diversification on valuation must account for the of the self-selection decision of these firms to diversify. They show that once accounting for this endogeneity, the industrial diversification discount, that is well documented in the literature, for example Lang and Stulz (1994) and Berger and Ofek (1995), disappears.

In summary, the increasing role of multinationals in world production and goods cross-border movement activities is accompanied by an increase in the exposure of these firms to the international economic environment. This increased exposure can provide investors with some indirect diversification benefits. In this case, modern portfolio theory would predict that investors positive disproportionate exposure to a country through the FDI of a domestically listed firm will be offset by a lower exposure through their direct holding of the assets of the country.

On the other hand FDI is also an important source of information flow relating to the economic conditions, increased familiarity with functioning of the institutions and norms of a country, that are also important for portfolio investments. The Uppsala internationalization model offers important insights on the informational content of FDI.<sup>85</sup> This model portrays the internationalization process as an incremental learning process that cultivates into an FDI investment. Four processes are identified. These are (i) Unorganized export activity, (ii) Export activities are organized around distributors, (iii) The establishment of an overseas subsidiary, and (iv) Foreign direct investments in manufacturing. The implicit argument of this model is that the development of the internationalization of firms follows logical steps with a cumulative impact on the information gathered on foreign markets. Larimo (1985)

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<sup>85</sup> Johanson and Vahlne (1977).



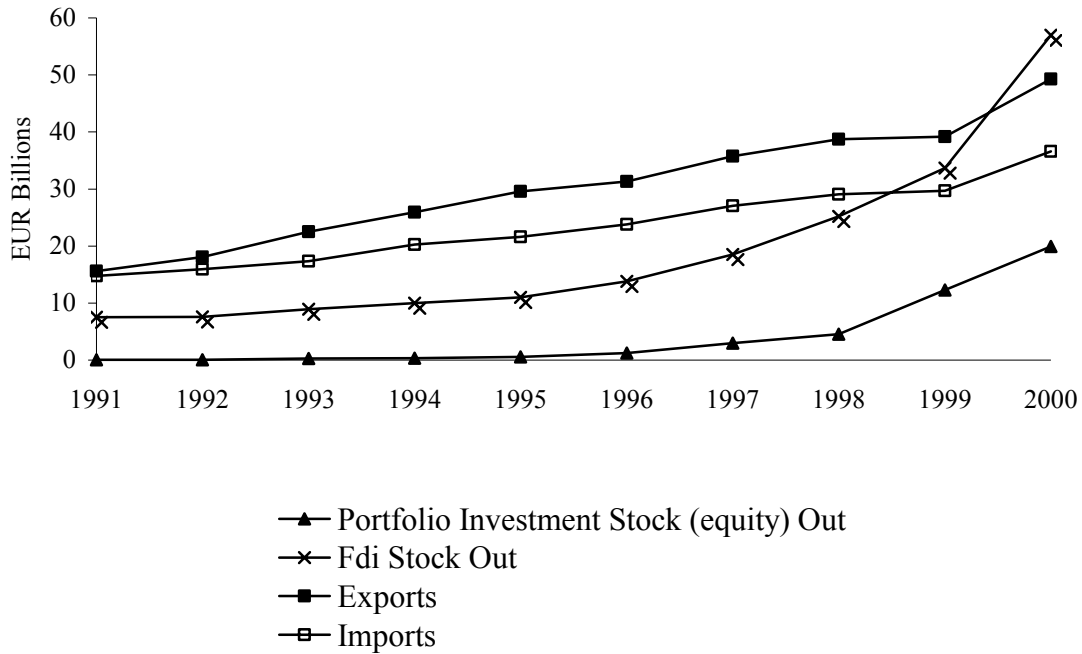
provide support that this process plays an import role in the manner by which Finnish firms initiate their FDI investments. Therefore, according to an informational-based explanation this increase in the flow of information with a country will also lead to an increase in the portfolio allocations in that country.

### **III. Data Sources and Description**

Our data for the international portfolio (equity) investment positions in more than 30 countries is from the Bank of Finland. The data covers all industrialized countries and a good number of newly industrialized and emerging countries. The data provides the position of Finnish investors in these countries as of the 31<sup>st</sup> of December for 1997 through 2000. Finnish Foreign direct investment data is also from the bank of Finland. The data set covers all European Union countries, nine other European countries including Norway and Switzerland, the United States and Canada, Mexico and Venezuela from South America, and thirteen Asian Pacific countries including Japan, Australia, Hong Kong and China. Table I.1 of the Appendix provides more details of the coverage of this data. In the analysis, we use all the available data including those with zero values reported by the source. The merchandize exports and imports of Finland are from the database of the Organization of Corporation and Development (OECD). Financial data is from FIBV and Datastream. Financial data is not available for Estonia, Latvia, and Lithuania. The remaining part of this section provides a brief overview of the characteristics of Finnish international portfolio investment, foreign direct investments, and exports.

Finnish investors appetite for international investments only took shape during the second half of the nineties, with the average stock position during 1996-2000 about 3000 % more than the average position during 1991-1995 (Figure 1). The growth during the second half of the nineties is just as impressive. The total value of the Finnish international portfolio investments increased from 2.8 billion Euro at the end of 1997 to 21.9 billion Euro at the end of the year 2000.

**Figure 1** The development of Finland's balance of payments



**Table 1** The International portfolio investments (Equities) of Finnish residents in the European Union, European Monetary Union and the top ten countries.

1997		1998		1999		2000	
Region / country	% of total portfolio	Region / country	% of total portfolio	Region / country	% of total portfolio	Region / country	% of total portfolio
EU	66.2	EU	68.0	EU	64.7	EU	69.5
EMU	34.9	EMU	39.1	EMU	30.2	Sweden	30.6
Sweden	15.6	US	13.1	Sweden	21.4	EMU	26.2
US	14.2	Sweden	12.7	US	16.6	US	17.9
UK	12.4	UK	12.2	UK	10.3	UK	10.6
Luxembourg	11.9	France	9.5	France	8.6	France	8.2
Japan	6.4	Germany	8.4	Japan	7.1	Netherlands	5.3
France	6.2	Luxembourg	7.5	Germany	7.0	Germany	4.7
Netherlands	6.0	Netherlands	6.3	Netherlands	5.4	Japan	4.5
Germany	5.6	Switzerland	6.0	Luxembourg	4.3	Switzerland	4.3
Norway	4.1	Japan	5.0	Norway	4.2	Luxembourg	3.4
Switzerland	4.1	Denmark	4.0	Switzerland	3.7	Denmark	2.0
Total: Millions EURO	2,844	Total: Millions EURO	4,894	Total: Millions EURO	12,539	Total: Millions EURO	21,934

Table 1 shows the top twelve destinations of Finnish portfolio investments for the period of 1997 to 2000. Finnish investors show a resounding bias towards investments in European Union countries. These countries receive more than four times the investment in the US market, even though the former has the same gross domestic product and about a third of the market capitalization of the US. In 2000, Sweden took a resounding 30.6 % of the total Finnish investment surpassing the value of the total investment in the European Monetary union countries, 26.2%.

During the last decade, Finland's FDIs have evolved into a major force in the economy. During this period Finland's outbound FDI stock has grown from 7.5 billion Euro in 1991 to 57 billion Euro in 2000 (Figure 1), an average annual growth rate of 27 %. The European union countries are the largest recipients of Finnish FDI. Further, the value of this FDI stock has increased from 55 % in 1991 to 64% in 2000 of the total. On the country level, Sweden, Finland's traditional partner took in 24.3% followed by Netherlands 20.3%, the U.S. 15.2%, Germany 9% and France 3.8% of the total outbound FDI stock.

Larimo (1995) documents a number of features that characterize outbound Finnish FDIs. First, they are strongly related to the host country demand potential, with the majority of investments directed towards developed economies. Second, FDI investments are mostly horizontal in nature. Third, its growth in OECD (developed) countries is largely achieved through acquisitions.

Trade flow data shows that Europe has a dominant position in Finland's foreign trade. Trade with Europe accounts for more than 70 % of the total Finnish trade. On the individual country levels seven of the top ten trading partners, belong to the European Union (4 EMU members).

#### **IV. The Relationship Between FDIs and Portfolio Investments**

The central building block of this paper addresses the role of the international activities of firms in investors' domestic portfolio, on the country allocations in their international portfolio investments. Specifically, we attempt to assess the association between these two forms of international allocation of investments. Investors' domestic portfolios of locally listed firms imply a certain international exposure as related to those firms' direct international investments. This international component of the domestic portfolio can have different implications on the manner by which investors formulate their international portfolio investments. From the perspective of portfolio theory, and after controlling for other country characteristics, investors direct allocation deviations from the prescribed world market portfolio should be related to allocation deviations implied by the domestic portfolio. That is apparent positive (negative) deviations in international portfolio allocations are balanced by negative (positive) deviations in indirect allocations as reflected by the domestic firms' direct international investments. On the other hand, the intensity of the direct international investments in a foreign country by firms in the domestic portfolio also implies more information flows with this country. This increase in information flows enhances cross border transmission of asset specific information leading to a positive proportional increase in the allocation of portfolio investments into that country.

The analysis of the relationship between international Portfolio investments and FDIs considers both the intensity of the country allocation in these investments as well as the relationship of this allocation to the size of the financial market and the economy of the country. Specifically, we are interested in showing how a deviation, from a certain benchmark, in relative portfolio investments in a country relates to the intensity of FDIs in the same country. Accordingly, we construct the following variables:

Portfolio investments deviation =  $((\rho_{it}^F / \rho_{it}^W) - 1)$ , where  $\rho_{it}^F$ , and  $\rho_{it}^W$  is the weight of country  $i$  in year  $t$  in the total international portfolio of Finnish investors and the world market portfolio,<sup>86</sup> and

Firms investments intensity =  $(\Phi_{it}^F / GDP_{it})$ , where  $\Phi_{it}^F$  is the outbound Finnish FDIs in country  $i$  in year  $t$ , and  $GDP_{it}$  is the gross domestic product of country  $i$  in year  $t$ , and

Firms income intensity =  $(\pi_{it}^F / GDP_{it})$ , where  $\pi_{it}^F$  is the outbound Finnish FDIs income in country  $i$  in year  $t$ , and  $GDP_{it}$  is the gross domestic product of country  $i$  in year  $t$ .

Therefore, the analysis will specifically address how a portfolio investment concentration in one country relative to that country's financial market size with respect to the world market portfolio, is related to an FDI concentration, in terms of both the level and the income of the investment, in the same country relative to that country's size of the economy.

To assess the relationship between the direct and indirect portfolio allocations of Finnish investors, we run multivariate regressions of the portfolio investment deviation against each of the proxies for the indirect portfolio allocation, firms' investments intensity, and firms' income intensity. The regressions include a number of control variables to account for the nature of the construction of these ratios as well as other characteristics of countries that may have an impact on the level of allocations by both investors and firms. These are:

1. Distance: The direct (great circle) distance between Helsinki and the economic center of the countries that receives the portfolio and FDI investments, in natural logarithmic form. Portes and Rey (1999) relate distance to information costs and find that it accounts for a significant portion of the variance of portfolio flows between countries. Specifically for Finland, Aba Al-Khail (1999) shows this

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<sup>86</sup> This formulation implies the assumptions of fully integrated world capital markets, an international version of the one country CAPM holds with the world market portfolio being the optimal risky portfolio for all investors from all countries.

variable plays a similar role on the manner by which Finnish investors formulate their international portfolio investments.

2. Market Capitalization: The equity market capitalization of country C at the end of period t, in natural logarithmic form. The literature documents that investors seem to exhibit a preference for larger stocks and equity markets. For example Morck et al. (2000) present evidence that larger markets have more informative prices that reflect more company specific news of individual stocks. Brennan and Cao (1997) find that foreign investors do not appear to face any informational disadvantage when investing in a large capital market such as that of the United States. This feature allows more informed investment decisions as well as lessens the information asymmetries that investors face in foreign markets.<sup>87</sup>
3. Per capita GDP: Per capita gross domestic product, during period t, in natural logarithmic form. This variable has been shown to provide a proxy for a country's respect for the rule of law, law enforcement and quality of accounting influence on the level of portfolio investments.<sup>88</sup> In addition, Morck et al. (2000) show that the per capita GDP is highly correlated with their proxy measuring government respect for private property. They show that government respect for private property is the main driver of the more asynchronous stock prices observed in higher income countries that has the potential of reducing the extent of information asymmetry between local and foreign investors.
4. Market return is the annualized average daily return, %, of the equity market of country C during period t. This variable controls for both the changes in levels as a result of market performance and the performance induced new allocation.

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<sup>87</sup> On a national level, Falkenstein (1996) using data on the holdings of US mutual funds finds that in addition to conventional risk proxies, funds prefer liquid and large stocks. He equates these preferences with information availability asymmetry between the large stocks and small stocks. Merton (1987) argues that investors hold shares in firms in which they are more familiar and investors are more likely to be familiar with large firms. Kang and Stulz (1997) find market value to be an important determinant of foreign holdings of Japanese firms.

<sup>88</sup> La Porta et al. (1997) report that the correlation between the per capita GDP and their measure of rule of law is 0.87. Also, La Porta et al. (1998) report that per capita GDP accounts for more than half the variation in their law enforcement and accounting standards measures.

5. Relative exports: The ratio (%) of the exports of Finland to country C relative to the total Finnish exports during period t. This variable is a component of the international activities of Finnish firms. In addition, previous research shows that the level and changes of this variable is a good proxy for information flows between countries that impacts portfolio allocations.

## V. Empirical Results

We begin this analysis by showing the relationship between portfolio investments deviations with the country characteristics summarized in the previous section. Table 2 presents the results of this regression. The multivariate regressions are for each year from 1997 through 2000, as well as for the pooled data.<sup>89</sup> The constants for all regressions and the fixed effect dummies for the pooled regression are not shown. Further, to account for the relatively shorter distance between Helsinki and the other financial markets in Europe relative to the rest of the world markets, we also include in this regression a Europe dummy variable (=1 if the financial market is situated in Europe).<sup>90</sup>

It is apparent from this table that the portfolio investment deviation is strongly influenced by both regional factors and the distance between the financial center of the investment receiving country and Helsinki. Both of these parameters are persistent across all years as well as the pooled sample. In the pooled regression the estimated coefficient for the logged distance between Helsinki, the financial center of Finland, and the financial capital of the investment receiving country is about -7. That is the Finnish portfolio investments in a country with a distance of about 2.7 times further from Helsinki than an otherwise identical country is on average 7 percent lower. In other words deviations away from the world portfolio allocations are strongly

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<sup>89</sup> Considering its tax haven status, Luxembourg is excluded from these regressions.

<sup>90</sup> The addition of a Europe dummy has a significant impact on the overall fit of the equation. I also ran two other separate regressions (not reported) with dummies that consider the location of the financial market as part of the European Union, and European Monetary Union. The results were inferior to the one that I report.

**Table 2** Regressions of portfolio investment deviation on country characteristics and investors' preferences

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>Pooled</b>
Distance	-5.12 (1.43)	-5.54 (0.95)	-7.83 (2.13)	-8.95 (3.86)	-7.05 (1.32)
Market capitalization	-0.59 (0.34)	-0.61 (0.47)	-1.39 (1.08)	-0.18 (0.83)	-0.64 (0.32)
Per capita GDP	1.10 (0.52)	0.93 (0.60)	1.49 (1.50)	-0.23 (1.00)	0.76 (0.40)
Return	1.11 (0.85)	-1.46 (0.85)	5.40 (3.43)	-2.26 (2.91)	0.33 (0.59)
Relative exports	10.28 (18.23)	5.11 (15.45)	16.11 (33.31)	19.75 (43.13)	12.68 (13.66)
Europe dummy	-7.75 (2.07)	-6.98 (1.38)	-9.30 (2.61)	-11.58 (5.03)	-9.65 (1.85)
Adjusted R <sup>2</sup>	0.59	0.71	0.65	0.48	0.60
Number of observations	29	29	23	24	105

This table reports parameter coefficients, white corrected standard errors (in parenthesis) and adjusted R<sup>2</sup> for the regression in which the dependent variable is the Portfolio investments deviation ( $(\rho_{it}^F / \rho_{it}^W) - 1$ ), where  $\rho_{it}^F$  and  $\rho_{it}^W$  is the weight of country *i* in year *t* in the total international portfolio of Finnish investors' and the world market portfolio respectively. The independent variables are [Distance] the direct (great circle) distance between Helsinki and the economic center of the investment receiving country, in natural logarithmic form, [Market capitalization] the market capitalization of the investment receiving country, in natural logarithmic form, [Per capita GDP] per capita gross domestic product of the investment receiving country, in natural logarithmic form, [Return] the annualized daily returns of the equity market index of the investment receiving country measured in US dollars, [Relative exports] the ratio of the exports of Finland to the investment receiving country relative to total Finnish exports, and [Europe dummy] a dummy variable that equals 1 if the receiving country is locate in Europe, and 0 otherwise. The regressions are for a year-by-year basis, as well as on data pooled over the years from 1997 to 2000. The pooled regression allows for fixed effects by year. Constants and year-dummies in the regressions are not shown.



influenced by the distance separating Finland from the portfolio investment destination.

Another observation from this result is the relatively smaller influence of market capitalization variable. In the pooled regression, market capitalization enters the regression with a negative sign implying that investment levels deviations from what is warranted by the market capitalization of the country are more influenced by the distance of Finland from the country and European location than its' capital market size.

We run (but do not report the results in a separate table) a number of additional regressions to check the robustness of these results. First we excluded Switzerland and Luxembourg, considering their tax haven status, and Sweden, a country that receives the highest portfolio investments relative to the size of its capital market. Further, we use dummy variables in the pooled regression to account for Finnish portfolio investments into developed countries, developing country, and non-European countries. We also check for potential influence of outliers in the dependent variable, that is countries with zero direct portfolio investments or heavily overweighed countries like Sweden and Denmark. The results of all of these regressions are not significantly different than for the pooled data that we report.

Having confirmed the adequacy of the regression model in capturing the dynamics of the country characteristic influence on the portfolio investment deviations, we will complement the pooled regression with the firms' investment intensity variable. Column 3.1 of table 3 presents the results of this regression.<sup>91</sup> The first observation from these results is the substantial improvement in the fit of the regression. The adjusted  $R^2$  increases from 0.60 to 0.68 indicating that the addition of the firms' investment intensity contributes substantially to the information that is necessary in explaining the characteristics of the portfolio investment deviation. In addition, these

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<sup>91</sup> The constant and the fixed effects dummies for this pooled regression are not shown.

results show a clear positive relationship between portfolio investment deviation and the firm investment intensity. A 1% increase in level of the firms investment relative to the size of the economy in a country, all else equal, leads to about 200% increase in Portfolio investment deviation. That is both investors' portfolio investments and their indirect portfolio exposure to a country via the shares of their domestically listed multinational firms move in the same direction. In other words, an over (under) exposure to the market fundamentals of a country is further increased (decreased) by the indirect exposure through the international activity of the domestic firms in that country. This increase in the deviations in the allocation of the assets of a country implies an increase in the deviations away from what it's market size and economy warrants with respect to the world market portfolio, a clear contradiction of the international CAPM<sup>92</sup>. On the other hand, if one relates firms FDI's investment in a country relative to the size of its economy, with the level of information flows that result from this activity, then one would expect that an increase in firms investment intensity, would generate more information flows that will lead to an increase in the allocation of the assets of the country. The results provide a clear support of this hypothesis.<sup>93</sup>

The results also show a substantial reduction in the coefficient estimate of the distance parameter. To further investigate this, we run the same regression without the distance parameter, column 3.2 of table 3. As is apparent from the results of this regression, the exclusion of the distance parameter has no effect on the sign of the firms' investment intensity. Since distance at least to some extent measures information costs, this finding tends to also provide support for an explanation centered on asymmetric information.

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<sup>92</sup> This is of course with the usual assumption of perfectly integrated capital and goods markets.

<sup>93</sup> For this regression we performed similar robustness checks as those reported for the country characteristics regression. The results of this analysis are not significantly different from the results that we report.

**Table 3** Regressions of portfolio investments deviation on firms' investments intensity, firms' income intensity, country characteristics, and investors' preferences.

	<b>3.1</b>	<b>3.2</b>	<b>3.3</b>	<b>3.4</b>	<b>3.5</b>
Distance	-4.63 (1.03)		-8.51 (1.76)	-5.76 (1.25)	-5.23 (1.35)
Market capitalization	-0.59 (0.29)	-1.35 (0.45)	-0.91 (0.55)	-0.96 (0.47)	-1.01 (0.46)
Per capita GDP	0.73 (0.34)	1.41 (0.49)	0.80 (1.07)	1.80 (1.11)	2.35 (1.17)
Return	0.15 (0.52)	0.52 (0.62)	0.69 (2.34)	-0.24 (2.44)	-0.84 (2.51)
Relative exports	6.37 (8.69)	43.09 (14.47)	13.45 (16.43)	12.60 (11.88)	11.28 (11.56)
Europe dummy	-6.35 (1.51)	-0.81 (0.59)	-13.02 (2.62)	-9.22 (2.11)	-8.62 (2.34)
Firms investment intensity	201.06 (81.20)	313.16 (71.07)		162.25 (87.17)	
Firms income intensity					2327.89 (919.45)
Adjusted R <sup>2</sup>	0.68	0.60	0.63	0.67	0.70
Number of observations	105	105	58	58	58

This table reports parameter coefficients, white corrected standard errors (in parenthesis) and adjusted R<sup>2</sup> for the regression in which the dependent variable is the Portfolio investments deviation ( $(\rho_{it}^F / \rho_{it}^W) - 1$ ), where  $\rho_{it}^F$ , and  $\rho_{it}^W$  is the weight of country  $i$  in year  $t$  in the total international portfolio of Finnish investors' and the world market portfolio respectively. The independent variables are [Firms' investments intensity] ( $\Phi_{it}^F / GDP_{it}$ ), where  $\Phi_{it}^F$  is the outbound FDIs in country  $i$  in year  $t$ , and  $GDP_{it}$  is the gross domestic product of country  $i$  in year  $t$ , [Firms, income intensity] ( $\pi_{it}^F / GDP_{it}$ ), where  $\pi_{it}^F$  is the outbound FDIs income in country  $i$  in year  $t$ , and  $GDP_{it}$  is the gross domestic product of country  $i$  in year  $t$ . Other independent variables are as defined in Table 2. The regressions are for data pooled over the years from 1997 to 2000. The regressions allow for fixed effects by year. Constants and year-dummies in the regressions are not shown.

Another measure that we use to gauge the exposure of the domestic portfolio to the direct international investments of locally listed firms is the income that these firms' generate from these investments. This measure can potentially provide a more accurate proxy of this exposure since income provides a more direct measure of the extent of the firms' profitability from cross-border investments.

Column 3.5 of table 3 presents the results of the basic regression complemented with the firms' income intensity.<sup>94,95</sup> Similarly to the results of the regression of firms' investment intensity, the addition of the firms' income intensity results in a substantial improvement in the fit of the regression, and has a very strong positive relationship with portfolio investment deviation.

These results provide further evidence that the intensity of firms FDIs seem to provide a good proxy for the intensity of the information flow channels of cross border equity investing. The insights of the Uppsala internationalization model on the informational content of FDI through its cumulative impact on the information gathered on foreign markets by definition requires a high level of commitment of resources, financial and otherwise, to activities that require transmission of information. Once the channels of information flow are open they will also enhance cross border transmission of asset specific information leading to a positive proportional increase in allocation of portfolio investments into that country.

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<sup>94</sup> The data on the income from FDI investment has substantially less coverage than the FDI stock data. Income data is available for 1997 through 2000 on FDI investment for Austria, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom and USA. Data for Belgium only covers 1999 and 2000. For the benefit of the reader, we also report the results of the country characteristic regression (column 3.3 of table 3) and the firms' investment intensity regression (column 3.4 of table 3) for this data set.

<sup>95</sup> The constants and the fixed effects dummies for these pooled regressions are not shown.

## **VI. Summary**

This paper looks at the influences of foreign direct investments (FDIs) on the country allocation in the international portfolios of investors. Specifically, the paper tests and discriminates between two alternative explanations for the observed relationship between these two variables. The first explanation relies on an information asymmetry explanation. According to this explanation, FDIs provides an additional information channel between countries that contributes to the reduction of information related transaction costs leading to an increase in portfolio investments. The second explanations builds on the idea that FDIs provide investors the opportunity to attain international diversification benefits via purchasing the shares of domestically listed multinational firms making the countries that receive the FDIs less attractive for investors.

Empirical results using a new four-year annual panel of Finnish international portfolio and FDI investments in twenty-five countries provide evidence consistent with an information asymmetry explanation. The results indicate that the direct international investments of locally listed firms in investors' domestic portfolios have a substantial impact on the country allocations in their international portfolio investments. In other words, an over (under) exposure to the market fundamentals of a country in the international portfolio is further increased (decreased) by the indirect exposure through the direct international investments of the domestic firms in that country. These results are consistent for both firms' investments intensity as well as the income it generates in a country.

Overall the results can be taken to lend support that considerations related to the flow of information between countries tends to have a substantial impact on the manner by which investors allocate their direct international portfolio investment. That is the level of FDIs country allocation is an additional channel for information flow that contribute to the reduction of information asymmetry resulting in an increase in country portfolio allocation.

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## Appendix I

**Table I.1 The Finnish International Portfolio Investments and FDI Data Coverage**

	Portfolio Investments				FDI Stock (outbound)			
	1997	1998	1999	2000	1997	1998	1999	2000
<b>European Union Countries</b>								
<b>European Monetary Union</b>								
Austria	X	X	X	X	X	X	X	X
Belgium	X	X	X	X	X	X	X	X
France	X	X	X	X	X	X	X	X
Germany	X	X	X	X	X	X	X	X
Greece	Y	Y	X	Y	X	Z	X	X
Ireland	X	X	X	X	X	X	X	X
Italy	X	X	X	X	X	X	X	X
Luxembourg	X	X	X	X	X	X	X	X
Netherlands	X	X	X	X	X	X	X	X
Portugal	X	X	X	X	X	X	X	X
Spain	X	X	X	X	X	X	X	X
<b>Others European union</b>								
Denmark	X	X	X	X	X	X	X	X
Sweden	X	X	X	X	X	X	X	X
United Kingdom	X	X	X	X	X	X	X	X
<b>Other Europe</b>								
Estonia	X	X	Z	Z	X	X	X	X
Iceland	Y	Y	Y	X	Z	Z	Z	Z
Latvia	X	X	Z	Z	X	X	X	X
Lithuania	X	X	Z	Z	X	X	X	X
Norway	X	X	X	X	X	X	X	X
Poland	Y	X	Z	Z	X	X	X	X
Russia	X	X	X	X	X	X	X	X
Switzerland	X	X	X	X	X	X	X	X
Turkey	Y	Y	Z	Z	X	X	X	X
<b>Americas</b>								
Canada	X	X	X	X	X	X	X	X
Mexico	Y	Y	Z	Z	X	X	X	X
United States	X	X	X	X	X	X	X	X
Venezuela	Y	Y	Z	Z	Z	Z	Z	Z
<b>Asia and Pacific</b>								
Australia	X	X	X	X	X	X	X	X
China	X	X	Z	X	X	X	X	X
China, Hong Kong	X	X	X	X	X	X	X	X
India	X	X	Z	Z	Z	Z	Z	Z
Indonesia	X	X	X	Z	Z	Z	Z	Z
Japan	X	X	X	X	X	X	X	X
Malaysia	X	X	Z	Z	X	X	X	X
New Zealand	X	X	X	X	Z	Z	Z	Z
Philippines	X	X	Z	Z	Z	Z	Z	Z
Singapore	X	X	Z	X	X	X	X	X
South Korea	X	X	X	X	X	X	X	X
Taiwan	X	X	X	X	Z	Z	Z	Z
Thailand	X	X	X	Z	Y	X	X	X
<b>Africa</b>								
South Africa	Y	Y	Y	Y	X	X	X	X

Notes:

- X: Available data.
- Y: A zero value is reported by the data source (The Bank of Finland).
- Z: Data is not available.

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