Consequences of the European Monetary Integration on Financial Systems

Consequences of the European Monetary Integration on Financial Systems

Edited by

Daniel Stavárek and Stanislav Polouček

CAMBRIDGE SCHOLARS PUBLISHING

Consequences of the European Monetary Integration on Financial Systems,
Edited by Daniel Stavárek and Stanislav Polouček

This book first published 2008

Cambridge Scholars Publishing

12 Back Chapman Street, Newcastle upon Tyne, NE6 2XX, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-4438-0068-6, ISBN (13): 978-1-4438-0068-6

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

PREFACE

In October 2007, the 11th International Conference on Finance and Banking took place at the Silesian University, School of Business Administration in Karviná, Czech Republic. Each time, the conference focuses on a specific new development in the banking and financial sector. This year, the theme was *Future of the European Monetary Integration*. All submitted papers were reviewed by the international programme committee and, finally, 55 papers were accepted for presentation.

This volume contains ten of the best papers presented at the conference and two invited papers. In spite of the fact that the book is a collection of independent studies it represents a comprehensive and cohesive work. All studies (book chapters) are tied together by common themes. Through original research, the book covers various aspects of the European monetary integration, giving a comparison of its impacts in the euro area and non-euro EU Member States, in the traditional, new and newest EU Member States. Special attention is paid to prospective integration of the euro-candidate countries to the euro area and the implications for national economic policies.

The book contains twelve chapters arranged in four thematic parts focusing on the exchange rate policy, financial markets, monetary policy, and optimal currency area issues.

In the first chapter, *Fernando Seabra, Lisanda Flach & Tatiana Santos* argue that despite deregulation of the international capital flows there is still a "home bias" to investment decisions. Geographical and institutional proximity, trade linkages, common currency or exchange rate regimes induce local portfolio allocations. Therefore, the authors analyse the determinants of foreign portfolio investment from the main European countries into 21 host countries. In the second chapter, *Ralph Setzer* aims to answer what factors determine a country's exchange rate policy. He argues that the exchange rate policy is the outcome of a political process with strong distributional and welfare implications. Such an assumption is applicable in the circumstances of the European economic and monetary integration. An innovative approach of survival analysis is used on a large sample of 47 countries over the period 1975 – 2000. In the third chapter, *Daniel Stavárek* applies a non-conventional approach to assess the convergence of the exchange rate development between the euro-candidate

currencies and the euro. Sufficient degree of the exchange rate convergence is one of the conditions that must be fulfilled by any euro-candidate country. Various alternative types of correlation coefficients are calculated using time series of both exchange rate returns and volatility. In the fourth chapter, *Tomáš Tichý* applies the simplest approaches to the dependency modelling of subordinated Lévy models in order to estimate the probability distribution of returns of a small exchange rate sensitive portfolio. He uses daily exchange rates of euro-candidate currencies as well as the major world currencies during a seven-year period.

In the fifth chapter, *Dimitris Georgoutsos & Petros M. Migiakis* stem from the empirically documented fact that European financial markets share increasing degrees of financial integration. However, they focus on issue that still remain to be answered – a strength of the linkages among the European bond markets. The authors aim to find dominant characteristics for some of the government bonds. Regime switching structures are adopted on data of 11 euro area countries. In the sixth chapter, *Marie Brière & Florian Ielpo* analyse how new information on economic fundamentals influence interest rates in Europe. They propose an original methodology allowing separation of the impacts due to European economic announcements from the influence of the US yield curve. Moreover, the innovative approach allows measuring the impact on the entire European yield curve. The impacts of announcements of 18 fundamentals are examined over the period January 2000 – July 2007. The next important part of financial system is stock market. In the seventh chapter, *Lumír Kulhánek* focuses on the stock market volatility in selected new and traditional EU Member States. He provides an overview of the stock markets' development with emphasis on risk and return; and also investigates linkages among the markets analysed. In the eighth chapter, *Salih Turan Katircioglu & Elif Katircioglu* concentrate the research on the relationship and direction of causality between financial development and economic growth in the euro area countries. They apply Granger causality tests on a comprehensive cross-sectional data set of 12 countries and 45 years.

The part of the book focused on monetary policy starts with the ninth chapter, in which *Felix Hammermann* analyses the potential cost of regional monetary integration while being at the same time integrated with third countries. For this purpose, he develops a New Keynesian three-country model. He evaluates the central bank loss function with and without ERM 2. Subsequently, he assesses the costs of ERM 2 and derives the implications of production sharing for monetary policy. In the tenth chapter, *Bogdan Murarașu & Nicoleta Ciurila* analyse the interest rate

channel of the monetary policy in selected new EU Member States. A special attention is paid on degree and speed of the interest rate pass-through as well as on contemporary adjustment to the long-term equilibrium. The analysis leads to conclusions on effectiveness of the monetary policy in the new EU Member States.

In the eleventh chapter, *Gerhard Fink, Peter Haiss, Wolfgang Rainer & Magdalena Oeberseder* point out that the accession of Bulgaria and Romania to the EU raised some concerns about the catch-up process in these countries. Therefore, the authors apply a scoring model to assess comprehensively the counties' risk. Besides the ex-post assessment in 2001 – 2006 the chapter also offers a country risk projection for the period 2007 – 2010. In the twelfth chapter, *Gabriel Bobeica, Elena Bojesteanu & Ionela Costica* also analyse Bulgaria and Romania. From the perspective of the Optimum Currency Area theory, the authors investigate the shock synchronicity between the EU newcomers and the euro area. Using inflation rate, nominal interest rate and real GDP growth rate a similarity in supply, demand and monetary shocks are empirically analysed.

Karviná, July 2008

Daniel Stavárek
Stanislav Polouček

ACKNOWLEDGEMENTS

There are many people to thank for their input in making the conference and this book possible. We would like to thank everyone who helped to make this conference so successful. We appreciate the speakers giving their valuable time to share their expertise as well as the discussants and audience participants who actively contributed to very interesting debates. In this context, we should express our gratitude to the invited keynote speakers: John Lewis, economist from De Nederlandsche Bank; Viktor Kotlán, Chief Economist of Česká spořitelna; and Marek Dohnal, Chief Financial Officer of Energy 21 and a graduate of Silesian University, School of Business Administration in Karviná. We also would like to thank the members of the International Programme and Organizing Committee and to all reviewers of the papers. A deep sense of gratitude is owed to members and staff of the Department of Finance, School of Business Administration in Karviná.

We offer our deepest appreciation to all the contributors for their enthusiasm about this project and their hard work in completing the chapters to a universally high standard.

We are glad to acknowledge the support provided by the Czech Science Foundation within the project ***GAČR 402/08/0067 "Financial integration of New EU Member States with the Eurozone"*** in editing the book and elaborating Chapter Three and Chapter Seven. And a final word of appreciation to Amanda Millar, Carol Koulikourdi, Andy Nercessian, and their colleagues at the publishers, who approved the project and helped to finalize it.

CHAPTER ONE

FOREIGN PORTFOLIO INVESTMENT, EUROPEAN ECONOMIC AND MONETARY UNION AND EXCHANGE RATE UNCERTAINTY

FERNANDO SEABRA, LISANDA FLACH AND TATIANA SANTOS

Cross-border flows of portfolio investment are by nature more unstable than foreign direct investment (FDI). Clearly, portfolio holdings are not subject to the high sunk costs and the market irreversibility that affect FDI. The literature has given less attention to foreign portfolio investment (FPI) due to its less predictable behaviour. More recently, however, the deepening of international financial integration has brought about an unprecedented movement of capital in bonds and equity markets. As barriers to flow are lower, portfolio holdings tend to move across countries according to higher returns and to a better sharing and diversification of risk.

Although portfolio diversification can be reasoned by investors' optimal behaviour – based on the international capital asset pricing model – information asymmetries between domestic and foreign investors can represent restrictions to invest overseas and establish a "home bias" to portfolio investment decisions. The literature points out that investors tend to include too little of their wealth in foreign assets as a consequence of investors' preferences for holding equities that they are more familiar with (Huberman, 2001).

In the context of a currency union, as the European Economic and Monetary Union (EMU), we can argue that a higher degree of financial integration enhances savings availability – increasing potential GDP growth – and risk sharing among the member countries. Besides, within the currency union area and also for those countries with a greater degree

of financial integration, the volatility of asset prices tends to be lower, motivating a more efficient allocation of financial capital.

Portfolio holdings in foreign countries are also subject to transaction and information costs. Geographical and institutional proximity, trade linkages, common language, and exchange rate arrangements reduce these costs and induce local portfolio allocations (Grinblatt and Keloharju, 2001). Hence, the "home bias" effect at the euro area level is likely to occur not only as a consequence of the European integration process (e.g., increase in intraregional trade and common legal systems) but also as a result of the lower volatility of asset prices, implied by the common currency or some level of exchange rate coordination.

Therefore, the objective of this study is to analyse the determinants of FPI from the main European countries into 21 main host countries. The focus is on both financial and real variables, especially exchange rate uncertainty, monetary integration and geographic and institutional distance. An FPI model is developed and estimated based on a panel dataset over the period 2001-2006. The remainder of this work is organized as follows. In the next section we provide a summary of the relevant literature. In the further sections, we develop the basic model, report the empirical results and, finally, draw some conclusions.

Portfolio Investment Behaviour

The experience of the EMU provides an opportunity to discriminate between different theoretical explanations for investment behaviour. There are basically two competing theoretical approaches to explain investment behaviour given the implementation of a currency union. From the diversification motive standpoint, the monetary union should reduce the attractiveness of European portfolio holdings in other euro area countries. On the other hand, the asymmetric information hypothesis argues that reduced transactions costs due to the EMU should increase the share of European portfolio investment within the euro area.

The basic intuition of the diversification motive was first developed by Grubel (1968) and Solnik (1974). In the line of these early works, Harvey (1991) and De Santis and Gérard (1997) argued that portfolio investors hold foreign securities because of the risk reduction benefits. The principle is that if securities in a portfolio are less than perfectly correlated, then some degree of diversification is desirable to counterbalance adverse shocks that disproportionately affect security returns. Levy and Sarnat (1970) demonstrate that the diversification motive across countries yields

benefits because of the imperfect correlation that may exist among returns from assets in different countries.

The literature supporting the asymmetric information hypothesis argues that there are significant indirect barriers that lead investors to concentrate their portfolio investments in the domestic market; that is, the "home-bias" effect. According to Al-Khail and Berglund (2003), the explanations for the "home bias" phenomenon fall into to two different categories. The first one explains the concentration of portfolio investment in the domestic countries by the existence of some inertia in financial markets and severe institutional restrictions. The other explanation to the asymmetric information motive – put forward, for instance, by Tesar and Werner (1995) – relies on geographic proximity, strong trade linkages and common language. Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide significant empirical evidence that geography, language and culture induce a "home bias" effect on portfolio allocations. Huberman (2001) shows that the "home bias" is a consequence of investors' preferences, since they tend to hold equities that they are more familiar with. Cooper and Kaplanis (1994) test whether the "home bias" in equity portfolio decisions is caused by investors attempting to hedge purchasing power parity deviations. They find that the bias towards domestic stocks is not reconcilable with investors need for hedging the domestic inflation.

Overall, the literature points out that while international financial markets have been witnessing a higher degree of integration in recent years, there still remain many considerations that prevent investors from taking advantage of large diversification strategies. 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 makes information gathering on foreign markets an expensive and imprecise task.

Model Used in the Empirical Analysis

In the context of international investment theory, portfolio decisions are assumed to be affected by the expectation of return differential at the domestic and the foreign capital markets. The underlying model for this hypothesis is provided by the well-known uncovered interest parity (UIP) condition. Besides, portfolio decisions are argued to be influenced by the investment climate at the source and at the host country. Therefore, the

nature of the investment determinants is twofold: financial variables, as interest rate differentials, and real variables, as the quality of institutions.

On the financial side, interest parity conditions recognize that investors have the choice of holding assets denominated in the currency of the source country (in bilateral terms, named as country *i*), which offer a domestic rate of return $\left(r_t^i\right)$, and of holding assets denominated in host currency (named as country *j*), which offer a foreign rate of return $\left(r_t^j\right)$. Since investors are concerned with returns denominated in their own currency, foreign rates of returns have to be adjusted by the expected devaluation of the foreign currency with respect to the domestic one. Therefore, the uncovered interest parity can be written as:

$$r_t^i = r_t^j + E_t[s_{t+1}^{ij} - s_t^{ij}] \tag{1.1}$$

where s^{ij} is the (log of the) nominal bilateral exchange rate.

The empirical evidence of the UIP condition has been widely tested. Most of the studies have pointed out the empirical failure of the UIP (e.g., Engel, 1996); although more recently, attempts to estimate long-run horizon regressions have found support for the uncovered interest parity.[1] For the purpose of this study, we are not concerned with the assumption of whether the UIP holds; but we rather assume that the investment decision is driven by the interest differential, including the expected devaluation.

Since future exchange rates are unknown, we estimate the value of s_{t+1}^{ij} using a simple autoregressive AR(1) process. The underlying uncertainty related to the future exchange rate is also assumed to condition the investment decision. The future exchange rate and the conditional uncertainty are estimated based on an Autoregressive conditional heteroscedasticity (ARCH) model:

$$s_t^{ij} = a_0 + a_1 s_{t-1}^{ij} + \varepsilon_t^{ij} \tag{1.2}$$

$$(\hat{\varepsilon}_t^{ij})^2 = \alpha_0 + \sum_{k=1}^{q} \alpha_k (\hat{\varepsilon}_{t-k}^{ij})^2 + \omega_t^{ij} \tag{1.3}$$

where $(\hat{\varepsilon}_t^{ij})^2$ is the conditional variance of the nominal bilateral exchange rate and ω_t^{ij} is an error term.

The real side of the FPI determinants can be based on the well-established gravity equation. We assume, therefore, that portfolio

investment is not only conditioned by financial variables but also by real factors. The literature on theoretical and empirical studies using the gravity model is quite vast. The gravity equation has been extensively used to explain bilateral trade and foreign direct investment.[2] However, applications to portfolio flows are more limited, partly due to lack of available information. One of the earliest studies on bilateral financial flows using the gravity approach is Portes and Rey (1999) who find support for gravity variables – mainly distance as a measure of information costs – in explaining bilateral equity flows between 14 countries. More recently, Guerin (2006) also estimated a modified gravity model to examine the determinants of bilateral foreign direct investment, trade and portfolio investment. Bilateral portfolio investment is found to be significantly affected by information costs and also to be more sensitive (as compared with FDI) to control variables, as macroeconomic fundamentals.

The original gravity theory is given by the Newtonian law, which states that attraction between two bodies is directly proportional to their mass and indirectly proportional to their distance. This notion applied to international trade and capital movements means that bilateral flows of goods and capital can be explained by the economic size, geographical distance and a set of variables that capture common institutional characteristics such as language, trade agreements, common borders and cultural aspects.

In a simple specification, the gravity equation can be expressed as:

$$F_{ij} = Y_i Y_j \Big/ D_{ijj} \tag{1.4}$$

where F_{ij} are flows (e.g. trade or capital flows), Y_i and Y_j are economic sizes, and D_{ij} is a separation measure. If the flows are portfolio holdings, the attraction forces are financial and real sector variables and the measures of separation are geographical and institutional distances, the gravity equation can be written as:

$$\begin{aligned} fpi_t^{ij} = {} & \beta_0^{ij} + \beta_1\left((r_t^j - r_t^i) - E_t(s_{t+1}^{ij} - s_t^{ij})\right) + \beta_2 eru_t^{ij} + \beta_3 EMU_t^i + \\ & + \beta_4\left(gdp_t^j - gdp_t^i\right) + \beta_6 geodist^{ij} + \beta_6 instdist_t^{ij} + u_t^{ij} \end{aligned} \tag{1.5}$$

The dependent variable is bilateral foreign portfolio investment (*fpi*). Source countries *i* are the largest eight European countries: Belgium, France, Germany, Ireland, Italy, Netherlands, Spain and the United

Kingdom. Host countries *j* are the main destination of FPI within the European Union (all the source countries except Belgium), two Eastern European countries (Hungary and Poland), seven emerging markets (Brazil, China, India, Malaysia, Mexico, Russia, South Africa, South Korea and Turkey) and three non-European developed countries (Canada, Japan and the United States). Annual data are from 2001 to 2006.

As for the financial variables, the UIP deviation – given by $(r_t^j - r_t^i) - E_t(s_{t+1}^{ij} - s_t^{ii})$ – is calculated based on the difference between nominal bilateral interest rates and the expected bilateral exchange rate devaluation.

Differently from the other variables, the expected exchange rate uncertainty (*eru*) is estimated for each exchange rate series (host country currency with respect to the euro or the British pound) based on monthly data. When the ARCH effect is found to be significant, the uncertainty variable is given by the square root of $(\hat{\varepsilon}_t^{ij})^2$ in equation (1.2). If there is no ARCH, the uncertainty variable is simply computed by the absolute value of error term in the mean equation (1.1). To compute the relevant *eru* variable, we take the annual average of either the first or the second measure.

To capture the EMU effect, we consider a dummy variable, which is 1 when the host and the source country adopt the euro and 0, otherwise. The reduction of transaction costs achieved by a monetary union stimulates portfolio investment and tends to magnify the "home bias" evidence to the level of regional integration areas. In fact, financial integration has progressed more remarkably within countries that are part of preferential trade agreements than at a multilateral level. As found by De Santis and Gérard (2006), the establishment of the EMU enhanced regional financial integration in the euro area and motivated equity and bonds flows within the region. Al Khail and Berglund (2001) reached similar results for the case of Finland. They concluded that the allocation of Finnish portfolio investment is predominantly influenced by the information based assumption, which supports that reduced information asymmetry produced by the EMU increases portfolio holdings in other euro area countries.

Two of the real sector variables are conventional gravity factors: the difference in economy sizes, given by GDP differentials *(GDP_t^j – GDP_t^i)*; and the geographic distance (*$geodist^{ij}$)* – taken by the distance between countries' capitals (see www.chemical-ecology.net). Interest rates, exchange rates and GDP (in USD) as well as bilateral FPI come from the IMF datasets (International Financial Statistics and www.imf.org/external/np/sta/pi/geo.htm).

The institutional distance variable ($instdist^{ij}$) was proxied by the six indicators computed by Kaufmann et al. (1999): government effectiveness (*gov*), regulatory quality (*reg*), voice and accountability (*vac*), political stability (*pol*), rule of law (*law*) and control of corruption (*cor*). Institutional distance is given by the difference in the indicator value at the host country and at the source country. The extension and quality of institutions have been often related as a structural change with significant impacts on economic development. In international financial sectors, institutions play a significant role since foreign investors are subject to uninsurable instability arising from different currencies and political and legal systems across countries. According to Al-Khail and Berglund (2003), asymmetric information is a significant restriction to financial capital movements. He includes institutional variables as proxies for the information costs, as long as these institutions provide a regulatory and legal environment that reduces the non-familiarity conditions with respect to the host country.

Empirical Results

Before dealing with the estimation of the determinants of bilateral portfolio investment, we focus on some preliminary results regarding our main variable FPI and the exchange rate uncertainty measure.

Table 1-1 shows the FPI stocks that the eight source European countries hold in the main destinations: European Union (EU), USA, Canada, Japan and the emerging countries in our sample. The EU bias is quite evident for most of the European countries, since the EU region is the main recipient of portfolio investment: Belgium (85.3 percent of FPI is allocated in EU countries); Spain (84.8 percent); Germany (80.1 percent); Italy (78.2 percent) and France (74.6 percent). On the other hand, for the UK, foreign portfolio holdings are more homogeneously distributed, with the highest shares among European countries in terms of destinations as the USA (42.4 percent of total British FPI) and emerging markets (9.2 percent).

Table 1-1 Foreign portfolio investment in 2006 (USD mln)

Source country	Host country					
	EU	USA	Canada	Japan	Emerg. markets	Total
UK	907.20	816.89	25.56	231.25	178.09	1,927.74
France	1,114.74	253.64	15.57	86.08	23.74	1,493.77
Ireland	781.63	397.39	19.35	56.99	34.62	1,289.97
Germany	986.93	179.10	12.28	28.27	24.77	1,231.34
Netherlands	603.19	305.53	9.40	37.29	35.21	990.63
Italy	486.33	103.64	2.98	13.92	15.08	621.95
Spain	384.84	52.16	1.65	2.59	12.29	453.52
Belgium	384.29	54.88	3.64	4.27	3.49	450.57

Source: International Monetary Fund

The results for the exchange rate uncertainty variable for selected countries are depicted in Figure 1-1 and Figure 1-2. The highest uncertainty values are consistently found in Brazil and Mexico. The relatively low exchange rate uncertainty estimated for China is due its pegged exchange rate system. Among the lowest uncertainties are the exchange rates for the UK (with respect to the euro), Hungary and Japan (both with respect to the euro and the British pound).

Figure 1-1 Exchange rate uncertainty measure: host country against the euro

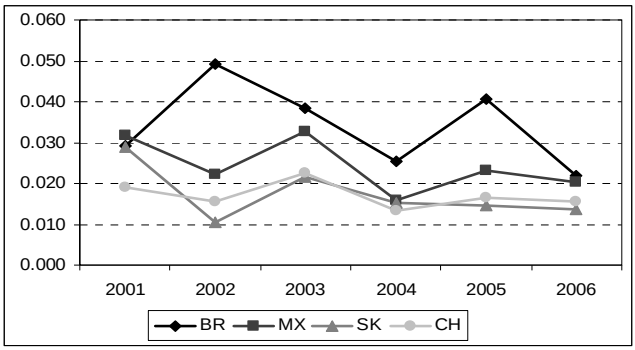
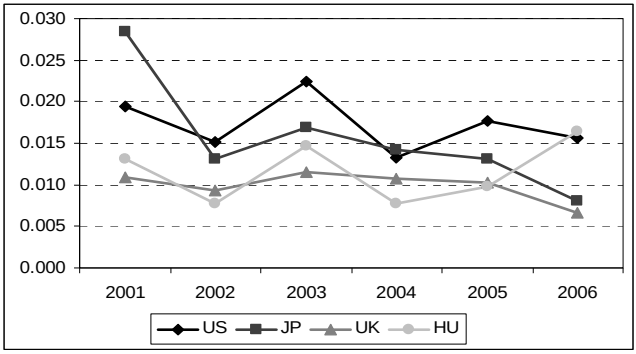


Figure 1-1 (cont.)



Source: Authors' calculations
Note: BR, Brazil; MX, Mexico; SK, South Korea; CH, China; US, United States; JP, Japan; UK, United Kingdom; HU, Hungary.

The ARCH model of the bilateral exchange rate, outlined in equations (1.2) and (1.3), was estimated for each exchange rate series (relating the host country currency against the euro and the British pound). The estimation was based on monthly data from 2001 to 2006. Appendix 1-A summarises the results. Out of 15 exchange rate series, the ARCH effect was statistically significant (at 5 percent significance) for 4 rates of the host country currency against the euro and for 3 rates of the host country currency against the pound. ARCH was found significant for some emerging markets (e.g., Brazil, Mexico, South Korea and Turkey) and for Japan.

Figure 1-2 Exchange rate uncertainty measure: host country against the British pound

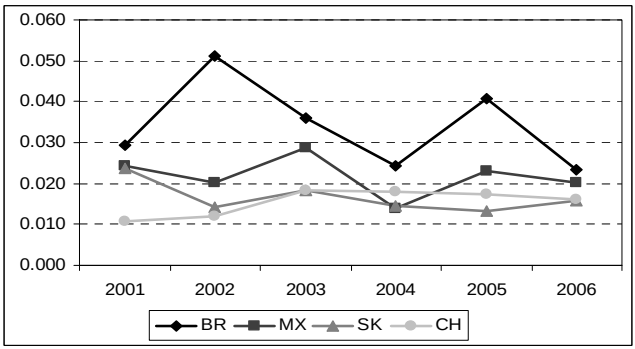
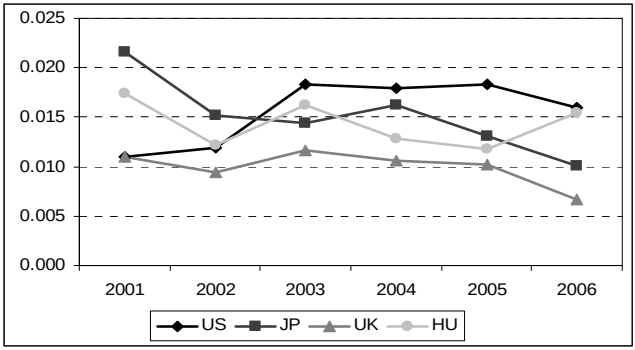


Figure 1-2 (cont.)



Source: Authors' calculations
Note: Countries denoted as in Figure 1-1

Table 1-2 Panel unit root tests

Null hypothesis: unit root	Statistic	Probability
fpi_t^{ij}	-18.279	0.000
ERU_t^{ij}	-44.170	0.000
$(r_t^j - r_t^i) - E_t(s_{t+1}^{ij} - s_t^{ii})$	-14.308	0.000
$(GDP_t^j - GDP_t^i)$	-24.185	0.000
$(gov_t^j - gov_t^i)$	-2.140	0.016
$(reg_t^j - reg_t^i)$	-11.391	0.000
$(vac_t^j - vac_t^i)$	-8.391	0.000
$(pol_t^j - pol_t^i)$	-15.462	0.000
$(law_t^j - law_t^i)$	0.021	0.508
$(cor_t^j - cor_t^i)$	-0.946	0.172

Source: Authors' estimation. Note: Test proposed by Levin et al. (2002).

The panel data model (equation 1.5) was estimated by the random effects method since geographical distance is invariant over time for a given country pair. In Table 1-3, we report the results for the FPI equation.

Specification (1) includes all variables in the model, while specification (2) only the statistical significant ones. In specification (3), we dropped the two institutional measures estimated with a negative sign – since such result is not compatible with theory. The withdrawal of these two variables does not change the qualitative results.

Table 1-3 Foreign portfolio investment determinants

	(1)	(2)	(3)
Constant	14.733*** (1.062)	14.787*** (1.111)	13.606*** (1.143)
$(r_t^j - r_t^i) - E_t(s_{t+1}^{ij} - s_t^{ii})$	0.016*** (0.004)	0.016*** (0.004)	0.023*** (0.004)
ERU_t^{ij}	-0.125*** (0.036)	-0.125*** (0.036)	-0.177*** (0.037)
EMU_t^i	1.108*** (0.338)	1.122*** (0.353)	0.699*** (0.363)
$(GDP_t^j - GDP_t^i)$	0.684*** (0.070)	0.673*** (0.071)	0.585*** (0.073)
$geodist_t^{ij}$	-0.730*** (0.129)	-0.735*** (0.135)	-0.505*** (0.137)
$(gov_t^j - gov_t^i)$	1.028*** (0.162)	1.017*** (0.162)	0.491*** (0.152)
$(reg_t^j - reg_t^i)$	0.768*** (0.170)	0.755*** (0.168)	0.431*** (0.172)
$(vac_t^j - vac_t^i)$	-0.591*** (0.129)	-0.614*** (0.130)	
$(pol_t^j - pol_t^i)$	0.650*** (0.120)	0.642*** (0.121)	0.565*** (0.126)
$(law_t^j - law_t^i)$	-0.989*** (0.244)	-1.018*** (0.200)	
$(cor_t^j - cor_t^i)$	-0.048 (0.192)		
Common language	0.691** (0.370)	0.691** (0.370)	0.624* (0.385)
Number of observations	966	966	966
Adjusted R^2	0.361	0.357	0.311
F-statistic	50.43	54.46	55.24

Source: Authors' estimation

Note: ***, **, * Significant at the 1, 5, and 10% level. Standard errors are in parentheses.

Among the financial variables, the UIP differential was found to be statistically significant and with a positive sign coefficient, indicating that FPI is attracted by higher rates of return (discounted of the expected exchange rate devaluation). Conditional exchange rate uncertainty – measured by the ARCH model – was estimated to significantly decrease

portfolio holdings in the host economy. The coefficient for the *eru* variable is higher than the coefficient for the UIP deviation, which means that FPI tends to be more responsive to changes in uncertainty than to changes in excess returns.

At last, the coefficient of the EMU variable was estimated to be positive and significant. This result confirms the asymmetric information hypothesis and indicates that the reduced transaction costs due to the EMU increase the share of European portfolio investment within the currency area.

As for the real sector results, the traditional gravity variables were found to be significant to explain European cross-border portfolio decisions. The coefficient for the difference in GDP levels was statistically significant and with a sizable magnitude. A ten percent GDP increase in the host market (relative to the source market) implies an increase of 5.8 percent in portfolio investment from European countries to host countries. Geographical distance was found to exert a negative and statistically significant influence to European FPI outflows. Common language was also a significant determinant of FPI.

Only three institutional variables were significant in the final specification. The non-stationarity result and some multicolinearity[3] are probably the main reasons for the non-significance of voice and accountability, rule of law and control of corruption. In the final specification, government effectiveness, regulatory quality and political stability are statistically significant and indicate that an improved institutional environment at the host country would attract FPI.

Conclusion

The literature on portfolio investment has pointed out two theoretical hypotheses: the diversification motive and the asymmetric information motive for cross-border portfolio holdings. Under the asymmetric information assumption, the launch of the EMU and the lower uncertainty among member countries should reduce transaction costs and facilitate capital movements within the currency area.

The estimation of a foreign portfolio investment equation for European countries confirms the general idea under the asymmetric information hypothesis. The EMU variable is statistically significant, indicating that there is a "regional bias" for European portfolio holdings. That result indicates that European investors prefer to invest more regionally (within the euro area) than internationally, given basically the lower transaction costs and familiarity aspects common to member countries. Besides, the

results show that investors behave negatively to exchange rate uncertainty, indicating that a currency area and exchange rate arrangements might be preferable to other systems where the instability is inherently higher. The gravity variables also give support to the asymmetric information assumption since both geographic distance and institutional distance depress foreign portfolio investment. That is, the farther and the less reliable the host country, the higher the transaction and informational costs, and, therefore, the lower the portfolio investment inflows.

In addition, foreign portfolio investment from European countries was found to be positively influenced by the relative size of the host country economy – which ratifies the empirical appeal of the gravity model for portfolio holdings – and also positively affected by higher rates of return (net of exchange rate depreciation), validating the UIP differential as an arbitrage gain directing FPI flows.

References

Al-Khail, M.A. and T. Berglund. 2003. *What Drives the Country Allocation of International Portfolio Investments? Universally Available Versus Trade Related Information.* EFMA 2004 Basel Meetings Paper. Swedish School of Economics and Business Administration. Stockholm.

—. 2001. *The Impact of the EMU on International Portfolio Investments.* Departmental Working Papers 141. Tor Vergata University, CEIS. Rome.

Cooper, I. and E. Kaplanis. 1994. Home Bias in Equity Portfolios, Inflation Hedging, and International Capital Market Equilibrium. *The Review of Financial Studies* 7(1): 45-60.

Coval, J.D. and T.J. Moskowitz. 1999. Home Bias at Home: Local Equity Preference in Domestic Portfolios. *Journal of Finance* 54(6): 2045-73.

Deardorff, A.V. 1998. Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World? In *The Regionalization of the World Economy*, ed. J.A. Frankel. Chicago, IL: University of Chicago Press.

De Santis, G. and B. Gerard. 1997. International Asset Pricing and Portfolio Diversification with Time-Varying Risk. *Journal of Finance* 52(5): 1881-912.

Engel, C. 1996. The Forward Discount Anomaly and the Risk Premium: a Survey of Recent Evidence. *Journal of Empirical Finance* 3(2): 123-92.

Feenstra, R.C., J.R. Markusen and A.K. Rose. 2001. Using the Gravity Equation to Differentiate Among Alternative Theories of Trade. *Canadian Journal of Economics* 34(2): 430-47.

Grinblatt, M. and M. Keloharju. 2001. How Distance, Language, and Culture Influence Stockholdings and Traders. *Journal of Finance* 56(3): 1053-73.

Grubel, H. 1968. Internationally Diversified Portfolios: Welfare Gains and Capital Flows. *American Economic Review* 58(5): 1299-314.

Guerin, S.S. 2006. The Role of Geography in Financial and Economic Integration: A Comparative Analysis of Foreign Direct Investment, Trade and Portfolio Investment Flows. *The World Economy* 29(2): 189-209.

Harvey, C.R. 1991. The World Price of Covariance Risk. *Journal of Finance* 46(1): 111-57.

Huberman, G. 2001. Familiarity Breeds Investment. *Review of Financial Studies* 14(3): 659-80.

Kaufmann, D., A. Kraay and P. Zoido-Lobatón. 1999. *Aggregating Governance Indicators*. World Bank Policy Research Working Paper 2195. Washington, DC.

Levin, A., C.F. Lin and C.S.J. Chu. 2002. Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties. *Journal of Econometrics* 108(1): 1-24.

Levy, H. and M. Sarnat. 1970. International Diversification of Investment Portfolios. *American Economic Review* 60(4): 668-75.

Portes, R. and H. Rey. 1999. *The Determinants of Cross-Border Equity Flows*. NBER Working Paper 7336. National Bureau of Economic Research. Cambridge, MA.

Solnik, B. 1974. Why Not Diversify Internationally Rather than Domestically? *Financial Analysts Journal* 30(July): 91-135.

Tesar, L.L. and I.M. Werner. 1995. Home Bias and High Turnover. *Journal of International Money and Finance* 14(4): 467-92.

Notes

[1] See, for instance, Chinn and Meredith (2005).

[2] See, for instance, the seminal papers by Deardorff (1998) and Feenstra et al. (2001).

[3] High partial correlation are found, for instance, between *law* and *reg* (0.93) and between *cor* and *gov* (0.97). For more details see Appendix 1-B.