Cross-Border Diversification in Bank Asset Portfolios

Claudia M. Buch, Kiel Institute for World Economics
John C. Driscoll, Federal Reserve Board
Charlotte Ostergaard, Norwegian School of Management*

First version: November 2002
This version: September 2003

Abstract

This paper examines the degree of cross-border diversification in bank assets portfolios and potential barriers to diversification. Using data on the cross-border assets of banks located in four countries (France, Germany, the U.K., and the U.S.), we assess whether banks can reduce their exposure to country risk through cross-border diversification, taking the mean variance-portfolio model as a benchmark and computing the optimal degree of diversification under different assumptions about currency hedging. Relative to these benchmarks, we find that banks over-invest domestically to a considerable extent and that cross-border diversification entails considerable gains. We then regress the difference between actual and benchmark portfolio weights on variables that proxy for barriers to cross-border lending: capital controls, political risk, credit risk, and information costs. We find strong evidence that banks underweight countries with capital controls and that political risk affects the degree of over-investment. We do not find systematic evidence that underweighting co-varies with proxies for informational barriers.

Keywords: International banking, portfolio diversification, international integration.
JEL-classification: G21, G11, E44, F40.

---

* Corresponding author: Norwegian School of Management, Department of Finance, Elias Smiths vei 15, PO Box 580, 1302 Sandvika, Fax: +47 67 55 7675, Tel: +47 67 55 7115, Email: charlotte.ostergaard@bi.no

We thank Peghe Braila, Ilan Cooper, Xavier Freixas, Bruno Gerard, Richard Priestley, Jesper Wormstrup, seminar audiences at Leuven, NHH, the Stockholm School of Economics, Tilburg, and participants and discussant at the 2nd CFS-ECB Research Network Workshop in Helsinki March 2003 for their comments. Special thanks to Farid Toubal for sharing his data on country risk and to Stine Pilegaard, Deutsche Bank and Søren Aarup, Nordea for helpful conversations. This paper was initiated while Claudia M. Buch was visiting the NBER. She thanks the NBER for its hospitality and the Volkswagen Foundation for financial support. Data on the international activities of commercial banks has kindly been provided by the Bank for International Settlements. Dennis Dong provided able research assistance. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Federal Reserve System.

1 Introduction

The international activities of commercial banks have expanded rapidly over the past few decades, although banks in most countries still hold only a small fraction of their portfolios in foreign claims. This paper attempts to find both the driving forces behind and the possible barriers to the internationalization of banks. We first argue that international diversification helps banks decrease their exposure to systematic risks. Through their transformation of assets, banks carry a considerably degree of non-diversifiable economic risks on their books. Given high costs of financial distress, international extensions of credit may improve the diversification of such risks. Furthermore, international lending may be associated with higher returns, and thus, overall, an improvement of banks' risk-return trade-off.[1]

We next contend that an assessment of potential barriers necessarily requires a benchmark. Thus, the main contribution of this paper is to study the issue of banks' internationalization against a well-defined benchmark, namely the mean-variance portfolio model (Markowitz 1952, 1959). One key aspects of this model are the benefits investors can reap from diversification. The portfolio benchmark has the important quality that it allows us to actually *compute* the composition of banks' optimally diversified portfolio.

We use data on the bilateral cross-border assets of banks located in four major reporting economies (France, Germany, the U.K., and the U.S.) provided by the Bank of International Settlement (BIS), covering the period 1995-1999. Hence, we study the diversification gains from international banking related to counter-party location or country risks. These risks primarily consist of transfer, political, and currency risk.

Our empirical analysis proceeds in three steps. First, for banks in each of the four reporting countries, we compute a set of optimally diversified portfolios for banks using standard mean-variance optimization under different assumptions about banks' hedging of foreign currency risk. Second, we compare the benchmark portfolio composition to banks' actual portfolios. Third, we run regressions to explain differences between actual and benchmark portfolios.

We find that banks in the four reporting countries may improve their risk-return trade-off considerably by investing more internationally relative to investing mainly in (risky) domestic assets. Furthermore, we find that banks over-invest domestically relative to the benchmark portfolios. Banks appear to have preferences (overweight relative to benchmark) for certain markets (countries) but these preferences do not appear to be explained by cultural similarities, that is, banks are *not* on average over-invested in more similar countries. Regressing the deviation between our benchmark and actual portfolio weight on variables

---

[1] Alternatively, banks may take risks off balance sheet through the use of derivatives. Hellwig (1998) discusses the asset transformation function of banks and their exposure to non-diversifiable risks.

proxying for regulations, information costs, political risk, and credit risk, we find strong evidence that banks' underweight countries that impose capital controls. Given banks' preferences for lending to certain countries, we also find that political risk systematically affects the degree of overinvestment, such that an improvement in risk conditions is associated with *increased* over-investment. We do not find systematic evidence that underweighting co-varies with proxies for informational barriers related to cultural differences or geographical distance.

Our paper is linked to four strands of literature:

First, our paper is related to the literature studying the internationalization of the banking industry. However, most of this work focuses on banks' establishment of foreign offices (see, e.g., Goldberg and Saunders 1980, 1981, Hultman and McGee 1989, Focarelli and Pozzolo 2001) or on the importance of nationality in the bank relationships of non-financial multinational firms (Berger et al. 2002). The internationalization of the banking industry generally occurs along two dimensions: through direct cross-border lending a foreign counter-party, denoted *international* banking, and through the ownership of foreign branches or subsidiaries; *multi-national* (or global) banking. Few empirical studies have looked at the cross-border lending of banks[2], and none consider the portfolio aspects of bank lending.

There is currently considerable interest in assessing the integration of bank markets. From this point of view, it is worth noticing that the establishment of foreign banking offices is not a necessary condition for integration. Perhaps when country risks are less costly and/or can more easily be controlled, credit can flow freely to locations that offer the best risk-return tradeoff in the form of direct cross-border lending. Seen in this light, the establishment of foreign offices may be a way of *overcoming* barriers to integration, in the case that certain risks, to be adequately controlled, necessitate a physical foreign presence. Hence, improving our understanding of the factors mitigating direct cross-border lending is an important a building block in the study of financial integration.[3]

---

[2] Exceptions are Buch (2002), and Goldberg (2001) who considers both of the above dimensions.

[3] Several authors note that, in light of the considerable deregulation of barriers to entry that has been taking place since the 1980s, the establishment of foreign bank offices is occurring at a surprisingly low pace. McCauley et al. (2001) observe that this is in fact a feature specific to the European continent, where the ratio of international to local foreign assets is high relative to other parts of the world, especially the Latin American and the Asia-Pacific region. They attribute this difference to, among others, the high degree of integration of European interbank markets.

Second, our paper is related to a recent strand of the international finance literature which uses gravity-type models to estimate the determinants of international investment choices.[4] One variable that has been used in the international finance literature to proxy information costs is the (geographical) distance between two markets. Empirical studies find a negative link between international asset holdings or international capital flows, on the one hand, and distance, on the other hand (Buch 2003, Burger and Warnock 2002, Focarelli and Pozzolo 2001, Portes and Rey 1999 and 2001, Wei and Wu 2002). In the banking literature, geographical distance has been used as a proxy for banks' ability to monitor (Petersen and Rajan 2000).[5]

Third, our paper is related to the portfolio approach of banking. The early papers by Pyle (1971) and Hart and Jaffee (1974) explain the existence of financial intermediaries within the mean-variance framework. Later applications of the portfolio model are Koehn and Santomero (1980) and Kim and Santomero (1988) which analyze the impact of capital regulation on banks' portfolio and choice of risk.

Finally, our approach is related to the literature on the international integration of equity markets and the home bias puzzle (Levy and Sarnat 1970, French and Poterba 1991, Tesar and Werner 1995).[6] Burger and Warnock (2002) study diversification of international bond portfolios.

The rest of the paper is organized as follows: Section 2 describes our methodological approach and discusses risks and returns in international banking. Section 3 presents the data and the construction of the benchmark portfolio weights. The empirical results are presented in Section 4 and 5, and Section 6 concludes.

2 Methodological Approach

In this section, we describe the methodological approach underlying our analysis. Our benchmark mean-variance approach used to determine the composition of the optimal international portfolio requires measurement of the risks and return in international banking. We discuss the assumptions that we make in deriving the return for our analysis as well as concerning the hedging of exchange rate risks.

---

[4] Martin and Rey (2001) provide a theoretical underpinning of the gravity model of international finance.

[5] Degryse and Ongena (2002) find that firm's borrowing costs are inversely related to distance in a sample of Belgian banks and interpret this as the effect of price-discrimination.

[6] Stulz (1994), Lewis (1999) and Karolyi and Stulz (2001) survey this literature.

2.1 Risk and Return in International Banking

Standard portfolio theory asserts that international diversification benefits investors because it expands the menu-choice of assets available. Low correlations between domestic and foreign assets lower the risk of an international portfolio and improve the risk-return trade-off of the investment opportunity set.[7] Banks may therefore benefit from holding foreign assets either because they gain access to activities with higher net present value than those available in domestic markets and/or by reaping gains from diversification of location-specific risks. These gains occur to the extent that revenues from foreign activities are less than perfectly correlated with corresponding domestic activities. Given that costs of financial distress are high in banking, improved diversification would appear to be value-enhancing.[8]

A quick glance at banks' actual portfolios, however, reveals that banks' domestic holdings far exceed their foreign claims (see Table 3). Hence, it appears that banks may not be taking advantage of gains from international diversification, assuming such gains exist. To qualify that proposition, of course, it is necessary to know the benchmark portfolio under optimal diversification.

In this paper, we study what the optimal risk-return trade-off implies for banks' cross-border allocation of assets using bilateral observations on banks' foreign assets. We compute a benchmark portfolio against which we compare banks' actual cross-border holdings, and we run regressions of the difference between the two on variables which may capture *barriers* to banks' cross-border extension of credit. If risks associated with cross-border lending cannot be controlled at reasonable costs due to asymmetries of information, regulations or the like, banks will abstain from direct cross-border transactions. For example, costs of obtaining information may impinge on banks' ability to monitor foreign borrowers and the ability to monitor may be closely related to the cultural ties between the location of the lender and borrower.[9]

---

[7] See, e.g., Solnik (1974). However, the risk-return gain is hard to assert empirically on the basis of ex-post data, measurement error being one important reason, see Jorion (1985).

[8] There is generally little quantitative evidence of the gain from "going international" in banking. Whalen (1988) provides some evidence that the size of gains from international diversification may be significant. Acharya, Hasan and Saunders (2002) consider gains from geographical diversification and test the model of Winton (1999) on a sample of Italian banks. They find support that regional diversification improves the risk-return tradeoff for banks that have low to moderate levels of downside risk.

[9] Even within countries, investment patterns have been found to be guided by regional and cultural proximity (Coval and Moskowitz 1999, Grinblatt and Keloharju 2000).

When lending internationally, banks are also exposed to currency risk and various country risks.[10] The expected return and risks on assets held against a counter-party residing in country *i* will generally have a country-component that may or may not be diversified away in an international portfolio:

- The currency denomination of assets will expose the lender to *currency risk*. If a country has a high interest rate differential vis-à-vis the world average, this may indicate the presence of a premium for currency risk equal to the expected devaluation of the foreign currency (cf. uncovered interest rate parity).
- Foreign positions may be subjected to *transfer risk* to the extent there are restrictions or a positive probability that currency controls may be imposed by the foreign government to limit capital outflows, as occurred, for example, in Malaysia in 1997 in the wake of the Asian crisis.
- Other country risks include *regulatory, legal* and *political risks*. Examples are the Mexican and Russian debt moratoriums of 1994 and 1998, or the imposition of minimum reserve requirements on cross-border credits of the type imposed in Chile in the 1990s.

The above types of risk have a direct effect on the rate of return on banks' international assets. Currency risk affects the rate of return on banking assets directly if assets are denominated in the foreign currency. Any factor that potentially lowers the ability of borrowers to repay their debt – such as the imposition of currency controls or other regulatory factors – affect the rate of return on banking assets. The benchmark portfolio that we calculate thus reflects the above risks which are material to international banking.

2.2 Assumptions of the Benchmark Portfolio

The empirical approach of this paper follows three steps. In a first step, we compute "optimal" portfolios for banks international assets. In a second step, we compare actual and benchmark portfolios and, in a third step, we try to explain these deviations. Hence, the key ingredient that we need to perform this analysis is the benchmark portfolio.

We use the mean-variance portfolio model (Markowitz 1952, 1959) and its international extension (Solnik 1973, Sercu 1980) as our benchmark model for optimal diversification of banks' foreign asset portfolio. Using the mean-variance model to evaluate the gains from international banking is equivalent to the following standardized model of the bank decision problem:

- There is a representative risk-averse bank in each country.

---

[10] See Stigum (1990) for an extensive discussion of country risks involved in international banking.

- Banks face a menu choice of *N* composite risky assets corresponding to *N* different locations (countries), including the domestic market. Furthermore, there is a risk-free domestic asset. Our focus is the allocation of the risky portfolio of assets, not the split between risky and riskless assets.
- Banks take interest rates on the risky assets as given and choose the international allocation that maximizes the risk-return tradeoff (Sharpe ratio) subject to a no-short-sales constraint.[11]

For each of our four reporting countries, we find the set of portfolio weights on risky assets which maximizes the Sharpe ratio (i.e. the ratio of the excess return of the portfolio to its standard deviation) subject to a no-short-sales constraint. Note that, since banks' assets and liabilities are fundamentally different kinds of contracts, a short sale of assets is not equivalent to the contracts banks hold as liabilities. The benchmark portfolio of risky assets is determined as the portfolio on the efficient (constrained) frontier with the highest Sharpe ratio, which we calculate by mapping out the constrained frontier.[12] Hence, we focus on banks' holdings of r*isky* assets and ignore the weight on the domestic riskfree portfolio. Of course, in the portfolio model, banks optimal *total* portfolio is a linear combination of the riskfree domestic asset and the risky portfolio. Since the relative weight depending on banks' degree of risk aversion. In our analysis we are interested in banks' preferences for investing domestically versus abroad and less in banks' preferences for safe and risky assets, and since the relative weights on the domestic and foreign assets in the risky portfolio are unaffected by the degree of risk aversion, we ignore the safe part of the portfolio.[13]

Applying a mean-variance optimization framework to study banks' cross-border asset allocation implies that we are making two main simplifying assumptions:

First, the decomposition of the asset and liability side implicit in this setup is equivalent to a view of a bank that faces a menu of exogenously given investment opportunities and that will attempt to raising funding for any nonnegative net present value project. Banks' ability to expand their balance sheet is of course subject to various constraints such as reserve and capital ratio requirements which work to pin down the overall size of the asset portfolio. Such constraints are abstracted from in this paper. We simply derive the composition of the Sharpe-

---

[11] If returns on bank claims are normally distributed, this is consistent with any utility function in a one-period model. Alternatively, for non-normal returns, restrictions must be placed on the utility function.

[12] We compute each point on the frontier by finding the set of weights which, for a given mean return, minimizes the standard deviation of the portfolio, subject to the non-negativity constraint.

[13] When we compare the benchmark portfolio with banks' actual portfolios we use data on banks' holdings of risky domestic assets only. That means that banks' actual domestic holdings are in fact higher by the magnitude of domestic safe assets.

ratio maximizing portfolio and compare it to banks' actual composition, treating portfolio size as exogenous.[14] While a simultaneous treatment of banks' assets and liabilities is essential in an analysis of the risks that banks carry *on* their books, in this paper, our perspective is rather to as ask how much risk banks can *take off* their books by means of cross-border diversification.

Second, the mean-variance benchmark treats banks as price-takers. This assumption differs in an important aspect from the modern theory of financial intermediation which rationalizes the existence of banks by the asymmetry of information in credit markets.[15] The return to monitoring and the connection between credit risk and asymmetries of information are central elements in the theory of financial intermediation which are abstracted from in the mean-variance model. Hence, information costs are a potential source of deviation between our benchmark portfolios and banks' actual portfolios. We consider this possibility explicitly in the analysis below by including regressors that proxy for information costs when we look for explanations for the deviation between the benchmark and actual portfolios.

Summing up, banks should not be, and indeed do not appear to be, indifferent about the risk-return trade-off on their asset portfolios. International cross-border lending is likely to entail gains from diversification although benefits may be mitigated if monitoring is costly at international level. In our approach, the value of the portfolio model is that it serves as a benchmark focusing on banks' exposures to the various country risks that are inherent to international loan markets. An additional important implication of this choice of benchmark is that it allow us to actually *compute* the benchmark asset composition. Without an explicit benchmark, the study of banks' portfolio is hampered as one does not know what one is supposed to be comparing to. Note that our choice of benchmark does not imply an assumption that banks' cross-border lending returns are generated by the CAPM. Rather, we take the return on cross-border lending as given and compute the corresponding asset demands (equivalently, supply of funds). The portfolio model is clearly not a model of the fundamental asset transformation process performed by banks, but its usefulness lies in the provision of an explicit benchmark, which, through a deviation-from-benchmark measure, may help us pin down some of the forces that underlie international banking.

---

[14] That binding capital constraints may affect the extent of banks' international lending has recently been showed by Peek and Rosengren (1997, 2000).

[15] Seminal references are Leland and Pyle (1977), Diamond and Dybvig (1983), and Diamond (1984). See also Freixas and Rochet (1998) for a comprehensive exposition of the theory of financial intermediation.

2.3 Hedged Returns

When banks invest internationally, they are exposed to currency risk. Changes in exchange rates imply that banks located in different countries face different investment opportunity sets when they convert the return on foreign assets into their domestic currency. Therefore, we calculate three alternative sets of benchmark portfolio weights. The alternatives differ with regard to the assumption we make about how banks choose to hedge their exposure for currency risk. We do not actually observe the currency-denomination of the bilateral positions in our data. However, we assume that the currency denomination coincides with the location of the counter-party as long as that counter party is a OECD-member. Liquid derivatives markets exist for all OECD-countries in our sample, so this assumption does not seem inappropriate. For emerging market, however, liquid forward markets do not necessarily exist, hence returns against emerging market counter parties are measured in USD and can be hedged with the USD-forward rate.

Using these assumptions, we compute the following hedging portfolios:

- In Case 1, we assume that banks do not hedge their currency exposures and hence choose to carry that risk on their books. This may correspond to a situation where it is optimal for banks to leave their foreign investments unhedged, either because the costs of hedging are too high or because

3 Data

3.1 Banks' Cross-Border Assets

To compute the geographical dispersion of banks' portfolios, we use the locational data published by the Bank for International Settlements (BIS) in its *Quarterly Review* (also known as the *BIS Territorial Data*). For each reporting country, the BIS reports the assets held vis-á-vis recipient countries from both the developed and the developing world. Supplementing the BIS Quarterly Review with historical unpublished data obtained from the BIS, we are able to construct a panel data set of annual bilateral assets positions for the following four reporting countries; France, Germany, United Kingdom, and the United States. The data sample used in this study covers the period from 1995 to 1999.

The data provide information on the total value of assets of banks located in the reporting countries against counter-parties located abroad (recipient countries). Only the total dollar value of the claims against counter-parties located abroad is collected. Hence, determining the benefit from investing abroad, the assets on any recipient country are best thought of as a *composite asset* with a return that is subjected to various country risks. This composite asset spans various types of assets against various types of counter-parties. In particular, the maturity, cash flow, currency denomination, besides location of counter-party, are characteristics that may differ across the contracts that make up the composite asset. In addition, asset positions include trade-related credit, holdings and own issues of international securities (except the US), and permanent financial interests in other undertakings such as equity positions (participations). Off-balance sheet items are generally excluded. The types of counter-parties contained in the cross-border position in our data include other banks, nonbanks, and own subsidiaries located abroad (by the locational nature of the data).[17] At the aggregate level, about two-thirds of international assets are interbank assets, and most of these are denominated in the major currencies. The distinguishing feature of our data set is the location of counter-party, whereas the other contractual dimensions (such as currency, maturity, type of counterparty) are not available to us at the bilateral level.

The BIS locational data, however, do not allow us to construct a perfect picture of the international diversification of banks' portfolios, as the location and ownership of counter-party do not necessarily coincide. Hence, the locational data do not consolidate assets vis-à-vis foreign branches and subsidiaries of the banks in the reporting country.[18] Bilateral consolidated data have not been collected by the BIS prior to 1999. Hence, we cannot

---

[17] Our data cover several different types of on-balance sheet contracts, including interbank deposits, syndicated lending, revolving credit, securities, and participations.

[18] That is, any office, branch or subsidiary of foreign banks residing in, say, the U.S. are registered as "banks in the U.S.".

distinguish loans made by UK-chartered banks to (say) Japan from funds channeled to Japan by Japanese subsidiaries located in London. Because interoffice positions are not netted out, there is noise in our measurement of the diversification of actual portfolios. The locational data do not net our interoffice claims and hence overestimates international diversification but on the other hand it underestimates international diversification by not considering the foreign positions of foreign offices located abroad. The direction of the bias also depends on the interoffice accounting practices of banks. To get a sense of the extent of this noise, we compare for the one overlapping year of 1999 the regional structure of portfolio weights calculated by the locational data with the BIS bilateral consolidated data. In fact, we find fairly small differences for Germany, France and the U.S. The deviation between the two portfolio weight measures is in the order of five percentage points for any individual recipient country, and typically much lower than that, and the sign of the difference varies. For the U.K., due to London's position as a financial center, the size of the unconsolidated portfolio is rather much larger than the consolidated portfolio, hence we underestimate the portfolio share of the domestic risky asset by 30 percentage points, making the U.K. look more diversified than it really is. Also, cross-border investment against counter-parties in the U.S. is overestimated by about six percent (these are interoffice positions of U.S. subsidiaries/offices in London). We comment on the latter observation in section 4.3 when we discuss the results, but in general they appear not to be seriously affected by the noise in the locational data.

Our computation of the benchmark portfolio also requires information about assets held domestically, and we obtain data on the domestic bank assets for the four reporting countries from the IMF publication *International Financial Statistics* (domestic assets are not collected by the BIS). We subtract out domestic claims on the government sector which proxies for the domestic risk-free asset. Notice that because the domestic data are taken from a different source, the measurement of the relative size of domestic and foreign positions may be affected by measurement error.

3.2 Estimating Returns on Banks' Cross-Border Assets

In order to determine the opportunity set that banks face in an international context, we need to estimate the expected returns and risks of the foreign composite assets. Banks typically lend at LIBOR plus a spread to each individual counter party depending on the credit rating of that counter party. The mark-up also contains a premium for transfer and political risk if not already priced into LIBOR. We want our benchmark portfolio to be based on returns that price transfer and political risk which is an integral part of international banking.

Given that we are working with a composite asset observed annually, we cannot treat the return at date t as a *known* interest earned on an investment maturing in one year. To the extent that assets are of shorter maturity or that the interest is reset at intermediary dates, the

future return earned on the composite claim will be random. For example, a bank that lends under a line of credit is exposed to both interest and quantity risk.

Based on these two considerations, we use total returns on sovereign bond indices to measure banks' expected return on cross-border assets: for the OECD-countries in our sample, which all have liquid and liberalized capital markets during the sample period, we compute returns measured in the domestic currency from the MSCI-sovereign bond indices. For emerging markets, we use the JP Morgan *EMBI+* indices, which are USD-denominated bonds, to calculate total returns:. The EMBI+ indices are available from 1994, thus determining the starting year of our sample. Hence, we are (realistically) assuming that lending to emerging markets takes place in USD (see, e.g. Claessens et al. 2003). Ideally, we would have preferred to work with corporate debt indices but such are available for only few of the countries in our sample.[19] We estimate the means and variance-covariance matrix of each national index from monthly observations of 3-months returns, using the entire time-series of observations (we do not use a rolling-window to allow for changes in expected returns over time, and hence time-varying benchmark weights, because our time-dimension is relatively short which occasionally produces unrealistically unstable weights).

The essential feature of the benchmark portfolio thus is that it is calculated from returns that price the country risks faced by banks engaged in cross-border lending. Our benchmark returns, however, may not capture individual counter-party credit risk to the extent such risk is priced at the aggregate level (cf. we work with national-level data). If on the other hand, any required premium for credit risk is approximately the same across recipient countries, our estimated benchmark weights will be valid nevertheless. This approximation will hold to the extent international transactions mostly take place between banks with an investment-grade credit-ratings. To account for the possibility that the approximation does not hold well, we include a proxy for credit risk of counter-parties in our regressions.

We construct a sample of the recipient countries based on the main criteria that data exist that allow us to construct times series of returns for the largest possible subset of countries in the BIS locational statistics, including both OECD and emerging markets using data from the *Datastream* data base. That leaves us with 21 countries: 12 OECD countries (Australia, Belgium, Canada, France, UK, Germany, Italy, Japan, Netherlands, Norway, Sweden, and the US), and 9 non-OECD emerging markets (Argentina, Mexico, Morocco, Panama, Peru, Philippines, Poland, Venezuela, and Russia). These 21 countries cover between 80-90% of total cross-border assets of banks in the four reporting countries.

---

[19] Alternatively, one could in principle adjust the promised return, LIBOR, for a measure of expected losses from information of banks' actual loan losses on a country-basis. To the best of our knowledge, bilateral data on loan losses are not collected by the regulatory authorities in any of the four reporting countries of our data set and hence such measures are impossible to construct.

4 Actual versus Optimal Portfolios: Empirical Results

In this section, we first look at the actual regional structure of banks' international asset portfolios. We then describe the estimated benchmark portfolios and the deviation from the benchmark.

4.1 Regional Structure of International Banking Assets

Figure 1 gives a breakdown of banks' external assets by region of the recipient countries for the years 1995 and 1999. Foreign assets of the reporting countries are highly concentrated in other developed countries. For Germany, France, and the U.K., these countries accounted for around 80–90 percent of total foreign assets. U.S. banks had the smallest exposure to other developed countries (55 percent of the total). The main reason for this difference between the U.S. and the other reporting countries is the relatively large exposure of U.S. banks to developing countries in Latin America and to offshore financial centers.

Over the sample period, lending to other developed countries has increased in importance. This can be seen both in the portfolio shares of EU and of OECD countries. Two interpretations of this restructuring of portfolios are conceivable. On the one hand, the re-structuring of portfolios may be the result of the financial crises of the late 1990s. Due to the increase in risks that have been associated with these crises, banks have tended to move away from emerging markets. On the other hand, regulatory changes such as the creation of the EU's Single Market or the Basle capital accord could be behind these patterns. We account for these two alternative explanations in our regressions below by using proxies for country risks as well as for regulatory changes at the EU level to explain differences in portfolio shares across countries.

4.2 Gains from an International Portfolio

Table 1 summarizes the benchmark portfolio characteristics for the three international benchmark portfolios under the assumption of unit-hedged, optimally hedged, and unhedged returns respectively for each of the reporting countries. The figures in the table are the average values over the five-year sample period We also report the average return and volatility on the purely (risky) domestic portfolio.[20] A comparison of Sharpe ratios suggests the existence of considerable gains from international diversification. The Sharpe ratios are reported on an annualized basis, hence for, say, the U.S. an annualized ratio of 1.88 corresponds to a monthly ratio of 0.54. The optimally hedged portfolio tends to have the

---

[20] The excess return of the risky domestic portfolio is not zero in our calculations as the risky domestic asset is proxied by the total return on the MSCI sovereign debt index and the risk-free return by the domestic 3-month t-bill rate. The return of the former is necessarily higher and differs by index composition, gains from diversification and reinvestment.

lowest volatility as expected (it is the minimum volatility portfolio), the highest return, and therefore the highest Sharpe ratio. The unhedged portfolio has the highest volatility among the international portfolios due to added volatility from exchange rates, but, interestingly, even the unhedged benchmark has lower volatility than the domestic portfolio.

4.3 Optimal Geographical Allocation and Deviation from Benchmark

In Table 2, we show the estimated average return on foreign assets for the three methods of hedging and for each reporting country.[21] In general, the estimated returns of the OECD-countries have lower mean and smaller standard deviation than those for the emerging markets. The emerging markets with the highest volatilities tend to be Russia, Panama, Peru and Venezuela.

Considering the unit-hedged returns, there is a clear tendency for the core-countries in the European Monetary System (EMS), France, Germany, Belgium and the Netherlands, to have rather similar means and standard deviations vis-à-vis the reporting countries France and Germany. This obviously reflects the convergence of interest rates experienced up to the introduction of the EMU. Domestic returns generally tend to have the lowest standard deviation, suggesting that exchange rate fluctuations matter even when hedged (the exception is the U.K for which the volatilities of the of the core-EU country assets are even lower). The volatility of unhedged returns is always lowest for the domestic asset.

In Table 3, we compare the actual and benchmark portfolio shares derived under the three different hedging assumptions. Generally, the reporting countries are considerably overweighted domestically. This tendency is less marked for the unhedged benchmark, where the added volatility from exchange rates makes the domestic asset more attractive (in fact, in the unhedged case, the U.K. is underweighted domestically). The European reporting banks also overweight North America but underweight Japan, which has a high weight in the hedged benchmark due to low volatility. Indeed, the pattern of benchmark weights appear to be determined by relatively volatilities, rather than expected returns. Therefore, the weight on European countries is high which is much in line with actual weights.

It is noticeable, that the emerging markets generally get assigned zero weights in the benchmarks, except Poland and Russia (and occasionally Peru and Morocco). From a mean-variance point of view, the higher expected returns are out-weighted by the cost of added volatility. In the case of Poland, which is the country with the most persistent pattern of non-zero weights, the reporting countries are all underweighted. The same holds, albeit less

---

[21] We report nominal returns. Converting to real returns affects the benchmark weights only to the extent that the inflation rate of the reporting country is correlated with changes in the exchange rate.

systematically, for Russia. Also notice that reporting country banks' overweight Latin America relative to the benchmarks.

The variation in actual and benchmark portfolio composition over the sample period is depicted in Figures 2-5 which plot the difference between actual and benchmark portfolio weights for the four reporting countries and for five regions (domestic, Asia (including Australia), E.U., North America, Latin America and East Europe (incl. Russia). Africa, represented by Morocco only, is left out). Generally, the domestic asset is overweighted and the assets of European countries are underweighted. This pattern is consistent across all reporting countries, although it appears that domestic overweighting is less in the U.K. Recalling the discussion from section 3.1 however, we know that the unconsolidated locational data in fact overestimates the domestic portfolio share by about 30 percentage points and overestimates the weight on the U.S. by 6 percent. Taking that into account we see that the U.K. is in fact equally overweighted domestically as the three other reporting countries. Finally, its worth noticing that visually one can make out a small tendency towards the benchmarks, that is, larger internationalization, over time.

The variation in the difference between actual and benchmark weights over time tend to stay within the order of five percent, reflecting changes in the actual portfolio share (the benchmark shares are constant over time). Considering that the actual domestic portfolio weights are between 70-90 percent, this variation is far from negligible. We address the issue of the determinants of this variation in Section 5.

5 Explaining the Deviation from Benchmark

How should we interpret the observed difference between the benchmark and actual portfolio compositions? We look for explanations by regressing the difference between the benchmark and actual portfolios weights on variables that proxy for regulations, information costs, and risks. Our motivation for this choice of regressors is discussed below.

5.1 Explanatory Variables

One explanation for the observed differences in actual and optimal portfolios is that these simply result from estimation/measurement error. Using ex post data, it is unlikely that the benchmark and actual portfolios will turn out to be identical and the variance-covariance matrix of returns may be estimated with error. However, the over-investment in the domestic economy relative to the investment implied by the optimal risk-return tradeoff appears too large to be a result of measurement error, even if we take into account that the domestic data are taken from a different source. Further, if the observed deviation in weights is caused by such errors alone, we should not observe a systematic relationship between the deviation and the regressors. Yet, the results in Table 4 indicate the presence of systematic covariations.

The alternative explanation is that our benchmark portfolios neglect elements that are important to international banking. In particular, the mean-variance benchmark ignores the potential importance of asymmetric information, as discussed in Section 2. We investigate this possibility by choosing regressors that may capture such factors. In particular, we run a panel regression of the difference between the benchmark and actual weights (benchmark minus actual) for country *i* and the actual weight on country *i* on proxies for regulations, information costs, and risk.

To capture barriers to foreign investment that are related to culture and asymmetry of information, we use a *similarity* measure which is the sum of a 0/1-dummy for common language and a common legal system (the latter may also proxy for legal risk). In addition, we include a variable measuring the distance between the partner countries. *Distance* measures the shortest line between two countries' commercial centers according to the degrees of latitude and longitude (in 1,000 km).[22]

Because costs of financial distress in the business of banking may be extreme, and because bankruptcy therefore is associated with large deadweight costs, we also include as regressors variables that proxies for credit risk at the country level. We use the *Euromoney* score for *political risk* of nonpayment of government debt and the *Euromoney* score for *forfeiting* premium and tenure available.[23] While the first measure likely captures the strength of government finances, the second measure captures credit and legal risks for claims on other banks and non-bank firms (a bank line of credit is sometimes required by the forfeiting company).

Finally, we include two variables which are intended to capture regulatory restrictions to foreign lending. The first is a dummy variable which equals one when the recipient country is an *EU*-member in order to take into account the impact of the EU's Single Market program. Second, we include a dummy for the presence of *capital controls* on cross-border financial credits. This variable equals 1 if countries do impose controls and 0 otherwise.

---

[22] Kindly provided by Dieter Schumacher from the German Institute for Economic Research (DIW).

[23] The Euromoney political risk index is constructed from a poll of risk analysts, risk insurance brokers, and bank credit officers. They were asked to give each country a score between zero and 10 (10 indicated no risk of nonpayment, zero indicates that there is no change of payments being made). Access to and discount on forfaiting reflects the average maximum tenor available and the forfaiting spread over riskless countries, such as the United States, based on the average maximum tenor minus the spread. The maximum score is 25. Countries for which forfaiting is not available score zero. Both variables vary over both the time and cross-sectional dimension. Data are supplied by Morgan Grenfell Trade Finance, West Merchant Bank, the London Forfaiting Company, Standard Bank, and ING Capital.

In the regressions, each of the above variables is interacted with a dummy variable that equals zero if the benchmark portfolio weight exceeds the actual weight for a recipient country (the *underweighted* group) and one otherwise (the *overweighted* group). In some cases in the regressions when the number of countries in a group is very low, there is no variation in the similarity and/or EU-dummy variables along neither the time nor cross-sectional dimension, and the variable is therefore excluded from the regression (indicated by 'n.a.'). We use the FGLS estimator allowing the error terms to differ in variance across countries, correcting both for heteroscedasticity and autocorrelation in the data. Time fixed effects are included in all regressions but these are predominantly.

Table 4 presents the regression results. Because we use the nominal deviation from benchmark weights as the dependent variable, one needs to distinguish between two cases when interpreting the coefficient signs; namely, the case where the benchmark weight exceeds the actual weight for country *i* and the deviation is positive, the case of *under-investment* relative to benchmark, and the opposite case where the deviation is negative, i.e. *over-investment*. For the under-investment case, a negative coefficient is interpreted as a movement *towards* benchmark (less under-investment). A positive sign indicates a movement *away from* benchmark (more under-investment). For the over-investment case, the coefficient signs have the opposite interpretation. The following Table summarizes these effects (where w_{opt} (w_{act}) = optimal (actual) portfolio shares):

	Over-investment $w_{opt} - w_{act} < 0$	Under-investment $w_{opt} - w_{act} > 0$
Negative coefficient	away from benchmark → more over-investment	towards benchmark → less under-investment
Positive coefficient	towards benchmark → less over-investment	away from benchmark → more under-investment

Considering the regressions in Table 4 the first thing to notice is that the sign patterns does not differ markedly across benchmarks, that is, when we change the assumption about currency hedging, not does it differ much between countries. We run the regressions with and without a dummy for EU-membership because as we hypothesize that the Single European Market may encourage cross-border lending, at least between the EU-member countries. This is certainly consistent with the observation discussed above that the bulk of cross-border lending is among EU-countries (with the exception of the U.S.). However, this fact may also be caused by other characteristics of the EU countries, hence we run the regressions both with and without the EU-dummy. In the regressions first notice that the sign of the other coefficients are generally unaffected by whether we control for this Single Market-effect or

not. the sign on the underweighted coefficient is generally positive and the sign of the overweighted coefficient is generally negative. Hence, given, say, Germany is over-invested in certain countries, it over-invests even more if that country is an EU member. Given its under-investing in certain countries, it under-invests even further if that country is an EU member. What these signs are reflecting is that Germany invests predominantly domestically, and underweights the other European countries in our sample. Since the weights must sum to one, the interpretation must necessarily be that a preference domestic investments appears to be driving the sign of the underweighted coefficient (otherwise, if underinvestment is hampered by some 'barrier', EU-membership should mitigate that barrier). Hence, for reasons other than EU-membership do German banks over-invest domestically, and therefore under-invest in other countries. We shall see below that this interpretation, that domestic investments looks like a 'driver', is a fundamental result of our regressions.

5.2 Informational and Regulatory Barriers

What are the interpretations of our findings? Considering first the under-investment case, if informational barriers are mitigating gains to international diversification and such barriers are captured by the similarity and distance variables, we would expect a negative sign on similarity (higher score associated with less under-investment) and a positive sign on distance (further apart, more under-investment).

In fact, our regression results do not provide evidence for this interpretation. For distance, we find a tendency for a negative sign for both the under- and overweighted group. That is, the more geographically remote is the recipient country the less one would under-invest, and the more one would over-invest. These signs are at odds with an interpretation of distance capturing information costs. Instead, they are more likely to reflect the importance of certain individual countries rather than a systematic effect.

For the similarity dummy, we get quite mixed results. For the U.K. and the U.S., the sign tends to be negative for the overinvested group, while it is positive for France. For the underinvested group, the sign in positive for Germany, negative for France, and we obtain mixed results for the U.S. (negative sign for the optimally hedged portfolio, positive for the unhedged portfolio). Again, the positive signs that we find do not support a story about informational barriers to cross-border lending, and we conclude that neither distance nor similarity appears to be able to explain the deviations from the benchmark portfolios that we find in the data. Hence, we do not find strong evidence that our proxies for information costs are a barrier to cross-border banking relative to the mean-variance benchmark.

While the information proxies are not consistent with a story about barriers to cross-border lending, the sign on the capital control dummy is very much so. The dummy attains the value of one when controls are in place, and we observe that the sign of the underweighted

coefficient is positive, implying that underinvestment is larger in magnitude for countries in this group when controls are imposed. Noticeably, the overweighted coefficient is insignificant as it should be. Namely, overinvestment implies that barriers are non-binding.

Notice too that the signs associated with the capital control variables are large, in the order of 10-20. Hence, reporting banks' portfolios are underweighted by an additional 10-20 percentage points relative to benchmark against recipient countries that impose capital controls. This figure is clearly of an economically significant magnitude.

5.3 Credit and Political Risk

In addition to proxies for information costs and regulations, we have included measures of political and credit risk to explain the deviation of actual from optimal portfolios. Consider first the political risk index. It has a negative sign for the overweighted group and a positive for the underweighted group. Given that banks overweight, they overweight more when political risk falls, and underweights even further. Given that over-investment cannot be a result of barriers and that the weights for the over- and under-investment groups must sum to one, this pattern is consistent with a situation where banks have preferences for certain countries for reasons unrelated to the optimal risk-return tradeoff, and when political risk lessens, resources move to those locations. Since the domestic market is always part of the over-investment group, this would also be consistent with a situation where banks focus on conditions in the domestic market and foreign investment to non-preferred countries is a residual (cf. Goldberg 2001). The size of the overweighted coefficient is between 0.34 and 1.95, with an average around 0.5, which is about five times larger than the average size of the coefficient of the underweighted group (between 0.02-0.24) and the effect of the overweighted group hence is economically much more significant.

The systematic co-variation with the political risk variable has an interesting implication in the mean-variance framework, given that political risk is likely priced into sovereign debt returns. The systematic co-variation with the deviation from benchmark portfolio weights implies that the political index has a component that is idiosyncratic relative to the benchmark portfolio which nevertheless affect banks' actual portfolio shares. That is, *under* the benchmark model of bank behavior, idiosyncratic political risk appears to matter for foreign investments over and above the risk premia incorporated into total returns on the indices.

The forfeiting index is included in the regressions to proxy for private sector credit risk, a risk-factor which we suspect a priori may not be well-captured by our benchmark returns. The pattern of signs is rather less systematic then the political index. For the US, the two groups' coefficient signs suggest higher investment in countries with more favorable credit 'conditions' conditional on over- or underweighting respectively. Its interesting to notice that the sign changes from negative to positive from the optimal to the unhedged benchmark.

From Table 3, it can be seen that Japan is heavily underweighted in the optimal case, whereas Japan is overweighted in the unhedged case (similarly for the Netherlands and Norway, however, the difference from benchmark weights is much smaller for the latter two). It is tempting to speculate that Japan is driving that change in signs, that is, when credit risk is less pervasive American banks' cross-border lending to Japan moves towards the benchmark. Also France has large negative coefficients for the underweighted group, consistent with an interpretation of credit risk as a barrier, and small positive coefficients on the overweighted group suggesting the effects of the underweighted group causally dominate (since the weights must sum to one). We conclude that there is some evidence from France and the U.S. which suggests that credit risk may be a barrier to cross-border lending, but that the results are somewhat ambiguous.

6 Conclusion

In this paper, we study the cross-border asset positions of banks located in four major economies (reporting countries): France, Germany, the U.K., and the U.S. We argue that banks are likely to benefit from diversifying risks on their balance sheet by lending internationally through an improvement in the risk-return tradeoff due to the diversification of location (country)-specific risks. We use the portfolio with the highest estimated Sharpe ratio (optimal risk-return trade-off) in the mean-variance portfolio model as the benchmark international portfolio allocation, and we compare this benchmark to the composition of banks' actual international portfolios. We also compute this benchmark under different assumptions about the hedging of foreign currency risks

The estimated gains from cross-border diversification appear considerable, increasing the domestic Sharpe ratio by a factor of 1.5 or more. We find that, from a mean-variance point of view, the effect of exchange rate risk involved in cross-border lending affects the composition of the benchmark portfolio considerably, and that the volatility of returns in particular is the primary determinant of the benchmark composition. Hence, our estimated benchmark portfolios all attach a high weight to European recipient countries. Our findings may be interpreted as suggesting that exchange rate risk may be an important consideration when assessing the return from international lending.

Considering banks' actual portfolios, we find a pattern of over-investment in the domestic economy of the reporting country relative to the mean-variance benchmark. This pattern is persistent over time. Banks' international assets, hence, do not appear to be consistent with the optimal risk-return tradeoff. This may suggest that there are barriers mitigating the gains to international diversification.

Regressing the deviation between our benchmark and actual portfolio weight on variables proxying for country-level political, credit risk, information costs (cultural and geographical

distance), and regulations we do not find systematic evidence that under-investment in certain markets is caused by barriers related to cultural differences or geographical distance.

We do, however, find strong evidence that reporting banks underweight recipient countries with capital controls in their portfolios and hence that capital regulations impact banks' cross-border lending. We also find strong evidence that idiosyncratic political risk affects banks' portfolio composition. Our findings are consistent with an interpretation where banks have preferences for domestic lending and increased domestic lending takes place at the expense of lending to overseas markets.

Furthering our understanding of the factors shaping banks' international asset allocation choice and the usefulness of applying the portfolio model as a benchmark, we see a number of routes along which the present study may be extended. For the data used in this study, the international asset is a composite asset which includes a number of different counter-parties, currencies, and types of contracts. Breaking up international asset holdings along these lines appears a promising approach.

7 References

Acharya, V.V., I. Hasan, and A. Saunders (2002). The Effects of Focus and Diversification on Bank Risk and Return: Evidence from Individual Bank Loan Portfolios. CEPR Working Paper No. 3252.

Bank for International Settlements (BIS). *Quarterly Review*. March 2001. Basle.

Berger, A.N., Q. Dai, S. Ongena, D.C. Smith (2003). To What Extent Will the Banking Industry be Globalized?: A study of bank nationality and reach in 20 European Nations. *Journal of Banking and Finance*, 27, 383-415.

Buch, C.M. (2002). Information or Regulation: What Drives the International Activities of Commercial Banks? *Journal of Money, Credit, and Banking* (forthcoming).

Buch, C.M., and G. DeLong (2001). Cross-Border Bank Mergers: What Lures the Rare Animal?. Kiel Institute for World Economics. Kiel Working Paper 1070. Kiel.

Burger, J.D., and F.E. Warnock (2002). Diversification, Original Sin, and International Bonds Portfolios. Sellinger School of Business and Management, and Board of Governors of the Federal Reserve System. Mimeo.

Claessens, S., D. Klingebiel, and S. Schmukler (2003). Government Bonds in Domestic and Foreign Currency: The Role of Macroeconomic and Institutional Factors. Mimeo.

Coval, J.D., and T.J. Moskowitz (1999). Home Bias at Home: Local Equity Preference in Domestic Portfolios. The Journal of Finance 54 (6), 2045–2073.

Degryse, H., and S. Ongena (2002). Distance, Lending Relationship, and Competition. Center for Economic Research. Discussion paper 2002-16.

Diamond, D. (1984). Financial Intermediation and Delegated Monitoring. *Review of Economic Studies* 51(3):393–414.

Diamond, D. and P. Dybvig (1983). Bank Runs, Deposit Insurance, and Liquidity. *Journal of Political Economy* 91(3): 401–419.

Disyatat, P., and R.G. Gelos (2002). Can a Simple Model Explain the Asset Allocation of Emerging Market Funds. Bank of Thailand and International Monetary Fund. Mimeo.

Focarelli, D. and A.F. Pozzolo (2001). The patterns of cross-border bank mergers and shareholdings in OECD countries. *Journal of Banking and Finance* 25: 2305-2337.

Freixas, X., and J.-C. Rochet (1998). *Microeconomics of Banking*. Cambridge: MIT Press.

Goldberg, L. and A. Saunders (1980). The Causes of US Bank Expansion Overseas: The Case of Great Britain, *Journal of Money, Credit and Banking*, 12, 630-644.

Goldberg, L.G. and A. Saunders, 1981, The Determinants of Foreign Banking Activity in the United States, *Journal of Banking and Finance* 5, 17-32.

Goldberg, L.S. (2001). When is U.S. Bank Lending to Emerging Markets Volatile? Working Paper 8209. National Bureau of Economic Research, Cambridge, Mass.

Grinblatt, M., and M. Keloharju (2000). Distance, Language, and Culture Bias: The Role of Investor Sophistication. Yale International Center for Finance. Yale ICF Working Paper 00-04.

Hart, O.D., and D.M. Jaffee (1974). On the Application of Portfolio Theory to Depository Financial Intermediaries. *Review of Financial Studies* 41(1): 581–600.

Hellwig, M. (1998). Banks, Markets, and the Allocation of Risks. *Journal of Institutional and Theoretical Economics* 154: 328-351.

Hultman, C. W, and L. R. McGee (1989). Factors Affecting the Foreign Banking Presence in the U.S., *Journal of Banking and Finance*, 13, 383-396.

IMF (International Monetary Fund) (2002). *International Financial Statistics*. Washington, D.C.

Jorion, P. (1985). International Portfolio Diversification with Estimation Risk. *Journal of Business*, 58, 259-78.

Karolyi, G. A., and R. M. Stulz. (2001). Are Financial Assets Priced Locally or Globally? In G. Constantinides, M. Harris, and R. M. Stulz (eds.), forthcoming in *Handbook of the Economics of Finance*, North-Holland.

Kim, D. and A. M. Santomero (1988). Risk in Banking and Capital Regulation. *Journal of Finance* 43(5): 1219–1233.

Koehn, M., and A. M. Santomero (1980). Regulation of Bank Capital and Portfolio Risk. *Journal of Finance* 35(5): 1235–1244.

Leland, H. E. and D. H. Pyle (1977). Information Asymmetries, Financial Structure, and Financial Intermediation. *Journal of Finance*, 32, 371-87.

Lewis, K. K. (1999). Trying to Explain Home Bias in Equities and Consumption, *Journal of Economic Literature*, 37, 571-608.

Markowitz, H. (1952). Portfolio Selection. *Journal of Finance* 7, 77-91.

Markowitz, H. (1959). *Portfolio Selection: Efficient Diversification of investments.* John Wiley, New York.

McCauley, R. N., J. S. Ruud, and P. D. Wooldridge (2001). Globalising International Banking. *BIS Quarterly Review*, March 2002.

Peek, J. and E.S. Rosengren (1997). The International Transmission of Financial Shocks: The Case of Japan. *American Economic Review* 87(4): 495–505.

Peek, J., and E.S. Rosengren (2000). Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States. *American Economic Review* 90(1): 30–45.

Petersen, M. A., and R. G. Rajan (2002). Does distance still matter? The Information Revolution in Small Business Lending. *Journal of Finance*, forthcoming.

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

Portes, R., and H. Rey (2001). The Determinants of Cross-Border Equity Flows: The Geography of Information. Mimeo. Princeton University and CEPR.

Pyle, D. H. (1971). On the Theory of Financial Intermediation. *Journal of Finance*, 26, 737-47.

Sercu, P. (1980). A Generalization of the International Asset Pricing Model. *Revue the l'Association the Francaise de Finance*, 1: 91-135.

Solnik, B. (1973). *European Capital Markets*, Lexington Books, Lexington Mass.

Stigum, M. (1990). *The Money Market*, 3rd edition, McGraw-Hill, New York.

Stulz, R. M. (1994). International Portfolio Choice and Asset Pricing: an Integrative Survey. NBER Working Paper. Cambridge, MA.

Whalen, G.W. (1988). The Risks and Returns Associated with the Insurance Activities of Foreign Subsidiaries of U.S. Banking Organizations. Working Paper. Office of the Comptroller of the Currency, Department of Treasury.

Winton, A. (1999). Don't Put All Your Eggs in One Basket? Diversification and Specialization in Lending. Manuscript, University of Minnesota.

Table 1 — Benchmark Portfolios. Summary Statistics: 1995-1999.

	International Unit Hedge	International Optimal Hedge	International Unhedged	Domestic
	Average Annual Excess Return (%)			
France	3.56	4.68	3.36	2.98
Germany	3.68	4.32	4.04	3.74
UK	5.12	5.92	4.40	4.43
US	4.76	5.60	4.28	3.55
	Average Annual Standard Deviation (%)			
France	1.49	1.63	1.51	1.61
Germany	1.21	1.21	1.44	1.62
UK	1.31	1.24	2.04	2.05
US	1.38	1.36	2.13	2.04
	Sharpe Ratios			
France	2.40	2.88	2.26	2.02
Germany	3.04	3.58	2.78	2.53
UK	3.90	4.78	2.16	2.20
US	3.44	4.12	2.00	1.88

Table 2 — Estimated Rate of Return on Cross-Border Claims, by Reporting Country and Type of Hedge. Average values (percent), 1995-1999

A. OECD-countries

Country	Hedge		AUS	BEL	CAN	FRA	UK	GER	ITA	JAP	NET	NOR	SWE	USA
France	Unit	Mean	6.34	6.76	6.04	6.08	5.57	6.54	6.54	6.50	6.26	3.66	6.84	5.11
		Std. Dev.	2.53	2.15	2.77	1.61	1.96	1.82	2.46	2.12	1.63	2.54	2.30	1.92
	Optimal	Mean	6.78	7.01	6.04	6.00	6.11	6.90	5.46	6.86	6.33	3.47	6.32	5.29
		Std. Dev.	2.15	1.96	2.18	1.44	1.63	1.60	1.92	1.89	1.52	1.66	1.88	1.63
	None	Mean	6.67	6.05	5.46	6.08	9.98	5.66	9.37	1.78	4.23	3.92	8.42	6.87
		Std. Dev.	12.53	2.61	10.99	1.61	7.77	2.66	8.54	14.11	2.52	7.08	9.08	8.72
Germany	Unit	Mean	5.65	6.07	5.36	5.40	4.89	5.84	5.88	5.79	5.57	2.96	6.17	4.42
		Std. Dev.	2.39	1.92	2.59	1.37	1.78	1.62	2.30	1.99	1.49	2.57	2.18	1.77
	Optimal	Mean	6.13	6.35	5.39	5.35	5.47	6.33	4.82	6.20	5.68	2.83	5.67	4.64
		Std. Dev.	1.99	1.75	2.02	1.22	1.47	1.39	1.75	1.71	1.37	1.58	1.75	1.44
	None	Mean	6.97	6.24	5.73	6.31	10.24	5.84	9.69	1.92	5.41	4.13	8.70	7.13
		Std. Dev.	13.27	2.02	11.65	2.87	8.43	1.62	9.74	13.62	1.56	7.23	9.81	9.34
UK	Unit	Mean	8.16	8.64	7.87	7.93	7.43	8.42	8.30	8.41	8.12	5.42	8.62	6.97
		Std. Dev.	2.59	2.07	2.69	1.60	2.05	1.74	2.50	2.00	1.65	2.58	2.46	1.98
	Optimal	Mean	8.85	9.07	8.12	8.05	8.12	9.05	7.51	8.90	8.37	5.48	8.40	7.33
		Std. Dev.	2.12	1.86	2.16	1.34	1.68	1.46	1.95	1.77	1.51	1.76	2.04	1.53
	None	Mean	4.14	4.16	2.90	4.13	7.43	3.77	7.14	-0.21	3.32	1.74	6.18	4.39
		Std. Dev.	10.18	9.15	7.71	8.20	2.05	9.19	9.21	15.98	8.88	7.99	9.44	5.61
US	Unit	Mean	7.15	7.59	6.87	6.89	6.39	7.38	7.30	7.37	7.07	4.38	7.58	5.95
		Std. Dev.	2.69	2.09	2.88	1.60	2.08	1.78	2.53	2.09	1.63	2.61	2.51	2.04
	Optimal	Mean	7.69	7.91	6.96	6.89	6.96	7.89	6.35	7.76	7.22	4.32	7.23	6.16
		Std. Dev.	2.24	1.93	2.29	1.39	1.73	1.53	2.00	1.84	1.52	1.75	2.09	1.63
	None	Mean	5.67	5.94	4.49	5.90	9.27	5.56	8.86	1.48	5.10	3.46	7.84	5.95
		Std. Dev.	8.42	10.25	6.46	9.20	5.65	10.31	9.39	16.19	9.94	8.52	9.01	2.04

B. Emerging markets

Country	Hedge		ARG	MEX	MOR	PAN	PER	PHI	POL	VEN	RUS
France	Unit	Mean	11.33	9.74	12.16	23.35	21.43	5.47	20.38	12.31	9.89
		Std. Dev.	18.15	16.39	17.20	28.35	27.25	12.57	21.93	24.62	51.04
	Optimal	Mean	13.15	10.91	15.66	24.34	28.71	7.99	27.47	18.76	14.81
		Std. Dev.	13.12	8.43	11.59	19.17	18.88	8.82	16.43	16.25	34.11
	None	Mean	13.09	11.50	13.92	25.11	23.19	7.23	22.14	17.08	11.65
		Std. Dev.	22.58	21.37	22.74	32.18	30.41	17.52	23.17	28.64	53.65
Germany	Unit	Mean	10.77	9.21	11.56	22.91	20.92	4.85	19.80	14.75	9.37
		Std. Dev.	17.99	16.17	17.11	28.09	27.05	12.38	21.70	24.49	50.86
	Optimal	Mean	12.49	10.29	14.99	23.65	28.05	7.31	26.82	17.98	14.05
		Std. Dev.	13.09	8.34	11.60	19.11	18.85	8.70	16.31	16.18	34.07
	None	Mean	13.48	11.92	14.27	25.62	23.63	7.56	22.51	17.46	12.09
		Std. Dev.	23.32	22.25	23.33	32.98	31.07	18.22	23.75	29.27	54.03
UK	Unit	Mean	12.80	11.17	13.45	24.50	22.75	7.02	22.17	16.51	10.42
		Std. Dev.	18.38	16.58	17.33	28.52	27.45	12.51	22.08	24.66	51.61
	Optimal	Mean	15.49	13.01	17.84	26.70	30.97	10.10	29.56	21.18	16.72
		Std. Dev.	13.21	8.38	11.78	19.26	19.05	8.63	16.45	16.35	34.21
	None	Mean	10.22	8.59	10.87	21.92	20.17	4.45	19.59	13.93	7.84
		Std. Dev.	20.10	18.45	19.29	29.73	28.46	14.56	22.71	25.73	51.68
US	Unit	Mean	11.63	9.99	12.25	23.38	21.69	5.89	21.23	15.44	9.60
		Std. Dev.	18.45	16.61	17.48	28.72	27.79	12.78	22.35	25.03	52.54
	Optimal	Mean	14.26	11.81	16.67	25.52	29.74	8.95	28.36	19.98	15.94
		Std. Dev.	13.20	8.42	11.74	19.29	19.12	8.78	16.67	16.48	34.63
	None	Mean	11.63	9.99	12.25	23.38	21.69	5.89	21.23	15.44	9.60
		Std. Dev.	18.45	16.61	17.48	28.72	27.79	12.78	22.35	25.03	52.54

Table 3 — Benchmark and Average Actual Weights 1995-1999

a. OECD

Country	Hedge	AUS	BEL	CAN	FRA	UK	GER	ITA	JAP	NET	NOR	SWE	USA
France	Unit	0	0	0	0	0	0	.043	.291	.451	0	.201	0
	Optimal	0	0	0	0	0	.389	0	.224	.227	0	.108	0
	None	0	0	0	.585	.081	.223	.023	.079	0	0	0	0
	Actual	**.001**	**.016**	**.004**	**.709**	**.072**	**.028**	**.026**	**.035**	**.012**	**.007**	**.003**	**.043**
Germany	Unit	0	0	0	.120	0	0	.071	.267	.379	.030	.121	0
	Optimal	0	0	0	0	.111	.096	0	.254	.400	.007	.103	0
	None	0	0	0	0	.067	.683	.022	.214	.011	.01	0	0
	Actual	**.001**	**.005**	**.003**	**.014**	**.047**	**.843**	**.015**	**.010**	**.010**	**.001**	**.003**	**.017**
UK	Unit	0	0	0	.108	0	0	.0052	.300	.434	.091	0	0
	Optimal	0	0	0	.090	.032	.254	.202	.387	.100	.10	0	0
	None	0	0	0	0	.993	0	0	0	0	0	0	0
	Actual	**.004**	**.014**	**.011**	**.037**	**.549**	**.064**	**.042**	**.064**	**.020**	**.003**	**.009**	**.098**
US	Unit	0	0	0	.074	0	0	.078	.274	.490	.068	.02	0
	Optimal	0	0	0	0	.02	.272	0	.217	.382	.069	0	0
	None	.021	0	0	0	.126	0	.005	0	0	0	.031	.773
	Actual	**.001**	**.001**	**.008**	**.005**	**.026**	**.005**	**.002**	**.016**	**.002**	**0**	**.001**	**.896**

b. Emerging Markets

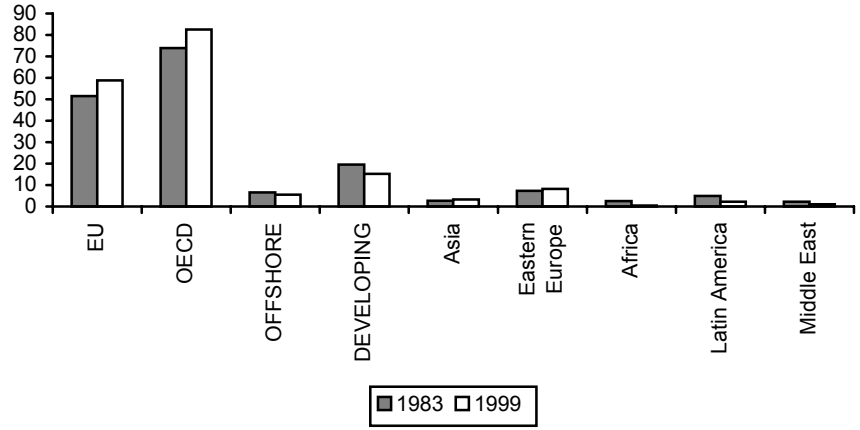
Country	Hedge	ARG	MEX	MOR	PAN	PER	PHI	POL	VEN	RUS
France	Unit	0	0	0	0	0	0	.014	0	0
	Optimal	0	0	.005	0	.017	0	.030	0	0
	None	0	0	0	0	.02	0	.009	0	0
	Actual	**.002**	**.003**	**.002**	**.001**	**0**	**.001**	**.001**	**.001**	**.003**
Germany	Unit	0	0	0	0	0	0	.012	0	0
	Optimal	0	0	0	0	.001	0	.026	0	.003
	None	0	0	0	0	0	0	.003	0	0
	Actual	**.001**	**.001**	**0**	**.001**	**0**	**0**	**.001**	**0**	**.009**
UK	Unit	0	0	0	0	0	0	.015	0	.001
	Optimal	0	0	0	0	0	0	.027	0	.008
	None	0	0	0	0	0	0	0	0	0
	Actual	**.002**	**.003**	**0**	**.001**	**0**	**.001**	**.001**	**.001**	**.002**
US	Unit	0	0	0	0	0	0	.016	0	0
	Optimal	0	0	0	0	0	0	.032	0	.004
	None	0	0	.002	0	0	0	0	0	.004
	Actual	**.002**	**.002**	**0**	**.001**	**.001**	**0**	**0**	**.001**	**.000**

c. Regions

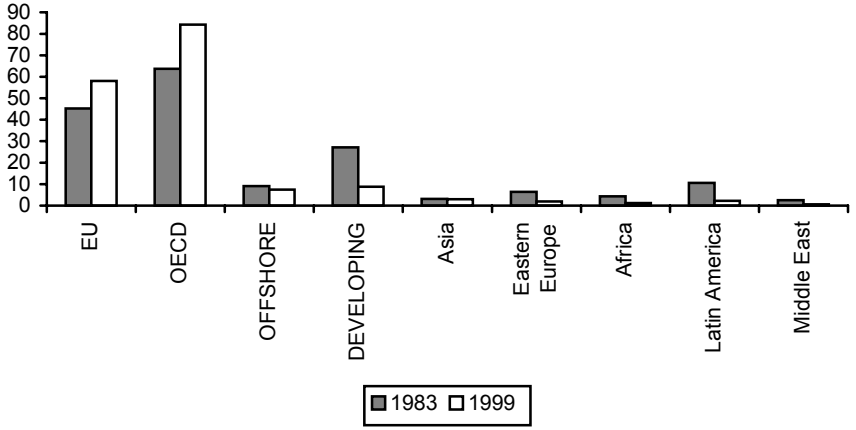
Country	Hedge	Europe	East Asia	North America	Pacific	Eastern Europe	Latin America	Africa
France	Unit	.695	.291	0	0	.014	0	0
	Optimal	.724	.224	0	0	.030	.017	.005
	None	.991	0	0	0	.009	0	0
	Actual	**.867**	**.036**	**.048**	**.001**	**.001**	**.006**	**.002**
Germany	Unit	.721	.267	0	0	.012	0	0
	Optimal	.717	.254	0	0	.029	.001	0
	None	.997	0	0	0	.003	0	0
	Actual	**.923**	**.011**	**.019**	**.001**	**.001**	**.003**	**0**
UK	Unit	.685	.300	0	0	.016	0	0
	Optimal	.763	.202	0	0	.035	0	0
	None	.993	0	0	0	.004	0	.002
	Actual	**.738**	**.065**	**.109**	**.004**	**.001**	**.006**	**0**
US	Unit	.710	.274	0	0	.016	0	0
	Optimal	.746	.217	0	0	.036	0	0
	None	.162	0	.713	.021	0	0	.044
	Actual	**.043**	**.016**	**.904**	**.001**	**0**	**.009**	**0**

Figure 1 — Regional Structure of Foreign Assets, Locational Data

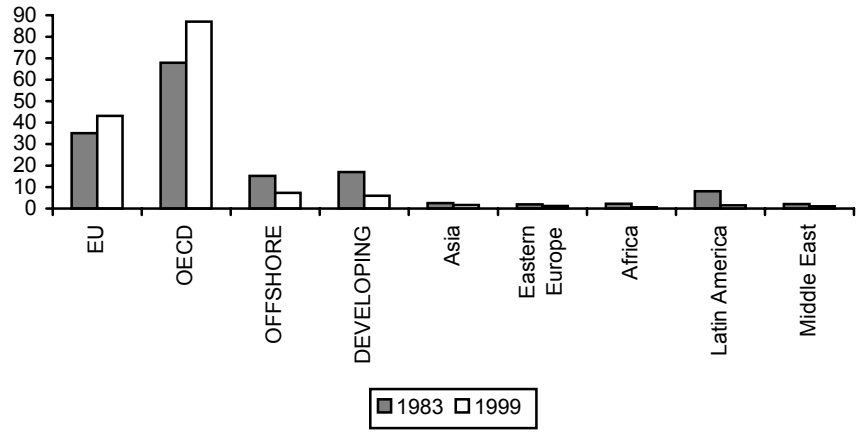
a) Germany



b) France



c) United Kingdom



d) United States

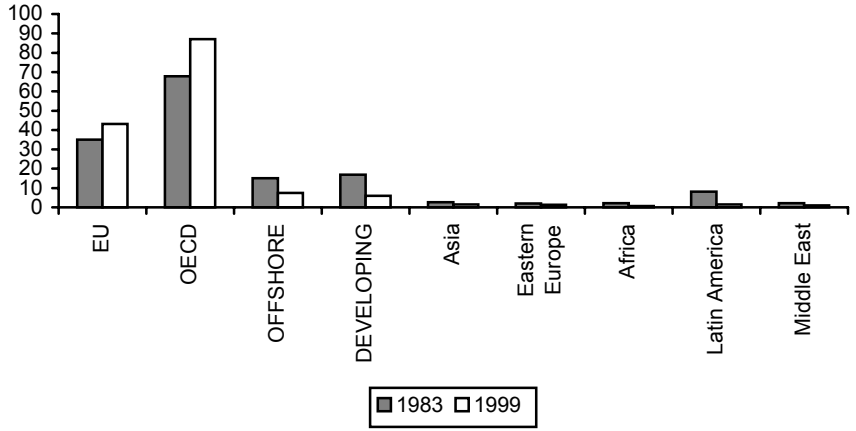


Table 4 — Regression Results: Deviation from Benchmark Portfolio Shares

This Table reports the results from a panel regression of the deviation from the optimal portfolio share, using three alternatives for hedging exchange rate risk: optimal hedging, a unit hedges and no hedging. The dependent variable is multiplied by 100 for appropriate scaling of coefficients. Each regression reports separate coefficients on countries which are overweighted (underweighted) relative to the optimal portfolio. Distance = geographical distance between reporting and recipient country. Similarity = sum of dummy variables for common language and common legal system. Risk indicators were taken from *Euromoney*. "Political Risk" is an index from 0 to 10 of risk on nonpayment. "Forfaiting" is an average of maximum tenure available and forfeiting spreads. EU = dummy equal to one when recipient country is an EU members. Capital controls = dummy indicating whether countries impose restrictions on cross-border financial credits. Standard errors are corrected for heteroskedasticity and autocorrelations. "n.a." = independent variable lacks time-series and cross-sectional variation.* (**, ***) = significant at the 1% (5%, 10%)-level.

(a) Germany

	Not including EU dummy			Including EU dummy		
	optimal	unit hedge	unhedged	optimal	unit hedge	unhedged
Overweighted countries						
log distance	–0.04	–0.05	–0.10	–0.91***	–2.93***	–0.10
	(–0.34)	(–0.27)	(–0.74)	(–2.84)	(–4.59)	(–0.25)
capital controls	–0.05	–0.05	–0.07	–0.18	–0.30	–0.06
	(–0.24)	(–0.26)	(–0.46)	(–0.45)	(–0.71)	(–0.23)
similarity	n.a.	n.a.	–0.11	n.a.	n.a.	–0.51
			(0.27)			(1.24)
forfeiting	–0.00	–0.01	–0.03	–0.02	0.01	–0.03
	(–0.05)	(–0.15)	(–0.55)	(–0.50)	(0.12)	(–0.65)
political risk	–0.09***	–0.07*	–0.06**	–0.06**	–0.15***	–0.02
	(–2.99)	(–1.88)	(–2.46)	(–2.39)	(–3.96)	(–1.03)
EU				–2.98***	–9.61***	–0.34
				(–3.24)	(–5.35)	(–0.36)
Underweighted countries						
log distance	–0.76**	–1.40	–1.35	–0.91**	–4.63***	–1.17
	(–2.04)	(–1.45)	(–1.39)	(–2.05)	(–4.06)	(–1.06)
capital controls	0.42	19.04***	n.a.	–0.18	32.87***	n.a.
	(0.21)	(5.53)		(–0.11)	(11.68)	
similarity	15.76***	n.a.	n.a.	25.37***	n.a.	n.a.
	(6.59)			(14.21)		
forfeiting	0.42	0.93	0.72	0.07	0.34	0.69
	(0.77)	(0.99)	(0.69)	(0.27)	(0.50)	(0.69)
political risk	0.48***	0.55***	0.23	–0.08	0.18	0.19
	(3.74)	(2.65)	(1.30)	(–1.31)	(1.14)	(1.16)
EU				10.40***	9.27***	1.02
				(3.96)	(8.76)	(0.65)
dy1996	0.04	0.02	–0.00	–0.00	0.04	–0.04
	(0.44)	(0.17)	(–0.03)	(–0.04)	(0.28)	(–0.47)
dy1997	0.02	0.01	–0.02	–0.02	0.02	–0.09
	(0.12)	(0.04)	(–0.19)	(–0.20)	(0.11)	(–0.81)
dy1998	0.02	0.01	–0.08	–0.08	0.09	–0.18
	(0.13)	(0.05)	(–0.54)	(–0.58)	(0.38)	(–1.25)
dy1999	–0.06	–0.08	–0.06	–0.14	–0.05	–0.05
	(–0.36)	(–0.35)	(–0.46)	(–0.95)	(–0.21)	(–0.38)
Constant	1.40	1.25	1.65	8.74***	27.19***	1.31
	(1.10)	(0.65)	(1.17)	(2.97)	(4.73)	(0.34)
Observations (N*T)	93	93	93	93	93	93

(b) France

	Not including EU dummy			Including EU dummy		
	optimal	unit hedge	unhedged	optimal	unit hedge	unhedged
Overweighted countries						
log distance	0.53**	0.15	–0.18	–0.16	–0.71	–0.16
	(2.44)	(0.82)	(–1.32)	(–0.47)	(–1.32)	(–0.89)
capital controls	–0.13	–0.14	–0.13	–0.07	–0.29	–0.15
	(–0.51)	(–0.52)	(–0.85)	(–0.36)	(–0.75)	(–0.84)
similarity	0.54	0.55**	–0.21	0.41	0.77**	–0.09
	(1.58)	(1.99)	(–1.08)	(1.15)	(2.20)	(–0.40)
forfeiting	–0.02	0.00	–0.01	–0.00	0.00	0.00
	(–0.29)	(0.04)	(–0.10)	(–0.03)	(0.04)	(0.00)
political risk	–0.07*	–0.16***	–0.05**	–0.03	–0.15***	–0.06**
	(–1.72)	(–3.74)	(–2.20)	(–0.99)	(–3.13)	(–2.16)
EU				–3.06**	–3.80**	–0.22
				(–2.47)	(–2.20)	(–0.35)
Underweighted countries						
log distance	–1.30***	–4.32***	–2.21***	–0.64	–5.06***	–1.36**
	(–3.37)	(–2.69)	(–5.28)	(–1.45)	(–2.79)	(–2.15)
capital controls	–0.28	12.09**	n.a.	0.92	22.07***	n.a.
	(–0.22)	(2.32)		(1.44)	(3.15)	
similarity	–3.64**	–0.01	–3.49**	–5.45***	–1.08	–3.37
	(–2.34)	(–0.00)	(–2.21)	(–3.72)	(–0.24)	(–1.12)
forfeiting	0.87**	2.43	1.60**	0.38*	2.10	1.21*
	(2.14)	(1.37)	(2.44)	(1.79)	(1.14)	(1.68)
political risk	1.29***	1.67***	0.48***	0.55***	1.27**	0.22
	(12.08)	(4.11)	(3.47)	(3.81)	(2.26)	(1.61)
EU				13.92***	8.86	2.54
				(5.64)	(1.46)	(0.67)
dy1996	0.02	0.02	–0.05	0.02	0.04	–0.02
	(0.19)	(0.17)	(–0.43)	(0.22)	(0.19)	(–0.17)
dy1997	–0.03	0.01	–0.04	–0.04	0.04	–0.03
	(–0.16)	(0.05)	(–0.28)	(–0.35)	(0.15)	(–0.18)
dy1998	–0.03	0.11	0.01	–0.01	0.16	0.03
	(–0.12)	(0.41)	(0.05)	(–0.04)	(0.47)	(0.18)
dy1999	–0.15	–0.13	–0.04	–0.09	–0.06	–0.02
	(–0.69)	(–0.50)	(–0.28)	(–0.59)	(–0.18)	(–0.10)
Constant	–4.12*	0.16	2.12	1.40	7.52	1.97
	(–1.81)	(0.08)	(1.52)	(0.44)	(1.51)	(1.17)
Observations (N*T)	93	93	93	93	93	93

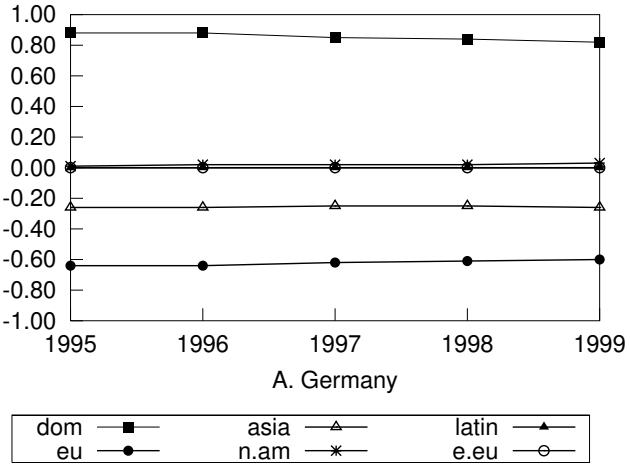
(c) United Kingdom

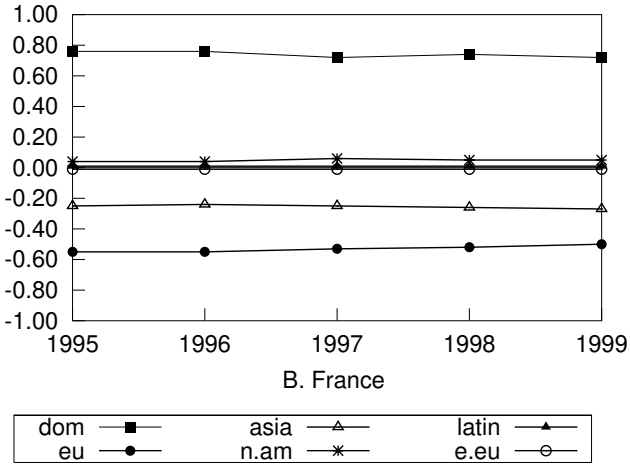
	Not including EU dummy			Including EU dummy		
	optimal	unit hedge	unhedged	optimal	unit hedge	unhedged
Overweighted countries						
log distance	0.04	–0.41	0.17	0.05	–0.66	–0.42*
	(0.26)	(–1.07)	(0.93)	(0.20)	(–1.30)	(–1.76)
capital controls	0.02	–0.14	–0.18	–0.07	–0.15	–0.14
	(0.13)	(–0.35)	(–0.90)	(–0.45)	(–0.43)	(–0.74)
similarity	–0.24	0.66	0.11	–0.74	0.15	–0.23
	(–0.52)	(0.99)	(0.24)	(–1.60)	(0.18)	(–0.49)
forfeiting	0.00	–0.04	–0.04	–0.00	–0.03	–0.04
	(0.04)	(–0.32)	(–0.64)	(–0.05)	(–0.21)	(–0.63)
political risk	–0.10**	–0.24**	–0.15***	–0.01	–0.17	–0.09**
	(–2.48)	(–2.36)	(–3.14)	(–0.25)	(–1.38)	(–2.04)
EU				–1.02	–1.82	–2.95***
				(–1.27)	(–0.86)	(–3.99)
Underweighted countries						
log distance	–2.38***	–2.66***	0.06	–1.25*	–2.84***	–0.58
	(–4.02)	(–2.85)	(0.17)	(–1.93)	(–2.97)	(–1.46)
capital controls	8.04***	20.80***	n.a.	7.32***	20.87***	n.a.
	(3.85)	(7.36)		(4.14)	(7.20)	
similarity	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
forfeiting	2.56***	1.88**	0.01	1.69**	1.92***	–0.03
	(3.37)	(2.53)	(0.05)	(2.28)	(2.79)	(–0.18)
political risk	0.58***	0.46***	–0.04	0.42***	0.46***	–0.02
	(4.62)	(3.34)	(–0.28)	(3.32)	(3.59)	(–0.19)
EU				7.97***	–3.59	
				(5.38)	(–1.34)	
dy1996	0.09	0.20	0.08	0.03	0.16	0.06
	(0.89)	(1.01)	(0.88)	(0.31)	(0.86)	(0.60)
dy1997	0.14	0.25	0.14	0.01	0.16	0.11
	(0.97)	(0.91)	(1.04)	(0.09)	(0.60)	(0.82)
dy1998	0.21	0.33	0.13	–0.01	0.21	0.06
	(1.13)	(1.00)	(0.60)	(–0.06)	(0.67)	(0.30)
dy1999	0.15	0.16	0.12	0.01	0.08	0.08
	(0.86)	(0.49)	(0.61)	(0.10)	(0.25)	(0.43)
Constant	0.62	6.08	0.08	–0.44	7.41	4.65**
	(0.38)	(1.39)	(0.04)	(–0.19)	(1.54)	(1.99)
Observations (N*T)	93	93	93	93	93	93

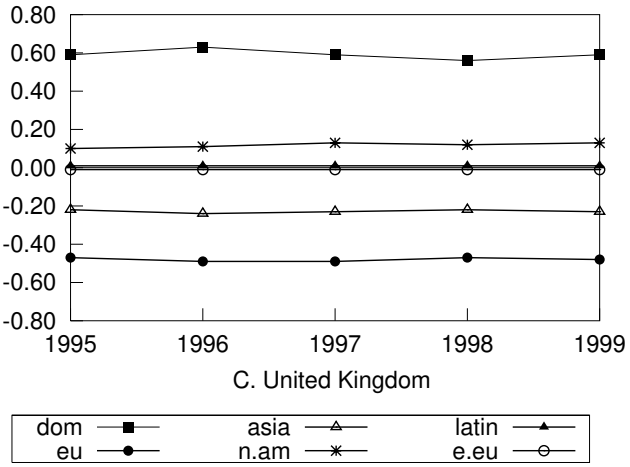
(d) United States

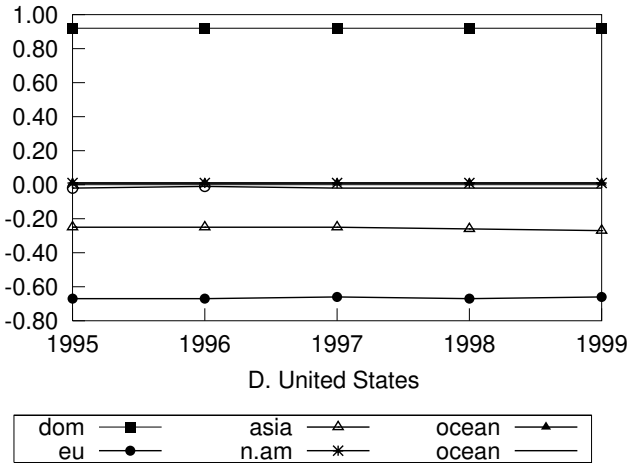
	Not including EU dummy			Including EU dummy		
	optimal	unit hedge	unhedged	optimal	unit hedge	unhedged
Overweighted countries						
log distance	0.26***	0.13	–0.00	0.19***	0.03	0.10
	(3.47)	(1.07)	(–0.02)	(5.26)	(0.32)	(1.49)
capital controls	0.01	–0.04	–0.28*	–0.01	–0.08	–0.15*
	(0.04)	(–0.29)	(–1.74)	(–0.26)	(–0.66)	(–1.79)
similarity	–0.08	–0.20*	–0.23*	–0.04	–0.95***	–0.17
	(–1.24)	(–1.68)	(–1.94)	(–0.91)	(–8.30)	(–1.36)
forfeiting	–0.04	–0.03	–0.04	–0.03*	–0.01	–0.02
	(–0.95)	(–0.68)	(–0.86)	(–1.89)	(–0.30)	(–1.18)
political risk	–0.01	–0.01	–0.01	–0.02**	0.10***	–0.01
	(–0.60)	(–1.12)	(–1.34)	(–2.09)	(4.37)	(–0.98)
EU				0.11	–1.53***	0.02
				(1.18)	(–6.27)	(0.12)
Underweighted countries						
log distance	–3.04***	–0.58	–3.59***	0.10	–0.06	–0.66***
	(–3.27)	(–0.56)	(–9.53)	(0.38)	(–0.07)	(–4.39)
capital controls	–3.70*	17.46***	15.57***	13.18***	19.27***	10.45***
	(–1.93)	(5.84)	(10.93)	(22.31)	(10.07)	(19.37)
similarity	–12.74***	n.a.	1.82***	–16.03***	n.a.	4.14***
	(–27.92)		(6.28)	(–18.14)		(17.10)
forfeiting	1.25	0.10	1.03**	–0.14	–0.35	–0.00
	(0.59)	(0.06)	(2.57)	(–0.28)	(–0.28)	(–0.05)
political risk	1.95***	0.58	1.24***	0.34***	0.42	0.02
	(6.46)	(1.60)	(8.52)	(3.87)	(1.57)	(0.36)
EU				25.28***	5.81	7.52***
				(13.87)	(1.44)	(21.83)
dy1996	–0.01	–0.01	–0.02	0.00	–0.07	–0.01
	(–0.16)	(–0.17)	(–0.37)	(0.03)	(–0.89)	(–0.38)
dy1997	–0.06	–0.02	–0.08	–0.00	–0.21**	–0.01
	(–0.56)	(–0.22)	(–1.00)	(–0.03)	(–2.03)	(–0.30)
dy1998	–0.09	–0.08	–0.17*	–0.03	–0.29**	–0.04
	(–0.81)	(–0.73)	(–1.93)	(–0.61)	(–2.48)	(–0.80)
dy1999	–0.06	–0.07	–0.18**	–0.01	–0.19*	–0.04
	(–0.55)	(–0.64)	(–2.02)	(–0.14)	(–1.69)	(–0.78)
Constant	–1.98***	–0.85	0.28	–1.35***	–1.31	–0.69
	(–3.19)	(–0.89)	(0.25)	(–4.58)	(–1.55)	(–1.34)
Observations (N*T)	93	93	93	93	93	93

F we

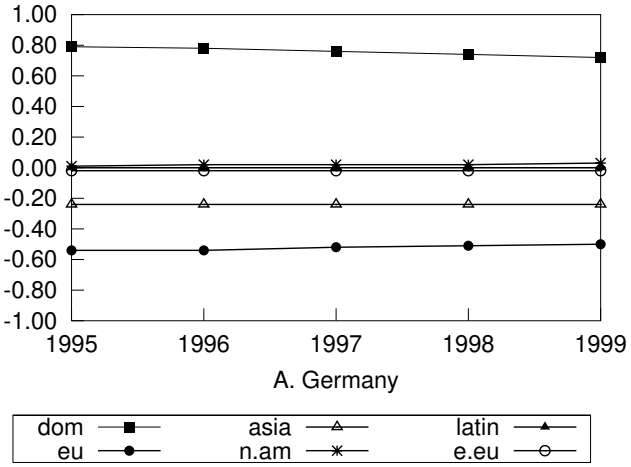

1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
1995
1996
1997
1998
1999
A. Germany
dom
eu
asia
n.am
latin
e.eu

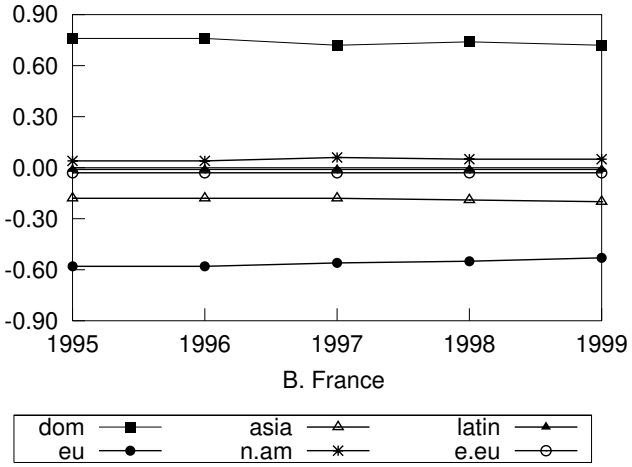

1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
1995
1996
1997
1998
1999
B. France
dom
eu
asia
n.am
latin
e.eu

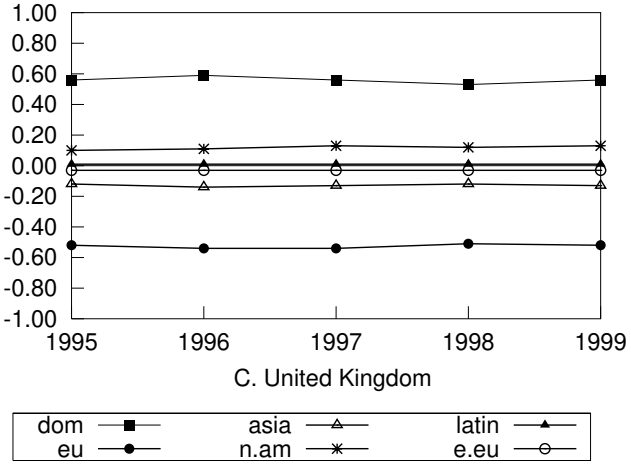

0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
1995
1996
1997
1998
1999
C. United Kingdom
dom
eu
asia
n.am
latin
e.eu

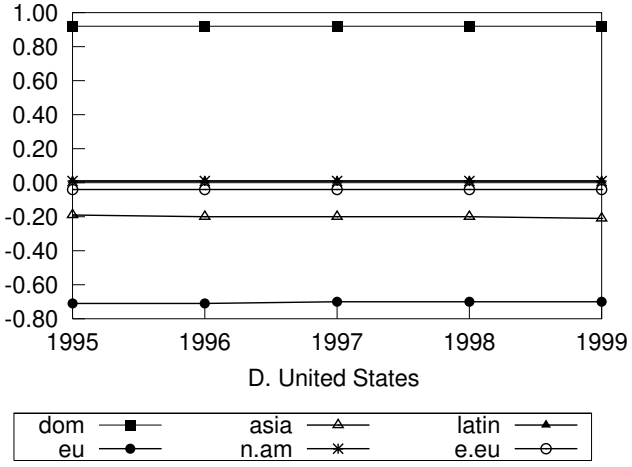

1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
1995
1996
1997
1998
1999
D. United States
dom
eu
asia
n.am
ocean
ocean

F we

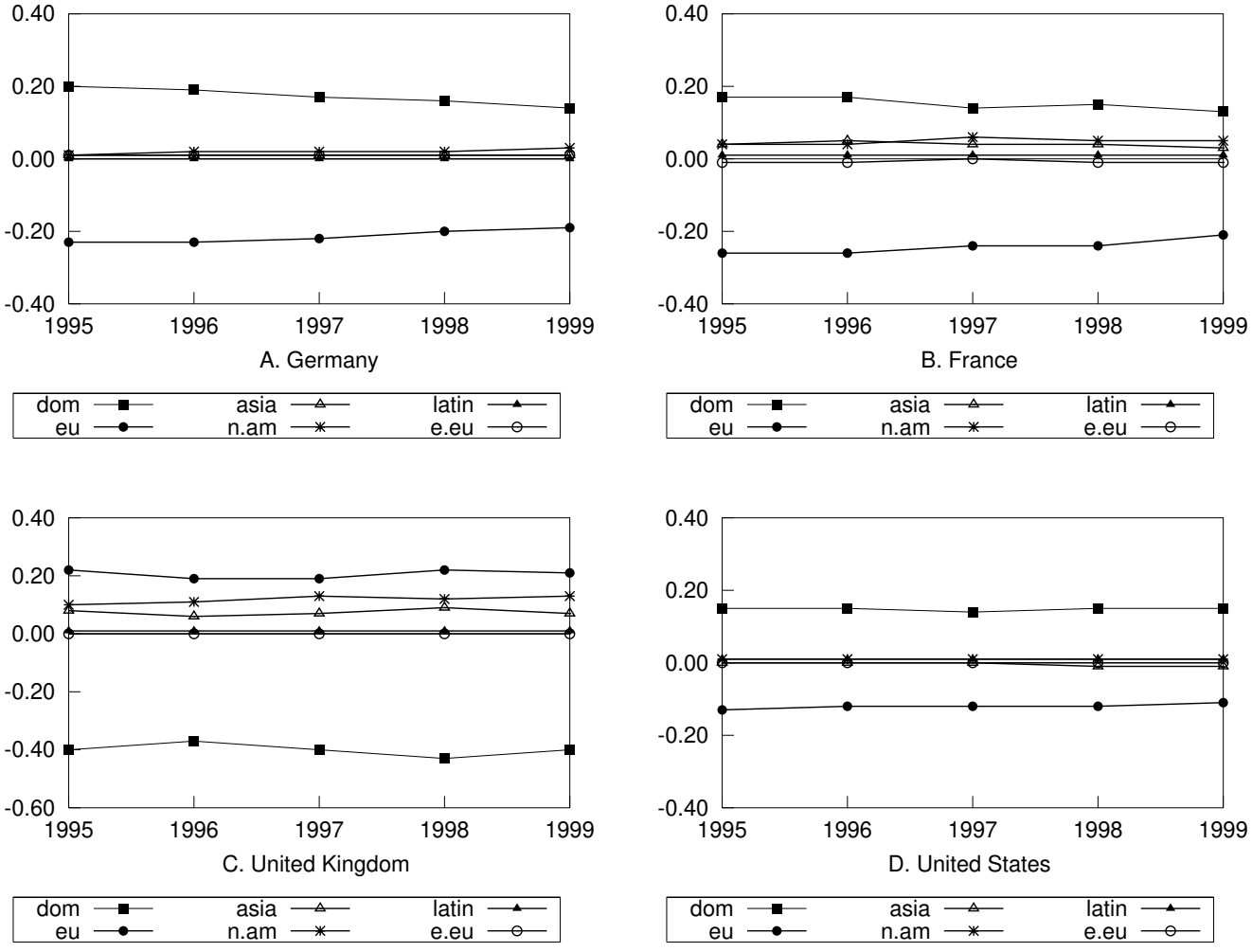

1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
1995
1996
1997
1998
1999
A. Germany
dom
eu
asia
n.am
latin
e.eu


0.90
0.60
0.30
0.00
-0.30
-0.60
-0.90
1995
1996
1997
1998
1999
B. France
dom
eu
asia
n.am
latin
e.eu


1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
1995
1996
1997
1998
1999
C. United Kingdom
dom
eu
asia
n.am
latin
e.eu


1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
1995
1996
1997
1998
1999
D. United States
dom
eu
asia
n.am
latin
e.eu

F we


0.40
0.20
0.00
-0.20
-0.40
1995
1996
1997
1998
1999
A. Germany
B. France
C. United Kingdom
D. United States
dom
eu
asia
n.am
latin
e.eu