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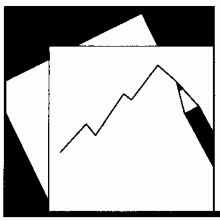

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International Financial Integration

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Abstract

In recent decades, the foreign assets and liabilities of advanced economies have grown rapidly relative to GDP, with the increase in gross cross-holdings far exceeding changes in the size of net positions. Moreover, the portfolio equity and FDI categories have grown in importance relative to international debt stocks. This paper describes the broad trends in international financial integration for a sample of industrial countries and seeks to explain the cross-country and time-series variation in the size of international balance sheets. It also examines the behavior of the rates of return on foreign assets and liabilities, relating them to "market" returns.

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I. INTRODUCTION

International financial integration is increasing. Capital account restrictions have been lifted in many countries, other barriers to investing overseas are also being dismantled, and activity in international financial markets has increased markedly over the last decades. This paper studies the dynamics of international financial integration using data on the level and composition of foreign assets and liabilities for a set of industrial countries. More specifically, we do the following:

1. characterize the salient features of the increase in international financial integration during the past two decades;

2. relate the growth in foreign asset and liability positions to potential "drivers" of integration (lifting of policy restrictions, increases in goods trade and output per capita, domestic financial developments, privatization programs, tax policy); and

3. study the behavior of rates of return on external assets and liabilities and relate them to differences in portfolio composition.

With regard to the first point, we address several questions. Has the composition of country portfolios systematically changed over time? To what degree does the increase in external assets and liabilities reflect valuation effects due to the stock market boom of the 1990s? What are the relative contributions of valuation changes (such as stock market and currency fluctuations) and new capital flows in determining gross international investment positions? With regard to the second point, we ask whether the time series and cross-sectional patterns in the levels and composition of cross-holdings can be systematically related to factors such as the increase in world trade in goods and services and rising income levels, as well as to "policy events" such as capital account liberalization; privatization programs; domestic financial liberalization; and other regulatory changes.

With regard to the third point, we have documented in previous work the existence of substantial differences in rates of return on external assets and liabilities across countries (Lane and Milesi-Ferretti, 2002a and 2002b). For example, rates of return on assets have systematically exceeded those on liabilities for the United States, so that the U.S. investment income position stayed positive for a number of years even when the net foreign asset position had turned negative.

Rates of return matter since they are the channel through which international investment positions provide risk sharing. The associated international transfers also are important in determining the trade balance and the real exchange rate. Moreover, the dynamics of asset and liability stocks depend on capital gains and losses in addition to new capital flows. This is especially important for countries holding large portfolio equity and FDI portfolios that may take most of their returns in the form of capital gains, which do not affect investment income flows, rather than yields (which do). In this paper, we study the dynamic behavior of rates of return, the links between rates of return on the international investment position and various

financial market returns, and the inter-relations between domestic and foreign real rates of return and real exchange rate fluctuations.

This work has clear relevance for policymakers. Stocks of foreign assets and liabilities represent an important global linkage—shocks in Country A have an impact on Country B via revaluation and other wealth effects. This will be stabilizing to the extent that the international balance sheet hedges domestic risks, but potentially raises volatility if external investments leverage domestic positions. In addition, identifying the sources of the growth in world asset trade can contribute to an understanding of its sustainability and likely future trends. In this regard, growth that is related to the once-off elimination of barriers to asset trade will not persist but rather represents the transition to a higher level of activity. In contrast, growth that is linked to positively trending variables such as output per capita and goods trade can be predicted to continue into the future.

In our previous work, we have explored the determinants of *net* foreign asset positions along the time series dimension (Lane and Milesi-Ferretti, 2002a). However, we have largely examined other components (e.g., debt-equity ratios for foreign liabilities) in a purely cross-sectional manner (Lane and Milesi-Ferretti, 2001a, 2001b). Lane (2000) provides some evidence on the change in gross cross-holding positions over time for the OECD countries but does not try to explain the panel dynamics. The available time series data have increased substantially in recent years, with countries now reporting data on their external portfolios in much greater detail.

In terms of empirical work on international financial integration, some other authors have looked at related questions. Bekaert and Harvey (2000) have attempted to date the integration of emerging market stock exchanges into the global market, using an asset-price model. Henry (2000), Beck, Levine, and Loayza (2000), Edison, Levine, Ricci, and Sløk (2002), Edison and Warnock (2003), and O'Donnell (2002), amongst others, have looked at the impact of international financial integration on various indicators. Obstfeld and Taylor (2002) provide a wide-ranging historical overview, including analysis of the long-run changes in gross asset trade. For Europe, Adam and others (2002) explore a wide range of measures of international financial integration. Finally, we note that such a study of the "growth in world asset trade" is complementary to the recent literature on the growth in world trade (Hummels and others, 2001; Yi, 2003).

The empirical literature on the rates of return earned on foreign assets and liabilities is very small. Bond (1977), Sorensen and Yosha (1998), and Lane (2001) study the behavior of investment income flows but not the contribution of capital gains and losses, while Sorensen, Yosha, and Wu (2002) also provide some indirect evidence on the role of portfolio equity holdings in international risk sharing. Lane and Milesi-Ferretti (2002a, 2002b) provide some initial evidence on the behavior of overall rates of return.

The plan for the rest of the paper is as follows. We discuss data issues and capture some basic facts about our data in Section 2. We examine the determinants of variation in the scale of international financial integration in Section 3. We turn to examining rates of returns and yields on foreign assets and liabilities in Section 4. Section 5 offers some conclusions.

II. Data Issues and Broad Trends

We study international financial integration using data on countries' portfolios of external assets and liabilities—the so-called International Investment Position (IIP). These data summarize total holdings by domestic residents of financial claims on the rest of the world, and nonresidents' claims on the domestic economy. Following the methodology of the *Balance of Payments Manual 5* (IMF, 1993), external liabilities are divided into five main categories: foreign direct investment (FDI), portfolio equity investment, portfolio debt investment, other investment, and derivatives. Assets are instead divided into six categories: the same five as liabilities, plus official reserves. Table 8 summarizes country and period coverage for the main categories of external assets and liabilities. The main data source is the International Monetary Fund's *Balance of Payments Statistics*, but we also made use of data from national sources. A data appendix describes data sources in more detail.

A. Data Issues

The methodologies used to construct data on external assets and liabilities can differ both across and within countries. For the purpose of cross-country comparisons, one particularly important factor in this regard is the methodology used to estimate the stock of FDI and portfolio equity investment, and in particular whether these stocks are evaluated at book or market value. Only a few countries (United States, France, and Sweden) provide estimates of the stock of FDI both at book and market value.[2] Other countries provide only one set of FDI estimates, most at book value (Australia and Netherlands use market value). For portfolio equity investment, most countries provide estimates at market value (Canada, which uses book value, is the exception). Generally, book value estimates understate the market value of the underlying assets and liabilities.

With regard to the time-series dimension, problems can arise because of within-country changes in the classification of certain types of assets or liabilities. For example, for the earlier years of the sample portfolio debt investment holdings are included in other investment holdings in the United Kingdom. More generally, the breakdown of external assets and liabilities between different categories is available only partially, especially for the earlier years of the sample.

When studying the individual dynamics of external holdings and rates of return, we have striven to use a dataset as homogeneous as possible, taking into account both structural breaks and methodological differences in the calculation of assets and liabilities. Nevertheless, heterogeneities in the data unavoidably remain—as we proceed, we point out the implications of such data problems for our analysis.

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[2] The United States provides estimates of FDI abroad and within its borders at historical cost, current cost, and market value. For a discussion of the impact of different FDI valuation methods, see Pratten (1992) on the United Kingdom, and Eisner and Pieper (1991) on the United States.

B. Broad Trends

A summary volume-based measure of international financial integration is

$$IFIGDP_{it} = \frac{(FA_{it} + FL_{it})}{GDP_{it}} \tag{1}$$

where FA and FL refer to the stocks of aggregate foreign assets and liabilities, respectively.[3] Figure 1 plots the evolution of this ratio over the period 1983–2001 for a set of industrial countries. This ratio has increased by 250 percent over this period, with a marked acceleration during the 1990s.[4] This increase in financial linkages has not been uniform across countries: Figure 2 shows a rise in dispersion in this ratio across countries over this interval.
Since international trade in debt instruments may be driven by special factors, we also consider an equity-based measure,

$$GEQGDP_{it} = \frac{(PEQA_{it} + FDIA_{it} + PEQL_{it} + FDIL_{it})}{GDP_{it}} \tag{2}$$

where *PEQA (L)* and *FDIA (L)* are the stocks of portfolio equity and FDI assets (liabilities). In other words, *GEQGDP* is an indicator of the level of equity (portfolio and FDI) cross-holdings. Figure 3 shows that the growth in this ratio has been even more rapid than for *IFIGDP*—it more than tripled over 1983–2001.

One possible reason for this rise in international financial cross-holdings is the increase in international trade, which has also been substantial in recent decades. However, Figures 4 and 5 show clearly that the increase in financial openness dwarfs the increase in goods' trade. Figure 4 shows the *IFI* and *GEQ* measures as ratios to exports plus imports rather than GDP ($IFITRADE, GEQTRADE$). Both ratios show substantial increases over the period: in the aggregate, international asset trade has grown far more rapidly than goods trade by this measure. Figure 5 illustrates that this finding holds at the individual country level, by showing the relation between the percentage change in the financial openness to GDP ratio and the percentage change in the trade openness to GDP ratio during the period 1991–2001. Only for Canada (which measures portfolio equity at book value, and therefore underestimates external assets and liabilities) and Japan has trade openness increased more than financial openness.

In theory, international financial integration may simply reflect financial deepening: in industrial countries, financial assets and liabilities increased much faster than GDP over the

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[3] See also Lane (2000a) and Obstfeld and Taylor (2002). The latter discuss the relative merits of this indicator versus other price-based measures of integration, as do Adam and others (2002).

[4] The decline during 2001 reflects the steep fall in world stock markets.

past two decades, and the share of external assets and liabilities in total financial holdings may thus have remained unchanged. Unfortunately the availability of financial balance sheets is limited, both along the cross-sectional and the time-series dimension. [5] Nevertheless, available data for the United Kingdom (since the early 1980s) and Belgium and Italy for the second half of the 1990s shows clearly an increase in the ratio of external financial holdings over total financial holdings (Figure 6). Another piece of evidence suggesting that increased international financial integration is more than the reflection of financial deepening comes from data on portfolio equity holdings. Figure 7 shows that the ratio of portfolio equity holdings by foreigners to stock market capitalization has increased over the past 10 years. Note that this ratio underestimates the increase in foreign equity holdings because it excludes the "controlling shares" of companies that are classified as FDI.

In a similar vein, we next investigate the degree to which the value of international portfolios is related to the boom in equity valuations during the 1990s, rather than an increase in capital flows. Table 1 reports the change in external assets and liabilities between end-1995 and end-2000 (as a ratio of GDP in 2000), cumulative capital outflows and inflows during the same period, and, as residual, the part of the change in the external position not explained by capital flows. The table shows clearly the remarkable increase in the size of country external portfolios, and the magnitude of the underlying gross capital flows. The increase in external diversification is particularly high in financial centers such as Switzerland and the United Kingdom, and small open economies such as the Netherlands and Scandinavian countries, and is much faster than in previous years. Indeed, compared with the previous 5-year period (1990–95), gross capital flows more than doubled, both in absolute terms and as ratios of GDP.

A second notable fact is the importance of capital gains and losses in explaining the dynamics of the external position. These are primarily due to exchange rate fluctuations and changes in stock market values, which were substantial during this period. In our sample, a remarkable case is Finland, where the increase in the market value of its equity liabilities (in particular Nokia, a stock widely held by nonresidents) implied an increase in external liabilities unexplained by new inflows of over 100 percent of its GDP. The impact of capital gains and losses on the *net* external position, which can be derived by subtracting Column (6) from (3), is even more substantial (in relative terms) than the impact on gross positions.

III. Analysis of International Investment Positions

This section discusses theoretical determinants of international financial integration, and conducts a simple econometric analysis aiming at identifying the key factors driving international asset trade.

[5] Kraay, Loayza, Servén, and Ventura (2000) calculate a measure of national net wealth, using estimates of physical capital stocks. However, measuring gross assets and liabilities is a yet more onerous task. See also Obstfeld and Taylor (2002).

A. Conceptual Issues

A natural benchmark in thinking about the level of international asset cross-holdings is the allocation that would hold under complete global financial market integration with no cross-border transactions costs. In such a world, each country would hold a very high level of foreign assets and liabilities, in line with full diversification. As a crude approximation, a country representing 1 percent of the world endowment would hold 99 percent of its wealth overseas and, in turn, 99 percent of its domestic tradable assets would be held by foreigners.[6] Although the world is still far from this idealized state, it is logical to relate the cross-country and time series variation in international portfolios to the corresponding dispersion in the (implicit and explicit) barriers to full integration and in the gains to international diversification. The level of international asset trade will also depend on the "tradability" of domestic assets: factors that reduce domestic transaction costs also facilitate cross-border asset trade.

Martin and Rey (2000, 2001) provide theoretical models that address some of these issues. In their framework, investors are risk averse, the number of financial assets is endogenous, assets are imperfect substitutes, and cross-border asset trade entails transactions costs. Under these assumptions, a reduction in international transactions costs stimulates an increase in the demand for (and supply of) assets and an increase in asset prices, leading to higher cross-border diversification.

As such, our empirical strategy is to identify a set of country characteristics that may influence the benefits to and costs of international asset trade. Most obviously, we consider the impact of controls on cross-border capital movements. If controls are binding, the level of international asset cross-holdings should increase if the capital account is liberalized. Second, we investigate the connection between trade in goods and services and trade in assets. Goods trade may matter for several reasons. First, much goods trade directly entails corresponding financial transactions (e.g., trade credit and export insurance). Second, following Obstfeld and Rogoff (2001), there is a close connection between the gains to international financial diversification and the extent of goods trade: trade costs create an international wedge between marginal rates of substitution and hence limit the gains to asset trade. Third, goods trade and financial positions are jointly determined in some situations, as is often the case with FDI, given the importance of intra-firm intermediates trade. Finally, openness in goods markets may increase the willingness to conduct cross-border financial transactions, reducing financial home bias (a "familiarity" effect).[7]

Income per capita may also influence the propensity to engage in international asset trade. To the extent that higher income per capita is associated with lower risk aversion and

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[6] See Obstfeld and Rogoff (1996, Chapter 5) for a textbook review of the theory of international financial trade.

[7] For Ireland, Honohan and Lane (2000) show that the bilateral pattern of goods trade explains the bilateral pattern of portfolio equity investment very well.

international investments are perceived as riskier than domestic alternatives, it may also raise international asset trade. If participation in foreign asset markets involves fixed costs (e.g., learning costs), this may provide another reason why international cross-holdings might rise with income levels. The Martin-Rey framework also naturally delivers such a positive relation.

The size of the domestic financial sector plausibly facilitates international asset trade in several ways.[8] Domestic financial intermediaries that also distribute international assets offer a local channel by which investors can gain foreign exposure. Exposure to domestic financial markets may also increase the desire for international diversification. On the liability side, an extensive financial infrastructure is attractive to foreign investors. However, a substitution effect may also operate: by necessity, domestic agents will have to invest on foreign markets if the domestic financial sector is underdeveloped. The quality of domestic financial regulation may also be important: foreign investors will stay away from markets that do not protect their interests.

Tax policy may also influence the level of international cross-holdings. Firm assets may be shifted to countries with low corporate income tax rates. Moreover, such a regime will also attract international financial intermediaries engaged in offshore financial transactions. In addition, at a household level, high tax rates on investment income will stimulate the growth of offshore savings vehicles, if overseas investments can be more easily hidden from domestic tax authorities.[9]

These factors may not have uniform effects on the different components of the international balance sheet. For instance, if the greatest barriers to trade have been with respect to more complex and riskier assets (i.e., portfolio equity and FDI), then we may expect that cost-reducing steps have a larger impact on these components.

B. The Empirical Specification

In line with the discussion in the previous subsection, we attempt to empirically identify the factors underlying the changing scale of international financial integration over time and across countries. Given the lack of firm theoretical priors and the sparse prior literature, this is intended to be an exploratory exercise.

We construct a panel data set for 18 member countries of the Organisation for Economic Cooperation and Development (OECD) over 1978–2001 and consider averaged data over six

[8] At this point, we are not attempting to establish lines of causality; some other studies in fact have tried to make a link running from external liberalization to domestic financial development. See, for example, Klein and Olivei (2000).

[9] See also Grilli (1990). This can directly create two-way financial trade if foreign loans can be raised on the back of these offshore assets. For instance, such round-tripping was popular in Ireland during the 1980s.

time periods: 1978–81, 1982–85; 1986–89; 1990–93; 1994–97; and 1998–2001. The basic panel specification in Table 2 is

$$\Delta(IFIGDP_{it}) = \alpha_i + \gamma * X_{it} + \beta * \Delta(Z_{it}) + \varepsilon_{it} \quad (3)$$

where we relate the growth in international financial integration to a set of country- and time-varying determinants X_{it}, Z_{it}. We first difference the data to take into account the nonstationarity of the levels of *IFIGDP* and some of the regressors.[10] We allow for a country-specific intercept, to allow for country-specific trends in the level of financial integration. [11] Accordingly, we conduct fixed-effect least squares estimation (with White-corrected standard errors).

We begin in Table 2 by examining *IFIGDP*. In Table 3, we restrict attention to the volume of asset trade in portfolio equity and FDI (GEQGDP). Finally, in Table 4 we examine the determinants of the composition of international balance sheets, as measured by the shares of equity instruments (both portfolio and FDI) in foreign assets and liabilities (*GEQSHARE*). The first variable we include in the list of regressors is a capital account liberalization index *EXTLIB*. It is the period-average value of an index of capital account restrictions, ranging from 0–4, with a score of 4 indicating complete liberalization. It is based on data constructed by Grilli and Milesi-Ferretti (1995) and updated by Mody and Murshid (2002).[12] To allow for gradual adjustment in stocks to the lifting of controls, we lag this variable in the regressions: the average value in 1978–81 is used for the time period 1982–85 and so on.

Our second regressor is trade openness, defined as the sum of exports plus imports relative to GDP (*TRADE*).[13] Our third regressor, the (log) level of GDP per capita, is included to allow for a systematic relation between cross-border financial activity and the level of development. We also consider three indicators of domestic financial development, potentially an important factor in driving international asset trade: the ratio of liquid liabilities to GDP (*FINDEPTH*); the ratio of stock market capitalization to GDP (*STKCAP*); and the ratio of cumulative

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[10] That is, we look at the change in the average value of *IFIGDP* between 1978–81 and 1982–85.

[11] We also tested for time-fixed effects but these were jointly insignificant.

[12] Edison and Warnock (2003) construct a capital controls measure based on restrictions of access to equity holdings, but this is designed for emerging market economies rather than the industrial economies in our sample.

[13] The theory discussed in the previous section indicates that there should be a direct relation between trade and financial integration. At a bilateral level, it is interesting also to consider the extent to which "gravity" equations explain financial trade as compared to goods trade. See Portes and Rey (2002) and Devereux and Lane (2003) on the determinants of bilateral financial flows.

privatization revenues to GDP (*CUMPRIVAT*).[14] The latter is included to address whether the sale of state-owned assets has been an important driver of international financial integration.[15] All of these variables are in the set Z_{it} and are included in the specification in first differences.

For a subset of 14 countries, we also explore the role played by corporate tax policies, by including in the regression a measure of the average effective corporate income tax rate (*TAXRATE*).[16] A favorable tax regime may stimulate FDI flows and also encourage financial transactions between host and parent companies: this variable is also first differenced. Finally, we also include a dummy variable for the introduction of insider-trading laws (*PROTECTION*).[17] The insider-trading variable, which is entered in levels, can proxy for the extent and quality of regulation of the domestic financial system.

Finally, we have also explored (but do not report) the impact of some other potential determinants, such as country size and telecommunications infrastructure: the former was always insignificant and did not alter the other results; the latter data are available for only a small number of countries.

C. Results

Table 2 shows the results in explaining $\Delta IFIGDP$ for a range of specifications. In column (1), we just include the *EXTLIB* variable: it is positive and significant but explains only a small fraction of the variation in gross asset trade. Once we include other regressors, *EXTLIB* no longer has independent explanatory power.

We add *TRADE* to the specification in columns (2)–(7): it is positive and highly significant throughout, and it improves the overall explanatory power substantially. The average *TRADE* coefficient of 3.7 in columns (2)–(7) indicates a strongly leveraged association: a 10 percentage point increase in the trade to GDP ratio is associated with a 37 percentage point increase in *IFIGDP*.

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[14] *FINDEPTH* is drawn from Beck and others (1999); *STKCAP* was kindly provided by Hali Edison; *CUMPRIVAT* is based on OECD data.

[15] If a privatized state firm is floated on the domestic stock market, it will be picked up by the *STKCAP* variable. However, private sales to foreign investors would not be captured in that index.

[16] This variable is constructed by Devereux, Lockwood, and Redoano (2002) and Devereux, Griffith, and Klemm (2002).

[17] This dummy variable is developed by Bhattacharya and Daouk (2002) and Bekaert and others (2001).

In columns (3)–(7), we add GDP per capita to the set of regressors. It enters positively and is highly significant across the specifications: a one percent increase in GDP raises *IFIGDP* by 2.5 percentage points on average.

We add *FINDEPTH* and *STKCAP* to the set of regressors in columns (4)–(7). The point estimate for *FINDEPTH* is always positive and is marginally significant in column (7), while *STKCAP* is quite important throughout: there is a strong positive correlation between an open capital account and a large domestic stock market. The overall explanatory power of the specification rises to 0.69 once these variables are included. In part, of course, there is a mechanical relation in that rising stock market indices increase both *STKCAP* value and the value of foreign equity liabilities in *IFIGDP*.

The cumulative privatization variable actually enters with a negative sign in columns (5)–(7), and is significant in the latter two regressions. This suggests that privatization may actually lead to a substitution away from foreign assets, which is especially plausible if the privatization process favors domestic investors.

The *TAXRATE* variable is included in columns (6)–(7), at the cost of a reduction in the number of observations. It turns out to be unimportant in explaining variation in the level of international financial integration. In addition, the *PROTECTION* variable is not significant in column (7).

We turn to the measure of cross-border equity holdings *GEQGDP* in Table 3. This is an increasingly important component of total international financial holdings, with their median value rising from 0.16 in 1982–85 to 0.36 in 1998–2001. Column (1) shows that *EXTLIB* has some limited explanatory power in explaining *GEQGDP*, but its individual significance is lost in columns (2)–(7). As in Table 2, *TRADE* is always highly significant: moving from column (1) to column (2) also increases explanatory power from 0.12 to 0.31. The average point estimate for *TRADE* is now 1.8, about half of its size in Table 2. Again, higher output per capita is significantly associated with an increase in external equities cross-holdings across columns (3)–(7).

Explanatory power sharply rises to 0.89 in column (4) once domestic financial market variables are included. *STKCAP* continues to exert a very strong positive influence: a 10 percentage-point increase is associated with a 9.2–9.4 percentage-point increase in *GEQGDP*. The smaller point estimates, as compared with Table 2, indicates that a higher value of *STKCAP* is also associated with a rise in debt cross-holdings. As in Table 2, the coefficient on *CUMPRIVAT* is negative, while neither *TAXRATE* nor *PROTECTION* are important. Overall, countries less open to trade, with shallow domestic financial markets, and large-scale privatization activities have smaller international cross-holdings.

We turn to the equity share in total external holdings (*GEQSHARE*) in Table 4.[18] The results here are generally weaker than for the aggregate volume measures in Tables 2 and 3. Not surprisingly, *STKCAP* again exerts a significantly positive influence; the overall explanatory power also rises from 0.19 to 0.53 once the financial variables are included. Another other notable finding is that *FINDEPTH* exerts a significantly negative influence on the equity share: a reasonable interpretation is that *FINDEPTH* disproportionately increases international trade in debt instruments. Finally, columns (6)-(7) show that *CUMPRIVAT* has a significantly positive impact on *GEQSHARE*: the contrast with the result in column (5) is entirely driven by the change in sample size, due to the lack of tax data for some countries.[19]

In summary, this section has investigated the covariates of the growth in international financial integration. We have shown that variables such as trade openness, GDP per capita, and stock market capitalization are quite successful in "explaining" the variation over time in the degree of international financial integration. Clearly, a future goal is to better establish lines of causality between these variables and our measures of external financial activity.

IV. Analysis of Rates of Return

In this section, we investigate the rates of return earned on foreign assets and liabilities. First, we describe the broad patterns in the data. Second, we ask whether the rates of return on foreign assets and liabilities are well tracked by various market indices.[20] Third, we examine whether the pattern of international investment indeed contributes to risk diversification. Finally, we explore the comovement between local and foreign real rates of return and real exchange rates.

A. Conceptual Issues

Consider the ex post real return (on foreign assets or liabilities) in domestic currency and in U.S. currency. For country i, these are statistically linked by the rate of bilateral real appreciation vis-à-vis the United States

$$(1+r_{it}^{US}) \equiv (1+r_{it}) * \frac{rer_{it}}{rer_{it-1}} \qquad (4)$$

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[18] In results not reported, and available upon request, we also examined separately the equity ratios for the asset and liability sides of the international balance sheet, and the ratio of portfolio-equity liabilities to domestic stock market capitalization. For the latter, an increase in goods trade is associated with a rise in the ratio.

[19] These are Denmark, Norway, Switzerland, Iceland, Australia, and New Zealand.

[20] For instance, if a country allocates its equity investment across countries in proportion to relative stock market capitalizations, the rate of return on foreign equity assets would just follow a global market index.

where $r_{it}^{US}(r_{it})$ is the real return in U.S. dollars (domestic currency) and *rer* is the bilateral CPI-based real exchange rate between the domestic currency and the U.S. dollar. Let us consider the determinants of local currency real returns. Statistically, the aggregate return on the (asset or liability) position is a weighted sum of the returns on the various components of the investment position[21]

$$r_{it} = \sum_{j} \omega_{ij} r_{ijt} \tag{5}$$

It follows that the aggregate rate of return depends on (i) the returns in each investment category; and (ii) the proportions invested in the different components. We can model the former as depending on some common country component, plus an idiosyncratic factor to the extent that the investment pattern deviates from overall market patterns

$$r_{ijt} = r_{ijt}^{*} + \mu_{ijt} \tag{6}$$

For example, the return on portfolio equity liabilities will equal the return on the domestic stock market index if foreign investors just "hold the market" but will differ if foreign investors choose a different portfolio composition.[22] Similarly, the return on foreign portfolio equity assets will deviate from the return on a "global" stock market index to the extent that a country pursues an idiosyncratic investment strategy for the foreign component of its portfolio.

In addition, we consider the comovement between the rate of return on foreign assets and various domestic financial returns

$$r_{ijt}^{FA} = \alpha_i + \beta * r_{ikt}^{M} + \nu_{ijt} \tag{7}$$

If $\beta = 1$, holding foreign assets provides no diversification against fluctuations in domestic financial returns. The weaker is the positive comovement, the greater is the scope for risk-sharing.[23]

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[21] In this setup, we assume time-invariant weights for convenience.

[22] One could, in turn, attempt to model the overall domestic return in a given asset category as a function of national macroeconomic variables. See Barro and Sala-i-Martin (1991) for an illustration with respect to interest rate determination.

[23] If markets are not integrated, a low comovement in returns may simply reflect the absence of common pricing factors. We checked our results using only a shorter sample of more recent data and the findings were broadly similar.

Third, we consider the relations between domestic- and dollar-based ex post real returns and the real exchange rate. Go back to an approximation of the identity (4)

$$r_{it}^{US} = r_{it} + drer_{it} \tag{8}$$

where $drer_{it}$ is the rate of real appreciation vis-à-vis the Unite States. If returns were entirely driven by "domestic" factors (orthogonal to exchange rate movements), the domestic real return and the real exchange rate would be uncorrelated and real exchange rate movements would fully pass through into dollar real returns. If instead returns were entirely driven by "external" factors, the correlation between the dollar real return and the real exchange rate would be zero and real exchange rate movements would fully pass through into domestic real returns.[24]

B. Data Issues on Rates of Return

In previous work (Lane and Milesi-Ferretti, 2002a, 2002b) we documented the importance of differences in rates of return for explaining the dynamics of net external positions. Three basic stylized facts emerged from the analysis: first, rates of return on both assets and liabilities tended to be high, easily exceeding countries' growth rates; second, cross-country differences in rates of return were substantial, and third, some countries exhibited substantial differences between returns on external assets and liabilities. One classical example is the United States, which according to IIP data has been a debtor country since 1989, but its investment income position turned negative only in 1998.

In this section, we attempt to explain the behavior of the rates of return on foreign assets and liabilities. We use IMF balance of payments statistics data on interest earnings and payments on external holdings, together with data on international investment positions and on capital flows, to construct measures of yields and rates of return on external assets and liabilities as

[24] An interesting general question, which is outside the scope of this paper, is how real exchange rate movements influence ex post returns. (Of course, in terms of ex ante returns, expectations of real exchange rate movements will drive a wedge between domestic and foreign returns but this link may be broken by ex post shocks.) The relation depends on whether returns on assets/liabilities are primarily based on domestic or external factors. The mechanics are most direct in the case of an unindexed nominal asset, where the impact of exchange rate movements on ex post returns depends on whether it is denominated in domestic currency or foreign currency. Similarly, the domestic currency return on an unhedged foreign currency nominal asset or liability is negatively related to real appreciation. For positions denominated in domestic currency, there is no mechanical relation. On the one side, real appreciation may proxy for good fundamentals (if not captured elsewhere in the regression) and so be associated with high domestic currency returns; real appreciation also boosts profits by lowering the costs of imported inputs if these are priced in foreign currency. On the other hand, real appreciation may reduce returns by a loss of competitiveness, or by lowering the terms of trade if local currency pricing in good markets prevails.

well as, where possible, on their subcomponents. We then assess the degree to which these yields and returns can be explained by "market" rates of return, which we construct using information on the composition and geographical allocation of external assets and liabilities. Let investment income receipts in U.S. dollars related to asset-type X in year *t* be IC_t^X (where *IC* stands for income credit) and investment income payments be ID_t^X (where *ID* stands for income debits). We define the U.S. dollar yield on assets as $yc_t^X = \frac{IC_t^X}{XA_{t-1}}$ and the yield on liabilities as $yd_t^X = \frac{ID_t^X}{XL_{t-1}}$, where XA (XL) are the country's stocks of external X-type assets and liabilities, respectively.

The year *t* capital gain on asset *X* is given by the difference between the change in the stock of *X* between *t* and *t-1* and the underlying flow *x* during year *t*, divided by the initial stock of *X*: $kc_t^X = \frac{XA_t - XA_{t-1} - xa_t}{XA_{t-1}}$ and $kd_t^X = \frac{XL_t - XL_{t-1} - xl_t}{XL_{t-1}}$. Finally, the nominal rate of return on assets is $ic_t^X = (1 + yc_t^x)(1 + kc_t^X) - 1$, and on liabilities $id_t^X = (1 + yd_t^x)(1 + kd_t^X) - 1$. Real yields and real rates of return are obtained by deflating nominal U.S. dollar returns by the U.S. rate of inflation. Nominal and real rates of return in domestic currency are obtained using the same methodology, but with all variables measured in domestic currency.[25]

The data difficulties in undertaking this type of study are substantial. These relate in particular to measurement error problems for balance-of-payments-derived yields and rates of return, and to lack of information concerning the currency composition of external assets and liabilities. We discuss these difficulties in turn.

Measurement error problems in deriving yields and rates of return from balance of payments data can arise from several sources:

- Reclassification of external assets and liabilities items between different categories. For example, in Swedish data for 1997, securities issued abroad by residents—previously recorded as other investment liabilities—were reclassified as portfolio debt liabilities.

- Recording of interest receipts and payments in balance of payments accounts. For example, several countries classify investment income data in only two categories, FDI and "other," where the second category also includes income on portfolio assets.

[25] Stocks are converted into domestic currency using the end-of-period exchange rate and flows using the period-average exchange rate, following the balance of payments convention.

In addition, in a few countries, interest receipts and payments appear to be overestimated for some years.[26]

- Valuation of FDI and portfolio equity holdings. Most countries record FDI stocks at book value, but a few use market values. Using the former will imply in general higher FDI yields (because the outstanding stock of assets is smaller) but lower capital gains. The problem for the valuation of portfolio equity assets and liabilities is less severe, because most countries record these stocks at market value (the exception being Canada).

- Breaks in the data series for the variables used in the calculations. These breaks may relate to changes in the methodology of estimation (for example, from book to market value).

Problems in constructing "benchmark" portfolios arise because of the scarcity of data on the currency composition of external portfolios, as well as on the geographical allocation of external assets. [27] In general, constructing benchmark yields and rates of return is easier for external liabilities than it is for external assets. For example, domestic stock market returns provide a reasonable benchmark for returns on portfolio equity liabilities. Benchmark yields and returns on debt instruments are more difficult to construct, in the absence of information on the currency of denomination. Taking into account these constraints, we have proceeded as follows.

- For **portfolio equity liabilities**, we use, as a benchmark for returns (measured in U.S.$), the total returns index from the domestic stock market, constructed by Morgan Stanley Capital International (MSCI).

- For **portfolio equity assets**, we make use of two alternative indices.

  (1) The MSCI world stock price index—a valid proxy for capital gains if all countries allocate their external equity holdings in shares reflecting the world portfolio. Clearly this index cannot contribute to explaining cross-country heterogeneity in rates of return on portfolio equity assets, except for countries with a significant

[26] These problems, which seem to affect gross, rather than net, investment income flows, may relate to the recording of receipts and payments associated with derivatives' operations or with nonresident transactions. These entail higher recorded interest receipts *and* payments, classified in either the portfolio or the "other investment" categories. Examples include the data for Denmark (1991–97), France (1990–93), and Japan (1991–95).

[27] Significant progress in this area has been made in recent years. For example, the 1997 IMF Portfolio Survey provides data on the geographical allocation of portfolio investment assets for 29 countries. A new, more comprehensive survey is currently being conducted. Also, countries such as Australia, Sweden, and the United States provide data on the currency composition of external holdings.

weight in the world index, such as the United States, the United Kingdom, and Japan.

(2) The weighted average of stock returns on individual markets, as reported by MSCI, where the weights reflect the country's allocation of portfolio equity assets reported in the IMF 1997 Portfolio Survey.

- For **FDI liabilities**, we use the same indices as for equity liabilities.

- For **FDI assets**, we construct the rate of return by using a weighted average of stock returns on individual markets, where the weights reflect the geographical allocation of FDI assets as reported by the OECD.

- For **debt liabilities**, which include portfolio debt and other investment, we use domestic bond returns from Global Financial data. We also compare yields with domestic short-term and long-term interest rates (from the OECD database).

- For **debt assets**, we construct several indices:

  (1) A weighted return and yield on a foreign bond portfolio, where weights are obtained from the 1997 IMF Portfolio Survey, bond returns from Global Financial Data, and interest rates from the OECD.

  (2) A weighted yield on a foreign debt portfolio, where weights are obtained from BIS data on the geographical allocation of bank assets, and interest rate data are from the OECD. With the BIS data, we are also able to take into account the fraction of foreign loans that are denominated in domestic currency versus foreign currency.

These indices can help us shed light on the degree to which rates of return and yields on external assets and liabilities can be explained by market developments and investment patterns. Obviously, even if the rate of return on individual asset categories, such as debt and portfolio equity, were the same for all countries, cross-country differences in overall rates of return may still arise because of differences in the *composition* of country portfolios. Indeed, one important "candidate" for the explanation of the stylized facts listed at the beginning of this section is the increasing importance of portfolio equity and FDI stocks in international portfolios. The increase in world stock market values during the 1990s has implied substantial capital gains and rates of return on these assets, thus potentially explaining the high measured rates of return on external assets and liabilities. Differences in countries' external holdings of equity-type instruments can also account for cross-country heterogeneity in rates of return.

Finally, differences between *yields* on external assets and external liabilities can be due to the different weight in the two categories of equity-type instruments. Most of the return on equity and FDI instruments comes through capital gains, and yields are relatively small. However, investment income flows (that enter in the current account) include only yields, but do not

include capital gains. As a result, ceteris paribus yields on external assets will tend to be higher in countries with more debt-type instruments in their portfolio.[28] A corollary of this observation is that the current account is becoming less and less indicative of changes in countries' external position, since it ignores such valuation changes.

C. Empirical Specification

In order to understand the time-series behavior of rates of return on foreign assets and liabilities, we consider the specification

$$r_{ijt}^{BOP} = \alpha_i + \gamma * r_{ijt}^{M} + \varepsilon_{ijt} \qquad (9)$$

where α_i is a country-fixed effect, r_{ijt}^{BOP} is the rate of return on a given category of the international investment position, as calculated from the balance of payments data and r_{ijt}^{M} is an estimated rate of return on some observable market portfolio.[29]

As was outlined in the previous subsection, we consider two market portfolios in tracking the returns on foreign portfolio equity assets: (1) the MSCI world stock return index; and (2) an index based on the portfolio weights reported in the 1997 IMF Portfolio Survey.[30] We use the national domestic stock market return index in tracking the rate of return on foreign portfolio equity liabilities.

To explain the rate of return on FDI assets and liabilities, we again use the MSCI return indices. For FDI assets, we also use partner countries' stock market returns weighted using relative shares in overseas FDI positions, as reported in the *OECD International Direct Investment Statistical Yearbook*. We report results separately for countries reporting FDI at book and at market value, and we expect stock market return indices to do a better job in the latter case.

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[28] For example, Italy is a creditor country where investment income payments are higher than receipts. This is accounted for by the fact that Italy's external assets have a larger share of equity-type instruments than Italy's external liabilities.

[29] The equation allows for a non-unitary coefficient on the market return index, since the market return and the omitted idiosyncratic element may be correlated.

[30] For the United States and Unted Kingdom, we use the MSCI indices that exclude these countries respectively. With respect to the IMF Portfolio Survey, we calculate portfolios on the basis of investment positions in six major markets: the United States, the United Kingdom, Japan, France, Germany and Italy. These portfolio shares only refer to end-1997; we make the heroic and obviously imperfect assumption that these weights are good indicators for the other years in our sample.

We aggregate data from the portfolio bond and other debt categories into a single aggregate rate of return on debt. As explained in the previous subsection, for foreign debt assets we consider a weighted index of bond returns, based on bond holdings as reported in the 1997 IMF Portfolio Survey, with bond returns on ten-year government bonds taken from Global Financial Data.

We also consider the yields on the debt component. For the yield on debt assets, we consider two sets of portfolio weights: (1) bond weights from the IMF portfolio survey; and (2) weights based on the geography of cross-border bank assets, taken from the BIS.[31] We use long-term interest rates, based on OECD data—results are analogous if we use an average of short- and long-term rates. For debt liabilities, we track yields and returns with the long-term domestic interest rate and the domestic bond return, respectively.[32]

We also investigate whether the returns on foreign assets provide diversification against variation in domestic financial returns. The specification is

$$r_{ijt}^{BOP,FA} = \alpha_i + \beta * r_{ikt}^{M} + \varepsilon_{ijt} \tag{10}$$

where $r_{ijt}^{BOP,FA}$ is the return on some category of foreign assets and r_{ikt}^{M} is the return on some category of foreign liabilities.

Finally, we address the relation between rates of return and real exchange rate movements. As discussed in the previous subsection, the co-variation between real returns in home currency and foreign currency depends on their correlations with real exchange rate fluctuations. For this reason, we report these correlations[33]

$$\rho(r_{it}, r_{it}^{US}); \quad \rho(r_{it}, drerus_{it}); \quad \rho(r_{it}^{US}, drerus_{it}) \tag{11}$$

D. Results

As a prelude to the investigation of returns on individual investment categories, we first show that the aggregate returns on foreign assets and liabilities depend on the composition of the

[31] For the latter, we know the relative proportions of lending in domestic currency versus other currencies. Accordingly, the yield on foreign assets depends on the domestic interest rate and on the weighted average of foreign interest rates.

[32]Since some debt liabilities are contracted in foreign currencies, this will be an imperfect approach. Of course, this consideration is much more important for emerging market economies, not included in this paper.

[33] This approach is simplified by the assumption that dollar real returns are a good representation of the "external" market.

international balance sheet between equity and non-equity components. Figures 8 and 9 plot average returns and the share of equity in the external portfolio over 1997-2001 for a cross-section of countries. In both cases, the figures show a strongly positive relation between the equity share and the average return—a larger equity share is associated with a higher return. Second, in terms of data properties, we record in Figures 10 and 11 that returns are substantially more variable than yields for both foreign assets and liabilities, providing the example of the United States—plots for other countries are similar.

In term of time-series behavior, Tables 5a and 5b report fixed-effects regressions over 1983-2001 for the specification given in equation (9), for foreign assets and foreign liabilities respectively.[34] Columns (1) and (2) of Table 5a consider the returns on portfolio equity foreign assets. The MSCI world return index explains the dynamics of these returns quite well. Adjusting for geographical differences in overseas investment patterns (column 2) does not improve performance. A possible explanation is that the geographical weights are based on end-1997 positions, and therefore this index may be compromised due to time-varying portfolio weights; in addition, foreign investors may hold equity baskets in a given country that differ in composition from the country's broad market index.

Columns (3)-(4) repeat these exercises for returns on FDI assets at book value, and columns (5)-(6) for returns on FDI at market value. Again, the explanatory power of the MSCI index is as good as the geographically weighted index—as expected, both track returns on FDI at market value much better than returns at book value. Column (7) shows that the weighted foreign bond return explains about a quarter of the overall variance in debt asset returns. Both weighted interest rate measures track the yield on foreign debt assets quite closely (columns 8 and 9).

We turn to the returns on foreign liabilities in Table 5b. Column (1) shows that the return on foreign portfolio equity liabilities co-moves strongly with the domestic stock market index return and this specification has high explanatory power. This close relationship is a demonstration of international risk sharing in action: selling shares to foreign investors hedges the risk of fluctuations in domestic equity returns. Once again, the domestic stock return explains returns on FDI at market value (column 3) much better than returns on book-value FDI (column 2). In regard to debt liabilities, domestic bond returns explain over a third of returns on debt liabilities (column 4), and the yield on foreign debt liabilities is well tracked by domestic interest rates (column 5).

The analysis of returns on foreign assets is further extended in Table 6 by comparing returns on foreign assets to domestic market returns. We consider the aggregate return on foreign assets in columns (1)-(2). The first specification shows that the return on foreign assets positively and significantly co-varies with the domestic stock market, but the elasticity is

[34] The countries are Australia, Canada, Finland, Germany, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, Switzerland, the United States, and the United Kingdom. Canada was dropped from the equity regressions, since it measures its foreign equity assets only at book value. Other countries were excluded due to data limitations.

quite low and the explanatory power limited. Hence, holding foreign assets provides some diversification against fluctuations in the local stock market. Column (2) shows that the domestic bond return is also positively correlated with the aggregate return on foreign assets, but with an elasticity well below one-half, which is again consistent with a diversification contribution from foreign assets.

We turn to the subcomponents of the overall foreign asset position in columns (3)-(5). Column (3) shows that domestic stock returns are significantly positively correlated with returns on foreign portfolio equity assets (there is a substantial global component to stock market performance) but the point estimate of only 0.4 again signals the benefits from diversification. The correlations between returns on foreign portfolio equity assets and domestic debt (column 4), foreign debt assets and domestic debt (column 5), and yields on foreign debt holdings and domestic debt (column 6) are of the same order of magnitude.

Finally, we turn the relation between domestic- and foreign-currency ex post real returns and exchange rates in Table 7. In column (1), we report the correlations between domestic- and foreign-currency real returns on aggregate foreign assets. The mean correlation is actually negative—an increase in the local-currency real return is typically associated with a fall in the dollar real return, demonstrating the importance of exchange rate shifts in de-linking real returns across countries. As shown in column (2), domestic real returns are lower during periods of real appreciation. As noted earlier, this could be due to several mechanisms but is consistent with the returns on at least some foreign assets being driven by external factors. Column (3) shows a very strong positive correlation between dollar real returns on foreign assets and the real exchange rate, suggesting that at least some of the returns on foreign assets are driven by domestic factors.

The correlation patterns on the foreign liability side are shown in columns (4)-(6). As shown in column (4), there is essentially no correlation between domestic and dollar real returns on foreign liabilities. The negative (positive) correlation between domestic (dollar) returns and the real exchange rate is also very high, in line with the pattern on the foreign asset side, and is consistent with a role for both foreign and domestic factors in determining returns on foreign liabilities.

In summary, this section has provided an exploratory analysis of rates of return and yields for foreign assets and liabilities. Market indices co-vary significantly with these returns, but for certain asset categories there are substantial unexplained residuals. More precise information on cross-border investment patterns would be helpful in this regard. International cross-holdings appear to provide diversification against fluctuations in domestic market returns. Finally, the dynamics of real exchange rates imply that the properties of real returns are very different for home and foreign investors.

V. CONCLUSIONS

Our goal in this paper has been to highlight some empirical features of the growth in international cross-holdings of foreign assets and liabilities. In addition to describing the broad trends, we have identified growth in goods trade and stock market capitalization as two

key co-variates of the growth in the scale of international balance sheets. Sorting out the lines of causality among these variables provides challenges for both theoretical and empirical researchers.

We have also analyzed the properties of the rates of return on foreign assets and liabilities. The standard modeling assumption of a common "world interest rate" on international investments is not supported by the data, which show rates of return varying over time and across asset classes. Better information on the composition of international portfolios would allow a more detailed investigation of this topic but we believe that the international investment position data provide a useful and fresh perspective on the international diversification literature. The study of higher-frequency data on rates of return would also be useful in modeling the international transmission of business cycle shocks.

Figure 1. Evolution of International Financial Integration, 1983-2001

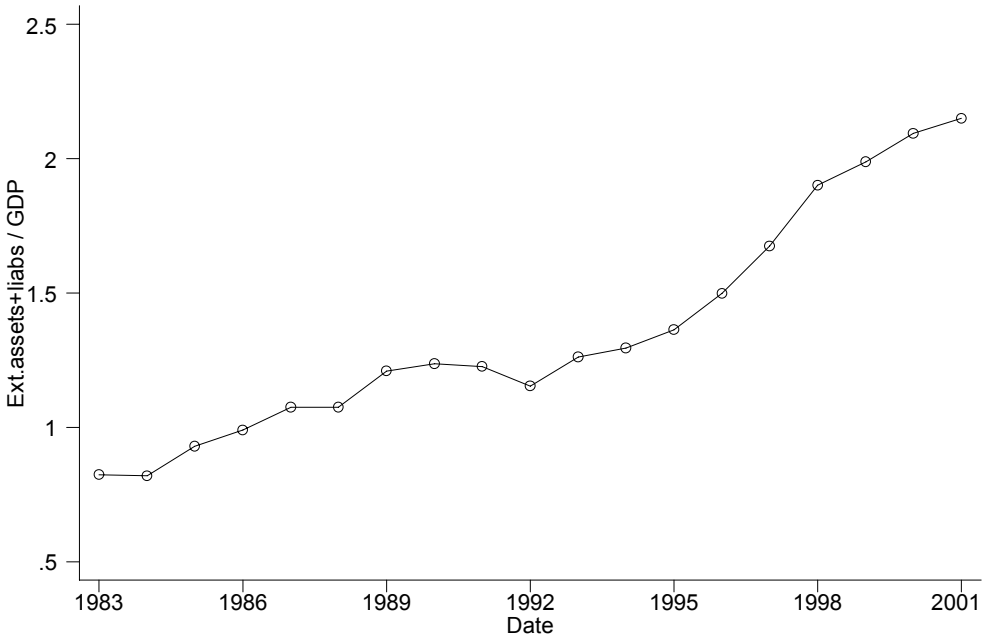
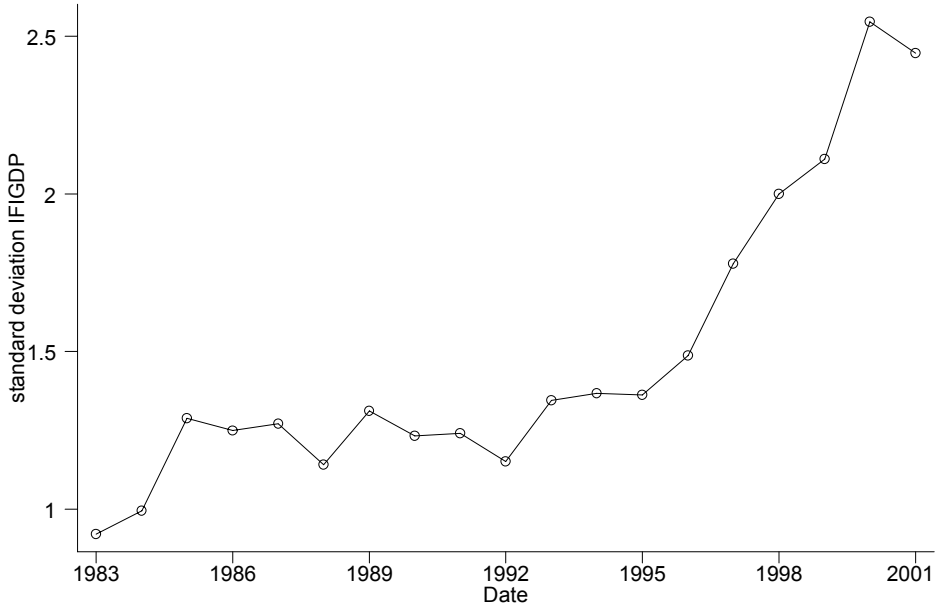
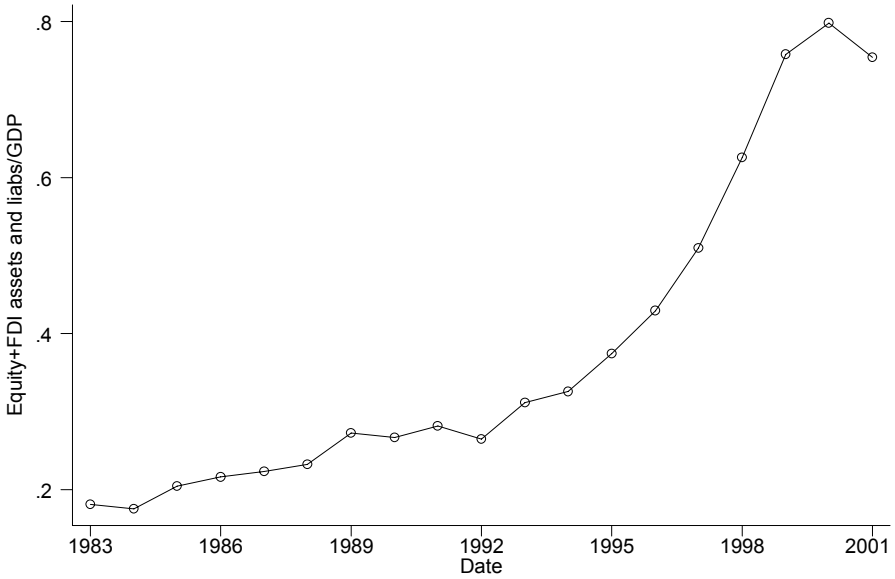


Figure 2. Dispersion in Level of International Financial Integration, 1983-2001



Note: Figure 1 plots the aggregate sum of external assets and liabilities over aggregate GDP. Figure 2 plots the standard deviation of IFIGDP ratio. Countries in the sample are the United States, United Kingdom, Austria, Belgium, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, and Spain.

Figure 3. International Equity Integration, 1984-2001



Note: The sum of FDI and portfolio equity assets and liabilities, aggregated over sample countries, divided by aggregate GDP. Countries in the sample are: the United States, the United Kingdom, Austria, Belgium, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, and Spain.

Figure 4. International Integration: Finance versus Trade

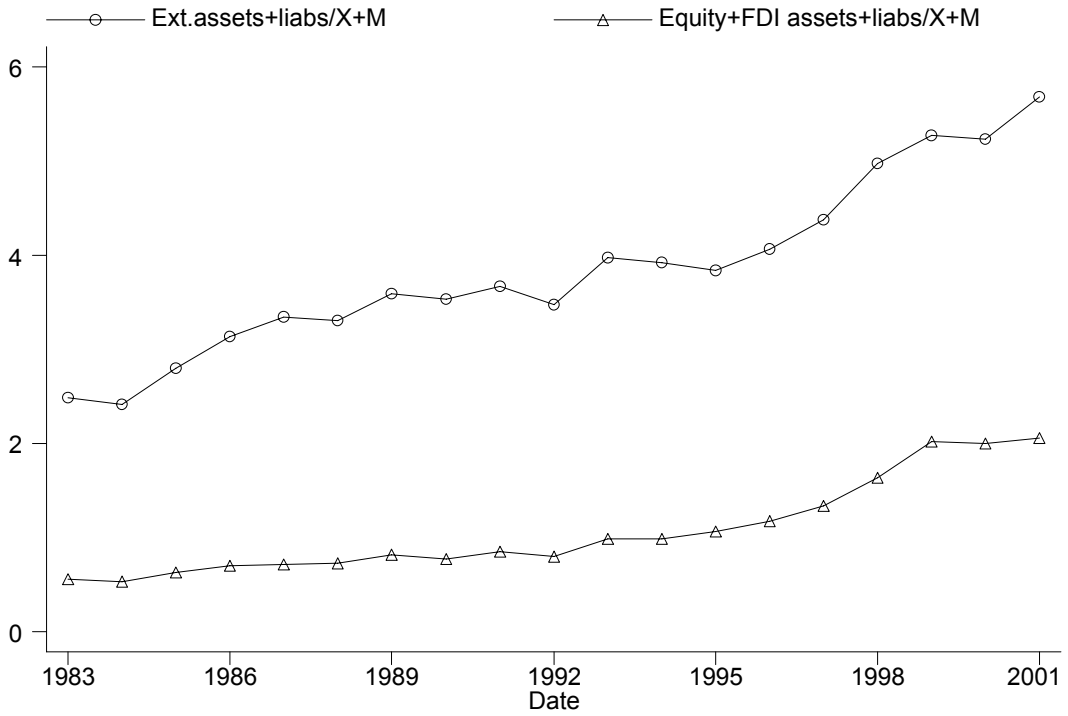


Figure 5. Percentage Change in Trade and Financial Openness, 1991-2001

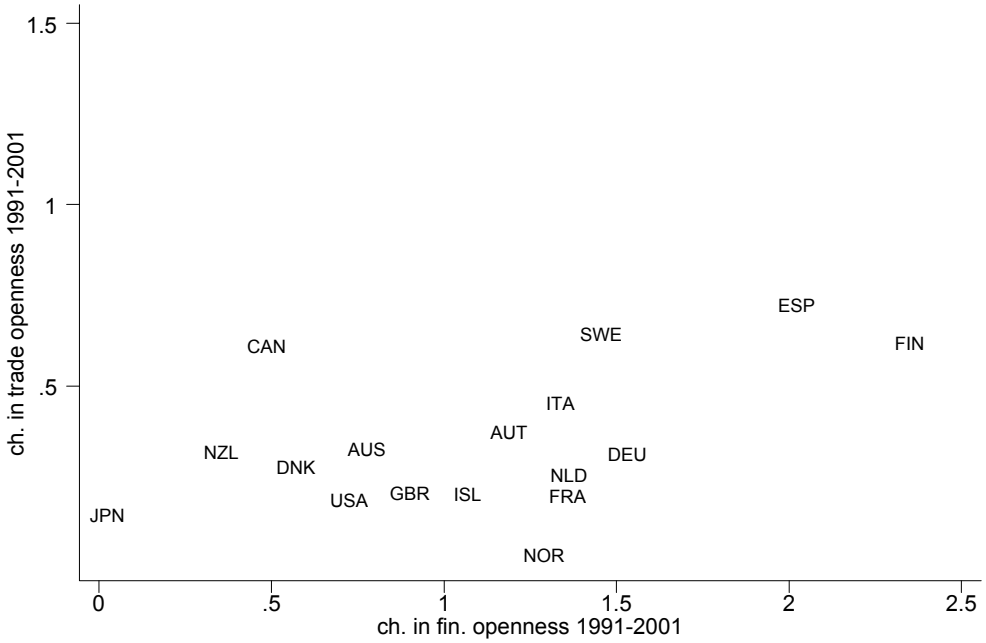
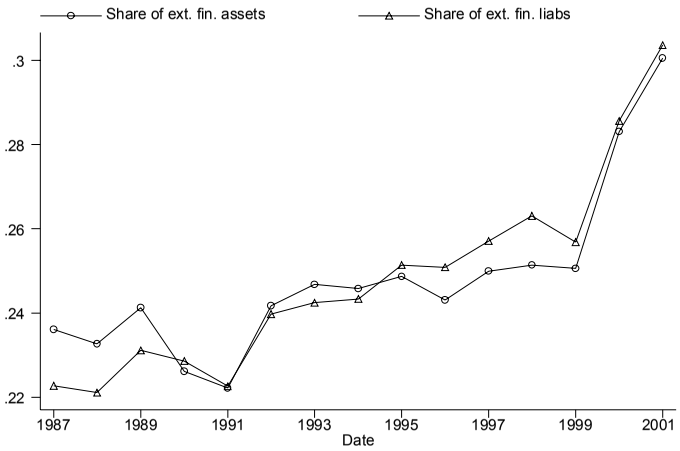


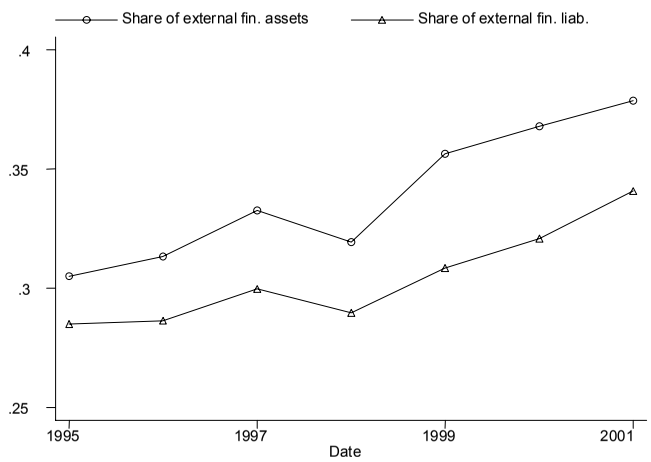
Figure 6. External versus Total Financial Holdings

United Kingdom, 1987-2001



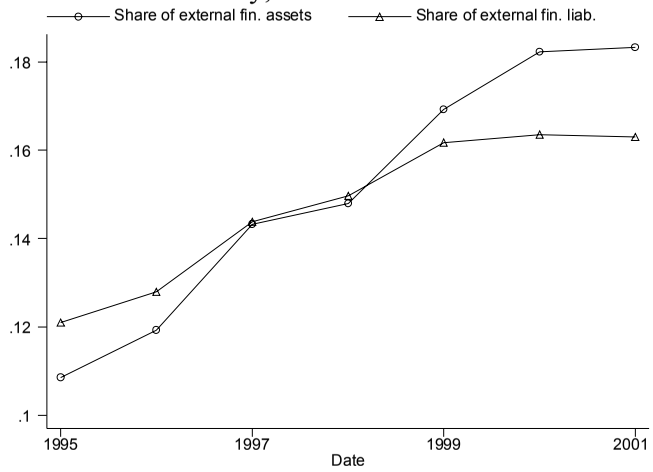
Source: Office of National Statistics.

Belgium, 1995-2001



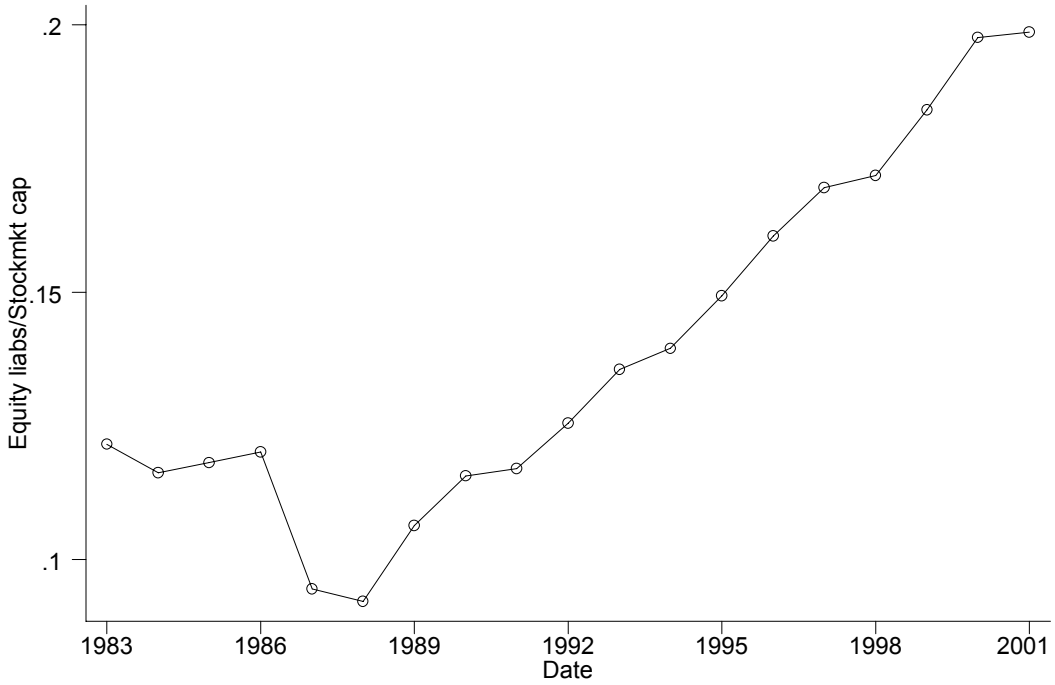
Source: Banque de Belgique.

Italy, 1995-2001



Source: Bank of Italy, Financial Accounts.

Figure 7. Portfolio Equity Liabilities, 1988-2001
(ratio of domestic stock market capitalization)



Note: Data aggregated over the United States, the United Kingdom, Austria, Belgium, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, Japan, Finland, and Spain.

Figure 8. Rate of Return on Foreign Assets and Equity Share
(average, 1997-2001)

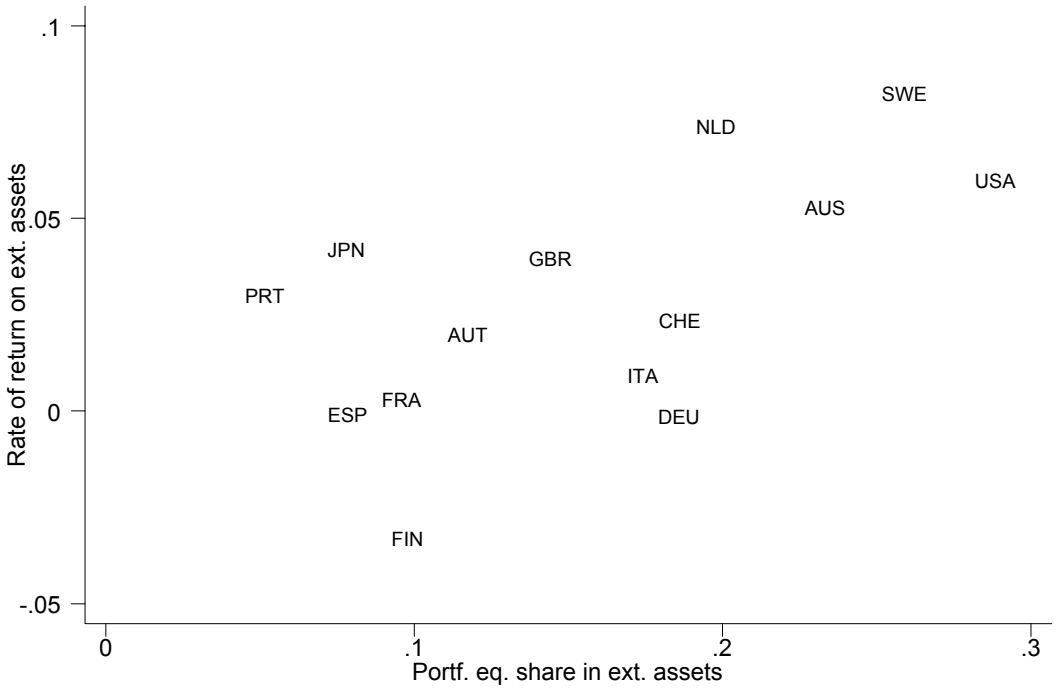
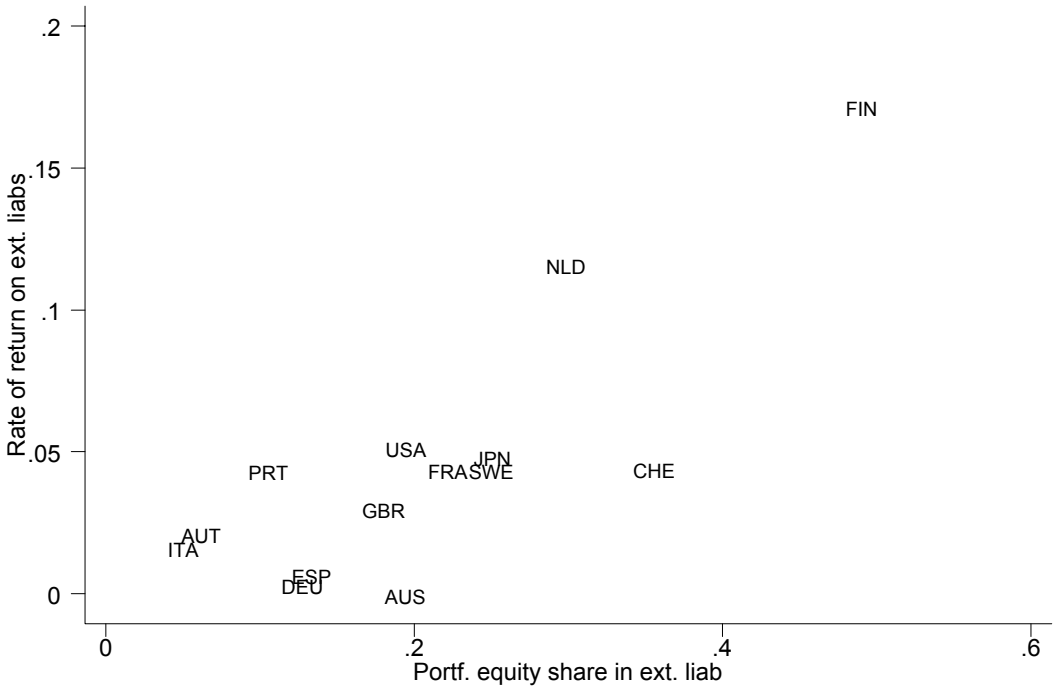


Figure 9. Rate of Return on Foreign Liabilities and Equity Share
(average, 1997-2001)



Note: Averaged data over 1997-2001. Correlation between portfolio equity share and rate of return is 0.60 for external assets, 0.80 (0.59 excluding Finland) for external liabilities.

Figure 10. United States: Rates of Return and Yields on Foreign Assets, 1983-2001

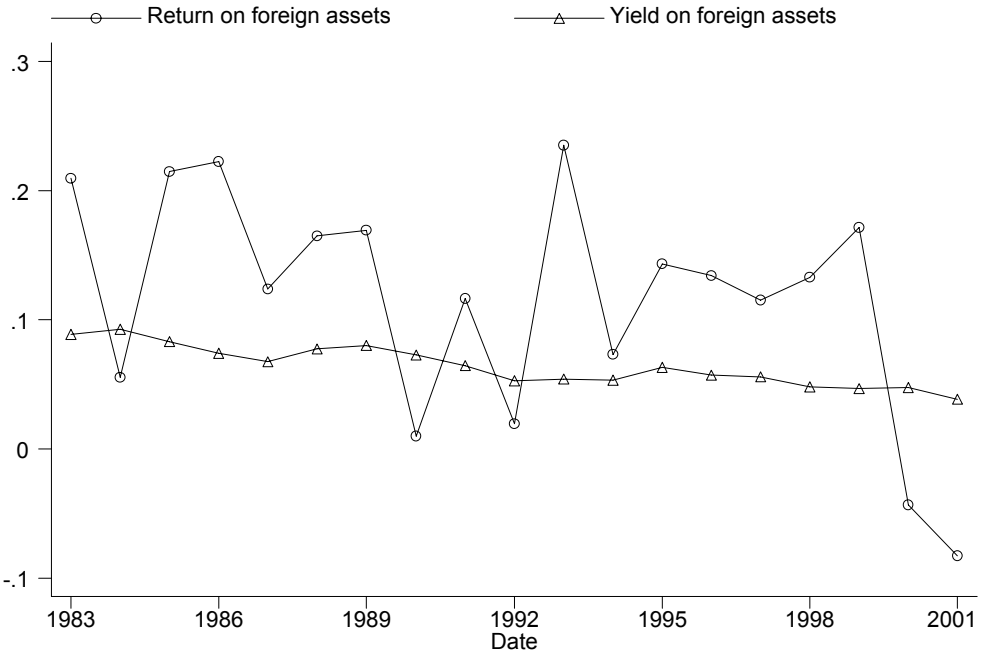
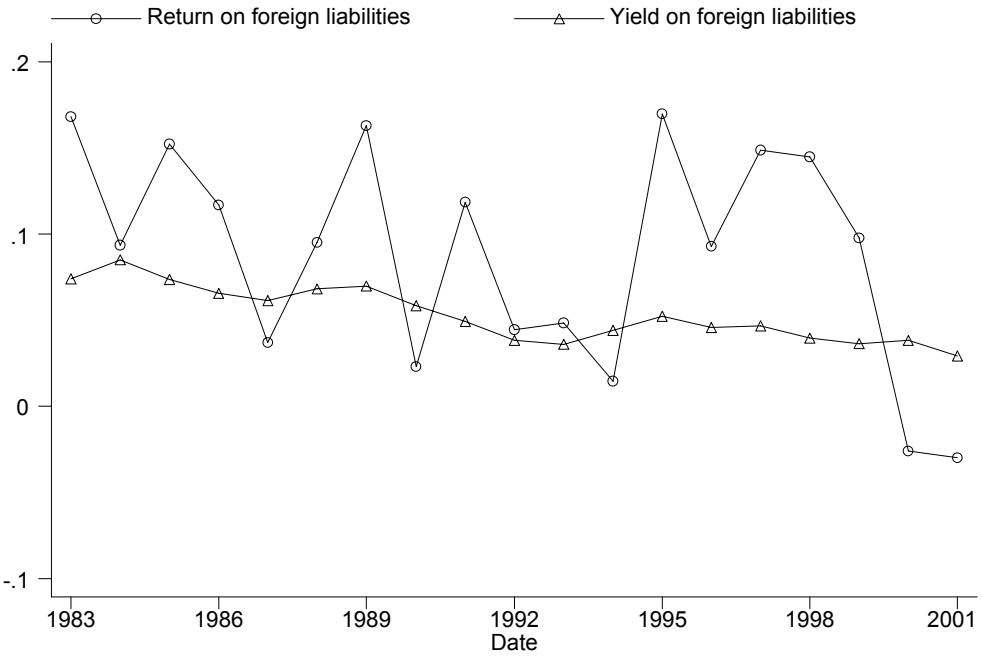


Figure 11. United States: Rates of Return and Yields on Foreign Liabilities, 1983-2001



Note: The graphs plot nominal U.S. dollar returns and yields on foreign assets and liabilities, with FDI at market value.

Table 1. Change in External Assets and Liabilities, Cumulative Capital Flows, and Capital gains, 1995-2000
(Ratios of 2000 GDP)

	(1) Change in external assets	(2) Cumulative capital outflows	(3) = (1)-(2) Impact of capital gains	(4) Change in external liabilities	(5) Cumulative capital inflows	(6)=(4)-(5) Impact of capital gains
			With FDI at book value			
United States	27.8	23.8	4.0	36.4	34.8	1.6
United Kingd.	144.1	145.2	-1.2	145.5	149.0	-3.5
Austria	53.7	70.9	-17.2	57.9	84.8	-26.9
Denmark	76.1	84.2	-8.1	60.0	85.3	-25.3
France	51.1	68.4	-17.3	64.3	55.1	9.1
Germany	49.9	72.2	-22.3	53.6	74.9	-21.4
Italy	50.1	56.4	-6.3	40.9	52.5	-11.7
Norway	76.8	79.5	-2.7	59.2	61.4	-2.2
Sweden	69.5	43.0	26.5	57.4	38.1	19.3
Switzerland	208.9	256.3	-47.4	208.1	201.4	6.7
Canada	31.1	37.6	-6.5	16.7	32.1	-15.4
Japan	7.1	4.0	3.1	-0.1	-7.4	7.3
Finland	74.3	99.6	-25.3	180.4	76.9	103.5
Iceland	31.9	33.5	-1.7	53.1	66.0	-12.9
Portugal	51.3	56.5	-5.2	83.8	85.9	-2.0
Spain	52.6	64.8	-12.2	51.6	69.2	-17.6
			With FDI at market value			
United States	34.6	23.1	11.6	47.2	37.4	9.9
France	80.5	68.4	12.1	70.3	55.1	15.2
Netherlands	135.4	100.0	35.3	163.7	88.3	75.4
Sweden	130.1	43.0	87.1	97.0	38.1	58.9
Australia	19.7	17.4	2.3	22.0	39.0	-16.9

Note: The change in external assets (liabilities) is the difference in gross external assets (liabilities) between end-2000 and end-1995 (end-1996 for Portugal), as ratio of 2000 GDP. The impact of capital gains is the difference between the change in external assets (liabilities) and cumulative capital outflows (inflows) between 1996 and 2000 (1997-2000 for Portugal), also as ratio of 2000 GDP.

Table 2. Panel Analysis of International Financial Integration, 1982-2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
External Liberalization	0.29 (5.3)***	0.06 (.69)	0.04 (.5)	-0.05 (.5)	-0.06 (.6)	0.08 (.8)	0.05 (.5)
Trade openness		4.18 (3.2)***	4.95 (3.7)***	3.08 (3.71)***	3.89 (4.5)***	3.29 (3.63)***	2.72 (3.01)***
Log GDP per capita			2.65 (2.5)**	1.56 (1.97)*	2.76 (3.51)***	2.82 (4.31)***	2.71 (4.06)***
Financial Depth				0.24 (1.58)	0.56 (1.68)	0.62 (1.88)*	0.75 (2.37)**
Stock market capitalization				1.27 (5.86)***	1.3 (6.18)***	1.32 (6.35)***	1.35 (6.95)***
Cumulative privatization					-1.65 (.66)	-9.67 (2.66)**	-9.92 (2.87)***
Corporate Tax Rate						-1.47 (1.65)	-1.27 (1.4)
Protection							0.19 (1.4)
Adjusted R^2	0.17	0.35	0.39	0.69	0.72	0.7	0.7
Number of obs.	78	78	78	72	64	49	49

Note: Dependent variable is first difference of the IFIGFP ratio. Fixed-effects panel estimation using averaged data for 1982-85, 1986-89, 1990-93, 1994-97, 1998-2001. White-corrected t-statistics in parentheses. See text for definition of variables.

Table 3. Panel Analysis of International Equity Integration, 1982-2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
External. Liberalization	0.17 (3.69)***	0.03 (.5)	0.02 (.36)	-0.01 (.5)	-0.01 (.2)	0.04 (.9)	0.03 (.71)
Trade openness		2.35 (3.62)***	2.96 (4.88)***	1.10 (3.37)***	1.53 (4.58)***	1.45 (4.0)***	1.33 (3.37)***
Log GDP per capita			2.15 (2.74)***	0.99 (3.65)***	1.56 (5.06)***	1.82 (4.98)***	1.8 (4.74)***
Financial Depth				0.02 (.48)	0.07 (.84)	0.08 (.96)	0.1 (1.3)
Stock market capitalization				0.92 (18.3)***	0.93 (17.4)***	0.94 (9.7)***	0.94 (9.52)***
Cumulative privatization					-1.5 (1.55)	-3.32 (1.76)*	-3.39 (1.82)*
Corporate Tax Rate						0.04 (.16)	0.09 (.31)
Protection							0.04 (.82)
Adjusted R^2	0.12	0.31	0.41	0.89	0.9	0.87	0.87
Number of obs.	72	72	72	66	59	46	46

Note: Dependent variable is first difference of *GEQGDP* (the ratio of foreign equity assets and liabilities to GDP). Fixed-effects panel estimation using averaged data for 1982-85, 1986-89, 1990-93, 1994-97, 1998-2001. White-corrected t-statistics in parentheses. See text for definition of variables.

Table 4. Panel Analysis of Gross Equity Share, 1982-2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
External. Liberalization	0.03 (2.92)***	0.02 (2.08)**	0.02 (2.27)**	0.02 (1.6)	0.02 (1.68)	-0.02 (1.51)	-0.01 (1.2)
Trade openness		0.1 (1.4)	0.18 (2.5)**	-0.05 (.55)	-0.04 (.38)	-0.03 (.35)	0.04 (.34)
Log GDP per capita			0.31 (1.97)*	0.2 (1.83)*	0.17 (1.36)	0.004 (.03)	0.02 (.1)
Financial Depth				-0.02 (1.57)	-0.03 (1.34)	-0.03 (2.04)*	-0.04 (2.09)**
Stock market capitalization				0.11 (3.15)***	0.11 (3.54)***	0.15 (7.04)***	0.15 (6.45)***
Cumulative privatization					-0.58 (1.96)*	0.93 (2.28)**	0.99 (2.15)**
Corporate Tax Rate						0.03 (.3)	0.02 (.82)
Protection							-0.021 (.94)
Adjusted R^2	0.12	0.12	0.19	0.53	0.48	0.69	0.69
Number of obs.	70	70	70	64	57	44	44

Note: Dependent variable is first difference of GEQSHARE ratio (the ratio of foreign equity assets and liabilities to total foreign assets and liabilities). Fixed-effects panel estimation using averaged data for 1982-85, 1986-89, 1990-93, 1994-97, 1998-2001. White-corrected t-statistics in parentheses. See text for definition of variables.

Table 5a. Rates of Return on Foreign Assets and Market Returns, 1982-2001

	(1) Real ret. Port. Eq.	(2) Real ret. Port. Eq.	(3) Real ret. FDI book	(4) Real ret. FDI book	(5) Real ret. FDI mkt	(6) Real ret. FDI mkt	(7) Real ret. Debt	(8) Real yld Debt	(9) Real yld Debt
Global Stock Return	0.77 (14.1)***		0.16 (3.45)***		0.57 (8.43)***				
Stock Return (Port. Survey weights)		0.74 (13.6)***							
Stock Return (FDI distrib. weights)				0.14 (2.12)**		0.62 (7.33)***			
Bond Return (Port. Survey weights)							0.49 (10.4)***		
Interest Yield (Port. Survey weights)								0.51 (10.2)***	
Interest Yield (BIS weights)									0.43 (7.40)***
Adj R^2	0.62	0.60	0.14	0.12	0.58	0.51	0.43	0.42	0.35
Number of observ.	138	138	217	157	56	56	157	158	112

Table 5b. Rates of Return on Foreign Liabilities and Market Returns, 1982-2001

	(1) Real return Portf. equity	(2) Real return FDI (book)	(3) Real return FDI (mkt)	(4) Real return Debt	(5) Real yield Debt
Dom Stock Return	1.04 (27.9)***	0.12 (2.55)**	0.45 (5.33)***		
Dom Bond Return				0.45 (8.20)***	
Dom Interest Rate					0.55 (12.1)***
Adj R^2	0.86	0.12	0.35	0.34	0.50
Number of observ.	139	217	57	146	160

* Panel regressions with country-fixed effects (t-statistics in parenthesis). ** (***) indicates statistical significance at the 0.05 (0.01) confidence level. See text for definition of variables.

Table 6. Foreign Asset Returns and Domestic Market Returns

	(1) Real return For. Assets	(2) Real return For. assets	(3) Real return Port.Eq. assets	(4) Real return Port.Eq. assets	(5) Real return Debt assets	(6) Real yield Debt assets
Dom Stock Return	0.12 (5.98)***		0.37 (8.37)***			
Dom Bond Return		0.45 (8.90)***		0.42 (3.94)***	0.47 (13.2)***	
Dom Interest Rate						0.47 (10.2)***
Adj R^2	0.15	0.52	0.36	0.11	0.55	0.42
Number of observ.	220	205	137	125	144	158

* Panel regressions with country-fixed effects (t-statistics in parenthesis). ** (***) indicates statistical significance at the 0.05 (0.01) confidence level. See text for definition of variables.

Table 7. Rates of Return and Real Exchange Rates

	(1) Assets	(2) Assets	(3) Assets	(4) Liabilities	(5) Liabilities	(6) Liabilities
Correlations	$\rho(r_t, r_t^{US})$	$\rho(r_t, drer_t)$	$\rho(r_t^{US}, drer_t)$	$\rho(r_t, r_t^{US})$	$\rho(r_t, drer_t)$	$\rho(r_t^{US}, drer_t)$
Australia	0.16	-0.47	0.79	-0.21	-0.54	0.94
Austria	-0.02	-0.32	0.95	0.19	-0.20	0.92
Finland	-0.10	-0.61	0.84	0.73	-0.36	0.37
France	0.36	-0.59	0.54	0.60	-0.48	0.40
Germany	-0.59	-0.74	0.98	-0.05	-0.29	0.97
Italy	-0.01	-0.52	0.84	-0.34	-0.62	0.95
Japan	-0.80	-0.96	0.93	0.66	0.24	0.88
Netherlands	-0.45	-0.80	0.89	-0.36	-0.72	0.91
Portugal	-0.04	-0.46	0.91	-0.34	-0.22	0.84
Spain	-0.55	-0.78	0.94	-0.70	-0.79	0.96
Sweden	0.17	-0.54	0.74	-0.22	-0.72	0.83
Switzerland	-0.51	-0.78	0.93	-0.17	-0.63	0.87
United Kingd.	-0.45	-0.93	0.72	-0.48	-0.88	0.82
Mean	-0.22	-0.65	0.85	-0.05	-0.48	0.82

Note: r_t, r_t^{US} are real returns on foreign holdings in domestic currency and in U.S. dollars, respectively; *drer* is the percentage change in bilateral end-of-period real exchange rate vis-à-vis the United States. Correlations calculated over time period 1982-2001 or shorter.

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DATA SOURCES

IFIGDP. Sum of total foreign assets and liabilities (net of the value of derivatives) as a ratio of GDP. Source: International Monetary Fund and national sources.

GEQGDP. Sum of total foreign equity assets and liabilities as a ratio to GDP. Equity is the sum of FDI and portfolio equity, and FDI is measured at book value. Source: International Monetary Fund, Balance of Payments Statistics, and national sources.

GEQSHARE. Share of foreign equity assets and liabilities in total foreign assets and liabilities. Equals the ratio of GEQGDP to IFIGDP.

EXTLIB. Index of capital account liberalization. Range is (0,4) where 4 denotes complete liberalization. A value of zero indicates the presence of capital controls, obligation to surrender export proceeds, multiple exchange rate practices, and current account restrictions. Source: Grilli and Milesi-Ferretti (1995), updated by Mody and Murshid (2002).

OPENNESS. Ratio of exports plus imports of goods and services to GDP. Source: International Monetary Fund, Balance of Payments Statistics (Penn World Tables, version 6.0 for Belgium).

GDP per Capita. Measured in constant U.S. dollars. Source: World Bank's World Development Indicators Online Database.

Financial Depth. Ratio of liquid liabilities to GDP. Source: Beck, Demirgüç-Kunt, and Levine (1999).

Stock Market Capitalization. Ratio of stock market capitalization to GDP. Source: Datastream, Thomson Financial Inc.

Cumulative Privatization. Ratio of cumulative privatization revenues to GDP. Source: OECD Privatization Database.

Corporate Tax Rate. Average tax rate on corporate profits as calculated by Devereux, Lockwood, and Redoano (2002).

Investor Protection. Dummy variable taking a value of one if a country has introduced a law prohibiting insider trading, and a value of zero otherwise. Source: Bekaert, Harvey, and Lundblad (2001).

Yields on External Assets and Liabilities. Investment income payments/receipts in U.S. dollars on a specific asset/liability category during year *t*, divided by the outstanding stock of the specific asset/liability at the end of year *t-1*. Source data for investment income flows and international investment positions: International Monetary Fund, Balance of Payments Statistics, and national sources.

Capital Gains on External Assets/Liabilities. The difference between the change in the stock of the relevant external asset/liability between the end of year *t* and the end of year *t-1*, and the corresponding capital flow during year *t,* as a ratio of the stock at end-year *t-1*. All variables measured in current U.S. dollars. Source: International Monetary Fund, Balance of Payments Statistics, and national sources.

Rate of Return on External Assets/Liabilities. The sum of yield and capital gain.

Real Exchange Rate. Ratio of domestic CPI, expressed in U.S. dollars (end-of-period exchange rate), to the United States CPI. Source: International Monetary Fund, International Financial Statistics.

Domestic Stock Market Returns. Index of U.S. dollar returns on the domestic stock market. Source: Morgan Stanley Capital International.

World Stock Prices. World stock market stock market index. Source: Morgan Stanley Capital International.

Stock Return (Portfolio Survey Weights). Weighted average of foreign stock market returns, with weights corresponding to the shares of portfolio equity assets invested in the corresponding stock markets, as reported in the 1997 IMF Portfolio Survey.

Stock Return (FDI Weights). Weighted average of foreign stock market returns, with weights corresponding to the shares of FDI invested in the corresponding countries, as reported in the OECD International Investment Yearbook.

Domestic Bond Return. Derived from 10-year Total Return Government Bond Index. Source: Global Financial Data.

Bond Return (Portfolio Survey Weights). Weighted average of foreign bond returns, with weights corresponding to the shares of portfolio debt assets invested in debt instruments of the corresponding countries, as reported in the 1997 IMF Portfolio Survey.

Domestic Short-Term Interest Rate. Three-month money market rates where available, or rates on proximately similar financial instruments. Source: OECD Economic Outlook Annex, Table 35.

Domestic Long-Term Interest Rate. Ten-year benchmark government bond yields where available or yield on proximately similar financial instruments. Source: OECD Economic Outlook Annex, Table 36.

Interest Yield (Portfolio Survey Weights). Weighted average of foreign bond interest rates, with weights corresponding to the shares of portfolio debt assets invested in debt instruments of the corresponding countries, as reported in the 1997 IMF Portfolio Survey.

Interest Yield (BIS Weights). Weighted average of domestic and foreign bond interest rates, with the weights on the domestic and foreign components in proportion to the relative importance of domestic-currency and foreign-currency assets in total overseas lending by domestic banks. In turn, the foreign component is a weighted average across destination countries, in proportion to the geographical spread of overseas lending by domestic banks. The data on the overseas assets of domestic banks are from the BIS.

Table 8. External Assets and Liabilities: Data Availability Dates

Country	Total		FDI		Portfolio equity		Portfolio debt		Other investment	
Date	Start	End	Start	End	Start	End	Start	End	Start	End
United States	1976	2001	1976	2001	1976	2001	1976	2001	1977	2001
United Kingdom	1970	2001	1970	2001	1980	2001	1984	2001	1984	2001
Austria	1980	2001	1980	2001	1998	2001	1998	2001	1992	2001
Belgium	1981	2000	1981	2000	1981	2000	1981	2000	1981	2000
Denmark	1991	2001	1991	2001	1991	2001	1991	2001	1991	2000
France	1989	2001	1989	2001	1989	2001	1989	2001	1989	2001
Germany	1980	2001	1980	2001	1980	2001	1980	2001	1980	2001
Italy	1972	2001	1972	2001	1972	2001	1972	2001	1972	2001
Netherlands	1982	2001	1982	2001	1982	2001	1982	2001	1982	2001
Norway	1980	2001	2000	2001	2000	2001	2000	2001	2000	2001
Sweden	1982	2001	1982	2001	1982	2001	1982	2001	1982	2001
Switzerland	1983	2001	1983	2001	1983	2001	1983	2001	1983	2001
Canada	1970	2001	1970	2001	1970	2001	1970	2001	1970	2001
Japan	1980	2001	1980	2001	1995	2001	1995	2001	1980	2001
Finland	1975	2001	1975	2001	1975	2001	1975	2001	1975	2001
Greece	1998	2001	1998	2001	1998	2001	1998	2001	1998	2001
Iceland	1986	2001	1986	2001	1986	2001	1986	2001	1986	2001
Ireland	1998	2001	1998	2001	1998	2001	1998	2001	1998	2001
Portugal	1996	2001	1996	2001	1996	2001	1996	2001	1993	2001
Spain	1981	2001	1981	2001	1981	2001	1981	2001	1981	2001
Australia	1986	2001	1988	2001	1988	2001	1988	2001	1988	2001
New Zealand	1990	2001	1990	2001	1990	2001	1990	2001	1990	2001