

Multi-country Empirical Investigation into International Financial Integration

Anil Mishra and Kevin Daly

Abstract

This paper focuses on the dynamics of international financial integration for a set of 13 industrial countries¹ including Australia over the period 1990 to 2003 by analysing data on the level and composition of foreign assets and liabilities. The objective of the study is to provide insights into the broad trends on cross country holdings of FDI and portfolio equity. An analysis of the composition of countries holdings of foreign assets and liabilities is important in that a particular combination of cross holdings can reduce the volatility of countries national income by generating investment income streams that are imperfectly correlated with domestic output fluctuations. The study investigates the correlation of international asset positions with various ‘explanatory variables’ such as the degree financial restrictions, the depth of the financial market, the openness to international trade, etc. The paper then examines returns on various asset classes (debt, portfolio equity, and FDI) in an attempt to measure from the returns the degree of diversification that is being offered by international investments. The results show that the growth in goods trade and stock market capitalisation are the main determinants of the growth in the scale of international balance sheets. In our analysis of rates of return on foreign assets and liabilities we find that international cross holdings provide diversification against fluctuations in domestic market returns.

¹ The countries are Australia, Canada, France, Germany, Italy, Japan, Netherlands, New Zealand, Spain, Sweden, Switzerland, United Kingdom and United States.

I Introduction

This paper focuses on the dynamics of international financial integration for a set of 13 industrial countries² over the period 1990 to 2003. The study utilizes data on the level and composition of foreign assets and liabilities for 13 industrial countries. The study is motivated by previous research which has demonstrated that the level and composition of foreign assets and liabilities affects countries macroeconomic adjustment to shocks. In particular the composition of countries holdings of foreign assets and liabilities can reduce the volatility of countries national income by generating investment income streams that are imperfectly correlated with domestic output fluctuations. Also relevant to our study is that the level of integration into international capital markets may also be important in understanding the diffusion of new financial technologies and in determining the level of productivity in the domestic financial sector (Grossman and Helpman, 1991).

Several authors have studied certain aspects of international financial integration including Bekaert and Harvey (2000) who used an asset-pricing model to integrate the emerging market stock exchanges into the global market. Henry (2000), Beck, Levine and Loyozza (2000), Edison, Levine, Ricci and Slok (2002), Edison and Warnock (2003) and O'Donnell (2002) examined the impact of international financial integration on various indicators. Obstfeld and Taylor (2002) provided a wide-ranging historical overview, including analysis of long run changes in gross asset trade. Adam and others (2002) explored a wide range of measures of international financial integration for Europe. Hummels *et al* (2001) and Yi (2003) studied the growth in world trade while Lane (2000) provided some evidence on the change in gross cross holding positions over time for OECD countries. Lane and Milesi Ferretti (2002) explored the determinants of net foreign asset positions over time. Lane and Milesi Ferretti (2003) studied international financial integration for 14 countries using portfolios of external assets and liabilities for the years 1982 to 2001. In the study they employed broad measures of financial integration *viz* trends in the ratio of total external assets and liabilities to GDP, ratio of portfolio equity and FDI assets (liabilities) to GDP, and the ratio of external assets and liabilities to the sum of imports and exports (financial openness).

Some empirical work has been done on the rates of return earned on foreign assets and liabilities. Bond (1977), Sorensen and Yosha (1998), and Lane (2001) studied the behaviour of investment income flows but not the contribution of capital gains and losses, while Sorensen, Yosha and Wu (2002) provided some indirect evidence on the role of portfolio equity holdings in international risk sharing. Lane and Milesi-Ferretti (2002a, 2002b 2003) provided some initial evidence on the behaviour of overall rates of return. They found that the rates of return on both assets and liabilities tended to be high, easily exceeding countries' growth rates; cross-country differences in rates of return were substantial and some countries exhibited substantial differences between returns on external assets and liabilities.

This study examines the international financial integration for 13 countries using data on countries' portfolios of external assets and liabilities over the years 1990 to 2003. The study

² The countries are Australia, Canada, France, Germany, Italy, Japan, Netherlands, New Zealand, Spain, Sweden, Switzerland, United Kingdom and United States.

compares the broad trends across the ratios of total external assets and liabilities to GDP, the portfolio equity and FDI assets (liabilities) to GDP, external assets and liabilities to the sum of exports and imports (financial openness), equity, FDI assets and liabilities to sum of exports and imports (trade openness) for Australia and 12 other countries. The paper also examines the behaviour of rates of return, the links between rates of return on international investment positions and various financial market returns and the inter relations between domestic and foreign real rates of return and real exchange rate fluctuations. The paper is structured as follows; Section 2 describes the data and broad trends, here we discuss several conceptual issues associated with international financial integration, Section 3 develops the empirical specification in line with approaches adopted by recent studies on international financial integration. Finally in Section 4 we examine the rates of returns and yields on foreign assets and liabilities.

II. Data and Conceptual Issues

The study employs data from the International Investment Position (IIP) publication by the International Monetary Fund (IMF) based on countries' portfolios of external assets and liabilities. This database summarizes the total asset holdings and total financial claims by both domestic and foreign residents. The data appendix describes data sources. The methodology employed by the IMF in their database involves the classification of assets/liabilities into foreign direct investment (FDI), portfolio equity investment, portfolio debt investment, other investment and derivatives.

In a world with no borders the allocation of international asset holdings would take place with no transactions costs here we assume that complete global financial market integration exists. Each country would hold a very high level of foreign assets and liabilities, in line with full diversification. However in the actual world with borders and transactions costs there are significant obstacles to full integration across countries and in the subsequent gains available from international diversification. In a recent study Martin and Rey (2000, 2001), develop a theoretical model that assumes that investors are risk averse, the number of financial assets are endogenous, assets are imperfect substitutes, and cross border asset trade entails transactions costs. Under these assumptions, a reduction in international transaction costs stimulates an increase in the demand for (and supply of) assets and an increase in asset prices, leading to higher cross border diversification.

A number of important issues arise in studying international financial integration. *Firstly* income per capita may influence the propensity to engage in international asset trade. Higher income per capita is associated with lower risk aversion and international investments are perceived as riskier than domestic alternatives. *Secondly* the size of the financial sector facilitates international asset trade in various ways.³ An economy with an extensive financial infrastructure is attractive to foreign investors. Here a substitution effect may operate where domestic agents have an incentive to invest in foreign markets given an underdeveloped domestic financial sector. Equally the quality of the domestic financial regulator may also be important here foreign investors may stay away from markets that do not protect their interests. *Thirdly* tax policy may also influence the level of international cross holdings. Firm's assets may be shifted to countries with low corporate income tax rates. This will also attract international financial intermediaries engaged in offshore financial transactions. At a household level, high tax rates on investment income will stimulate the growth of offshore

³ See Klein and Olivei (2000)

saving vehicles, if overseas investments can be more easily hidden from domestic tax authorities.⁴

The study makes the distinction between trade in goods and trade in services for a number of reasons. Firstly, goods trade directly entails corresponding financial transactions (e.g. trade credit and export insurance). Second, there is a close connection between the gains to international financial diversification and the extent of goods trade. Third, goods trade and financial positions may be jointly determined, given the importance of intra-firm intermediates trade. Fourth, openness in goods markets may increase the willingness to conduct cross-border financial transactions, reducing financial home bias.⁵

In this study we employ an empirical modelling strategy developed by Lane and Milesi-Ferreti (2003), used to identify a set of country characteristics that affect the benefits and costs of international trade in financial assets/liabilities. In particular their model takes account of the impact of controls on cross border capital movements, the level of international asset cross holdings and the extent to which the capital account is liberalized.

II.I Measures of International Financial Integration

The study involves the construction of several proxies to measure international financial integration covering the period 1990 to 2003 for a group of countries across a range of measures commonly used as indicators of international financial integration in an attempt to compare Australia's relative performance with a representative group of countries considered to be at a similar stage of economic development. In Fig 1 we illustrate a broad indicator of international financial integration based on a volume measure to compare our representative group of countries with that of Australia.

$$IFI_{it} = \frac{FA_{it} + FL_{it}}{GDP_{it}} \quad (1)$$

where IFI_{it} = volume based measure of international financial integration' FA_{it} = stock of foreign assets, FL_{it} = stock of foreign liabilities and GDP_{it} = gross domestic product

Over the time period from 1990 to 2002 our measure of international financial integration has increased by approximately 93 percent for the representative group of countries and by 97 percent for Australia. Noteworthy is the depression in the aggregate international financial integration ratio for the year 1999 coinciding with the steep fall in international stock market prices. Overall the 1990s has been marked by a clear acceleration in the measure international integration.

⁴ See Grilli (1990)

⁵ For Ireland, Honohan and Lane (2000) and for Australia, Mishra and Daly (2004) show that the bilateral pattern of goods trade explains the bilateral pattern of portfolio equity investment.

Figure 1: International Financial Integration, 1990-2002



Series 1: Countries are US, UK, Canada, Japan, Germany, France, Italy, Sweden, Switzerland, Spain, New Zealand, Netherlands
Series 2: Country is Australia.

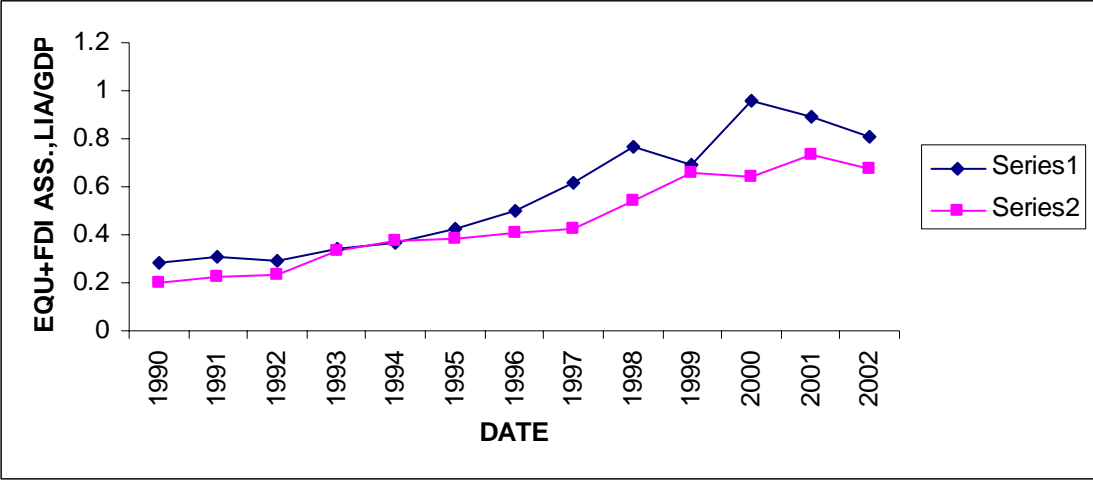
Equation 2 indicates that measuring the growth of international financial integration with an equity-based (portfolio and FDI) measure suggests that an even more rapid increase in international financial integration has taken place over the study period.

$$EQ_{it} = \frac{PQA_{it} + FDIA_{it} + PQL_{it} + FDIL_{it}}{GDP_{it}} \tag{2}$$

where EQ_{it} = indicator of the level of equity (portfolio and FDI) cross-holdings
 $PQA(L)$ = portfolio equity (liabilities)
 $FDIA(L)$ = FDI assets (liabilities)

Figure 2 provides us with an indication of the level of equity cross-holdings, which illustrates the changes in international equity integration over the period 1990 to 2002, the noticeable feature here is the increase in this ratio by approximately 185 percent for 12 countries' and about 236 percent for Australia. This ratio has increased much faster than the increase in IFI_{it} measure reported above in Fig 1. The rise in the international financial asset holdings may be due to the substantial increase in the international trade.

Figure 2: International Equity Integration, 1990-2002

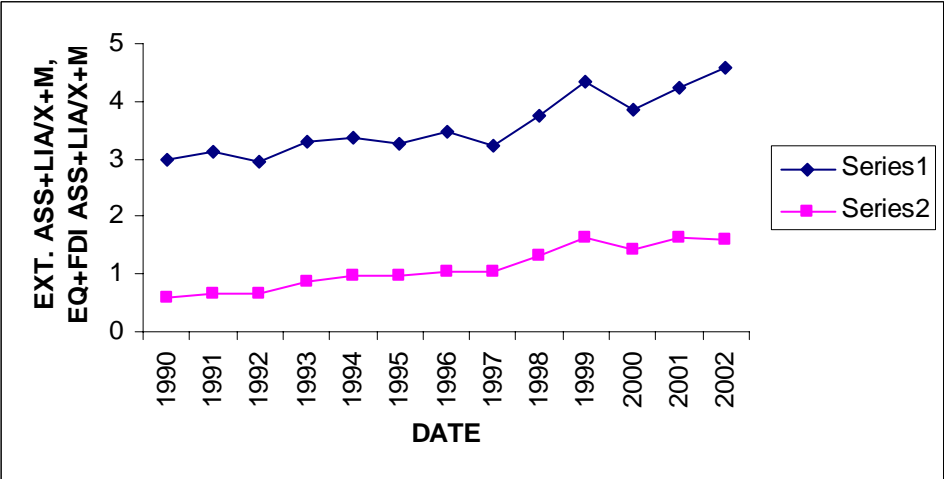


Series 1: Countries are US, UK, Canada, Japan, Germany, France, Italy, Sweden, Switzheland, Spain, New Zealand, Netherlands

Series 2: Country is Australia.

Figure 3a, 3b shows financial openness and trade openness ratios for 12 countries and Australia, respectively by plotting the IFI and EQ measures as a ratio of exports plus imports rather than GDP as in Figs 1 and 2 above. While both ratios have increased over the period, international asset trade has grown far more rapidly than goods trade.

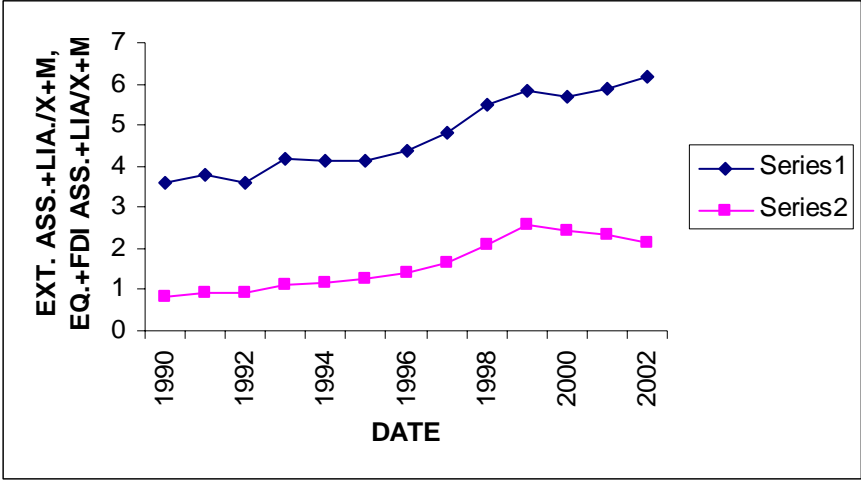
Figure 3a: International Integration: Finance versus Trade (1990-2002)



Series 1: External assets + liabilities/Export + Import

Series 2: Equity + FDI assets, liabilities/Export + Import

Figure 3b: Australia's International Integration: Finance versus Trade (1990-2002)



Series 1: External assets + liabilities/Export + Import
Series 2: Equity + FDI assets, liabilities/Export +Import

Figure 3b compares Australia's financial openness relative to her trade openness positions, both series have similar trends as the twelve industrial countries illustrated in Fig 3a. At the aggregate level international asset trade has grown at a more accelerated rate compared to goods trade by this measure.

Figure 4 shows the scatter plot at the individual country level, by showing the relation between the ratio of the sum of external assets and liabilities to GDP (i.e. financial openness) and the ratio of the sum of exports and imports to GDP (i.e. trade openness) for the years 1989 to 2003. Australia has greater external assets and liabilities to GDP ratio as compared to exports and imports to GDP ratio.

Figure 4: Scatter Plot of trade openness versus financial openness

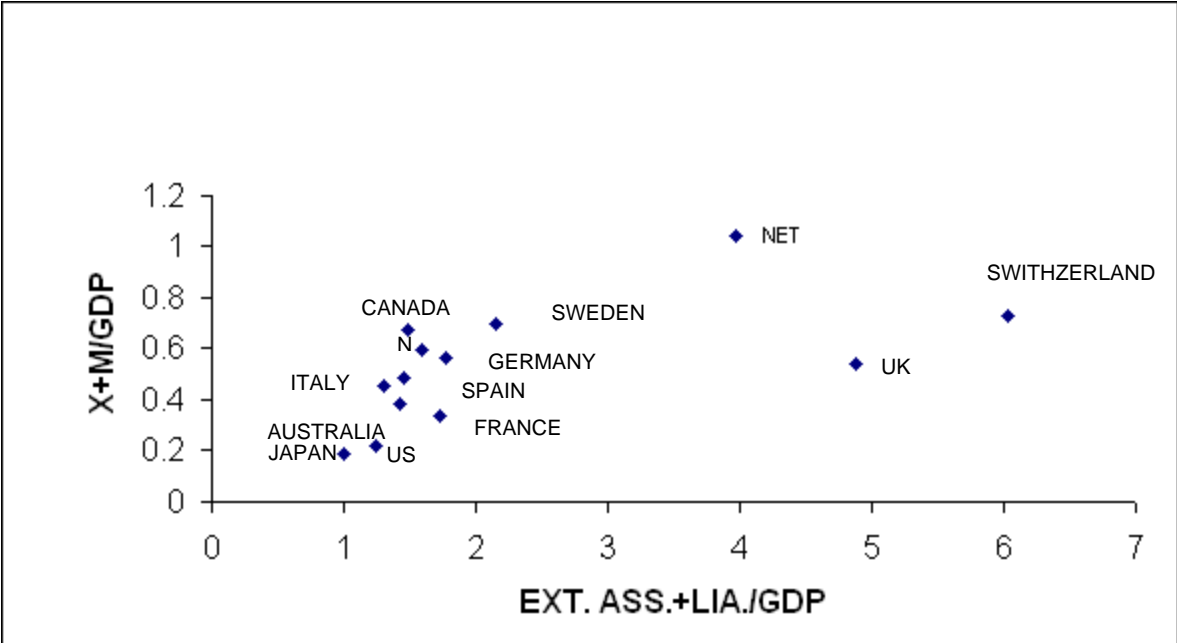
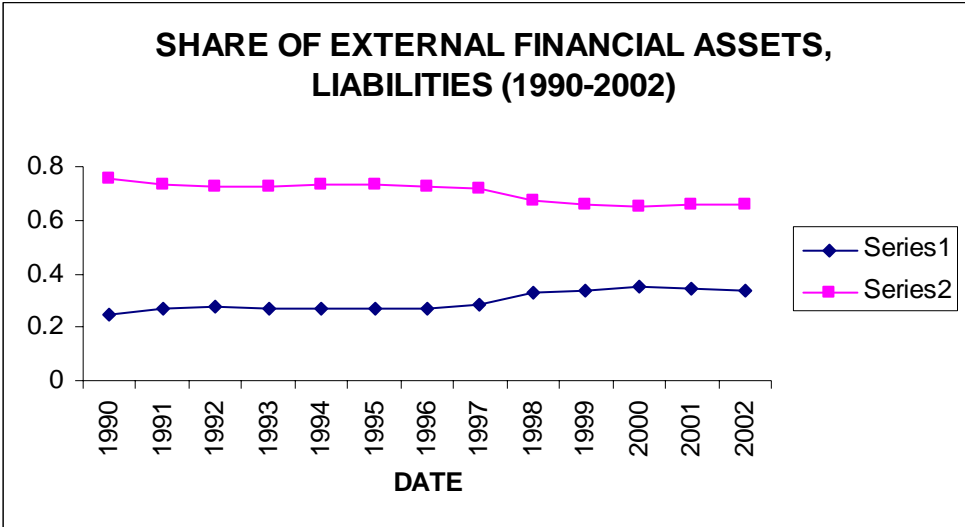


Figure 5 illustrates the ratio of external financial holdings over total financial holdings for Australia. The ratio of external financial assets holdings over total financial holdings shows clearly an increase from 1990 onwards. The ratio of external financial liabilities over total financial holdings shows a slight decrease from 1990 to 2001 and then gradually rises.

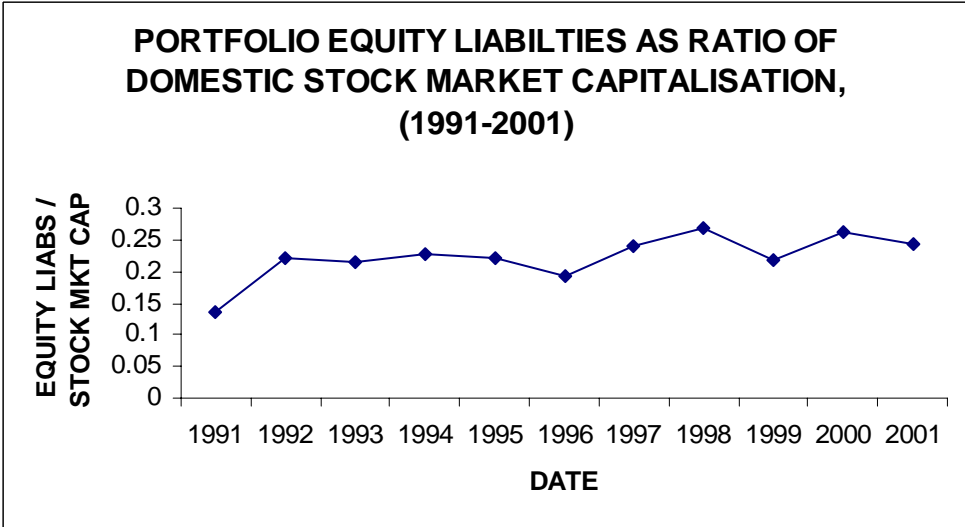
Figure 5: Australia’s share of external financial assets, 1990-2002



Series 1: Australia’s share of external financial assets
 Series 2: Australia’s share of external financial liabilities

Further evidence of increased financial integration is provided in Figure 8 which shows that the ratio of portfolio equity holdings by foreigners to stock market capitalisation for Australia has gradually increased from 1991 to 2001.

Figure 8: Portfolio equity liabilities/domestic stock market capitalisation, 1991-2001



III. Empirical Specification of International Financial Integration

To complement the above graphical analysis of the trends in international financial integration, in this section we attempt to empirically identify the factors underlying the evolution of international financial integration over time and across countries. We begin by constructing a panel data set for 13 countries over 1990-2003. The basic panel specification is provided in equations 6 to 9 below;

$$\Delta(IFIG_{it}) = \alpha_i + \gamma * X_i + \beta * \Delta(Z_{it}) + \varepsilon_{it} \quad (6)$$

$$\Delta(GEQG_{it}) = \alpha_i + \gamma * X_i + \beta * \Delta(Z_{it}) + \varepsilon_{it} \quad (7)$$

$$\Delta(GEQSHARE_{it}) = \alpha_i + \gamma * X_i + \beta * \Delta(Z_{it}) + \varepsilon_{it} \quad (8)$$

$$\Delta(FELSTK_{it}) = \alpha_i + \gamma * X_i + \beta * \Delta(Z_{it}) + \varepsilon_{it} \quad (9)$$

where X_{it}, Z_{it} relate the growth in international financial integration to a set of country and time varying determinants. The study employs first differences data to take into account the nonstationarity of the levels of all the dependent variables along with some of the regressors.

In equation 9 the study incorporates a dependent variable suggested by Engel (2003) which accounts for the effect of foreign equity liabilities, the latter denoted by $FELSTK_{it}$ is taken as the ratio of stock market capitalisation.

The dependent variables for the various panel regressions are respectively, $IFIG_{it}, GEQG_{it}, GEQSHARE_{it}$ and $FELSTK_{it}$. The independent variables for the panel regressions are trade openness, defined as the ratio of the sum of exports and imports to GDP. There is a direct relation between trade and financial integration as discussed in the previous section. The log of GNI per capita allows for the systematic relationship between cross-border financial activity and level of development. We use financial depth and stock market capitalisation as measures of financial development. Financial depth is the ratio of currency plus demand and interest bearing liabilities of banks and non bank financial intermediaries to GDP. This ratio is in line to King and Levine (2003). Stock market capitalisation is the ratio of domestic stock market capitalisation to GDP. We also include capital account liberalization index (CAP), based on the Jacques Miniane (2004) capital account measures. Jacques Miniane has utilized the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and extended the IMF's post 1996 disaggregated capital account indices back to 1983 for a sample of 34 countries. The disaggregated indices are better than the pre-1996 single dummy in reflecting both global trends toward capital account liberalization and country specific liberalization that during the period. We include in the regression a measure of the average effective corporate income tax rate (TAX).⁶ A favourable tax system may encourage FDI flows and also encourage financial transactions between host and parent companies.

⁶ See Devereux, Lockwood, and Redoano (2002) and Devereux, Griffith, and Klemm (2002).

IV. Results

Table 1 shows the pool panel data analysis by taking the growth in international financial integration $IFIG_{it}$ as the dependent variable for the years 1990 to 2003. The first regressor trade openness defined as the sum of exports plus imports relative to GDP (Trade) is significant throughout. The overall explanatory power of 0.43 is encouraging; the average trade openness coefficient in the columns (1) to (5) is 3.50. This indicates that a 10 percentage point increase in the trade to GDP ratio increases $IFIG_{it}$ by 35 percent. The results here are in accordance with theoretical insights which posit a direct relationship between trade and financial integration. In columns (2) to (5), we introduce GNI per capita as a proxy for the systematic relationship between cross-boarder financial activity and the level of development, this variable shows a negative but not significant relationship. We add financial depth and stock market capitalisation variables to the set of regressors in columns (3) to (5), both variables are positive throughout. The stock market capitalisation variable is significant in the columns (3) and (5). Not surprising is the mechanical result arising from an increase in stock market capitalisation value and the value of foreign equity liabilities. We add a tax rate variable in the columns (4) and (5), this variable is not significant in explaining the variation in the level of international financial integration. Finally the capital control variable is added in the column (5) which turns out to be negative and insignificant.

Table 1: Panel Analysis of International Financial Integration $IFIG_{it}$, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	4.26 (10.47)***	4.26 (10.52)***	2.98 (5.88)***	2.97 (5.92)***	3.05 (5.99)***
Log GNI per capita		-1.34 (-1.39)	-1.20 (-1.36)	-1.29 (-1.47)	-1.17 (-1.29)
Financial Depth			0.17 (0.78)	0.20 (0.96)	0.15 (0.74)
Stock Market Capitalisation			0.20 (1.93)*	0.16 (1.58)	0.18 (1.72)*
Tax Rate				-0.35 (-1.64)	-0.34 (-1.57)
Capital Control					-0.11 (-1.04)
Adjusted R ²	0.43	0.44	0.27	0.28	0.29
Number of observations	182	182	156	156	156

Note: Fixed effect panel estimation. t-statistics in parentheses. Dependent variable is first difference of $IFIG$. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Countries : USA, UK, Japan, Germany, Canada, France, Italy, Switzerland, Sweden, Spain, New Zealand, Netherland, Australia.

Table 2 shows the pool panel data analysis for the cross border equity holdings measure, $GEQG_{it}$ as the dependent variable for the years 1990 to 2003. From these results we observe that trade openness is both a positive and highly significant variable in explaining cross border equity holdings with an overall explanatory power of 0.48 in the column. The average trade openness coefficient in the columns (1) to (5) is 1.57. This indicates that a 10 percentage point increase in the trade to GDP ratio increases $IFIG_{it}$ by 35 percentage. We introduce output per capita in the columns (2) to (5), his variable is marginally positive. Financial depth and stock market capitalisation variables are introduced in the columns (3) to (5). The former variable is just positive for the columns (4) and (5) while the stock market capitalisation variable is positive and highly significant throughout indicating a strong positive influence on cross border equity holdings for instance a 10 percentage point increase in stock market capitalisation is associated with a 2.4 percentage point increase in cross border equity holdings. The tax rate variable is negative and insignificant throughout while the capital control variable is again insignificant in column (5). Countries less open to trade, with shallow domestic financial markets have smaller international cross holdings.

Table 2: Panel Analysis of cross border equity holdings, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	2.12 (10.81)***	2.13 (10.65)***	1.19 (4.96)***	1.20 (4.99)***	1.22 (5.02)***
Log GNI per capita		0.10 (0.21)	0.04 (0.09)	0.03 (0.07)	0.004 (0.01)
Financial Depth			-0.005 (-0.06)	0.02 (0.19)	0.02 (0.24)
Stock Market Capitalisation			0.26 (5.56)***	0.24 (5.04)***	0.24 (5.06)***
Tax Rate				-0.12 (-1.28)	-0.12 (-1.29)
Capital control					0.03 (0.63)
Adjusted R ²	0.48	0.47	0.38	0.38	0.37
Number of observations	182	182	151	151	151

Note: Fixed effect panel estimation. t-statistics in parentheses. Dependent variable is first difference of $GEQGD$. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Countries : USA, UK, Japan, Germany, Canada, France, Italy, Swithzerland, Sweden, Spain, New Zealand, Netherland, Australia

Table 3 indicates the pool panel data analysis by taking the measure of cross border equity share in total external holdings, $GEQSHARE_{it}$ as the dependent variable, for the years 1995 to 2003. The results here are generally weaker than the than for the aggregate volume measure in the previous Tables 1 and 2 above. For example trade openness does not exert a significant influence on $GEQSHARE_{it}$. Introducing financial depth and stock market capitalisation

variables does not explain the overall change in cross border equity share in total external holdings. The tax variable introduced in the column (4) and (5) is negative and insignificant. Finally the capital control variable entered in column (5) is insignificant.

Table 3: Panel Analysis of Gross Equity Share, 1995-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	0.04 (0.76)	0.05 (1.03)	0.06 (1.23)	0.06 (1.17)	0.06 (1.12)
Log GNI per capita		0.48 (4.99)***	0.49 (5.14)***	0.49 (5.03)***	0.48 (4.9)***
Financial Depth			-0.014 (-0.71)	-0.013 (-0.65)	-0.016 (-0.79)
Stock Market Capitalisation			0.018 (1.94)	0.017 (1.83)	0.019 (1.93)
Tax Rate				-0.01 (-0.42)	-0.013 (-0.51)
Capital control					0.01 (0.75)
Adjusted R ²	0.32	0.52	0.57	0.56	0.55
Number of observations	117	117	94	94	94

Note: Fixed effect panel estimation. t-statistics in parentheses. Dependent variable is first difference of *GEQSHARE*. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Countries : USA, UK, Japan, Germany, Canada, France, Italy, Switzerland, Sweden, Spain, New Zealand, Netherland, Australia

Table 4 illustrates the panel data analysis by taking the ratio of foreign equity liabilities to stock market capitalisation denoted by $FELSTK_{it}$ as the dependent variable, for the years 1995 to 2003. Trade openness is positive and significant throughout. The average value of this variable is 1.85. A 10 percentage point increase in the trade openness increases $FELSTK_{it}$ by 18.5 percentage points, we introduce output per capita in the columns (2) to (5) where the variable is positive throughout with an average value is 0.68. Financial depth variable is introduced in the column (3) to (5) where the effect in explaining foreign equity liability growth is both positive and significant throughout. The overall explanatory power rises from 0.09 to 0.50, on introducing this variable. The average value of the variable is 0.28 indicating that a 10 percentage point increase in the financial depth increases the $FELSTK_{it}$ by 2.8 percentage. Finally introducing tax in columns (4) and (5) indicates positive but insignificant relationship with growth in foreign equity liabilities while the capital control variable in column (5) is also insignificant. Motivation for inclusion of the regression derives from Engel⁷ (2003) comment with respect to Lane and Milesi-Ferretti (2003) foreign equity liabilities as a fraction of total market capitalisation provides a measure of depth of equity markets.

⁷ Engel (2003) pp 117 ‘if we were building a model in which depth of equity markets were going to explain something about external holdings I would guess that the variable we would end up trying to explain is foreign equity holdings as a fraction of total market capitalization’

Table 4: Equity Liabilities as a share of Stock Market Capitalisation 1995-2003

	(1)	(2)	(3)	(4)	(5)
Trade	0.65	0.64	2.60	2.64	2.76
Openness	(3.2)**	(2.93)**	(8.09)***	(8.19)***	(8.61)***
Log GNI per capita		0.44 (1.63)	0.70 (1.13)	0.75 (1.18)	0.83 (1.23)
Financial Depth			0.28 (3.16)**	0.29 (3.23)***	0.26 (2.92)***
Tax Rate				0.04 (0.35)	0.04 (0.32)
Capital control					0.061 (0.86)
Adjusted R ²	0.09	0.09	0.50	0.51	0.52
Number of observati ons	113	113	91	91	91

Note: Fixed effect panel estimation. t-statistics in parentheses. Dependent variable is first difference of *STMKT*. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Countries: USA, UK, Japan, Germany, Canada, France, Italy, Switzerland, Sweden, Spain, New Zealand, Netherlands, Australia

Turning our attention to the application of the above estimated regressions at the aggregate multi country level to that at the individual country level namely Australia allows us to comment on how representative the results for a small open economy are compared to the results for the aggregate multi country case. Table 5 shows the regression results for our international financial integration proxy $IFIG_{it}$ on a range of explanatory variables similar to those in Table 1 above over the period 1990 to 2003. The trade openness variable is significant throughout while the overall explanatory power is 0.51. Output per capita variable is also significant while the financial depth and stock market capitalisation variables are also positive and significant throughout. The average value of financial depth is 4.68 implying that a 10 percentage point increase in financial depth is associated with 46 percentage point increase in international financial integration. Stock market capitalisation measure is also positive and significant. Finally the tax variable is negative and significant while the capital control variable is negative value and insignificant.

Table 6 shows the regression results of taking the cross border equity holdings measure $GEQG_{it}$ as the dependent variable for the years 1990 to 2003. Trade openness is positive and significant throughout columns (1) and (2). The overall explanatory power of the regression is 0.64. Output per capita variable is also significant. Finally both financial depth and stock market capitalisation variables are positive and significant throughout.

Table 5: OLS Regression of Australia's International Financial Integration, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	7.83 (3.84)**	6.34 (2.45)*	-1.54 (-2.24)*	-1.72 (-2.90)*	-1.84 (-3.22)*
Log GNI per capita		2.79 (0.93)	-2.57 (-3.88)**	-1.84 (-2.79)*	-0.88 (-0.93)
Financial Depth			5.14 (7.27)***	4.78 (7.65)***	4.12 (5.31)**
Stock Market Capitalisation			0.53 (2.84)*	0.44 (2.71)*	0.29 (1.55)
Tax Rate				-1.38 (-2.10)*	-2.14 (-2.53)*
Capital control					-2.56 (-1.34)
Adjusted R ²	0.51	0.51	0.9816	0.9866	0.9878

Note: t-statistics in parentheses. Dependent variable is *IFIGDP*. *, **, *** indicate statistical significance at 0.1, 0.05 and 0.01 confidence level, respectively.

Table 6: OLS Regression of Australia's International Equity Integration, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	4.53 (4.92)***	3.72 (3.23)**	0.18 (0.57)	0.16 (0.48)	0.08 (0.26)
Log GNI per capita		1.52 (1.15)	-0.89 (-2.92)*	-0.81 (-2.17)*	-0.22 (-0.41)
Financial Depth			1.68 (5.17)***	1.64 (4.63)***	1.23 (2.86)*
Stock Market Capitalisation			0.40 (4.67)**	0.39 (4.20)***	0.30 (2.83)*
Tax Rate				-0.14 (-0.39)	-0.61 (-1.31)
Capital control					-1.57 (-1.49)
Adjusted R ²	0.64	0.65	0.9859	0.9844	0.9865

Note: t-statistics in parentheses. Dependent variable is *GEQGD*. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Table 7 shows the results of ols regression for Australia, by taking the cross border equity holdings measure $GEQSHARE_{it}$, as the dependent variable for the years 1990 to 2003. We introduce Trade Openness as the first independent variable. Trade Openness is positive and significant throughout. The average value of Trade Openness is 0.99. A 10 percentage point increase in the Trade Openness is associated with 9.9 percentage point increase in

$GEQSHARE_{it}$. The overall explanatory power is 0.82 in the column (1). Output per capita is introduced in columns (2) to (5). This variable is positive throughout and significant in column (2). The average value of Output per capita is 0.31. A 10 percentage point increase in the Output per capita is associated with 3.1 percentage point increase in $GEQSHARE_{it}$. The explanatory power rises from 0.82 to 0.86 upon introducing this variable.

Financial Depth and Stock Market Capitalisation variables are introduced in columns (3) to (5). The Financial Depth variable is negative and insignificant throughout. The Stock Market Capitalisation is positive and significant throughout. The average value of Stock Market Capitalisation is 0.17. A 10 percentage point increase in Financial Depth is associated with 1.7 percentage point increase in $IFIGDP_{it}$. The overall explanatory power rises from 0.86 to 0.96, upon introducing these variables.

Tax Rate is introduced in columns (4) and (5). Tax Rate has negative value and it is insignificant. Capital Control is introduced in the column (5). This variable also has a negative value and it is insignificant.

Table 7: OLS Regression of Australia's Gross Equity Share, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	1.58 (7.66)***	1.27 (5.63)***	0.71 (4.78)***	0.71 (4.46)***	0.70 (4.09)**
Log GNI per capita		0.59 (2.27)**	0.20 (1.41)	0.20 (1.14)	0.28 (1.01)
Financial Depth			-0.20 (-1.31)	-0.20 (-1.19)	-0.26 (-1.12)
Stock Market Capitalisation			0.18 (4.57)***	0.18 (4.16)***	0.17 (2.99)*
Tax Rate				-0.004 (-0.02)	-0.07 (-0.28)
Capital control					-0.22 (-0.39)
Adjusted R ²	0.82	0.86	0.9684	0.9644	0.9602

Note: t-statistics in parentheses. Dependent variable is $GEQSHARE$. *, **, *** indicate statistical significance at 0.1, 0.05 and 0.01 confidence level, respectively.

Table 8 shows the results the regression results for Australia by taking the stock market capitalisation as share of equity liabilities as the dependent variable namely $FELSTK_{it}$ for the years 1990 to 2003. Trade openness is positive and significant as shown in columns (1) and (2). The overall explanatory power is poor at 0.28.

Table 8: OLS Regression of Stock Market Capitalisation as share of Equity Liabilities, 1990-2003

	(1)	(2)	(3)	(4)	(5)
Trade Openness	0.56 (21.45)***	0.68 (2.08)*	-0.39 (-1.05)	-0.48 (-1.4)	-0.56 (-1.63)
Log GNI per capita		-0.01 (-0.36)	-0.01 (-0.91)	0.07 (1.27)	0.27 (1.52)
Financial Depth			0.73 (3.69)***	0.52 (2.35)*	0.13 (0.33)
Tax Rate				-0.61 (-1.73)	-0.82 (-2.1)*
Capital control					-1.07 (-1.18)
Adjusted R ²	0.28	0.23	0.62	0.68	0.69

Note: t-statistics in parentheses. Dependent variable is *STMKT*. *,**,*** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

In summary at both the aggregate country level and the individual Australian level the above results indicate that variables such as trade openness, GNI per capita and stock market capitalization are reasonably successfully in explaining the variation over time in the degree of international financial integration.

V. Analysis Of Rates Of Returns

In this section we investigate the rates of returns on foreign assets and liabilities. First, we describe country wise rates of returns on external assets (liabilities) and portfolio equity share in external assets (liabilities). Second, we determine the linkage between the rates of returns and various market indices. 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. Third, we investigate whether foreign rates of return provide diversification against variation in domestic financial returns. Fourth, we examine the co movement between local and foreign real rates of return and real exchange rates.

For a country i , the real return (on foreign assets or liabilities) in domestic and in US currency are linked as

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

where, r_{it}^{US} is the real rate of return in US dollars.

r_{it} is the real rate of return in domestic currency.

rer is the bilateral CPI-based real exchange rate between the domestic currency and the US dollar.

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

The above equation illustrates that the returns in each investment category depends on some country component plus an idiosyncratic factor to the extent that the investment pattern deviates from overall market patterns. For example, the return from foreign portfolio equity assets will deviate from the return on global stock market index to the extent that a country pursues an idiosyncratic investment strategy for the foreign component of its portfolio.

$$r_{ijt}^{FA} = \alpha_i + \beta * r_{ikt}^M + v_{ijt}$$

The above equation indicates the co-movement between the rate of return on foreign assets and various financial returns. 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.

The equation below, illustrates the relations between domestic and dollar based ex post real returns and the real exchange rate.

$$r_{it}^{US} = r_{it} + drer_{it}$$

where $drer_{it}$ is the rate of real appreciation vis-à-vis the United 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 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.

V.I Data on Rates of Return

We use IMF balance of payments statistics data on interest earnings and payments on external holdings and data on international investment positions and on capital flows, to construct measures of yields and rates of return on external assets and liabilities. We then assess the degree to which these yields and returns can be explained by market rates of return. These market rates of return are constructed using information on the composition and geographical allocation of external assets and liabilities. The specification below follows that of Lane and Milesi-Ferretti 2003;

$$yc_t^X = \frac{IC_t^X}{XA_{t-1}}$$

$$yd_t^X = \frac{ID_t^X}{XL_{t-1}}$$

where yc_t^X is the yield on assets

yd_t^X is the yield on liabilities

IC_t^X is the income credit in US dollars for asset type X in year t .

ID_t^X is the income debit in US dollars for asset type X in year t .

XA is the country's stocks of external X -type assets

XL is the country's stocks of external X -type liabilities

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 :

$$kc_t^X = \frac{XA_t - XA_{t-1} - xa_t}{XA_{t-1}}$$

$$kd_t^X = \frac{XL_t - XL_{t-1} - xl_t}{XL_{t-1}}$$

The nominal rate of return on assets is,

$$ic_t^X = (1 + yc_t^X)(1 + kc_t^X) - 1$$

The nominal rate of return on liabilities is,

$$id_t^X = (1 + yd_t^X)(1 + kd_t^X) - 1$$

Real yields and real rates of return are obtained by deflating nominal US dollar returns by US 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.

V.II Empirical Specification

In previous work by Lane and Milesi-Ferretti (2002 a, 2002b and 2003) a number of stylized facts emerged relating to differences in rates of return across countries. In particular they found that rates of return on both assets and liabilities tended to be higher than own countries rates; second cross country differences in rates of return were substantial and finally some countries showed significant differences between rates of returns on external assets and liabilities. They illustrate the above by given the example of the US which according to their data was a debtor country since 1989 but its investment income position turned negative only in 1998.

Below we attempt to explain the behaviour of rates of return on foreign assets and liabilities for our chosen group of countries based on IMF balance of payment statistics. As discussed by Lane and Milesi-Ferretti 2003 some serious measurements errors arise with data derived from balance of payments derived yields and returns. These problems are discussed when we examine the results from estimating the empirical model below. The model below is similar to Lane and Milesi-Ferretti 2003 specification where the rate of return on a category of international investment position r_{ijt}^{BOP} as calculated from the BOP data and r_{ijt}^M is the estimated rate of return on some market portfolio eg MSCI.

$$r_{ijt}^{BOP} = \alpha_i + \gamma * r_{ijt}^M + \varepsilon_{ijt}$$

where α_i is country fixed effect r_{ijt}^{BOP} is the rate of return i.e. real rate of return on portfolio equity assets, portfolio equity liabilities, real yield on assets, real yield on liabilities, as calculated from the balance of payments data r_{ijt}^M is an estimated rate of return on some

observable market portfolio i.e. MSCI world stock return index, bond returns on ten year government bonds, domestic stock returns, domestic bond returns, long-term and short term interest rates based on OECD data.

Following Lane and Milesi-Ferretti 2003 we also investigate whether the returns on foreign assets provide diversification against variation in domestic financial returns by employing the following specification;

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

where $r_{ijt}^{BOP,FA}$ is the rate of return on foreign assets, as calculated from the balance of payments data and r_{ijt}^M is the return on some category of foreign liabilities. In order to address the relation between rates of return and real exchange rate movements in particular since the co-variation between real returns in home currency and foreign currency depends on their correlations with real exchange rate fluctuations. We report these correlations as;

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

V.III Results

Figures 9 and 10 plot the average returns and the share of equity in the external portfolio over 1987 to 2003 for our cross section of countries. The figures show a strongly positive relation between the equity share and the average return i.e. a larger equity share is associated with a higher return.

Figure 9: Rate of Return on Foreign Assets and Equity Share (average, 1990-2003)

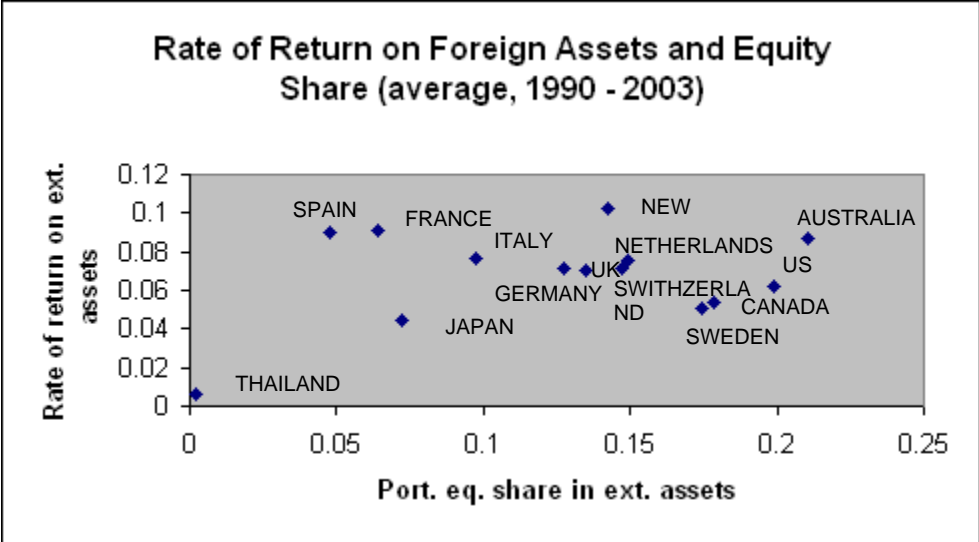
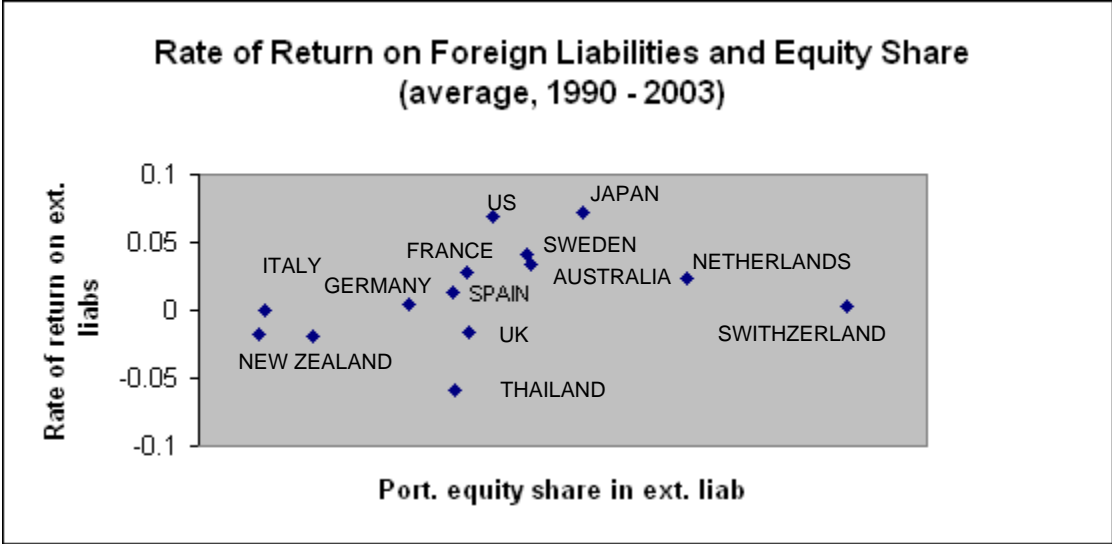
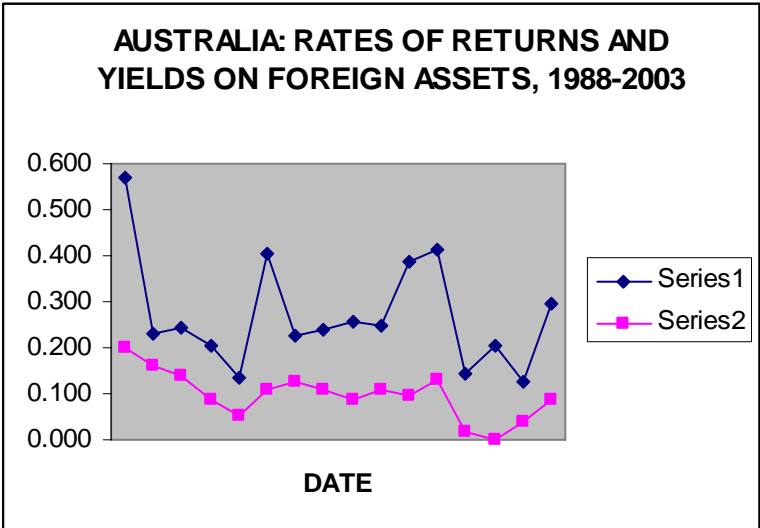


Figure 10: Rate of Return on Foreign Liabilities and Equity Share (average, 1990-2003)



Figures 11 and 12 show that returns are more variable than yields for both foreign assets and liabilities in the case of Australia. Similar results are found for United States (Lane and Milesi Ferretti, 2003)

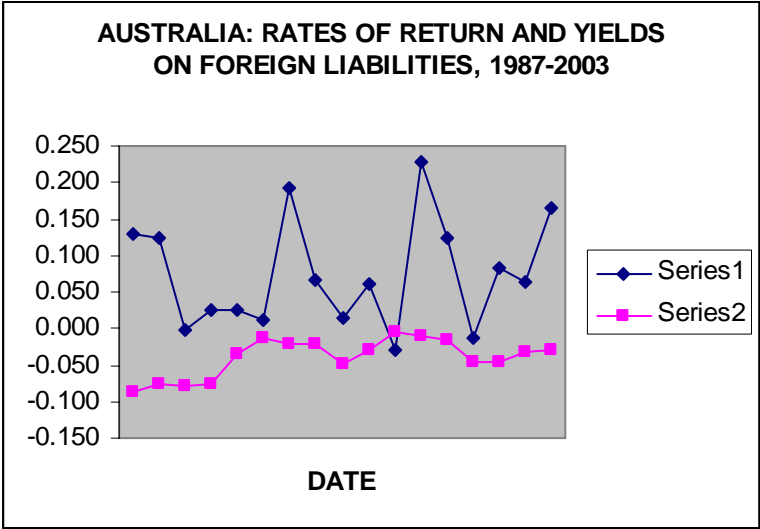
Figure 11: Rates of Returns and Yields on Australia’s Foreign Assets, 1988-2003



Series 1: Return on foreign assets

Series 2: Yield on foreign assets

Figure 12: Rates of Returns and Yields on Australia’s Foreign Liabilities, 1987-2003



Series 1: Return on foreign assets

Series 2: Yield on foreign assets

Table 5 illustrates the fixed effect panel regression for rates of return on foreign assets and market returns over the years 1990 to 2003. Column (1) indicates that real return on portfolio equity is the dependent variable and rate of return on stocks is the independent variable. The stock return variable has positive value of 0.78. The explanatory power is 0.52 as shown in column (1). A 10 percentage point increase in the stock returns is associated with 7.8 percentage point increase in real return of portfolio equity. This indicates that foreign investors may hold equity baskets in a given country that differ in composition from the country’s broad market index.

In the column (2), the dependent variable is real return on debt assets and the independent variable is bond yield. The bond yield has a positive value of 0.21. The explanatory power is 0.56 as shown in column (2). A 10 percentage point increase in the bond yield is associated with 2.1 percentage point increase in real return of debt assets.

The dependent variable in column (3) is real yield on debt assets and the independent variable is bond yield. The bond yield has a positive value of 0.11 and it is significant. The explanatory power is 0.11 as shown in column (3). A 10 percentage point increase in the bond yield is associated with 1.1 percentage point increase in real yield on debt assets.

Table 5: Rates of Return on Foreign Assets and Market Returns, 1990-2003

	Real Return Portfolio Equity (1)	Real Return Debt (2)	Real Yield Debt (3)
Stock Return	0.78 (1.58)		
Bond Yield		0.21 (0.96)	0.11*** (4.23)
Adjusted R ²	0.52	0.56	0.12
Number of observations	183	106	125

Note: Fixed effect panel estimation. t-statistics in parentheses. *, **, *** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Table 6 illustrates the fixed effect panel regression for rates of return on foreign liabilities and market returns over the years 1990 to 2003. Column (1) indicates that real return on portfolio equity is the dependent variable and rate of return on stocks is the independent variable. The stock return variable has positive value of 0.09 and it is significant. The explanatory power is 0.51 as shown in column (1). A 10 percentage point increase in the stock returns is associated with 0.9 percentage point increase in real return of portfolio equity.

In the column (2), the dependent variable is real return on debt liabilities and the independent variable is bond yield. The bond yield has a positive value of 0.82. The explanatory power is 0.75 as shown in column (2). A 10 percentage point increase in the bond yield is associated with 7.5 percentage point increase in real return of debt liabilities.

The dependent variable in column (3) is real yield on debt liabilities and the independent variable is bond yield. The bond yield has a positive value of 1.49 and it is significant. The explanatory power is 0.84 as shown in column (3). A 10 percentage point increase in the bond yield is associated with 8.4 percentage point increase in real yield on debt liabilities.

Table 6: Rates of Return on Foreign Liabilities and Market Returns, 1990-2003

	Real Return Portfolio Equity	Real Return Debt	Real Yield Debt
Stock Return	0.09 (1.94)*		
Bond Yield		0.82*** (3.54)	1.49*** (4.78)
Adjusted R ²	0.51	0.75	0.84
Number of observations	189	107	120

Note: Fixed effect panel estimation. t-statistics in parentheses. *,**,*** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Table 7 illustrates the fixed effect panel regression for rates of return on foreign aggregate and market returns over the years 1990 to 2003. In Column (1), the real return on foreign aggregate asset is the dependent variable and rate of return on stocks is the independent variable. The stock return variable has positive value of 11.39 and it is significant. The explanatory power is 0.53 as shown in column (1). This indicates that holding foreign assets provides diversification against fluctuations in the local stock market.

In the column (2), the dependent variable is real return on foreign aggregate asset and the independent variable is bond yield. The bond yield has a positive value of 0.96. The explanatory power is 0.63 as shown in column (2). This indicates that holding foreign assets provides diversification against fluctuations in the local bond market.

The dependent variable in column (3) is real return on foreign portfolio equity asset and the independent variable is stock return. The stock return has a positive value of 1.18 and it is significant. The explanatory power is 0.53 as shown in column (3). This indicates that foreign investors may hold equity baskets in a given country that differ in composition from the country's stock market.

In the column (4), the dependent variable is real return on foreign portfolio equity asset and the independent variable is bond yield. The bond yield has a negative value of 0.45 and it is significant. The explanatory power is 0.73 as shown in column (4). This indicates that foreign portfolio equity assets and domestic bond yield are negatively associated with each other.

Table7: Foreign Assets and Market Returns, 1990-2003

	Real Return Foreign Asset	Real Return Foreign Asset	Real Return Portfolio Equity Asset	Real Return Portfolio Equity Asset
Stock Return	11.39 (2.19)**		1.18 (2.84)***	
Bond Yield		0.96 (1.25)		-0.45*** (-8.24)
Adjusted R ²	0.53	0.63	0.53	0.73
Number of observations	189	135	156	156

Note: Fixed effect panel estimation. t-statistics in parentheses. *,**,*** indicate statistical significance at 0.01, 0.05 and 0.1 confidence level, respectively.

Table 8 indicates the relation between domestic and foreign currency ex post real returns and exchange rates. Column (1) indicates the correlations between domestic and foreign currency real returns on aggregate foreign assets. The mean correlation is positive – an increase in the local currency real return is associated with an increase in the dollar real return. In column (2), the mean correlation is negative, which implies that domestic real returns are lower

during periods of real appreciation. This may happen due to the influence of several external factors. Column (3) shows a marginal negative correlation between dollar real returns on foreign assets and the real exchange rate, suggesting that there is minor influence of domestic factors on some of the returns on foreign assets. Column (4) indicates a positive correlation between domestic and dollar real returns on foreign liabilities. In column (5), the mean correlation is negative, which implies that domestic real returns are lower during periods of real appreciation. Column (6) shows a marginal negative correlation between dollar real returns on foreign liabilities and the real exchange rate, suggesting that there is minor influence of domestic factors on some of the returns on foreign liabilities.

Table 8: Rates of Return and Real Exchange Rates

	Assets	Assets	Assets	Liabilities	Liabilities	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	0.55	-0.27	-0.05	0.59	-0.09	0.07
France	0.18	0.22	0.001	0.04	0.27	0.05
Germany	0.20	0.09	-0.20	0.42	0.06	-0.19
Italy	0.23	0.33	0.07	0.30	0.25	-0.14
Canada	0.69	-0.59	-0.18	0.30	-0.47	0.20
Japan	0.20	0.50	0.24	0.54	0.65	0.31
Netherland	0.14	-0.02	-0.11	0.35	0.16	0.22
NewZealand	0.92	0.10	0.23	0.76	0.34	0.45
Spain	0.28	0.14	-0.13	0.06	0.14	-0.25
Sweden	0.97	-0.98	-0.95	0.97	-0.98	-0.96
Switzerland	0.18	-0.39	0.33	0.59	-0.30	0.23
UK	0.64	-0.59	-0.11	0.73	-0.60	-0.26
Mean	0.43	-0.12	-0.07	0.47	-0.05	-0.02

Note: r_t, r_t^{US} are real returns on foreign holdings in domestic currency and in US dollars respectively, $drer_t$ is the percentage change in bilateral end of period exchange rate vis-à-vis the United States. Correlations calculated over the period 1990 to 2003 or shorter. Correlations calculated over the period 1992 to 2003 for Germany, 1995 to 2003 for Japan, 1990 to 2002 for Sweden, 1994 to 2003 for Switzerland and 1990 to 2003 for the remaining countries.

This section provides an initial investigation into rates of return and yields for our chosen group of countries. Overall the results indicate that market indices co-vary with these returns however for several asset categories there are significant unexplained differences. Finally international cross holdings provide diversification against fluctuations in domestic market returns. The dynamics of real exchange rates imply that the properties of real returns are different for home and foreign investors.

VI. Conclusions

This paper provides some insights into the empirical features of the growth in international cross holdings of foreign assets and liabilities. The results show that the growth in goods trade

and stock market capitalisation are the main determinants of the growth in the scale of international balance sheets. Trade openness is a significant explanatory variable in determining the movement in all our dependent variables; international financial integration, cross border equity holdings as a share of external holdings and foreign liability holdings as a ratio of stock market capitalisation. Taxes and capital controls do not appear as significant variables in explaining movements in our dependent variables. Foreign assets and liabilities as a ratio of GDP is strongly correlated with stock market capitalisation,

The analysis of the properties of the rates of return on foreign assets and liabilities suggest that international cross holdings provide diversification opportunities against fluctuations in domestic market returns. Importantly our data supports Lane and Milesi-Ferreti (2003) finding that the 'one world interest rate' common modelling assumption is not supported by the data as there appears to be as many rates of return as there are asset classes varying over time.

REFERENCES

- Adam, Klaus, Tullio Japelli, Annamaria Menichini, Mario Padula, and Marco Pagano, 2002, "Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union" (unpublished; University of Salerno) Salerno, Italy.
- Baro, Robert and Xavier Sala-i-Martin, 1991, "World Real Interest Rates," *NBER Macroeconomics Annual 1990* (Cambridge, MA: MIT Press).
- Beck, Thorsten, Asli Demirguc-Kunt, and Ross Levine, 1999, "A New Database on Financial Development and Structure (unpublished, Washington: World Bank).
- Beck, Thorsten, Ross Levine and Norman Loayza, 2000, "Finance and Sources of Growth," *Journal of Financial Economics*, Vol. 58, No. 1-2, pp. 261-300.
- Bekaert, Geert and Campbell Harvey, 2000, "Foreign speculators and emerging equity markets," *Journal of Finance*, Vol.55 (2), 565-613 (April).
- Bekaert, Geert Campbell Harvey and Christian Lundblad, 2001, "Does Financial Liberalization Spur Growth?" NBER Working Paper No. 8245 (Cambridge, Mass: NBER).
- Bhattacharya, Utpal and Hazem Daouk, 2002, "The World Price of Insider Trading," *Journal of Finance* LVII, February, pp. 75-108.
- Bond, Marianne, 1977, "A Model of International Investment Income Flows," *IMF Staff Papers*, Vol. 23, pp. 344-379.
- Charles, Engel (2003), "Comment on "International Financial Integration," IMF Staff Papers, Vol. 50, Special Issue.
- Devereux, Michael B., and Philip R. Lane, 2003, "Understanding Bilateral Exchange Rate Volatility," *Journal of International Economics*, Vol. 60, pp 100-132.
- Devereux, Michael P., Rachel Griffiths, and Alexander Klemm, 2002, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, Vol. 35 (October), pp. 451-95.
- Devereux, Michael P., Ben Lockwood, and Michela Redoano, 2002, "Do Countries Compete Over Corporate Tax Rates?" CEPR Discussion Paper No. 3400 (London: CEPR).
- Edison, Hali, Ross Levine, Luca A. Ricci, and Torsten M. Slok, 2002, "International Financial Integration and Economic Growth," *Journal of International Money and Finance*, Vol. 21, No. 6, pp. 749-76.

Eisner, Robert, and Paul J. Pieper, 1991, "Real Foreign Investment in Perspective," *Annals of the American Academy of Political and Social Sciences*, Vol. 516 (July), pp. 22-35.

Grilli, V. (1990). Financial Markets. *Economic Policy* 8, 387-421.

Henry, Peter Blair, 2000, "Stock Market Liberalization, Economic Reform, and Emerging Market Equity Prices," *Journal of Finance*, Vol. 55, pp. 529-64.

Honohan, Patrick, and Philip R. Lane, 2000, "Where Do the Irish Invest," *Irish Banking Review*, Autumn, pp. 12-23.

Hummels, David, Joshi Ishii, and Kei-Mu Yi, 2001, "The Nature and Growth of Vertical Specialization in World Trade," *Journal of International Economics*, Vol. 54, pp. 75-96.

International Monetary Fund, 1993, *Balance of Payments Manual*, Vol. 5 (Washington: International Monetary Fund).

International Monetary Fund (2000a), Results of the 1997 Comprehensive Portfolio Investment Survey, (Washington, DC: International Monetary Fund).

International Monetary Fund (2000b), International Financial Statistics, April,(Washington, DC: International Monetary Fund).

International Monetary Fund, *Balance of Payments Statistics* (Washington: International Monetary Fund).

Jacques Miniane (2004), "A New Set of Measures on Capital Account Restrictions," IMF Staff Papers, vol. 51, n.2

Klein, and Giovanni Olivei, 2000, " Capital Account Liberalization, Financial Depth, and Economic Growth" (unpublished).

Kraay, Aart, Norman Loayza, Luis Servén, and Jaume Ventura, 2000, " Country Portfolios," NBER Working Paper No. 7795.

Lane, Philip R. (2000 b), "International Investment Positions: A Cross Sectional Analysis", *Journal of International Money and Finance* 19, August, 513-534.

Lane, Philip R. (2001), "Do International Investment Income Flows Smooth Income?," *Weltwirtschaftliches Archiv*, Vol. 55, pp. 263-294.

Lane, Philip R. and Gian Maria Milesi-Ferreti, 2001a, "The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Nations," *Journal of International Economics*, Vol. 55, pp. 263-294.

Lane, Philip R. and Gian Maria Milesi-Ferreti, 2001b, "External Capital Structure: Theory and Evidence," in *The World's New Financial Landscape: Challenges for Economic Policy*, ed. By Horst Siebert (Berlin/Heidelberg: Springer – Verlag).

Lane, Philip R. and Gian Maria Milesi-Ferreti, 2002a, "Long Term Capital Movements," in *NBER Macroeconomics Annual 2001*, ed. By B. Bernanke and K. Rogoff (Cambridge, MA: MIT Press).

Lane, Philip R. and Gian Maria Milesi-Ferreti, 2002b, "External Wealth, The Trade Balance, and The Real Exchange Rate," *European Economic Review*, Vol. 46, pp. 1049-71.

Lane, Philip R. and Gian Maria Milesi-Ferreti (2003), "International Financial Integration", *International Monetary Fund Staff Papers* 50(S), 82-113.

Martin, Phillippe, and Helene Rey, 2000, "Financial Integration and Asset Returns," *European Economic Review*, Vol. 44, pp. 1327-50.

Martin, Phillippe, and Helene Rey, 2001, "Financial Supermarkets: Size Matters for Asset Trade," NBER Working Paper 8476 (September).

Obstfeld, Maurice, and Kenneth Rogoff, 1996, *Foundations of International Macroeconomics* (Cambridge, MA: MIT Press).

Obstfeld, Maurice, and Kenneth Rogoff, 2001, "The Six Major Puzzles in International Macroeconomics: Is there a Common Cause?" in *NBER Macroeconomics Annual 2000*, ed. By B. Bernanke and K. Rogoff (Cambridge, MA: MIT Press).

O' Donnell, Barry, 2002, *International Financial Integration and Economic Performance*, PhD Dissertation, Trinity College Dublin.

Obstfeld, Maurice, and Alan M. Taylor, 2002, "Globalization and Capital Markets," *NBER Working Paper No. 8846 (March)*.

Portes, R. and H. Rey (2000). *The Determinants of Cross Border Equity Flows: the Geography of Information*. Mimeo. Princeton University.

Pratten, Cliff, 1992, *Overseas Investments, Capital Gains and The Balance of Payments*, Research Monograph no. 48 (London, UK: Institute for International Affairs).

Sorensen, Bent E. and Oved Yosha, 1998, "International Risk Sharing and European Monetary Unification," *Journal of International Economics* 45, 211-238.

Sorensen, Bent E., Oved Yosha, and Yi-Tsung Wu, 2002, "Home Bias and International Risk Sharing: Twins Separated at Birth" (unpublished, Tel Aviv University).

World Bank (1999), *World Development Indicators 1999*, CD-ROM, (Washington DC: The World Bank).

World Bank (2003), *World Development Indicators 2003*, CD-ROM, (Washington DC: The World Bank).

Yi, Kei-Mu, 2003, "Can Vertical Specialization Explain the Growth of World Trade?" *Journal of Political Economy*, Vol. 111, pp. 52-102.

DATA SOURCES

$IFIG_{it}$: Sum of total foreign assets and liabilities as a ratio of GDP. Source: International Monetary Fund's International Financial Statistics

$GEQG$: Sum of FDI and portfolio equity as a ratio of GDP. Source: International Monetary Fund's International Financial Statistics

Capital Control: Jacques Miniane (2004), "A New Set of Measures on Capital Account Restrictions," IMF Staff Papers, vol. 51, n.2

Trade Openness: Ratio of exports plus imports of goods and services to GDP. Source: International Monetary Fund's International Financial Statistics

GNI per capita: Measured in constant US dollars. Source: World Bank's World Development Indicators

Stock Market Capitalisation: Ratio of stock market capitalisation to GDP. Source: World Stock Exchanges FIBV database

Tax Rate: Source: Devereux, M.P. and R. Griffith (2003)

Yield on External Assets and Liabilities: Source: Calculated from International Monetary Fund's International Financial Statistics

Capital Gains on External Assets/Liabilities: Source: Calculated from International Monetary Fund's International Financial Statistics

Real Exchange Rate: Ratio of domestic CPI, expressed in US dollars to the United States CPI. Source: International Monetary Fund's International Financial Statistics

Domestic Stock Market Returns: Source: Calculated from Morgan Stanley Capital International, Datastream

Domestic Bond Return: Source: International Monetary Fund's International Financial Statistics

Financial Depth: Ratio of Liquidity to GDP. Source: International Monetary Fund's International Financial Statistics

