

International Investment Patterns: Evidence Using A New Dataset

Anil V. Mishra*

*Department of Finance and Banking, University of Southern Queensland, 17/5
Spencer House, Uni Plaza Court, Toowoomba, QLD 4350, Australia*

Abstract

This paper examines the bilateral, source and host factors driving portfolio equity investment across a set of countries using International Monetary Fund's new dataset on international equity holdings at the end of 1997, 2001 and 2002.

This paper finds that the bilateral equity investment is strongly correlated with the underlying patterns of trade in goods and services. The information asymmetries and cultural-institutional proximity are important for bilateral equity investment. The size of domestic stock market is the key correlate of aggregate foreign portfolio equity asset and liability holdings. The scale of aggregate foreign equity asset holdings is larger for richer countries.

JEL Classification: F21, F34

Keywords: International portfolio equity investment, source and host country factors, trade

* E-mail: anil.mishra@usq.edu.au

1. Introduction

International parity relations suggest that in a fully-integrated global economy without frictions in product or asset markets, the investors should hold identical portfolios, regardless of nationality. However, it is observed that, in the international equity investment patterns, there is a strong bilateral variation in portfolio allocations. The study of asymmetries in the portfolio allocations raises several questions. For instance, which bilateral factors are responsible for explaining the overall size of countries' portfolio investment holdings? Are cultural, informational factors important in explaining the asymmetries in portfolio allocations? How do financial frictions in markets affect the structure of international portfolio allocations? What is the connection between domestic and international financial development? The answers to these questions are important to several fields in economics including international macroeconomics and international finance, portfolio analysis, behavioural finance etc. This paper focuses on identifying the bilateral factors that explain the asymmetries in portfolio allocations.

There is a voluminous literature that tries to explain the international patterns of bilateral investment. Investments may be broadly classified as direct investment, portfolio investment, financial derivatives, reserve assets and other investment. According to Balance of Payments Manual 5 (BPM5), direct investor has ownership of a minimum of 10 percent of the ordinary shares or voting power or the equivalent in the direct investment enterprise. Wei (2000) and Stein and Daude (2003), among others focus on the geography of foreign direct investment. These studies have used the readily available, Organization for Economic Cooperation and Development (OECD) database for foreign direct investment.

Buch (2002,2003); Buch et al (2003); and Kawai and Liu (2001) study the bank lending by employing the readily available BIS database. Ghosh and Wolf (2001) and Sarisoy (2003) study the comparative analysis of the impact of spatial factors on different international investment categories. Portes, Rey and Oh (2001) investigate the roles of explicit informational variables and distance in explaining cross border trade in corporate equities, corporate bonds and government bonds; for the United States.

These studies have used the OECD and BIS database on direct investment and bank lending, respectively. BIS data measure the gross claims and liabilities of all banks located in a reporting country vis-à-vis entities located in other countries. In addition, BIS data also measures the foreign claims of the banks' head office and all its branches and subsidiaries on a worldwide consolidated basis, excluding positions between offices of the same group. OECD data measures international direct investment to and from the OECD area. This paper employs a new IMF's CPIS dataset on portfolio equity investment. CPIS collects information on the stock of cross border holdings of equities, long and short term debt securities valued at market prices prevailing at the time of the CPIS, and broken down by the economy of residence of the issuer. CPIS data focuses on bilateral equity holdings as against BIS dataset which does not differentiate between equities, bonds and cross-border bank lending. This is important because informational costs differ for different types of assets (Portes et al, 2001). This paper also employs International Investment Position (IIP) data. IIP is the balance sheet of the stock of external assets and liabilities of an economy. IIP data focuses on countries' external assets and liabilities as against OECD dataset which focuses only on OECD countries' international direct investment.

Some authors have focussed specifically on the pattern of bilateral equity investment. Portes and Rey (2005) use panel data set on bilateral gross cross-border equity flows among 14 countries, for the period from 1989 to 1996. They show that gross transaction flows depend on market size and trading costs. The geography of information is the main determinant of the pattern of international transactions. Some studies on the geography of the stock of portfolio equity investment have focussed on a single source country. Studies by Ahearne et al (2003), Mane and Meade (2002); Dahlquist et al (2003) have focussed on United States. Coval and Moskowitz (1999) and Huberman (2001) have studied the regional investment patterns within the United States. Honohan and Lane (2000) have focussed their research on Ireland. However, the papers by Yildirim (2003) and Lane and Milesi-Ferretti (2004) are exceptions. Yildirim (2003) has examined the role of various corporate governance indicators in determining investment patterns, by employing 2001 Coordinated Portfolio Investment Survey (CPIS) data (23 source countries, 49 host countries). Lane and Milesi-Ferretti (2004) have analysed the bilateral, source and host factors driving portfolio equity investment across countries (50 sources and 172 host countries), using 2001 CPIS data.

This paper adds value to the existing literature on both the theoretical and empirical front. On the theoretical front, this paper extends Fisher's (1930) model to the N country generalized, Obstfeld and Rogoff's (2001) model and includes the informational and financial frictions similar to those employed by Lane and Milesi-Ferretti (2004) and Portes and Rey (2005). The model links bilateral equity holdings to bilateral trade in goods and services after allowing for informational and financial frictions. On the empirical front, this paper employs a new dataset on international portfolio equity investments. This dataset provides a geographical breakdown of

international portfolio holdings at end – 1997, 2001 and 2002 and includes virtually all major international investors' economies. The empirical analysis focuses on the roles played by financial and informational frictions in explaining countries' equity investment patterns and also highlights the role of aggregate country characteristics in explaining the overall size of countries' foreign equity asset and liability positions. This paper analyses the portfolio equity international investment patterns both in the international and the Australian context.

The structure of this paper is as follows. Section II describes a theoretical framework, Section III the empirical strategy, Section IV the data, Section V the empirical analysis and results and Section VI the conclusions and directions for future research.

2. Theoretical framework

Davis, Nalewaik, and Willen (2001), Martin and Rey (2000, 2004); Obstfeld and Rogoff (2001); and Ahearne, Alan B., William Grier and Frank Warnock (2004); have developed approaches to model bilateral equity investment positions.

Ahearne et. al (2004) test home bias in equity holdings using cross-border holdings data and quantitative measures of barriers to international investment in United States. The authors regress the degree of US investors home bias against each country, on a vector of explanatory variables that includes direct and indirect barriers to international investment and control variables such as trade links and historical risk adjusted returns.

Martin and Rey (2004) investigate the impact of financial integration on asset return, risk diversification and breadth of financial markets. They analyse a three country macro economic model in which the number of financial assets is endogenous; assets are imperfect substitutes; cross border asset trade entails some transaction costs and investment technology is indivisible. They study the impact of financial integration in a subset of two of these countries. In this case, lower transaction costs between two financial markets translate into higher demand for assets issued on those markets, higher asset price and larger diversification. For the third country left outside the integrated area, the welfare impact is ambiguous i.e. it enjoys better risk diversification but faces an adverse movement in its financial terms of trade. The authors find that the financial integration benefits the largest economy of the integrated area, when they endogenise financial market location. Financial integration leads to relocation of markets in the smallest economy, only when transaction costs become very small.

Martin and Rey (2003) model generates a bilateral equation for equity positions as a function of the cost of bilateral financial trade and the endogenously determined market capitalization levels. The authors interpret financial frictions to include informational asymmetries. Their model assumes incomplete asset markets, iceberg costs in financial markets and endogenous asset creation. They show that larger country will benefit from higher asset prices, more financial assets and more diversification per capita than the smaller country. Financial integration leads to an increase in asset prices and imperfect competition structure also leads to a new source of home bias in equity holdings.

Davis, Nalewaik and Willen (2001) have developed dynamic analysis of international trade in risky financial assets under incomplete markets. They construct optimal portfolio positions, compute the benefits of expanded portfolio menus, express the equity premium puzzle in welfare terms and quantify the gains to international trade in risky financial assets. In their model, domestic financial instruments consist of a riskless and a risky asset. The ability of a domestic agent to diversify risk at home depends on the correlation between labour income and the return on the risky asset. The degree to which the availability of an international equity fund improves risk allocation depends on its correlation with domestic labour income and its correlation with the domestic risky asset. In the model, the gains to international financial trade in risky assets depends on these correlations.

In a two country model, Obstfeld and Rogoff (2001) show that the existence of trading costs in the goods market generates a home bias in equity positions, even if global financial markets are complete. These authors also indicate that heterogeneity in consumption preferences is an additional potential source of variation in bilateral investment patterns. This model is the extension of the N-country generalization of the Obstfeld and Rogoff (2001) model and it incorporates the financial frictions similar to those employed by Lane and Milesi-Ferretti (2004).

2.1. Model

This paper considers Irving Fisher's (1930) two period microeconomic model of saving, for the case of a small open economy that consumes a single good and lasts for two periods (1 and 2).

An individual i maximizes lifetime utility, U_1^i . The utility U_1^i depends on period consumption levels, c^i :

$$U_1^i = u(c_1^i) + \beta u(c_2^i), \quad 0 < \beta < 1. \quad (1)$$

where, β is a fixed preference parameter, (subjective discount or time-preference factor), that measures the individual's impatience to consume.

We assume that the period utility function $u(c_1^i)$ is strictly increasing in consumption and strictly concave: $u'(c^i) > 0$ and $u''(c^i) < 0$.

We assume that there are $s = 1, 2, \dots, S$ possible date 2 states of nature. We can write lifetime utility as

$$U_1 = u(C_1) + \beta u\{\Omega[C_2(1), \dots, C_2(S); \pi(1), \dots, \pi(S)]\}, \quad (2)$$

where the consumption index $\{\Omega[C_2(1), \dots, C_2(S); \pi(1), \dots, \pi(S)]\}$ is homogenous of degree 1 in $C_2(1), \dots, C_2(S)$.

We take $\{\Omega[C_2(1), \dots, C_2(S); \pi(1), \dots, \pi(S)]\}$ to be the constant elasticity of substitution (CES) function,

$$\left[\nu^{\frac{1}{\theta}} C_T^{\frac{\theta-1}{\theta}} + (1-\nu)^{\frac{1}{\theta}} C_N^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}}, \quad \nu \in (0,1), \theta > 0, \quad (3)$$

where, C_T, C_N denote consumption of tradable and non-tradable goods respectively.

θ is the intratemporal substitution elasticity between tradable and non-tradable goods.

$\nu, 1-\nu$ are the weights of the prices of tradable and non-tradable goods.

The *constant relative risk aversion* (CRRA) class of utility functions is given by

$$u(C) = \frac{C^{1-\rho}}{1-\rho} \quad (\rho > 0, \rho \neq 1) \quad (4)$$

$$u(C) = \log(C) \quad (\rho = 1) \quad (5)$$

where, ρ is the coefficient of relative risk aversion. These equations fit the iso-elastic

class if σ , the intertemporal substitution of elasticity, equals $\frac{1}{\rho}$.

Replace the intratemporal substitution elasticity θ in equation (3) by $\frac{1}{\rho}$.

$$\{\Omega[C_2(1), \dots, C_2(S); \pi(1), \dots, \pi(S)]\} = \left[\sum_{s=1}^S \pi(s) C_2(s)^{1-\rho} \right]^{\frac{1}{1-\rho}} \quad (6)$$

$u(C)$ (in equation (1) is iso-elastic), alongwith the equation (4), leads to an intertemporal utility function that generalizes both isoelastic and CRRA utility by

allowing σ , to differ from $\frac{1}{\rho}$.

$$U_1 = \frac{C_1^{1-\frac{1}{\sigma}}}{1-\frac{1}{\sigma}} + \beta \frac{\left\{ \left[\sum_{s=1}^S \pi(s) C_2(s)^{1-\rho} \right]^{\frac{1}{1-\rho}} \right\}^{1-\frac{1}{\sigma}}}{1-\frac{1}{\sigma}}. \quad (7)$$

When $\sigma = \frac{1}{\rho}$, the equation (5) reduces to the expected life time utility,

$$U_1 = \frac{C_1^{1-\rho}}{1-\rho} + \beta \sum_{s=1}^S \pi(s) \frac{C_2(s)^{1-\rho}}{1-\rho}. \quad (8)$$

There are inherent uncertainties, that underlie the consumption decisions. Therefore, we consider a stochastic model wherein we make assumption that individuals have rational expectations. A rational expectation is a mathematical conditional expectation based on an accurate model of the economy's structure and on all the information about current economic variables that the individual has available.

In stochastic models, individuals can only choose contingency plans for future consumption, rather than definite future consumption levels. Future consumptions are therefore random variables. We assume that the representative individual, faced with this uncertainty, maximizes the expected value of lifetime utility,

$$U_1 = E_t \left\{ \frac{C_1}{1-\rho} + \beta \sum_{s=1}^S \pi(s) \frac{C_2(s)^{1-\rho}}{1-\rho} \right\} \quad (9)$$

The operator $E_t \{ \cdot \}$ is a mathematical conditional expectation i.e. a probability weighted average of possible outcomes, in which probabilities are conditioned on all information available to the decision maker up to and including date t .

For one period, equation (7) reduces to,

$$U_1 = E_t \frac{C_1}{1-\rho} \quad (10)$$

In an N country generalization of Obstfeld and Rogoff (2001), the share of country i 's equity that is held by country j is a decreasing function of the bilateral trading cost between i and j , relative to the average trading costs between country i and all other countries; and an increasing function of the relative importance of good i in country's j 's consumption preferences.

There are N countries and there is symmetric joint distribution across (Y_1, \dots, Y_N) .

There is a complete set of Arrow Debreu securities¹. We consider a one period portfolio problem. An individual i seeks to maximize the expected utility from consumption,

$$EU_j = E \left\{ \frac{1}{1-\rho} \left[\left(\sum_{i=1}^{i=N} \omega_{ij} C_{ij}^{\frac{\theta-1}{\theta}} \right)^{\frac{\theta}{\theta-1}} \right]^{1-\rho} \right\} = E \frac{C_j^{1-\rho}}{1-\rho} \quad (11)$$

where ω_{ij} is the relative preference by consumers in country j for good i , C_j is the index of total real consumption, θ is the elasticity of substitution between any two goods and ρ is the coefficient of relative risk aversion. These are iceberg shipping costs and only a fraction $(1-\tau_{ij})$ of a unit of a good shipped from country i to country j survives the journey.

Following the Lane and Milesi-Ferretti (2004),

$$\log(x_{ij}) = \phi_i + \phi_j + \sigma \log(IMP_{ij}) + \gamma F_{ij} + \varepsilon_{ij} \quad (12)$$

where x_{ij} is the the country's j share of equity holdings in country i ; ϕ_i , ϕ_j denote aggregate financial frictions that apply at the level of the source and host countries; IMP_{ij} is the volume of imports to country j from country i ; F_{ij} denotes a set of factors that generate financial frictions at the bilateral level.

Eq. (12) guides the empirical work. Incorporate α_i and α_j in Eq. (12),

$$\alpha_i = \rho H_i + u_i \quad (13)$$

$$\alpha_j = \rho S_j + u_j \quad (14)$$

¹ See Obstfeld and Rogoff (1996), for a discussion on Arrow Debreu securities.

where H_i and S_j are vectors of country characteristics that explain variation in aggregate levels of portfolio positions for host and source countries respectively.

3. Empirical Strategy

This paper focuses on single cross sectional observation for the structure of external equity portfolios for the years 1997, 2001 and 2002 respectively. The empirical strategy is to isolate the relative contributions of bilateral factors, source country factors and host country factors. Bilateral factors may explain the heterogeneity in the geographical composition of the asset portfolios of source countries and investor bases of host countries. Controlling for these bilateral considerations, source country factors may explain the cross-country differences in the tendency to invest overseas while host country factors may determine variation in the attractiveness of different destinations for overseas investors.

3.1. Bilateral Factors

This paper employs a set of gravity type variables viz. telephone cost, common language, common legal origin, correlation in GDP growth rates, correlation in stock returns, correlation in GDP growth rates and stock returns to proxy for information costs, similarity in institutions and financial frictions. Portes and Rey (2005) explore a panel data set on bilateral gross cross-border equity flows between 14 countries for a period from 1989 to 1996. They find that gross transaction flows depend on market size in source and destination country as well as trading costs, in which both information and the transaction technology play a role. The geography of information is the main determinant of the pattern of international transactions.

Portes et al (2001) find that information asymmetries are responsible for the strong negative relationship between asset trade and distance. Information frictions are positively correlated with distance. Geographical distance is a barrier to interaction among economic agents and to cultural exchange. Cultural affinities are a component of the network effects that influence international economic relations (Rauch, 2001). This paper uses phone cost as a proxy for distance. Phone cost reflects both the cost component of the information friction (price of calls) and a cultural one (links between two countries because of immigration, tourism, etc.). The cost of information gathering would likely to increase with distance, as familiarity with the host country's investment opportunities, customs and culture decreases. Higher telephone costs imply greater distance between host and source countries. Traders might be more influenced by their information about fundamentals, which are more closely correlated; the closer is a pair of countries geographically.

A common language variable is used as a dummy for familiarity. Sharing a common language can be viewed as a common cultural link. In one Finnish study Grinblatt and Keloharju (2001) find that investors are more likely to hold, buy and sell the stocks of firms that are located close to the investor, that communicate in the investor's native tongue, and that have chief executives of the same cultural background. The influence of distance, language and culture is less prominent among the most investment savvy institutions than among both households and less savvy institutions.

Common origin to the legal system uses a dummy variable for similarity in institutions. Laws in different countries are typically not written from scratch, but rather transplanted from a few legal families or traditions. In general, commercial laws come from two broad traditions: common law, which is English in origin and

civil law, which derives from Roman law. In the civil tradition French, German and Scandinavian are the three major families from which the modern commercial laws originate. The English common law and the French and German civil law are the three major law tradition families that have global impact either through conquest, imperialism, outright borrowing and imitation. In case of individual countries, the resulting laws reflect both the influence of their families and country specific law characteristics.

The proxies for financial frictions are some bilateral financial correlations that may influence asset holdings in an incomplete market environment. These bilateral financial correlations are correlations in stock market returns and correlation in GDP growth rates. Further, following Davis et al (2001), research in this chapter also includes the correlation between the host country stock market return and the source country GDP growth rate to take into account the role of the host country stock market in potentially hedging against source country output fluctuations. These correlations are calculated using historical data and since much of the foreign portfolio equity investment occurred since mid-1990s, the endogeneity of financial correlations to the level of bilateral financial holdings may not be a major concern. However, as a robustness check, research in this chapter reports instrumental-variables estimates that allow for the potential endogeneity of a number of regressors.

3.2. Source and Host Country Factors

Lane and Milesi-Ferretti (2003) consider the determinants of the sum of equity assets and liabilities, as a measure of general international financial integration. Research in this chapter examines separately the determinants of equity assets and equity liabilities, by including various source and host factors viz. country size, domestic

stock market capitalisation, trade openness and capital control. Separate examination of equity assets and equity liabilities side of international balance sheet will provide a more complete picture of international financial integration.

Country size (G) may matter in international portfolio allocations. The establishment of domestic financial markets may involve fixed set up costs and so a small country may perform its financial transactions in the financial and capital markets of other large economies. On the contrary, richer countries may invest more overseas to the extent that there are fixed costs to overseas investment and that risk aversion decreases in wealth. Larger countries may be more attractive to international investors because of the existence of fixed costs in acquiring information about investment condition in a given country. Smaller countries may be more specialized, with greater vulnerability to external shocks and more volatile national output levels as compared to larger countries. Countries that face a more volatile environment may increase cross holdings of foreign assets and liabilities to smooth their income.

Larger economies will have correspondingly larger international equity asset and liability positions. However, the gains to international risk sharing may be larger for a smaller country, due to lesser scope for domestic diversification.

Income per capita (I) may influence the tendency to engage in international asset trade. Higher income per capita is associated with lower risk aversion and the international asset trade is perceived as riskier than domestic trade; this may also raise international asset trade. The participation in foreign asset markets involve fixed

costs, this may provide a reason why high income level countries' involve more in international asset trade.

The measures of trade openness (T) are also important in explaining aggregate international investment positions. First, international trade in goods and services itself generates financial flows and accordingly, firms may adopt various investment strategies to hedge the risk. Second, trade openness may raise volatility and hence countries may acquire international asset cross holdings to smooth their income. Third, the cross holdings of assets and liabilities acquired by the countries as a result of foreign direct investment, may generate increased trade in goods and services.

A well developed domestic financial sector (S) may affect international investment in several ways. First, a large domestic financial sector enables the issuing of liabilities to foreign investors and thus facilitates international risk sharing. Second, the accumulation of domestic financial assets and liabilities may increase exposure to domestic risk and thus increase the need to diversify overseas. Third, the domestic financial transactions may increase financial sophistication and thus lead to an increase in international investment. These factors may lead to a positive correlation between domestic financial market development and international asset holdings.

However, domestic investors may invest overseas if investment opportunities in a shallow domestic financial market are scarce. Thus, a shallower domestic financial market may be associated with higher asset holdings overseas. The size of the domestic financial market is a basic constraint on the scale of foreign portfolio

liabilities because foreign portfolio equity investment in domestic public companies cannot exceed the size of the domestic stock market capitalization.

This paper considers the impact of controls (C) on the determination of countries' aggregate portfolio equity assets and liabilities. The level of foreign holdings may be affected by a country's capital control regulations. A country may have a small foreign asset position if capital controls are in place or have been in recent past. If capital controls are imposed, the level of international asset cross-holdings may increase if capital account is liberalized.

Following from the above discussion and in line with the benchmark allocation model (12),

$$\log(x_{ij}) = \log(G) + \log(I) + \log(T) + \log(S) + C + \varepsilon_{ij} \quad (15)$$

4. CPIS data

In 1993, the IMF Committee on Balance of Payments decided to promote an idea for an internationally coordinated benchmark survey of long term portfolio investment holdings to facilitate cross country comparisons, permit data exchanges, and encourage standardization and best practice. Countries undertaking the benchmark survey of holdings would be in a position to obtain a reasonable estimate of the outstanding balances, at market price, of the level of portfolio investment held by their residents, rather than merely summing the balance of payments flows. This would reduce to some extent the imbalance at the global level.

The purpose of the Coordinated Portfolio Investment Survey (CPIS) is to improve statistics of holdings of portfolio investment assets viz. equity, long term debt, and short term debt. CPIS collects comprehensive information, with geographical detail on the country of residence of the issuer, on the stock of cross border equities, long term bonds and notes, and short term debt instruments related to international investment position (IIP). The IIP statistics provide information to check the coverage of recorded estimates of portfolio investment financial flows and associated investment income transactions recorded in the balance of payments. CPIS exchanges the bilateral data among the participating and other countries. This data exchange enables the participating countries to improve their statistics of non-resident holdings of their portfolio investment liabilities and associated financial flows and investment income data.

The IMF has released CPIS data for end-1997, 2001 and 2002. In 1997 CPIS survey, 29 countries participated. 67 countries participated in 2001 CPIS survey. In 2002, 66 countries participated in the CPIS survey. Now, CPIS survey is performed on annual basis and results reported accordingly.

Fig. 1 illustrates the scatter plot of equity holdings versus imports for the year 2002. The plot indicates that United States has both highest value of imports and equity holdings. On the other hand, Indonesia has the lowest value of both, imports and equity holdings. Developed countries have both, large value of equity holdings and imports. Larger economies will have correspondingly larger international equity asset and liability positions. Higher income per capita is associated with lower risk aversion and the international asset trade is perceived as riskier than domestic trade; this may also raise international asset trade. The participation in foreign asset markets involve

fixed costs and may provide a reason why high income level countries involve more in international asset trade.

The plot also supports the hypothesis that trade linkages heavily influence investment patterns (Honohan and Lane, 2000; Mishra and Daly, 2006). At one end of the spectrum, international trade in goods and services itself may generate financial flows and at the other end, cross holdings of assets and liabilities acquired by the countries as a result of foreign direct investment, may generate increased trade in goods and services.

[INSERT FIGURE 1 HERE]

5. Empirical analysis and results

This paper explains the portfolio equity positions for the end-1997, 2001 and 2002. There are three different dependent variables: bilateral positions, aggregate asset positions and aggregate liability positions. This paper considers a wide range of explanatory variables in the empirical analysis.

5.1. The Determinants of Bilateral Equity Holdings

Tables 1-3 present results of panel regressions of equity holdings for the years 1997, 2001 and 2002, respectively. Table 4 provides the panel regression results for Australia. The dependent variable is $\log(1+\text{equity})$. The equity positions are measured in dollars; adding 1 to the equity position does not distort the results, rather allows including any zero observations in the log specification.

[INSERT TABLES 1-3 HERE]

In Tables 1-3, column (1) includes source country imports from the host country, as an explanatory variable. A one percent increase in imports is related to an increase of about 0.93 percent in portfolio equity holdings. These results indicate a strong link between bilateral imports and bilateral investment holdings. This is in accordance with Lane and Milesi-Ferretti (2004). The point estimate is slightly below the theoretical value of unity. This may be attributed to several reasons. First, there may be measurement errors in imports, which impart a downward bias to the coefficient estimate. Second, holding destination country's equity is not the only route to gain exposure to import related risk: a complementary route would be to invest in domestic firms with overseas operations in those markets (Cai and Warnock 2004). Third, the composition of destination's stock market index may not perfectly reflect import risk (e.g. it may include domestically-orientated firms). Fourth, in some cases, imports from the country may consist of generic commodities for which country's stock market would not be the appropriate hedging mechanism.

The importance of trade in explaining bilateral equity holdings stands in contrast to Ahearne et al (2004). They use 1997 data to study the US pattern of overseas investment and found that the bilateral trade has no role in explaining the bilateral equity holdings of US investors. Their specification includes a different array of control variables and does not account for fixed host country effects. They also measure trade as a ratio of host country's GDP.

Column (2) of Tables 1-3 adds phone cost to take into account informational asymmetries. This variable is significant and negative, supporting the theoretical result that phone cost increases with distance. For the year 2001, a one - percent increase in phone cost is associated with a decrease in the cross border portfolio

equity holdings of 0.92 percent. Column (2) also includes the correlation in GDP growth rates between the source and host country; and a dummy for common language. The GDP growth rate variable is a proxy for the gains from bilateral diversification, along the lines of Davis et al (2001). The correlation between GDP growth rates of source and host countries is significantly positive for the years 1997 and 2001. The positive sign of GDP growth rate is unexpected. This indicates that investors hold equity in destinations with similar business cycles. The common language dummy variable is positive for all the years and both positive and significant for the years 1997 and 2002. The results indicate that speaking a common language raises equity holdings by approximately 35 percent (for the years 1997 and 2002). The import variable is positive and significant.

Column (3) of Tables 1-3 adds a dummy for common origins to the legal system. The legal origin dummy is positive and insignificant for the years 1997 and 2002, however it is negative for the year 2001. The common language variable is positive, for all the three years; but it is insignificant. This may be due to the fact that both the common language variable and the legal origin variable are associated with the countries cultural similarities. For all the three years, the import variable is both, positive and significant; the phone cost variable is both, negative and significant; and the GDP growth variable is positive.

Along with import, phone cost and GDP growth variables; column (4) includes the correlation between stock market returns in the source and host country; and the correlation between source country GDP and host country equity returns (following Davis et al, 2001). The correlation between stock market returns in the source and

host country, and the correlation between source country GDP and host country equity returns variables are proxies for the gains to bilateral diversification.

The correlation of GDP growth rates is positive for the years 1997 and 2001, and both positive and significant for the year 2001. However, it loses its significance and is negative for the year 2002. The positive sign of GDP growth rate is unexpected. This indicates that investors hold equity in destinations with similar business cycles (consistent with results in column (2)).

The correlation of stock returns is positive for all the three years, and both positive and significant for the years 2001 and 2002. The positive sign of the correlation of stock return coefficient is against the predictions of standard diversification arguments. This implies that bilateral equity investment is taking place between countries with correlated stock market returns.

The correlation between source country GDP and host country equity returns is negative for all the three years and it is significantly negative for the years 2001 and 2002. This indicates that the GDP growth rate in host country and stock market return of source countries move in opposite directions. This suggests that investors may offset the fall in GDP growth rate in host country by the stock market return in source countries. This is in line with the standard diversification arguments.

The common language dummy is positive and significant for all three years. This indicates that speaking a common language raises equity holdings. For all three years, the import variable is positive and significant while the phone cost variable loses statistical significance for the years 2001 and 2002. This implies that once trade is

controlled, the phone cost may help predict whether a given source country is going to invest in a given host country rather than the size of investment.

Column (5) of Tables 1-3 includes a dummy for common origins to the legal system to the column (4) variables. The results are similar to those just discussed for column (4), except that the common language variable loses its significance. The legal origin variable is positive for all the three years.

Column (6) of Table 3 presents two stage least squares results after incorporating instrumental variables viz. lagged values of correlation of GDP growth rates, lagged values of correlation of stock returns, lagged values of correlation of GDP growth - stock returns and phone costs. The correlations between growth rates prior to 1990 as well as the correlation between stock returns prior to 1995 are exogenous with respect to 2002 equity holdings, which reflect to a substantial degree the large flows of the period 1995 to 2002. For this reason, lagged correlations are used, which have an exogenous overlap with the instrumented variables, as instruments. The use of lagged variables is in accordance with Lane and Milesi-Ferretti (2004). The import variable is positive and significant. The correlation of GDP growth rates variable is negative and insignificant. The correlation of source and host countries' stock returns variable is positive and significant. The correlation of source countries' GDP growth rates and host countries' stock returns variable is negative and significant. The dummy variable for Language appears to be positive, however it is insignificant. Overall, the two stage least squares result supports the robustness of the ordinary least squares results.

Table 4 furnishes the regression results for source country Australia's bilateral portfolio equity holdings. Column (1) includes source country Australia's imports

from the host countries, as an explanatory variable. A one - percent increase in imports is related to an increase of about 1.05 - percent in portfolio equity holdings. These results indicate a strong link between bilateral imports and bilateral investment holdings. The phone cost variable is negative and significant. A one - percent increase in phone cost results in the decrease of bilateral equity investment by about 2.49 - percent. The correlation of GDP growth rates variable is negative and significant supporting the theoretical argument that investors hold equity in destinations with dissimilar business cycles. This is contrary to the results in Tables 3.5 and 3.6. The correlation of stock market returns variable is negative and insignificant. This implies low diversification motives of equity investors. The correlation of source country Australia's GDP growth rates and host countries stock returns is negative and insignificant. The language dummy variable is positive and insignificant.

Column (2) of Table 4 presents the source country Australia's bilateral portfolio equity holdings regression results for 2002. The results are similar to those in column (1). The two stage least squares regression results are mentioned in column (3). The instrumental variables employed are the lagged values of correlation of GDP growth rates, lagged values of correlation of stock returns, lagged values of correlation of GDP growth - stock returns and phone costs. Import variable appears to be positive and significant.

The coefficient increases from 0.97 to 1.07. The correlation of GDP growth rates variable is negative and significant. The coefficient increases significantly from 1.84 to 0.44. The correlation of source and host countries stock returns variable is negative and insignificant. This indicates low diversification motives of Australian equity investors consistent with column (1) results. The correlation of source

countries GDP growth rates and host countries stock returns variable is negative and insignificant. The dummy variable for Language appears to be positive and significant. This indicates that Australian investors prefer equity holdings in English language speaking countries. Overall, the two - stage least squares result supports the robustness of the ordinary least squares results.

In the international and the Australian context, the results indicate that the geography of bilateral portfolio equity holdings is strongly related to bilateral trade, proxies for information asymmetries i.e. phone costs and cultural-institutional proximity, such as a common language and a common legal origin. Investors prefer investing in those destination countries with which they have trading relationships. Investors also prefer investing in countries that have common language and similar legal origin. Further, the results indicate that in the international context, the bilateral equity investments are taking place between countries with similar characteristics, including coordinated business cycles and correlated stock market returns, against the predictions of standard portfolio diversification theories.

5.2. Aggregate asset positions

This section empirically examines the factors explaining overall size of countries' portfolio investment holdings. Table 3.8 illustrates the panel regressions of the aggregate asset positions, for the years 1997, 2001 and 2002. The dependent variable is the log of portfolio equity assets. The independent variables are the log components of the size of domestic GDP, GNI per capita, total exports of goods and services, the size of domestic stock market and a measure of capital controls.

[INSERT TABLE 2 HERE]

The dominant factors explaining equity asset positions are GNI per capita and the size of domestic stock market. For the year 2001, the results indicate that a 1 - percent increase in GNI per capita would increase the portfolio equity assets by 1.41 - percent. This implies that income per capita influences the tendency to engage in international asset trade. Higher income per capita is associated with lower risk aversion and the international asset trade is perceived as riskier than domestic trade. This may also raise international asset trade. The participation in foreign asset markets involve fixed costs and may provide a reason why high income level countries involve more in international asset trade.

For the year 2001, the results indicate that 1 - percent increase in domestic stock market capitalisation would increase the portfolio equity assets by 1.22 - percent. This supports the notion that countries with well developed domestic financial markets are more likely to engage in international asset trade. Further, the importance of stock market development in explaining portfolio equity investment is in line with the findings of Di Giovanni (2005), who explains that countries with more developed domestic financial market are more likely to engage in mergers and acquisitions abroad. The results indicate that the overall level of development and the depth of financial market, as reflected by stock market capitalization, lead to increased external diversification, i.e. countries with strong equity culture hold larger gross foreign equity positions. The measure of capital controls is strongly and significantly negatively correlated with aggregate equity assets.

5.3. Aggregate liability positions

This section investigates what makes countries attractive as a destination for non-resident portfolio equity investors by employing similar set of explanatory variables as those employed for explaining asset holdings.

[INSERT TABLE 3 HERE]

Table 6 illustrates the panel regressions of the aggregate liability positions, for the years 1997, 2001 and 2002. The dependent variable is the log of portfolio equity liabilities. The liabilities are not measured directly by the CPIS, but are derived by summing the asset holdings that participating countries report in each destination country.

The size of the host country's domestic stock market is the key correlate of portfolio equity liabilities. For the year 2001, a 1 - percent increase in the domestic stock market capitalisation increases the portfolio equity liabilities by 1.15 - percent. This implies that a large domestic financial sector enables the issuing of liabilities to foreign investors and thus facilitating international risk sharing. The level of GNI per capita is positive for the years 2001 and 2002. The measure of capital controls is strongly negatively correlated with total equity liabilities; however, statistically insignificant.

6. Concluding remarks

Research in this paper analyses the bilateral, source and host factors driving portfolio equity investment across countries using the International Monetary Fund's new dataset on international equity holdings at the end of 1997, 2001 and 2002. Research in this paper illustrates a model that links bilateral equity holdings to bilateral trade in goods and services. The most significant result is that the bilateral equity investment

is strongly correlated with the underlying patterns of trade in goods. This result supports the findings of Aviat and Coeurdacier (2004) and Lane and Milesi-Ferretti (2004). The information asymmetries and cultural-institutional proximity, such as a common language and a common legal origin are also important for bilateral equity investment. These results are in accordance with those of Portes and Rey (2005) and Lane and Milesi-Ferretti (2004). Generally, the bilateral equity investments take place between countries with similar characteristics, including coordinated business cycles and correlated stock market returns, against the predictions of standard diversification arguments. Results also indicate low diversification motives for Australian investors, in accordance to Mishra and Daly (2006).

Capital controls have a negative and significant impact on the countries' aggregate foreign portfolio equity asset positions. Income per capita has a positive and significant impact on the countries' aggregate cross-border portfolio equity asset positions. The overall level of development and the depth of financial market, as reflected by stock market capitalization, lead to increased external diversification, i.e. countries with strong equity culture hold larger gross foreign equity positions.

Capital controls and income per capita do not have a significant impact on countries' aggregate foreign portfolio equity liabilities positions. The size of domestic stock market is the key correlate of aggregate foreign portfolio equity liabilities. These results are in agreement with Lane and Milesi-Ferretti (2004).

There are several issues for future research. A comparative analysis across different asset classes, including portfolio debt allocations, bank loans and deposits and FDI positions would provide a more comprehensive account of the various components of

the geography of international investment positions. In addition, this will provide insight into the external capital structure of nations. An important issue, which may be examined, is the role of offshore centres in equity investment patterns. The research objective may be to devise methods to allocate equity investment in offshore centres to their ultimate destinations.

Appendix A. Appendix

Countries: Argentina, Australia, Brazil, China, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Indonesia, India, Ireland, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, NewZealand, Norway, Pakistan, Peru, Phillipines, Poland, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, UK, US.

Total portfolio equity holdings, CPIS: Total portfolio equity holdings held by source country residents as per CPIS 1997, 2001 and 2002.

Bilateral portfolio equity holdings: Portfolio equity issued by host country residents and held by source country residents as per CPIS 1997, 2001 and 2002.

Source – country imports (IMP): Imports of goods by source countries from host country. Source: International Monetary Fund, Direction of Trade Statistics.

Phone Cost: Cost of 5 minute phone call between capital cities of host and source country. Source: <http://www.phone-rate-calculator.com/>

Correlation in growth rate (G): correlation between GDP growth rate in the source and host country, 1990-2002. Source: calculations based on World Bank, World Development Indicators.

Correlation of stock returns (S): Correlation between the stock market returns of the host and source country, 1995-2002. Source: Calculations based on Datastream, Morgan Stanley Capital International.

Correlation growth-stock return (GS): correlation between GDP growth in source country and real stock returns in host country, 1995-2002. Source: Calculations based on Datastream, Morgan Stanley Capital International and World Development Indicators.

Common Language (Lan): dummy taking the value 1 if host and source country share a common language. Source: <http://www.cia.gov/cia/publications/factbook/>

Common Legal Origin (Leg): dummy taking the value 1 if host and source countries have a legal system with a common origin. Source: La Porta, Lopez de Silanes, Shleifer and Vishny (1998).

Log GDP: Log of 1997, 2001, 2002 GDP level in current US dollars. Source: World Bank, World Development Indicators.

Log GNI per capita: Log of 1997, 2001, 2002 GNI per capita level in current US dollars. Source: World Bank, World Development Indicators.

Log domestic stock market capitalization: Log of domestic stock market capitalization in US dollars for end- 1997, 2001 and 2002. Source: World Stock Exchanges, FIBV

Capital Controls: Source : Jacques Miniane (2004)

References

Ahearne, Alan B., William Grier and Frank Warnock (2004), "Information Costs and the Home Bias," *Journal of International Economics* 62, 313-336.

Buch, Claudia (2002), "Are Banks Different? Evidence from International Data," *International Finance* 5(1), 97-114.

Buch, Claudia (2003), "Information or Regulation: What Drives the International Activities of Commercial Banks?" *Journal of Money, Credit and Banking*, 35 (6) (December), 851-69.

Buch, Claudia, M., John C. Driscoll, and Charlotte Ostergaard (2003), "International Diversification in Bank Asset Portfolios," *mimeo*, Norwegian School of Management, March.

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

Dahlquist, Magnus, Pinkowitz, Lee, Rene M Stultz and Rohan Williamson (2002), "Corporate Governance and the Home Bias," *Journal of Financial and Quantitative Analysis*, 38 (1) (March), 87-110.

Di Giovanni, Julian (2005), "What Drives Capital Flows? The Case of Cross-Border M&A Activity and Financing Deepening," *Journal of International Economics*, 65(1) (January), 127-149.

Fisher, Irving (1930), *The Theory of Interest*, The Macmillan Company, New York.

Ghosh, Swati and Holger Wolf (2001), "Is There A Curse of Location? Spatial Determinants of Capital Flows to Emerging Markets," in *Capital Flows and The Emerging Economies: Theory, Evidence and Controversies*, edited by Sebastin Edwards, Chicago:University of Chicago Press for NBER.

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

Huberman, G. 2001. Familiarity Breeds Investment. *Review of Financial Studies* 14 no. 3 (Fall): 659-80.

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).

Kawai, M. and L. Liu-Gang. 2001. Determinants of International Commercial Bank Loans to Developing Countries. *Mimeo. University of Tokyo* (June).

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

Lane, Philip R. and Gian Maria Milesi-Ferreti (2004), "International Investment Patterns", *IISC Discussion Paper No. 24*.

Mann, C. and E. Meade. 2002. Home Bias, Transaction Costs, And Prospects for the Euro: A More Detailed Analysis. *Mimeo. Institute for International Economics and Center for Economic Performance, LSE*.

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

Martin, Phillipe, and Helene Rey (2004), "Financial Supermarkets: Size Matters for Asset Trade," *Journal of International Economics*, 64 (December), 335-61.

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

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).

Portes, R. and H. Rey (2005), “Determinants of Cross Border Equity Flows”, *Journal of International Economics*, 65(2) (March), 269-96.

Portes, R., H. Rey, and Y. Oh (2001), “Information and Capital Flows: The Determinants of Transactions in Financial Assets,” *European Economic Review* 45, May, 783-96.

Rauch, J. 2001. Business and social networks in international trade. *Journal of Economic Literature* 39: 1177-1203.

Sarisoy, Selen (2003), “Foreign Direct Investment, Trade and Portfolio Investment Flows: The Role of Geography,” *mimeo*, Trinity College, Dublin.

Stein, E.H. and Daude, C. 2003. Longitude Matters: Time Zones and the Location of FDI. *Mimeo*. Inter-American Development Bank.

Wei, S.J. 2000. How Taxing Is Corruption On International Investors? *The Review of Economics and Statistics* LXXXII (February): 1-11.

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).

Yildirim, Canan (2003), "Information Assymetries, Corporate Governance Infrastructure and Foreign Portfolio Equity Investment," *mimeo*, Tilburg University.

Table 1 : Bilateral Portfolio Equity Holdings Regressions (1997)

	(1)	(2)	(3)	(4)	(5)
IMP	0.94 (153.71) ***	0.89 (51.58) ***	0.88 (52.20) ***	0.88 (40.47) ***	0.87 (43.09) ***
Phone Cost		-0.80 (-1.65) *	-0.89 (-1.97) **	-0.82 (-1.65)	-0.93 (-2.02) **
G		0.43 (1.68) *	0.40 (1.63)	0.42 (1.58)	0.37 (1.45)
S				0.08 (0.27)	0.17 (0.58)
GS				-0.18 (-0.73)	-0.22 (-0.95)
Lan		0.32 (2.00) **	0.17 (0.63)	0.34 (2.14) **	0.16 (0.59)
Leg			0.22 (0.76)		0.27 (0.91)
Obs	408	224	224	224	224
Host	6	14	14	14	14
Source	70	16	16	16	16
Adj R ²	0.34	0.25	0.25	0.24	0.24

Note: The dependent variable is log of 1 + portfolio equity holdings of the source country in the host country. t – statistics is reported in parentheses. *, **, *** indicate statistical significance at 0.1, 0.05 and 0.01 confidence level, respectively.

Table 2: Bilateral Portfolio Equity Holdings Regressions (2001)

	(1)	(2)	(3)	(4)	(5)
IMP	0.93 (164.44) ***	0.90 (52.44) ***	0.90 (49.94) ***	0.88 (47.03) ***	0.88 (43.35) ***
Phone Cost		-0.92 (-1.86) *	-0.89 (-1.77) *	-0.75 (-1.51)	-0.75 (-1.50)
G		0.58 (2.29) **	0.60 (2.37) **	0.40 (1.74) *	0.39 (1.68) *
S				0.99 (2.66) ***	1.00 (2.66) ***
GS				-0.80 (-2.69) ***	-0.81 (-2.75) ***
Lan		0.16 (1.18)	0.23 (0.98)	0.24 (1.73) *	0.21 (0.93)
Leg			-0.10 (-0.45)		0.03 (0.16)
Obs	424	272	272	272	272
Host	6	17	17	17	17
Source	71	16	16	16	16
Adj R ²	0.45	0.19	0.19	0.22	0.22

Table 3: Bilateral Portfolio Equity Holdings Regressions (2002)

	(1)	(2)	(3)	(4)	(5)	(6)
IMP	0.93 (160.02) ***	0.91 (65.17) ***	0.91 (62.76) ***	0.88 (54.29) ***	0.87 (50.52) ***	0.91 (41.31) ***
Phone Cost		-0.59 (-1.61)	-0.63 (-1.77) *	-0.28 (-0.78)	-0.37 (-1.05)	
G		0.11 (0.49)	0.08 (0.39)	-0.14 (-0.72)	-0.23 (-1.16)	-0.22 (-0.90)
S				1.28 (4.62) ***	1.38 (4.86) ***	0.97 (3.02) ***
GS				-0.78 (-3.20) ***	-0.89 (-3.61) ***	-0.73 (-1.86) *
Lan		0.39 (3.18) ***	0.31 (1.61)	0.47 (3.94) ***	0.27 (1.43)	0.62 (0.84)
Leg			0.12 (0.57)		0.31 (1.41)	
Obs	391	272	272	272	272	272
Host	7	17	17	17	17	17
Source	66	16	16	16	16	16
Adj R ²	0.42	0.42	0.41	0.46	0.47	

Table 4: Bilateral Portfolio Equity Holdings Regressions for Australia

	(1) OLS 2001	(2) OLS 2002	(4) IV 2002
IMP	1.05 (11.10) ***	0.97 (15.46) ***	1.07 (9.13) ***
Phone Cost	-2.49 (-1.90) *	-3.08 (-3.20) **	
G	-2.40 (-2.22) *	-1.84 (-2.60) **	-4.44 (-2.42) ***
S	-0.99 (-0.96)	-0.34 (-0.41)	1.80 (0.48)
GS	-0.50 (-0.53)	-0.70 (-0.72)	-2.24 (-1.47)
Lan	0.38 (0.68)	0.68 (1.66)	2.51* (1.91)
Obs	16	16	16
Adj R ²	0.52	0.67	

Table 5: Aggregate Portfolio Equity Assets : Panel Regressions

	(1) 1997	(2) 2001	(3) 2002
Log GDP	-0.03 (-1.18)	-0.58 (-1.30)	-0.59 (-1.37)
Log GNI per capita	1.49 (5.57)***	1.41 (5.13)***	1.34 (4.97)***
Log domestic stock market capitalisation	0.88 (3.25)***	1.22 (2.94)***	1.09 (2.78)***
Log exports	0.09 (0.23)	0.40 (0.95)	0.45 (1.08)
Capital controls	-6.74 (-2.59)**	-7.11 (-3.01)***	-5.74 (-2.42)**
Observations	22	32	32
Adjusted R ²	0.89	0.85	0.84

Note: Dependent variable is the log of portfolio equity assets. t – statistics is reported in parentheses. *,**,*** indicate statistical significance at 0.1, 0.05 and 0.01 confidence level, respectively.

Table 6: Aggregate Portfolio Equity Liabilities: Panel Regressions

	(1) 1997	(2) 2001	(3) 2002
Log GDP	0.002 (0.06)	-0.19 (-0.68)	0.10 (0.41)
Log GNI per capita	-0.07 (-0.41)	0.10 (0.52)	0.31 (2.38)
Log domestic stock market capitalisation	1.14 (5.10)***	1.15 (4.11)***	0.84 (3.76)**
Log imports	0.05 (0.16)	0.24 (0.67)	-0.007 (-0.02)
Capital controls	-2.82 (-1.40)	-3.23 (-1.77)	-1.31 (-0.90)
Observations	35	35	35
Adjusted R ²	0.86	0.85	0.85

Note: Dependent variable is the log of portfolio equity liabilities. t – statistics is reported in parentheses. *,**,*** indicate statistical significance at 0.1, 0.05 and 0.01 confidence level, respectively.

Fig 1: Scatter of 2002 Equity Holdings Versus 2002 Imports

