

Two-way Cross-border Transactions in Financial Assets and Their Implications for Financial Cooperation in East Asia*

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Intra-industry trade in goods is a well-documented phenomenon that has provided the empirical stimulus for the development of the New International Trade Theory. Intra-industry trade also characterizes international trade in assets as two countries simultaneously export and import assets to/from each other. This study shows the magnitude of two-way transactions in equities and bonds to be quantitatively significant, using data gathered from the IMF's Coordinated Portfolio Investment Survey (CPIS) and the relevant Grubel-Lloyd index. This study also shows that countries whose market size, degree of capital market liberalization, and real interest rates are similar have a greater propensity to engage in two-way transactions of financial assets. It is also found that the extent of two-way holdings of financial assets between Japan and other East Asian countries is smaller than that between Japan and other non-East Asian countries. This finding suggests that despite the recent efforts to strengthen financial cooperation in East Asia, links among intraregional financial markets are still low. Our results are theory-based and are robust to a number of different empirical specifications.

JEL Classification: F12, F15, F21, G15

Keywords: financial asset holdings, equities, bonds, Grubel-Lloyd index, Asian financial cooperation

* Received September 1, 2010. Accepted October 24, 2010. Earlier versions of this paper were presented at the International Conference on Trade and Investment Cooperation in East Asia (July 2008, Seoul, Korea), the 8th Asia-Pacific Economic Forum Annual Conference (November 2008, Isfahan, Iran), the Asia-Pacific Economic Association Annual Conference (December 2008, Beijing, China) and the Bank of Korea International Finance Workshop (January 2009, Seoul, Korea). I am grateful to Pierfederico Asdrubali, Yung Chul Park, Innwon Park, Robert Scollay, Daekeun Park and other participants for their helpful comments and suggestions. I also thank Herbert Grubel, Joshua Aizenman, Fukunari Kimura and Kazunobu Hayakawa for their comments. This work was supported by a Korea Research Foundation grant funded by the Korean Government (MOEHRD, Basic Research Promotion Fund, KRF-2007-B00144).

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1. INTRODUCTION

The Theory of Intra-industry Trade and its mathematical formulation in The New International Trade Theory have considerably enriched economists' knowledge about the causes and welfare effects of international trade.¹⁾ Hitherto most empirical studies and analyses of intra-industry trade have been confined to trade in goods. One exception is Lee and Lloyd (2002) who showed that intra-industry trade was also important for service industries and that it had policy implications similar to those for trade in differentiated products.

On the other hand, intra-industry trade in financial assets (i.e., two-way cross-border transactions in financial assets) was reviewed by Grubel (2002), who showed that intra-industry trade in assets enriched the basic theory of international capital flows found in dominant models like that of Mundell (1961), Fleming (1962), and Dornbusch (1976), which cannot account for countries' simultaneous export and import of assets during given time periods.²⁾

The present paper extends the Grubel (2002) paper so as to enrich our understanding of the nature, determinants and welfare effects of two-way transactions of financial assets. First, while the Grubel (2002) paper draws on statistics found in *The Balance of Payments Statistical Yearbook* published annually by the International Monetary Fund, this paper draws on a set of data gathered from the IMF's Coordinated Portfolio Investment Survey (CPIS), which geographically breaks down securities holdings (bonds and equities). Second, with the help of the theoretical predictions of the financial gravity model developed by Courdacier and Martin (2006), this paper formally attempts to estimate the determinants of two-way transactions

¹⁾ See Grubel and Lloyd (1975) for the theory of intra-industry trade and the nature of the widely used Grubel-Lloyd index. The theory in this book has been put into mathematical form in the publications of Krugman (1979), Brander (1981) and others.

²⁾ Moshirian, Li, and Sim (2005) look at intra-industry trade in financial services. They find that factor endowments, average per-capita income, FDI in banking, economies of scale in the banking sector, trade intensity between the US and its partners and market openness make a positive contribution to the volume of IIT in banking services.

of financial assets and their implications for welfare.

Third, this paper attempts to evaluate the extent of two-way holdings of assets among East Asian countries to draw implications for financial cooperation in East Asia. This is an important question because intra-regional cooperation cannot be sustained if one country dominates trade in financial assets in the sense that it is always a large net buyer or seller of securities issued in the region.³⁾ This also relates to the recent discussions on business cycle synchronization among East Asian countries, as Shin and Wang (2003) and Rana (2007) find that intra-industry trade (IIT) is the major channel through which business cycles become synchronized among Asian economies, although increasing trade does not itself necessarily lead to close business cycle coherence. It seems reasonable to believe that this also applies to cross-border financial transactions. That is, as two-way flows of securities between countries become larger, the greater will be the synchronization of the business cycles of the nations.

This paper finds that the magnitude of two-way transactions in financial assets is substantial for certain pairs of countries. Specifically, this study shows that countries whose market size, degree of capital market liberalization, and real interest rates are similar have a greater propensity to engage in two-way transactions of financial assets. It is also found that the extent of two-way holdings of financial assets between Japan and other East Asian countries is smaller than that between Japan and other non-East Asian countries. This is in contrast with the finding that France enjoys more two-way transactions in financial assets with other Euro member countries

³⁾ Following the East Asian financial crisis of 1997-1998, a number of new financial arrangements emerged at the regional level in an attempt to prevent future financial crises in the region. These include the bilateral swap arrangement under the Chiang Mai Initiative to defend against speculative currency attacks; an institutionalized program of policy dialogue and information exchange; and the creation of the Asian Bond Funds as an initial step to foster a regional bond market. Several proposals have also been floated to form an Asian Monetary Fund, to coordinate exchange rates, and to create an Asian monetary union (see Park and Wyplosz (2008) for a comprehensive review). More recently, in March 2010 the ASEAN Plus Three countries launched a US\$120 billion currency swap program, under the auspices of the Chiang Mai Initiative Multilateralization (CMIM) agreements. Despite the recent efforts to strengthen financial cooperation in East Asia, links among intraregional financial markets are still low (Eichengreen and Park, 2005; Lee, 2008).

than with non-Euro members.

Section 2 describes the extent of two-way holdings of assets involving East Asian countries. The magnitude of bilateral holdings of assets among East Asian countries is also presented in section 2. Section 3 introduces a simple theoretical framework to generate testable IIT equations for two-way holdings of assets and proposes three different empirical specifications to test the determinants of two-way holdings of assets. In section 4, we present empirical results. Finally, concluding remarks are offered in section 5.

2. SIZE OF BILATERAL AND TWO-WAY HOLDINGS OF FINANCIAL ASSETS

2.1. Data

The data used in this study are gathered from the IMF's Coordinated Portfolio Investment Survey (CPIS),⁴⁾ which geographically breaks down securities holdings (equities and bonds).⁵⁾ The first CPIS was conducted in 1997, when 29 economies participated. Since 2001, the CPIS has been undertaken on an annual basis and the number of participating economies has been expanded to 74. The CPIS collects information on the stock of cross-border holdings of equities and bonds, broken down by the economy of the residence of the issuer.⁶⁾ Holdings of securities which comprise direct investment are excluded.

⁴⁾ <http://www.imf.org/external/np/sta/pi/cpis.htm>

⁵⁾ Bond holdings include Long-Term Debt Securities and Short-Term Securities, but in many cases Short-Term Securities take the value of zero. Therefore, rather than separating bonds into long-term and short-term bonds, we consider only the sum of long-term and short-term bonds.

⁶⁾ Readers should note that all the data for equities and bonds are not flows but outstanding stocks. Thus, we use the cumulative value (or stock) of past net flows of assets reported at a specific point in time. Simply taking differences from holdings to estimate net flows could be misleading because the reporting population changes between surveys and exchange rate movements may alter asset values. One advantage of working with holdings is that they are less volatile than flows and can be used to investigate the long-term determinants of international capital movement.

We take three major economies in terms of the size of security markets, one each from East Asia, North America, and Europe, namely, Japan, the U.S., and France.⁷⁾ We then calculate for three individual years, namely 1997, 2001, and 2005, the total value of bilateral holdings of securities (i.e., the sum of holdings of foreign securities by domestic residents and holdings of domestic securities by foreign residents) and the Grubel-Lloyd (*GL*) index of two-way holdings of securities for 60 different countries for which at least one positive value is observed for total holdings in any single year.⁸⁾

2.2. Absolute Size of Asset Holdings

Before we present the size of the two-way cross-border transactions in financial assets for countries in the sample, it is useful to consider some insights on the nature of bilateral holdings of financial assets involving East Asian countries.⁹⁾ Table 1 shows a geographic breakdown of equity holdings as of 2005. The total value of equity investment in the world was US\$10,570 billion. The share of the U.S. was 31.4%, with US\$3,318 billion, whereas the shares of Japan and France were 3.9% (US\$ 409 billion) and 5.0% (US\$ 529 billion), respectively.

The total value of foreign equities held by East Asian countries in 2005 was US\$ 738 billion, among which only US\$ 67 billion was the value of equities invested in East Asia. Thus, the average share of intra-East-Asia holdings of equities was 9.1% in 2005. Among the East Asian countries, Indonesia and Malaysia were the countries with over 50% of their equity investments made in East Asia. It should be noted, however, that this was mainly because the major destination of their equity investment was Singapore.

⁷⁾ We also replaced France with the United Kingdom and found that the key results remained the same. The results are not shown for brevity, but are available from the authors upon request. Germany, another major economy in Europe, was not considered here because its data are not available in the 1997 CPIS.

⁸⁾ Year 2008 is not considered here because the cross-border financial transactions in 2008 were “abnormal” because of the global financial crisis.

⁹⁾ Hong Kong, Indonesia, Japan, Korea, Macao, Malaysia, the Philippines, Singapore, and Thailand.

Table 1 Geographic Breakdown of Equity Investment, Year-end 2005

(Unit: millions of U.S. dollars)

From In	Hong Kong	Indonesia	Japan	Korea	Macao	Malaysia	Philippines	Singapore	Thailand	United States	France	East Asia (c)	(c/d)*100	Total Value of Investment (d)
Hong Kong	.	–	8,166	582	936	170	–	12,660	19	44,465	2,737	22,533	17.4	129,775
Indonesia	239	.	187	1	–	8	–	1,258	1	7,127	225	1,694	9.3	18,232
Japan	9,129	.	.	878	59	21	–	5,013	5	493,343	37,743	15,104	1.6	954,192
Korea	2,723	.	2,065	.	8	31	–	4,772	1	110,264	2,163	9,600	4.8	199,007
Macao	.	.	–	.	.	.	.	.	–	.	–	–	0.1	110
Malaysia	517	.	197	99	1	.	.	6,902	102	6,934	358	7,818	33.0	23,694
Philippines	155	.	43	2	–	6	.	325	1	3,068	130	531	8.8	6,022
Singapore	2,269	61	1,902	59	3	640	4	.	45	29,109	654	4,982	8.5	58,337
Thailand	1,374	–	528	9	–	18	2	3,012	.	8,992	246	4,943	17.9	27,641
United States	11,862	2	192,604	1537	91	159	93	16,169	62	.	70,839	222,579	13.0	1,708,709
France	1,021	.	16,731	70	27	12	.	756	1	205,113	.	18,618	3.1	606,098
East Asia (a)	16,406	61	13,088	1,629	1,007	894	6	33,942	173	703,302	44,255	67,207	4.7	1,417,010
(a/b)*100	7.2	65.2	3.2	11.7	35.6	57.7	5.1	41.1	17.1	21.2	8.4	9.1		13.4
Total Value of Investment (b)	227,834	93	408,575	13,913	2,829	1,550	118	82,563	1,017	3,317,705	529,289	738,493	7.0	10,570,463

Note: “–” indicates a zero value or a value less than US\$ 500,000 and “.” indicates “not available”.

Source: Constructed by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>

On the other hand, while the destination of Singapore's equity investment was quite diverse among East Asian countries, Singapore's share of intra-regional holdings of equities was also very high with 41.1%.

In contrast, Japan's intra-regional share of equity investment was particularly small, with only 3.2% (US\$ 13 billion out of US\$ 409 billion), which was the lowest among the East Asian countries. On the other hand, almost half of Japan's holdings of foreign equities was issued in the U.S. (US\$ 193 billion). It is also interesting to note that only 1.6% (US\$ 15 billion out of US\$ 954 billion) of Japanese equities was held by other East Asian countries, while over half (US\$ 493 billion) of Japanese equities was held by the residents of the U.S. Thus, Japan, the biggest investor and investee of equities among East Asian countries, trades only a very small amount of equities with other East Asian countries and mostly with the U.S.¹⁰⁾

Table 2 shows a similar picture for bond holdings in 2005. The intra-East-Asia share of bond holdings by nine East Asian countries was also very small with 3.4% (US\$ 71 billion out of US\$ 2,085 billion). Again, Japan's intra-regional share of bond holdings was very small with only 0.7% (US\$ 12 billion out of US\$ 1,706 billion), which is the lowest among the East Asian countries. The share of Japanese bonds held by other East Asian countries was also very small — only 4.2%. Thus, as in the case of equities, Japan's major bond trading partner was the U.S., not East Asian countries.

2.3. Extent of Two-way Holdings of Securities

As in Grubel (2002), we utilize the *GL* index to measure the extent of two-way holdings of securities. The *GL* index for trade between countries *i* and *j* is:

¹⁰⁾ Lee and Huh (2008) adopt a theory-based gravity model of bilateral financial asset holdings in East Asia and compares them with Europe, and find that cross-border asset holdings between Japan and other East Asian countries are smaller than those between Japan and non-East-Asian countries, even when they control for economic size, expected return, security market liberalization, and geographic distance. Lee (2008) also finds a similar result in a different gravity model.

Table 2 Geographic Breakdown of Bond Investment, Year-end 2005

(Unit: millions of U.S. dollars)

From In	Hong Kong	Indonesia	Japan	Korea	Macao	Malaysia	Philippines	Singapore	Thailand	United States	France	East Asia (c)	(c/d)* 100	Total Value of Investment (d)
Hong Kong	.	–	758	437	836	26	114	2,509	12	1,760	1,374	4,691	28.2	16,635
Indonesia	228	.	386	6	.	17	.	5,644	–	1,898	71	6,281	52.2	12,043
Japan	7,554	17	.	585	20	30	19	4,727	48	26,741	28,925	13,000	4.2	307,000
Korea	9,553	1	5,391	.	179	39	.	4,921	75	8,243	1,305	20,159	44.0	45,796
Macao	33	.	–	.	.	.	.	–	–	.	–	33	100.0	33
Malaysia	3,669	.	1,065	179	36	–	.	7,825	10	4,348	920	12,784	49.5	25,826
Philippines	964	5	1,339	20	.	4	.	493	–	4,111	1,029	2,825	16.7	16,871
Singapore	4,828	156	2,513	258	91	112	623	–	464	7,252	544	9,046	33.4	27,116
Thailand	844	.	219	31	4	58	16	1,024	.	1,545	117	2,196	42.1	5,222
United States	46,294	110	555,143	18,131	1,021	407	2,620	18,630	554	.	131,288	642,911	17.8	3,604,209
France	7,472	.	109,206	1,436	254	205	120	4,696	57	64,832	–	123,445	12.4	994,077
East Asia (a)	27,673	179	11,672	1,514	1,165	286	772	27,143	609	55,898	34,285	71,013	15.6	456,542
(a/b)*100	13.3	16.6	0.7	5.1	21.3	12.8	13.8	22.0	25.2	4.4	2.6	3.4		3.0
Total Value of Investment (b)	208,736	1,075	1,706,315	29,751	5,462	2,231	5,608	123,139	2,419	1,273,417	1,327,713	2,084,736	13.6	15,284,352

Note: “–” indicates a zero value or a value less than US\$ 500,000 and “.” indicates “not available”.

Source: Constructed by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>

$$GL_{ij}^X = 1 - \frac{|X_{ij} - X_{ji}|}{X_{ij} + X_{ji}}, \quad (1)$$

where X_{ij} represents the annual exports of a certain commodity X from country i to country j and X_{ji} represents country i 's annual imports of X from country j . Similarly, the extent of two-way flows of a class of securities (say, equities) between countries can be measured as follows:

$$GL_{ij}^{Asset} = 1 - \frac{|Asset_{ij} - Asset_{ji}|}{Asset_{ij} + Asset_{ji}}, \quad (2)$$

where $Asset_{ij}$ and $Asset_{ji}$ represent country i 's holdings of securities (equities or bonds) issued in country j and country j 's holdings of securities issued in country i , respectively.

It is worth noting that the value for GL is zero if either $Asset_{ij}$ or $Asset_{ji}$ is zero, which means that there are no two-way holdings of assets. The value for GL is one if $Asset_{ij}$ equals $Asset_{ji}$. Under these conditions, GL is at its maximum when the value of country i 's holdings of assets issued in country j is exactly the same as the value of country j 's holdings of assets issued in country i .

Tables 3 and 4 present the GL index for equities and bonds, respectively, involving nine Asian countries (and the U.S. and France for comparison).¹¹⁾ As can be seen in table 3, Hong Kong enjoys a high extent of two-way holdings of equities with high-income countries like Japan (0.944), Korea (0.352), Malaysia (0.495), Singapore (0.304), the U.S. (0.421) and France (0.544), while it reveals a low extent of GL index with low-income countries such as Indonesia (0.001) and the Philippines (0.003). Japan also reveals high values of the GL indices with the high-income countries like Hong Kong (0.944), Korea (0.597), Singapore (0.550), the U.S. (0.562) and France (0.614),

¹¹⁾ Appendix tables A1-A6 present the values of GL index for equities and bonds, respectively, between each of the three "source" countries and the 60 "partner" countries.

Table 3 Size of Two-way Equity Holdings, Year-end 2005

	Hong Kong	Indonesia	Japan	Korea	Macao	Malaysia	Philippines	Singapore	Thailand	United States	France
Hong Kong		0.001	0.944	0.352	.	0.495	0.003	0.304	0.027	0.421	0.544
Indonesia			0.092	0.034	0.000	.
Japan				0.597	0.004	0.194	0.002	0.550	0.019	0.562	0.614
Korea					.	0.475	.	0.024	0.208	0.027	0.063
Macao						.	.	.	0.000	.	0.000
Malaysia							.	0.170	0.306	0.045	0.062
Philippines								0.026	0.515	0.059	.
Singapore									0.030	0.714	0.928
Thailand										0.014	0.008
United States											0.513
France											

Notes: 1) Numbers on the top-right panel indicate size of two-way equity holdings calculated by the Grubel-Lloyd index. 2) “.” indicates “not available”.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>

Table 4 Size of Two-way Bond Holdings, Year-end 2005

	Hong Kong	Indonesia	Japan	Korea	Macao	Malaysia	Philippines	Singapore	Thailand	United States	France
Hong Kong		0.002	0.182	0.087	0.075	0.014	0.211	0.684	0.028	0.073	0.311
Indonesia			0.084	0.164	.	.	.	0.054	.	0.110	.
Japan				0.196	0.000	0.055	0.027	0.694	0.360	0.092	0.419
Korea					.	0.362	.	0.100	0.577	0.625	0.952
Macao						.	.	0.000	0.000	.	0.000
Malaysia							.	0.028	0.298	0.171	0.364
Philippines								0.883	0.000	0.778	0.209
Singapore									0.623	0.560	0.208
Thailand										0.528	0.650
United States											0.661
France											

Notes: 1) Numbers on the top-right panel indicate size of two-way bond holdings calculated by the Grubel-Lloyd index. 2) “.” indicates “not available”.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>

and low values with the low-income countries such as the Philippines (0.002) and Thailand (0.019). On the other hand, low-income countries such as Indonesia, the Philippines, and Thailand do not reveal such a systemic pattern.

On the other hand, as can be seen in table 4, the share of two-way transactions in bonds appears smaller on average than that in equities. Unlike the case of equities, no clear pattern is observed in the case of bonds. Thus, the nature of the market for bonds seems somewhat different from that for equities. We speculate that the gains from international diversification are more pronounced for equities than for bonds, since the returns to the former are determined more by local and industry-specific factors than are the returns to bonds. This will be examined further in the following section with a formal regression analysis.

3. THEORETICAL FRAMEWORK AND EMPIRICAL SPECIFICATIONS

The central objective of the following empirical study is to explore the determinants of size of two-way cross-border financial transactions. Since Grubel and Lloyd (1975)'s extensive work on intra-industry trade, this phenomenon, defined as two-way trade in similar products, has acquired a permanent position at the frontier of international trade theory. Krugman (1979), Lancaster (1980) and Brander (1981) have suggested some formal theoretical explanations for intra-industry trade. Krugman (1979) and Lancaster (1980) modeled intra-industry trade of differentiated products under monopolistic competition, while Brander (1981) explained two-way trade in identical products under oligopolistic competition. Helpman (1987), utilizing the theory under monopolistic competition, has shown that the share of intra-industry trade increases, as countries become more similar in their factor endowments. On the other hand, Bernhofen (1999) extended Brander (1981)'s model to develop a general reciprocal-markets model of trade that

accounts for intra-industry trade in homogeneous and differentiated products under oligopolistic competition. The model predicts that the share of intra-industry trade between a country-pair increases, when countries become more similar in their industry productivity and demand size. In their reciprocal dumping model, Feenstra *et al.* (2001) also showed that two-way trade only occurs when countries are of similar size.

Thus, a very useful caveat derived from the models of intra-industry trade in goods is that the share of IIT increases as two countries become more similar. This caveat holds regardless of the types of goods: differentiated products or identical products under either monopolistic competition or oligopolistic competition.

Our paper builds on recent papers that have analyzed the financial gravity equation, such as Martin and Rey (2004 and 2006), Portes and Rey (2005), Aviat and Courdacier (2005), and Courdacier and Martin (2006). Specifically, we draw a testable equation for two-way trade in financial assets from the model of Martin and Rey (2004) and Courdacier and Martin (2006).¹²⁾ As will be seen in the following, the share of two-way flows of cross-border financial assets also increases as two countries become more similar.

3.1. Theoretical Framework

Based on the model of Martin and Rey (2004 and 2006), Courdacier and Martin (2006) derive a gravity equation for international trade in assets with financial transaction costs. In a two-period model with two countries, the value of the aggregate demand by country i agents for assets issued in country j is:

¹²⁾ Basu and Chau (2007) develop a theoretical model of two-way capital flow, exploiting insights from decision-making under uncertainty. But their model is to demonstrate theoretically why the outward flight of capital and inward foreign direct investment co-exist, and hence is not relevant for our purpose.

$$Asset_{ij} = \frac{\beta L_i y_i n_j}{(1 + \beta)} \left(\frac{r_j Q_i}{\tau_{ij}} \right)^{\varepsilon-1}, \quad (3)$$

where L_i = population of country i ,

y_i = per capita income of country i ,

$L_i y_i$ = size factor (GDP or market capitalization of country i),

n_j = number of assets in country j (financial sophistication of country j),

τ_{ij} = transaction costs between the two countries,

r_j = expected return in country j ,

Q_i = financial price index specific to country i .¹³⁾

Therefore, the value of the aggregate demand by country j agents for assets issued in country i is:

$$Asset_{ji} = \frac{\beta L_j y_j n_i}{(1 + \beta)} \left(\frac{r_i Q_j}{\tau_{ij}} \right)^{\varepsilon-1}, \quad (4)$$

which is the exact counterpart of equation (3).

As noted above, we use GL index to measure the extent of two-way holdings of financial assets between countries:

$$GL_{ij}^{Asset} = 1 - \frac{|Asset_{ij} - Asset_{ji}|}{Asset_{ij} + Asset_{ji}}. \quad (2)$$

This implies that GL approaches one as the value of the aggregate demand by country i agents for a class of asset (say, equities) issued in country j becomes similar to the value of the aggregate demand by country j agents for the same class of asset issued in country i . Therefore, GL approaches one as

¹³⁾ As in Anderson and van Wincoop (2003 and 2004) where price index measures the country's remoteness in the gravity equation for goods trade, Q_i measures the country's financial remoteness.

the country-specific variables become similar in both countries. That is, $GL \rightarrow 1.0$ as $L_i y_i \rightarrow L_j y_j$, $n_i \rightarrow n_j$, $r_i \rightarrow r_j$, and $Q_i \rightarrow Q_j$. To summarize, GL is a function of relative differences in the country-specific variables in equations (3) and (4). Thus, transaction costs between countries, τ_{ij} , do not appear to have any association with the extent of two-way holdings of financial assets between the two countries, but in the following regressions, we include the proxy variables for the transaction costs to examine if this theoretical prediction is supported by the data.

3.2. Empirical Specification (1)

As noted earlier, we explore a panel data set for three years, namely 1997, 2001, and 2005, on two-way holdings of cross-border financial assets between three “source” countries and 60 “partner” countries. The three source countries are Japan, the U.S., and France, which represent three major security markets in the world: East Asia, North America, and Europe, respectively.

As noted above, GL approaches one as the country-specific variables become similar in both countries. For the market size ($L_j y_j$), we use market capitalization (in 2000 US dollars), taken from the World Bank’s WDI Online data.¹⁴⁾¹⁵⁾ In Martin and Rey (2006), the number of assets issued by a country is shown to increase with financial openness of the country. We therefore proxy the financial sophistication (n_j) of market (j) by the capital control intensity index drawn from the *Economic Freedom of the World (EFW)* index published annually by the Fraser Institute.¹⁶⁾ This measures the foreign ownership/investment restrictions and capital controls, taking a value between 0 and 1. The higher the value, the lower are the restrictions on foreign ownership/investment and the capital controls, and hence the more liberalized is the capital market. We call this $Caplib_j$.

¹⁴⁾ <http://publications.worldbank.org/WDI>

¹⁵⁾ We also used GDP in place of market capitalization, but this did not affect our estimates.

¹⁶⁾ <http://www.freetheworld.com>

Here, relative difference in capitalization (*Cap_dif*) is calculated as:

$$Cap_dif_{ijt} = 1 + [w \cdot \ln w + (1 - w) \cdot \ln(1 - w)] / \ln 2, \quad (5)$$

where w is the ratio of the capitalization of country j to the sum of the capitalizations of countries i and j . As the difference becomes large, w approaches zero or one and Cap_dif_{ijt} approaches one. If the values of capitalization of two countries are the same, w is 1/2 and Cap_dif_{ijt} will be zero.

Relative difference in liberalization of capital market (*Caplib_dif*) is also calculated by using the formula for *Cap_dif*, with the capitalization being replaced with *Caplib*.

Relative difference in expected return (*Irate_dif*) is calculated by using the formula for *Cap_dif*, with *Cap* being replaced with the real interest rate drawn from the World Development Indicators of the World Bank.¹⁷⁾ Thus, we assume that the real interest rate parity (RIP) condition is to hold when other factors are controlled. Any difference in the interest rates can be seen as a reflection of the country (or political) risk premium and the currency risk premium.¹⁸⁾

We control for fixed effects in the source country dimension (i) to account for the financial price index, Q_{it} , which can be considered as the “multilateral resistance term” of Anderson and van Wincoop (2003 and 2004). We also

¹⁷⁾ One might suggest that we use the average gross equity returns over some preceding years (say 10 years), but we believe that real interest rate is a better proxy, because the interest rate difference between countries has been considered as the main driver of the cross-border capital movement.

¹⁸⁾ One might suggest that we use the covered interest parity (CIP) condition or the uncovered interest parity (UIP) condition. The CIP condition, which requires the domestic interest rate to be equalized by the sum of the foreign interest rate and the forward margin, cannot be utilized here, as the data on forward rates are not easily available for many developing economies. The UIP condition, which requires the domestic interest rate to be equalized by the sum of the foreign interest rate and the expected exchange rate change at time t , could be utilized here, as the expected exchange rate could be measured by using ex-post differentials. However, this would not be an easy task, and we do not consider doing this here for the work in the future. See Cavoli, Rajan, and Siregar (2004) for a survey of the empirical literature on financial integration in East Asia, with the focus being on alternative interest parity conditions.

include year dummies to take account of factors such as world business cycle, global capital market shocks, and so forth.

Therefore, our empirical equation for two-way holdings of assets depends upon relative difference in capitalization (*Cap_dif*), relative difference in liberalization of capital market (*Caplib_dif*), and relative difference in expected return (*Irate_dif*) as follows:

$$GL_{ij}^{Asset} = \alpha + \beta_1 Cap_dif_{ijt} + \beta_2 Caplib_dif_{ijt} + \beta_3 Irate_dif_{ijt} + \beta_4 \log \tau_{ijt} + u_i + u_t + \varepsilon_{ijt}, \quad (6)$$

where τ_{ij} is transaction costs between the two countries, which takes the following specific functional form:

$$\tau_{ij} = Dist_{ij}^{\delta} \exp(\delta_2 Comlang_{ij} + \delta_3 Contig_{ij} + \delta_4 Colony_{ij} + \delta_5 Fcenter_j),$$

where *Dist* is the bilateral distance, and *Comlang*, *Contig*, *Colony*, and *Fcenter* are dummies that indicate that partner countries share a common language, share a common border, are former colonies, and are offshore financial centers, respectively. It is noted that English was taken as the national language of Japan because, while Japanese is used only in Japan, English, a major universal business language, is used widely for business in Japan. We include *Fcenter* to control for partner countries that are offshore financial centers with very favorable fiscal treatment.¹⁹⁾

Geographical distance is taken from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)'s website.²⁰⁾ It is noted that the distances are weighted distances, which use city-level data to assess the geographic distribution of population inside each nation. The variables indicating whether the countries share a geographic border or a common

¹⁹⁾ Offshore financial centers in our sample are Bahrain, Barbados, Bermuda, Costa Rica, Cyprus, Hong Kong, Ireland, Luxembourg, Malta, and Panama.

²⁰⁾ <http://www.cepii.fr/anglaisgraph/bdd/distances.htm>

language or are former colonies of another country are also taken from CEPII's website.

To analyze whether Japan is the major partner of other East Asian countries in two-way asset trade, we add a dummy variable, Jp_Asia , which takes one if the two countries are Japan and an East Asian country. We will also add another dummy variable, Us_Asia , which takes one if the two countries are the U.S. and an East Asian country, to evaluate whether the U.S. is the major partner in East Asian countries' two-way asset trade. In addition, in order to compare these with the case of the Euro, we also add another dummy variable, Fr_Euro , which takes one if the two countries are France and another Euro member economy. Thus, equation (6) becomes

$$GL_{ijt}^{Asset} = \alpha + \beta_1 Cap_dif_{ijt} + \beta_2 Caplib_dif_{ijt} + \beta_3 Irate_dif_{ijt} + \beta_4 \log \tau_{ijt} + \beta_5 Jp_Asia + \beta_6 Us_Asia + \beta_7 Fr_Euro + u_i + u_t + \varepsilon_{ijt}. \quad (7)$$

Lastly, it is noted that the estimation of a linear function would predict values of GL index that lie outside the interval $[0, 1]$, while the index can take values only within this interval. Therefore, we estimate the dependent variable by applying a logistic transformation as follows:

$$GL^T = \ln[GL / (1 - GL)]. \quad (8)$$

Applying a logistic transformation to the dependent variable involves dropping observations with zero values for the dependent variable. There are also countries in our sample whose data are not available, perhaps because their financial markets are not well developed. Thus, our data are truncated, making standard ordinary least squares (OLS) regression estimates biased. Therefore, we also estimate equation (8) with the Tobit regression model.²¹⁾

²¹⁾ We also estimated equation (8) with a very small number replaced for the missing observations and found the qualitative results remain the same. We do not report the results here for brevity.

3.3. Empirical Specification (2)

It is reasonable to ask whether the relationship between the two-way holdings of cross-border financial assets and our explanatory variables behaves in a consistent way for the three source countries: Japan, the U.S. and France. Indeed, the three countries are quite different in terms of their geographical location, membership of trading blocks, the degree of financial market openness and development, etc.

To take account of any possible differences among the three source countries noted above, empirical specification (2) considers two-way asset holdings for each source country. This specification also allows us to check whether our results from empirical specification (1) are dominated by any particular source country.

In this specification, country i stands for only one country (Japan, the U.S., or France), and hence fixed effects for country i are removed from the empirical equations and instead country j effects are considered. In addition, we include a dummy variable, *Asia*, which takes the value of one if the partner is an East Asian country and, in the French equation, a dummy variable, *Euro*, for Euro members.

$$GL_{ijt}^{Asset} = \alpha + \beta_1 Cap_dif_{ijt} + \beta_2 Caplib_dif_{ijt} + \beta_3 Irate_dif_{ijt} + \beta_4 \log \tau_{ijt} + \beta_5 Asia(+\beta_6 Euro) + u_j + u_t + \varepsilon_{jt}. \quad (9)$$

In this case, the commonly used fixed-effects procedure is not appropriate, as partner country dummies (u_j) and the time-invariant variables are perfectly collinear. Therefore, random-effects procedure is applied in this specification.²²⁾ We also estimate equation (9) by applying random-effect

²²⁾ It is noted that random effects procedure may be inconsistent because it imposes the assumption of strict exogeneity and orthogonality between explanatory variables and the error term, but unobserved local factors could be captured by the error term and correlated with an explanatory variable. Nonetheless, we apply this procedure as a robustness check for the results obtained from empirical specification (1).

Tobit left censoring estimation to account for the unavailable observations.

3.4. Empirical Specification (3)

It is also reasonable to ask whether the relationship between the two-way asset holdings and our explanatory variables behaves in a consistent way over time, without being dominated by any particular year. As a matter of fact, 1997 was the year when the East Asian financial crisis erupted, and in the 1997 CPIS only a limited number of economies participated; holdings of short-term securities were not mandated, and hence a comparison of estimates for different years may be useful.

Therefore, with source country dummies included, we run our equations as a cross-section for each year of the sample as follows:

$$GL_{ij}^{Asset} = \alpha + \beta_1 Cap_dif_{ij} + \beta_2 Caplib_dif_{ij} + \beta_3 Irate_dif_{ij} + \beta_4 \log \tau_{ij} + \beta_5 Jp_Asia + \beta_6 Us_Asia + \beta_7 Fr_Euro + u_i + \varepsilon_j. \quad (10)$$

To account for the unavailable observations, we also apply Tobit left censoring estimation.

4. EMPIRICAL RESULTS

4.1. Results from Specification (1)

Table 5 shows our benchmark regression results with a full-panel model with source country dummies and year dummies included. Columns (1) and (2) present the results for equities estimated with ordinary least squares (OLS) and the Tobit left censoring method, respectively, and columns (3) and (4) show the equivalent results for bonds.

As can be seen, the overall explanatory power of the equations is low with

Table 5 Determinants of Two-way Holdings of Securities — Panel (1997-2005)

	Equities		Bonds	
	(1) OLS	(2) Tobit	(3) OLS	(4) Tobit
<i>Cap_dif</i>	-2.04*** (0.28)	-2.26*** (0.32)	-0.35 (0.31)	-0.36 (0.30)
<i>Caplib_dif</i>	-6.28*** (1.29)	-11.40*** (2.54)	-4.03*** (1.46)	-6.32*** (1.71)
<i>Irate_dif</i>	-0.031*** (0.006)	-0.034*** (0.010)	-0.011* (0.007)	-0.015 (0.010)
<i>logDist</i>	0.04 (0.13)	0.10 (0.14)	-0.06 (0.04)	-0.06 (0.13)
<i>Fcenter</i>	0.17 (0.24)	-0.04 (0.17)	-0.27 (0.22)	-0.37 (0.24)
<i>Comlang</i>	0.23 (0.18)	0.26 (1.33)	0.01 (0.17)	0.06 (0.19)
<i>Contig</i>	0.05 (0.37)	-0.00 (0.47)	-0.32 (0.39)	-0.40 (0.45)
<i>Colony</i>	-0.22 (0.25)	-0.28 (0.32)	0.28 (0.31)	0.24 (0.31)
<i>Jap_Asia</i>	-0.42 (0.29)	-0.05 (0.12)	0.07 (0.37)	0.16 (0.37)
<i>Us_Asia</i>	-0.89*** (0.24)	-0.86*** (0.34)	-0.11 (0.30)	-0.08 (0.31)
<i>Fr_Euro</i>	0.72** (0.31)	0.86** (0.43)	0.91** (0.40)	0.91** (0.41)
<i>Constant</i>	0.85 (1.26)	0.44 (1.30)	-0.64 (1.35)	-0.64 (1.24)
# OBS	310	310	312	312
Log likelihood		-486.91		-492.13
LR Chi ²		137.17***		102.98***
R ²	0.328		0.256	
Pseudo R ²		0.124		0.095

Notes: 1) Columns 1 and 3 are estimated with ordinary least squares (OLS) and columns 2 and 4 are estimated applying Tobit left censoring method to account for the unavailable observations. 2) All estimates include source country dummies and year dummies, but they are not reported for brevity. 3) Shown in parentheses are the robust errors corrected for heteroskedasticity. 4) ***, **, and * denote 1, 5, and 10% level of significance, respectively.

R-squares ranging from 0.328 to 0.256. However, such results are common to all intra-industry trade models.

Looking at the results obtained by OLS (column 1), it is striking to find that, for the equity holdings, the three difference variables all have estimates with the predicted negative sign and are statistically significant. This finding suggests that the three “source” countries enjoy the highest extent of two-way holdings of equities with countries which are similar in terms of market size, capital market liberalization, and real interest rate. The estimates derived from Tobit (column 2) also support this finding.

As for the two-way holdings of bonds, this finding is only valid for the capital market liberalization variable in both models (columns 3 and 4). The interest rate difference variable is only statistically significant in OLS and the capitalization difference variable is statistically insignificant in either model, even though it still has a negative estimate. Thus the nature of the market for bonds is somewhat different from that for equities.

It is also interesting to note that none of the variables related with transaction costs such as bilateral geographical distance, the commonality of language and border, and being former colonies reveals any statistically significant estimates, as predicted by the theory. It is also noted that Japan, the U.S., and France do not have a propensity to engage in higher levels of two-way holdings of financial assets with off-shore financial centers.

Above and beyond these effects, do Japan and other East Asian countries enjoy a greater degree of two-way transactions in financial assets? The answer is no. Specifically, we find that Japan’s two-way trade in securities with other East Asian countries is not greater than that with non-East-Asian countries. This is in contrast with the finding that France enjoys more two-way trade in securities with other Euro member countries than with non-Euro members. It is also noteworthy that the degree of two-way trade in securities between the U.S. and East Asian countries is smaller than between other country group pairs. Thus, equity trade between the U.S. and East Asian countries can be characterized as unilateral, with the U.S. being the investor and East Asian countries being the recipients.

4.2. Results from Specification (2)

Table 6 reports the estimated results from the random-effects procedure for two-way holdings of equities, for each source country. The first three columns report the results from the standard random-effects panel model and the last three columns report random effects panel Tobit results.

Looking at the results from the standard random-effects panel model shown in columns (1)-(3), the Japanese equation finds that difference in the size of the country, difference in capital market liberalization, and difference in real interest rate enter with the right sign and coefficients and are statistically significant. While the equations for the U.S. and France also reveal negative coefficients for the three variables, in the U.S. equation, the coefficients for the market size difference and the real interest rate difference are statistically significant, and in the French equation, only the coefficient for the market size difference is statistically significant. It is also noted that none of the transaction cost-related variables reveals a statistically significant estimates.

Turning to our key dummy variables, we find that the extent of two-way transactions in equities between Japan and other East Asian countries is not greater than with non-East Asian countries.

The Tobit results shown in columns (4)-(6) are largely consistent with those obtained by the standard random-effects procedure. Thus, the results obtained from empirical specification (1) are generally supported by empirical specification (2).

Table 7 reports the corresponding results for the two-way holdings of bonds. It is interesting to note that among the three difference variables, the difference variable for capital market liberalization has an expected negative estimate which is statistically significant, irrespective of home countries and estimation procedures. It is also noted that except for the offshore financial center dummy variable in the U.S. equation, none of the transaction-cost-related variables reveals a statistically significant estimate. Again, Japan does not seem to enjoy a two-way trade in bonds with other East Asian countries at a degree greater than with non-East-Asian countries.

Table 6 Determinants of Two-way Holdings of Equities for Japan, U.S., and France

	Random Effects			Random Effects Tobit		
	(1) Japan	(2) U.S.	(3) France	(4) Japan	(5) U.S.	(6) France
<i>Cap_dif</i>	-2.20*** (0.61)	-3.21** (1.27)	-1.29** (0.62)	-2.54*** (0.65)	-3.40** (1.27)	-1.56** (0.54)
<i>Caplib_dif</i>	-5.50** (2.62)	-1.12 (3.78)	-4.05 (3.22)	-9.34** (3.84)	-1.22 (3.78)	-10.57** (4.86)
<i>Irate_dif</i>	-0.026* (0.013)	-0.056** (0.027)	-0.004 (0.028)	-0.041* (0.018)	-0.053** (0.027)	-0.007 (0.024)
<i>logDist</i>	-0.35 (0.54)	-0.59 (0.77)	-0.02 (0.23)	-0.03 (0.58)	-0.65 (0.75)	-0.003 (0.19)
<i>Fcenter</i>	0.47 (0.50)	-0.40 (0.68)	-0.23 (0.51)	0.34 (0.55)	-0.52 (0.66)	-0.33 (0.48)
<i>Comlang</i>	-0.06 (0.40)	0.53 (0.51)	-0.20 (0.96)	0.01 (0.42)	0.53 (0.50)	-0.28 (0.73)
<i>Contig</i>		-1.13 (1.46)	0.44 (0.99)		-1.19 (1.42)	0.26 (0.76)
<i>Colony</i>		-0.79 (0.73)	0.48 (0.93)		-0.80 (0.71)	0.40 (0.73)
<i>Euro</i>			1.01 (0.63)			1.08** (0.50)
<i>East_Asia</i>	-0.73 (0.73)	-0.78 (0.62)	0.57 (0.55)	-0.11 (0.79)	-0.81 (0.60)	0.55 (0.47)
<i>Constant</i>	4.48 (4.88)	7.57 (6.94)	0.63 (1.89)	1.70 (5.24)	8.26 (6.80)	0.71 (1.57)
# OBS	105	113	92	105	113	92
Log likelihood				-147.88	-157.73	-143.40
Wald Chi ²				36.58***	29.50***	43.59***
R ²	0.420	0.323	0.334			

Notes: 1) Columns 1-3 are estimated with ordinary least squares (OLS) and columns 4-6 are estimated applying random-effect Tobit left censoring method to account for the unavailable observations. 2) All estimates include source country dummies and year dummies, but they are not reported for brevity. 3) Shown in parentheses are the robust errors corrected for heteroskedasticity. 4) ***, **, and * denote 1, 5, and 10% level of significance, respectively.

Table 7 Determinants of Two-way Holdings of Bonds for Japan, U.S., and France

	Random Effects			Random Effects Tobit		
	(1) Japan	(2) U.S.	(3) France	(4) Japan	(5) U.S.	(6) France
<i>Cap_dif</i>	-0.58 (0.50)	1.18 (0.90)	-0.33 (0.64)	-0.45 (0.51)	1.15 (0.82)	-0.45 (0.54)
<i>Caplib_dif</i>	-2.80** (2.01)	-3.22*** (3.43)	-4.75*** (3.55)	-5.19** (2.52)	-3.08*** (3.21)	-7.44** (3.42)
<i>Irate_dif</i>	-0.007 (0.011)	-0.002 (0.020)	-0.020 (0.030)	-0.014 (0.012)	-0.002 (0.019)	-0.019 (0.026)
<i>logDist</i>	-0.04 (0.43)	-0.61 (0.57)	-0.05 (0.25)	-0.18 (0.44)	-0.60 (0.53)	-0.05 (0.21)
<i>Fcenter</i>	0.28 (0.40)	-1.45*** (0.51)	-0.20 (0.60)	0.08 (0.41)	-1.43*** (0.47)	-0.08 (0.52)
<i>Comlang</i>	0.15 (0.31)	0.13 (0.35)	-0.47 (1.04)	0.24 (0.31)	0.13 (0.32)	-0.47 (0.82)
<i>Contig</i>		-1.08 (1.10)	0.10 (1.07)		-1.05 (1.01)	0.12 (0.85)
<i>Colony</i>		0.60 (0.47)	0.61 (1.00)		0.59 (0.42)	0.51 (0.81)
<i>Euro</i>			0.85 (0.68)			0.75 (0.56)
<i>East_Asia</i>	0.11 (0.58)	0.25 (0.42)	0.07 (0.57)	0.04 (0.58)	0.23 (0.38)	0.03 (0.48)
<i>Constant</i>	-0.49 (3.94)	3.84 (5.11)	0.25 (2.10)	0.73 (3.98)	3.75 (4.71)	0.33 (1.74)
# OBS	105	112	95	105	112	95
Log likelihood				-137.16	-168.53	-158.27
Wald Chi ²				12.13	26.39***	16.21
R ²	0.154	0.192	0.150			

Notes: 1) Columns 1-3 are estimated with ordinary least squares (OLS) and columns 4-6 are estimated applying random-effect Tobit left censoring method to account for the unavailable observations. 2) All estimates include partner country dummies and year dummies, but they are not reported for brevity. 3) Shown in parentheses are the robust errors corrected for heteroskedasticity. 4) ***, **, and * denote 1, 5, and 10% level of significance, respectively.

4.3. Results from Specification (3)

Table 8 Determinants of Two-way Holdings of Equities — Each Year

	OLS			Tobit		
	(1) 1997	(2) 2001	(3) 2005	(4) 1997	(5) 2001	(6) 2005
<i>Cap_dif</i>	-0.66 (0.77)	-2.73*** (0.43)	-1.67** (0.44)	-0.38 (0.62)	-3.01*** (0.48)	-1.93** (0.53)
<i>Caplib_dif</i>	-21.28** (7.97)	-5.28*** (1.72)	-6.63** (2.18)	-20.39** (9.13)	-11.49*** (3.55)	-12.51*** (4.35)
<i>Irate_dif</i>	-0.120*** (0.033)	-0.031*** (0.009)	-0.029* (0.009)	-0.186v (0.057)	-0.021*** (0.015)	-0.040** (0.015)
<i>logDist</i>	-0.24 (0.30)	-0.23 (0.22)	0.38* (0.21)	-0.25 (0.24)	-0.23 (0.21)	0.52* (0.23)
<i>Fcenter</i>	0.52 (0.72)	0.25 (0.34)	-0.02 (0.37)	0.43 (0.61)	-0.46 (0.31)	-0.25 (0.39)
<i>Comlang</i>	0.21 (0.24)	0.41 (0.29)	0.11 (0.31)	0.24 (0.30)	-0.46 (0.31)	0.10 (0.34)
<i>Contig</i>	0.24 (0.46)	-0.36 (0.55)	0.30 (0.64)	0.20 (0.69)	-0.50 (0.77)	0.34 (0.79)
<i>Colony</i>	-0.33 (0.29)	-0.66 (0.44)	0.23 (0.44)	-0.36 (0.45)	-0.72 (0.48)	0.20 (0.57)
<i>Jp_Asia</i>	-1.44** (0.55)	-0.64 (0.43)	0.38 (0.55)	-1.41** (0.61)	-0.19 (0.57)	0.91 (0.71)
<i>Us_Asia</i>	-0.30 (0.46)	-0.84*** (0.37)	-1.14*** (0.42)	-0.25 (0.53)	-0.65*** (0.51)	-1.21*** (0.57)
<i>Fr_Euro</i>	0.20 (0.64)	0.44 (0.59)	0.89** (0.43)	0.12 (0.65)	0.58 (0.66)	1.05** (0.76)
<i>Cons</i>	3.33 (2.62)	3.61* (1.99)	-2.59 (1.96)	3.49 (2.16)	3.68* (1.93)	-3.64 (2.17)
# OBS	58	118	134	58	118	134
Log likelihood				-73.10	-172.77	-217.61
LR Chi ²				46.58***	80.43***	46.98***
R ²	0.517	0.460	0.255			

Notes: 1) Columns 1-3 are estimated with ordinary least squares (OLS) and columns 4-6 are estimated applying Tobit left censoring method to account for the unavailable observations. 2) All estimates include source country dummies, but they are not reported for brevity. 3) Shown in parentheses are the robust errors corrected for heteroskedasticity. 4) ***, **, and * denote 1, 5, and 10% level of significance, respectively.

Table 9 Determinants of Two-way Holdings of Bonds — Each Year

	OLS			Tobit		
	(1) 1997	(2) 2001	(3) 2005	(4) 1997	(5) 2001	(6) 2005
<i>Cap_dif</i>	-0.02 (1.00)	-0.03 (0.47)	-0.47 (0.48)	0.12 (0.08)	-0.00 (0.41)	-0.49 (0.47)
<i>Caplib_dif</i>	-3.45 (2.33)	-3.88** (1.55)	-2.91** (1.98)	-3.65 (3.94)	-7.43*** (2.59)	-4.61* (2.79)
<i>Irate_dif</i>	-0.127 (0.083)	-0.021** (0.010)	-0.004 (0.008)	-0.121 (0.077)	-0.027* (0.015)	-0.007 (0.012)
<i>logDist</i>	-0.18 (0.28)	-0.10 (0.22)	0.03 (0.24)	-0.20 (0.30)	-0.08 (0.17)	0.03 (0.21)
<i>Fcenter</i>	-0.10 (0.75)	-0.52* (0.31)	-0.08 (0.36)	-0.09 (0.81)	-0.68* (0.33)	-0.14 (0.34)
<i>Comlang</i>	-0.06 (0.45)	0.07 (0.24)	0.13 (0.28)	-0.05 (0.40)	0.08 (0.28)	0.16 (0.30)
<i>Contig</i>	1.28** (0.63)	-1.13** (0.54)	-0.43 (0.57)	1.25** (0.92)	-1.18** (0.67)	-0.48 (0.71)
<i>Colony</i>	-0.50 (0.69)	0.51 (0.40)	0.79* (0.40)	-0.49 (0.61)	0.47 (0.42)	0.76* (0.51)
<i>Jp_Asia</i>	1.02 (1.85)	-0.56 (0.40)	0.35 (0.48)	1.01 (0.92)	-0.46 (0.49)	0.54 (0.57)
<i>Us_Asia</i>	1.61*** (0.46)	-0.39 (0.48)	-0.76 (0.44)	1.62*** (0.68)	-0.32 (0.42)	-0.74 (0.49)
<i>Fr_Euro</i>	-0.66 (0.71)	1.94*** (0.54)	0.57 (0.56)	-0.65 (0.84)	1.96*** (0.57)	0.54 (0.67)
<i>Constant</i>	-1.02 (1.61)	-0.23 (2.15)	-1.39 (2.19)	1.25 (2.76)	-0.41 (1.60)	-1.47 (2.02)
# OBS	61	121	130	61	121	130
Log likelihood				-96.11	-168.60	-205.00
LR Chi ²				20.66*	79.61***	47.27***
R ²	0.297	0.450	0.279			

Notes: 1) Columns 1-3 are estimated with ordinary least squares (OLS) and columns 4-6 are estimated applying Tobit left censoring method to account for the unavailable observations. 2) All estimates include source country dummies, but they are not reported for brevity. 3) Shown in parentheses are the robust errors corrected for heteroskedasticity. 4) ***, **, and * denote 1, 5, and 10% level of significance, respectively.

Tables 8 and 9 report the estimated results for two-way holdings of equities and bonds, respectively, for each year. OLS estimates appear in columns (1)-(3) and Tobit estimates in columns (4)-(6). Again, the results for each year confirm the main results found in the previous specifications: for two-way transactions in equities, the three difference variables continue to have negative and significant estimates in most equations, irrespective of years and estimation procedures. We also find that Japan does not have a greater propensity to engage in two-way holding of equities with other East Asian countries.

In equations for bonds reported in table 9, difference in capital market liberalization reveals negative estimates statistically significant for the two years of 2001 and 2005, while the difference variable for real interest rate reveals a statistically significant negative estimate only for 2001. In both OLS and Tobit, it is also shown that Japan does not have a greater propensity to engage in two-way holding of bonds with other East Asian countries.

5. SUMMARY AND CONCLUDING REMARKS

The theory of international finance underlying models of macro-economic adjustment and the motives for and welfare effects of capital flows are based on the simplifying assumption that all financial assets are homogeneous and that risk is not an argument in the utility function of wealthholders. These models imply that a country either exports or imports financial assets and that it either holds foreign debt or is indebted to the rest of the world.

This standard, heuristically useful theory is enriched by the recognition that financial assets are not homogeneous, that countries simultaneously import and export them and that they simultaneously hold foreign assets and are indebted to the rest of the world. The size of this phenomenon was documented in this study through the calculation of the Grubel-Lloyd index. It was seen to be quantitatively significant for many country pairs.

Given the magnitude of the simultaneous holdings of assets for many

country pairs it is important to remember that the basic, traditional models of international capital flows used widely in teaching do not account for these. In all of these models capital flows from the country with the lower to the country with the higher interest rate, never in both directions. This fact points to the need to enrich these traditional models of international capital flows by including the existence of risk and wealthholders' opportunities to reduce portfolio risk through the international diversification of their assets.

Our regression study shows that Japan, the U.S., and France have a greater propensity to engage in two-way holding of equities (and bonds to some extent) with countries whose market size, the degree of capital market liberalization, and real interest rates are similar.

Noting that the three source countries have large market size and a high degree of capital market liberalization, the results may also imply that these countries have a greater propensity to engage in two-way holdings of securities with countries whose market size is larger and whose degree of capital market liberalization is higher. Thus, the evidence presented here may imply that more and freer movement of capital has resulted in high levels of portfolio diversification, which reduces risk and raises the welfare of wealthholders in these countries.

The policy implications of our study and results add to the case for the free movement of capital among countries. The actions of wealthholders who diversify their portfolios internationally reveal that they increase their welfare by doing so. Obstacles to the purchase of foreign assets maintained by many smaller countries with low per capita incomes reduce welfare and should be eliminated.

It was also found that the market for bonds is fundamentally different from that for equities. Among the difference variables, only difference in capital market liberalization retains statistically significant estimates, irrespective of estimation procedures. As a matter of fact, none of the coefficients for the explanatory variables is statistically significant. This may be due to the greater degree of globalization for bonds and the resultant greater correlation in returns that reduces the benefits from diversification. It is also possible

that central banks around the world hold large quantities of US government bonds in their international reserve portfolios. These holdings are driven less by the diversification motive than by the need to own assets that can readily be converted into cash in a deep and liquid world market whenever they are needed for official exchange market interventions or other national emergencies.

It has also been found that Japan does not have a propensity to engage in two-way holdings of financial assets with other East Asian countries. Thus, we have evidence that while intraregional trade in goods in East Asia is already quite high, comparable to that of the European Union, East Asia's intraregional trade in financial assets is more or less still in its infancy. Without a deeper integration of financial markets in East Asia, the prospects for the East Asian Community are only halfway there.

APPENDIX

A1. Data Sources

- Bilateral Securities Holdings: in millions of US dollars (denominated by US GDP deflator, 2000=100), the International Monetary Fund, the Coordinated Portfolio Investment Survey, <http://www.imf.org/external/np/sta/pi/cpis.htm>
- Market Capitalization: in millions of US dollars (denominated by US GDP deflator, 2000=100), from the World Bank, the World Development Indicators, <http://publications.worldbank.org/WDI>
- Bilateral Distance: weighted distances in km, which use city-level data to assess the geographic distribution of population inside each nation, from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)'s website, <http://www.cepii.fr/anglaisgraph/bdd/distances.htm>
- Geography Variables (Comlang, Contig, Colony): from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)'s website, <http://>

www.cepii.fr/anglaisgraph/bdd/distances.htm

- Real Interest Rate: from the World Development Indicators, <http://publications.worldbank.org/WDI>
- Capital Liberalization (*Caplib*) and Trade Liberalization (*Tradelib*): *Economic Freedom of the World Index* by the Fraser Institute, <http://www.freetheworld.com/release.html>

Table A1 Size of Two-way Transactions in Equities — Japan

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	.	25	71	.	0.054	0.140
Australia	5,581	6,719	22,255	0.740	0.893	0.932
Austria	517	900	2,701	0.530	0.111	0.567
Bahrain	.	24	50	.	0.000	0.000
Barbados	.	.	75	.	.	0.017
Belgium	1,768	2,400	3,723	0.917	0.688	0.878
Bermuda	2,071	3,346	15,206	0.143	0.972	0.995
Brazil	.	118	524	.	0.017	0.012
Bulgaria	.	.	0	.	.	0.000
Canada	8,584	17,183	43,581	0.543	0.322	0.506
Chile	33	9	57	0.061	0.716	0.736
Colombia	.	0	.	.	0.000	.
Costa Rica	.	.	.	.	.	.
Cyprus	.	2	15	.	0.000	0.993
Czech Republic	.	4	108	.	0.066	0.107
Denmark	2,176	2,799	9,974	0.475	0.353	0.233
Egypt	.	1	37	.	0.000	0.000
Estonia	.	.	2	.	.	0.812
Finland	457	2,665	5,056	0.875	0.520	0.857
France	13,385	17,501	54,474	0.960	0.828	0.614
Germany	.	12,572	28,268	.	0.918	0.819
Greece	.	114	994	.	0.182	0.109
Hong Kong	.	6,993	17,295	.	0.613	0.944
Hungary	.	22	278	.	0.618	0.196
Iceland	.	24	179	.	0.000	0.000
India	.	.	2,750	.	.	0.000
Indonesia	.	52	.	.	0.085	.
Ireland	3,517	8,913	38,451	0.455	0.594	0.462
Israel	.	71	347	.	0.113	0.669
Italy	7,749	13,213	20,799	0.455	0.445	0.614
Japan	.	.	.	.	.	.
Kazakhstan	.	.	195	.	.	0.082
Korea, Republic of	.	483	2,943	.	0.420	0.597
Kuwait	.	.	13	.	.	0.000
Lebanon	.	3	4	.	0.000	0.000
Luxembourg	.	24,774	80,034	.	0.329	0.226
Malaysia	1,081	345	218	0.026	0.040	0.194
Malta	.	0	.	.	0.000	.
Mexico	.	.	.	.	.	.
Netherlands	13,136	14,413	36,526	0.543	0.758	0.415
New Zealand	577	643	2,223	0.295	0.571	0.318
Norway	471	4,130	9,937	0.480	0.131	0.253
Pakistan	.	.	.	.	.	.
Panama	.	10	.	.	0.000	.
Philippines	.	213	43	.	0.005	0.002
Poland	.	8	.	.	0.091	.
Portugal	142	304	547	0.986	0.536	0.415
Romania	.	.	.	.	.	.
Russian Federation	.	10	851	.	0.000	0.000
Singapore	1,413	2,460	6,915	0.324	0.751	0.550
Slovak Republic	.	0	10	.	0.000	0.000
South Africa	.	383	685	.	0.435	0.871
Spain	1,511	6,372	7,530	0.124	0.904	0.565
Sweden	4,693	6,688	15,585	0.765	0.513	0.456
Switzerland	.	12,490	.	.	0.937	.
Thailand	223	291	533	0.009	0.007	0.019
Turkey	.	.	.	.	.	.
United Kingdom	81,693	82,090	182,576	0.463	0.718	0.433
United States	222,400	294,225	685,947	0.783	0.840	0.562
Venezuela	.	.	.	.	.	.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

Table A2 Size of Two-way Transactions in Bonds — Japan

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	2,996	1,925	885	0.002	0.016	0.004
Australia	28,159	17,076	37,382	0.030	0.105	0.150
Austria	7,168	7,009	11,553	0.073	0.157	0.104
Bahrain	.	72	103	.	0.000	0.000
Barbados	.	.	97	.	.	0.248
Belgium	11,461	7,044	16,839	0.911	0.318	0.098
Bermuda	4,071	655	12,069	0.891	0.828	0.830
Brazil	.	4,187	2,449	.	0.000	0.000
Bulgaria	.	.	24	.	.	0.085
Canada	27,561	19,599	31,848	0.031	0.047	0.084
Chile	.	23	279	.	0.440	0.000
Colombia	.	505	380	.	0.006	0.000
Costa Rica	.	.	0	.	.	.
Cyprus	.	11	120	.	0.136	0.039
Czech Republic	.	21	347	.	0.169	0.001
Denmark	5,949	5,025	8,781	0.187	0.173	0.046
Egypt	.	8	163	.	0.501	0.171
Estonia	.	0	31	.	.	0.237
Finland	7,799	4,115	4,719	0.041	0.003	0.005
France	31,541	64,193	138,131	0.725	0.312	0.419
Germany	.	109,134	163,277	.	0.085	0.202
Greece	.	2,132	4,418	.	0.003	0.012
Hong Kong	.	8,371	8,312	.	0.303	0.182
Hungary	.	1,037	664	.	0.002	0.030
Iceland	.	.	633	.	.	0.023
India	832	.	.	0.002	.	.
Indonesia	.	109	403	.	0.018	0.084
Ireland	11,930	27,559	41,381	0.162	0.295	0.652
Israel	314	542	862	0.140	0.063	0.002
Italy	18,106	32,888	58,596	0.073	0.112	0.070
Japan	.	.	.	.	.	.
Kazakhstan	.	.	339	.	.	0.147
Korea, Republic of	.	5,528	5,976	.	0.027	0.196
Kuwait	.	.	60	.	.	0.000
Lebanon	.	7	21	.	0.000	0.073
Luxembourg	.	48,432	100,686	.	0.274	0.670
Malaysia	3,487	2,215	1,096	0.001	0.014	0.055
Malta	.	80	38	.	0.771	0.000
Mexico	.	.	.	.	.	.
Netherlands	39,320	43,234	67,051	0.082	0.118	0.166
New Zealand	2,522	.	4,056	0.035	.	0.153
Norway	5,161	11,084	27,166	0.958	0.765	0.918
Pakistan	.	.	.	.	.	.
Panama	.	67	.	.	0.030	.
Philippines	.	1,352	1,358	.	0.007	0.027
Poland	.	10	.	.	0.061	.
Portugal	1,908	1,439	1,362	0.020	0.022	0.122
Romania	.	.	.	.	.	.
Russian Federation	.	124	517	.	0.097	0.000
Singapore	1,415	10,223	7,240	0.977	0.236	0.694
Slovak Republic	.	31	.	.	0.030	.
South Africa	.	1,081	1,134	.	0.099	0.041
Spain	7,021	10,859	23,960	0.019	0.046	0.037
Sweden	19,965	17,605	23,279	0.025	0.175	0.140
Switzerland	.	5,817	.	.	0.182	.
Thailand	.	748	267	.	0.000	0.360
Turkey	.	.	.	.	.	.
United Kingdom	118,686	122,356	127,352	0.749	0.678	0.831
United States	277,050	393,814	581,884	0.218	0.138	0.092
Venezuela	.	.	.	.	.	.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

Table A3 Size of Two-way Transactions in Equities — France

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	.	30	24	.	0.395	0.004
Australia	1,653	2,941	.	0.364	0.258	.
Austria	550	1,793	19,133	0.705	0.094	0.198
Bahrain	.	48	268	.	0.000	0.000
Barbados	.	.	794	.	.	0.000
Belgium	5,326	20,814	52,578	0.792	0.545	0.512
Bermuda	1,303	1,198	11,595	0.910	0.189	0.818
Brazil	.	242	1,297	.	0.210	0.221
Bulgaria	.	0	22	.	.	0.000
Canada	5,101	9,706	3,910	0.557	0.199	0.554
Chile	.	24	104	.	0.382	0.939
Colombia	.	2	62	.	0.000	0.472
Costa Rica	.	.	4	.	.	0.000
Cyprus	.	16	604	.	0.108	0.015
Czech Republic	.	44	1,488	.	0.438	0.228
Denmark	2,008	3,768	8,697	0.304	0.261	0.330
Egypt	.	100	123	.	0.141	0.653
Estonia	.	0	128	.	.	0.005
Finland	587	6,271	21,362	0.654	0.515	0.787
France	.	.	.	.	.	.
Germany	.	67,610	162,031	.	0.603	0.772
Greece	.	147	5,213	.	0.934	0.758
Hong Kong	.	1,144	10,208	.	0.718	0.536
Hungary	.	43	1,025	.	0.818	0.037
Iceland	.	28	168	.	0.000	0.058
India	.	.	.	.	.	.
Indonesia	.	.	.	.	.	.
Ireland	2,553	13,258	66,471	0.895	0.963	0.668
Israel	.	148	370	.	0.162	0.859
Italy	10,095	25,479	99,877	0.856	0.745	0.632
Japan	13,385	17,501	146,949	0.960	0.828	0.514
Kazakhstan	.	.	511	.	.	0.336
Korea, Republic of	.	455	3,598	.	0.020	0.798
Kuwait	.	.	196	.	.	0.000
Lebanon	.	112	145	.	0.298	0.141
Luxembourg	.	49,899	164,310	.	0.913	0.806
Malaysia	73	100	562	0.137	0.100	0.728
Malta	.	3	336	.	0.000	0.000
Mexico	.	.	542	.	.	0.185
Netherlands	16,554	41,177	122,272	0.861	0.867	0.620
New Zealand	138	104	78	0.159	0.085	0.609
Norway	583	2,978	11,162	0.823	0.249	0.340
Pakistan	.	.	2	.	.	0.000
Panama	.	1	105	.	0.000	0.493
Philippines	.	.	250	.	.	0.960
Poland	.	32	631	.	0.334	0.543
Portugal	511	871	17,515	0.387	0.935	0.165
Romania	.	4	5	.	0.288	0.137
Russian Federation	.	94	769	.	0.000	0.471
Singapore	236	863	5,350	0.653	0.572	0.244
Slovak Republic	.	0	76	.	0.000	0.000
South Africa	.	514	846	.	0.970	0.023
Spain	5,006	17,425	90,185	0.790	0.882	0.484
Sweden	3,041	6,990	11,266	0.689	0.406	0.789
Switzerland	.	21,366	62,079	.	0.993	0.804
Thailand	.	74	303	.	0.000	0.373
Turkey	.	35	308	.	0.009	0.119
United Kingdom	51,262	110,471	80,285	0.357	0.462	0.373
United States	105,481	154,121	135,671	0.401	0.544	0.956
Venezuela	.	.	4	.	.	0.962

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

Table A4 Size of Two-way Transactions in Bonds — France

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	.	507	329	.	0.003	0.224
Australia	1,544	3,777	.	0.201	0.181	.
Austria	3,778	14,246	29,323	0.532	0.658	0.208
Bahrain	.	625	104	.	0.000	0.289
Barbados	.	.	55	.	.	0.093
Belgium	10,506	35,990	96,449	0.766	0.825	0.938
Bermuda	1,321	2,971	2,572	0.186	0.516	0.946
Brazil	.	1,453	829	.	0.003	0.519
Bulgaria	.	82	45	.	0.552	0.002
Canada	8,478	10,129	27,410	0.078	0.139	0.878
Chile	.	81	67	.	0.823	0.976
Colombia	.	52	.	.	0.644	.
Costa Rica	.	.	.	.	.	.
Cyprus	.	146	391	.	0.821	0.176
Czech Republic	.	214	537	.	0.725	0.967
Denmark	4,310	4,190	11,222	0.445	0.913	0.708
Egypt	.	38	54	.	0.887	0.075
Estonia	.	1	67	.	0.000	0.920
Finland	5,119	11,986	16,516	0.160	0.998	0.539
France	.	.	.	.	.	.
Germany	.	92,935	186,943	.	0.580	0.550
Greece	.	10,907	34,448	.	0.102	0.020
Hong Kong	.	2,365	2,395	.	0.207	0.853
Hungary	.	285	1,608	.	0.013	0.032
Iceland	64	122	3,952	0.156	0.217	0.139
India	.	.	184	.	.	0.001
Indonesia	26	21	.	0.000	0.085	.
Ireland	5,036	13,905	78,362	0.748	0.791	0.622
Israel	65	197	778	0.369	0.487	0.527
Italy	10,672	91,989	220,082	0.915	0.607	0.224
Japan	31,541	64,193	45,656	0.725	0.312	0.733
Kazakhstan	.	14	92	.	0.028	0.683
Korea, Republic of	.	1,317	1,375	.	0.323	0.102
Kuwait	.	.	136	.	.	0.977
Lebanon	.	17	322	.	0.420	0.471
Luxembourg	.	39,931	83,639	.	0.394	0.489
Malaysia	.	143	931	.	0.357	0.025
Malta	.	139	115	.	0.000	0.029
Mexico	.	.	961	.	.	0.015
Netherlands	17,737	88,507	179,745	0.301	0.618	0.279
New Zealand	136	809	678	0.426	0.269	0.621
Norway	2,271	3,547	10,701	0.498	0.919	0.712
Pakistan	.	.	6	.	.	0.161
Panama	.	58	.	.	0.099	.
Philippines	.	149	.	.	0.471	.
Poland	.	238	3,632	.	0.090	0.037
Portugal	3,539	14,340	33,754	0.483	0.456	0.050
Romania	.	.	122	.	.	0.207
Russian Federation	.	330	638	.	0.000	0.041
Singapore	129	2,586	1,300	0.930	0.063	0.837
Slovak Republic	.	26	103	.	0.052	0.298
South Africa	.	17	622	.	0.233	0.731
Spain	15,760	44,827	163,383	0.137	0.536	0.249
Sweden	4,917	9,061	23,752	0.554	0.515	0.728
Switzerland	.	19,273	17,648	.	0.132	0.210
Thailand	.	131	118	.	0.748	0.017
Turkey	.	61	542	.	0.066	0.003
United Kingdom	37,941	88,708	181,169	0.921	0.972	0.650
United States	42,507	105,981	336,401	0.690	0.592	0.781
Venezuela	140	.	.	0.243	.	.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

Table A5 Size of Two-way Transactions in Equities — United States

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	12,804	6,974	8,003	0.002	0.213	0.286
Australia	45,107	74,489	139,838	0.634	0.996	0.983
Austria	5,828	8,203	19,075	0.728	0.294	0.876
Bahrain	.	.	.	.	.	.
Barbados	.	.	378	.	.	0.000
Belgium	10,117	18,448	36,253	0.813	0.912	0.900
Bermuda	46,131	130,852	197,636	0.968	0.183	0.241
Brazil	.	22,100	69,312	.	0.027	0.022
Bulgaria	.	0	79	.	0.000	0.021
Canada	123,653	223,981	442,651	0.865	0.800	0.880
Chile	4,624	3,109	9,136	0.030	0.767	0.771
Colombia	.	321	1,476	.	0.936	0.979
Costa Rica	.	7	28	.	0.621	0.580
Cyprus	.	138	270	.	0.856	0.779
Czech Republic	.	579	2,127	.	0.467	0.376
Denmark	13,347	22,435	37,605	0.678	0.672	0.832
Egypt	.	343	2,567	.	0.017	0.000
Estonia	.	40	175	.	0.063	0.710
Finland	15,136	55,413	51,506	0.059	0.148	0.276
France	105,481	154,121	275,952	0.401	0.544	0.513
Germany	.	142,091	218,074	.	0.984	0.551
Greece	.	3,090	11,673	.	0.181	0.367
Hong Kong	.	41,612	56,327	.	0.551	0.421
Hungary	.	1,785	5,090	.	0.093	0.082
Iceland	118	857	1,548	0.051	0.096	0.018
India	.	.	32,772	.	.	0.001
Indonesia	.	.	7,129	.	.	0.000
Ireland	24,534	74,554	132,806	0.861	0.761	0.497
Israel	7,577	15,196	34,539	0.167	0.245	0.314
Italy	51,883	71,785	100,401	0.409	0.939	0.727
Japan	222,400	294,225	685,947	0.783	0.840	0.562
Kazakhstan	.	7	742	.	0.597	0.016
Korea, Republic of	.	29,991	111,801	.	0.030	0.027
Kuwait	.	.	.	.	.	.
Lebanon	.	232	423	.	0.327	0.473
Luxembourg	.	87,901	170,294	.	0.054	0.131
Malaysia	4,782	2,646	7,093	0.031	0.052	0.045
Malta	.	6	17	.	0.000	0.000
Mexico	.	.	60,230	.	.	0.078
Netherlands	153,637	207,013	328,252	0.620	0.911	0.809
New Zealand	6,953	5,928	13,233	0.499	0.676	0.700
Norway	12,080	19,774	62,326	0.444	0.800	0.707
Pakistan	.	.	364	.	.	0.000
Panama	.	7,462	21,079	.	0.003	0.008
Philippines	.	1,436	3,161	.	0.128	0.059
Poland	.	1,220	4,873	.	0.038	0.128
Portugal	7,670	4,888	6,697	0.201	0.437	0.410
Romania	.	3	249	.	0.240	0.001
Russian Federation	.	4,616	18,687	.	0.001	0.006
Singapore	11,876	27,410	45,278	0.302	0.440	0.714
Slovak Republic	.	10	61	.	0.586	0.033
South Africa	.	10,607	39,568	.	0.734	0.403
Spain	30,869	41,105	75,086	0.378	0.421	0.308
Sweden	54,746	63,528	93,998	0.594	0.764	0.862
Switzerland	.	122,803	246,402	.	0.769	0.443
Thailand	2,199	1,930	9,054	0.045	0.015	0.014
Turkey	.	2,278	11,135	.	0.008	0.002
United Kingdom	333,146	479,204	807,887	0.706	0.539	0.668
United States	.	.	.	.	.	.
Venezuela	1,987	365	490	0.012	0.091	0.028

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

Table A6 Size of Two-way Transactions in Bonds — United States

	Total Holdings			Grubel-Lloyd Index		
	1997	2001	2005	1997	2001	2005
Argentina	.	8,432	12,017	.	0.941	0.950
Australia	20,874	25,140	82,026	0.490	0.562	0.609
Austria	6,069	11,146	21,577	0.644	0.562	0.608
Bahrain	.	.	.	.	.	.
Barbados	.	.	10,767	.	.	0.051
Belgium	9,720	23,691	25,186	0.622	0.364	0.375
Bermuda	19,480	113,843	242,590	0.406	0.116	0.106
Brazil	.	13,908	23,147	.	0.227	0.123
Bulgaria	.	2,335	504	.	0.490	0.612
Canada	153,289	140,163	227,806	0.618	0.261	0.498
Chile	17,845	5,449	9,255	0.396	0.520	0.146
Colombia	.	3,503	7,855	.	0.510	0.914
Costa Rica	.	192	772	.	0.068	0.914
Cyprus	.	314	1,474	.	0.324	0.142
Czech Republic	.	481	782	.	0.154	0.038
Denmark	7,825	10,804	29,569	0.005	0.849	0.651
Egypt	.	787	1,477	.	0.668	0.391
Estonia	.	14	126	.	0.766	0.556
Finland	9,072	7,058	8,408	0.702	0.914	0.957
France	15,632	105,981	196,120	0.124	0.592	0.661
Germany	.	100,219	130,586	.	0.764	0.849
Greece	.	2,757	4,059	.	0.728	0.505
Hong Kong	.	29,688	48,054	.	0.128	0.073
Hungary	.	427	1,062	.	0.481	0.578
Iceland	28,152	248	3,446	0.022	0.520	0.134
India	1,744	.	481	0.013	.	0.032
Indonesia	.	564	2,008	.	0.883	0.110
Ireland	3,538	103,435	234,311	0.032	0.078	0.361
Israel	18,915	11,887	24,220	0.556	0.671	0.746
Italy	18,304	50,423	90,547	0.086	0.576	0.342
Japan	50,466	393,814	581,884	0.805	0.138	0.092
Kazakhstan	.	1,386	5,140	.	0.199	0.128
Korea, Republic of	.	8,247	26,374	.	0.803	0.625
Kuwait	.	.	.	.	.	.
Lebanon	.	118	516	.	0.824	0.806
Luxembourg	.	103,044	179,826	.	0.207	0.391
Malaysia	6,258	1,820	4,755	0.617	0.154	0.171
Malta	.	440	1,013	.	0.424	0.190
Mexico	.	.	32,683	.	.	0.272
Netherlands	13,124	84,479	146,707	0.012	0.860	0.806
New Zealand	16,679	3,468	9,160	0.416	0.775	0.406
Norway	5,125	21,717	40,781	0.153	0.620	0.702
Pakistan	.	.	.	.	.	.
Panama	.	3,777	7,334	.	0.673	0.595
Philippines	.	4,424	6,731	.	0.792	0.778
Poland	.	2,388	5,193	.	0.407	0.854
Portugal	7,403	3,063	6,491	0.334	0.449	0.225
Romania	.	10	3	.	0.131	0.515
Russian Federation	.	5,804	21,740	.	0.072	0.932
Singapore	3,113	13,419	25,882	0.353	0.215	0.560
Slovak Republic	.	177	712	.	0.523	0.868
South Africa	.	1,639	3,753	.	0.600	0.611
Spain	9,803	15,816	38,943	0.595	0.944	0.324
Sweden	14,484	24,446	58,160	0.206	0.973	0.828
Switzerland	.	36,879	49,397	.	0.056	0.175
Thailand	9,215	1,060	2,099	0.752	0.524	0.528
Turkey	.	1,492	3,163	.	0.297	0.054
United Kingdom	54,575	342,757	596,871	0.001	0.951	0.928
United States	.	.	.	.	.	.
Venezuela	.	5,414	.	.	0.778	.

Source: Calculated by authors using International Monetary Fund, *Portfolio Investment: Coordinated Portfolio Investment Survey*, drawn from <http://www.imf.org/external/np/sta/pi/cpis.htm>.

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