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Asian Development Bank

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Abstract

This paper analyzes the patterns and determinants of financial integration in East Asia by using the data set of cross-border holdings of financial assets such as equity portfolio, long-term and short-term debt securities, and bank claims. Empirical analysis based on the gravity model of bilateral international asset holdings shows that financial integration among East Asian economies, particularly in equity and debt securities, is relatively lower than in Europe. A large part of regional financial integration in East Asia is due to heavy intra-regional trade in goods—after controlling for bilateral trade volume, East Asia's relatively lower regional integration becomes apparent. The relative lack of financial integration is due largely to underdeveloped financial infrastructure, a low level of capital account liberalization, and higher exchange volatility.

Keywords: Cross-border portfolio investment, financial integration, East Asia, gravity model.

JEL Classifications: F21, F36, F41, G15.

I.   Introduction

International capital mobility in East Asia has increased rapidly since the early 1990s, reflecting the commitment among economies in the region to continue deregulating financial markets. But although the process has seen the region's economies integrate into global financial markets, it is not clear that the process has contributed significantly to the integration of financial markets within the region. Several studies suggest that links among intraregional financial markets in East Asia are still low, particularly compared to Europe, and instead favor integration at a global level (Eichengreen and Park 2004, and Kim, Lee and Shin 2007). In this regard, it is important to understand the patterns of cross-border capital flows and the forces that have influenced them in East Asia.

This paper analyzes those patterns and investigates the forces that have determined the degree of financial integration. The paper compiles data on cross-border holdings of international financial assets including equity portfolio, long-term and short-term debt securities, and bank claims from 1997 to 2004. It then analyzes the geographical composition of cross-border financial asset holdings in East Asia and compares them with Europe. A gravity model of bilateral financial asset holdings is then adopted to investigate the factors determining the patterns of cross-border holdings of international financial assets—such as total portfolio assets and individual assets including equity portfolio, long-term and short-term debt securities, and bank claims—in East Asia. The empirical results demonstrate that the level of financial integration among East Asian economies, particularly in equity portfolio and debt securities markets, is indeed relatively lower than in Europe. East Asian financial markets, except for bank claims, have relatively stronger links to global markets than they have to one another. Based on the results of the empirical investigation, a discussion on the factors causing the relatively lower level of regional integration then follows.

Section II analyzes data on geographical distribution of international portfolio assets and bank claims for East Asia compared with Europe, judging the patterns of bilateral financial asset holdings. Section III adopts a gravity model of bilateral financial asset holdings to formally assess the patterns and determinants of regional and global asset diversification in East Asia. Section IV suggests policies and institutional frameworks that can enhance the degree of regional financial integration in East Asia. Section V concludes.

II.   Stylized Patterns of International Financial Asset Holdings in East Asia

A.   Data

Data on cross-border holdings of portfolio assets and bank claims were compiled to judge the stylized patterns of the geographical distribution of financial asset holdings. Data on international portfolio asset holdings have recently been published by the International Monetary Fund (IMF), which has conducted the Coordinated Portfolio Investment Survey (CPIS) annually since 2001 (and for the first time in 1997).

The first CPIS involved 20 economies, while the CPIS 2001 expanded participation to 67 source economies, including several offshore and financial centers. In each case, the bilateral positions of the source countries in 223 destination countries/territories are reported.[1] The CPIS provides a breakdown of a country's stock of portfolio investment assets by country of residency of the

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[1] Refer to the IMF website at http://www.imf.org/external/np/sta/pi/cpis.htm for details.

nonresident issuer. Lane and Milesi-Ferretti (2004) point out the problems of survey methods and under-reporting of assets by participating countries, which are shortcomings of the CPIS data. Nevertheless, the survey presents a unique opportunity to examine foreign equity and debt holdings of many participating countries.

Data on international bank claims come from the Bank for International Settlements (BIS), and are the consolidated international bank claims of BIS reporting banks by nationality of lenders and borrowers.[2] The data are gathered for 25 reporting countries, including two economies from East Asia (Japan and Taipei,China) and 15 European countries from the BIS Quarterly Review.[3] The data are available from 1983 on a biannual basis, but most countries report more complete bilateral data from 1999. Comparable data for the Republic of Korea (Korea) were also obtained from the associated supervisory authority. It is important to note that although the data set includes only three economies in East Asia reporting consolidated foreign bank claims, the other economies, such as Hong Kong, China; Indonesia; Malaysia; Philippines; Singapore; and Thailand, are included as destination countries for bank loans.

B. Geographical Distribution of Cross-border Financial Asset Holdings

1. Portfolio Investment

Tables 1 and 2 provide the geographical distribution of bilateral portfolio asset holdings for East Asia, compared with Europe in 2003. Table 1A presents the level of bilateral portfolio assets in millions of United States (US) dollars held by each East Asian and European economy. Table 1B presents the ratio of international portfolio asset holdings to gross domestic product (GDP). The GDP value in the denominator of these ratios refers to the East Asian or European economy paired with four major destinations including the US, Europe, Japan, and 10 economies of East Asia[4] including Japan. Tables 2A and 2B present the cross-border portfolio assets invested in East Asian or European economies by these major regions. In other words, Table 1 presents where the East Asian economies invest their cross-border portfolio financial assets, while Table 2 presents which countries invest in East Asia.

According to Table 1A, the total recorded level of portfolio asset holdings of eight East Asian economies (excluding the People's Republic of China [PRC] and Taipei,China) is about $2.2 trillion, or around 13.4% of world total portfolio assets, amounting to $16.5 trillion. Japan; Hong Kong, China; and Singapore are the largest investors in East Asia. Japan holds international portfolio assets of approximately $1.7 trillion, or 10.5% of total international portfolio assets. Hong Kong, China holds $335 billion and Singapore $144 billion. The average portfolio asset holding for the East Asian economies is about $278 billion, compared with $539 billion in the European economies.

The major destination for East Asian portfolio investment is the US (31.5%) and Europe (34.1%), in total international portfolio assets held by East Asia. In comparison, East Asian assets

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[2] This measure of international bank claims is classified by the country of origin of the claims (specifically, the country in which the head office of the reporting bank is located), summing contractual lending by the head office as well as its branches and subsidiaries on a worldwide consolidated basis (net inter-office accounts). Claims of Japanese bank branches operating in other countries (for example in the Republic of Korea [Korea]) raising funds and extending loans to Korean borrowers are counted as Japanese claims on Korea. Therefore, this is not an exact measure of cross-border capital flows, but it can measure the degree of financial integration between Japan and Korea more accurately (see Eichengreen and Park, 2004).

[3] Refer to the BIS website at http://www.bis.org/statistics/histstats10.htm for details.

[4] People's Republic of China (PRC); Hong Kong, China; Indonesia; Korea; Malaysia; Philippines; Singapore; Taipei,China; Thailand; and Japan.

constitute only 4.9% of the total holdings for eight East Asian economies. The share of East Asian assets is only 1.3% in Japan. Malaysia has the largest East Asian asset share, amounting to 46% of its international portfolio assets. In comparison, most of Europe holds greater than one half of its portfolio assets within Europe. The share of European portfolio asset holdings is 57% of the total international portfolio assets held by 17 European countries.

When scaling portfolio holdings by GDP, small economies with financial and offshore centers dominate the representation (Table 1B). For instance, Hong Kong, China; Singapore; Ireland; and Switzerland have total assets amounting to several times their own domestic output levels. For a typical East Asian economy, bilateral financial links represent a relatively small fraction of GDP. The average ratio of international portfolio holdings to GDP for East Asia is 52.9%, of which 9.4 percentage points is held in the US, 16.9% in Europe, and 8.6% in East Asia. However, the level of bilateral financial linkage is higher in Europe. For 17 European countries, the comparable average ratio of international portfolio holdings to GDP amounts to 108.0%, of which 21.2 percentage points is held in the US, 62.1% in Europe, and 3.6% in East Asia.

Tables 1A and 1B also report information for the US, the largest foreign investor. It holds cross-border assets amounting to approximately $3.1 trillion, or 19.1% of total international portfolio assets. At the end of 2003, the share of East Asia in the international investment portfolio of the US (14.3%) is far above the average of Europe (3.2%).

Tables 2A and 2B demonstrate the geographical distribution of the total portfolio assets invested in East Asian or European economies. The general patterns are similar to those for portfolio asset holdings by East Asia and Europe, depicted in Tables 1A and 1B. The major source of portfolio investment in East Asia arises from the US and Europe, which constitute 42.8% and 37.2% respectively of total international portfolio assets invested in East Asia (reported by 67 source economies), amounting to $1.1 trillion. The share of asset holdings by nine East Asian economies, including the PRC, constitutes only 8.2%. In comparison, total portfolio assets invested in Europe amount to about $8.7 trillion, of which the share of intra-Europe holdings is greater then 60%. Total portfolio assets invested in an average East Asian economy amount to $113 billion, far smaller than in an average European economy, which amount to $510 billion.

Among the East Asian economies, bilateral financial links are a relatively small fraction of GDP. Cross-border portfolio assets invested in an average East Asian economy amount to 26.4% in terms of GDP, of which 9.8 percentage points is held by the US, 8.1 percentage points by Europe, and 5.0 percentage points by East Asia. The comparable figure for an average European economy is 90.0%, of which 14.1 percentage points is held by the US, 59.0 percentage points by Europe, and 6.9 percentage points by East Asia.

Tables 3–8 provide the geographical distribution of portfolio investment holdings separately for each asset—equity, long-term debt, and short-term debt securities.

The geographical distribution for equity and debt securities asset holdings demonstrate stylized patterns that are broadly similar to those for total portfolio assets. Table 3 shows that the amount of equity assets held by East Asia—both in total and as a ratio to GDP—is smaller than that of Europe, and the share of East Asian equity assets in total equity asset holdings by East Asia is far lower than that of European equity asset holdings by European economies. The share of East Asian equity assets in total holdings is 10.5% for eight East Asian economies. This number is much smaller than the comparable intraregional share for 17 European countries (41.2%). Japan; Hong Kong, China; and Singapore—the three largest investors in East Asia— hold international portfolio assets of about $274.5 billion, $152.8 billion, and $42.7 billion,

respectively. The intra-East Asian share of their holdings is 3.9%, 17%, and 28% respectively. The cross-border portfolio asset holdings of an average East Asian economy amount to 19.1% of its GDP, while the comparable figure for an average European country is 37.6%.

Table 4 demonstrates that the amount of equity assets invested in an average East Asian economy by international investors ($86.0 billion) is smaller than that invested in an average European country ($173.8 billion). The US and Europe are the major sources of equity asset investment in East Asia. The share of intra-East Asia holdings in total world equity assets invested in East Asia is only 3.9%, while the comparable intra- Europe share amounts to 45.8%. The international equity asset invested in an average East Asian economy amounts to 19.1% in terms of its GDP, while the comparable figure for an average European economy is 29.7%.

Tables 5 and 6 present the geographical distribution of long-term debt securities. Table 5 demonstrates that only 2.7% of the total long-term securities asset holdings by eight East Asian economies are invested within East Asia, which is far lower than the intra-Europe share of long-term debt securities holdings by Europe, amounting to 66.9%. However, Table 6 demonstrates that 23.3% of the world total long-term debt securities assets invested in East Asia is made by nine East Asian economies (including the PRC). The large discrepancy between the two intra-East Asia shares is attributed to the fact that Japan holds a very small share of long-term debt securities issued by other East Asian economies (0.8%). However, it is important to note that the total amount of global long-term debt securities assets invested in East Asia—$185 billion— is far smaller than total long-term debt securities assets invested by East Asia (mostly by Japan) of $1.6 trillion.

Table 7 demonstrates that in the short-term debt securities market, East Asian short-term debt securities constitute 12.1% of total short-term securities asset holdings by eight East Asian economies ($113 billion), which is far lower than the share of European short-term debt securities in total short-term securities asset holdings by European countries amounting to 59.0%. However, as Table 8 demonstrates, the share of short-term debt securities holdings by East Asian economies in total global short-term debt securities assets invested in East Asia is much higher, reaching 71.6%. But the amount of the world total short-term debt securities assets invested in East Asia (mostly by Singapore and Hong Kong, China) is much smaller: only $18.3 billion, compared with $592 billion for Europe. Hence, the higher intraregional share of short-term debt securities holdings invested in East Asia implies not that the East Asian short-term debt securities markets are well-integrated, but that the US and European countries purchase too little short- term debt securities issued by East Asian economies.

The data demonstrate that East Asian economies are far less financially integrated among themselves, compared with their European counterparts. East Asian economies tend to be more closely financially linked with the US and Europe rather than with each other.

2. Bank Lending

Tables 9 and 10 report the geographical distribution of cross-border bank claims for East Asia, Europe, and the US at the end of 2003. Data are presented for three East Asian reporting economies (Japan; Korea; and Taipei,China). In Table 9, the average share of intra-East Asia bank claims in total cross-border bank claims for the three East Asian economies is 9.5%. It is 17% in Japan, 36% in Korea, and 26% in Taipei,China. The comparable intraregional share for Europe is 51.8%. East Asia is a small investor in international bank lending markets. While Europe holds about $10.7 trillion—international bank claims in total and about $5.5 trillion claims within Europe—East Asia holds only around $1.4 trillion total claims in international bank

lending markets and $131 billion within East Asia. Table 10 demonstrates a similar pattern for the geographical distribution of total cross-border bank claims held in 10 East Asian economies (including PRC and Taipei,China). The share of East Asian economies' holdings in the world total cross-border bank claims against East Asia is 10.1%, whereas the comparable intra-Europe share is 83.9%.

III.   A Gravity-Model of Determinants of Cross-Border Financial Asset Holdings

A.   Specification of the Gravity Model and Data

A gravity model of the bilateral financial asset holdings is set up. The gravity model was originally developed as an explanation for gravitational forces. The model was adopted by economists to analyze issues related to international trade. In its basic form, trade between two countries depends positively on their total income and negatively on the distance between each other. The model can be extended to include other variables, depending on the study's purpose. The great empirical success of the gravity model to explain bilateral trade flows has motivated a number of theoretical models that justify the solidity of the model (for example, see Evenett and Keller, 2002).

While the gravity model of bilateral trade flows has a long history, relatively few attempts have been made to use it to explain exchanges of financial assets. The main reason is that unlike goods, financial assets are weightless, hence distance cannot represent transaction costs. Recently, however, Portes and Rey (2005) have found that a gravity model performs at least as well in asset trade as goods trade.[5] Portes and Rey interpret that to mean that information friction is positively correlated with distance, justifying the idea that financial asset trade is also negatively related to distance.

Following their model, an extended gravity model is set up as follows:

$$\ln(Assets_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(GDP_i/Pop_i)_t + \beta_4 \ln(GDP_j/Pop_j)_t$$
$$+ \beta_5 \ln(Area_i) + \beta_6 \ln(Area_j) + \beta_7 \ln Dist_{ij} + \beta_8 Border_{ij} + \beta_9 Language_{ijt} \tag{1}$$
$$+ \beta_{10} ExComColony_{ij} + \beta_{11} ExColony_{ij} + \delta Year_t + \varepsilon_{ijt}$$

where i and j denote economies, t denotes time, $Assets_{ijt}$ denotes the financial assets of economy j held by economy i at time t, GDP is real GDP, Pop is population, $Area$ is land area of the economy, $Dist$ is the distance between i and j, $Border$ is a binary variable which is unity if i and j share a land border, $Language$ is a binary variable which is unity if i and j have a common language, $ExComColony$ is a binary variable which is unity if i and j were ever colonies after 1945 under the same colonizer, $ExColony$ is a binary variable which is unity if i ever colonized j or vice versa, and $Year$ denotes a set of binary variables which are unity in the specific year t.

It is important to note that this framework separates between economy i's holdings of economy j's financial assets and its reverse, that is, economy j's holdings of economy i's financial assets for the dependent variable. The usual gravity model of goods trade considers bilateral trade (an average of exports and imports) between economy i and j as one dependent variable. The different specification is adopted for asset trade because the bilateral holdings of assets, and

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[5]   See subsequent research including Buch (2002, 2003), Yildrim (2003), and Lane and Milesi-Ferritti (2003).

stock variable, between economy *i* and *j* are fairly asymmetric, and often only unilateral transaction data are available.

The underlying GDP data are the purchasing power-adjusted values from Penn-World Tables 6.1, as described in Heston, Summers, and Aten (2002). The Summers-Heston data is updated using information on real GDP from the World Bank's World Development Indicators (WDI). A number of economy-specific variables such as distance, land area, language, land border, and colony relationship were obtained from Rose and Spiegel (2004).

The data set has features of a panel structure consisting of 12,459 annual observations from 2001 to 2003 for the portfolio data, and 4,731 observations for the bank claims data. East Asian country pairs constitute approximately 1% in each data set, while the proportion of European country pairs is much larger, amounting to about 6% for the portfolio data set and about 10% for the bank claims.

Table 11, column (1) presents the estimation results of specification (1) for total portfolio assets. A random effect estimation technique is applied.[6] The result demonstrates that the gravity model fits the data very well, and most estimated coefficients are statistically significant with the expected signs. In order to summarize briefly, the estimated coefficients for log of GDP of source economy, log of GDP of destination economy, log of per capita GDP of source economy, log of per capita GDP of destination economy, common land border dummy, common language dummy, ex-common colonizer dummy, and ex-colony-colonizer dummy are significantly positive. The estimated coefficient for bilateral distance is significantly negative. The area size of source economy is significantly negative, while the area size of destination economy is significantly positive, which seems to indicate that a larger economy tends to invest less in international assets, controlling for other variables, but receives greater cross-border financial investment.

The above regression result suggests that a gravity model can be used as a benchmark to appropriately explain normal financial asset holdings. The value of bilateral asset holdings predicted from the estimation result of specification (1) can be thought as a 'normal' value determined by the gravity forces of those countries' characteristics.

In this section, a dummy variable for intra-East Asia asset holdings is added in column (2) in order to investigate how deeply financial integration is entrenched in East Asia relative to a normal asset holding predicted by the gravity model. It is found that the coefficient of the intra-East Asia dummy is significantly positive (0.432, s.e.=0.130), indicating that there is some evidence of regional financial integration among East Asian economies. The estimated coefficient indicates that East Asia invests 1.54 times ($e^{0.0432}$=1.54) greater among themselves, than a random pair of economies in other regions.

In order to compare the degree of financial integration in East Asia with Europe, the intra-Europe dummy variable has also been added and the estimation result is reported in column (3) of Table 11. Even after the intra-Europe dummy is added, the estimated coefficient of the intra-East Asia dummy is statistically significant (0.588, s.e.=0.117). The coefficient of the intra-Europe dummy is significantly positive and large in magnitude (2.231, s.e.=0.074), which

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[6] The fixed-effect "within" estimation results is not adopted. This method can provide more consistent estimates by controlling for the influences from omitted country-specific factors. One drawback of this fixed-effect approach is, however, that since the fixed effect estimator exploits variation over time, the estimates for time-invariant factors such as distance, area, land border, and the common language cannot be obtained. And, more importantly, the estimate for the regional dummy variables that will be investigated later, can not be estimated too.

implies that European countries make particularly more portfolio investments among themselves. The estimated coefficients indicate that countries in Europe invest 9.3 times more among themselves, than a random pair of other economies. This estimation result implies that regional financial integration is much deeper in Europe than in East Asia.

Column (4) investigates whether East Asian economies are more closely linked to the global (US) financial market than among themselves. In order to answer this question, two more dummies were added: the first is for an East Asian economy and the United States (East Asia-US) pair, and the second is for a European economy and the US (Europe-US) pair. The coefficients of East Asia-US and Europe-US dummy variables measure how East Asian and European countries are relatively more intertwined to the US market than a random-pair of economies. In column (4), it is found that the coefficients of two dummy variables are positive and statistically significant: the estimate of the Europe-US dummy is 4.224 (s.e.=0.158) and that of the East Asia-US dummy is 3.236 (s.e.=0.204). It is important to note that the estimate of the East Asia (Europe)-US dummy is relatively larger in magnitude than that for the intra-East Asia (Europe) dummy. This indicates, perhaps surprisingly, that world financial integration plays a more important role than regional integration does both for East Asia and Europe. However, global integration is relatively more important than regional integration for East Asia, compared to Europe. When the relative importance of the global market is compared vis-à-vis the regional market for East Asia with that for Europe, it is realized that East Asia has relatively greater integration with the global market, rather than the regional market. The estimated coefficients of intra-East Asia and East Asia-US dummy are 0.658 and 3.236, while the corresponding figures for Europe were 2.346 and 4.224. The estimated coefficient of the global integration is more dominatingly larger in magnitude only for East Asia. Hence, the results confirm the view that East Asian financial markets have relatively greater linkages to the global markets than to the financial markets in the region (Kim, Lee and Shin, 2007).

It is suspected that the significance of the intra-East Asian dummy may reflect strong intraregional trade in East Asia. Financial integration must be strongly associated with trade integration. Lane and Milesi-Ferretti (2003) find that for a panel of industrialized countries an increase in trade openness is significantly associated with an increase in financial openness. More interaction in the goods market can reduce informational friction and thereby lower financial home bias, encouraging cross-border financial transactions between the trade partners. In order to verify this conjecture, bilateral trade is added as an additional regressor to the specifications of Table 11, and the results are reported in Table 12. This conjecture appears to be supported by the fact that the estimate of the intra-East Asia dummy turned significantly negative in the regressions where (1-year lagged value of) bilateral trade is added as an explanatory variable in columns (2), (3) and (4) of Table 12.

The interpretation of the estimates may require some caution because the inclusion of bilateral trade, though a 1-year lagged value is used, the estimate of its coefficient can be subject to endogeneity bias. An omitted region- or economy-specific factor in East Asia must influence both bilateral goods trade as well as asset trade. Nevertheless, the results are reasonably suggestive. The dummy variables for East Asia-US, intra-Europe, and Europe-US are all statistically significant with positive coefficients, although their estimates become smaller in magnitude. In contrast, the estimated coefficient for the intra-East Asia dummy is negative and statistically significant. Hence, this result appears to indicate that the relatively higher degree of regional financial integration in East Asia, compared to a random pair of countries or economies (such as a Latin American-African country pair), is mainly due to the relatively higher degree of trade integration taking place in the region (which is in turn determined by those gravity factors included in the specification as well as other unexplained factors). The negative coefficient

implies that after controlling bilateral trade volume, East Asian economies have a significantly lower degree of regional financial integration than other regions.

Now concentration relates to the regressions for each type of international portfolio assets and cross-border bank claims. In columns (1)~(4) of Table 13, the regression results from the specification (4) of Table 11 are reported, after replacing the dependent variable by the equity portfolio, long-term debt securities, short-term debt securities, and bank claims. For the majority of the usual gravity factors, similar results as in Table 11 are retrieved. However, a notable difference is that the estimated coefficients of per capita GDP of source economy are significantly negative in the regressions for long-term debt securities and short-term debt securities. Hence, with other controlling variables, including total GDP of source and destination economy, an economy with higher per capita GDP tends to invest less in international debt securities issued by other economies, while it receives greater investment in internal debt securities from other economies. This is an interesting finding that requires further investigation.

For equity portfolio and long-term debt securities, in columns (1) and (2) of Table 13, the results are similar to those for total portfolio asset. The estimated coefficients for the intra-East Asia dummy—0.546 for equity and 0.435 for long-term debt securities—are close in magnitude to that for total portfolio assets (0.658). Therefore, some degree of regional integration exists among equity and long-term debt securities markets in East Asia. However, estimates for the intra-East Asia dummy are far smaller in magnitude than those for the intra-Europe dummy, implying that the degree of intraregional integration in East Asia is relatively lower than in Europe. It is also found that the estimate of the East Asia-US dummy is much larger in magnitude than that for the intra- East Asia dummy. Thus, East Asia is relatively more integrated with the global market than with regional markets, compared with Europe, both in equity and long-term debt transactions. The comparison of the estimates on the intra-East Asia dummy and the East Asia-US dummy demonstrates that the tendency to integrate more with global markets than regional markets in East Asia is stronger in the long-term debt securities markets than in equity markets.

Unlike equity and long-term debt securities, little intraregional integration in short-term debt securities markets is found. In column (3), the estimated coefficient of intra-East Asia dummy is small in magnitude and is statistically insignificant (-0.059, s.e.=0.049). This contrasts with the significantly positive estimate on the intra-Europe dummy (0.694, s.e.=0.082). The insignificant intra-East Asia dummy may reflect that the short-term debt securities market in East Asia is quite small and under-developed, and East Asian investors, particularly Japanese, tend to invest little in East Asian short-term debt securities.

However, much stronger evidence of regional integration in bank claims is found among East Asian economies. The coefficient of intra-East Asia dummy in column (4) is positive and has a high statistical significance. The estimate (1.250) is comparable to that for intra-Europe dummy (1.702) and larger than that for East Asia-US dummy (0.661).

The significance of regional financial integration in East Asia in terms of equity and long- term debt securities as well as bank claims may reflect heavy trade integration in the region. In particular, the larger degree of global integration relative to regional integration of cross-border bank lending for East Asian economies can be the result of a higher level of intraregional trade as bank loans such as trade credit that are more closely related to trade. This hypothesis is tested in columns (1)~(4) of Table 14 by adding (1-year lagged) bilateral trade as an additional explanatory variable to the specifications of columns (1)~(4) in Table 13. The estimates of the intra-East Asia dummy turn from significantly positive to significantly negative in the regressions

for equity portfolio and long-term debt securities (columns 1 and 2). For bank claims, the estimate of the intra-East Asia dummy (-0.350, s.e.=0.199) is also negative, though statistically insignificant. Hence, after controlling bilateral trade volume, East Asian economies have a significantly lower degree of regional financial integration in each type of portfolio asset and bank claim than other regions, as they are in total portfolio assets. In the regressions of Table 14, the bilateral trade variable estimate is the highest for bank claims (0.802) and the lowest for short-term securities (0.166). This difference must reflect that cross-border bank lending is more closely involved with trade than portfolio assets, in particular short-term securities.

IV. How to Enhance the Integration of East Asian Financial Markets

The data and empirical results in the previous sections suggest that regional financial integration is extremely weak in East Asia and the majority can be explained by trade integration in the region in addition to the conventional gravity factors.

Empirical evidence in the previous section suggests that financial integration is closely associated with trade integration. This may imply that East Asia can be further financially integrated as it continues to promote growth of intraregional trade. However, as the intraregional trade-to-GDP ratio is already extremely high for East Asia, compared with Europe, it is not clear that further regional trade integration can create substantial cross-border finance. The finding that regional financial integration in East Asia is much weaker than that in other regions, after controlling for the degree of intraregional trade integration, suggests that there are other structural and institutional impediments to financial integration that need to be addressed by policies, particularly designed to promote the growth of Asian financial markets.

There are several institutional and structural characteristics in East Asian financial systems that constrain regional financial integration, particularly with regard to portfolio assets.[7] First, the underdevelopment of financial markets must hinder trade in regional securities between different East Asian economies. Lane and Milesi-Ferretti (2003) provide evidence from cross-country data that financial development involving domestic financial deepening and rising stock market capitalization are closely related to the extent of international financial integration. In East Asia, where financial systems have been traditionally bank-oriented, securities markets have been relatively less developed. The inadequate financial and legal structure, low auditing and accounting standards, low transparency, and weak corporate governance have hampered the development of capital markets in East Asia. The underdevelopment of financial markets and institutions in East Asian economies are the primary cause of the lower degree of financial integration in the region. Therefore, among other things, East Asian economies must improve financial infrastructure while working to harmonize financial markets within the region in areas including rules, regulations, and taxes.

Bond markets are particularly underdeveloped: in terms of the composition of domestic financing, East Asia relies less on bond markets than equity or bank loans, and many Asian domestic bond markets are small relative to those of developed economies such as the US and Japan. The bond markets in East Asia lack liquidity and remain largely fragmented.

Eichengreen and Luengnaruemitchai (2004) empirically investigate the determinants of bond market development in a cross-section of developed and developing economies. It was found

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[7] See Lee, Park and Shin (2004), Eichengreen and Luengnaruemitchai (2004), and Eichengreen and Park (2005a, 2005b) for more discussion.

that while geographical and historical factors play an important role in bond market development, policies and institutional factors have more crucial influence. It is suggested that improved regulation, enhanced transparency, stronger investor protection, and stable macroeconomic policies are important for the development of deep and liquid bond markets in East Asia.

After the financial crisis of 1997/98, there has been considerable progress in the development of regional bond markets. The basic motive is to re-channel the region's vast pool of savings toward Asian economies in which long-term investment is still needed, thereby reducing the double mismatch problem and diversifying the means of financing. Prominent among these efforts is the Asian Bond Market Initiative (ABMI) which was endorsed by the ASEAN+3 (which includes PRC, Japan, and Korea) Finance Ministers Meeting in August 2003. ABMI aims to develop efficient and liquid bond markets in the region and foster a high degree of financial integration in Asia. ABMI has made considerable progress enhancing market infrastructure for bond markets, such as a regional credit guarantee mechanism, a regional clearing and settlement system, and legal and regulatory frameworks.[8]

The development of the regional bond market has also been discussed extensively among Asian central banks through the Executives Meeting of East Asia-Pacific Central Banks (EMEAP). EMEAP launched the Asian Bond Fund (ABF) in June 2003, its first stage (ABF1) contributing $1 billion to invest in dollar-denominated, sovereign, and quasi-sovereign bonds issued by Asian entities. Building on the success, the central banks launched the $2 billion Asian Bond Fund 2 (ABF2), which is intended to be invested in local currency-denominated Asian bonds.

Meanwhile, ADB launched the $10 billion Asian Currency Note Programme in September 2006 under which Asian local-currency denominated bonds are issued in their domestic markets under a single unified framework with a common set of documents governed by English law. The single structure allows Asian or multilateral leading issuers to access several Asian financial markets simultaneously and helps reduce legal and transaction costs.

Second, to enhance the degree of regional financial integration, continuous efforts are needed to advance capital account liberalization. Regardless of efforts to develop regional bond markets, there are preliminary tasks that must also be fulfilled. The most important is the deregulation and opening of the domestic financial systems so that more local currency bonds are issued, domestic investors are allowed to invest in foreign bonds, and foreign borrowers can issue bonds denominated in different currencies in East Asia's domestic markets.

It is still true that a number of countries in East Asia remain behind the capital market liberalization process by relying frequently on capital controls. Restrictions on capital account transactions and on entering foreign financial institutions must be an impediment to the process of integrating financial markets across economies in the region. Eichengreen and Park (2005b) provide evidence that a lower level of capital market liberalization and an underdevelopment of financial markets and institutions, particularly in potential lending countries, are the main factors contributing to the difference between intra-Europe and intra-East Asia integration in the cross-border bank lending market. Chelley-Steeley and Steeley (1999) present evidence that the abolition of exchange controls helped equity markets to become more closely integrated in Europe.

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[8] More detailed information on the ASEAN+3 Asian Bond Markets Initiative (ABMI) is available at the ADB- run *AsianBondsOnline* website (asianbondsonline.adb.org).

Third, East Asia also needs further financial and monetary cooperation for exchange rate stabilization among regional currencies. Higher exchange rate volatility in East Asia hampers financial integration, and a number of studies suggest it leads to fewer transactions in goods and assets trade. Danthine et al (2000) and Fratzscher (2001) provide evidence that the introduction of the euro has increased the degree of financial integration in the euro zone.

Another special feature of post-crisis East Asia is the accumulation of substantial dollar reserve assets, with economies inclined to build up a reserve capacity for contingency purposes. A "fear of floating" against the US dollar—which saw central banks intervening in foreign exchange markets to moderate excessive volatility of exchange rates and to maintain export competitiveness—also contributed to the accumulation. The East Asian economies tended to hoard reserves in low-yielding US Treasuries and other dollar-denominated financial assets. This preference for dollar-denominated safe-assets must have had a negative impact on intra-region financial integration, while the post-crisis experience generally has raised questions about the optimal exchange rate regime for East Asia. Whether the region can emulate the European experience of monetary integration by taking the steps to build institutions and policies that lead to the formation of a monetary union must be an important issue.

V.   Concluding Remarks

The level of financial market integration within East Asia, as demonstrated, is relatively lower than in Europe. While there exists some integration of East Asian portfolio asset and bank loan markets, the size of intra-East Asian portfolio asset holdings for East Asia is far lower than that of intra-Europe asset holdings for Europe. The estimation of the gravity model of cross-border financial asset holdings confirms that the degree of regional financial integration among East Asian economies is relatively lower than that in Europe. It is also found that a large part of financial integration in East Asia is due to heavy intraregional trade in goods. After controlling for bilateral trade volume, East Asia demonstrates a significantly lower degree of regional integration than others, particularly Europe. East Asian financial markets are also relatively more linked to global markets than they are to one another.

The prospects for greater regional financial integration have been hotly debated among scholars and public officials. Greater financial integration can provide a risk-sharing mechanism that ensures country- or economy-specific income risks. Regional financial integration also contributes to the development of local financial industries by enhancing the role of financial intermediaries. An increase in financial integration within East Asia is also expected to promote regional monetary integration because it reduces the cost of losing monetary policy independence involved with a fixed exchange rate arrangement. In order to promote regional integration of financial markets, East Asian economies must endeavor to improve financial market infrastructure and harmonize legal and regulatory systems and market practices. They must also build regional institutions for further financial and monetary cooperation.

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Table 1A: Portfolio Asset Outflows to Selected Regions, 2003 ($ million)

| Source Economy | Portfolio Assets Held in Each Region | | | | |
	US	Europe	Japan	East Asia*	Total
Hong Kong, China	46,670	90,297	10,443	54,686	334,912
Indonesia	450	276	3	205	1,814
Japan	620,208	608,173	...	21,871	1,721,314
Korea, Rep. of	7,961	2,871	243	1,368	17,343
Malaysia	301	389	19	763	1,664
Philippines	2,535	716	14	256	3,681
Singapore	22,605	55,973	3,457	29,095	143,875
Thailand	1,764	563	0	80	2,748
East Asia Average	87,812	94,907	1,772	13,541	278,419
	(31.5)	(34.1)	(0.6)	(4.9)	(100)
Austria	20,426	145,910	1,910	2,620	206,807
Belgium	32,390	285,306	2,004	3,247	417,785
Denmark	29,131	71,793	2,989	5,537	126,994
Finland	8,737	88,407	925	1,559	107,412
France	152,142	994,453	29,881	37,920	1,367,001
Germany	133,346	765,107	25,764	32,106	1,205,127
Greece	4,822	16,028	45	66	33,996
Iceland	881	1,361	69	170	3,687
Ireland	222,525	456,613	17,657	26,409	811,644
Italy	98,845	381,471	11,683	15,927	791,064
Netherlands	217,186	460,379	18,623	29,758	782,593
Norway	42,254	110,746	12,153	14,156	184,358
Portugal	5,841	64,644	126	126	97,290
Spain	36,771	298,674	1,426	2,556	432,701
Sweden	65,613	98,273	8,504	10,890	213,706
Switzerland	95,804	284,273	12,306	16,050	654,432
United Kingdom	431,712	721,464	118,497	188,027	1,729,515
Europe Average	94,025	308,524	15,562	22,772	539,183
	(17.4)	(57.2)	(2.9)	(4.2)	(100)
United States	…	1,700,000	291,850	447,089	3,134,244
		(54.2)	(9.3)	(14.3)	(100)

Notes: (…) = not available.

Table 1B: Portfolio Asset Outflows to Selected Regions, 2003 (% of GDP)

Source Economy	Portfolio Assets Held in Each Region				
	US	Europe	Japan	East Asia*	Total
Hong Kong, China	29.8	57.6	6.7	34.9	213.8
Indonesia	0.2	0.1	0.0	0.1	0.9
Japan	14.4	14.1	...	0.5	40.0
Korea, Rep. of	1.3	0.5	0.0	0.2	2.9
Malaysia	0.3	0.4	0.0	0.7	1.6
Philippines	3.1	0.9	0.0	0.3	4.6
Singapore	24.7	61.3	3.8	31.9	157.5
Thailand	1.2	0.4	0.0	0.1	1.9
East Asia Average	9.4	16.9	1.3	8.6	52.9
Austria	8.1	57.6	0.8	1.0	81.7
Belgium	10.7	94.5	0.7	1.1	138.4
Denmark	13.7	33.9	1.4	2.6	59.9
Finland	5.4	54.6	0.6	1.0	66.4
France	8.7	56.6	1.7	2.2	77.8
Germany	5.5	31.8	1.1	1.3	50.1
Greece	2.8	9.3	0.0	0.0	19.7
Iceland	8.4	12.9	0.7	1.6	35.1
Ireland	144.8	297.0	11.5	17.2	528.0
Italy	6.7	26.0	0.8	1.1	53.9
Netherlands	42.5	90.0	3.6	5.8	153.0
Norway	19.1	50.1	5.5	6.4	83.5
Portugal	3.9	43.7	0.1	0.1	65.8
Spain	4.4	35.6	0.2	0.3	51.6
Sweden	21.8	32.6	2.8	3.6	70.9
Switzerland	29.9	88.8	3.8	5.0	204.4
United Kingdom	24.1	40.2	6.6	10.5	96.4
Europe Average	21.2	62.1	2.5	3.6	108.0
United States	…	15.1	2.7	4.1	28.6

Notes: (…) = not available.

*East Asia includes People's Republic of China; Hong Kong, China; Indonesia; Republic of Korea; Malaysia; Philippines; Singapore; Taipei,China; Thailand; and Japan. Europe includes the 17 European economies listed in column 1.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 2A: Portfolio Asset Inflows from Selected Regions, 2003 ($ million)

	Portfolio Assets Sent by Each Region				
Recipient Economy	**US**	**Europe**	**Japan**	**East Asia***	**Total**
China, People's Rep of	13,738	10,419	2,518	24,837	53,891
Hong Kong, China	37,661	37,873	7,181	12,130	101,780
Indonesia	5,072	3,120	141	2,826	17,673
Japan	291,850	264,562	...	14,179	640,846
Korea, Rep. of	53,429	35,848	5,289	21,022	124,184
Malaysia	7,953	8,101	1,705	13,453	32,608
Philippines	5,046	4,873	1,314	3,347	14,837
Singapore	25,001	15,075	2,707	9,243	55,692
Thailand	7,339	7,253	1,016	7,287	25,402
East Asia Average	48,150	41,856	2,150	9,276	112,558
	(42.8)	(37.2)	(1.9)	(8.2)	(100)
Austria	10,372	146,525	11,205	12,895	190,588
Belgium	16,987	153,876	15,296	17,485	231,942
Denmark	22,141	69,923	7,144	9,906	118,522
Finland	41,126	103,179	6,743	7,677	165,691
France	183,425	671,931	90,335	105,843	1,090,209
Germany	186,611	959,861	154,751	172,932	1,543,115
Greece	5,935	118,441	4,424	4,808	140,189
Iceland	143	8,645	314	461	10,697
Ireland	33,470	218,784	33,713	40,438	323,338
Italy	66,931	693,464	58,380	60,966	928,263
Netherlands	182,193	714,909	61,329	74,540	1,070,618
Norway	21,243	38,558	10,808	13,635	82,399
Portugal	5,276	88,753	1,449	2,028	104,123
Spain	51,547	345,414	21,760	23,827	460,039
Sweden	45,257	124,330	21,598	24,559	231,035
Switzerland	119,715	136,531	9,375	11,183	302,818
United Kingdom	663,120	651,778	99,549	176,075	1,670,051
Europe Average	97,382	308,524	35,775	44,662	509,626
	(19.1)	(60.5)	(7.0)	(8.8)	(100)
United States	...	1,600,000	620,208	702,494	2,822,191
		(56.7)	(22.0)	(24.9)	(100)

Notes: (…) = not available.

Table 2B: Portfolio Asset Inflows from Selected Regions, 2003 (% GDP)

Recipient Economy	Portfolio Assets Sent by Each Region				
	US	Europe	Japan	East Asia*	Total
China, People's Rep. of	1.0	0.7	0.2	1.8	3.8
Hong Kong, China	24.0	24.2	4.6	7.7	65
Indonesia	2.4	1.5	0.1	1.4	8.5
Japan	6.8	6.2	...	0.3	14.9
Korea, Rep. of	8.8	5.9	0.9	3.5	20.5
Malaysia	7.7	7.8	1.6	13	31.4
Philippines	6.3	6	1.6	4.2	18.4
Singapore	27.4	16.5	3	10.1	61
Thailand	5.1	5.1	0.7	5.1	17.8
East Asia Average	9.8	8.1	1.4	5.0	26.4
Austria	4.1	57.9	4.4	5.1	75.3
Belgium	5.6	51	5.1	5.8	76.8
Denmark	10.4	33	3.4	4.7	55.9
Finland	25.4	63.7	4.2	4.7	102.4
France	10.4	38.2	5.1	6	62
Germany	7.8	39.9	6.4	7.2	64.2
Greece	3.4	68.8	2.6	2.8	81.4
Iceland	1.4	82.2	3	4.4	101.8
Ireland	21.8	142.3	21.9	26.3	210.3
Italy	4.6	47.2	4	4.2	63.2
Netherlands	35.6	139.8	12	14.6	209.3
Norway	9.6	17.5	4.9	6.2	37.3
Portugal	3.6	60	1	1.4	70.4
Spain	6.1	41.2	2.6	2.8	54.9
Sweden	15	41.2	7.2	8.1	76.6
Switzerland	37.4	42.7	2.9	3.5	94.6
United Kingdom	36.9	36.3	5.5	9.8	93
Europe Average	14.1	59.0	5.7	6.9	90.0
United States	…	14.6	5.7	6.4	25.8

Notes: (…) = not available.

* East Asia is 8 source economies in Table 1 excluding People's Republic of China.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 3: Equity Asset Outflows to Selected Regions, 2003 ($ million, % of GDP)

Source Economy	Equity Assets Held in Each Region				Total	
	US	Europe	Japan	East Asia	($ million)	(% GDP)
Hong Kong, China	8,016	34,743	3,290	26,520	152,831	97.5
Indonesia	1	9	0	2	16	0.01
Japan	142,798	84,870	...	10,612	274,457	6.4
Korea, Rep. of	961	194	171	288	3,416	0.6
Malaysia	93	47	19	640	853	0.8
Philippines	143	…	…	2	166	0.2
Singapore	6,973	8,969	2,089	11,939	42,739	46.8
Thailand	42	33	0	31	248	0.2
East Asia Average	19,878	16,108	696	6,254	59,341	19.1
	(33.5)	(27.1)	(1.2)	(10.5)	(100.0)	
Europe Average	43,300	79,533	10,351	16,192	193,218	37.6
	(22.4)	(41.2)	(5.4)	(8.4)	(100.0)	
United States	…	1,100,000	255,496	392,415	2,080,302	19.0
		(52.9)	(12.3)	(18.9)	(100.0)	

Notes: (…) = not available.
See notes Table 1.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 4: Equity Asset Inflows from Selected Regions, 2003 ($ million, % of GDP)

| Recipient Economy | Equity Assets Sent by Each Region | | | | Total | |
	US	Europe	Japan	East Asia	($ million)	(% GDP)
China, People's Rep. of	13,064	8,944	2,094	19,625	45,788	3.2
Hong Kong, China	36,210	35,223	5,594	7,901	92,889	59.3
Indonesia	4,406	2,542	89	922	12,597	6.0
Japan	255,496	175,975	…	5,569	493,763	11.5
Korea, Rep. of	49,121	27,702	708	3,579	92,822	15.3
Malaysia	4,075	4,862	296	3,258	14,544	14.0
Philippines	1,634	683	158	325	3,027	3.8
Singapore	21,932	12,579	1,280	4,096	42,857	46.9
Thailand	6,477	6,746	393	4.759	21,291	14.9
East Asia Average	42,150	29,590	946	3,379	85,977	19.1
	(49.0)	(34.4)	(1.1)	(3.9)	(100)	
Europe Average	64,759	79,533	4,992	7,580	173,786	29.7
	(37.3)	(45.8)	(2.9)	(4.4)	(100)	
United States	…	736,108	142,798	159,027	1,288,012	11.2
		(59.9)	(11.6)	(12.9)	(100)	

Notes: (…) = not available.
See notes Table 2.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

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Table 5: East Asia's Long-term Debt Securities Holdings in Selected Regions, 2003
($ million, % of GDP)

| Source Economy | Long-term Debt Securities Held in Each Region | | | | Total | |
	US	Europe	Japan	East Asia	($ million)	(% of GDP)
Hong Kong, China	33,652	48,879	6,553	22,264	154,096	98.4
Indonesia	367	267	3	202	1,715	0.8
Japan	463,351	512,126	...	10,726	1,407,173	32.7
Korea, Rep. of	6,963	2,625	72	1,083	13,833	2.3
Malaysia	208	330	…	122	800	0.8
Philippines	1,601	149	13	243	2,202	2.7
Singapore	14,311	20,170	1,316	9,916	57,580	63.0
Thailand	1,526	514	0	49	2,224	1.6
East Asia Average	65,247	73,133	995	5,576	204,953	25.3
	(31.8)	(35.7)	(0.5)	(2.7)	(100)	
Europe Average	42,748	209,357	2,967	3,978	313,085	59.4
	(13.7)	(66.9)	(0.9)	(1.3)	(100)	
United States	…	402,604	35,682	53,718	868,948	7.9
		(46.3)	(4.1)	(6.2)	(100)	

Notes: (…) = not available.
See notes Table 1.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 6: Selected Regions' Long-term Debt Securities Holdings in East Asia, 2003
($ million, % of GDP)

| Recipient Economy | Long-term Debt Securities Held by Each Region | | | | | |
| | US | Europe | Japan | East Asia | Total | |
					($ million)	(% of GDP)
China, People's Rep. of	667	658	422	2,399	4,018	0.3
Hong Kong, China	1,419	2,447	1,574	3,693	8,065	5.1
Indonesia	666	549	50	1,019	4,091	2.0
Japan	35,682	50,433	…	7,957	105,577	2.5
Korea, Rep. of	4,217	3,360	4,555	15,176	24,218	4.0
Malaysia	3,878	3,154	1,409	6,205	13,988	13.5
Philippines	3,403	4,180	1,156	2,330	11,043	13.7
Singapore	2,951	2,396	969	4,396	11,158	12.2
Thailand	835	447	591	1,430	2,909	2.0
East Asia Average	5,895	7,441	1,145	4,690	20,117	6.1
	(29.3)	(37.0)	(5.7)	(23.3)	(100.0)	
Europe Average	23,683	209,357	30,125	34,415	300,090	54.7
	(7.9)	(69.8)	(10.0)	(11.5)	(100.0)	
United States	…	726,717	463,351	521,979	1,413,454	12.9
		(51.4)	(32.8)	(36.9)	(100.0)	

Notes: (…) = not available.
See notes Table 2.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 7: East Asia's Short-term Debt Securities Holdings in Selected Regions, 2003
($ million, % of GDP)

	Short-term Debt Securities Held in Each Region					
					Total	
Source Economy	**US**	**Europe**	**Japan**	**East Asia**	($ million)	(% of GDP)
Hong Kong, China	5,001	6,672	600	5,900	27,985	17.9
Indonesia	82	…	…	0	82	0.04
Japan	14,059	11,175	…	530	39,684	0.9
Korea, Rep. of	38	56	0	0	94	0.02
Malaysia	0	12	…	0	12	0.01
Philippines	790	…	…	…	1,313	1.6
Singapore	1,320	26,835	52	7,238	43,556	47.7
Thailand	196	17	0	0	276	0.2
East Asia Average	2,686	5,596	82	1,709	14,125	8.5
	(19.0)	(39.6)	(0.6)	(12.1)	(100)	
Europe Average	7,977	19,411	79	130	32,881	11.0
	(24.3)	(59.0)	(0.2)	(0.4)	(100.0)	
United States	…	151,990	672	956	184,994	1.7
		(82.2)	(0.4)	(0.5)	(100.0)	

Notes: (…) = not available.
See notes Table 1.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 8: Selected Regions' Short-term Debt Securities Holdings in East Asia, 2003
($ million, % of GDP)

| Recipient Economy | Short-term Debt Securities Held by Each Region | | | | Total | |
	US	Europe	Japan	East Asia	($ million)	(% of GDP)
China, People's Rep. of	7	0	1	2,809	3,141	0.2
Hong Kong, China	32	200	12	533	821	0.5
Indonesia	0	29	2	881	948	0.5
Japan	672	1,347	…	652	3,026	0.1
Korea, Rep. of	91	373	25	2,264	2,729	0.5
Malaysia	0	84	0	3,989	4,075	3.9
Philippines	9	13	0	692	716	0.9
Singapore	118	103	458	753	1,658	1.8
Thailand	27	63	32	1,095	1,199	0.8
East Asia Average	105	246	59	1,207	1,686	1.0
	(6.3)	(14.6)	(3.5)	(71.6)	(100.0)	
Europe Average	8,941	19,411	657	2,633	34,825	5.2
	(25.7)	(55.7)	(1.9)	(7.6)	(100.0)	
United States	…	135,605	14,059	21,486	180,735	1.7
		(75.0)	(7.8)	(11.9)	(100.0)	

Notes: (…) = not available.

See notes Table 2.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 9: Cross-Border Bank Claims on Selected Regions, 2003 ($ millions, % of GDP)

| Source Economy | Bank Claims Held in Each Region | | | | Total | |
	US	Europe	Japan	East Asia	($ million)	(% of GDP)
Japan	488,871	441,207	…	90,776	1,238,176	28.8
Korea, Rep. of	10,750	10,744	2,596	18,150	50,788	8.4
Taipei,China	30,862	19,051	4,289	21,802	83,238	29.1
Average	176,828	157,001	2,295	43,576	457,401	22.1
	(38.7)	(34.3)	(0.5)	(9.5)	(100)	
Europe Average	162,400	345,107	25,603	53,691	665,739	111.1
	(24.4)	(51.8)	(3.8)	(8.1)	(100.0)	
United States	…	409,820	69,552	165,825	838,340	7.7
		(48.9)	(8.3)	(19.8)	(100.0)	

Notes: (…) = not available.
See notes Table 1.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 10: Selected Regions' Cross-Border Bank Claims on East Asia, 2003
($ million, % of GDP)

| Host Economy | Bank Claims Held by Each Region | | | | Total | |
	US	Europe	Japan	East Asia	($ million)	(% of GDP)
China, People's Rep. of	4,714	30,241	11,623	15,766	51,952	3.7
Hong Kong, China	19,348	183,371	23,440	37,220	248,028	158.3
Indonesia	2,781	21,877	5,697	7,526	32,653	15.7
Japan	69,552	409,642	…	6,885	495,740	11.5
Korea, Rep. of	17,375	49,768	12,134	14,572	86,479	14.3
Malaysia	9,503	26,976	5,002	6,323	43,101	41.5
Philippines	4,614	13,210	2,563	3,712	21,967	27.3
Singapore	15,900	72,098	17,483	24,746	119,258	130.6
Taipei,China	17,587	34,381	4,005	4,385	56,941	19.9
Thailand	4,451	17,484	8,829	9,593	31,597	22.1
East Asia Average	16,111	82,881	7,915	11,496	113,576	44.1
	(14.2)	(73.0)	(7.0)	(10.1)	(100.0)	
Europe Average	22,768	305,572	24,512	26,167	364,159	119.1
	(6.3)	(83.9)	(6.7)	(7.2)	(100.0)	
United States	…	2,600,000	488,871	530,483	3,358,676	30.7
		(77.4)	(14.6)	(15.8)	(100.0)	

Notes: (…) = not available.
See notes Table 2.

Source: International Monetary Fund (http://www.imf.org/external/np/sta/pi/cpis.htm).

Table 11: Determinants of Total International Portfolio Asset Holdings

	(1)	(2)	(3)	(4)
GDP of source country	0.125 **	0.119 **	0.122 **	0.105 **
	[0.009]	[0.009]	[0.009]	[0.008]
GDP of destination country	0.150 **	0.144 **	0.144 **	0.128 **
	[0.009]	[0.009]	[0.008]	[0.008]
Per capita GDP of source	0.175 **	0.182 **	0.112 **	0.091 **
	[0.013]	[0.013]	[0.012]	[0.012]
Per capita GDP of destination	0.133 **	0.139 **	0.079 **	0.063 **
	[0.011]	[0.011]	[0.011]	[0.010]
Area size of source	-0.029 **	-0.026 **	-0.037 **	-0.042 **
	[0.007]	[0.007]	[0.006]	[0.006]
Area size of destination	-0.033 **	0.036 **	0.025 **	0.018 **
	[0.007]	[0.007]	[0.006]	[0.006]
Distance	-0.156 **	-0.151 **	-0.016	-0.023
	[0.017]	[0.017]	[0.016]	[0.015]
Border	0.660 **	0.661 **	0.549 **	0.575
	[0.091]	[0.091]	[0.083]	[0.075] **
Common language	0.126 **	0.118 **	0.161 **	0.139 **
	[0.036]	[0.036]	[0.032]	[0.030]
Ex-common colonizer	0.152 *	0.151 *	0.191 **	0.142 *
	[0.069]	[0.069]	[0.063]	[0.058]
Ex-colony-colonizer	-0.116	-0.104	-0.137	-0.144
	[0.105]	[0.105]	[0.095]	[0.086]
Intra-East Asia dummy		0.432 **	0.588 **	0.658 **
		[0.130]	[0.117]	[0.105]
Intra-Europe dummy			2.231 **	2.346 **
			[0.074]	[0.066]
East Asia-US dummy				3.236 **
				[0.204]
Europe-US dummy				4.224 **
				[0.158]
Observations	12459	12459	12459	12459
R-squared	0.363	0.363	0.438	0.518

Note: The dependent variable is source economy's cross-border holding of destination economy's total portfolio assets. It is taken logarithm after adding 1 to include all the observations with value zero. All other explanatory variables except the dummy variables are taken logarithm. Random effect estimation technique is used. Robust standard errors of the estimated coefficients are reported in parentheses. Intercept and year dummy variable are included (not reported). ** and * indicate that the estimated coefficients are statistically significant at 1% and 5% levels respectively.

Table 12: Determinants of Total International Portfolio Asset Holdings: Controlling Bilateral Trade

	(1)	(2)	(3)	(4)
Bilateral trade (lagged)	0.705 ** [0.016]	0.753 ** [0.016]	0.686 ** [0.015]	0.609 ** [0.015]
GDP of source country	-0.101 ** [0.009]	-0.102 ** [0.009]	-0.080 ** [0.009]	-0.068 ** [0.008]
GDP of destination country	-0.072 ** [0.009]	-0.072 ** [0.009]	-0.053 ** [0.008]	-0.040 ** [0.008]
Per capita GDP of source	0.196 ** [0.011]	0.180 ** [0.011]	0.125 ** [0.011]	0.105 ** [0.011]
Per capita GDP of destination	0.136 ** [0.010]	0.122 ** [0.010]	0.077 ** [0.009]	0.063 ** [0.009]
Area size of source	-0.003 [0.006]	-0.010 [0.006]	-0.02 ** [0.005]	-0.026 ** [0.005]
Area size of destination	0.054 ** [0.006]	0.048 ** [0.006]	0.038 ** [0.006]	0.030 ** [0.005]
Distance	0.035 * [0.015]	0.035 * [0.015]	0.126 ** [0.014]	0.108 ** [0.013]
Border	-0.113 [0.077]	-0.167 * [0.076]	-0.176 * [0.070]	-0.075 [0.066]
Common language	0.043 [0.030]	0.058 * [0.029]	0.097 ** [0.027]	0.096 ** [0.026]
Ex-common colonizer	-0.107 [0.058]	-0.122 * [0.058]	-0.068 [0.054]	-0.077 [0.051]
Ex-colony-colonizer	-0.298 ** [0.087]	0.341 ** [0.086]	-0.346 ** [0.079]	-0.316 ** [0.074]
Intra-East Asia dummy		-1.081 ** [0.109]	-0.823 ** [0.100]	-0.620 ** [0.094]
Intra-Europe dummy			1.686 ** [0.061]	1.835 ** [0.057]
East Asia-US dummy				1.378 ** [0.177]
Europe-US dummy				3.203 ** [0.134]
Observations	12459	12459	12459	12459
R-squared	0.537	0.549	0.594	0.627

Note: The bilateral trade variable is log (1+real bilateral trade volume). See notes Table 11.

Table 13: Determinants of Various Types of International Financial Asset Holdings

	Equity	Long-term Securities	Short-term Securities	Bank Claims
GDP of source country	0.022 ** [0.007]	0.147 ** [0.008]	0.033 ** [0.004]	0.521 ** [0.019]
GDP of destination	0.133 ** [0.007]	0.069 ** [0.007]	0.021 ** [0.004]	0.245 ** [0.016]
Per capita GDP of source	0.095 ** [0.010]	-0.023 * [0.011]	-0.023 ** [0.006]	0.479 ** [0.033]
Per capita GDP of destination	-0.014 [0.009]	0.093 ** [0.009]	0.024 ** [0.005]	0.216 ** [0.022]
Area size of source	0.014 ** [0.005]	-0.093 ** [0.006]	-0.020 ** [0.003]	-0.178 ** [0.014]
Area size of destination	-0.033 ** [0.005]	0.048 ** [0.005]	0.006 ** [0.003]	0.039 ** [0.013]
Distance	-0.024 [0.013]	-0.015 [0.013]	-0.008 [0.007]	-0.220 ** [0.033]
Border	0.519 ** [0.063]	0.490 ** [0.065]	0.307 ** [0.032]	1.158 ** [0.157]
Common language	0.149 ** [0.026]	0.073 ** [0.026]	0.066 ** [0.013]	0.455 ** [0.071]
Ex-common colonizer	0.133 * [0.053]	0.139 * [0.056]	0.009 [0.031]	
Ex-colony-colonizer	-0.123 [0.072]	-0.140 [0.074]	-0.048 [0.034]	0.691 ** [0.134]
Intra-East Asia dummy	0.546 ** [0.090]	0.435 ** [0.090]	-0.059 [0.049]	1.250 ** [0.236]
Intra-Europe dummy	2.825 ** [0.169]	2.353 ** [0.166]	0.694 ** [0.082]	1.702 ** [0.302]
East Asia-US dummy	1.470 ** [0.055]	2.161 ** [0.055]	0.652 ** [0.024]	0.661 ** [0.108]
Europe-US dummy	4.074 ** [0.130]	3.383 ** [0.129]	2.088 ** [0.053]	1.658 ** [0.233]
Observations	11489	11586	9752	4731
R-squared	0.456	0.508	0.353	0.636

Note: The dependent variable is source economy's holding of each type of destination economy's financial assets. See notes Table 11.

Table 14: Determinants of Various Types of International Financial Asset Holdings: Controlling Bilateral Trade

	Equity	Long-term Securities	Short-term Securities	Bank Claims
Bilateral trade (lagged)	0.455 ** [0.013]	0.505 ** [0.013]	0.166 ** [0.007]	0.802 ** [0.027]
GDP of source country	-0.109 ** [0.008]	-0.004 [0.008]	-0.017 ** [0.005]	-0.19 ** [0.019]
GDP of destination	0.002 [0.007]	-0.069 ** [0.007]	-0.028 ** [0.004]	-0.059 ** [0.018]
Per capita GDP of source	0.111 ** [0.010]	-0.002 [0.010]	0.013 * [0.006]	0.442 ** [0.030]
Per capita GDP of destination	-0.011 [0.008]	0.086 ** [0.008]	0.022 ** [0.005]	0.192 ** [0.018]
Area size of source	0.026 ** [0.005]	-0.074 ** [0.005]	-0.014 ** [0.003]	-0.146 ** [0.012]
Area size of destination	-0.02 ** [0.005]	0.055 ** [0.005]	0.010 ** [0.003]	0.060 ** [0.011]
Distance	0.119 ** [0.012]	0.089 ** [0.012]	0.043 ** [0.007]	-0.001 [0.028]
Border	0.037 [0.057]	-0.069 [0.058]	-0.114 ** [0.031]	0.190 [0.132]
Common language	0.116 ** [0.023]	0.031 [0.023]	0.057 ** [0.012]	0.291 ** [0.058]
Ex-common colonizer	-0.054 [0.048]	-0.076 [0.050]	-0.065 * [0.030]	
Ex-colony-colonizer	-0.252 ** [0.063]	-0.268 ** [0.064]	-0.097 ** [0.033]	0.536 ** [0.109]
Intra-East Asia dummy	-0.430 ** [0.084]	-0.611 ** [0.081]	-0.387 ** [0.049]	-0.350 [0.199]
Intra-Europe dummy	1.451 ** [0.152]	0.851 ** [0.145]	0.225 ** [0.081]	-0.200 [0.253]
East Asia-US dummy	1.091 ** [0.049]	1.748 ** [0.048]	0.522 ** [0.023]	0.310 ** [0.088]
Europe-US dummy	3.321 ** [0.115]	2.560 ** [0.110]	1.830 ** [0.050]	0.882 ** [0.189]
Observations	11489	11586	9752	4731
R-squared	0.559	0.601	0.398	0.749

Note: See notes Tables 12, 13.

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About the paper

Jong-Wha Lee analyzes the patterns and determinants of financial integration in East Asia using cross-border holdings of financial assets. He finds financial integration among East Asian economies, particularly in equity and debt securities, is lower than in Europe. A large part of regional financial integration in East Asia is related to heavy intra-regional trade in goods. The lack of financial integration is due largely to underdeveloped financial infrastructure, a low level of capital account liberalization, and higher exchange volatility.