

RESEARCH ARTICLE

ASEAN Bond Market Integration: What Drives Cross-Border Bond Investment in ASEAN?

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Abstract: Bond market integration in the Association of Southeast Asian Nations (ASEAN) appears to be relatively low or weak especially in terms of intraregional bond investment despite the robust growth in bond market size in recent years and policy initiatives in support of developing bond markets in the region. This paper aims to contribute to the literature on ASEAN financial integration by providing empirical evidence and policy insights on what can help boost intra-ASEAN bond investment. Using panel regression following a gravity model framework and spanning five major ASEAN member countries—Indonesia, Malaysia, the Philippines, Singapore, and Thailand—over the 2001–2014 period, this study finds that the bond market size of the origin country, having a common language between origin and destination countries, and financial openness in both origin and destination countries are positively significant with respect to intra-ASEAN bond investment. These findings highlight the importance of narrowing information or transaction costs in order to promote freer flow of capital within ASEAN bond markets and thereby attain regional financial integration.

Keywords: ASEAN, bond market, financial integration, gravity model, policy

JEL Classifications: F32, G18

Investigating the relevant factors of bond market integration in the Association of Southeast Asian Nations (ASEAN)¹ is an important research objective in light of the recent trends in the region's bond markets. The start of the twenty-first century saw rapid growth in the ASEAN bond market, with the combined outstanding size of local-currency (LCY) bonds in Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam expanding to US\$990 billion by the end of September 2015 from US\$218 billion at the beginning of 2001 (ADB AsianBondsOnline, 2016). Moreover, the degree of bond market integration in the region appears to have increased over time as intra-ASEAN debt securities (bonds) asset holdings

rose to US\$58 billion by the end of 2014 from only US\$5 billion at end 2001 (IMF, 2016).

Supporting the development and integration of ASEAN domestic bond markets are various regional bond market initiatives such as the Asian Bond Markets Initiative (ABMI)—an ASEAN+3² initiative that was set up in 2003 in response to the 1997–98 East Asian financial crisis to promote the development of LCY bond markets within the ASEAN+3 region—and the Asian Bond Markets Forum (ABMF)—created in 2010 to promote the harmonization of rules and regulations and standardization of bond market practices across ASEAN+3 countries in order to enhance intraregional bond investment.

Studies have shown, however, that in Asia, financial integration lags behind trade integration and that despite its increase over time, it's still "relatively low" (see Ananchotikul et al., 2015). Interestingly, it has been found that the degree of financial integration in Asia is "less strong" than in the European Union (EU) or euro area, and that *home bias* in Asia is "particularly strong" (Ananchotikul et al., 2015). Specifically, financial integration in terms of cross-border portfolio equity and bond investment in East Asia is "extremely weak" and is lower compared to Europe (Lee, 2008). Furthermore, it has been observed that Asian foreign investments are more concentrated outside the region vis-à-vis within the region (Garcia-Herrero et al., 2009). Since the bond market is part of the financial market, then these scholarly works seem to infer that bond market integration and intraregional bond investment in Asia, particularly in the ASEAN, may also be "relatively low" and/or "extremely weak."

Against this backdrop, it is imperative for ASEAN policymakers to raise regional financial integration by boosting cross-border bond investment within the region. This necessitates a firm understanding of what policy measures may be needed in order to promote greater intraregional bond market integration. This paper posits that an ASEAN member country's degree of financial openness or intensity of capital controls could influence its participation in other ASEAN bond markets. Its contribution to the literature is that it appears to be the first to provide an empirical investigation on the potential relationship between financial openness and cross-border bond investment within ASEAN.

The next section examines the existing literature on cross-border portfolio investment. After which, an empirical model is tested in order to identify certain gravity model variables that could potentially influence cross-border bond investment in ASEAN. Results from the model are then used to formulate policy measures aimed at enhancing regional bond market integration.

Literature Review

Many empirical studies on cross-border financial asset flows or holdings have made use of a gravity model in identifying its determinants. Gravity modeling is a well-known empirical methodology that has been first seen in the literature on international trade in goods and

thereafter in studies on foreign investment in financial assets. (As empirically established by Portes and Rey [2005], the gravity model explains bilateral trade in goods "at least as well" as bilateral financial asset flows or holdings; this is because similar to the gravity models in trade in goods, their gravity model regression results based on their model of financial asset trade are robust to different sets of dummy variables, individual years, country by country, detrending, and different estimation techniques, and also, their results account for 70% of the variance in cross-border equity flows given a set of variables.)

Studies on financial asset trade using gravity modeling have mainly focused on three types of financial asset stocks or flows—i) bank claims or lending (Ananchotikul et al., 2015; Lee, 2008; Aviat & Coeurdacier, 2007), ii) aggregate portfolio (equities and bonds) investment asset holdings (Ananchotikul et al., 2015), iii) portfolio equity holdings or flows (Ananchotikul et al., 2015; Giofré, 2014; Roque & Cortez, 2014; Aggarwal et al., 2012; Lee et al., 2012; Garcia-Herrero et al., 2009; Lane & Milesi-Ferretti, 2008; Lee, 2008; Aviat & Coeurdacier, 2007; Portes & Rey, 2005), and iv) portfolio debt securities (bonds) holdings or flows (Ananchotikul et al., 2015; Aggarwal et al., 2012; Lee et al., 2012; Garcia-Herrero et al., 2009; Eichengreen & Luengnaruemitchai, 2008; Lee, 2008; Aviat & Coeurdacier, 2007).

In the literature, those gravity model variables that are found to have a significantly positive impact on cross-border bond investment between origin countries (or source countries) and destination countries are i) GDP of both origin and destination countries (Garcia-Herrero et al., 2009; Eichengreen & Luengnaruemitchai, 2008), ii) GDP per capita of both origin and destination countries (Lee et al., 2012; Eichengreen & Luengnaruemitchai, 2008; Lee, 2008), iii) geographical size of destination country (Lee, 2008), iv) population size of destination country (Lee et al., 2012), v) common language between origin and destination countries (Aggarwal et al., 2012; Lee et al., 2012; Garcia-Herrero et al., 2009; Lee, 2008), vi) common border between origin and destination countries (Eichengreen & Luengnaruemitchai, 2008), vii) common religion between origin and destination countries (Aggarwal et al., 2012), viii) bilateral trade in goods between origin and destination countries (Lee et al., 2012; Garcia-Herrero et al., 2009; Lee, 2008), ix) financial market liberalization in destination country

(Lee et al., 2012), x) risk-adjusted bond market return in the destination country (Garcia-Herrero et al., 2009), xi) bond market return correlation between the origin country and destination country (Garcia-Herrero et al., 2009), xii) bond market size in origin country (Ananchotikul et al., 2015; Aggarwal et al., 2012), xiii) bond market size in destination country (Ananchotikul et al., 2015), xiv) equity market development in both origin and destination countries (Aggarwal et al., 2012), xv) investor protection in destination country (Aggarwal et al., 2012), xvi) bond market liquidity in the destination country (Garcia-Herrero et al., 2009), and xvii) certain individual components of “cultural distance”—such as distance in and degree of “masculinity” and “individualism” in both origin and destination countries (Aggarwal et al., 2012).

In contrast, the factors that have a significantly negative impact on bilateral debt securities investment as uncovered by the above-mentioned studies are i) GDP of both origin and destination countries (Lee, 2008), ii) population size of the origin country (Lee et al., 2012), iii) geographical size of the origin country (Lee, 2008), iv) geographical distance between capital cities of origin and destination countries (Ananchotikul et al., 2015; Aggarwal et al., 2012; Garcia-Herrero et al., 2009), v) common border between origin and destination countries (Lee, 2008), vi) capital controls in the origin country (Garcia-Herrero et al., 2009; Eichengreen & Luengnaruemitchai, 2008), vii) capital controls in the destination country (Eichengreen & Luengnaruemitchai, 2008), viii) country risk in both origin and destination countries (Aggarwal et al., 2012), ix) accounting quality in destination country (Aggarwal et al., 2012), and x) financial risk in destination country (Lee et al., 2012).

Sample coverage, model specification, and research objective, among others, tend to differ across the abovementioned studies on cross-border bond investment. Ananchotikul et al. (2015) combined both portfolio equity and debt in their study of cross-border portfolio investment to cover multiple countries worldwide that include ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and focus on the 2001–2012 period; they also have an empirical model for cross-border portfolio bond investment only (excluding equities), and this is a year-specific fixed-effects standard gravity regression model with its results showing bond market size for both origin and destination countries and a common

language to be both positively associated and geographical distance to have a negative relation with cross-border short-term bond investment and with cross-border long-term bond investment. One of the main contributions of Ananchotikul et al. (2015) in the literature is that they highlight the role of regulation in bilateral portfolio equity and bond investment.

Aggarwal et al. (2012) examine 174 origin countries and 50 destination countries (albeit unclear as regards which ASEAN member country is covered) spanning the 2001–2007 period; in their empirical results for long-term debt holdings, they use panel regression following a gravity model to show that “cultural characteristics” of both origin and destination countries and “cultural distance” between the two affect cross-border long-term bond investment holdings. Lee et al. (2012), in their empirical investigation of cross-border bond investment, likewise made use of long-term debt securities holdings as well as flows focusing on Asia-Pacific Economic Cooperation (APEC) member economies (but only includes one ASEAN origin country, i.e., Singapore) to partner with 43 destination countries, which include 18 APEC members, encompassing the 2001–2007 period; their study makes use of a fixed-effect regression model, that is, with origin-country and year-specific fixed effects, as well as random effects using a gravity equation, and their results show that APEC members hold a larger amount of long-term bonds of other APEC members compared to nonmembers, but this is concentrated among East Asian member economies.

Garcia-Herrero et al. (2009) have four ASEAN countries (Indonesia, the Philippines, Singapore, and Thailand) in their total of 73 origin countries to combine with almost 200 destination countries, and their time period is 2001–2005; one of their main gravity model findings for Asia is that bond market liquidity is important for cross-border long-term bond investment in the region. Eichengreen and Luengnaruemitchai (2008) contain five ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) in their total sample of almost 70 countries but only cover the 2001–2003 period; they made use of pooled ordinary least squares (OLS), destination country-fixed and random effects, and country-pair fixed-effects models, and their results on cross-border long-term bond investment reveal that their gravity model variables are “well behaved.” Meanwhile, Lee (2008) shows East Asia—which includes ASEAN-5 countries—to have “some degree” of intraregional

integration in long-term debt securities markets but “little” intraregional integration in short-term debt securities markets.

As regards the composition of cross-border bond investment, most related studies focus on long-term debt securities and ignores short-term debt securities (Aggarwal et al., 2012; Lee et al., 2012; Garcia-Herrero et al., 2009; Eichengreen & Luengnaruemitchai, 2008; Aviat & Coeurdacier, 2007). Only Ananchotikul et al. (2015) and Lee (2008) cover both short-term and long-term debt securities but empirically investigated the two separately.

In this paper, the sample country coverage is that of five ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) grouped by pairs with one country being the origin (source) of debt securities (bonds) investment and the other country the destination (recipient) of bond investment. The time period for this study is 2001–2014. Unlike most of the related studies in the literature, both short-term and long-term debt securities (bonds) holdings of an ASEAN origin country in an ASEAN destination country are combined and used in this study. Thus, in this paper, bond investment refers to both short-term and long-term debt securities investment. The contribution of this paper to the literature is to empirically test whether an ASEAN country’s degree of financial openness matters for intra-ASEAN bond investment. This paper appears to be the first to empirically investigate the potential role of financial openness in cross-border bond investment within the ASEAN region.

Data and Methodology

Data

Bilateral debt securities (bonds) asset holdings data are based from the International Monetary Fund’s (IMF) Coordinated Portfolio Investment Survey (CPIS). This dataset is available on an annual basis for both the origin country and the destination country and, as of this writing, spans the 2001–2014 period. Most aforementioned studies have used this dataset. This study will make use of all of the yearly data. The sample ASEAN origin and destination countries are Indonesia, Malaysia, the Philippines, Singapore, and Thailand.³

Bond market size for both the origin country and the destination country is based on the amount of outstanding domestic bonds at the end of each year. This is available from the ADB’s *AsianBondsOnline*. It is expected that bond market sizes for the origin country and for the destination country are positively associated to bilateral bond investment between the two countries.

Proxies for information or transaction costs are geographical distance between origin and destination countries, common language between origin and destination countries, and degree of financial openness in both origin and destination countries. Geographical distance refers to the physical distance between the capital city of the origin country and the capital city of the destination country; this data is culled from the Centre d’Etudes Prospectives et d’Informations Internationales (CEPII). The a priori sign for geographical distance is negative. Data on common language—a dummy variable that equals 1 if the origin country and destination country share the same official language and 0 otherwise—are likewise from CEPII. It is expected that countries with a common language would have stronger ties when it comes to bond investment.

The proxy for the degree of financial openness for each origin country and destination country is the Chinn–Ito index, which is constructed using binary dummy variables that codify restrictions on cross-border financial transaction as reported by the IMF in its *Annual Report on Exchange Arrangements and Exchange Restrictions*; more specifically, the index is the first principal component of the variables that refer to capital controls on multiple exchange rates, current account transactions, capital or financial account transactions, and requirements for surrendering export proceeds (Chinn & Ito, 2006). The index is also a measure of intensity of capital controls (Ibid.). Capital controls refer to policies, rules, or regulations that affect the inflow and outflow of portfolio capital in a given market; some examples are withholding taxes on capital gains and/or interest income as well as outright limits on foreign bond investment.

This study uses the normalized version of the Chinn–Ito index, which ranges between 0 and 1, with 0 (1) representing the lowest (highest) degree of financial openness. In the case of the ASEAN countries in the sample, the 2013 index ranges from 0.2 for Malaysia, the Philippines, and Thailand; 0.4 for Indonesia; and

1.0 for Singapore. These figures portray the degree of financial openness in Malaysia, the Philippines, and Thailand to be relatively low and of the same magnitude, that of Indonesia to be higher than the three, and Singapore to have the most open financial market in the region. The index data also imply that the intensity of capital controls is relatively high and at par with Malaysia, the Philippines, and Thailand; relatively low or nonexistent in Singapore; and in between for Indonesia. (As of this writing, the index is available per ASEAN country from 2001 to 2013; because the index has not been updated to 2014 yet, this study uses the 2013 figure as its data for 2014.)

Model Specification

A panel regression in a gravity model framework is utilized with the baseline model specification that is partially patterned after that of Ananchotikul et al. (2015), which is then based on the theoretical framework of Martin and Rey (2004) and Aviat and Coeurdacier (2007); this is presented in equation (1):

$$\ln Y_{ijt} = \alpha + \beta_1 \ln X0_{it} + \beta_2 \ln X1_{jt} + \beta_3 \ln X2_{ij} + \beta_4 X3_{ij} + \delta X4_t + \varepsilon_{ijt} \quad (1)$$

where $\ln Y_{ijt}$ is the natural logarithm of portfolio short- and long-term debt securities (bond) asset holdings of origin country i in destination country j in year t ; $\ln X0_{it}$ is the natural logarithm of bond market size of origin country i in year t ; $\ln X1_{jt}$ is the natural logarithm of bond market size of destination country j in year t ; $\ln X2_{ij}$ is the natural logarithm of geographical distance between capital cities of origin country i and destination country j ; $\ln X3_{ij}$ is a dummy variable that equals 1 if origin country i and destination country j share a common official language, 0 otherwise; $X4_t$ is year-specific dummy variables to control for economic shocks affecting all country pairs for each year except for the year 2001, which serves as the base year; and ε_{ijt} is the error term. Standard errors are robust for heteroscedasticity and are clustered at country pairs.

The baseline regression will then be re-estimated but with the addition of the proxies for the degree of financial openness, that is, the Chinn–Ito indices for both origin and destination countries; the new model specification is presented in equation (2):

$$\ln Y_{ijt} = \alpha + \beta_1 \ln X0_{it} + \beta_2 \ln X1_{jt} + \beta_3 \ln X2_{ij} + \beta_4 X3_{ij} + \delta X4_t + \beta_5 X5_{it} + \beta_6 X6_{jt} + \varepsilon_{ijt} \quad (2)$$

where $X5_{it}$ is a measure of the degree of financial openness (Chinn–Ito index) of origin country i in year t and $X6_{jt}$ is a measure of the degree of financial openness (Chinn–Ito index) of destination country j in year t .

The model has five origin countries and five destination countries, with each country having four partner countries. There are a total of 49 country pairs, and the total number of observations is 280. Given that this study's model is largely patterned after the baseline regression model of Ananchotikul et al. (2015), which has 13 time dummy variables alongside the basic 4 standard gravity model variables, this research is constrained to focus on financial openness only as it faces a relatively small number of observations and degrees of freedom. Thus, a caveat to this paper's model is that it tends to ignore other proxies for determinants of cross-border bond investment that are cited in the literature and that could serve as control variables—such as, GDP, GDP per capita, accounting quality, bilateral trade, bond market liquidity, bond market return, capital controls, country risk, cultural distance, equity market development, financial market liberalization, financial risk, geographical size, investor protection, and population size.

Results

Descriptive Statistics

Table 1 shows the average annual bilateral cross-border debt securities (bonds) investment holdings in the ASEAN region spanning the 2001–2014 period. Based on the average annual amount of ASEAN bonds held by an ASEAN country during the said period, the largest ASEAN bond holder country is Singapore while the smallest is Thailand. For Singapore, its largest bond investments are in Malaysia, a close neighboring country. In terms of the average annual amount of ASEAN bond investments received by an ASEAN country, the largest recipient is Malaysia, where most of its ASEAN bond investments came from Singapore, whereas the smallest is the Philippines.

Table 1. *Bilateral Debt Securities Investment Holdings in ASEAN (Annual Average 2001–2014, US\$ Million)*

Origin Country	Destination Country				
	Indonesia	Malaysia	Philippines	Singapore	Thailand
Indonesia	—	46	5	261	4
Malaysia	277	—	122	1,893	119
Philippines	366	24	—	178	35
Singapore	6,082	9,836	2,173	—	2,492
Thailand	16	63	6	172	—

Notes: Data not available for Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Myanmar, and Viet Nam as an origin country. Destination country data for the abovementioned countries are incomplete and are excluded from the study.

Source: author's calculations based on raw data from the International Monetary Fund's (IMF) Coordinated Portfolio Investment Survey.

Regression Results

Table 2 presents the regression results for equations (1) and (2). The baseline regression model per equation (1) indicates that the origin country's bond market size is positively associated with bilateral bond investment within ASEAN, with the statistical significance at the 10% level. This implies that ASEAN economies with relatively large or more developed bond markets tend to drive the entry of its financial capital into other ASEAN bond markets. In contrast, the ASEAN destination country's bond market size is not statistically significant, suggesting that the size of the bond market in the destination country is irrelevant, especially when it comes to attracting or prohibiting bond inflows from ASEAN origin countries.

As regards geographical distance, this is found to be unimportant in connection with cross-border bond investment in ASEAN due to its statistically insignificant results.

However, having a common language between the origin and destination countries is important, as its coefficient is statistically significant at the 10% level. The results on common language show that ASEAN countries that have the same language or similar linguistic roots tend to engage more actively in bilateral bond investment. Such a finding implies that bond investors domiciled in an ASEAN origin country, which shares a common language with an ASEAN destination country, tend to be more familiar with

the characteristics of bonds and bond markets in the ASEAN destination country; this investor familiarity is likely to reduce bond investors' information costs and thereby increase their willingness to invest in bonds issued in the ASEAN destination country. For instance, having one common language for the write-ups of bond prospectuses and other materials in marketing bonds in ASEAN is seen to be a step towards improving investor familiarity and reducing information costs and thereby serves as an important requirement in boosting intra-ASEAN bond investment.

The column for Equation (2) in Table 2 presents the regression results based on the model that contains the financial openness proxies for both origin and destination countries. Bond market size of the origin country is still statistically significant, but at a higher level, that is, at 1%. Also, common language remains statistically significant at the 10% level, while both bond market size of the destination country and geographical distance are still statistically insignificant. As regards the variables of interest, it is clear from the results that financial openness of the origin country is highly significant, that is, statistically significant at 1% level, having a positive relationship with bilateral cross-border bond investment in ASEAN, and the financial openness of the destination country is statistically significant at 10% level and that it also positively affects intra-ASEAN bond investment. The

Table 2. *Regression Results*

Variable	Dimension	Equation (1)	Equation (2)
Bond Market Size (natural logarithm)	it	2.978* (1538)	4.364*** (1.253)
Bond Market Siza (natural logarithm)	jt	-0.933 (2.368)	0.647 (2.033)
Geographical Distance (natural logarithm)	ij	-3.164 (1.975)	-1.265 (1.534)
Common Language	ij	3.754* (2.120)	2.600* (1.272)
Financial Openness	it		7.703*** (2.302)
Financial Openness	jt		3.800* (1.877)
Constant		-15.395 (98.177)	-108.600
(82.526)			
Year-specific effects		Yes	Yes
Number of observations		280	280
R-squared		0.3833	0.4403

Statistical significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Standard errors, which are robust to heteroscedasticity and clustered by country pairs, are in parentheses.

significant findings on financial openness show that more open bond markets tend to trade more bonds with one another, and more restrictive bond markets tend to impede the free flow of capital between them. In ASEAN, it is worthwhile to note that most member countries have a relatively low degree of financial openness, per the Chinn–Ito index, with only Singapore having one of the highest degrees of financial openness not just in the region but also globally. With this, the findings strengthen the need to promote greater bond market integration efforts in ASEAN amid the existence of regulatory restrictions in capital account transactions in most ASEAN countries.

Conclusions and Recommendations

One of the important foundations for regional financial integration, specifically, regional bond market integration, is intraregional bond investment. Increasing the degree of intra-ASEAN bond market integration via more active cross-border bond investment requires not only big bond market sizes

or well-developed bond markets but also lower information or transaction costs. The study's results confirm that narrowing the “language barrier” in cross-border bond transactions in ASEAN by having a common language is important in boosting regional bond investment. Moreover, mitigating the intensity of capital controls and thereby increasing the degree of financial openness in ASEAN countries is also vital to expand bilateral bond investment within the region and thereby attain higher degree of regional bond market integration.

Against this backdrop, this study recommends that ASEAN policy makers responsible in regulating bond markets in their respective home countries (namely, central banks, finance ministries, securities regulators, and stock exchanges, etc.) continue to pursue regional cooperation efforts aimed at narrowing information costs on intra-ASEAN bond investment. Adopting a common language for cross-border ASEAN bond transactions and easing capital control measures that hamper the free flow of capital in ASEAN bond markets are among the specific policy measures that are proposed by this study.

Moreover, this study calls attention to future research work in this area by proposing a more detailed or exhaustive empirical investigation on what types of capital controls or barriers to financial openness that do exist in ASEAN countries have been instrumental in intra-ASEAN bond investment.

Notes

- ¹ ASEAN comprises of ten member countries—Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam.
- ² ASEAN+3 comprises of ASEAN plus the People's Republic of China, Japan, and the Republic of Korea.
- ³ Origin country data in the IMF's CPIS are not available for Brunei Darussalam, Cambodia, Myanmar, and Viet Nam. The aforementioned countries are also excluded from the sample destination country coverage due to lack of complete time-series data.

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