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**Working Paper**

## Loans from my neighbors: East Asian commercial banks, banking integration, and bank default risk

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## **ADB Working Paper Series**

### **LOANS FROM MY NEIGHBORS: EAST ASIAN COMMERCIAL BANKS, BANKING INTEGRATION, AND BANK DEFAULT RISK**

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**Asian Development Bank Institute**

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**Abstract**

This study investigated the impact of banking integration on recipient country bank default risk and, in particular, whether the type of banking integration moderates that relationship. Using the system generalized method of moments (GMM), the study found that banking integration lowers bank default risk in recipient countries. The foreign claims that Asian lenders extend and the foreign claims that banks extend via local affiliates primarily drive the impact. These results show that the close proximity of lenders and borrowers or “local” knowledge via an affiliate’s presence alleviates information asymmetry, allowing for effective monitoring and disciplining of the loan relationship. The result supports the fostering of banking integration, promoting deeper intra-regional connectedness throughout East Asia. Where foreign claims come from outside East Asia, policy makers should encourage their presence through local affiliates, as this has an equivalent impact.

**Keywords:** banking integration, international banking claims, default risk, information asymmetry, East Asia

**JEL Classification:** G21, G28, F36

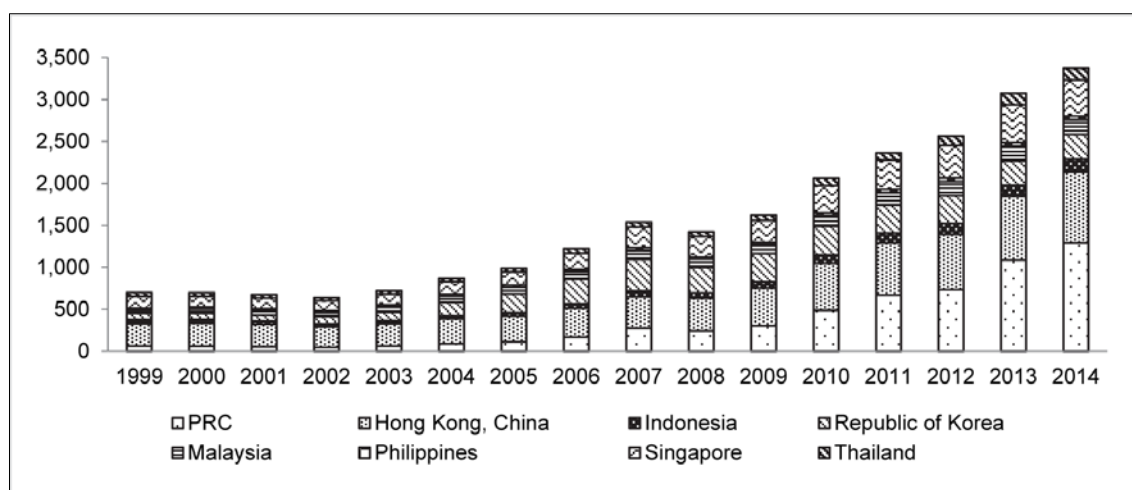
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# 1. INTRODUCTION

East Asia is an economically dynamic region of growing importance to the international financial system and the global economy. Unsurprisingly, East Asia has become increasingly integrated with the global financial system (World Bank 2018). This trend is apparent from the large increase in foreign banking claims to East Asia for the period 1999–2014, which Figure 1 depicts. These changes appear against the backdrop of the Asian financial crisis, which led to high-profile bank defaults and a painful economic contraction in many East Asian economies (Asian Development Bank 2008). Thus, the climate for financial integration and particularly for banking integration has fostered continued academic and policy interest in understanding the impact of banking integration with regard to financial stability.

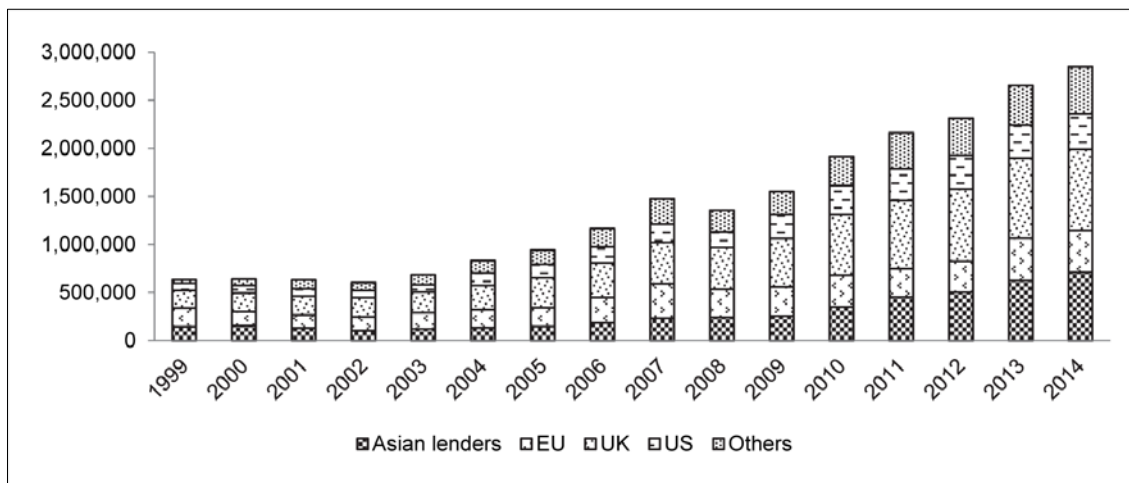
**Figure 1: Total Foreign Banking Claims on Each Country in the Sample**



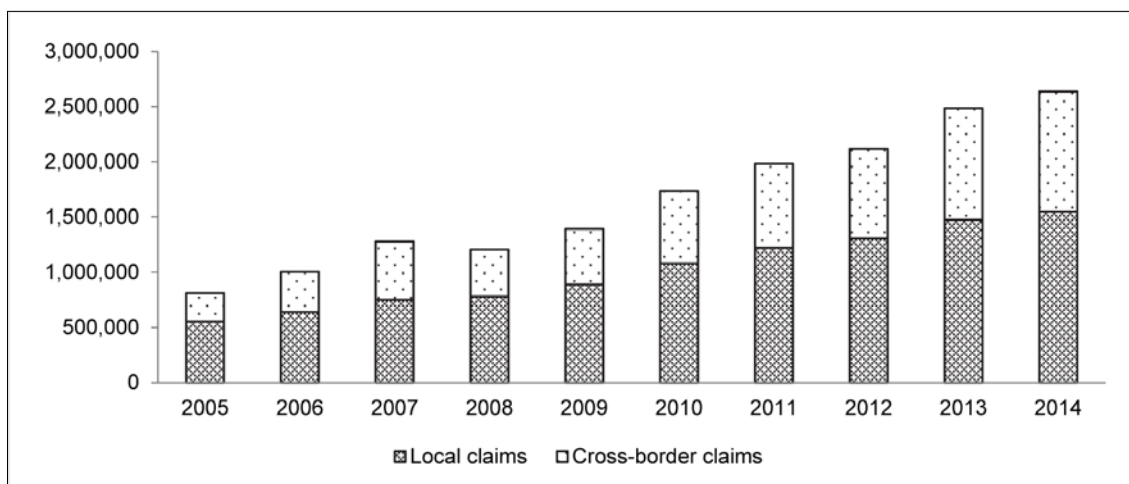
This figure reports the total foreign claims (in millions USD) that banks extended to each recipient country in the sample during the period 1999–2014. The source (lender) countries consist of 31 countries that report to the BIS (see Appendix A). The types of reporting banks are: (i) domestic banks (controlled by parent entities with the same country code as the reporting country); (ii) banks located in the reporting country but controlled by parent entities located in non-reporting countries; and (iii) banks controlled by parent entities located in the reporting country but not consolidated by their parent. Source: BIS Consolidated Banking Statistics on Immediate Counterparty basis (CBS-IC), bank type “All excluding 4C banks, excluding domestic position.”

As Figure 2 shows, the statistics for foreign banking claims to East Asia reveal a steadily growing share of foreign claims that Asian banks have extended, especially after the global financial crisis. This finding is consistent with efforts to promote intra-regional integration throughout East Asia (starting with the Chiang Mai Initiative in 2000 and the Asian Bond Markets Initiative in 2003 and culminating in the formation of the ASEAN Economic Community in 2015) (Ananchotikul, Piao, and Zoli 2015).

International banks can extend claims locally through their branches and subsidiaries in recipient countries; alternatively, they can extend claims across borders by financing and booking their claims from outside these recipient countries (García-Herrero and Martínez Pería 2007). Hence, it is possible to decompose foreign banking claims by the method of extension. In Figure 3, local claims account for the majority of claims and represent international banks’ efforts to obtain “local” knowledge via affiliate presence. Overall, these facts motivate a detailed examination of the impact of banking integration in East Asia.

**Figure 2: Foreign Banking Claims by Lender Nationality**

This figure reports the foreign claims (in millions USD) that banks extended to all the sampled countries broken down by lender nationality during the period 1999–2014. The source (lender) countries consist of 31 countries that report to the BIS (see Appendix A). The reporting Asian lenders include Australia; Taipei, China; Hong Kong, China; Japan; Singapore; and the Republic of Korea. We considered only one type of reporting banks: domestic banks (controlled by parent entities with the same country code as the reporting country). Source: BIS Consolidated Banking Statistics on Immediate Counterparty basis (CBS-IC), bank type “Domestic banks, excluding domestic position.”

**Figure 3: Foreign Banking Claims by Method of Extension**

This figure reports the foreign claims (in millions USD) that banks extended to all the sampled countries, broken down by method of extension, during the period 2005–2014. The source (lender) countries are similar to the CBS-ICs, except for three countries, Brazil, Mexico, and Luxembourg, that do not report in the CBS-URs (see Appendix A). These source countries could extend claims either via their local affiliates set up in the recipient countries (local claims) or across borders (cross-border claims). We considered only one type of reporting banks: domestic banks (controlled by parent entities with the same country code as the reporting country). Source: BIS Consolidated Banking Statistics on Ultimate Risk basis (CBS-UR), bank type “Domestic banks, excluding domestic position.”

This study investigated the impact of banking integration on recipient country bank default risk and whether the *type* of banking integration moderates that relationship. In particular, as the title of the paper intimates, we explored whether foreign banking claims from “neighbors” have a preferential impact on bank default risk. We employed two definitions of “neighbors”: (i) banks from other Asian countries, and (ii) foreign banks’ presence via a full affiliate office in the recipient countries.

More specifically, and considering East Asian countries as the foreign claim recipients, the first research question (RQ1) asks: How does banking integration affect recipient country bank default risk? The extant literature provides limited and contrasting findings. For instance, Dinger and Kaat (2017) reported that inflows of foreign capital lead to more impaired loans, while Karolyi, Sedunov, and Taboada (2018) showed that cross-border banking flows lower banks' systemic risk. This paper contributes to the empirical evidence on the relationship between banking integration and bank default risk using a sample of commercial banks in East Asia, a dynamic and growing region that relies increasingly on foreign claims from international banks.

The study then decomposed the measure of total foreign claims based on lenders' nationality and methods of extension. According to lenders' nationality, either Asian neighbors or distant non-Asian lenders extend foreign banking claims. This finding motivates the second research question (RQ2): Does regional lending affect recipient country bank default risk differently from non-regional lending? Considering methods of loan extension, it is possible to extend foreign claims via local affiliates that international banks have set up in the recipient countries or international banks have set up across borders. This leads to our third research question (RQ3): Do local affiliate claims affect recipient country bank default risk differently from cross-border claims with no local presence?

The literature contains well-documented evidence of information asymmetry associated with the distance between lenders and borrowers (Brennan and Cao 1997; Petersen and Rajan 2002; Knyazeva and Knyazeva 2012). This leads to our central argument that each type of foreign banking capital is associated with different levels of information asymmetry. Specifically, Asian claims face less information asymmetry than their non-Asian counterparts due to the geographic, cultural, and institutional proximity between Asian lenders and their regional borrowers (Mian 2006; Claessens and van Horen 2014). Similarly, the extension of funds via local affiliates rather than across borders involves some forms of foreign direct investment (García-Herrero and Martínez Pería 2007), which also help to obtain "local knowledge." Therefore, the information advantage associated with Asian claims and local claims arguably creates an effective disciplinary mechanism and strong competitive pressure on banks in the recipient countries, thus leading to lower risk-taking behavior. Although the rationale for expecting the preferential impact of Asian claims and local claims is highly intuitive, there is currently no research that has investigated the difference. Therefore, this paper addresses the literature gap.

The main result from this paper is that banking integration (measured via the total foreign claims of international banks) lowers bank default risk in recipient countries. This effect is primarily due to the foreign claims that Asian lenders extend and the foreign claims that banks extend via local affiliates. The findings remain robust when employing an alternative measure of bank risk (i.e., profit volatility) or conducting a different subsampling strategy (i.e., domestic banks or countries with low financial integration).

The paper contributes to the existing literature in several ways. The first research question sheds light on the broader debate about the impact of financial integration and international capital on financial stability. Research by Cubillas and González (2014) and Wu et al. (2017) confirmed that financial liberalization and foreign bank presence increase banks' risk taking in emerging countries. Similarly, several empirical studies have established a connection between international capital flows, credit growth, and lower credit quality or even the incidence of financial crisis (e.g., Reinhart and Rogoff 2008; Dinger and Kaat 2017). In contrast, this paper focuses on the impact of banking integration measured via the foreign claims that international banks extend and documents a positive effect on banking stability (lower bank default risk) in the recipient



countries. This finding complements Karolyi, Sedunov, and Taboada (2018), who found that cross-border banking flows help to lower banks' systemic risk at the country level.

The second and third research questions connect the literature on the distance constraint between providers and recipients of funds. In the context of international equity portfolio investment, the theoretical model and empirical evidence of Brennan and Cao (1997) suggested that foreign investors are less informed about the foreign markets than local investors, which could affect their investment returns. Similarly, foreign banks that lend in poor countries face severe information asymmetry due to the geographic, cultural, and institutional distance between the home and the host country (Mian 2006; Detragiache, Tressel, and Gupta 2008). In the bank loan market, Knyazeva and Knyazeva (2012) reported higher loan spreads between distant borrowers and lenders due to the costs of gathering soft information. The evidence from these studies implies that information asymmetry decreases when the borrowers' and lenders' proximity increases. This paper uses the context of foreign claims that international banks have extended, taking the viewpoint of the recipient countries, to make the definition of "closeness" or "neighbors" more direct. Specifically, "closeness" refers to the fact that regional lenders or local affiliates established in the recipient countries extend foreign claims.

The findings are useful in guiding important policy decisions affecting the design of a financial and banking integration strategy within East Asia. To maintain the financial stability of their banking systems, countries should favor either the foreign claims from Asian lenders or the foreign claims from local branches of international banks established in their countries. Foreign claims from Asian lenders are synonymous with the promotion of intra-regional financial integration. Foreign claims from outside East Asia, via local branches of international banks, imply that policy makers should encourage their presence through local affiliates.

The rest of the paper proceeds as follows. Section 2 reviews the relevant literature and develops the hypotheses. Section 3 outlines the empirical methodology. Sections 4 and 5 present the descriptive and empirical findings. Section 6 concludes.

## **2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

The first research question examines the impact of banking integration (which we measure via the total foreign claims from international banks) on bank default risk in recipient countries. The existing theoretical and empirical literature has suggested that banking integration can both decrease and increase bank default risk.

On the one hand, lower bank default risk could arise through different channels, including funding diversification, competition, and monitoring. With regard to the first channel, either retail deposits or international interbank borrowing can fund domestic banks. The latter may serve as an alternative source of funding in the event of local shocks (Allen et al. 2011). Second, foreign capital could create healthy competition among the different providers of financing, leading to the threat of "flight to quality" (Agénor 2003). In other words, banks in recipient countries are under pressure to improve their risk management and credibility to compete with international banks, which provide another source of finance for domestic borrowers. The final channel relates to the monitoring of international banks. East Asian borrowers have received large volumes of foreign claims from international banks, especially since the global financial crisis (World Bank 2018). The substantial exposure to the region has encouraged international banks to monitor their loans, contributing to the improved recipient country bank stability. Karolyi et al.

(2018) provided recent empirical evidence documenting this monitoring channel. The authors attributed the stabilizing impact of cross-border banking flows to the oversight that lending banks located in countries with better regulatory quality provide relative to banks in recipient countries with weaker regulatory and supervisory systems.

On the other hand, banking integration can increase recipient country bank default risk via excessive liquidity and regulation arbitrage. Specifically, international capital inflows (as a result of capital account openness and financial liberalization) may generate excessive liquidity in the recipient countries (Dell'Ariccia and Marquez 2006). Acharya and Naqvi (2012) further posited that this excessive liquidity aggravates bank agency problems, leading to the relaxation of lending standards and higher bank risks. Houston, Lin, and Ma (2012) conjectured that banks tend to transfer funds to countries with fewer regulations. Consistent with regulation arbitrage motives, Ongena, Popov, and Udell (2013) found that banks operating in countries with tighter bank restrictions and higher capital requirements tend to make riskier loans abroad. This behavior has the potential to destabilize the recipient countries' financial system.

The East Asian countries examined in this paper are both developed (Hong Kong, China; Singapore; and the Republic of Korea) and emerging (Indonesia, Malaysia, the People's Republic of China [PRC], Thailand, and the Philippines) in nature. While developed countries have regulatory systems in place, emerging countries, following lessons from the Asian financial crisis, have formed improved systems to regulate international banking capital flows (Asian Development Bank 2008). These initiatives help to alleviate concerns about regulation arbitrage and excess liquidity. Therefore, Hypothesis 1 states: *Banking integration significantly lowers bank default risk in recipient countries.*

Empirical evidence on the relationship between banking integration and bank default risk is relatively scant. The extant literature has mainly studied the relationship between financial liberalization or foreign bank presence and bank risks (such as Claessens, Demirgüç-Kunt, and Huizinga 2001; Cubillas and González 2014; Wu et al. 2017). Notably, Cubillas and González (2014) found that financial liberalization increases bank risk taking via improved competition and more risk-taking opportunities. Similarly, Wu et al. (2017) documented that the risk of domestic banks increases with the presence of foreign banks. In contrast to the de jure indicator of financial liberalization (i.e., the capital account openness or the financial freedom index) that Cubillas and González (2014) used or the foreign bank penetration ratio that Wu et al. (2017) used, this paper measures financial integration in the banking sector via the total foreign claims that international banks extended and provides a new de facto approach to examining the impact of banking integration on bank risks.

The contrasting evidence from working papers that have directly examined the impact of international capital on recipient country bank risks highlights the need for further research. Dinger and Kaat (2017) found that inflows of foreign capital (measured via a country's negative account balance) lead to higher loan-to-asset ratios and impaired loans using a sample of 11 countries in the eurozone area. In contrast, Karolyi, Sedunov, and Taboada (2018) documented evidence that heightened cross-border banking flows lower banks' systemic risk in 114 recipient countries. This paper contributes to the current literature by providing additional evidence on the impact of foreign claims from international banks on default risk at the individual bank level for a sample of East Asian banks.

The second research question addresses whether the impact of banking integration on bank default risk differs due to the source countries of the foreign claims. International banks that extend claims to East Asia will seek to monitor and discipline the recipients

of funds. However, informational disadvantages and higher monitoring costs mean that non-Asian international banks will exercise less effective monitoring power than their Asian counterparts. Several seminal studies, such as those by Brennan and Cao (1997), Petersen and Rajan (2002), and Knyazeva and Knyazeva (2012), have confirmed this. These studies implied that lenders face greater information asymmetry and more costly monitoring for distant borrowers. Large institutional, cultural, and geographic distances also heighten the loss of relationship lending between loan officers and management (Mian 2006; Detragiache, Tressel, and Gupta 2008). Conversely, Asian international banks are informationally advantaged. The information advantage results from their familiarity with the cultural, legal, political, and economic environments of the recipient countries (Mian 2006; Claessens and van Horen 2014). In addition to region-specific knowledge, the information advantage is inherent to the local business relationship (Buch, Koch, and Koetter 2012).

The informational advantage allows Asian lenders to conduct better monitoring of the claims that banks have extended to regional borrowers. Furthermore, regional knowledge enables Asian lenders to compete as finance providers with banks in the recipient countries. Therefore, the benefit of the monitoring and competition channel in lowering bank default risk that the first hypothesis outlines become stronger in the case of Asian claims. In other words, the expectation is that the receipt of Asian claims will lead to lower bank default risk. This leads to Hypothesis 2: *Foreign claims that Asian banks extend, as distinct from claims that non-Asian banks extend, significantly lower bank default risk in recipient countries.*

The third research question aims to test whether the impact of banking integration on bank default risk differs across methods of extension, namely local claims and cross-border claims. Neumann (2003) argued that portfolio debt flows (relative to equity flows and foreign direct investment) do not incorporate ownership and thus augment manager control, increasing the severity of information asymmetry. This also holds true in the context of local claims and cross-border claims; the former involves some forms of foreign direct investment in the host country's financial sector, while the latter does not (García-Herrero and Martínez Pería 2007). In short, the information asymmetry is more pronounced for cross-border claims. Therefore, the monitoring and discipline of international banks over cross-border claims will be less effective, meaning that banks in recipient countries are likely to take on more risks than they might otherwise.

If international banks set up their affiliates to extend their claims to the recipient countries, additional benefits will arise from the competition between domestic and foreign banks. Claessens, Demirgüç-Kunt, and Huizinga (2001) empirically proved that multinational banks stimulate healthy competition among local banks in host countries. The dynamic multinational banking model of Faia and Ottaviano (2017) specifically links tougher local competition from global bank entry in retail banking to less risk taking for the host banking system. Following this line of reasoning, the a priori expectation is that claims that banks extend via local affiliates will lower the bank default risk in the recipient countries. This motivates Hypothesis 3: *Foreign claims that banks extend via local affiliates of international banks, as distinct from cross-border flows, significantly lower recipient country bank default risk.*

Given the current limited empirical evidence, this is the first study to test the differential impact of different types of foreign banking claims on bank default risk.

### 3. METHODOLOGY AND DATA

#### 3.1 Model Specification

The paper adopts the dynamic specification to model the determinants of bank default risk. The dynamic setting is appropriate, since Berger et al. (2000) argued that the risk–return profile of banks shows a tendency to persist over time, reflecting impediments to market competition and information opacity. More specifically, Equation 1 provides the first-order dynamic model of bank default risk.<sup>1</sup>

$$\text{RISK}_{ijt} = \beta_0 \text{RISK}_{ijt-1} + \beta_1 \text{INTEG}_{jt} + \beta_k \text{BANK}_{ijt}^k + \beta_m \text{COUNTRY}_{jt}^m + \theta_i + \gamma_j + \mu_t + \varepsilon_{ijt} \quad (1)$$

In this specification, it is possible to write the default risk of bank  $i$  in year  $t$  for country  $j$  as a function of its past level, banking integration (INTEG), a vector of  $k$  bank-level variables reflecting the characteristics of each bank  $i$  (BANK), and a vector of  $m$  variables reflecting the macroeconomic condition for all banks, including bank regulation and supervision (COUNTRY), for any given country  $j$ .  $\theta_i$  is the bank-specific fixed effect to control for unobserved factors that do not change over time for each bank.  $\gamma_j$  and  $\mu_t$  are the country and time dummies, respectively, and  $\varepsilon_{ijt}$  is the error term. All the explanatory variables enter the estimation of equations at the contemporaneous level based on the assumption that banks revise their targets during the estimation period (measured in years) in response to changes in their financial health as well as the macroeconomic conditions.

#### 3.2 Estimation Method

The paper employs the two-step system generalized method of moments (GMM) that Arellano and Bover (1995) and Blundell and Bond (1998) developed with finite-sample corrected standard errors following Windmeijer (2005). Arellano and Bover (1995) and Blundell and Bond (1998) suggested employing the lagged first differences of the explanatory variables as instruments for the equation in levels and the lagged values of the explanatory variables in levels as instruments for the equation in differences.

The system GMM helps to address several econometric issues. Specifically, the GMM provides an unbiased estimator for the dynamic panel data model with the presence of bank fixed effects, which is a solution to Nickell's (1981) famous finite-sample bias. More importantly, the GMM accommodates possible endogeneity between bank default risk and other covariates in the model, which could affect the interpretation of the empirical results. For instance, it treats contemporaneous bank-level regressors ( $\text{BANK}_{ijt}$ ) as endogenous due to their simultaneous relationship with bank default risk. Among the country-level regressors, it treats banking integration ( $\text{INTEG}_{jt}$ ) and bank regulation and supervision variables as predetermined variables. To explain, a lower bank default risk (i.e., a stable financial system) in the recipient countries would attract more foreign claims from international banks (Karolyi, Sedunov, and Taboada 2018). Similarly, regulators could change their regulation and supervision to discipline bank risk-

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<sup>1</sup> To specify the lag order appropriately, as in Equation 1, we employ the moment selection criteria for GMM models that Andrews and Lu (2001) developed. Specifically, the first-order dynamic panel is our preferred model, because it has a smaller Bayesian information criterion (BIC) than the second-order one.

taking behavior (Agoraki, Delis, and Pasiouras 2011). Finally, it treats other macro-economic variables as exogenous variables.

After running the system GMM, we performed some post-diagnostic tests. For instance, we used the second-order (i.e., the AR(2)) Arellano–Bond autocorrelation test to detect the serial correlation of the residuals in the differenced equation. Besides, we conducted both the Hansen J-statistics and the difference-in-Hansen test to check the joint validity of the full instrument set and the subsets of instruments, respectively.

### 3.3 Variables and Data

#### 3.3.1 Bank Default Risk

To measure bank default risk, we used the distance-to-default (Z-score).  $Z\text{-score} = (\text{ROA} + \text{CAP}) / (\text{Std ROA})$ , where ROA is the rate of return on assets, CAP is the equity capital to asset ratio, and Std ROA is the standard deviation of ROA (Roy 1952). To calculate the standard deviation of ROA, we used the three-consecutive-year moving window (i.e., year  $t-2$ ,  $t-1$ , and  $t$ ) rather than the full sample period. By its construction, we interpreted the Z-score as the number of standard deviations by which returns must decrease to wipe out all the equity that a bank owns; it is possible to view the Z-score as the inverse of the probability of bank failure (Roy 1952; Laeven and Levine 2009; Demirgüç-Kunt and Huizinga 2010). This means that a higher value of the Z-score suggests lower exposure to default risk. As the distribution of the Z-score is highly skewed, following Laeven and Levine (2009), we took the natural logarithm of the Z-score.

#### 3.3.2 Banking Integration Proxies

To address the first research question and test Hypothesis 1, we constructed an overall measure of banking integration based on the foreign claims that international banks extend to the sampled (recipient) countries. We sourced the statistics from the Consolidated Banking Statistics (CBSs) on an Intermediate Counterparty (IC) basis that the Bank for International Settlement (BIS) published.<sup>2</sup> In detail, it reports foreign claims in their outstanding amount (in million USD) on a quarterly basis. The study constructed the annual claims by using the stock data on the last quarter of each year in the sampled period. It then aggregated bilateral claims of a source–recipient country pair by the recipient country. After these steps, it obtained the year- and country-level claims on each of the sampled countries. As all lenders extend these claims regardless of their nationality or method of extension, it regarded the value of claims that it obtained after all these steps as the total foreign claims. The study either scaled the total foreign claims by the GDP of the corresponding sampled countries to construct the variable CLAIM or transformed them by taking the natural logarithm to construct the variable LN(claim). CLAIM is relevant to assessing the size of the international banking activities of one country in comparison with its GDP; higher values of CLAIM are associated with more participation in the international banking market and greater banking integration.<sup>3</sup> In

<sup>2</sup> The BIS CBSs provide the credit exposures (termed “foreign claims”) of banks with headquarters in 31 BIS-reporting (source/lender) countries to over 200 counterparties (recipient) countries on a bilateral basis (Bank for International Settlement 2015). Appendix A presents some caveats, which are helpful in understanding the structure and reporting basis of this report.

<sup>3</sup> Houston, Lin, and Ma (2012) and Karolyi, Sedunov, and Taboada (2018) also used the BIS CBSs to construct the international banking *flow* as the difference in natural logarithm of outstanding foreign claims between year  $t$  and  $t-1$ . As the paper aims to measure the level of financial integration, it purposely constructs a *stock* measure. Stock measures capture the progress of financial integration better than flow measures, as the latter are prone to measurement errors (Kose et al. 2009) and

short, both measures (CLAIM and LN(claim)) act as a proxy for the total foreign claims on the sampled countries that all lenders extend regardless of their nationality and methods of extension. Thus CLAIM and LN(claim) provide the baseline measure of  $INTEG_{jt}$  in Equation 1.

Question 2 and Hypothesis 2 test whether the source country of foreign claims matters in the impact of banking integration on bank default risk. Accordingly, we classified the total foreign claims, which we measured by the nationality of the lenders,<sup>4</sup> to compute the foreign claims that Asian banks extended (or Asian claims, for short) and the foreign claims that non-Asian banks extended (or non-Asian claims, for short). We then scaled these statistics by the GDP of the sampled countries (to construct ASIAN and NON\_ASIAN, respectively) or transformed them into a natural logarithm (to construct LN(Asian) and LN(non\_Asian), respectively). Thus, these measures are alternative definitions of  $INTEG_{jt}$  in Equation 1. The breakdown by nationality reflects the difference not only in geographic location but also in source country characteristics, including culture and institutional quality.

Question 3 and Hypothesis 3 examine the variation in the relationship between banking integration and bank default risk due to the difference in the methods of extension of the foreign claims. We could classify the foreign claims as cross-border claims (i.e., claims that banks extended from their headquarters and booked outside the recipient countries) or local claims (i.e., claims that international banks extended locally through their branches and subsidiaries in the recipient countries). We sourced the data for this breakdown from the CBSs on Ultimate Risk basis (CBS-URs) rather than the CBS-ICs, as the latter do not provide a clear-cut distinction between cross-border claims and local claims. In a similar approach to the earlier one, we scaled measures of cross-border claims and local claims<sup>5</sup> by the GDP of the sampled countries (to obtain CROSS and LOCAL, respectively) or transformed them into a natural logarithm (to obtain LN(cross) and LN(local), respectively). These provide the final definitions of  $INTEG_{jt}$  in Equation 1.

The difference in the available time periods and reporting basis between CBS-ICs and CBS-URs prevents the analysis of local claims and Asian claims in a fully parallel fashion. However, there is one scenario in which local claims and Asian claims measure the same thing, which is when Asian banks own the majority of foreign affiliates/branches in the sampled countries. To prove that this is not the case, we employed the database from Claessens and van Horen (2015) on bank ownership to examine the origin of foreign banks in the sampled East Asian countries. First, we computed the total number of foreign banks in these countries. Then, we calculated the number of foreign banks that Asian BIS-reporting countries owned. In the Republic of Korea, no foreign banks originate from Asian BIS-reporting countries. The ratio of Asian foreign banks to total foreign banks varies among the rest of the group (as Appendix B reports). For instance, in Thailand, Indonesia, and the PRC, nearly 50%

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can fluctuate markedly due to changes in short-term market conditions and investors' sentiment (Agénor 2003).

<sup>4</sup> The Asian source countries include Australia; Taipei, China; Hong Kong, China; India; Japan; the Republic of Korea; and Singapore. The non-Asian lenders mainly include European and North American advanced countries, such as the US; the UK; Germany; France; and so on (see Appendix A).

<sup>5</sup> The CBS-ICs report the breakdown of foreign claims into "international claims" and "local claims in local currency," in which international claims include both cross-border claims and local claims in foreign currency. In contrast, the CBS-URs separately report cross-border claims and local claims. There are differences in the reporting basis of the CBS-ICs and CBS-URs. While the CBS-ICs look at the immediate relationship between borrowers and lenders, the CBS-URs track the ultimate bearer of the obligations (Bank for International Settlement 2015). Furthermore, the CBS-URs are only available since 2005, while the CBS-ICs are available since the 1980s.

of the foreign banks are Asian foreign banks, while in Singapore and Hong Kong, China, the proportion is around 23%. In short, the data that Appendix B presents give confidence that the two measures “local claims” and “Asian claims” are distinctive but related measures of “closeness” or “neighbors.”

### 3.3.3 Control Variables

In line with the existing literature on the determinants of bank risks (Laeven and Levine 2009; Demirgüç-Kunt and Huizinga 2010; Beck, De Jonghe, and Schepens 2013), Equation 1 includes standard explanatory variables. The commonly used bank-level control variables include the natural logarithm of total assets (SIZE), the equity to total assets ratio (CAP), the ratio of non-performing loans to gross loans as a proxy for credit risk (CRERISK), the ratio of non-interest operating expenses to total assets as a proxy for cost efficiency (COST), the share of non-interest income to total income as a proxy for income diversification (INC\_DIV), the ratio of demand deposits to total deposits as a proxy for the bank charter value (CHARTER), and a dummy variable as a proxy for the foreign and domestic ownership of a bank (ODUM). It also includes the market concentration (CON), which we measured as the assets of the three largest banks to the total assets of all the commercial banks in a country.

Consistent with cross-country studies, such as those by Demirgüç-Kunt and Huizinga (2010), Agoraki, Delis, and Pasiouras (2011), and Wu et al. (2017), the model also includes the GDP growth rate (GDP), the inflation rate (IFL), and the interest rate (INT), to capture the impact of business cycles on financial stability, as well as the level of financial development (PRICE), which we measured as the ratio of private sector credit to GDP, and a dummy as a proxy for a bank crisis (CRISIS). Based on the deposit insurance database from Demirgüç-Kunt, Kane, and Laeven (2014), we constructed a dummy variable to indicate the existence of an explicit deposit insurance scheme in a country (INS). Finally, the model includes three categories of bank regulation and supervision as other important determinants of bank risk (Laeven and Levine 2009; Beck et al., 2013). Appendix C provides the definitions of all the variables.

## 3.4 Sample

The study examined an unbalanced sample of 2,280 commercial bank-year observations (or 393 banks) from eight countries in East Asia (the PRC; Hong Kong, China; Indonesia; Malaysia; the Philippines; the Republic of Korea; Singapore; and Thailand) over the period 1999–2014. We obtained bank-level data from Bankscope. We excluded banks with less than three consecutive years of available financial data for all the bank-specific variables. The dataset accounts for all mergers and acquisitions and bank failures during the sample period, so it includes both active and inactive banks to avoid selection bias.<sup>6</sup> We drew the data from unconsolidated statements to reduce aggregation bias in the results (we used consolidated data if unconsolidated statements were unavailable). We winsorized all bank-level data at the top and bottom 0.5% percentiles.

## 4. DESCRIPTIVE ANALYSIS

Table 1 reports the descriptive statistics of all the variables that the regression included. The LN(zscore) of the sampled commercial banks has a mean value of

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<sup>6</sup> We dropped 10 negative observations of the Z-score so that we could define the natural logarithm of the variable. Active banks make up 91.49% of the sample; 8.17% of banks in the sample are dissolved; 0.04% of banks are in bankruptcy; and 0.21% of sampled banks are in liquidation.

3.648 and a standard deviation of 1.226. The wide range of LN(zscore) (ranging from –2.37 to 7.89) highlights the substantial variation on the level of default risk across banks in the sampled period.

With regard to the banking integration variables, the ratio of total foreign claims to GDP (CLAIM) has a mean value of 28.1% and a standard deviation of 38.2%. This partly reflects the different levels of banking integration among the sampled countries. Besides, the mean value of NON\_ASIAN (16.2%) is higher than the mean value of ASIAN (5.1%). This is consistent with the observation that the foreign claims on the sampled countries mostly come from non-Asian international banks, as Figure 2 depicts. LOCAL has a mean value of 14.3%, which is higher than CROSS's value of 8%. This is also consistent with the fact that local claims account for the major share of the total claims, as Figure 3 depicts.

**Table 1: Descriptive Statistics**

	Mean	Std	Min.	Max.	N
LN(zscore)	3.648	1.226	-2.377	7.895	2,280
CAP (%)	10.275	7.264	1.520	81.300	2,280
ROA (%)	1.118	1.134	-8.970	8.840	2,280
ROA_VOL	0.611	1.592	0.012	17.423	2,280
CRERISK(%)	5.400	9.233	0.010	70.780	2,280
INC_IV (%)	14.122	11.064	0.100	85.057	2,280
COST (%)	1.942	1.600	0.050	23.423	2,280
CHARTER (%)	33.983	26.322	0.153	100.000	2,280
CON (%)	44.734	10.018	29.789	94.407	2,280
IFL (%)	4.145	3.209	-3.953	20.489	2,280
GDP (%)	12.934	10.453	-13.044	47.368	2,280
PRICRE (%)	91.607	46.601	19.909	233.663	2,280
INS	0.514	0.500	0.000	1.000	2,280
INT (%)	3.068	3.521	-3.903	13.347	2,280
ACT	8.627	2.409	3.000	12.000	2,141
SUP	12.304	2.584	7.000	16.000	1,161
PRIMON	9.427	1.070	7.000	11.000	1,846
CLAIM (%) (*)	28.136	38.240	3.357	290.071	2,280
LN(claim)	11.854	1.137	9.937	14.074	2,280
ASIAN (%)	5.126	7.063	0.644	50.360	2,280
NON_ASIAN (%)	16.230	26.975	1.718	189.181	2,280
LN(Asian)	10.111	1.095	8.021	12.217	2,280
LN(non_Asian)	11.165	1.055	9.452	13.219	2,280
LOCAL (%)	14.388	27.132	1.446	186.572	1,710
CROSS (%)	8.035	7.915	1.761	50.262	1,710
LN(local)	11.201	1.039	8.842	13.206	1,710
LN(cross)	11.192	1.104	9.187	13.135	1,710

The table reports descriptive statistics for the variables that the empirical analysis used. There are 2,280 bank-year observations (about 393 banks) for eight sampled countries (the PRC; Hong Kong, China; Indonesia; Malaysia; Philippines; the Republic of Korea; Singapore; and Thailand) during the period 1999–2014. For the definition and construction of the variables, see Appendix C. Mean refers to the average value for each variable. Std refers to the standard deviation. Min. and Max. are the minimum and maximum observations for each variable in the sample. N refers to the number of observations.

(\*): ASIAN and NON\_ASIAN (similarly LOCAL and CROSS) do not add up to CLAIM. The deviation originates from the types of reporting banks from which we aggregated the underlying statistics. Specifically, in the case of CLAIM, there are three types of banks reporting to the BIS, specifically (i) domestic banks (controlled by parent entities with the same country code as the reporting country); (ii) banks located in the reporting country but controlled by parent entities located in non-reporting countries; and (iii) banks controlled by parent entities located in the reporting country but not consolidated



by their parent. In the case of ASIAN, NON\_ASIAN, LOCAL, and CROSS, reporting banks are only domestic banks. For further detail, refer to Appendix A.

Table 2 reports the Pearson pairwise correlation coefficients. The bank-level variables and macro-economic variables are not highly correlated with each other, implying that the joint inclusion of these variables is unlikely to lead to concerns about multicollinearity. Variance inflation factor (VIF) tests (not reported) also confirm this.

**Table 2: Pairwise Correlation between Variables**

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[1] ZSCORE	1.00									
[2] CAP	0.12*	1.00								
[3] CRERISK	-0.03	0.17*	1.00							
[4] INC_DIV	0.01	0.22*	0.13*	1.00						
[5] COST	-0.04*	0.19*	0.23*	0.11*	1.00					
[6] CHARTER	0.00	-0.09*	-0.01	0.00	-0.25*	1.00				
[7] CON	-0.01	0.01	0.06*	0.12*	-0.04*	0.30*	1.00			
[8] IFL	-0.04*	0.12*	0.09*	-0.08*	0.32*	-0.15*	0.09*	1.00		
[9] GDP	-0.04*	-0.10*	0.00	-0.14*	-0.04*	0.18*	0.02	0.28*	1.00	
[10] PRICRE	0.06*	-0.22*	-0.25*	-0.10*	-0.54*	0.23*	-0.08*	-0.61	-0.10*	1.00
[11] INT	0.00	0.08*	0.14*	0.07*	0.15*	-0.14*	0.14*	0.04*	-0.43*	-0.16*
[12] CLAIM	0.02	0.10*	0.02	0.31*	-0.08*	-0.02	0.50*	-0.17*	-0.24*	0.25*
[13] ASIAN	0.05*	0.15*	0.03	0.30*	-0.04	-0.04	0.62*	-0.11*	-0.26*	0.19*
[14] NON_ASIAN	0.00	0.08*	0.02	0.29*	-0.08*	0.01	0.51*	-0.15*	-0.21*	0.24*
[15] CROSS	0.05	0.09*	-0.03	0.40*	-0.02	-0.11*	0.62*	-0.15*	-0.27*	0.18*
[16] LOCAL	0.03*	0.08*	-0.07*	0.33*	-0.09*	-0.11*	0.58*	-0.18*	-0.23*	0.31*
[17] ACT	-0.06*	-0.17*	-0.16*	-0.41*	-0.22*	0.28*	-0.09*	0.17*	0.45*	0.14*
[18] SUP	-0.03*	0.17*	-0.07*	0.02	0.08*	-0.06*	-0.02	0.29*	0.29*	-0.30*
[19] PRIMON	-0.07*	-0.18*	-0.25*	-0.24*	-0.26*	0.23*	-0.11*	-0.15*	0.16*	0.28*
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
[1] ZSCORE										
[2] CAP										
[3] CRERISK										
[4] INC_DIV										
[5] COST										
[6] CHARTER										
[7] CON										
[8] IFL										
[9] GDP										
[10] PRICRE										
[11] INT	1.00									
[12] CLAIM	0.15*	1.00								
[13] ASIAN	0.18*	0.91*	1.00*							
[14] NON_ASIAN	0.16*	0.99*	0.89*	1.00						
[15] CROSS	0.19*	0.96*	0.87*	0.95*	1.00					
[16] LOCAL	0.12*	0.99*	0.89*	0.98*	0.94*	1.00				
[17] ACT	-0.40*	-0.55*	-0.49*	-0.52*	-0.64*	-0.56*	1.00			
[18] SUP	-0.26*	-0.05	-0.02	-0.07*	-0.19*	-0.15*	0.51*	1.00		
[19] PRIMON	-0.14*	-0.26*	-0.30*	-0.24*	-0.35*	-0.31*	0.36*	0.04	1.00	

The table reports the Pearson rank correlation coefficients among variables. \* indicates statistical significance at the 5% level.

## 5. EMPIRICAL ANALYSIS

### 5.1 The Impact of Banking Integration on Bank Default Risk

Table 3 reports the system GMM estimates of Equation 1 to test Hypothesis 1.<sup>7</sup> The post-estimation tests (which the end of Table 3 reports) confirm the validity of the system GMM estimators. Specifically, the AR(2) test is statistically insignificant, confirming the absence of the second-order serial correlation. The high p-values of the Hansen J-statistics and the difference-in-Hansen tests suggest that the full set and each sub-set of instruments are valid.

Table 3 shows that the coefficients of banking integration (measured through CLAIM and LN(claim), respectively, in models 1 and 2) are positive and significant. This implies that banking integration is associated with an increase in the bank Z-score (or a reduction in the bank default risk) and is consistent with Hypothesis 1. With regard to the economic impact, taking column 1 as an example, a 1% increase in CLAIM is associated with approximately a 4.6% ( $0.046 \times 100$ ) increase in the Z-score. Overall, the evidence points to the benefit of banking integration from lowering the individual bank default risk for the recipient countries. This result is consistent with the monitoring channel of international banks, which we found drives the association between heightened cross-border banking flows and lower systemic risk (Karolyi, Sedunov, and Taboada 2018). Further, the finding supports the competition channel, which predicts that foreign banking claims would engender healthy competition among different providers of funds, thus leading to lower risk-taking behavior (Agénor 2003; Faia and Ottaviano 2017). Overall, the results strongly support Hypothesis 1.

The results in Table 3 also show that the bank and year fixed effects capture a significant fraction of the overall explanatory power of the Z-score. The only bank-level variables that have a significant impact on the Z-score are the equity capital ratio (CAP) and income diversification (INC\_DIV). Banks with a lower level of equity capital to buffer against return volatility have higher default risk. Similarly, due to the greater reliance on non-interest income, banks are exposed to more volatile activities or expand to risky non-traditional activities, reducing bank stability. This finding is congruent with the work of Demirgüç-Kunt and Huizinga (2010).

At the country level, the positive coefficient of CON implies that market concentration helps to lower bank default risk, which is in line with the “competition–fragility” hypothesis that Beck, Demirgüç-Kunt, and Levine (2006) postulated. The negative and significant coefficient for financial development (PRICRE) suggests that banks take more risks in more financially developed countries. It is easier for firms to switch from bank-based to market-based funding in more financially developed markets (Beck,

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<sup>7</sup> Before running the system GMM, all the variables that the regression included were tested for non-stationary with the Fisher test that Maddala and Wu (1999) developed. We dropped SIZE due to its unit root. Additionally, we conducted the Durbin–Wu–Hausman (DWH) endogeneity test at the level equation and confirmed the endogenous relationship between the bank-level covariates and the dependent variable. These results are available on request.

It is also noteworthy that the number of observations that we used in the system GMM (836 observations) is substantially lower than the original bank-year observations (2,280 observations, as section 4 reports). This is mostly due to the simultaneous inclusion of three regulation variables, which are not available for all the observations. As a robustness check, we estimated two models, which dropped SUP (i.e., the variable with the lowest available observations) and all three variables from the regression, respectively. The results are quantitatively similar to the baseline's (and available on request). However, the coefficients of the lagged dependent variable fall outside the possible range between the FE and the OLS estimates, which is a sign of model misspecification (Roodman 2009). Therefore, we included all three variables in our model, as Table 3 reports.

Demirgüç-Kunt, and Levine 2013). Competitive pressure from stock market developments pushes banks to take more risks. Similarly, the negative and significant coefficient of economic growth (GDP) implies that banks take more risks in the period of economic expansion. Banks could relax their lending standards to satisfy the growing credit demand from the economy, which is likely to lead to higher bank default risk (Dell’Ariccia and Marquez 2006). The negative association between the interest rate (INT) and the bank distance to default that we found for the sampled East Asian countries remains a puzzle. The result is not in line with the “search for yield” motive, which predicts that a low (lending) interest rate induces banks to expand credit recklessly to generate more income (Rajan 2006). All three categories of bank regulation and supervision are significantly and positively related to the Z-score. Consistent with Agoraki, Delis, and Pasiouras (2011), a lower default risk profile characterizes banks in countries with stricter restrictions on bank activities (ACT), stronger private monitoring (PRIMON), and greater authority power (SUP). Finally, the negative bank crisis coefficient indicates that bank default risk is greater during periods of financial crisis.

**Table 3: The Impact of Banking Integration on Bank Distance to Default**

	(1)	(2)
L.LN(zscore)	0.423*** (0.04)	0.425*** (0.04)
CLAIM	0.046* (0.02)	
LN(claim)		1.924*** (0.66)
CAP	0.063*** (0.02)	0.060*** (0.02)
CRERISK	−0.004 (0.01)	−0.004 (0.01)
INC_DIV	−0.024** (0.01)	−0.021* (0.01)
COST	−0.112 (0.09)	−0.087 (0.10)
CHARTER	0.001 (0.01)	−0.002 (0.01)
CON	0.075** (0.03)	0.052* (0.03)
IFL	−0.034 (0.03)	−0.029 (0.03)
GDP	−0.037** (0.02)	−0.041** (0.02)
PRICRE	−0.044** (0.02)	−0.028** (0.01)
INS	−0.933* (0.52)	−0.514 (0.44)
INT	−0.049* (0.03)	−0.061** (0.03)
ACT	0.163 (0.10)	0.291** (0.13)

*continued on next page*

**Table 3** *continued*

	(1)	(2)
SUP	0.219** (0.11)	0.115 (0.10)
PRIMON	0.639** (0.26)	0.337* (0.18)
ODUM	0.015 (0.10)	0.020 (0.11)
CRISIS	-1.389** (0.70)	-1.741** (0.70)
Constant	-6.383* (3.58)	-25.450*** (8.78)
# Obs.	836	836
# Banks	202	202
# IV	100	100
AR(2) test (p value)	0.342	0.288
Hansen-J test (p value)	0.602	0.476
Diff-In-Hansen test (p value):		
GMM instruments for level	0.698	0.417
GMM instruments for the lagged dependent variable	0.696	0.619
GMM instruments for endogenous bank-level variables	0.486	0.186
GMM instruments for predetermined variables	0.275	0.192
IV instruments for exogenous variables	0.579	0.287

The table reports the impact of banking integration on bank default risk from Equation 1:

$$RISK_{ijt} = \beta_0 RISK_{ijt-1} + \beta_1 INTEG_{jt} + \beta_k BANK^k_{ijt} + \beta_m COUNTRY^m_{jt} + \theta_i + \gamma_j + \mu_t + \varepsilon_{ijt}$$

The dependent variable is the natural logarithm of the Z-score to proxy for bank default risk. We proxied for banking integration via the ratio of foreign claims to GDP (CLAIM) or the natural logarithm of foreign claims (LN(claim)). For the definition and construction of the other control variables, see Appendix C. We included bank FE, country, and time dummies but do not report them to save space.

We estimated all the models using the system GMM. For the dependent variable and endogenous bank-level control variables, we used their second and third lagged values as instruments in the transformed equation; we used the first lag of their differenced values as instruments in the level equation. For the predetermined variables (including the banking integration and regulation variables), we used their first and second lagged values as instruments in the transformed equation; we used their differenced values as instruments in the level equation. For the exogenous variables (including other country-level control variables and time and country dummies), we used their differenced values as instruments in the transformed equation; we used their level values as instruments in the level equation. We ran the system GMM using the *xtabond2* Stata syntax that Roodman (2009) wrote. We used the *collapse* option for specifying instruments for the endogenous and predetermined variables. As there are gaps in the sample panel, we used the forward orthogonal deviations transform (*orthogonal* option) instead of first differencing to maximize the sample size. We used the *twostep* along with the *robust* option to obtain the finite sample corrected two-step covariance matrix following Windmeijer's (2005) correction. The *small* option is to adjust the estimates for a small sample and report t-statistics instead of z-statistics.

The insignificant values of the AR(2) tests confirm the absence of the serial correlation in the second order. Similarly, the insignificant values of the Hansen J-statistics test and difference-in-Hansen test ensure the validity of the instruments. The table reports the robust standard errors in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The next two sections explore Hypotheses 2 and 3 to determine whether neighbors' banks with information advantages drive the above results; we take two alternative definitions of "neighbors" (see section 1), namely regional banks and international banks with affiliate offices.

## **5.2 The Impact of Asian Claims and Non-Asian Claims on Bank Default Risk**

Table 4 reports the impact of Asian claims (ASIAN) and non-Asian claims (NON\_ASIAN). According to Hypothesis 2, foreign claims that Asian lenders extend should significantly lower bank default risk in recipient countries. Based on the results in columns 1 and 3 of Table 4, the significant and positive ASIAN and LN(Asian) coefficients provide evidence to support this hypothesis. In fact, the magnitude of the ASIAN coefficient is much larger than the CLAIM coefficient that Table 3 reports. Given a 1% increase in ASIAN, the coefficient in column 1 of Table 4 predicts a 7.1% ( $0.071 \times 100$ ) increase in the Z-score for the recipient country.

Consistent with Hypothesis 2, only the Asian claims contribute to the greater stability of banks in the recipient countries, as the non-significant coefficients of NON\_ASIAN and LN(non\_Asian) in columns 2 and 4 evidence. The result supports the argument that Asian claims are linked to lower information asymmetry, as regional banks possess an information advantage, facilitating closer recipient country bank monitoring (Mian 2006; Claessens and van Horen 2014). The impact of the other control variables is relatively similar to the baseline result in Table 4, though some variables lose their explanatory power.

## **5.3 The Impact of Local Claims and Cross-Border Claims on Bank Default Risk**

Table 5 reports the significant and positive coefficients of local claims regardless of the measures (i.e., LOCAL in column 1 or LN(local) in column 3, though in the latter case it is only marginally significant). The coefficients for cross-border claims are insignificant in both models, as columns 2 and 4 report. The result indicates that local claims that banks extend via foreign affiliates rather than across borders help to lower recipient country banks' default risk. In fact, the magnitude of the LOCAL coefficient is much larger than that of the CLAIM coefficient that Table 3 reports. Given a 1% increase in LOCAL, the coefficient in column 1 predicts a 10.1% ( $0.101 \times 100$ ) increase in the Z-score for the recipient country. Overall, this finding strongly supports Hypothesis 3 and confirms the link between lower information asymmetry and local affiliate-based lending.

**Table 4: The Impact of Asian Claims and Non-Asian Claims on Bank Distance to Default**

	(1)	(2)	(3)	(4)
L.LN(zscore)	0.460*** (0.04)	0.434*** (0.04)	0.439*** (0.04)	0.429*** (0.05)
ASIAN	0.071** (0.03)			
NON_ASIAN		0.013 (0.03)		
LN(Asian)			0.824** (0.38)	
LN(non_Asian)				0.618 (0.40)
CAP	0.052** (0.02)	0.056*** (0.02)	0.053*** (0.02)	0.049** (0.02)
CRERISK	-0.005 (0.01)	-0.006 (0.01)	-0.006 (0.01)	-0.007 (0.01)
INC_DIV	-0.014 (0.01)	-0.021** (0.01)	-0.014 (0.01)	-0.025** (0.01)
COST	-0.089 (0.10)	-0.123 (0.08)	-0.086 (0.10)	-0.119 (0.09)
CHARTER	-0.004 (0.01)	0.002 (0.01)	-0.004 (0.01)	0.002 (0.01)
CON	0.016 (0.03)	0.047 (0.04)	0.032 (0.02)	0.061* (0.03)
IFL	-0.050 (0.03)	-0.041 (0.03)	-0.063* (0.03)	-0.036 (0.03)
GDP	-0.033** (0.02)	-0.025 (0.02)	-0.028** (0.01)	-0.028* (0.02)
PRICRE	-0.019 (0.01)	-0.017 (0.02)	-0.010 (0.01)	-0.018 (0.01)
INS	-0.445 (0.45)	-0.580 (0.50)	-0.312 (0.44)	-0.324 (0.45)
INT	-0.037 (0.02)	-0.034 (0.03)	-0.039 (0.02)	-0.041 (0.03)
ACT	0.077 (0.06)	0.064 (0.08)	0.142 (0.09)	0.168* (0.09)
SUP	0.082 (0.10)	0.147 (0.12)	0.097 (0.10)	0.162 (0.11)
PRIMON	0.212 (0.18)	0.378 (0.27)	0.202 (0.16)	0.373* (0.22)
ODUM	0.040 (0.10)	0.014 (0.10)	0.004 (0.09)	0.028 (0.10)
CRISIS	-0.211 (0.48)	-0.631 (0.81)	-0.848 (0.53)	-1.480* (0.87)
Constant	0.246 (3.02)	-3.777 (4.17)	-10.069** (4.70)	-16.984** (8.33)
# Obs.	836	836	836	836
# Banks	202	202	202	202
# IV	100	100	100	100
AR(2) test (p value)	0.308	0.397	0.347	0.381
Hansen-J test (p value)	0.643	0.655	0.665	0.37
Diff-in-Hansen test (p value):				
GMM instruments for level	0.492	0.761	0.697	0.276
GMM instruments for the lagged dependent var.	0.887	0.795	0.815	0.728
GMM instruments for endogenous var.	0.281	0.716	0.252	0.595
GMM instruments for predetermined var.	0.572	0.339	0.483	0.171
IV instruments for exogenous var.	0.33	0.665	0.375	0.201

The table reports the impact of different forms of banking integration on bank default risk. We classified the total foreign claims by the lender nationality. In columns 1 and 2, ASIAN and NON\_ASIAN are the foreign claims from international banks with Asian and non-Asian nationality, respectively; we then scaled these statistics by the GDP of the sampled countries. As a robustness check, columns 3 and 4 construct and present the natural logarithm of these statistics (i.e., LN(Asian) and LN(non\_Asian)). The dependent variable is the natural logarithm of the Z-score to proxy for bank default risk. Other control variables' definition and the system GMM specification remain unchanged (as Table 3 reports). The robust standard errors are in the parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 5: The Impact of Local Claims and Cross-Border Claims on Bank Distance to Default**

	(1)	(2)	(3)	(4)
L.LN(zscore)	0.464*** (0.06)	0.455*** (0.06)	0.445*** (0.06)	0.451*** (0.06)
LOCAL	0.101** (0.04)			
CROSS		0.046 (0.05)		
LN(local)			1.438* (0.78)	
LN(cross)				0.213 (0.54)
CAP	0.036* (0.02)	0.033 (0.02)	0.039* (0.02)	0.028 (0.02)
CRERISK	0.009 (0.02)	0.007 (0.02)	0.008 (0.02)	0.006 (0.02)
INC_DIV	-0.018* (0.01)	-0.014 (0.01)	-0.015 (0.01)	-0.011 (0.01)
COST	-0.132 (0.10)	-0.105 (0.09)	-0.111 (0.09)	-0.108 (0.10)
CHARTER	-0.005 (0.01)	-0.006 (0.01)	-0.006 (0.01)	-0.006 (0.01)
CON	0.035 (0.03)	0.059 (0.05)	0.027 (0.03)	0.034 (0.04)
IFL	0.005 (0.04)	-0.028 (0.04)	0.012 (0.04)	-0.041 (0.04)
GDP	-0.042** (0.02)	-0.031* (0.02)	-0.039* (0.02)	-0.024 (0.02)
PRICRE	-0.052*** (0.02)	-0.036* (0.02)	-0.025 (0.02)	-0.023 (0.02)
INS	-0.499* (0.27)	0.388 (0.25)	0.233 (0.26)	-0.496** (0.24)
INT	-0.041 (0.04)	-0.027 (0.04)	-0.033 (0.05)	-0.015 (0.05)
ACT	-0.071 (0.12)	0.032 (0.14)	0.176 (0.16)	0.137 (0.15)
SUP	0.360 (0.25)	0.322 (0.25)	0.318 (0.33)	0.337 (0.30)
PRIMON	0.807 (0.70)	0.762 (0.74)	0.911 (0.94)	0.907 (0.88)
ODUM	0.137 (0.12)	0.142 (0.13)	0.113 (0.12)	0.143 (0.13)
Constant	-15.697* (8.53)	-4.613 (6.40)	-22.26** (10.91)	-7.781 (8.64)
# Obs.	615	615	615	615
# Banks	156	156	156	156
# IV	80	80	80	80
AR(2) test (p value)	0.103	0.15	0.186	0.239
Hansen-J test (p value)	0.509	0.415	0.42	0.289
Diff-in-Hansen test (p value)				
GMM instruments for level	0.716	0.847	0.724	0.804
GMM instruments for lagged dependent var.	0.583	0.523	0.387	0.575
GMM instruments for endogenous bank-level var.	0.228	0.492	0.13	0.159
GMM instruments for predetermined var.	0.884	0.536	0.829	0.357
IV instruments for exogenous var.	0.886	0.550	0.860	0.474

The table reports the impact of different forms of banking integration on bank default risk. We classified the total foreign claims by the methods of extension. In columns 1 and 2, LOCAL and CROSS are the foreign claims that international banks extended via their foreign affiliates or across borders; we then scaled these statistics by the GDP of the sampled countries. As a robustness check, columns 3 and 4 construct and present the natural logarithm of these statistics (i.e., LN(local) and LN(cross)). The examination period is 2005–2014 due to the availability of data. The dependent variable is the natural logarithm of the Z-score to proxy for bank default risk. Other control variables' definition and the system GMM specification remain unchanged (as Table 3 reports). The robust standard errors are in the parenthesis. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

In short, the findings in sections 5.2 and 5.3 complement and further elucidate the findings in section 5.1. They show that the positive association between the banking integration (measured via the total foreign claims) and the Z-score is due to claims that Asian banks extend and local claims, as distinct from non-Asian claims and cross-border claims, respectively. Section 6 discusses the policy implication of these results. Prior to this, the study explores the robustness of the above results further with alternative specifications of the models.

## 5.4 Robustness Tests

We performed several robustness tests. First, we employed an alternative measure of bank risk, namely volatility in bank profit, which we measured using the volatility of ROA over the three-year window (ROA\_VOL). Table 6 reports the result. As it shows in column 1, banking integration (CLAIM) helps to lower bank profit volatility (ROA\_VOL). Consistent with the earlier findings, the effect is present when Asian lenders (ASIAN) or local affiliates (LOCAL) extend claims. This result reinforces the findings in sections 5.2 and 5.3. Additionally, Table 6 reports a positive association between higher rates of inflation, economic growth rates, and greater financial development and profit volatility (ROA\_VOL). Bank regulation and supervision help to reduce profit volatility via effective private monitoring and local authorities' supervisory power.

Second, we utilized a sub-sample of the low-integration group of countries to ensure that our original analysis was not biased by the presence of financial centers (i.e., Singapore and Hong Kong, China). Table 7 reports the low banking integration sub-sampling. Again, the results are fully consistent with the previous results and Hypotheses 1, 2, and 3. In fact, the impact of banking integration on bank default risk becomes stronger with this sub-sampling, as the magnitude of the CLAIM, ASIAN, and LOCAL coefficients is higher than their baseline's. This implies that countries with a lower level of banking integration benefit more from the receipt of foreign banking claims.

Third, we sampled only domestic banks to ensure that our prior findings were not driven by the presence of foreign banks in the recipient countries. The concern is valid, as foreign banks have better risk management and thus a lower level of default risk (Wu et al. 2017). Table 8 reports the domestic sub-sampling. Overall, the main findings remain qualitatively unchanged from the baseline results. Specifically, the banking integration measures, such as CLAIM, ASIAN, and LOCAL, are significantly and positively associated with the bank distance to default. Additionally, higher bank costs are associated with higher default risk in the domestic banks' sample.



**Table 6: The Impact of Banking Integration on Bank Profit Volatility**

	(1)	(2)	(3)	(4)	(5)
L.ROA_VOL	0.391*** (0.12)	0.399*** (0.12)	0.397*** (0.12)	0.429*** (0.06)	0.431*** (0.06)
CLAIM	-0.023** (0.01)				
ASIAN		-0.031** (0.01)			
NON_ASIAN			-0.020 (0.01)		
LOCAL				-0.026* (0.02)	
CROSS					-0.000 (0.01)
CAP	-0.007 (0.01)	-0.005 (0.01)	-0.006 (0.01)	0.001 (0.01)	0.003 (0.00)
CRERISK	-0.004 (0.01)	-0.002 (0.01)	-0.003 (0.01)	-0.020 (0.02)	-0.015 (0.02)
INC_DIV	0.012 (0.01)	0.010 (0.01)	0.012 (0.01)	0.001 (0.01)	-0.002 (0.00)
COST	-0.035 (0.05)	-0.025 (0.04)	-0.028 (0.05)	0.014 (0.03)	0.011 (0.03)
CHARTER	-0.003 (0.01)	-0.003 (0.00)	-0.002 (0.01)	0.000 (0.00)	0.002 (0.00)
CON	-0.026* (0.02)	-0.005 (0.01)	-0.022 (0.02)	0.006 (0.01)	0.006 (0.01)
IFL	0.063** (0.03)	0.054* (0.03)	0.060* (0.03)	-0.011 (0.02)	0.003 (0.01)
GDP	0.031*** (0.01)	0.023** (0.01)	0.026*** (0.01)	0.011** (0.01)	0.007 (0.01)
PRICRE	0.029** (0.01)	0.016** (0.01)	0.020** (0.01)	0.018** (0.01)	0.008 (0.01)
INS	0.390 (0.25)	0.190 (0.19)	0.255 (0.21)	-0.038 (0.14)	-0.077 (0.10)
INT	0.001 (0.01)	-0.004 (0.01)	-0.005 (0.01)	-0.005 (0.01)	-0.005 (0.01)
ACT	-0.079 (0.05)	-0.036 (0.04)	-0.053 (0.05)	-0.017 (0.04)	-0.023 (0.03)
SUP	-0.141*** (0.05)	-0.081* (0.05)	-0.129** (0.06)	-0.235** (0.11)	-0.167** (0.07)
PRIMON	-0.310** (0.12)	-0.165* (0.09)	-0.238* (0.12)	-0.568** (0.28)	-0.399** (0.20)
ODUM	-0.078 (0.12)	-0.068 (0.10)	-0.087 (0.11)	-0.062 (0.07)	-0.045 (0.06)
CRISIS	0.622 (0.49)	0.134 (0.35)	0.516 (0.50)		
Constant	2.364* (1.34)	0.520 (1.24)	2.248 (1.65)	7.647** (3.86)	3.197* (1.71)
# Obs.	836	836	836	615	615
# Banks	202	202	202	156	156
# IV	100	100	100	80	80
AR(2) test (p value)	0.844	0.719	0.946	0.84	0.758
Hansen-J test (p value)	0.46	0.764	0.454	0.711	0.654

The table reports the impact of banking integration on bank profit volatility (ROA\_VOL). \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 7: Low Banking Integration Countries' Sub-sample**

	(1)	(2)	(3)	(4)	(5)
L.LN(zscore)	0.421*** (0.05)	0.464*** (0.04)	0.433*** (0.05)	0.465*** (0.06)	0.463*** (0.06)
CLAIM	0.065** (0.03)				
ASIAN		0.073** (0.03)			
NON_ASIAN			0.018 (0.05)		
LOCAL				0.132*** (0.04)	
CROSS					0.062 (0.05)
CAP	0.060*** (0.02)	0.046** (0.02)	0.056*** (0.02)	0.023 (0.02)	0.023 (0.02)
CRERISK	-0.006 (0.01)	-0.006 (0.01)	-0.009 (0.01)	0.000 (0.02)	0.003 (0.02)
INC_DIV	-0.023* (0.01)	-0.012 (0.01)	-0.017 (0.01)	-0.014 (0.01)	-0.008 (0.01)
COST	-0.132 (0.10)	-0.107 (0.10)	-0.111 (0.08)	-0.077 (0.10)	-0.057 (0.09)
CHARTER	0.003 (0.01)	0.002 (0.01)	0.000 (0.01)	0.001 (0.01)	-0.006 (0.01)
CON	0.066* (0.04)	0.022 (0.03)	0.024 (0.04)	0.021 (0.03)	0.081** (0.04)
IFL	-0.050 (0.03)	-0.054 (0.03)	-0.073** (0.03)	0.025 (0.05)	-0.026 (0.05)
GDP	-0.035** (0.02)	-0.032* (0.02)	-0.023 (0.02)	-0.038* (0.02)	-0.040** (0.02)
PRICRE	-0.050** (0.02)	-0.026 (0.02)	-0.017 (0.02)	-0.067*** (0.02)	-0.048* (0.03)
INS	-0.662 (0.58)	-0.435 (0.55)	-0.301 (0.54)	0.712* (0.40)	0.515 (0.38)
INT	-0.055* (0.03)	-0.055* (0.03)	-0.043 (0.03)	-0.033 (0.04)	-0.051 (0.04)
ACT	0.221* (0.13)	0.055 (0.09)	0.027 (0.13)		
SUP	0.171 (0.12)	0.077 (0.12)	0.105 (0.11)	0.482* (0.25)	0.313 (0.27)
PRIMON	0.623** (0.28)	0.287 (0.21)	0.230 (0.26)	1.275** (0.64)	0.756 (0.70)
ODUM	-0.082 (0.11)	-0.076 (0.11)	-0.071 (0.10)	0.069 (0.13)	0.089 (0.12)
CRISIS	-1.256* (0.71)	-0.141 (0.50)	-0.044 (0.88)		
Constant	-5.482 (3.86)	-0.040 (3.06)	-0.480 (4.36)	-17.275* (9.18)	-11.552 (10.78)
# Obs.	796	796	796	575	575
# Banks	188	188	188	142	142
# IV	98	98	98	78	78
AR(2) test (p value)	0.398	0.432	0.466	0.116	0.155
Hansen-J test (p value)	0.438	0.444	0.364	0.314	0.199

This table reports the robustness test on the sub-sample of countries with a low level of banking integration. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 8: Domestic Banks' Sub-sample**

	(1)	(2)	(3)	(4)	(5)
L.LN(zscore)	0.426*** (0.05)	0.451*** (0.05)	0.424*** (0.06)	0.404*** (0.07)	0.416*** (0.08)
CLAIM	0.041* (0.02)				
ASIAN		0.062* (0.04)			
NON_ASIAN			0.027 (0.04)		
LOCAL				0.150*** (0.05)	
CROSS					0.065 (0.07)
CAP	0.049 (0.03)	0.042 (0.03)	0.046 (0.03)	0.013 (0.03)	0.016 (0.02)
CRERISK	-0.009 (0.02)	-0.006 (0.02)	-0.014 (0.01)	0.019 (0.03)	0.001 (0.03)
INC_DIV	-0.022* (0.01)	-0.020 (0.01)	-0.021 (0.01)	-0.019* (0.01)	-0.011 (0.01)
COST	-0.183* (0.10)	-0.161 (0.11)	-0.170* (0.10)	-0.100 (0.08)	-0.061 (0.10)
CHARTER	-0.000 (0.01)	-0.001 (0.01)	0.001 (0.01)	0.010 (0.01)	0.004 (0.01)
CON	0.032 (0.04)	-0.006 (0.03)	0.024 (0.05)	-0.024 (0.04)	0.005 (0.05)
IFL	-0.038 (0.05)	-0.036 (0.04)	-0.034 (0.05)	0.075 (0.05)	-0.002 (0.05)
GDP	-0.018 (0.02)	-0.015 (0.02)	-0.007 (0.02)	-0.024 (0.02)	-0.008 (0.02)
PRICRE	-0.031 (0.02)	-0.014 (0.01)	-0.011 (0.02)	-0.071*** (0.03)	-0.043* (0.03)
INS	-0.717 (0.81)	-0.310 (0.76)	-0.405 (0.85)	0.014 (0.40)	0.002 (0.46)
INT	-0.005 (0.04)	0.004 (0.04)	0.010 (0.04)	0.040 (0.04)	0.044 (0.05)
ACT	0.148* (0.08)	-0.016 (0.07)	-0.024 (0.09)	-0.142 (0.21)	0.011 (0.28)
SUP	0.228 (0.14)	0.250*** (0.09)	0.187 (0.16)	0.601** (0.27)	0.210** (0.10)
PRIMON	0.341 (0.31)	0.059 (0.24)	0.206 (0.35)	1.079 (0.80)	0.912 (0.97)
CRISIS	-0.752 (0.87)	0.198 (0.79)	-0.463 (1.11)		
Constant	-2.032 (3.62)	2.411 (3.57)	-1.400 (4.74)	-22.050** (8.63)	-4.819 (8.34)
# Obs.	521	521	521	366	366
# Banks	142	142	142	99	99
# IV	99	99	99	79	79
AR(2) test (p value)	0.799	0.854	0.818	0.263	0.194
Hansen-J test (p value)	0.852	0.891	0.813	0.447	0.273

This table reports the robustness test on the sub-sample of domestic banks. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

## 6. CONCLUSION

The paper considered a country receiving foreign claims from international banks to examine the impact of banking integration on its bank default risk. The key finding was that banking integration lowers recipient countries' bank default risk. The result was primarily due to the foreign claims that Asian lenders extend and the claims that foreign lenders extend via local affiliates. The findings remained robust when employing an alternative measure of bank risk (i.e., profit volatility) or conducting a different sub-sampling strategy. Overall, the results provide empirical support for the positive effect of banking integration and international banking capital on bank stability.

From a practical perspective, the findings suggest some preference about the forms of banking integration that may be beneficial to East Asian recipient countries. Specifically, these countries should favor either the foreign claims that Asian lenders extend or the foreign claims that international banks extend via local branches established in their countries. The former is synonymous with the promotion of intra-regional banking integration. This implication is meaningful because intra-regional finance still lags behind trade in terms of both the level of integration and the benefits of risk sharing (Ng and Yarcia 2014). The latter implies that, when foreign claims come from outside East Asia, policy makers should encourage the presence through local affiliates, as this has an equivalent impact. These two options of the foreign claims of "neighbors" are complementary, providing recipient countries' policy makers with flexibility in their choice of banking integration form.

Finally, this paper is subject to some limitations. First, the PRC has recently emerged as an important financial hub (in addition to Hong Kong, China; Japan; and Singapore), channeling funds both inter- and intra-regionally (World Bank 2018). The majority of Asian countries, including the PRC, have not reported their foreign claims to the BIS CBSs. Therefore, the analysis so far might underestimate the value of foreign claims with an intra-regional origin. An increase in the number of emerging Asian lenders reporting to the BIS in the future would facilitate better monitoring of intra-regional claims as well as their impact on the bank stability of the recipient countries. Second, as the original design of the BIS CBSs had a lender perspective, the data that we used to construct our measures of total foreign claims, the decomposition by lender nationality, and the methods of extension relied on different reporting bases (see Appendix A). This prevented comparative and parallel analysis for these measures. Therefore, the possibility to break down data on lender nationality further by methods of extensions, or vice versa, would enable us to provide a more detailed analysis.

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## APPENDIX A

### Some Caveats about the BIS Consolidated Banking Statistics (CBSs)

The CBSs provide the credit exposures (termed “foreign claims”) of banks headquartered in 31 BIS-reporting (source) countries to over 200 counterparties (recipient) countries on a bilateral basis. The CBSs are structured on the nationality (not the location) of the reporting banks. Specifically, the Asian source countries include Australia; Taipei, China; Hong Kong, China; India; Japan; the Republic of Korea; and Singapore. The non-Asian lenders include Austria, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

To illustrate the reporting basis of the CBSs, we can take Singapore as an example of a country reporting to the BIS. Four types of reporting banks are located in Singapore:

- (i) domestic banks (controlled by parent entities with the same country code as the reporting country), for instance the OCBC Bank, United Overseas Bank, and so on;
- (ii) banks located in the reporting country but controlled by parent entities located in non-reporting countries, for instance an affiliate of the Bank of China;
- (iii) banks located in the reporting country but controlled by parent entities located in reporting countries; for instance, an affiliate of HSBC;
- (iv) banks controlled by parent entities located in the reporting country but not consolidated by their parent.

These reporting banks report the claims that they extend to counterparties in a recipient country (i.e., the sampled East Asia). The total “foreign claims” data (to construct CLAIM) consider three types of reporting banks, including (i), (ii), and (iv).

When breaking down “foreign claims” by lender nationality (to construct ASIAN and NON\_ASIAN), we only considered the first type of reporting banks (i.e., domestic banks). This is to clarify that we did not consider the affiliates of distant international banks set up in Singapore (such as an affiliate of HSBC in Singapore) to construct Asian claims. The parent bank (e.g., HSBC (UK)) will later consolidate the claims that an affiliate of HSBC in Singapore extends and the claims then become non-Asian claims.

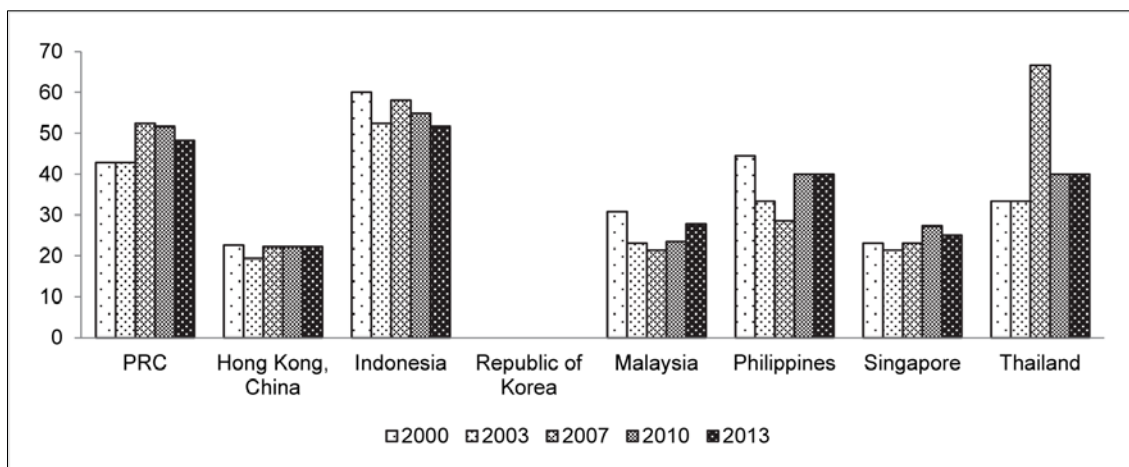
The breakdown of “foreign claims” by methods of extension (to construct CLAIM and CROSS\_BORDER) only considered the first type of reporting bank (i.e., domestic banks). Specifically, the United Overseas Bank (Singapore) set up its branch in the PRC and extends claims to counterparties in the PRC via this branch; this is the case of local claims. Alternatively, the United Overseas Bank (Singapore) books its claims outside the PRC (by extending them either from its head office in Singapore or from its branch located in another country); this is the case of cross-border claims.

With regard to the reporting basis of immediate counterparty (IC) and ultimate risk (UR), the former considers parties that are directly involved in lending contracts, while the latter takes into account the credit risk transferring from one counterparty to another via collateral or guarantees. For example, a Singapore bank extends a loan to a company in the PRC and then a bank from Hong Kong, China guarantees the loan. On an IC basis, the Singapore bank reports the loan as a claim on the PRC. On a UR basis, it reports the loan as a claim on Hong Kong, China instead.



## APPENDIX B

**The Ratio of Asian Foreign Banks to Total Foreign Banks  
in the East Asian Sampled Countries  
(%)**



This figure presents the ratio of Asian foreign banks to total foreign banks in East Asia (%). The denominator is the total number of foreign banks in these sampled countries. The numerator is the number of foreign banks that Asian BIS-reporting countries own. Source: Claessens and van Horen (2015).

## APPENDIX C

### Lists of Variables and Definitions

Variable	Definition	Source
<b>Dependent variable</b>		
LN(zscore)	Default risk = natural logarithm of bank Z-score Z-score = $[\text{ROA} + (\text{equity} / \text{total assets})] / [\text{std}(\text{ROA})]$ Std (ROA) is calculated over a three-year rolling window	Bankscope
<b>Bank-level variables</b>		
SIZE	Natural logarithm of total assets	Bankscope
CAP	Equity ratio = total equity / total assets (%)	Bankscope
INC_DIV	Income diversification = (non-interest income / total income) (%)	Bankscope
COST	Overhead cost = total non-interest operating expenses / total assets (%)	Bankscope
CHARTER	Charter value = customer demand deposits / total assets (%)	Bankscope
CRERISK	Credit risk = non-performing loans / gross loans (%)	Bankscope
ROA	Bank profitability = return on assets (%)	Bankscope
ROA_VOL	Profitability volatility = standard deviation of ROA calculated over a three-year rolling window	Bankscope
CON	Market concentration = top 3 largest banks' assets / total banks' assets (%)	Bankscope
ODUM	Foreign ownership equals 1 while domestic ownership equals 0	Claessens and van Horen (2015)
<b>Banking integration variables</b>		
CLAIM	Foreign claims extended by international banks / GDP (%)	BIS CBS IC
ASIAN	Foreign claims extended by Asian international banks / GDP (%)	BIS CBS IC
NON_ASIAN	Foreign claims extended by non-Asian international banks / GDP (%)	BIS CBS IC
LN(Asian)	Natural logarithm of foreign claims extended by Asian international banks	BIS CBS IC
LN(non_Asian)	Natural logarithm of foreign claims extended by non-Asian international banks	BIS CBS IC
CROSS	Foreign claims extended across borders by international banks / GDP (%)	BIS CBS UR
LOCAL	Foreign claims extended via foreign affiliates of international banks / GDP (%)	BIS CBS UR
LN(cross)	Natural logarithm of foreign claims extended across borders by international banks	BIS CBS UR
LN(local)	Natural logarithm of foreign claims extended via foreign affiliates of international banks	BIS CBS UR
<b>Country-level control variables</b>		
IFL	Inflation rate = $(\text{CPI}t - \text{CPI}t-1) / \text{CPI}t$ (%)	Global Financial Development (GFD-WB)
GDP	GDP growth rate = $(\text{GDPT} - \text{GDPT}-1) / \text{GDPT}-1$ (%)	GFD-WB
PRICRE	Private credit to GDP = bank credit to private sector / GDP (%)	GFD-WB
INT	Real interest rate (%)	World Development Indicator (WDI-WB)
CRISIS	Dummy year for the financial crisis	Laeven and Valencia (2012)
INS	Dummy to proxy for the deposit insurance coverage of a country: equals 1 when the country has explicit deposit insurance and 0 otherwise	Demirgüç-Kunt, Kane, and Laeven (2014)
ACT	Overall restrictions on banking activities index = the index measures the degree to which banks are allowed to engage in securities, insurance, real estate investment, and ownership of non-financial firms. Higher values indicate more restrictiveness	Barth, Caprio Jr, and Levine (2013)
SUP	Supervisory power index = the index measures whether the supervisory authorities have the authority to take specific actions to prevent and correct problems. Higher values denote that supervisory agencies have more oversight power	Barth, Caprio Jr, and Levine (2013)
PRIMON	Private monitoring index = the index measures the degree of private monitoring that requires banks to release accurate and comprehensive	Barth, Caprio Jr, and Levine (2013)

information to the public. Higher values indicate greater regulatory  
empowerment of the monitoring of banks by private investors

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