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How Should We Bank With Foreigners?—An Empirical Assessment of Lending Behavior of International Banks to Six East Asian Economies

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Abstract

The possible crucial role of international bank lending in transmitting adverse economic disturbance from developed economies to emerging economies in the 2008–2009 global financial crisis has placed capital flows into sharper scrutiny in academic and policy discussions. The authors construct macro-and micro-panel data on international bank lending to six Asian economies—Indonesia, the Republic of Korea, Malaysia, Philippines, Singapore, and Thailand—to analyze a number of objectives. The paper first examines the influence of critical determinants not only to overall international bank lending but also to cross-border bank lending, and obtained one finding that cross-border lending by international banks tend to pull out from host economies during difficult times in source economies, whereas such retrenchments are not evident on an aggregated basis. This suggests that encouraging brick-and-mortar affiliates of international banks to "set up shop" in recipient economies may be the judicious choice for these economies. The paper next examines the differences between subsidiaries and branches of international banks in terms of their ability to shield themselves from the financial difficulties of their global parent banks and thus their ability to continue lending in destination markets. The results show that foreign bank subsidiaries are more capable in this regard. This finding carries with it the attraction of favoring an organizational banking structure that is biased toward subsidiaries. However, national banking regulators should remember that apart from encouraging a host of other domestic and cross-border initiatives, encouraging the entry of brick-and-mortar subsidiaries of international banks should not be viewed as a panacea to financial stability concerns of economies in Asia and in emerging markets in general.

JEL Classification: C23, F34, F36, G15, N25

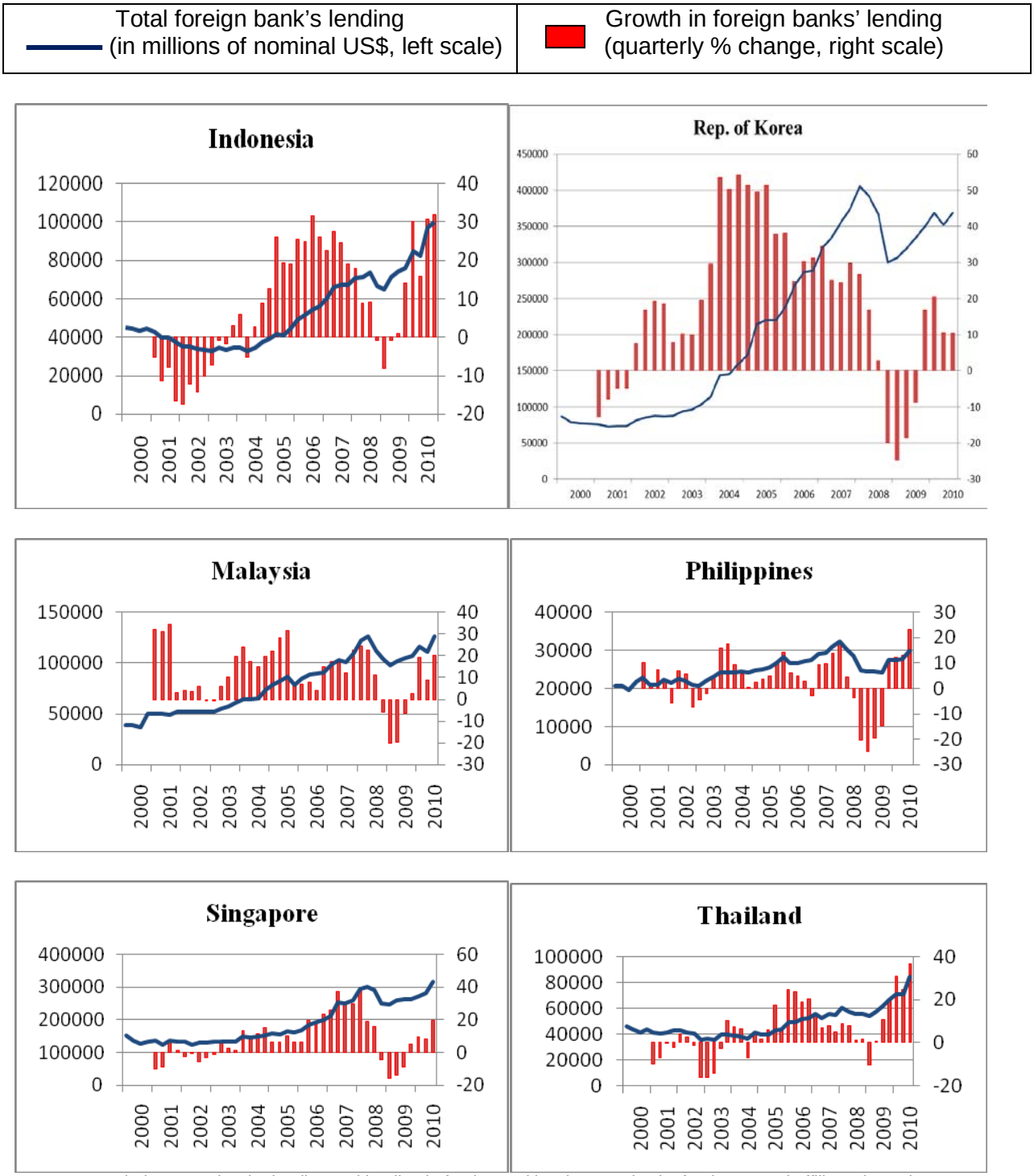
Contents

1. INTRODUCTION

One trademark of financial globalization has been the remarkable rise in cross-border banking links between countries since the late 1980s or early 1990s. The positive and negative aspects of these links are being re-assessed in the wake of the 2008–2009 global financial crisis. The advantages are well known. Emerging market countries have benefitted in the form of mitigating anti-competitive behavior of domestic banks in view of competition or the threat of competition from foreign banks which arguably leads to efficiency gains in the form of a greater variety of financial services and lower prices, the transfer and spillover of knowledge and technical know-how, as well as the greater availability of finance, especially to credit-constrained firms and households. Yet the recent interruption of the global financial crisis to the rise in international bank lending serves as a reminder, especially to policymakers, that international bank lending can rapidly transmit adverse shocks emanating from developed financial markets to emerging markets. It is no surprise that under these circumstances, the role of the global banking system, in general, and international bank lending, in particular, has once again been placed under close scrutiny. As a testament to this greater focus on the important role of large and volatile cross-border capital flows, most especially greater cross-border banking interconnectedness, the International Monetary Fund and the Group of Twenty (G20) have placed this concern high in the policy reform agenda of the global financial system (IMF 2010).

In the case of the East Asian economies, the intensified volatility in global bank lending and the accompanying sharp drops in lending by the international banks in late 2008 brought back fears of a repeat episode of the credit squeeze suffered by these economies during the height of the 1997–1998 Asian financial crisis. Indonesia, the Republic of Korea, and Thailand, among the most severely affected by the Asian financial crisis, experienced sudden and sharp reversals of international bank lending flows. From 1997 to 2000, total international bank claims on Indonesia contracted by an average annual rate of 6.3%, on the Republic of Korea by 7.5%, and on Thailand by 13.3%. Thereafter, a steadfast surge in international bank lending resumed and flooded these same East Asian markets for five consecutive years until the collapse of Lehman Brothers in 2008. The Republic of Korea, for instance, experienced a remarkable growth in international bank lending at an average annual rate of around 35% from 2003 to 2007. In 2008, the country, however, suffered a sudden retrenchment in international bank lending of around 20%. Countries such as the Philippines and Malaysia also experienced similar rates of sharp contractions in international bank lending that same year (Figure 1).

Figure 1: Total Foreign Banks' Lending to Selected Asian Countries*



* Includes cross-border lending and lending in foreign and local currencies by foreign-owned affiliates in each country.

Source: Raw data from the Condolidated Banking Statistics, Bank for International Settlements (BIS); http://www.bis.org/statistics/consstats.htm; accessed: 10 February 2012; authors' calculations.

The importance of international bank lending can also be understood from the size of the loans in particular from the banks of three developed economies, Japan, the United States (US), and the United Kingdom (UK). In early 2010, the total lending of these banks to the ASEAN-5[1] economies and the Republic of Korea varied from less than 10% to as high as 75% of their annual gross domestic product (GDP). The total loans of the banks from these three developed economies hovered at 6% of GDP in Indonesia and 9% of GDP in the Philippines. In the same year, Thailand received around 15% of its GDP in terms of lending and the Republic of Korea and Malaysia reported a higher amount of lending of around 25% of their GDP. Singapore, in view of its status as a regional financial center, received flows of international bank lending from these developed economies of around 75% of its GDP in 2010.

In light of the interconnectedness of the domestic banking systems in the above-mentioned East Asian economies to lending by international banks, and the consequent role of these same international banks as a crucial source of finance for these economies, the key objectives of this paper are as follows. The study assesses the fundamental determinants of lending by the Japanese, UK, and US banks to five Southeast Asian economies (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and the Republic of Korea. These economies are selected for their increased reliance on international bank lending, both prior to the 1997–1998 Asian financial crisis as well as in the years preceding the 2008–2009 global financial crisis. There is a sizeable amount of literature that ascribes the cause and severity of the Asian financial crisis to the large number of short-term bank loans that these economies obtained mainly from Japan, UK, and the US. It is not surprising then that once the stylized data on international bank lending had been examined, banks from Japan, UK, and the US have lent strongly in these economies not just in recent years, but also since the early 1990s when the surge in international lending coincided with liberalization and structural reforms in the banking sector of these Asian economies.

The determining factors that we examine include home and host country indicators. Economic performance as measured by the GDP growth rates of the host and home economies are included as potential pull and push factors, and as such tries to account for the effect of cyclical conditions to international lending. Interest rate differentials between the host and home economies are another macroeconomic factor that we examine and try to account for the role of relative rates of return. These factors are considered as standard in the emerging literature on the determinants of international bank lending.[2] This study, however, goes beyond the examination of the standard fundamental determinants of international bank lending by squarely ascertaining the role of three other critical factors.

First, we take into account the role of expectations regarding short-term volatility in the global financial market in driving shifts in global supply conditions with regards to international bank lending. Second, a concern that resurfaced during the 2008–2009 global financial crisis was the issue of potential spillover or contagion effect. A crucial question is whether decisions by international banks to ramp-up or contract their lending to one country necessarily extend to neighboring economies in East Asia. This is known in the seminal literature as the potential existence of a common lender effect.[3] Third, we deal with the issue of stability in international bank lending to the six Asian host economies by examining it via the sensitivity or reaction of lending by international banks to shocks coming from their own economies while, at the same time, taking into account the extent of the exposure by international banks into these Asian

[1] Comprising Indonesia, Malaysia, Philippines, Singapore, and Thailand.

[2] See, for instance, Buch Carstensen, and Schertler (2010).

[3] See, for instance, Van Rijckeghem and Weder (2003).

economies. In other words, we investigate whether an escalation in international bank exposure to the six Asian host economies translates into steady financing on the part of these international banks in the face of economic disturbance occurring in their own economies. In view of what transpired during the 2008–2009 global financial crisis as well as contentions of earlier literature on the issue of stability in international bank lending against the background of shocks coming instead from host economies,[4] this is a timely and interesting research objective to pursue.

Rather than focusing solely on overall international bank lending,[5] we also assess the impact of the above-mentioned determinants on cross-border lending by international banks. By comparing the extent of the influence of the above same determinants on overall international bank lending as opposed to cross-border lending by international banks, we are able to investigate on an aggregate level the distinctive influence of each factor on the two channels by which international banks lend—cross-border lending as compared with local lending. More importantly, we can also explore the relative stability of the two channels of international bank lending. This is a well-timed and worthwhile task to pursue in light of recent evidence that brick-and-mortar presence of international banks in recipient economies is the more prudent and judicious policy to undertake within the context of host economies.[6]

The strength and soundness of an international bank's balance sheet should also influence its capacity to extend loans. Deterioration in its asset quality, for instance, would affect the capital adequacy position of the bank and in turn would influence its lending decision (Bayoumi and Melander 2008). In order to test the likely impact of balance sheet strength and quality on the lending of the bank, our micro-panel empirical estimation includes a number of commonly observed balance sheet indicators that deal with aspects of size, solvency, net interest margin, profitability, and liquidity.

Finally, once we have some understanding on the relative stability of the two channels of international bank lending as emphasized above, our study goes further by dealing with another relevant and contentious policy issue of the mode or organizational form of entry of international banks. Did subsidiaries and branches of international banks in the six Asian economies have a crisis-mitigating impact in terms of an unfettered capacity to lend in these economies during the 2008–2009 global financial crisis? In relation to this question, we want to know whether there is a significant difference between these two organizational forms of entry as far as their ability to withstand financial difficulties in their global parent banks and thereby are able to continue lending in the six economies.

These are crucial research questions that have recently been brought into the limelight of policy discussions and arguments. One argument, for instance, is that the attraction of being able to easily protect the assets of subsidiaries of foreign banks as opposed to foreign bank branches (ring-fencing) leads banking regulators to favor an organizational bank structure comprising mainly subsidiaries rather than branches (Mihaljek 2010; Fiechter et al. 2011). In addition, as a perceived advantage for the international bank, the ability to screen and monitor its lending activities may be improved by the establishment of a local subsidiary (de Haas and Van Horen, 2011). On the other hand, while the local subsidiary reduces geographical distance, Aghion and Tirole (1997) argue that it could potentially create "functional distance" within the bank as information may not be efficiently passed on from the subsidiary to the bank's headquarters. It is surprising that in spite of the policy importance of the issues raised above, hardly any formal

[4] See, for instance, Peria, Powel, and Vladkova-Hollar (2005).

[5] See, for instance, Siregar and Choy (2010).

[6] See, for instance, Kamil and Rai (2010) and de Haas and Lelyveld (2010).

empirical work has been conducted to investigate the lending behavior of subsidiaries and branches during a crisis, particularly so in the 2008–2009 global financial crisis. We consider this aspect as one key contribution of our study.

The paper proceeds as follows. Section 2 presents key trends and stylized facts. Section 3 introduces the empirical approach as well as the data employed, after which Section 4 elaborates in greater detail the exhaustive empirical findings. The paper ends with a concluding section.

2. STYLIZED TRENDS

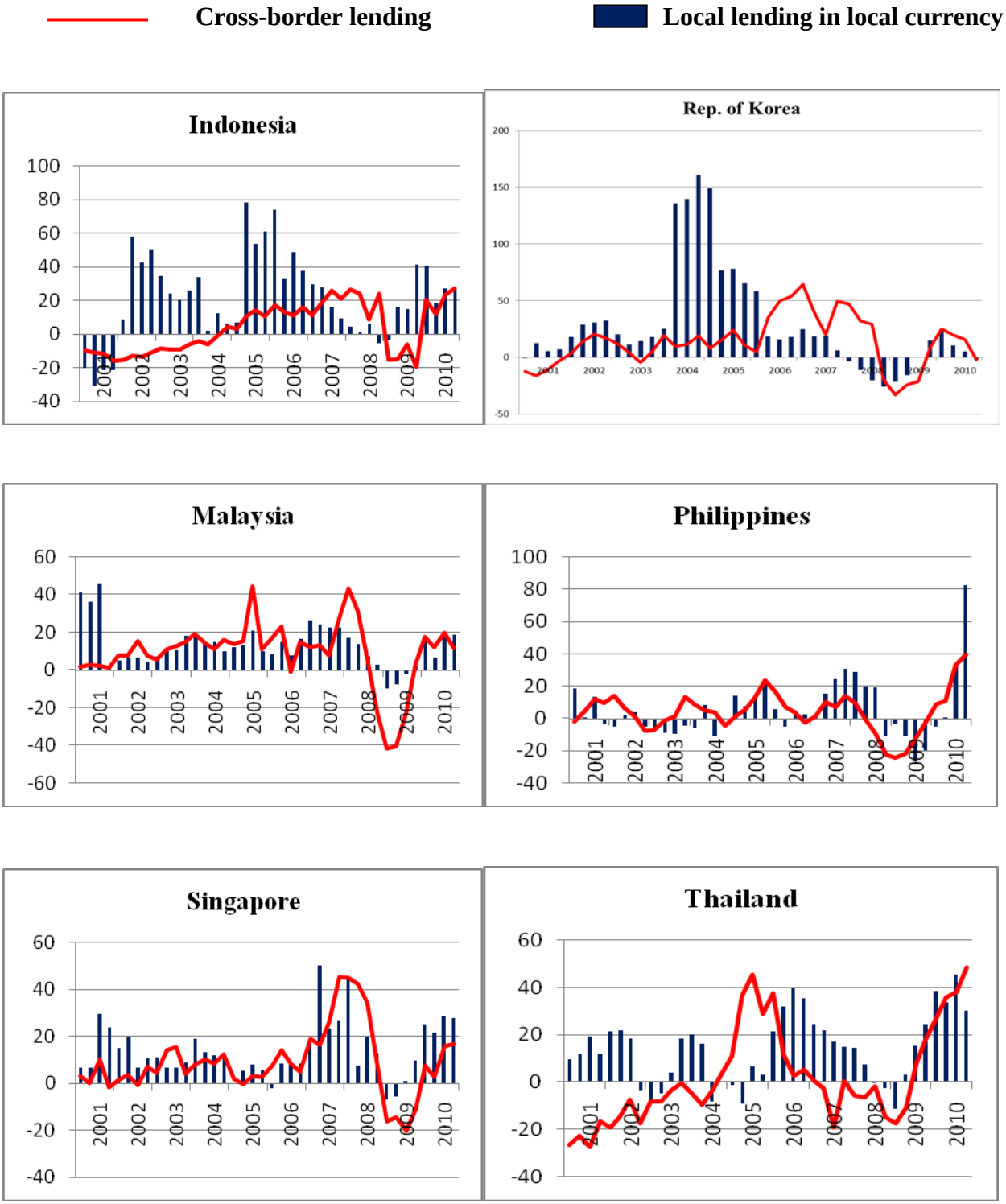
Private international capital flows are a defining feature of the global financial landscape—the experience of the six Asian economies is no exception. Lending by international banks or global banks on an aggregated level that occurs through two channels—directly, cross-border lending by parent banks headquartered abroad, or indirectly, via credit extended by the local affiliates of these globally active banks—has expanded rapidly for the six Asian economies from modest levels in 2000 (Figure 1). This expansion has been volatile and uneven across the six economies and has been intermittently punctuated by surges and reversals throughout the decade. The latter characterization was much more drastic and consistently felt across the six economies (perhaps with the exception of Thailand) during the 2008–2009 global financial crisis, which put an end to an international bank lending boom that was experienced by these economies during the middle and latter part of the 2000s.

Nonetheless, an examination of what transpired during the global financial crisis suggests a more nuanced story to the sudden reversal in international bank flows in these six Asian economies. The component of international bank lending extended directly by the overseas headquartered parent banks was volatile and experienced a much sharper decline during the crisis as opposed to credit extended by the local affiliates of these same internationally active banks that either slowed to a lesser extent than the former or quickly recovered in the immediate aftermath of the crisis (Figure 2). In other words, the sudden retrenchment in international bank flows during the financial turmoil was predominantly driven by the curtailment in cross-border lending by internationally active banks.

Between the early-1990s and prior to the 1997–1998 Asian financial crisis, Japanese banks were the largest sources of funding in these six economies.[7] For instance, at one point between 1990 and 1994, Japanese lending amounted to close to 60% of total international bank lending in Thailand, Singapore, and Indonesia. Not far from these three economies were the Republic of Korea that recorded lending by Japanese banks of around 30% and Malaysia that recorded around 40%. At the onset of the Asian financial crisis and in its aftermath, all six economies experienced a consistent waning in the share of lending by Japanese banks. The diminishing dominance in lending by Japanese banks has been replaced recently to some extent by UK banks and consistently by US banks. As a result of the critical influence of Japanese, UK, and US owned-banks, the combined lending of these three big economies accounted for at least half of the combined lending by developed countries to the six Asian economies from 1990–2009. (Figure 3).

[7] An exception is the Philippines which is dominated by lending from US-owned banks.

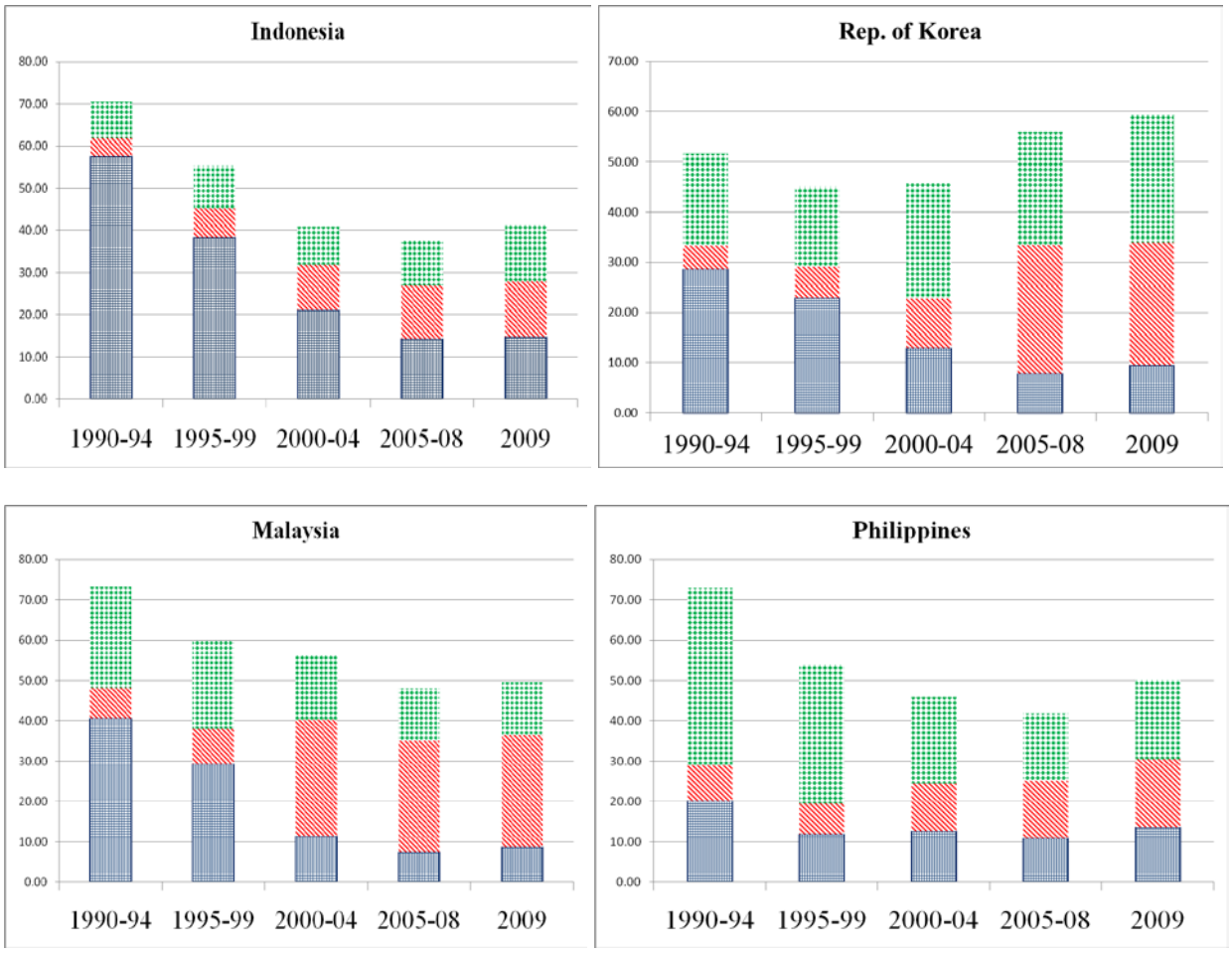
Figure 2: Differences in Behavior of Channels of Foreign Banks' Lending to Selected Asian Countries (quarterly percentage change)

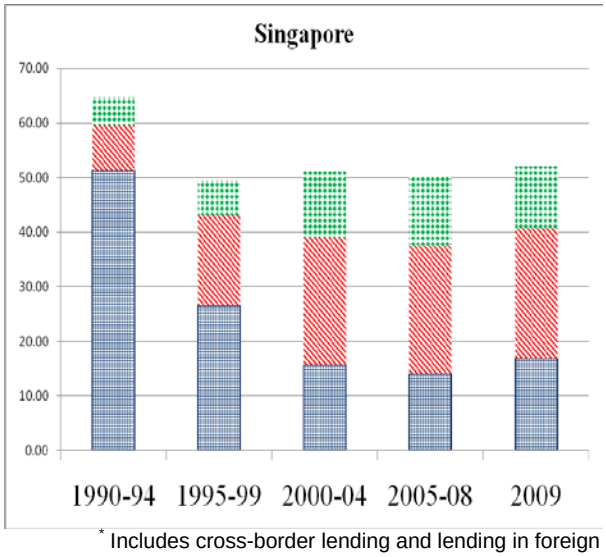


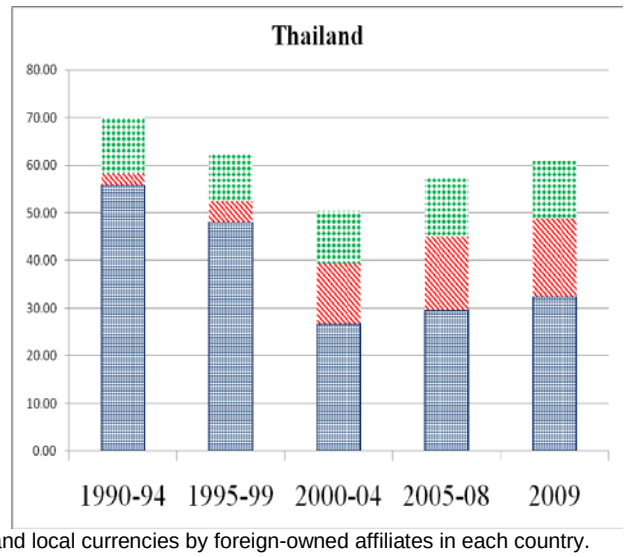
Sources: Raw data from the Locational and Condolidated Banking Statistics,Bank for International Settlements (BIS); http://www.bis.org/statistics/bankstats.htm; accessed: 10 February 2012; authors' own calculations.

Figure 3: Period Averages of Shares of Japanese, UK, and US Banks' Lending to Total Foreign Bank Lending in Selected Asian Countries (%)*

Average share of Japanese banks
Average share of UK banks
Average share of US banks







* Includes cross-border lending and lending in foreign and local currencies by foreign-owned affiliates in each country.

Sources: Raw data from the Consolidated Banking Statistics, Bank for International Settlements (BIS); http://www.bis.org/statistics/constats.htm; accessed: 10 February 2012; authors' own calculations.

Finally, while international banks that are headquartered overseas have expanded their lending activities for the greater part of the 2000s via their cross-border lending to the six economies, the extent of penetration by the local affiliates of these international banks reveals that these so-called foreign banks have made inroads into these six Asian economies but the extent of participation varies depending on the measures used. For instance, Table 1 shows that in terms of the share of foreign banks to the total number of banks in the Asian economies' banking systems, with the exception of the Republic of Korea, the number of local affiliates of these international banks account for at least half of the domestic banking systems. Whereas an examination of the share of foreign banks in terms of total domestic banking assets indicate that foreign banks account for less than a third of domestic banking assets in these economies. This latter point may be a reflection that in these Asian economies, takeovers by foreign banks have been in the form of purchases of small financial institutions (Gopalan and Rajan 2010).

Table 1: Measures of Foreign Bank Penetration in Selected East Asian Economies

	Number of foreign banks (%)[a]	Share of banking assets (%)[b]
Indonesia[c]	52	23
Rep. of Korea[d]	35	13
Malaysia[c]	52	17
Philippines[e]	46	12
Singapore[f]	90	NA
Thailand[d]	63	21

[a] Measured as percentage share of the total number of banks in the country; [b] Measured as percentage share of total bank assets; [c] As at end-2009; [d] As at end-2010; [e] As at September 2010; [f] As at June 2010; NA = not available.

Sources: Bankscope, https://bankscope2.bvdep.com; (accessed: 15 March 2012; 2011 EIU Financial Services Country Reports.

3. ESTIMATION APPROACH AND DATA

3.1 Dynamic Macro-panel Model

The basic working empirical model employed to assess the possible determinants of international bank lending is represented by the following dynamic panel equation:

$$\Delta \log Claims_{ij,t} = \alpha_0 + \alpha_1 \Delta \log Claims_{ij,t-1} + \beta_1 indiff_{ij,t} + \beta_2 VIX_t + \beta_3 Clender_{ij,t} +$$

$$\beta_4 growthrate_{j,t} + \beta_5 growthrate_{i,t} + \beta_7 growth_{i,t} \times \exp osure_{ij,t} + \upsilon_{ij,t} \quad (1)$$

Where i and j represent country pairs i and j, and i denotes the home or source economies of international bank lending (Japan, UK, and US), while j denotes the six Asian host or recipient countries of Indonesia, the Republic of Korea, Malaysia, Philippines, Singapore, and Thailand. The dependent variable in this section of the paper, $\Delta \log Claims_{ij,t}$ is the logarithmic differences of international bank lending from banks in home country i to our six host countries j; $\Delta \log Claims_{ij,t-1}$ is the lagged of the dependent variable. In Equation (1) we assume that $\upsilon_{ij,t}$ contains the following two effects: (a) the unobserved time-invariant country-pair specific effect, $\eta_{ij,}$, and (b) a stochastic error term $\varepsilon_{ij,t}$, varying across time and cross-section.

We pursue the first group of objectives set out in the beginning of this paper by conducting our estimation of equation (1) in two separate stages. In the first stage we obtain and use for our left-hand side variable, available raw data on total international bank lending (cross-border lending plus total credit extended by affiliates of these international banks), whereas in the second stage we only employ available data on international cross-border lending. In doing so, we can assess the relative stability of local lending by affiliates of international banks in the six Asian host economies vis-à-vis the cross-border lending by these international banks that are headquartered overseas to our same six Asian destination economies.

In terms of our right-hand side variables in equation (1), the fundamental determinants of international capital flows are accounted for by home or push and host or pull factors that figure prominently in the literature. The roles of standard macroeconomic factors such as the respective real GDP growth of host country j $\left(growthrate_{j,t}\right)$ and home country i $\left(growthrate_{i,t}\right)$ to capture economic cycles and nominal interest differential between host country j and home country i $\left(indiff_{ij,t}\right)$ to reflect rates of return in both home and host economies are included.[8] We expect a positive coefficient on the $\left(indiff_{ij,t}\right)$ variable as higher interest rates in the host country or, conversely, lower interest rates in the home countries, *ceteris paribus*, should lead to an increase in international bank flows in the host economies. We also expect a positive coefficient on the real GDP growth of host countries as higher returns in these countries should then lead to a rise in international bank flows in these countries. Whereas, there is ambiguity as to the expected sign of the real GDP growth in home countries as, on the one hand, recessionary economic conditions in home countries entail lower profit opportunities at home, which should then encourage foreign banks to seek better or higher returns abroad in which case we expect a negative coefficient on the $\left(growthrate_{i,t}\right)$ variable. On the other hand, weak economic conditions in home countries may signal a worsening of the capital position of foreign banks that should then discourage, or worse, retrench their lending overseas.

Apart from considering the role of traditional push and pull factors on international bank lending, we also take into account a measure of the state of the global financial market, such as the S&P 100 Volatility Index $\left(VIX_t\right)$ of the Chicago Board Options Exchange which is widely used as an indicator of expected short-term volatility. A high value for the $\left(VIX\right)$ indicates more volatile market expectations and as such we expect a negative coefficient on the $\left(VIX\right)$ variable as greater global volatility should lead to a reduction in international bank flows to host economies (Herrmann and Mihaljek 2010).[9] Furthermore, in line with the study by Van Rijckeghem and Weder (2003), we also include in our empirical model a measure of the potential contagion or spillover of changes in international bank flows from one country to another, and is denoted by the $\left(Clender_{ij,t}\right)$ variable. More popularly known as the common lender effect, this argues that movements in international bank lending in one country may be transmitted to other countries that owe from the same international banks. We follow Peria, Powel, and Vladkova-Hollar

[8] These macroeconomic factors have also been considered by earlier studies such as by Jeanneau and Micu (2002) and Buch, Carstensen, and Schertler (2010).

[9] It is also based on this expected relation that (*VIX*) is construed as a factor that measures the global supply of international bank lending. Higher volatility corresponding to a high value of (*VIX*) makes it more difficult for banks to raise additional capital (Takats 2010).

(2005) in accounting for this effect and thus operationalize $(Clender_{ij,t})$ as the changes in lending from home country i banks to all the major Asian host countries except that of the individual Asian host country j.[10,11] We should then expect that if the common lender effect works, the coefficient on the variable $(Clender_{ij,t})$ would be positive and significant.

To test the impact of home economy shocks on the stability of international bank lending to our six Asian host economies, our main variable of interest, an interaction term between our home countries' real GDP growth rate variable, $(growthrate_{i,t})$ and a measure of international banks' exposure to our individual Asian host countries, $(\exp osure_{ij,t})$, was created. We measure $(\exp osure_{ij,t})$ as the ratio of home country $i's$ international bank lending on one particular Asian host country j to the total worldwide lending of home country $i's$ banks. The rationale underlying this interaction variable follows on from a similar idea by Peria, Powel, and Vladkova-Hollar (2005) that the variable $(growthrate_{i,t})$ can be considered an alternative measure of home economy shocks as it is essentially indistinguishable from a crisis on the grounds that crisis coincide with deterioration in macroeconomic fundamentals such as real GDP growth rates as what happened in developed markets, for instance, during the 2008–2009 global financial crisis. Consequently, the interaction between the variable $(growthrate_{i,t})$, and with the latter variable on international bank exposure, $(\exp osure_{ij,t})$ captures the reaction of international banks to shocks or crisis that emanate from home economies which then indicate the commitment, or lack of, of international banks to continue lending to host economies. Based on this interpretation, a rise in international bank exposure to host economies has an effect that can work in equal but opposite directions—as exposure increases, the response of international banks to shocks coming from their own economy is either to retrench or remain steady in their lending to the six Asian host economies.[12] Depending on the significance of the interaction term, we can ascertain the impact of international bank exposure on how the international banks respond to shocks that originate from their own economies. Thus, if higher exposure translates into stable international bank lending, we should expect the interaction between home country foreign banks' real GDP growth rate and international bank exposure to be negative.

[10] As pointed out by Peria, Powel, and Vladkova-Hollar (2005), in an ideal sense, the common lender effect can be equated to a portfolio allocation choice wherein changes in values of lending trigger an adjustment in other assets or claims. The limitation of working then with aggregated country level data on international bank lending is that it obscures this portfolio allocation decision at the individual bank level.

[11] These major Asian host countries are the same six Asian economies that are examined in this paper, that is, Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand, plus the People's Republic of China. Herein lies the distinction of the present study with regards to Peria, Powel, and Vladkova-Hollar (2005) in which the latter defines the common-lender effect as the changes in lending from home country banks to all non-BIS-reporting countries other than that of the host economy. Our rationale for so doing is that we would like to capture more of the regional spillover dimension as far as the movements in this type of flows is concerned.

[12] We should point out, however, that the major difference between the interaction term used in our study as opposed to the interaction term used in the above cited Peria, Powel, and Vladkova-Hollar (2005) study is that the latter examines the response of international banks to shocks in host economies and as such the interaction term used is the product between the host countries' real GDP growth rate (as opposed to the home countries' real GDP growth rate used in our present study) and the measure of international bank exposure. Nonetheless, the interpretation of the expected a-priori signs with regards to both the interaction term and the shock variable work out to be similar in both studies.

3.2 Dynamic Micro-panel Model

In order to further examine the overarching issue of the credit stability of international bank lending amidst the financial turbulence that occurred in source economies in the 2008–2009 global financial crisis as well as the implications of the balance sheet strength of these same banks, we estimate the following dynamic panel equation on a micro-panel dataset of foreign banks operating in the six Asian host economies:

$$loangrowth_{i,t} = \alpha_0 + \alpha_1 loangrowth_{i,t-1} + \beta_1 growth\,\mathrm{hom}\,e_{i,t} + \beta_2\,\mathrm{int}\,rate\,\mathrm{hom}\,e_{i,t} +$$

$$\beta_3 growthhost_{i,t} + \beta_4\,\mathrm{int}\,ratehost_{i,t} + \beta_5 solvency_{i,t} + \beta_6 weakness_{i,t} +$$

$$\beta_7\,\mathrm{int}\,erestm\,\mathrm{arg}\,in_{i,t} + \beta_8 liquidity_{i,t} + \beta_9 profitability_{i,t} + \beta_{10} size_{i,t} +$$

$$\beta_{11} crisisdummy_{i,t} + \upsilon_{ij,t} \qquad (2a)$$

where i denotes the individual foreign bank operating in Indonesia, the Republic of Korea, Malaysia, Philippines, Singapore, and Thailand. The dependent variable in this part of the analysis, $(loangrowth_{i,t})$, is the growth rate of lending by affiliates (branches and subsidiaries) of these international banks located in the host economies. Just as in the previous analysis, we also include macroeconomic home or push factors and host or pull factors of host country lending by foreign banks in equation (2a). To be more specific, we employ two home country variables of the foreign banks, that is, home country GDP growth ($growth\,\mathrm{hom}\,e_{i,t}$) and home country lending rate $(\mathrm{int}\,rate\,\mathrm{hom}\,e_{i,t})$ as well as two analogous host country variables: host country GDP growth $(growthhost_{i,t})$and host country lending rate $(\mathrm{int}\,ratehost_{i,t})$. Along similar lines of arguments presented in the previous section, we expect that the sign of home country GDP growth is ambiguous with respect to host country lending by foreign banks, whereas host country GDP growth is expected to be strongly positively related to host country lending by foreign banks. Furthermore, higher home (host) country lending rates will be negatively (positively) related to host country lending by foreign banks as higher lending rates in a country makes it attractive for banks to expand their credit in that economy.

As a point of departure from the earlier presented dynamic macro-panel model, we now include in equation (2a) a set of bank specific balance sheet variables in order to control for other bank characteristics that may influence the decision of a bank to extend credit. Strengthening the balance sheet position of international banks has taken more prominence and traction in recent years in light of the package of proposed changes in the regulatory structures and supervisory standards in developed economies' financial systems. Perhaps one underlying motivation in these discussions comes from the belief that the deterioration in the balance sheets of international banks from developed economies has been blamed as one of the root causes for the sharp and sudden drops in lending of international banks to East Asian economies in late 2008 and early 2009. For instance, doubts about the quality of international banks' balance sheets started to surface in 2008, especially in the wake of the collapse of Bear and Stearns and Lehman Brothers (Hoggarth, Mahadeva, and Martin 2010). As earlier mentioned, another

timely contribution of this study is on the inclusion and assessment of the effects of various balance sheet indicators with regards to the lending of these international banks to the six Asian economies.

A number of balance sheet indicators are thus considered in equation (2b). Quality and adequacy of assets are represented by total assets $\left(size_{i,t}\right)$, liquid assets to total assets $\left(liquidity_{i,t}\right)$ and equity to total assets $\left(solvency_{i,t}\right)$. Theoretically, a strengthening of asset size and quality should have a positive effect on international bank lending. In addition, we also consider a cost factor measured as the ratio of the loan loss provisions to net interest revenue $\left(weakness_{i,t}\right)$. It is expected that a rise in this measure of cost factor should reduce a bank's capacity to lend. Lastly, but equally important, is the overall past performance of the bank. In this case, we consider the commonly used indicator of profit, that is, return-on-asset $\left(profitability_{i,t}\right)$. The lending activity of a bank should be positively related to its level of profitability. Furthermore, banks that enjoy higher net interest margins $\left(\text{int}erestm\text{arg}in_{i,t}\right)$ tend to expand their lending.

We also include a crisis dummy $\left(crisisdummy_{i,t}\right)$ that takes on the value of 1 for 2008–2009 to capture the amplified volatility emanating from the global financial crisis, whereas it is zero otherwise. There is ambiguity as to the expected sign of this crisis dummy variable with respect to its effect on host country lending by the affiliated branches and subsidiaries of the international banks. On the one hand, the coefficient of this variable has been found to be either insignificant or even positive by earlier empirical studies such as those by Peria, Powel, and Vladkova-Hollar (2005), De Haas and Van Lelyveld (2006), and De Haas and Van Lelyveld (2010). The underlying argument in support of this evidence is that the affiliated offices of these international banks in host economies can rely on their parent banks for support if they encounter financial difficulties that make these banks either insensitive or robust to crisis episodes. This is unlike the case of domestic banks that lack support from parent banks with substantial wealth and have to rely on their own resources in times of financial strain. On the other hand, the nature and scale of acuteness of the global financial crisis in which the robustness and resilience of this so called internal capital support from parent banks to their network of affiliates in overseas locations was severely tested in the wake of the economic slowdown in the home countries of these global banks, and as such we expect a negative coefficient for the crisis dummy variable.

Finally, in order to advance with our final main objective to test the credit stability implications of foreign bank branches as opposed to foreign bank subsidiaries as distinct organizational forms of entry of foreign banks, we create another dummy variable to capture the organizational form of foreign banks in our sample. To be more specific, the $subsidiary_{i,t}$ dummy variable takes a value of 1 if the particular foreign bank in our sample is a subsidiary operating in the individual six Asian economies, whereas it is zero if the particular foreign bank is a branch. We then use this dummy variable to create an interaction term with our earlier crisis dummy variable to explicitly test the differences between subsidiaries and branches in their credit stability consequences to our six Asian host economies. We therefore expect to find support to the argument that subsidiaries rather than branches can shield themselves from the financial difficulties of its global parent bank if the sign of the coefficient of this interaction term comes out to be positive upon its inclusion in the same dynamic micro-panel regression that we encountered previously in equation (2a). For completeness, the dynamic micro-panel regression presented earlier as equation (2a) can now be expressed as:

$$loangrowth_{i,t} = \alpha_0 + \alpha_1 loangrowth_{i,t-1} + \beta_1 growth\,\mathrm{home}_{i,t} + \beta_2 \,\mathrm{int}\, rate\,\mathrm{home}_{i,t} +$$

$$\beta_3 growthhost_{i,t} + \beta_4 \,\mathrm{int}\, ratehost_{i,t} + \beta_5 solvency_{i,t} + \beta_6 weakness_{i,t} +$$

$$\beta_7 \,\mathrm{int}\, erestm\arg in_{i,t} + \beta_8 liquidity_{i,t} + \beta_9 profitability_{i,t} + \beta_{10} size_{i,t} + \quad (2b)$$

$$\beta_{11} crisisdummy_{i,t} + \beta_{12} crisisdummy_{i,t} \times subsidiary_{i,t} + \upsilon_{ij,t}$$

3.3 Bank for International Settlements' Banking Statistics

As discussed, the estimation of equation (1) in two separate stages requires us to obtain two country-level dependent variables on international bank lending—foreign bank claims and cross-border claims. We extract these two variables and facilitate the construction of our panel using the *International Banking Statistics* database of the Bank for International Settlements (BIS). Specifically, in the first stage of our estimation of equation (1), we use data on foreign bank claims, the foreign financial claims of international banks to the financial and non-financial sectors in the six Asian economies as reported in the BIS's *Consolidated Banking Statistics*. This bilateral data comprises the international financial claims—defined as the sum of the credit extended by the foreign banks headquartered overseas (cross-border claims) and the credit extended in foreign currencies by the affiliates of foreign banks in host economies (local claims of foreign affiliates in foreign currency) —plus the credit extended in local currency by the affiliates of foreign banks in host economies (local claims of foreign affiliates in local currency). As emphasized in the previous section, driven by the importance of international bank lending from Japan, UK, and US banks in the six Asian economies, the focus of our first-stage estimation of equation (1) will be on the behavior of foreign bank claims from banks coming from these three developed economies.

Obtaining convenient and suitable data on the cross-border claims variable with regards to the second stage of our estimation of equation (1) is not straightforward. One limitation of *Consolidated Banking Statistics* is that the data on international financial claims does not disaggregate "pure" cross-border claims from that of the credit extended in foreign currencies by the affiliates of foreign banks, that is, local claims of foreign affiliates in foreign currency. Alternatively, one can resort to using the external positions of BIS reporting banks to the financial and non-financial sectors of our six Asian economies as reported in *Locational Banking Statistics* (BIS). These are also the data that we use for our variable on cross-border claims at this stage of estimation of equation (1).[13] However, an issue with the *Locational Banking Statistics* on cross-border loans is that unlike the *Consolidated Banking Statistics* on foreign financial claims of international banks, it only makes available to the public the aggregate cross-border claims of all the BIS reporting home country banks to non-BIS reporting countries including that of the six Asian economies examined here. In other words, in contrast to the estimation of equation (1) in the first stage in which we specifically focus on the behavior of bilateral foreign bank claims from banks coming from Japan, UK and the US, a constraint faced by this study is that similarly investigating the respective bilateral cross-border claims of the

[13] Hermann and Mihaljek (2010) also use this data for their own variable on cross-border flows.

major banks in the three home countries in the second stage of estimation of equation (1) is not possible due to limitation on the available data. Thus, we settle at this stage of our estimation of equation (1) with the data on aggregate cross-border claims of all the BIS-reporting home country banks that mostly comprise industrialized countries, to our individual six Asian host economies.[14]

Finally, we construct the common lender variable, $(Clender_{ij,t})$, and the variable on exposure, $(\exp osure_{ij,t})$, in the first stage of estimation of equation (1) using the above mentioned BIS Consolidated Banking Statistics data on international financial claims, whereas these same two variables were constructed using the BIS' *Locational Banking Statistics* data on external positions of BIS reporting banks in the second stage estimation of equation (1).[15]

3.4 Bankscope Dataset

The raw data used in the calculation of the bank-specific variables of foreign banks as well as the raw data on total loans of affiliated branches and subsidiaries of foreign banks in equations (2a) and (2b) above were obtained from the Bureau Van Dijk's BankScope database for all active foreign commercial banks in the six Asian host economies. To be sure that the individual foreign commercial banks covered by the database were representative of the foreign commercial banking system in each of the six countries, they were verified by information obtained from the respective national monetary authorities.[16] The advantage of working with Bankscope on the lending of affiliated branches and subsidiaries of foreign banks in host economies is that it not only provides data on the BIS-reporting foreign banks (the aggregated lending of these group of banks are included in the BIS Consolidated Banking Statistics data), but also on the lending of foreign banks from non-BIS reporting countries. Finally, from our constructed panel data of foreign banks and the organizational form of these individual banks for the six Asian host economies from Bankscope[17], the earlier mentioned organizational form dummy variable in equation (2b) for each bank in each year can then be constructed. As mentioned, the organizational form dummy (subsidiary) is 1 for foreign banks that operate as a subsidiary and zero for all other foreign banks that operate as branches.

[14] It should then be noted this caveat upon our presentation of the empirical results in the subsequent section of the paper. One should also be made aware of the distinction between the BIS Consolidated Banking Statistics and Locational Banking Statistics. In the former, creditor data is reported according to the nationality principle while the latter is based on the residency principle. An illustrative example will be helpful here. Take for instance US bank loans which are consolidated on a worldwide basis regardless of their location (including for example US bank branches in Paris). In the locational statistics, all cross-border loans made by international banks in the US (including for instance Japanese banks) are reported as 'US', while the loans from US bank branches in Paris are reported as French loans. For further discussion on the limitation of BIS data, please refer to Box 1 of Hoggarth, Mahadeva, and Martin (2010).

[15] In view of the limitation we face in terms of available data on cross-border lending as highlighted above, one should note that in the latter construction of these two variables, the aggregate cross-border lending of all the BIS-reporting home country banks were used.

[16] In this study, we use a standard definition of a foreign bank, that is, if foreign shareholders own a majority of outstanding shares that exceeds 50% of the subscribed capital of a bank.

[17] This is denoted in Bankscope as entity type.

4. EMPIRICAL RESULTS

4.1 Macro-panel Results on International Bank Lending Stability

4.1.1 Evidence from country-level data on total lending by international banks

The results of our estimation of equation (1) in two separate stages are reproduced in Tables 2 and 3. In both tables, we first report pooled ordinary least squares (OLS) in column (1) and simple fixed-effects panel estimates in column (2). The last two columns of Tables 2 and 3 report the results from the two dynamic generalized-method-of-moments (GMM) panel estimators, that is, the results from the GMM difference estimator (column 3) and the GMM system estimator (column 4). It is well known that both pooled OLS and fixed-effects estimation of a dynamic panel model will be subject to serious biases in the estimation of all model parameters. Specifically, the OLS estimate of the autoregressive coefficient will be biased upwards, while the corresponding fixed-effects estimate will be biased downwards. On the other hand, GMM estimates are supposedly free of such bias in large samples and given some weak assumptions, the estimate of the autoregressive coefficient should lie between the OLS and fixed-effects estimates. This is known as the "bounds-test" of small sample bias. For instance, the estimate of the autoregressive coefficient, $\Delta \log Claims_{ij,t-1}$ coming from the two GMM estimators reported in columns (3) and (4) of Table 2 lie between –0.11 (fixed effects) and –0.08 (OLS), and thus passes the small sample bias test referred to above.

Moreover, the absence and the lack of significance in the OLS and fixed-effects point estimates are largely due to endogeneity problems in these estimates, and, suitably for this purpose, for which the GMM point estimates are intended to control. When this problem is managed using the GMM, most of the point estimates improved markedly in significance. The system GMM results in column (4) is considered superior, *a priori*, to the differenced GMM results in column (3). The results from using both the differenced and the system GMM estimators show almost similar results, with the lone exception of the statistical significance of the host country growth rate variable. Finally, the standard diagnostic tests suggest no misspecification problems.[18]

We also highlight the effect of home and host country conditions. First, we do not find evidence for a relationship between the nominal interest rate differentials between the host and home economies and the changes in lending by international banks. This is the result even after we control for the possible presence of nonlinearities in the rates with the inclusion in the regression of a quadratic term of the nominal interest rate differential as nonlinearities can arise due to the distinct divergence in interest rates during periods of financial turmoil such as during the 2008–2009 global financial crisis where developed economy interest rates fell to almost zero when compared to normal or tranquil times.[19] A plausible explanation for this result is that international banks when deciding to lend to host economies do not only take into account relative prices but also the relative risk levels (de Haas and Lelyveld 2006). Furthermore, the insignificant role of the interest rate differential on changes to total lending of international banks also suggests that changes in the monetary policy stances in the home and host countries do not affect international lending by these banks. This result is in line with evidence obtained by

[18] The Hansen test for identifying restrictions and the differenced Hansen test for the validity of the instruments used in system GMM estimator in addition to those used in the differenced GMM estimator, fails to reject the null hypothesis that the instruments are valid. The AR2 test fails to reject the null hypothesis of no second-order residual autocorrelation.

[19] We also ran the dynamic panel GMM regressions without this quadratic term and the insignificant effect of the nominal interest rate differential remained.

Cetorelli and Goldberg (2012) where international lending in the case of large and global US banks are insulated from changes in monetary policy in the US.[20]

Table 2: Dynamic Panel Estimation Results of Determinants of Changes in International Total Bank Claims, 2000Q1–2010Q3

	(1) OLS	(2) FE	(3) First-diff. GMM	(4) System GMM
Log difference international total bank claims (lagged)	-0.08 [0.34]	-0.11 [0.21]	-0.10 [0.18]	-0.09 [0.24]
Interest differential	0.02 [0.95]	0.42 [0.30]	0.53 [0.56]	0.06 [0.82]
Square of interest differential	-0.03 [0.17]	-0.06 [0.07]*	-0.06 [0.31]	-0.03 [0.14]
Growth rate (host)	0.05 [0.63]	0.19 [0.04]**	0.51 [0.20]	0.51 [0.01]***
Growth rate (home)	0.45 [0.26]	0.50 [0.16]	1.80 [0.00]***	0.72 [0.04]**
Growth rate (home) × Exposure	0.01 [0.97]	-0.11 [0.55]	-1.41 [0.00]***	-0.39 [0.00]***
VIX	0.01 [0.93]	-0.05 [0.65]	-3.86 [0.00]***	-3.79 [0.00]***
Common lender	0.05 [0.44]	0.05 [0.46]	0.29 [0.00]***	0.32 [0.00]***
R-squared	0.16	0.16		
AB test AR1			0.01	0.01
AB test AR2			0.69	0.65
Hansen *J* test			0.99	0.99
Difference Hansen *J* test				0.99

Notes: *p*-values in brackets. 'AB test AR1(2)': *p*-value of the Arellano-Bond test that average auto covariance in residuals of order 1 (order 2) is 0. 'Hansen *J*' and 'difference Hansen *J*': *p*-value of the Hansen *J* test for over identifying restrictions and for the validity of the instruments used in SYS-GMM in addition to those used for first-diff. GMM, respectively, which are both asymptotically distributed as χ^2 under the null of instrument validity.

[20] Buch, Carstensen, and Schertler (2010) found a contrasting result in the case of international lending by banks headquartered in 17 OECD countries.

* Significance at 10%; ** Significance at 5%; *** Significance at 1%.

Source: Authors' calculations.

Table 3: Dynamic Panel Estimation Results of Determinants of Changes in International Cross-border Bank Claims, 2000Q1–2010Q3

	(1) OLS	(2) FE	(3) First-diff. GMM	(4) System GMM
Log difference international total bank claims (lagged)	-0.08 [0.51]	-0.14 [0.26]	-0.12 [0.15]	-0.10 [0.37]
Interest differential	0.31 [0.27]	0.89 [0.09]*	1.29 [0.34]	0.36 [0.11]
Square of interest differential	-0.05 [0.05]**	-0.07 [0.03]**	-0.09 [0.14]	-0.05 [0.06]*
Growth rate (host)	-0.09 [0.48]	0.02 [0.93]	-0.28 [0.31]	-0.15 [0.19]
Growth rate (home)	-1.33 [0.09]*	-0.61 [0.29]	1.57 [0.06]*	1.85 [0.06]*
Growth rate (home) × Exposure	0.64 [0.02]**	0.11 [0.84]	0.49 [0.48]	0.52 [0.05]**
VIX	-0.33 [0.25]	-0.32 [0.28]	-0.97 [0.10]	-1.43 [0.03]**
Common lender	0.01 [0.98]	-0.19 [0.67]	-0.13 [0.72]	0.10 [0.81]
R-squared	0.43	0.44		
AB test AR1			0.02	0.02
AB test AR2			0.17	0.21
Hansen *J* test			0.99	0.99
Difference Hansen *J* test				0.99

Notes: p-values in brackets. 'AB test AR1(2)': p-value of the Arellano-Bond test that average auto covariance in residuals of order 1 (order 2) is 0. 'Hansen J' and 'difference Hansen J': p-value of the Hansen J test for over identifying restrictions and for the validity of the instruments used in SYS-GMM in addition to those used for first-diff. GMM, respectively, which are both asymptotically distributed as $\chi 2$ under the null of instrument validity.

Significance at 10%; ** Significance at 5%; *** Significance at 1%.

Source: Authors' calculations.

A second result is that changes in lending by international banks are positively affected to some extent by host country GDP growth (this result is found not to be significant, however, in the differenced GMM estimator). That is, the presence of a "pull factor" in lending by international banks suggests that these banks increase (decrease) their lending in host markets once these same economies experience stronger (adverse) macroeconomic conditions. Meanwhile, we also find that changes in lending by international banks are significantly positively influenced by the international banks' home country GDP growth as well. This implies that international banks' behavior is veered toward focusing their activities at home when domestic economic conditions are low and weak, that is, international banks increase and decrease their international lending to the six Asian economies in the course of cyclical conditions in their own home economies.

Next, we find evidence in support of the common lender effect in view of the positive and significant coefficient on the $Clender_{ij,t}$ variable, that is, changes in lending by international banks in one country tend to spillover to other countries that owe from the same international banks. Furthermore, in conformity with the theoretical expectation, a rise in the expected short-term volatility of the global financial market, which is proxied in this study by the widely used S&P 100 Volatility Index (VIX_t), is found to significantly contribute to a decline in the changes in lending by international banks.

Finally, with regards to our ultimate variable of interest which is the interaction term between the home country international banks' real GDP growth rate and a measure of its exposure to the six Asian host economies, we obtain a negative and significant coefficient for this interaction variable as compared to the separate positive and significant coefficient of the international banks' home country real GDP growth rate. This suggests that the reaction or sensitivity of lending by international banks to shocks coming from their own economies tend to decrease as international bank exposure in the six Asian host economies increases. In short, a rise in international bank exposure translates into steady financing on the part of the international banks in response to shocks in their own economies.[22] Peria, Powel, and Vladkova-Hollar (2005), using similar data on foreign financial claims of international banks, found that the lending of international banks also become less responsive to shocks in host economies as exposure increases.

4.1.2 Evidence from cross-border lending

In certain respects, the above main result suggesting that even in the face of economic downturn in source economies, lending by international banks in host economies tend to remain stable as their exposure rises, appears not to be in sync with our earlier depicted stylized trend on the behavior of these aggregated international bank lending flows. However, it should be recalled that the results presented in this part of the study use total international bank lending (what is known as the total foreign bank claims in BIS), based on BIS's definition that combines data on cross-border lending and total credit extended by affiliates of these international banks. On this basis, it is logical that we formally examine the hypothesis that cross-border operations of these international banks are more prone to "a sudden-stop" and sharp reversal during periods of economic downturn in source economies.

The dynamic-panel estimation results of directly testing this hypothesis and as such exclusively concentrating only on publicly available data on cross-border lending by international banks, are presented in Table 3. The standard diagnostic tests suggest no misspecification problems and we see that the two GMM estimates of the autoregressive coefficient reported in columns (3) and (4) lie between the OLS and simple fixed-effects estimates in columns (1) and (2),

[22] De Haas and Van Horen (2011) find that in the wake of the Lehman Brothers collapse, agency problems increased less for bank lending to countries that they had been lending to before.

respectively, and thus pass the small sample bias test referred to above. However, the differenced GMM estimates in column (3) indicate marginal improvement in significance compared to the simple fixed effects results in column (2). On this basis, the results are slightly weaker compared to the previous GMM results presented in Table 2—the host country's real GDP growth rate is completely insignificant while there is no evidence of the common lender effect.

However, unlike the case of total lending by international banks, the test result for the quadratic term of the interest rate differential variable in the case of cross-border lending is found to be significant at the 10% level. This suggests that the transmission of monetary policy changes via bank lending is non-linear in both home and host economies and this non-linearity is revealed in the case of cross-border lending by international banks (Table 3) as opposed to total lending by international banks (Table 2). In addition, the VIX variable retains its strong negative significance in column (4), reconfirming the role of global market uncertainty in explaining the fluctuations of cross-border lending.

Furthermore, we still obtain a positive and significant coefficient on the international banks' home country real GDP growth rate as well as a significantly positive coefficient for the interaction variable between the international banks' home country real GDP growth rate and the measure of international bank exposure (Table 3). It is crucial to note that this positive sign of the interaction term in Table 3 is in contrast to the negative coefficient earlier obtained for this same variable in Table 2 for the case of total international bank lending. This result suggests that the response or sensitivity of international banks to shocks coming from their own economies would be to cut back on their international cross-border lending to the six Asian host economies even when international bank exposure to these economies increases.

The story implied by these results is that cross-border lending by international banks is to pull out from host or recipient economies during difficult and tough economic times in home economies, whereas, under similar circumstances such curtailment in lending is not evident on an aggregate or collective basis. These findings reinforce the stylized evidence of the important role played by the lending of the brick-and-mortar affiliates of these international banks in mitigating or resisting the vulnerability of the six Asian economies from shocks originating in home countries. This analysis carries with it an important implication that when a country has concerns for foreign bank financing stability and is confronted with the need to make tough choices on whether to further open their domestic banking systems, it appears that encouraging internationally active banks to lend by establishing brick-and-mortar presence in recipient economies is the prudent and sensible policy. Recent studies that arrive at similar conclusions are Peria, Powel, and Vladkova-Hollar (2005), Kamil and Rai (2010), and de Haas and Lelyveld (2010).

That said, more recently Takats (2010) and the IMF (2011) have further added to the argument that not only the brick-and-mortar presence of international banks matters in terms of the financial stability concerns of emerging markets but also the organizational form of the entry of international banks. Specifically, encouraging the entry of subsidiaries and less so on branches can shield the said banks from the financial difficulties of their parent banks (Fiechter et al. 2011; IMF 2011). This is a very interesting and noteworthy objective at this juncture of the paper, to which we turn to in the next subsection.

4.2 Micro-panel Test Results on Local Lending: Effects of Balance Sheets and Subsidiary Modes of Entry

We now analyze the results of the estimation of our two equations 2a and 2b using the pooled OLS, simple fixed-effects, and the two GMM estimators of differenced and system GMM estimators. In all, there are eight columns of results as shown in Table 4. The results based on these estimators will each have two respective columns, one containing the estimation results for equation (2a) and the other for equation (2b). Between the two GMM estimators, only the system GMM estimates in columns (7) and (8) pass the small sample bias test referred to above that also show no misspecification problems.[23] Accordingly, we concentrate and emphasize the results coming from our system GMM estimates reported in Table 4.

Table 4: Dynamic Panel Estimation Results of Determinants of Loan Growth, 2000–2010

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) First-diff. GMM	(6) First-diff. GMM	(7) System GMM	(8) System GMM
Loan growth (lagged)	0.20 [0.00]***	0.21 [0.00]***	0.10 [0.16]	0.10 [0.16]	0.05 [0.00]***	0.02 [0.28]	0.15 [0.00]***	0.12 [0.00]***
Interest rate (home)	0.29 [0.89]	0.29 [0.89]	-10.55 [0.00]***	-10.54 [0.00]***	-24.45 [0.00]***	-27.08 [0.00]***	-8.70 [0.01]***	-5.54 [0.03]**
Square of interest rate (home)	-0.06 [0.72]	-0.06 [0.72]	1.00 [0.00]***	1.00 [0.00]***	2.44 [0.00]***	2.67 [0.00]***	0.51 [0.11]	0.34 [0.30]
Growth rate (home)	1.04 [0.02]**	1.04 [0.02]**	0.91 [0.12]	0.91 [0.12]	0.90 [0.00]***	1.10 [0.00]***	0.67 [0.02]**	1.27 [0.00]***
Interest rate (host)	1.71 [0.00]***	1.71 [0.00]***	2.94 [0.09]*	2.95 [0.09]*	3.41 [0.00]***	3.04 [0.00]***	1.16 [0.00]***	1.75 [0.00]***
Growth rate (host)	0.17 [0.73]	0.16 [0.75]	0.21 [0.68]	0.21 [0.67]	1.10 [0.00]***	1.23 [0.00]***	1.50 [0.00]***	1.31 [0.00]***
Crisis dummy	-0.70 [0.80]	4.25 [0.17]	0.59 [0.88]	3.24 [0.31]	-3.05 [0.09]*	-89.66 [0.02]**	-3.12 [0.03]**	-57.91 [0.07]*

[23] That is, the differenced-GMM estimates of the autoregressive coefficient of equations (2a) and (2b) in columns (5) and (6) are smaller compared to the fixed-effects estimates (columns (4) and (5)). In addition, the result of the AR2 test shown in column (6) weakly rejects at the 10% level the null hypothesis of no second-order residual autocorrelation.

Crisis dummy × subsidiary dummy		-5.02 [0.18]		-2.71 [0.56]		89.71 [0.02]**		56.71 [0.08]*
Solvency	-0.10 [0.58]	-0.10 [0.62]	1.53 [0.02]	1.53 [0.02]	1.56 [0.00]***	1.13 [0.01]**	-0.94 [0.00]***	-0.89 [0.00]***
Profitability	0.09 [0.96]	0.08 [0.96]	-1.18 [0.55]	-1.17 [0.55]	0.26 [0.89]	0.45 [0.86]	3.20 [0.02]**	2.44 [0.09]*
Size	0.00 [0.67]	0.00 [0.66]	-0.00 [0.00]***	-0.00 [0.00]***	-0.00 [0.00]***	-0.00 [0.00]***	-0.00 [0.33]	-0.00 [0.96]
Weakness	-0.01 [0.42]	-0.01 [0.42]	-0.02 [0.02]**	-0.02 [0.02]**	-0.00 [0.88]	-0.01 [0.75]	-0.05 [0.09]*	-0.02 [0.51]
Interest rate margin	-0.67 [0.29]	-0.68 [0.28]	0.35 [0.70]	0.35 [0.70]	4.62 [0.03]**	5.14 [0.00]***	2.01 [0.00]***	2.08 [0.01]***
Liquidity	0.02 [0.83]	0.02 [0.83]	0.58 [0.00]***	0.58 [0.00]***	1.12 [0.00]***	1.28 [0.00]***	-0.25 [0.00]***	-0.27 [0.00]***
R-squared	0.24	0.24	0.20	0.20				
AB test AR1					0.00	0.00	0.00	0.00
AB test AR2					0.20	0.09	0.86	0.78
Hansen *J* test					0.89	0.93	0.89	0.99
Difference Hansen *J* test							0.99	0.99

Notes: p-values in brackets. 'AB test AR1(2)': p-value of the Arellano-Bond test that average auto covariance in residuals of order 1 (order 2) is 0. 'Hansen J' and 'difference Hansen J': p-value of the Hansen J test for over identifying restrictions and for the validity of the instruments used in SYS-GMM in addition to those used for first-diff. GMM, respectively, which are both asymptotically distributed as $\chi 2$ under the null of instrument validity.

* Significance at 10%, ** Significance at 5%, *** Significance at 1%.

Source: Authors' calculations.

We first highlight the results emanating from the effect of home and host country conditions on local lending by international banks. First, we find that the pull factors in terms of the host country GDP growth rate and the host country interest rate both exert a strongly positive and significant effect on host credit growth by international banks. Likewise, the home country GDP growth rate push factor is significant and positively related to host country credit growth by international banks, which is in line with what we found in the previous section when using country-level data on international lending by international banks and again indicates that international banks tend to refocus their lending activities at home when economic conditions weaken. Furthermore, we now find evidence of a significant and negative relation between

home country interest rate and host country credit growth by international banks after controlling for the possible presence of a nonlinear relationship between these two variables by the inclusion of a quadratic term of the home country interest rate in the system GMM estimations.[24] These results suggest that the changes in the transmission of monetary policy in home and host economies have an impact on local lending by international banks.

Other results are worth highlighting from the inclusion of balance sheet variables. To start with, we find that profitable foreign banks expand their credit faster while relatively solvent and liquid foreign banks tend to significantly decrease their host country credit growth. The latter results are contrary to our earlier expectations although a plausible explanation for this puzzling result is that relatively solvent and liquid foreign banks are typically more risk-averse and expand credit only moderately (De Haas and Van Lelyveld 2010). Our test results also demonstrate that foreign banks that enjoy relatively higher interest rate margins tend to expand their host country lending.

Finally, we move to our main variables of interest beginning with the crisis dummy. This dummy variable registers significantly negative in both columns (7) and (8), which indicate that during the 2008–2009 global financial crisis, foreign banks contracted their local lending in the six Asian host economies. However, when testing for the differential in credit stability of foreign bank branches as opposed to foreign bank subsidiaries via the interaction term of the same crisis dummy variable with the organizational form dummy variable, the coefficient estimates are found to be significantly positive, as reported in column (6) as well as in column (8) (although it is only significant at the 10% level in this case). This suggests that subsidiaries have a crisis-mitigating impact on host economies, especially when the source of the shock emanates from strains in the financial conditions of global parent banks. What is a plausible explanation for the notable difference between foreign bank subsidiaries and foreign bank branches in their ability to shield themselves from the financial difficulties of their parent banks? A reasonable explanation is that the payment of higher and irreversible fixed costs that comes with the direct investment decision of a foreign bank to establish an operational presence in a host economy is no more evident than that of a foreign subsidiary, which makes it harder for international banks to "cut" and "run" during times of financial troubles either in host or home economies.[25]

The message that comes from this part of our study is that not only are home macroeconomic conditions relevant to local lending by international banks, but also that local lending by international banks reacts procyclically to changing local economic conditions. The financial characteristics of an individual foreign bank also matter. More importantly, encouraging foreign banks to operate as subsidiaries to maintain "arm's length" relations with their global parent banks may be the most compelling and viable solution to limiting the susceptibility of these flows to changing international economic conditions as well as a device to commit these banks to the host economies. That said, it is important to note, that from our system GMM estimated results, the coefficient estimate for the interaction term that captures the differential in credit stability of foreign bank branches as opposed to foreign bank subsidiaries, is not the most significant variable.[26] This result should be viewed in the perspective that pursuing a favored subsidiary

[24] Though the quadratic term is found to be insignificant in columns (7) and (8), without the inclusion of this quadratic term in the system-GMM regressions, the linear home country interest rate variables also becomes insignificant.

[25] See also, for instance, Peria, Powel, and Vladkova-Hollar (2005) and Kamil and Rai (2010).

[26] Refer to the last column of Table 4.

policy is not a guarantee that such a policy will provide the fullproof insulation, for example, ring-fencing policy, from problems coming from the global parent banks.[27]

5. CONCLUSION

Just as any other type of short-term capital flows, international bank lending is subject to episodes of ebbs and flows. In the case of financially integrated economies of East Asia, for instance, international bank lending provided the much needed financial capital to sustain the aspirations of economic expansion at various times in the region's recent economic history, that is, the years prior to the 1997–1998 Asian financial crisis and the period preceding the 2008–2009 global financial crisis. On the other hand, the Asian financial crisis provided a valuable lesson that flows of international bank lending could easily and rapidly exit in sizeable amounts in economies that play host to these types of flows. Not only that, some recent studies have demonstrated that international bank lending plays a vital role in the transmission of economic shocks from one economy or region to another. It is a widely held observation that such a mechanism was at work in the global financial crisis and that such financial links made the situation worse. In this study we find in the affirmative the existence of the so-called common-lender or spillover effect, that is, movements in international banks' lending in one country in the region has the potential to be transmitted to neighboring countries that borrow from the same international banks.

In order to be able to devise effective measures that can assist policymakers in East Asia in addressing the vices of international banking flows, while at the same time, reap the virtues that emanate from such flows, it is important to understand the lending behavior of international banks. "Rounding up the possible suspects" or unearthing the likely determinants of these international banking flows is the logical way to proceed. This is the first main objective of our paper.

We find some indications of procyclicality in international bank flows, that is, internationally active banks increase (decrease) their lending on host or recipient markets once these same economies experience stronger (adverse) macroeconomic growth performance. Robust evidence suggests that weak (strong) economic conditions in the home or source countries leads internationally active banks to decrease (increase) their lending to host or recipient economies. We also find strong evidence that a "global supply factor" is at work with international bank flows, that is, higher volatility in international financial markets leads to a reduction in international bank flows to host markets.

In addition to domestic and global macroeconomic factors, we also find supporting evidence to the significant role of balance sheet factors in explaining the movements of bank lending. The size and quality of assets, profitability, and cost factors have influenced the lending of the banks of developed economies to ASEAN-5 and the Republic of Korea. More importantly, our empirical assessment also confirms that cross-border lending by internationally active banks tend to pull out from host or recipient economies during difficult and tough economic times in home economies. However, under similar circumstances such curtailment in lending is not evident on an aggregate or collective basis, thus reinforcing the critical role played by the brick-and-mortar affiliates of these internationally active banks in mitigating the vulnerability of the six East Asian economies from shocks originating in home countries. This leads us to the other major aim of this paper. We tested whether there is a significant difference between foreign

[27] One can point to the earlier presented stylized facts in which Malaysia experienced one of the most severe sudden stops in cross-border bank lending that it received in spite of pursuing a policy of local incorporation of foreign banks.

bank subsidiaries and branches as far as their ability to withstand financial difficulties in their global parent banks and thereby continue their ability to lend in the six Asian economies. Our results suggest that from 2000 to 2010 foreign bank subsidiaries rather than foreign bank branches provided the credit stability to the six major East Asian economies, especially amidst the turbulent economic environment in the developed economies.

Nonetheless, encouraging the entry of brick-and mortar subsidiaries of internationally active banks in the domestic banking systems of emerging market economies should not be viewed as the solution to the financial stability concerns of these countries. As our stylized facts clearly indicate, pursuing a local incorporation policy does not necessarily insulate the local banking sector from the sudden pull out of lending by these international banks. It is important that national banking regulators and supervisors should focus on first-best initiatives and efforts. Besides superior risk management techniques and stronger capital-related prudential requirements for systemically important and interconnected banks that often have large cross-border banking presence they should strengthen supervisory capacity, including through active participation in cross-border banking supervision cooperation.

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