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The determinants of cross-border consolidation in eight Asian countries: Before and after the Asian financial crisis

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ABSTRACT

This paper studies the motivation that drives financial institutions to engage in cross-border M&A activity in eight Asian countries before and after the 1997 financial crisis. Five hypotheses are examined, namely, the *gravity hypothesis*, the *following the client hypothesis*, the *market opportunity hypothesis*, the *information cost hypothesis* and the *regulatory restriction hypothesis*.

The first conclusion concerns those proxies which are effective in both periods. DISTANCE has a negative impact in both periods, thus supporting the *gravity hypothesis*. The *following the client hypothesis* is supported in both periods, too, but only when TRADE is employed as the proxy. The gap in terms of regulatory barriers between two countries, when proxied by the differences in the regulatory quality, has a positive impact in both periods, also supporting the *gravity hypothesis*.

Next, some determinants are found to be only effective before the Asian crisis. For example, the stock return has a negative impact before the Asian crisis but no effect after it. Thus, the *market opportunity hypothesis* was at play before the crisis but was not important after it.

Third, some determinants are only effective after the Asian crisis. For instance, the same religious faith has a positive impact on the cross-border M&A activity only after the crisis.

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Fourth, the three concepts are found to have more influence on the determinants after the Asian crisis. They are trade between the home country and host country, GDP growth in the host country and the same religion between the two countries.

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1. Introduction

Since the occurrence of the Asian financial crisis in 1997, the financial sectors of Asian countries have been experiencing a period of consolidation. However, at the time of the crisis, local currencies and equity prices plummeted, and real estate bubbles burst. Meanwhile, reduced collateral values placed banking institutions under severe stress, and what was even worse was that the amounts of non-performing loans soared, seriously undermining the respective financial sectors. Because one of the factors suspected to lie at the root of the banking crisis was over-competition, i.e., there were too many banks in the market, policy-makers became committed to reducing their numbers in an attempt to resolve the crisis. Of the methods adopted to accomplish this, policy-makers seemed to particularly favor bank mergers (Shih, 2003). To cite a few examples, in 1998, the governor of the central bank of the Philippines stated, "The central bank favors mergers as a way to keep the number of bank failures to a minimum. . .". In the meantime, the Malaysian government urged banks to merge into a total of only six (which later became 10), and soon thereafter Taiwan's president announced the so-called "Second Phase of Financial Reform" in an attempt to encourage banks to consolidate or form strategic alliances with foreign financial institutions. Thus began the welcoming of mergers and acquisitions (M&As) that were about to start their new journey across the wide financial landscape of Asia.

Before the crisis, foreign banks were, for the most part, restricted from entering Asian financial markets, but the markets clearly became much more open and much more accessible after the crisis.² It is therefore interesting, if not also puzzling, to try to better understand whether the determinants of mergers and acquisitions of financial institutions were different before and after the Asian crisis.

The purpose of this paper is to empirically investigate whether the Asian crisis has changed the determinants of cross-border mergers and acquisitions among financial institutions in eight Asian countries. To the best of our knowledge, this is the first study to explore the impact of the Asian crisis on the determinants of cross-border M&A activity among financial institutions. In this line of research, most of the relevant literature has focused on OECD countries (Fecher and Pestieau, 1993; Focarelli and Pozzolo, 2000, 2001, 2005), European countries (Campa and Hermando, 2006; Altunbas and Marques, 2004), high-income countries (Portes and Rey, 2005) and on the U.S. and four European countries (Vasconcellos and Kish, 1998). Two exceptions are the studies of Buch and DeLong (2004) and Giovanni (2002) that use some 150 countries in their sample, but their studies neither cover the period of the Asian crisis, nor do they take similar crises, such as the European currency crisis or the Tequila crisis, into account. Because the Asian crisis significantly changed the attitude of governments towards M&As, it is expected that the present study which focuses on Asian countries and the Asian crisis should significantly complement existing studies.

To be more specific, some parallels can be drawn between our paper and others in the field of location choice, particularly in terms of how foreign banks choose a city to set up subsidiaries, branches, representative offices and agencies. Brealey and Kaplanis (1996), for example, used the locations of the overseas offices of 1000 of the world's largest banks to examine the determinants of foreign bank location. Shen and Chou (2007) recently studied the determinants of foreign banks' choices of Asian cities to establish new branch offices, and they pointed to a significant relationship between the choice of bank location, foreign trade and foreign direct investment. Our paper, however, differs from those studies in that it focuses on cross-border consolidation rather than on the establishment of foreign offices.³ Our paper differs from the past studies in three respects. First, because we compare the

² See the Appendix A in regard to the openness of each country.

³ In broad terms, our paper is also related to FDI. Most studies on FDI are related to economic growth. For example, De Mello (1999) reported that the first international capital flows in the form of FDI inflows appear to enhance economic growth in both

determinants before and after the Asian crisis, our sample periods cover a long span from 1990 to 2006. Past studies that focus on the determinants that may affect M&As do not consider the related important events that may change the impact of the determinants. In addition, the studies are commonly limited to one particular year.

Next, our study belongs to the “from-many-to-many” category in the field of multinational enterprises, which means that the acquirers are from many countries and their targets are also in many countries. In this regard, Clarke et al. (2001) have explained that the “from-many-to-many” studies are probably fewer in number because of difficulties associated with data collection. Because our sample includes “all” the M&As of financial institutions in eight Asia countries are involved as the acquirers, our paper could be the most comprehensive study on M&As on financial institutions in the Asian area.⁴

Third, our financial institutions included all targeted and acquiring firms in the financial sectors of eight Asian countries. The financial institutions include investment banks, mutual funds, insurance and securities companies, credit unions, credit cooperatives and so on. Therefore, the use of firm-level data is not possible since, except for banks, other firm-level data are not available. Even the bank-level data are not available before 1995, making the use of firm-level data impossible.⁵

In addition, we assume the acquirers are parents because the acquirer’s decision as to whether to buy the target will be made by the parent based on the gains to the consolidated financial group. The parent may, however, find it convenient for legal or operational reasons to structure the deal as a takeover by one of its subsidiaries located outside the parent’s home country.⁶

There are very few theories regarding cross-border M&As among financial institutions, which explains the rationale behind the fact that most current empirical studies borrow their theories from international trade. Furthermore, this paper is no exception. We explore whether or not the following five existing hypotheses are related to cross-border M&A activity in Asian countries. These hypotheses are the *gravity hypothesis*, the *following the client hypothesis*, the *market opportunity hypothesis*, the *information cost hypothesis* and the *regulatory restrictions hypothesis*. These five hypotheses are explained in detail in the following section. The remainder of this paper proceeds as follows. Section 2, which follows, provides a survey of the literature. Section 3 presents the empirical model, and Section 4 gives the source of the data and the basic statistics. Section 5 summarizes the estimated results of our model, and Section 6 presents the estimated reports of the robustness testing. Section 7 reviews the conclusions.

2. Literature review on cross-border consolidation

There is a paucity of studies in the literature related to the determinants of the M&A activities involving financial institutions, largely stemming from the fact that some researchers may have been impeded by problems with data collection and by the fact that cross-border M&As in the financial sector have been relatively rare. This section introduces the five hypotheses we examine.

developing and OECD countries. However, Borestein et al. (1998) found that the positive effects of FDI can only be detected when a recipient country has a sufficiently high level of human capital. Carkovic and Levine (2000), however, concluded that FDI does not have an unconditionally robust, positive effect on economic growth but that the effect is instead dependent on national income, educational attainment, and so on. For a survey, see Prasad et al. (2003). In studying the effect of taxation and corruption on international direct investment from fourteen source countries to 45 host countries, Wei (2001) found that an increase in either the tax rate on multinational firms or the corruption level in the host governments will reduce inward foreign direct investment. Wei (2000) pointed out that the corruption can be interpreted more broadly as “poor public governance” rather than as bureaucratic corruption narrowly defined, and that the corruption in a developing country may increase that country’s chances of suffering a crisis.

⁴ Some Asian countries are excluded from our sample if the government policies dominate the market forces in deciding the cross border consolidation. Thus, we exclude both China and Vietnam from our sample. In addition, we drop the M&A transactions for Singapore and Hong Kong because they are financial centers. Consolidations occurring in financial centers are probably due to their unique financial status in the region and not the five hypotheses proposed in this study.

⁵ Therefore, those using cross-border firm-level data in location choice studies tend to focus only on banks. In addition, because researchers’ bank-level data are obtained from BankScope, a data bank launched in the market in 1995, coverage of the earlier years is limited, especially before 1996.

⁶ We thank the referee gives us this guidance.

2.1. Gravity hypothesis

The *gravity hypothesis*, first adopted by Tinbergen (1962), explains trade flows between two countries, say i and j , using two masses, usually GDP and distance, where the former and the latter are suggested to have positive and negative effects, respectively. Most commonly, distance has been reported to have a very significantly negative impact on M&As among financial institutions. This is slightly mystifying given that most assets in financial institutions are “weightless”, and distance is not a good proxy for transportation cost in transacting financial assets (Portes and Rey, 2005).

As regards this conundrum, Portes and Rey (2005) suggest that distance might also be a proxy for information asymmetry. To explain this, countries which are geographically near each other tend to know more about each other, either because of direct interaction between their citizens for business or tourism or because of more extensive media coverage. Thus, the significance of distance may reflect the validity of the *gravity hypothesis* or the *asymmetric information hypothesis*.

Our model considers distance (DISTANCE) as the measure of the *gravity hypothesis*.

2.2. Following the client hypothesis

Following the customer is a defensive expansionary strategy that argues that international financial institutions follow their customers when they go abroad in order to protect their existing relationship with them (see Williams (2002) for a detailed survey). The typical proxy for this hypothesis is the trade between two countries that is measured by the sum of exports and imports. However, Focarelli and Pozzolo (2005) propose a similar but broad term which they refer to as “economic integration”.

This paper follows the convention by using the degree of openness of the country, i.e., the sum of exports and imports from the home country to the host country divided by the GDP of the home country (TRADE) as a proxy for this concept. The *following the client hypothesis* suggests that TRADE should be positively related to M&As.

2.3. Market opportunity

The decision to expand abroad is likely spurred by the banks' search for profit opportunities beyond those offered by traditional banking activity at home. Banks in a more profitable, better developed banking sector in their home country most probably have a competitive advantage over their competitors in the destination market. Focarelli and Pozzolo (2001) use the total credit of the banking sector (measured as the ratio of total credit to GDP) and the average ROA of banks in home countries as proxies for *market opportunity*. They find that the two variables are positively related to international expansion. In addition, economic growth in the host market is important. Focarelli and Pozzolo (2001) also point out that the individual bank's size is another critical factor.

Focarelli and Pozzolo (2000) define *market opportunity* in such a way that it includes the expected rate of economic growth and bank efficiency in the destination country. The use of the former is the same as that in their 1991 paper, but the use of the latter is probably dependent upon the individual banks they analyze, which allows them to estimate the banks' efficiency. They then investigate those factors that affect foreign shareholdings. Vasconcellos and Kish (1998) study the M&A activity between the U.S. and four European countries (France, Germany, Italy and the UK) and find that an increase in stock returns in the U.S. discourages the foreign acquisition activity by American firms. Conversely, an increase in European country stock returns results in an escalation in acquisition activity by American firms. Thus, increases in the stock returns of acquirers appear to augment acquisitions, but an increase in the stock returns of target companies has the opposite effect.

In this study, our *market opportunity hypothesis* comprises the expected rate of the economic growth effect on M&As. Following this concept, and given the currently rapid economic growth, we surmise that acquiring firms may continuously feel optimistic regarding the future economic growth of the target market. This optimistic view of economic growth suggests that the impact of the economic growth is positive. Focarelli and Pozzolo's (2000) findings, for example, support the optimistic economic growth view since they indicate that banks prefer to invest in countries with high expected rates of economic growth.

The proxy for *market opportunity* in our paper is the expected GDP growth rate at time $t + 1$ (GDP-GROW).

2.4. Information cost hypothesis

Berger et al. (2000) contended that such efficiency barriers as distance as well as differences in language, culture, currency and regulatory/supervisory structures inhibit cross-border bank mergers within Europe. Buch and DeLong (2004) examined three different measures of *information cost*, i.e., distance, common language and common legal system. They found that partners in bank mergers tended to speak the same language and to be close in terms of geographical distance. The distance is also the proxy for the *information cost hypothesis* because, as mentioned earlier, countries which are in close geographical proximity tends to know more about each other.

Many studies have shown that foreign direct investment is negatively related to *information cost* (Sabi, 1988; Dunning, 1998; Kim and Wei, 1999). That is, large-scale FDI means that firms are familiar with the transaction behavior of the host countries, which in turn reduces *information cost*. Therefore, foreign direct investment could also include the cost of information.

In this paper, we only consider one proxy for each hypothesis. Thus, although Buch and DeLong (2004) suggest that distance, a common language and a common legal system can be used as the proxies for the *information cost hypothesis*, in our study, these variables have been used for other hypotheses. For example, distance is used as a proxy for the *gravity hypothesis* (see Tinbergen) and the legal system is suggested as a proxy for the *regulation hypothesis* (see Focarelli and Pozzolo). A common language is our proxy in the previous version, but after we exclude Singapore and Hong Kong, whose official language is English, we find that only the Philippines and India have the same language. Thus, we choose a common religion as the proxy for the *information cost*. We also use the common language as the proxy in the sensitivity test.

2.5. Regulatory restrictions

It is conceivable that the attitude towards M&As by the local authority of a particular country could be a critical factor in affecting a firm's decision as to whether or not to engage in a cross-border M&A. On the one hand, imposing explicit limits on cross-border M&As or blocking single takeovers would definitely reduce the number of cross-border M&As, and more than that, *regulatory restrictions* would, in all likelihood, reduce the international competitiveness of banks, thereby hindering their opportunities for international expansion. On the other hand, restrictions could reduce the degree of information asymmetry—for example, by making the relationship between banks and depositors more transparent. In an environment with such *regulatory restrictions*, those banks would be likely to have a greater incentive to expand their activities abroad in order to bypass their home country's restrictions.

Two categories of *regulatory restrictions* are often used. Of note, the *regulatory restrictions* here are considered in a broad sense, and as such, they include the rule of law as well as the institutional quality of those governing. Restrictions that comprise the first category of *regulatory restrictions* are related to the rule of law, institutional quality and government effectiveness. Thus the proxies include legal origin (La Porta et al., 1997, 1998, LLSV), the regulatory burden and corruption as well as rule of law (Kaufmann et al., KKZ, 2002). Focarelli and Pozzolo (2000) claim that, as a rule, countries with a relatively more efficient judicial system are preferred by foreign acquirers since their market transactions will tend to be better guaranteed. Note that Galindo et al. (2003) do not use these regulatory indices to measure cross-border activities, but argue that it is the differences between the home and host countries that have positive effects on bilateral cross-border banking activity.

The second category of *regulatory restrictions* are taken from Barth et al.'s (2000, 2006) survey and comprise restrictions on banking activities in securities, insurance and real estate, with higher values denoting more stringent restrictions. Shen and Chang (2006) hypothesize that although these restrictions may harm the performance of banks, sound government governance can reduce the adverse effects. Focarelli and Pozzolo (2000) argue that these restrictions may be a proxy for actual limitations on firms from entry into a country from abroad. Both their 2000 and 2001 results show that stricter

Table 1
Data specification and sources.

| Variables | Definitions | Sources |
|-------------|---|---------|
| DISTANCE | Compute as the shortest line between two countries' commercial centers according to the degrees of latitude and longitude. | CIA |
| TRADE | Bilateral trade volume (imports + exports) between the acquiring and target countries divided by GDP. | DOTSY |
| GDPGROW (%) | $GDPGROW = 100 \times (GDP_{t+1} - GDP_t) / GDP_t$ of the target's home country | WDI |
| LANGUAGE | Dummy variable set equal to 1 if the same legal system prevails in the target and the acquiring countries, and 0 otherwise. | CIA |
| RELIGIOUS | Dummy variable set equal to 1 if the same religion prevails in the target and the acquiring countries, and 0 otherwise. | CIA |
| KKZ.REGQUL | KKZ index, this variable measures the Regulatory Quality dimension. The KKZ index is measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance. | WB |

Notes: 1. CIA: Central Intelligence Agency web site, USA. 2. DOTSY: Direction of Trade Statistics Yearbook, published by the IMF. 3. DY: DataStream and Yahoo! 4. WB: World Bank website, www.worldbank.org. 5. WDI: World Development Indicators, 2006.

restrictions actually reduce the number of acquisitions. However, because this category is designed for the bank industry, we include all the financial institutions in our sample, and so we do not use this category as the proxy for the *regulatory restrictions*.

We adopt KKZ's indices of the quality of regulation (KKZ.REGQULA). The KKZ indices are renewed every two years and contain six governance clusters (see Table 1 for the definition of each proxy). Rossi and Volpin (2004) and Galindo et al. (2003) suggest using the difference forms of the indices as one of the determinants. Following their suggestion, we also use the difference form, which is denoted by ΔKKZ . Then we proceed to examine whether the regulatory difference index is related to those countries' firms' propensities to engage in cross-border M&A activity. Thus while the original KKZ indices range from -2.5 to 2.5, with a higher number denoting better governance, the transformed gap indices now range from -5 to 5.⁷

3. Econometric model

We use the number of M&As as our dependent variable for the following two reasons. First, we study whether or not the Asian crisis has changed the attitude towards the consolidation. For example, it is generally thought that the authority is more welcoming to the foreign buyers after the crisis. Thus, the number of transactions may appear to reflect this change in attitude. The value of the transactions, however, is often more related to performance and financial conditions.

Next, the data on the value of the transactions is often not available to the public because the actual amount of money involved in a transaction is sometimes a business secret. The data regarding the number of M&As is, however, complete and is thus a more accurate measure in this case.

We therefore employ the Poisson regression model given that our dependent variable is a countable number. That is,

$$N_{ij} = \exp(\alpha + \beta_1 XD + \beta_2 X(1 - D) + \varepsilon_{ij}) \quad (1)$$

where i and j denote the home country i and host country j , respectively, so that N_{ij} is the number of M&As between home country i and host country j , and D is the dummy variable for the Asian crisis, which is equal to unity before the crisis and zero after it. X contains five variables, representing the five aforementioned hypotheses. That is, we use distance for the *gravity model*, trade for the *following the client model*, the GDP growth rate for the *market opportunity model*, religion for the *information cost model*, and rule of law for the *regulation model*. β_1 and β_2 are the corresponding coefficient vectors of the explanatory variables before and after the crisis, respectively, and ε represents the errors.

⁷ Note that Galindo et al. (2003) also take the absolute values of the differences.

In addition, we test for parameter constancy or stability in two sub-sample periods. The null hypothesis is

$$H_0 : \beta_1 = \beta_2, \quad (2)$$

β_1 represents the estimation coefficient before the Asian crisis, and β_2 represents the estimation coefficient after the Asian crisis. If we reject the null hypothesis, it means the variable will affect the cross-border decision in different ways in the two subsample periods.

4. Data description and basic statistics

We calculate the number of takeovers from the SDC database. Our selection of M&A data is based on the following simple rules. First, the sample period extends from January 1, 1990 to December 31, 2006. Next, all targeted and acquiring firms in the financial industry from eight Asian countries are included. Third, the announcement day of the proposed M&A is used instead of the day on which the transaction was completed. Fourth, our financial institutions includes banks, securities houses, insurance companies, mutual funds and so on, which helps us to know the impact of the crisis on the financial industry.

We divide the whole sample into the pre- and post-Asian sub-sample using the year 1998 for the following reasons. Following the Thai Baht's devaluation in mid-1997, the region entered a severe economic crisis. Growth was negative in 1998 in most countries in the region. The economic indexes exhibited dramatic changes in 1998. Corsetti et al. (1998) and Berg (1999) each refer to the changes that took place in financial markets in Asia in 1998.

Table 2 reports the number of M&As before (1990–1997) and after (1999–2006) the crisis. Five particularly interesting results emerge. First, the number of M&As is much higher after the crisis than before it. For example, for Malaysia, the numbers before and after the crisis are 24 and 34, respectively, for Japan, 28 and 40, respectively, and for Taiwan, 3 and 8, respectively. Therefore, Malaysia, Japan and Taiwan are the three most active acquirers in the post crisis period. The higher number after the crisis is probably due to the policy of openness towards the financial consolidation following the crisis. It is, nevertheless, difficult for the present paper to examine the effect of policy on the consolidation. See the Appendix A for the policy of openness.

Secondly, since Indonesia has the highest numbers (7 and 20) of targeted firms before and after the crisis, financial institutions in that country appear to have been the most likely targets for consolidation. Thailand has the second largest number of targeted financial institutions.

Third, Japan exhibits the most asymmetric pattern in terms of targeted and acquiring firms. It acquired 68 foreign banks, but there were only 2 Japanese financial institutions that were acquired throughout the sample periods. This unbalanced pattern in consolidations could be owing to the sample restrictions because we exclude purchases by developed countries from Asian countries. In addition, it could be difficult for foreigners to buy Japanese banks, because Japan consolidation environment is relatively unfriendly to foreigners (Shioji and Nakano, 1999). Thus, even if banks in other Asian countries are interested in purchasing Japanese banks, they may not be able to make such an idea a reality. Future studies could investigate whether this unbalanced pattern is robust and what the underlying reasons are. An opposite asymmetric case can be found for Thailand. That is, 27 financial institutions in Thailand were targeted, but only 8 financial institutions in Thailand were acquiring firms.

Fourth, during both periods, in India, M&A activity was almost non-existent, while in Indonesia and Thailand, it was only negligible. Finally, and somewhat surprisingly, the number of M&As in Malaysia was relatively high.

Table 3 presents the mean of each of the explanatory variables before and after the crisis. Of particular interest here are three findings, which may be summarized as follows. First, the level of TRADE is obviously higher after the crisis, in large part because of the higher economic growth. Somewhat surprisingly, the value of GDPGROW does not always increase after the crisis.

Third, the Δ KKZ regulatory gap indices are overwhelmingly negative for India, Indonesia, the Philippines and Thailand. Because these gap indices are the indices of acquiring countries minus those

Table 2
Numbers of cross-border mergers in Asian countries.

| Target country | Acquiring country | | | | | | | | | | | | | | | | | |
|----------------|-------------------|-----|-----------|-----|-------|-----|-------|-----|----------|-----|-------------|-----|--------|-----|----------|-----|-----|-----|
| | India | | Indonesia | | Japan | | Korea | | Malaysia | | Philippines | | Taiwan | | Thailand | | Sum | |
| | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft |
| India | | | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 |
| Indonesia | 0 | 2 | | | 7 | 4 | 2 | 2 | 10 | 20 | 1 | 0 | 1 | 1 | 0 | 3 | 21 | 32 |
| Japan | 0 | 0 | 0 | 0 | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| Korea | 0 | 0 | 0 | 0 | 4 | 9 | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 11 |
| Malaysia | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | | | 2 | 0 | 0 | 0 | 0 | 1 | 5 | 7 |
| Philippines | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 0 | 10 | 8 | | | 2 | 2 | 1 | 1 | 18 | 13 |
| Taiwan | 0 | 0 | 0 | 0 | 3 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | | | 0 | 0 | 3 | 9 |
| Thailand | 0 | 0 | 0 | 0 | 4 | 10 | 0 | 0 | 4 | 5 | 0 | 0 | 0 | 4 | | | 8 | 19 |
| Sum | 0 | 2 | 0 | 2 | 28 | 40 | 2 | 4 | 24 | 34 | 3 | 0 | 3 | 8 | 2 | 6 | 158 | |

Bef and Aft denote Before and After the Asian crisis, respectively.

Table 3
Descriptive statistics.

| Variable | Acquiring country | | | | | | | | | | | | | | | |
|--------------|-------------------|-------|-----------|-------|-------|------|-------|------|----------|-------|-------------|------|--------|------|----------|-------|
| | India | | Indonesia | | Japan | | Korea | | Malaysia | | Philippines | | Taiwan | | Thailand | |
| | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft |
| GDPGROW (%) | 5.43 | 5.97 | 7.38 | 3.98 | 1.84 | 1.02 | 7.25 | 6.08 | 9.24 | 5.37 | 3.13 | 4.18 | 6.1 | 4.49 | −3.91 | 4.98 |
| Trade | 0.07 | 0.13 | 0.21 | 0.23 | 1.83 | 1.60 | 0.39 | 0.50 | 0.48 | 0.56 | 0.09 | 0.17 | 0.48 | 0.61 | 0.28 | 0.30 |
| ΔKKZ.REQQULA | −0.98 | −1.1 | −0.61 | −1.24 | −0.07 | 0.36 | −0.22 | 0.02 | 0.02 | −0.18 | −0.38 | −0.6 | 0.29 | 0.43 | −0.39 | −0.27 |
| KKZ.REGQULA | −0.12 | −0.36 | 0.2 | −0.48 | 0.69 | 0.95 | 0.55 | 0.65 | 0.78 | 0.47 | 0.41 | 0.08 | 1.02 | 1.01 | 0.41 | 0.38 |

Bef and Aft denote Before and After the Asian crisis, respectively.

of the targeted countries, the negative signs indicate that the targeted countries have higher regulatory indices than these four countries.

5. Empirical results

Table 4 reports our estimated results for each of the five hypotheses. There are six specifications, which are reported from columns two to seven in the table. The first five specifications examine each of the five hypotheses individually, and the last one examines the five hypotheses simultaneously. Column 2 reports the estimated results of the *gravity hypothesis*. The coefficients for DISTANCE are -0.725 and -0.566 before and after the Asian crisis, respectively, where both are significant. This likely reflects the commonly-held notion that the greater the distance, the higher the transaction cost, and if so, this then conceivably reduces the likelihood of firms engaging in transnational M&A activity. This result is similar to that of Buch and DeLong (2004). Thus, the *gravity hypothesis* gains momentum and support here. However, we do not reject the null hypothesis in the test for parameter constancy. This means that the effect of the distance on the cross-border M&A does not change from one sub-sample period to the next.

It is worth noting that earlier studies also challenge the idea that distance may not be a good proxy for the *gravity hypothesis* when M&As occur in the financial industry (Portes and Rey, 2005). Their reason is simply that the financial assets are mostly intangible and “weightless” and thus transportation costs should not be important. Contrary to this argument, our results show that distance is still a matter of concern for M&A transactions in the financial industry. One possible explanation might be that distance serves as a proxy for information asymmetry. When two countries are in close proximity, the extent of the information asymmetry is substantially reduced, thus encouraging M&A activity. However, in this paper we use a common religion instead of distance as the proxy for the *information cost*.

In column 3, the coefficients of the second hypothesis, TRADE are 0.652 and 0.949 in the pre- and post-crisis periods, respectively, and both are significant, lending support to the *following the client hypothesis*. That is, greater trade between two countries increases the tendency for their financial institutions to merge. Furthermore, we reject the null hypothesis in the test for parameter constancy, which means the effect of the trade on the cross-border M&A may change in the two sub-sample periods. Because the coefficient is positive and bigger in the post-crisis, we think the *following the client hypothesis* becomes more important after the crisis.

In column 4, the results for the *market opportunity hypothesis* reveal an interesting pattern. The coefficients of GDPGROW are negative and positive for the pre- and post-crisis, respectively. Furthermore, the coefficient is only significant after the crisis. A positive coefficient after the crisis appears to support the optimistic economic growth view. Let us recall that GDPGROW is the GDP growth rate at $t + 1$. Thus, during periods when economic growth in a host country is positive, the potential acquirers may continuously feel optimistic about the future economic growth of the target market. Furthermore, we reject the null hypothesis of equal coefficients. Because the post-crisis coefficient is larger than pre-crisis coefficient, it indicates that the *market opportunity hypothesis* becomes more important after the crisis.

The coefficients of the fourth hypothesis, the *Information cost hypothesis*, proxied by RELIGION, are 0.071 and 1.067 before and after the crisis, respectively. However, only the latter coefficient is significant. Thus, before the Asian crisis, countries with the same religion did not motivate the consolidation of financial institutions, but did not facilitate their consolidation after the crisis. The evidence after the crisis is also found by Qiu and Zhou (2006), Rossi and Volpin (2004) and Buch and DeLong (2004). We conjecture that this is because the same culture could shorten the period of friction between two financial institutions that are being consolidated.

Furthermore, we reject the null hypothesis in the test for parameter constancy, which means that the effect of the trade on the cross-border M&A may change in the two sub-sample periods. Because the coefficient in the post-crisis period is positive and significant, we think the *information cost hypothesis* becomes more important after the crisis.

In column 6, the coefficients of the fifth hypothesis, the *regulatory restrictions hypothesis*, proxied by $\Delta\text{KKZ.REGQUAL}$ are overwhelmingly significantly positive, indicating that the increase in the gap

Table 4
Determinants of international financial mergers: Poisson estimates.

| Variable | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|------------------------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|-----------------------|-------------------|---------------------|---------------------|---------------------|-----------------------|-----------------------|
| | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft |
| CONST | −0.371 (−1.025) | −2.158*** (−12.518) | −1.815*** (−8.859) | −1.956*** (−13.091) | −1.982*** (−14.908) | −1.034*** (−2.226) | | | | | | |
| Gravity hypothesis | | | | | | | | | | | | |
| DISTANCE | −0.725*** (−3.482) | −0.566*** (−3.224) | | | | | | | | | −0.982*** (−4.735) | −1.076*** (−4.448) |
| Following the client hypothesis | | | | | | | | | | | | |
| TRADE | | | 0.652*** (4.754) | 0.949*** (7.984) | | | | | | | 1.192*** (6.192) | 0.991*** (3.993) |
| Market opportunity hypothesis | | | | | | | | | | | | |
| GDPGROW | | | | | −0.046 (−1.333) | 0.071* (1.676) | | | | | −0.061*** (−2.532) | 0.092 (1.068) |
| Information cost hypothesis | | | | | | | | | | | | |
| RELIGION | | | | | | | 0.071* (0.169) | 1.067*** (3.501) | | | −0.338 (−0.827) | 0.523 (1.482) |
| Regulatory restrictions hypothesis | | | | | | | | | | | | |
| ΔKKZ.REGQULA | | | | | | | | 1.047*** | 1.032*** (4.825) | 3.475*** (6.391) | 1.313*** (5.136) | (4.695) |
| Ho: $\beta_1 = \beta_2$ | 0.238 | 0.062* | 0.006*** | 0.036** | 0.958 | 0.042** | | | | | | |
| R ² | 0.038 | 0.028 | 0.010 | 0.018 | 0.019 | 0.240 | | | | | | |

We employ the Poisson regression model given that our dependent variable is a countable number. That is,

$$N_{ij} = \exp(\alpha + \beta_1 XD + \beta_2 X(1 - D) + \varepsilon_{ij})$$

where N_{ij} : the number of M&As between home country i and host country j , X : the vector of the explanatory variables, D : the dummy variable for the Asian crisis, which is equal to unity before the crisis and zero after it

Notes: 1. Five hypotheses are tested here. They are *Gravity*, *Following the clients*, *Market opportunity*, *Information cost* and *Regulatory restrictions*. 2. The numbers in parentheses are t -statistics. 3. Bef and Aft denote Before and After the Asian crisis, respectively. 4. Ho: $\beta_1 = \beta_2$ tests the equality of the coefficients of interest during the pre- and post-crisis periods. The p -values are reported. 5. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 5
Determinants of international financial mergers – different proxies.

| Variable | 1 | | 2 | |
|------------------------------------|------------------------|-----------------------|-------------------------|-------------------------|
| | Bef | Aft | Bef | Aft |
| CONST | −0.885 *** (−2.315) | −1.007** (−2.259) | | |
| Gravity hypothesis | | | | |
| DISTANCE | −1.121 *** (−4.677) | −0.945*** (−4.206) | −0.952*** (−4.475) | −1.071*** (−4.448) |
| Following the client hypothesis | | | | |
| TRADE | −0.281 (−0.602) | 0.547* (1.777) | 1.137*** (5.968) | 0.922*** (3.944) |
| Market opportunity hypothesis | | | | |
| GDPGROW | | | −0.060** (−2.760) | 0.112 (1.391) |
| STOCKRET | −0.022*** (−3.319) | 0.002 (0.352) | | |
| Information cost hypothesis | | | | |
| RELIGION | 0.180 (0.320) | 1.015*** (2.836) | | |
| LANGUAGE | | | −30.683*** (−56.214) | −30.683*** (−56.214) |
| Regulatory restrictions hypothesis | | | | |
| ΔKKZ.RULELAW | 1.882*** (4.654) | 0.923*** (4.722) | | |
| ΔKKZ.REGQUA | | | 3.135*** (5.367) | 1.437*** (4.541) |
| Ho: $\beta_1 = \beta_2$ | 0.176 | 0.074* | | |
| R ² | 0.312 | 0.223 | | |

We employ the Poisson regression model given that our dependent variable is a countable number. That is,

$$N_{ij} = \exp(\alpha + \beta_1 XD + \beta_2 X(1 - D) + \varepsilon_{ij})$$

where N_{ij} : the number of M&As between home country i and host country j , X : the vector of the explanatory variables, D : the dummy variable for the Asian crisis, which is equal to unity before the crisis and zero after it.

Note: 1. This table presents the robust estimations. We have changed some proxies for some hypotheses. In the first estimation, we use the stock return (STOCK) instead of the GDP growth rate (GDPROW) and the index of rule of law instead of the index of the regulatory quality. In the second estimation, we use the common language (LANGUAGE) instead of the common religion (RELIGION). 2. The numbers in parentheses are t-statistics. 3. Bef and Aft denote Before and After the Asian crisis, respectively. 4. Ho: $\beta_1 = \beta_2$ tests the equality of the coefficients of interest during the pre- and post-crisis periods. The p -values are reported. 5. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

in the regulation quality index between two countries encourages more M&As. Therefore, regulations are indeed associated with the willingness of firms from different Asian countries to engage in cross-border M&A activity. When the regulatory quality differs in the home and host countries, the firms from those countries appear to be encouraged to form partnerships (M&As) before and after the crisis. In other words, in both periods, financial institutions in countries with high regulatory quality are more likely to acquire financial institutions in countries with relatively low regulatory quality.

In the last column, we examine the five hypotheses simultaneously. The results are similar to those found in the previous five columns with the following two minor differences. First, GDPGROW has a negative effect before the crisis but not after the crisis. Since this leads us to ask whether GDPGROW is a good proxy for market opportunity, we use stock returns as the proxy to check the results again in the next section. In addition, RELIGION does not affect the M&As in either period. From this we can infer that the *information cost* may not be important in Asian cross-border M&As by using this proxy. Furthermore, we reject the null hypothesis in the test for parameter constancy and the coefficient is positive in the post-crisis period. This means that the crisis may change the relationship between the proxy and the cross-border M&A decision.

Table 6
Determinants of international financial mergers – scale effect.

| Variable | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|--|-----------------------|-----------------------|---------------------|---------------------|----------------------|---------------------|--------------------|---------------------|---------------------|--------------------|-----------------------|-----------------------|
| | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft | Bef | Aft |
| CONST | 0.865*** (6.478) | 0.129** (2.419) | 0.374*** (6.409) | 0.279*** (5.703) | 0.323*** (7.662) | 0.797*** (4.676) | | | | | | |
| Gravity hypothesis DISTANCE | –0.240*** (–3.989) | –0.217*** (–3.611) | | | | | | | | | –0.202*** (–2.844) | –0.330*** (–4.065) |
| Following the client hypothesis TRADE | | | 0.480*** (4.680) | 0.720*** (0.114) | | | | | | | 0.462*** (3.920) | 0.655*** (3.989) |
| Market opportunity hypothesis GDPGROW | | | | | –0.021** (–2.075) | 0.009 (0.988) | | | | | –0.039*** (–2.766) | 0.023 (0.608) |
| Information cost hypothesis RELIGION | | | | | | | –0.015 (–0.119) | 0.364*** (2.810) | | | –0.008 (–0.045) | 0.187 (0.856) |
| Regulatory restrictions hypothesis ΔKKZ.REGQULA | | | | | | | | 0.293** | 0.267*** (2.496) | 0.425** (3.691) | 0.181 (2.534) | 0.187 (1.324) |
| Ho: $\beta_1 = \beta_2$ | 0.598 | 0.089* | 0.016** | 0.026** | 0.854 | 0.352 | | | | | | |
| R ² | 0.025 | 0.064 | 0.008 | 0.009 | 0.022 | 0.125 | | | | | | |

We employ the ordinary least squares (OLS) regression model for the robustness testing. That is,

$$S_{ij} = \exp(\alpha + \beta_1 XD + \beta_2 X(1 - D) + \varepsilon_{ij})$$

where S_{ij} : the number of M&As between home country i and host country j divided by the number of takeovers by the number of financial firms in country j , X : the vector of the explanatory variables, D : the dummy variable for the Asian crisis, which is equal to unity before the crisis and zero after it.

Notes: 1. This table presents the results of the OLS models estimated using maximum likelihood for the sample of Asian countries. The cross-border M&As are scaled according to the total number of financial institutions in the target country. 2. The numbers in parentheses are t -statistics. 3. Before and After denote Before and After the Asian crisis, respectively. 4. Ho: $\beta_1 = \beta_2$ tests the equality of the coefficients of interest during the pre- and post-crisis periods. The p -values are reported. 5. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

We therefore use different proxies to reexamine these two hypotheses in conducting the robustness testing.

6. Robustness testing

6.1. Different proxies

Because there are two minor differences between the individual test for each hypothesis and the joint test of the five hypotheses, we next try different proxies to examine the estimated results for the robustness testing.

In the first column of Table 5, we use the stock return in period $t + 1$ (STOKRET) as the proxy for the *market opportunity hypothesis* and the rule of law index as the proxy for the *regulatory restrictions hypothesis*. By comparing the result with the last column of Table 4, we find that the coefficients of the five hypotheses using the new proxies yield the same signs. For example, the signs of the coefficients of the new proxy for the *market opportunity hypothesis*, the stock return, are negative before the crisis and positive after the crisis. This means that the *market opportunity hypothesis* is also supported only after the crisis, for which the result is consistent with the findings in Table 4. Next, we use LANGUAGE as the proxy for the information cost.

In the second column of Table 5, we use the common language (LANGUAGE) as the proxy for the *information cost hypothesis*. The common language is a dummy variable; if the shared official language is English, the dummy is unity, otherwise it is zero. By comparing the result with the last column of Table 4, we find that most of the coefficients of the five hypotheses using the new proxies yield the same signs; however, the signs of the coefficients of LANGUAGE change. The coefficients of LANGUAGE are significantly negative in both periods, indicating that the *information cost hypothesis* is not supported in both periods. Thus, using different proxies still yields the same results for the first four hypotheses but not for the *information cost hypothesis*. Using different proxies, such as religion (RELIGION) and language (LANGUAGE), we obtain different results especially during the after-crisis period. Thus, the *information cost hypothesis* is sensitive to the proxies used.

6.2. The scale effect

Our results may be affected by the number of potential targets in each country. To avoid this scale effect, we divide the dependent variable by the number of banks and the number of securities in the target country.⁸ Because of this division, the dependent variable is no longer a cardinal integer number, and we therefore use the OLS method to estimate the model. Table 6 presents the estimated results, of which the results remain similar to those where this scaling adjustment has not been taken into consideration.

7. Conclusions

We have studied the motivation driving financial institutions to engage in cross-border M&A activity in eight Asian countries prior to and subsequent to the Asian financial crisis. In other words, we have delved into the impact of the Asian crisis on the determinants of cross-border M&As in eight Asian countries. Our main conclusions are as follows.

First, some determinants have an equal impact on M&A activity before and after the Asian crisis. For example, DISTANCE has a negative impact in both periods, which supports the *gravity hypothesis* and *information cost hypothesis*. The *following the client hypothesis* is supported in both periods too,

⁸ The SDC databank only provides the M&A transactions and does not provide the number of financial firms in each country. We then search the data provided by the financial supervisory commissions or similar authorities in each country, and find that the data on the numbers of banks are the most complete, followed by those for securities. We cannot so easily find the numbers of insurance companies, mutual funds, trust companies, and so on. Faced with this situation, we have no alternative but to use the sum of these two variables (the number of banks and the number of securities) to scale the M&A activities.

but only when TRADE is employed as the proxy. The gap in terms of the regulatory quality also has a positive impact in both periods, which supports the *regulatory restrictions hypothesis*.

Secondly, some determinants are only effective before the Asian crisis. For example, the stock return at $t + 1$ has a negative impact before the Asian crisis, but no effect after it. Thus, the *market opportunity hypothesis* is seen to have been at play before the crisis, but was not important after it.

Third, some determinants are only effective after the Asian crisis. For instance, the same religious faith has a positive impact only in the cross-border M&A activity after the crisis.

Fourth, from the test results for the constancy in the parameters, we can find that the Asian crisis may enhance the effect of the proxies on the cross-border decisions. The coefficients of the three proxies TRADE, GDPGROW and RELIGION are larger during the post-crisis period and reject the constancy test. The *following the client*, *market opportunity* and *information cost* hypotheses thus have more of an effect on the cross-border M&A decisions in that they use these three variables as proxies.

Appendix A.

Indonesia

1998: By the end of January 1998, further steps were taken in regard to bank restructuring with the granting of a full guarantee for all bank depositors and creditors, together with the introduction of the Indonesian Bank Restructuring Agency (IBRA).

The restrictions on foreign holdings in domestic financial institutions were to be eased.

Korea

The government has been encouraging mergers between banks that are both sound and of substantial size.

In 1998, the regulation limiting the control of commercial banks by foreigners to 4% was lifted.

Malaysia

In 1998, requests were made for 58 financial institutions to merge into 10 large anchor banks.

The Philippines

1998: Development cooperation, development assistance and other such topics had a key role to play, and were not to be hijacked by discussions on a new financial system. There was a need for the international community to create partnerships that met development needs. The international community was also to create the required resources for implementing the proposals and commitments made in the major United Nations' conferences.

1999: Nine mergers involving 12 commercial banks, four thrift banks and two rural banks, took place. All these measures promoted the mobilization of more resources that were to be made available to the market.

Taiwan

On December 13, 2000, the Law Governing Mergers of Financial Institutions was passed to encourage M&A activity. M&As involving foreign financial institutions were also allowed.

Thailand

1997: The Bank of Thailand said that restrictions on foreign holdings in domestic financial institutions would be eased. It said that domestically incorporated banks and finance companies "with sound financial status" would be allowed to hold 49% of other financial institutions for 10 years. These

measures were to apply to 15 commercial banks, 33 active finance companies and 12 property finance companies whose activities had not been suspended.

Foreign holdings in 58 bankrupt finance companies, whose activities were suspended this year, were to be unlimited for 10 years. Currently, foreign companies may hold no more than a 10% stake in a bank or a 25% stake in a property finance company.

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