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The effect of financial market development on bank risk: evidence from Southeast Asian countries

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ABSTRACT

This paper examines how bank risk varies with changes in financial markets development in a broad data set of 52 publicly listed commercial banks in five Southeast Asian countries over a 23-year period between 1990 and 2012. A consequence of two financial crises (i.e. the Asian financial crisis of 1997–1998 and the global financial crisis of 2007–2009) provides a natural experiment in which linkages between financial markets development and bank risk are measured. Empirical results show that higher degrees of financial markets development are associated with weaker bank capital positions and are positively related to higher degrees of bank revenue diversification. There is also evidence for a U-shaped relationship between the degree of financial markets development and bank capital.

1. Introduction

Financial markets development (hereinafter "financial development") represents a key source of opportunities and threats to the economy because it can promote economic growth by providing the efficient allocation of capital to firms in the economy, but it can pose risk to the health of the financial system. Evidence of banking or financial crises in both developing and developed countries is abundant, and the effects of financial crises on firms as well as the economy are substantial (see e.g., Acharya & Naqvi, 2012; Chava & Purnanandam, 2011; Miyajima & Yafeh, 2007). Several studies show that financial liberalization and trade openness increase comovement of returns across countries (see e.g., Beine, Cosma, & Vermeulen, 2010), implying that macroeconomic shocks in one country subsequently affect other countries due to financial markets integration as well as trade integration.

A key question in this paper is whether financial development influences individual bank risk in countries that had experienced financial crises. More specifically, this paper aims to address the question of whether banks alter their behavior subsequent to experiencing financial crises. From the perspective of bank supervision authorities as well as that of market participants, it would be healthful to the financial system and to the economic system if banks learn from the financial crisis experience and become more prudent or conservative in managing their business activities. To address these questions, I examine the linkages between financial development and bank risk in a sample of 52 commercial banks operating in five Southeast Asian countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) over a 23-year period between 1990 and 2012. The main hypothesis to be tested is whether the variation in bank risk can be explained by financial development.

Reforms in law and regulations, especially financial and banking reforms, implemented in the aftermath of the Asian financial crisis of 1997 in these countries should, theoretically, reduce the extent to which banks take on excessive risk. According to the database of financial reforms (combining several dimensions, including, e.g., banking regulations and supervision, credit controls, entry barriers, interest rate controls) constructed by Abiad, Detragiache, and Tressel (2010), all five countries in the sample implemented financial reforms in mid to late 1980s and had not implemented financial reforms until the Asian financial crisis of 1997: that is, Indonesia and Thailand implemented financial reforms in 1996; the Philippines undertook financial reforms in 1997; Singapore implemented financial reforms in 1998; Malaysia implemented financial reforms in

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1999.[1] If monitoring of banks by bank supervision authorities as well as market participants is efficient and effective after the Asian financial crisis, financial development should be beneficial to the economy, while its adverse effects should be alleviated. As a consequence, the influence of financial development on bank risk should be less evident in periods following the Asian financial crisis. Prior studies (e.g., Williams & Nguyen, 2005) show that the banking sector liberalization in Southeast Asian countries lead to higher efficiency performance of commercial banks between 1990 and 2003. Some studies (e.g., Espenlaub, Khurshed, & Sitthipongpanich, 2012) also show that reforms after the Asian financial crisis alleviate moral hazard problems between banks and connected firms. If these financial reforms are indeed effective, banks should be better prepared to withstand the adverse effects of the global financial crisis of 2007–2009. However, some regulatory reforms (e.g., the introduction of partial or full deposit insurance scheme[2]) may inadvertently increase bank risk by lowering market discipline (e.g., Hadad, Agusman, Monroe, Gasbarro, & Zumwalt, 2011). In a recent study, Karas, Pyle, and Schoors (2013) show that following the introduction of explicit deposit insurance in Russia in 2004, the sensitivity of insured depositors to bank risk decreases, relative to that of uninsured depositors, suggesting the adverse effect of the presence of explicit deposit insurance on market discipline.

I test my hypotheses by using two measures of financial development (stock market development and banking sector development) and two indicators of bank risk (bank capital and bank revenue diversification). Stock market development (*SMD*), measured as the ratio of the market capitalization of stock markets to GDP, indicates the extent to which stock markets in a country are well developed, while banking sector development (*BSD*), measured as the ratio of domestic credit provided by banking sector to GDP, indicates the relative size of the banking sector to the size of the economy. Bank capital (*BCR*) is measured as the ratio of total capital to total assets (*CAPTA*) (e.g., Rime, 2001) or the ratio of the Tier 1 capital to total risk-weighted assets (*CAR*) (e.g., Rime, 2001), while bank revenue diversification (*BRD*) is measured as the ratio of noninterest income to net revenue. The choices of bank risk proxies, which are consistent with prior studies, show that the leverage ratio (Diamond & Rajan, 2000) and non-core banking activities (DeYoung & Torna, 2013) are positively associated with the probability of bank failures (e.g., financial distress/bank runs).

The main findings of this paper can be summarized as follows. First, bank capital is negatively associated with banking sector development but is not related to stock market development, after controlling for GDP growth, trade openness, and bank-level characteristics. In terms of the economic significance, the coefficient on *BSD* of –0.126 (see column (2) of Table 4) implies that a one-standard deviation increase of banking sector development will, on average, lead to a 7.5% decrease in *CAPTA*; given that the mean *CAPTA* of the sample banks during 1990–2012 is 14.5%, these figures suggest a reduction in the capitalization ratio of about 51.7% when banking sector development is one standard-deviation above the mean. Furthermore, the coefficient on *SMD* of –0.017 (in column (4) of Table 8) implies that a one-standard deviation (of 42.93) increase of stock market development will lead to a 0.72% decrease in *CAR* at the mean (of 14.38%), after controlling for the macro-level and bank-level factors.

Second, the negative effect of banking sector development on bank capital is weaker after the Asian financial crisis (the 1997–2012 period), relative to the pre-crisis period (the 1990–1996 period). Third, evidence of the relation between banking sector development and bank revenue diversification is mixed. The effect of banking sector development on bank revenue diversification seems to be weaker after the Asian financial crisis, relative to the pre-crisis period. Fourth, while panel OLS regressions show that stock market development is not associated with bank revenue diversification, panel quantile regressions consistently show the positive relation between stock market development and bank revenue diversification, implying that banks tend to engage more in non-core banking businesses when the depth of stock markets increases. Last but not least, there is evidence of non-linear effects of financial marker development on bank risk. That is, banking sector development has a non-linear effect on bank revenue diversification. There is evidence for a U-shaped relationship between the degree of banking sector development and bank capital, when measured as the capital adequacy ratio.

Empirically, the findings in this paper are consistent with the view that the presence of deposit insurance schemes may weaken the influence of bank regulation and supervision or market discipline (e.g., Angkinand & Wihlborg, 2010; Karas et al., 2013; Kiss, Rodriguez-Lara, & Rosa-GarcÍA, 2012; Kupiec & Ramirez, 2013), thereby allowing banks to bear higher degrees of risk. As a result, the impact of financial development on bank risk remains evident after the 1997 financial crisis, despite the fact that a series of financial and regulatory reforms were implemented after the Asian financial crisis.

2. Data and methodology

2.1. Data

To construct the sample of commercial banks, I start with the commercial banks that are publicly listed on the stock exchanges in any of the five Southeast Asian countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand)[3] as of December 31, 2012. To be included the sample, banks must be in operation before the end of 2004, allowing for at least three years of data prior to the global financial crisis of 2007–2009. This selection criterion results in a sample of 55 commercial banks in the five Southeast Asian countries. I then collect annual bank-level and country-level data during the period 1990–2012 from Datastream, Worldscope and World Bank WDI.[4] I begin my sample in 1990, since Datastream's coverage for these banks prior to 1990 is limited. The main goal is to include all publicly listed commercial banks that were in operation both the Asian financial crisis of 1997–1998 and the global financial crisis of 2007–2009 in the sample. The cost is a rather small sample of firms with potentially small cross-sectional variations; therefore, I include all banks that were in operation at least three years prior to the global financial crisis of 2007–2009. This sample construction approach at least allows for the examination of possible structure changes in banks' behavior after experiencing the global financial crisis of 2007–2009.

After applying the above selection procedure, I have unbalanced annual panel data from 55 commercial banks (i.e. 19 banks in Indonesia, 10 banks in Malaysia, 13 banks in the Philippines, 3 banks in Singapore, and 10 banks in Thailand) over the 1990–2012 period.[5] It is worth noting that 41 of the 55 banks (i.e. 7 banks in Indonesia, 10 banks in Malaysia, 11 banks in the Philippines, 3 banks in Singapore, and 10 banks in Thailand) were in operation prior to the onset of the Asian financial crisis of 1997,

[1] A detailed review of banking reforms in the Southeast Asian region would be beyond the scope of this paper. Interested readers are referred to Pathan, Skully, and Wickramanayake (2008) for an overview of banking reforms in Thailand, Manlagñit (2011) for a detailed discussion of banking reforms and the liberalization of foreign bank entry in the Philippines, and Lee and Hsieh (2014) for the effects of foreign ownership of banks and banking reforms on financial stability in Asian countries.

[2] Prior studies (e.g., Kiss et al., 2012) find that there is a negative relation between the degree of deposit insurance and the probability of bank runs. Kupiec and Ramirez (2013) note that deposit insurance schemes may encourage banks to take higher risks by increasing bank leverage or lowering the lending standard, which can explain the evidence of the larger effect of bank failures on firm failures in states with deposit insurance schemes, relative to states with no insurance scheme.

[3] According to Angkinand and Wihlborg (2010), as of 2003, the full deposit insurance coverage existed in Indonesia, Malaysia, and Thailand, while the limited insurance coverage existed in the Philippines.

[4] Datastream and Worldscope do not provide quarterly accounting data for the sample of firms.

[5] It is worth noting that of the 55 banks, Bangkok Bank and Kasikornbank are included in the sample of 22 banks of Huang, Zhou, and Zhu (2012).

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