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Bank- and country-based determinants of banks' performance in Asia

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ABSTRACT

This paper examines the joint impact of bank- and country-based drivers of performance of banks in 11 Asian countries. The panel data technique is used to deal with possible endogeneity issues and the heterogeneity of individual banks. We find evidence that the ownership structure and the capital ratio are critical determinants of the banks' profitability. The revenue diversification impacts negatively on the net interest margin. Examining the institutional factors of banks' performance, we find that enhanced financial and regulatory structures reduce the capacity to generate non-competitive, abnormal profits. Those most affected are the consumers, who bear the burden of higher prices resulting from weak competition.

1. Introduction

The role of banks as financial intermediaries is to cycle funds from deficit to surplus agents in the most efficient manner possible. Since banks are the most influential agent in countries' economic growth and development (Levine 1997), good corporate governance practices are necessary in the banking industry to ensure stable long-run performance. Nations with well-developed banking systems and sound financial institutions are more likely to experience persistent growth and better face the onslaughts during economic recessions (Hung 2003).

From a global perspective, Asian economies have been gaining significant attention over the last few decades (Peng, Bhagat, and Chang 2010; Pilbeam 2005). Specifically, the performance of Asian banking has been affected in different ways by bank-level financial decisions (Moshirian 2008) as well as of new country-level regulatory conditions and exogenous forces such as economic crises (Soedarmono, Machrouh, and Tarazi 2013). Therefore, the goal of this research is to study how bank-level and country-level variables determine banks' profitability in the Asian region. By doing so, this study provides a broader understanding of the factors affecting the profitability of banks.

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We chose the Asian banking sector for several reasons. First, previous literature is mainly focused on the analysis of US and European banking industry, with much less discussions and insights on the Asian banking industry. Second, Asian countries have faced dramatic financial reforms and deregulations over the last few decades (Cook 2008; Seenaiah, Badri Narayan, and Amaresh 2015). Therefore, the analysis of banks' profitability might provide further insight into the efficiency of such interventions. Third, the private sector of the Asian economies is considered vulnerable due to the presence of poor accounting standards, weak transparency in management, and political turmoil all of which cause restrictions to bank credits (credit rationing) with the subsequent financial instability in the region (Stiglitz and Weiss 1981; Pontines 2008). Hence, the analysis of the determinants of banks' profitability might guide policy-makers and regulators to apply measures to ensure financial stability. Thus, the profitability of the Asian banking industry seems to be an appealing and unexplored research field.

The major contributions of this paper are: (i) unlike the previous literature for the Asian context, we follow an eclectic one-step estimation process based on a behavioral model of banking firms which combines bank-based as well as country-based determinants of banks' profitability under a governance approach. For instance, Lee and Hsieh (2014) examined the impact of foreign ownership on financial stability, but with no consideration of corporate governance features. Similarly, Perera, Skully, and Chaudhry (2013) analyze the determinants of commercial banks' profitability, but they fall short in building hypotheses on the impact of country-level variables on banks' profitability; (ii) the major limitations of the current literature on the Asian banking industry is rooted in either the scope or scale of its analysis for further inference. For instance, there are studies focused only on an individual Asian country (Berger, Hasan, and Zhou 2010; Ariyadasa et al. 2017; Seenaiah, Badri Narayan, and Amaresh 2015). Our study, however, reveals a holistic view of major drivers of Asian bank performance by using a representative sample of banks from 11 Asian countries; (iii) we use a suitable estimation technique that allows us to control the unobservable heterogeneity problem of individual banks and the endogeneity problem, which is a consequence of unclear identification of causality in the model estimations; and (iv) we factor into the analysis certain corporate governance characteristics of individual banks measured through variables which describe the banks' ownership structure features. To the best of our knowledge, there are no studies which link the ownership structure of Asian banks with their profitability.

This paper is organized as follows: Section 2 articulates the related literature and develops the research hypotheses, Section 3 describes the methodology and variables applied in the empirical analysis, the main results are shown in Section 4 and after this, in the final section, the paper draws the conclusions and policy implications.

2. Related literature and research hypotheses

2.1. Determinants of banks' performance and research hypotheses

2.1.1. Bank-based determinants

Bank-based variables are those controllable by management and account for intra-firm differences in commercial banks' profitability. In this section, we derive hypotheses on capital ratio, ownership structure, and revenue diversification as determinants of banks' profitability.

Capital ratio[1]: Even though there are not clear findings regarding the relationship between a bank's capital ratio and its performance, Berger (1995b) argues that this relationship is positive, supported by two complementary arguments. First, the expected bankruptcy-costs argument which suggests that banks increase their capital ratio whenever expected bankruptcy costs increase. While the second argument is based on the signaling view that management might be willing to convey information to the market on its capacity to generate profits by increasing the capital ratio.

A negative relationship between banks' capital and performance is also evidenced. The traditional view of bank profitability suggests that a higher capital-asset ratio is linked with a lower return on equity because a higher capital ratio decreases the risk on equity and the tax subsidy provided by interest deductibility (Berger 1995a). Additionally, the efficiency-risk view suggests that more efficient banks tend to choose relatively low capital ratios, as higher expected returns from the greater profit efficiency substitute equity capital to some degree (Berger and Bonaccorsi di Patti 2006). Similarly, according to the agency costs approach (Jensen 1986; Jensen and Meckling 1976), high leverage – or low capital ratio – reduces the agency costs by encouraging managers to act more in the interest of shareholders, leading to a better performance. Finally, an excessively high capital ratio might denote that a bank is operating over-cautiously and ignoring potential profitable growth opportunities (Saona 2011).

Most of the previous empirical literature uses monotonic relationships between the capital ratio and banks' profitability (Chaudhry, Chatrath, and Kamath 1995; Goddard, Molyneux, and Wilson 2004; Molyneux, Remolona, and Seth 1998; Molyneux and Thornton 1992; Ben Naceur and Omran 2011). Nevertheless, the previous arguments support a non-monotonic relationship in which banks look for an optimal level of capital which maximizes the profitability. We hypothesize that:

H1: There is an inverse U-shaped relationship between the capital ratio and the performance of Asian banks.

Bank ownership structure: Starting from Berle and Means (1932) on, finance literature contains an extensive debate on ownership structure features and firm performance. For instance, according to the incentive theory (Morck, Shleifer, and Vishny 1988; Short and Keasey 1999; Perrini, Rossi, and Rovetta 2008) and the agency theory (Jensen and Meckling 1976; Demsetz and Villalonga 2001) there is a roof-shaped relationship between firm value and management ownership. The explanation is that executive shareholdings encourage managers to improve firm value–convergence or alignment of interests' view. However, when the interests of managers and shareholders are not fully aligned, higher stock ownership can give managers too much power, giving rise to the entrenchment problem with detrimental consequences on banks' performance. Hence, we hypothesize that:

H2: There is an inverse U-shaped relationship between the managerial ownership concentration and the bank performance, supported by the convergence and the entrenchment arguments.

Regarding the ownership concentration, the vertical and a horizontal agency conflicts may be observed. The vertical agency problem arises when there are discrepancies in the

interests between managers and shareholders (Shleifer and Vishny 1986), which is reduced through higher ownership concentration, leading to a better performance – known as the monitoring argument. However, when the concentration of the ownership structure exceeds the optimal at which it reduces the agency conflicts, it triggers the expropriation of minority shareholders' wealth or horizontal agency conflict, which harms the banks' profitability (de Miguel, Pindado, and de la Torre 2004; 2005). The hypothesis is:

H3: There is an inverse U-shaped relationship between the ownership concentration and the performance of banks, supported by the monitoring and expropriation arguments.

Functional diversification: Studies on functional diversification provide mixed results (Trujillo-Ponce 2013). While Mercieca, Schaeck, and Wolfe (2007) from a sample of small EU banks found no effect of diversification on bank performance; Cybo-Ottone and Murgia (2000) found significant positive abnormal returns associated with product diversification. Moreover, Wall and Eisenbeis (1984) and Berger, Hasan, and Zhou (2010) found a negative correlation between bank earnings and different dimensions of diversification.

Despite all the previous arguments, fee-based and financial advising-based banking services represent an additional source of revenues in the Asian context (Peng, Bhagat, and Chang 2010). As a process of liberalization and international integration in Asia, the traditional banking business of the 1980s has been gradually pursued to functional diversification through activities such as electronic transactions, delivery channels, clearing systems, investment banking, security trading, hedge funds, foreign exchange, assurance, and other financial services able to generate revenue in a variety of different ways (Valdez 2007). Consequently, we hypothesize that:

H4: A positive relation exists between functional diversification and banks' performance.

2.1.2. Country-based determinants

This set of drivers of banks' performance is not defined internally by managerial decisions, but by the current financial system and regulatory conditions and are outside of the banks' control (Demirgüç-Kunt, Laeven, and Levine 2004). These variables are:

Financial development: A wide range of literature is found on determinants of financial development that ensures banks' performance (Hung 2003; Guillaumont Jeanneney, Hua, and Liang 2006). According to Ben Naceur and Omran (2011) and Valdez (2007), more efficient and developed financial markets reduce bank profitability through greater competitiveness. Similarly, Demirgüç-Kunt and Levine (2004) suggest that countries with developed stock markets might create a competitive environment that exerts downward pressure on bank interest margins. Consequently, our research hypothesis states that:

H5: A negative relationship exists between financial development and banks' performance.

Legal enforcement and regulatory system: Examining the South East Asian banks, Levine, Loayza, and Beck (2000) showed that government restrictions allowed banks to increase their lending capacity and capture larger market shares, which led to higher profits. La Porta et al. (1998) and Levine (1998) examined bank performance and identified that the

countries with low legal framework to protect creditors have fewer performing banks in their economy. In the same way, Demirgüç-Kunt, Laeven, and Levine (2004) found that better legal enforcement and efficient regulatory systems are associated with lower levels of corruption, reducing the frictions in the financial system. For the case of Asian banks, one should expect that the weak enforcement of the law and the high levels of corruption would be ameliorated if subject to more efficient legal and regulatory systems, which eventually would have a positive influence on banks' performance. Thus, we hypothesize that:

H6: Improvements in the legal and regulatory system have a positive impact on banks' performance.

3. Methodology and variables' measurement

3.1. Methodology

We utilize panel data estimation as it captures panel or bank-specific effects that allow for heterogeneity (e.g. internal policies, managerial style, attitude toward risk, among others) that remain invariant over time and are part of the random component (Arellano and Bover 1995). This econometric strategy also allows us to deal with the endogeneity problems when certain independent variables are affected by bank performance (Goddard, Molyneux, and Wilson 2004; Trujillo-Ponce 2013) and allows for estimation of the dynamic effects that otherwise would not be possible in cross sectional or time series analysis (Himmelberg, Hubbard, and Palia 1999; Athanasoglou, Brissimis, and Delis 2008).[2] The GMM two-step system estimator with adjusted standard errors for potential heteroskedasticity is used to deal with these econometric limitations (Arellano and Bover 1995; Blundell and Bond 1998).

3.2. Source of information and variables definition

The empirical analysis is carried out for a sample of 248 banks from 11 Asian countries (China, Indonesia, India, Japan, Korea, Sri Lanka, Malaysia, Philippine Islands, Singapore, Thailand and Taiwan), which compounds a set of 2465 observations, with an average of 10 year-observations per bank, for the period from 2001 to 2013. The data-set is comprised of information from different sources. For instance, the banks' financial reports as well as the ownership structure information were obtained from Thomson Reuter's dataset. Information on both, financial development and development of the legal and regulatory systems at the country level, were obtained from the updated data based on the works of Beck, Demirgüç-Kunt, and Levine (2000) and Kaufmann, Kraay, and Mastruzzi (2011), respectively. This information is publicly available on the World Bank web page.[3]

Banks' performance is measured as the bank interest spread or net interest margin (NIM), corresponding to the net interest income over the average earnings assets (Demirgüç-Kunt and Huizinga 1999; Angbazo 1997). We use the *ex post* spreads measured as the difference between the banks' actual interest revenues and their actual interest expenses. This *ex post* spread differs from the *ex ante* spread by the amount of loan defaults, and it is a more suitable measure because it accounts for the fact that banks with high-yield, risky credits are likely to face more defaults.[4]

At the bank-level, the capital ratio (CAP) was measured as the total common equity over the total assets. Its quadratic form (CAP^2) is used to study the suggested non-linear relationship between the capital ratio and the bank's profitability (Saona 2016).

Two measures are used for bank ownership structure features. First, the insider ownership (INSOWN) represented by the percentage of closely held shares as a fraction of outstanding shares held by cross holdings (e.g. corporations and holding companies), government, employees, and insiders (e.g. managers, officers and directors). Second, the ownership concentration (OWN1) measured as the percentage of shares held by the majority or controlling shareholder.

Two alternative measures of diversification were computed. The first one corresponds to $DIVER1 = 1 - \left[\left(\frac{NetIntInc}{OpInc} \right)^2 + \left(\frac{NetNonIntInc}{OpInc} \right)^2 + \left(\frac{LoanLossProv}{OpInc} \right)^2 \right]$ according to Lee, Hsieh, and Yang (2014), where OpInc denotes the total operating income which is equal to the sum of the absolute values of net interest income (NetIntInc), the net non-interest income (NetNonIntInc), and the provision for loan losses (LoanLossProv). This index ranges between zero – the bank is fully specialized in one source of income and 0.66 – the bank generates a fully balanced revenue mix from all three areas. The second measure for revenue diversity (DIVER2) is based on Laeven and Levine (2007), Baele, De Jonghe, and Vander Vennet (2007), and Lin et al. (2012). This measure takes the form of $DIVER2 = 1 - |2x - 1|$, where x is the ratio of non-interest income to total operating income – the higher this ratio is, the more a bank relies on non-traditional banking activities. Consequently, DIVER2 takes values between 0 and 1 and means that the firm diversification increases with higher values.

Among the institutional- or country-based variables we include the financial development and regal and regulatory systems. Financial development is measured by six proxies taken from the updated data base of Beck, Demirgüç-Kunt, and Levine (2000). These measures include: (i) Deposit Money Bank Assets to GDP (DBAGDP); (ii) Other Financial Institution Assets to GDP (OFAGDP); (iii) Private Credits by Deposit Money Banks and Other Financial Institutions to GDP (PCRDBOFGDP); (iv) Stock Market Capitalization to GDP (STMKTCAP); (v) Stock Market Turnover Ratio (STTO) which is the value of total shares traded to average real market capitalization; and (vi) Private Bond Market Capitalization (PRBOND) which is the private domestic debt securities issued by financial institutions and corporations as a share of GDP. The first three proxies of the financial development (DBAGDP, OFAGDP, and PCRDBOFGDP) are used to measure the development of the banking system, while the other three proxies (STMKTCAP, STTO and PRBOND) are associated with the development of the capital markets. Details on the computation of these variables are provided in Beck, Demirgüç-Kunt, and Levine (2000) and greater values for these variables are associated to more developed financial systems.

For the legal enforcement and regulatory system we include the following variables, resulting in a total of six dimensions of governance (Kaufmann, Kraay, and Mastruzzi 2011): (i) Voice and Accountability (VA); (ii) Political Stability and Absence of Violence/Terrorism (PS); (iii) Government Effectiveness (GE); (iv) Regulatory Quality (RQ); (v) Rule of Law (RL); and (vi) Control of Corruption (CC). Even though the original values for each one of these six indicators range from approximately −2.5 (weak) to 2.5 (strong) governance performance, in our sample the values are not that extreme. Details on the computation of these variables are in Kaufmann, Kraay, and Mastruzzi (2011).

As control variables we included the natural logarithmic transformation of banks' total assets (LNTA) as a proxy for the bank size (Maudos and Solís 2009); the credit risk measured as the total loan loss provision over gross loans (CREDRISK) (Athanasoglou, Brissimis, and Delis 2008); the bank loans which are basically the proportion of total loans to total assets (LTA); and the demand for deposit (DEPTA) measured as the total deposit over total assets (Berger and Bonaccorsi di Patti 2006). Additionally, dummy variables by country and year are also included in the estimations.

Berger and Bonaccorsi di Patti (2006) argue that bank profits show a tendency to persist over time, suggesting a dynamic model of banking profitability. Accordingly, our model takes the form:

$$\text{NIM}_{it} = \beta_0 + \beta_1 \text{NIM}_{it-1} + \sum_1^5 \delta_j X_{ijt} + \sum_1^2 \theta_k Y_{kt} + \sum_1^4 \xi_k Z_{ilt} + \eta_i + \mu_t + \varepsilon_{it} \quad (1)$$

where X_{ijt} represents the vector of j bank-based determinants of profitability of the i bank in the t period, Y_{kt} is the vector of the k country-based determinants, Z_{ilt} is the vector of l control variables, and η_i, μ_t and ε_{it} measure the individual effect, the temporal effect, and the stochastic error, respectively.

4. Results

4.1. Multivariate analysis

Diagnostic tests were applied to verify the quality of all the regression results. First, the joint significance of variables used in the various models was tested with the Wald contrast, while the Hansen test was applied to check the validity of the instruments used for the endogenous variables. Second, a Fisher-type test[5] was used to ensure that the variables were generated by a stationary process. Additionally, the Lind and Mehlum (2010) test was applied to verify the existence of the hypothesized non-lineal relationships (e.g. in variables CAP, OWN, and INSOWN). As seen in all the tables, results are robust regarding the standard diagnostic tests for the panel data.[6]

4.1.1. Bank-level determinants of profitability

In line with the expectations and literature (Berger and Bonaccorsi di Patti 2006) in Table 1, we observe that the one-period lagged dependent variable (NIM_{t-1}) in Equation (1) shows systematically a positive and statistically significant coefficient, suggesting a relatively high persistency in profitability in the Asian banking industry.

Concerning the capital ratio (CAP), in all except Models 2 and 8 in Table 1, the CAP variable is significantly associated with banks' NIM. Unlike most of the previous empirical literature (Chaudhry, Chatrath, and Kamath 1995; Goddard, Molyneux, and Wilson 2004; Molyneux, Remolona, and Seth 1998; Molyneux and Thornton 1992; Ben Naceur and Omran 2011), we find that there is a non-linear relationship between CAP and NIM. As such, higher capital increases bank profits, but only up to 27.06% (computed as the average of the critical values of the CAP variable).[7] Beyond this threshold, capital infusion decreases bank profits. Both the expected bankruptcy costs as well as the signaling arguments support the positive relationship, while the negative relationship is explained by the opportunity cost of the equity capital, since high capital ratios prevent banks taking

Table 1. Regression analysis for internal determinants of profitability.

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	0.00224*	0.000890	−0.00274**	0.0161***	0.0192***	0.0274**	0.00996*	0.0141**	0.00919**
	(0.000530)	(0.000718)	(0.000222)	(0.000791)	(0.000815)	(0.000933)	(0.00112)	(0.00122)	(0.00106)
NIM_{t-1}	0.807***	0.868***	0.746***	0.732***	0.721***	0.720***	0.693***	0.693***	0.686*
	(0.0102)	(0.0257)	(0.00367)	(0.00550)	(0.00526)	(0.00370)	(0.00405)	(0.00400)	(0.00447)
CAP	0.0315**	−0.0126	0.0708*	0.0606**	0.0795**	0.0442***	0.0464***	0.0167***	0.0536***
	(0.00856)	(0.0186)	(0.00352)	(0.00332)	(0.00306)	(0.00263)	(0.00347)	(0.00398)	(0.00356)
CAP^2	−0.0343*	0.0891	−0.118**	−0.142*	−0.194*	−0.162**	−0.0868*	−0.00502	−0.0985*
	(0.0203)	(0.0684)	(0.00856)	(0.00777)	(0.00690)	(0.00635)	(0.0114)	(0.0118)	(0.0109)
Critical value CAP	0.4592	–	0.3000	0.2134	0.2049	0.1364	0.2673	–	0.2721
OWN1		0.0106***							
		(0.00359)							
$OWN1^2$		−0.00565							
		(0.00449)							
INSOWN			0.0277***	0.0183**	0.0177**	0.0156*	0.0159*	0.0184**	0.0156**
			(0.000495)	(0.000525)	(0.000573)	(0.000559)	(0.000563)	(0.000532)	(0.000604)
$INSOWN^2$			−0.0284*	−0.0187**	−0.0175***	−0.0138***	−0.0138**	−0.0161**	−0.0135***
			(0.000556)	(0.000589)	(0.000627)	(0.000586)	(0.000592)	(0.000542)	(0.000644)
Critical value INSOWN			0.4877	0.4893	0.5057	0.5652	0.5761	0.5714	0.5778
LNTA				−0.000962**	−0.000995**	−0.000974**	−0.000392**	−0.000488**	−0.000229**
				(4.04e−05)	(3.98e−05)	(3.25e−05)	(5.53e−05)	(5.63e−05)	(6.42e−05)
LTA					−0.00494**	−0.00323***	−0.000377	0.00181***	−0.00150**
					(0.000421)	(0.000454)	(0.000668)	(0.000695)	(0.000755)
DEPTA						−0.00899**	−0.00438***	−0.00183*	−0.00490*
						(0.000696)	(0.000858)	(0.000817)	(0.000898)
CREDRISK							0.305**	0.35700*	0.30800***
							(0.00654)	(0.00801)	(0.00680)
DIVER1								−0.0104***	
								(0.000944)	
DIVER2									−0.00207**
									(0.000265)
Observations	2465	1397	2283	2283	2262	2249	2238	2234	2234
Number of iden	235	243	248	248	238	236	235	235	235
Temporal effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald	116.7***	121.04***	42.39***	289.71***	172.01***	136.54***	151.97***	175.48***	166.99***
AR(2)	−1.80	−2.000	−2.06	−2.20	−2.23	−2.35	−2.769	−2.88	−2.769
Hansen	187.8	127.85	196.26	200.02	199.46	202.38	188.13	181.56	187.8
Lind–Mehlum CAP	28.93***	–	22.63***	19.25***	25.66***	15.84***	4.75***	–	5.61***
Lind–Mehlum INSOWN	–	–	41.71***	25.84***	23.28***	17.57***	16.76***	22.57***	15.14***

advantage of external sources of funds. Hence, there is evidence to accept the empirical hypothesis of the existence of an inverse U-shaped relationship between the capital ratio and a bank's performance. This finding suggests an optimal capital structure which maximizes the profitability of banks when the CAP ratio ranges from a level of 13.64%–45.92% (see Models 6 and 1 in Table 1). Such U-shaped relationship between CAP and NIM is formally supported by the Lind and Mehlum (2010) test.

Regarding ownership structure features, the closely held shares (INSOWN) also revealed a quadratic relationship with NIM. More precisely, banks' NIM improves as INSOWN increases supported by the convergence of interest between insiders and shareholders. Such improvement of NIM is observed in INSOWN growths up to 53.90% (computed as the arithmetic mean among the critical values of INSOWN in Table 1).[8] However, when the closely held shares (INSOWN) surpass this threshold, the horizontal agency conflict arises resulting in net interest margin deterioration. In this case, the negative effects of the managerial entrenchment erode the performance of banks by tunneling wealth from minority shareholders to insiders. Therefore, we accept the research hypothesis of an inverse U-shaped relationship between the managerial ownership structure and the bank performance supported by the interaction of the convergence and the entrenchment hypotheses (Demsetz and Villalonga 2001).

Concerning the ownership concentration (OWN), the evidence rejects our research hypothesis of an inverse U-shaped relationship between OWN variable and the NIM. In fact, these results are consistent with the finance theory concerning a positive impact of ownership concentration on banks' performance endorsed by the monitoring effect (Jensen and Meckling 1976).

The negative and statistically significant relationship between DIVER1 and NIM suggests that non-traditional banking activities raise the overall operating costs and increase the volatility of earnings by eroding the banks' performance (DeYoung and Roland 2001). Additionally, Lepetit et al. (2008) have argued that banks expanding their business toward non-interest income activities – such as those with higher diversification – show higher insolvency risk than less diversified banks. Consequently, this higher risk of insolvency suppresses the performance of the banks as shown in our results. Similar results are found with the DIVER2 variable which considers the non-interest income over the operating income to measure revenue diversity. Hence, revenue diversification in the Asian financial institutions indicates that, on the one hand, there is an operating inefficiency of holding non-traditional activities; and on the other hand, there is a higher risk associated with more volatile profits which erodes the performance of the banks. Consequently, our research hypothesis on a positive association between functional diversification and banks' performance is rejected.

4.1.2. Country-level determinants of profitability

The institutional or country-level variables were classified into two big groups: (i) the development of the financial system and (ii) the development of the legal and regulatory system. The development of the financial system was measured through the development of the banking system (DBAGDP, OFAGDP, and PCRDBOFGDP) and through the development of the capital markets (STMKTCAP, STTO, and PRBOND); while the development of the legal and regulatory system was measured through six alternative governance indicators (VA, PS, GE, RQ, RL, and CC).

In line with expectations, in Table 2, we observe that improvements in the banking system and in the capital markets –the stock market and the market for corporate bonds – negatively impact the net interest margins (see Models 1 through 6). These findings are evidence that Asian economies are still immature compared with other industrialized economies. This fact describes a scenario where banks have taken advantage to realize abnormal (or non-competitive) profits. Consequently, when the financial system achieves higher stages of development, such capacity to generate abnormal profits is constrained with less room for monopolistic profits.

Regarding the regulatory system (see Models 7 through 12 in Table 2), contrary to expectations, we observe that improved enforcement of the law and enhanced regulatory systems diminish the banks' net interest margin. These findings are similar to Demirgüç-Kunt, Laeven, and Levine (2004). This indicates that when legislation which protects the interests of investors is weak, the country is plagued with corporate scandals and corruption; and when the institutions lose their credibility as regulators, the financial institutions might generate abnormal profits by increasing their spreads. Contrary to what was hypothesized, higher net interest margins seem to be the measure adopted by banks to protect themselves against weak regulatory systems.

4.1.3. Comparative analysis based on differences in the regulatory systems

Table 3 is used to compare the impact of the determinants of the NIM based on the cross-country differences in the regulatory systems. For doing so, the country sample is split in two groups according to the average of the legal and regulatory system variables per country (average among VA, PS, GE, RQ, RL, and CC as shown in Panel A). We considered countries with relatively high standards of corporate governance as those with a positive average index (Japan, Korea, Malaysia, Singapore, and Taiwan) while the group of countries with relatively low governance indicators is formed by those with a negative average index (China, Indonesia, India, Sri Lanka, Philippines, and Thailand).

The regressions' outputs are shown in Table 3, Panel B. The findings are quite interesting and shed some light on the differences between these two groups of countries. For those countries with relatively high legal and regulatory standards, banks' profitability improves before capital infusion (see models 1 and 3). The expected bankruptcy costs view endorses this finding, suggesting that banks increase their capital ratio to reduce the likelihood of bankruptcy risk. However, in countries with relatively weaker legal systems, the inverse U-shaped relationship is observed between the CAP and NIM variables (see Models 2 and 4). This suggests that banks take advantage of external debt up to the point where the bankruptcy risk offsets the benefits of the leverage. The hypothesis of the inverse U-shaped relationship between CAP and NIM for the group of countries with relatively high legal and regulatory standards is trivially rejected.

Concerning the INSOWN variables we also observe appealing results. The first and third models in Table 3 show that as insiders' ownership increases, banks improve profitability for the group with better legal and regulatory standards. However, when such concentration of ownership is higher than the one needed for effective monitoring (in-between 43.32% and 48.19% as seen in the critical values of INSOWN), the managerial entrenchment problems arise and the bank performance decreases. Therefore, under a sound legal and regulatory system, insider ownership represents an efficient corporate governance tool. A dissimilar effect is observed when there are poor legal and regulatory

Table 2. Regression analysis for internal and external determinants of profitability.

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Development of the financial system							Development of the legal and regulatory system				
	Banking system				Capital markets							
Constant	0.00788***	0.00913***	0.00781*	0.00917***	0.00874***	0.00809	0.0141***	0.00325***	0.0106*	0.0106**	0.0144*	0.0119
	(0.00111)	(0.00113)	(0.00103)	(0.00107)	(0.00102)	(0.00106)	(0.00106)	(0.00101)	(0.00102)	(0.00103)	(0.00103)	(0.000942)
NIM_{t-1}	0.639**	0.681**	0.634***	0.685***	0.686**	0.676***	0.611***	0.547***	0.615***	0.619*	0.555***	0.587***
	(0.00451)	(0.00504)	(0.00478)	(0.00448)	(0.00460)	(0.00506)	(0.00508)	(0.00488)	(0.00486)	(0.00463)	(0.00520)	(0.00516)
CAP	0.0428***	0.0523**	0.0426***	0.0535***	0.0499**	0.0518**	0.0408*	0.0431***	0.0468**	0.0413*	0.0389*	0.0387**
	(0.00389)	(0.00377)	(0.00372)	(0.00363)	(0.00357)	(0.00368)	(0.00441)	(0.00324)	(0.00398)	(0.00361)	(0.00428)	(0.00400)
CAP^2	−0.0654**	−0.0956***	−0.0664***	−0.0968***	−0.0868***	−0.0903**	−0.0563***	−0.0480***	−0.0741***	−0.0554***	−0.0500***	−0.0593*
	(0.0108)	(0.0109)	(0.0104)	(0.0112)	(0.0107)	(0.0110)	(0.0122)	(0.00936)	(0.0109)	(0.0101)	(0.0118)	(0.0109)
Critical value CAP	0.3272	0.2735	0.3208	0.2763	0.2874	0.2868	0.3623	0.4490	0.3158	0.3727	0.3890	0.3263
INSOWN	0.0138**	0.0157*	0.0157***	0.0152*	0.0156*	0.0153**	0.0146***	0.0128***	0.0139**	0.0137***	0.0128***	0.0102***
	(0.000562)	(0.000607)	(0.000611)	(0.000669)	(0.000622)	(0.000612)	(0.000563)	(0.000522)	(0.000601)	(0.000568)	(0.000569)	(0.000557)
$INSOWN^2$	−0.0137***	−0.0138**	−0.0157***	−0.0132*	−0.0134**	−0.0138*	−0.0132*	−0.0135***	−0.0142*	−0.0142**	−0.0148*	−0.0117*
	(0.000637)	(0.000652)	(0.000685)	(0.000711)	(0.000659)	(0.000672)	(0.000618)	(0.000625)	(0.000703)	(0.000647)	(0.000678)	(0.000633)
Critical Value INSOWN	0.5036	0.5688	0.5000	0.5758	0.5821	0.5543	0.5530	0.4741	0.4894	0.4824	0.4324	0.4359
LNTA	3.31e−05	−0.000214***	3.71e−05	−0.000219***	−0.000167***	−0.000133**	−0.000495***	7.05e−05	−0.000178***	−0.000206*	−0.000283***	−0.000272**
	(7.24e−05)	(6.57e−05)	(6.25e−05)	(6.38e−05)	(6.15e−05)	(6.21e−05)	(5.55e−05)	(4.95e−05)	(5.38e−05)	(5.58e−05)	(4.85e−05)	(5.65e−05)
LTA	0.000472	−0.00150*	3.19e−05	−0.00110	−0.00163**	−0.000889	0.000295	0.00485***	0.00109	0.00136*	0.00135**	0.00209***
	(0.000836)	(0.000812)	(0.000808)	(0.000777)	(0.000749)	(0.000764)	(0.000785)	(0.000809)	(0.000781)	(0.000719)	(0.000675)	(0.000804)
DEPTA	−0.00289**	−0.00459***	−0.00289***	−0.00528***	−0.00468***	−0.00467**	−0.00211*	−0.00144*	−0.00416***	−0.00350***	−0.00344***	−0.00278*
	(0.00101)	(0.000937)	(0.000985)	(0.000909)	(0.000913)	(0.000948)	(0.000741)	(0.000724)	(0.000892)	(0.000860)	(0.000823)	(0.000859)
CREDRISK	0.298***	0.305***	0.304**	0.301*	0.305***	0.309***	0.278***	0.280***	0.282***	0.276***	0.273***	0.261***
	(0.00801)	(0.00731)	(0.00836)	(0.00715)	(0.00681)	(0.00772)	(0.00695)	(0.00859)	(0.00774)	(0.00861)	(0.00823)	(0.00778)
DIVER2	−0.00219***	−0.00218***	−0.00272*	−0.00210**	−0.00204***	−0.00218***	−0.00178*	−0.00365***	−0.00102*	−0.00117*	−0.00122*	−0.00113*
	(0.000270)	(0.000274)	(0.000287)	(0.000272)	(0.000289)	(0.000282)	(0.000264)	(0.000268)	(0.000262)	(0.000283)	(0.000238)	(0.000261)
DBAGDP	−3.10e−05***											
	(2.75e−06)											
OFAGDP		−1.40e−06*										
		(8.30e−07)										
PCRDBOFGDP			−2.84e−05***									
			(2.20e−06)									
STMKTCAP				4.72e−07								
				(1.96e−06)								
STTO					−5.23e−06***							
					(1.49e−06)							
PRBOND						−2.46e−05***						
						(7.60e−06)						
VA							−0.00250***					
							(0.000121)					

Table 2. (*Continued*)

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
		Development of the financial system						Development of the legal and regulatory system				
		Banking system			Capital markets							
PS								−0.00399** (0.000117)				
GE									−0.00282** (0.000154)			
RQ										−0.00376*** (0.000184)		
RL											−0.00419*** (0.000127)	
CC												−0.00312** (0.000146)
Observations	2234	2234	2234	2234	2234	2234	2234	2234	2234	2234	2234	2234
Number of idem	235	235	235	235	235	235	235	235	235	235	235	235
Temporal effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald-test	102.71***	146.68***	122.02***	163.40***	122.81***	101.7***	171.44***	106.22***	172.20***	164.58***	156.59***	140.00***
AR(2)	−2.52	−2.75	−2.68	−2.75	−2.78	−2.78	−2.82	−2.43	−2.70	−2.70	−2.56	−2.589
Hansen-test	183.93	187.76	188.36	185.42	18.40	187.34	187.97	187.41	187.68	19014	192.09	190.40
Lind–Mehlum CAP	7.51***	5.42***	3.32***	5.25***	4.80***	4.84***	1.92**	0.85**	3.69***	2.09**	1.49*	2.80**
Lind–Mehlum INSOWN	19.28***	15.57***	18.87***	13.59***	14.62***	15.17***	15.68***	17.97***	16.28***	18.31***	19.59***	16.81***

Table 3. Comparative analysis based on the regulatory systems.

Panel A		
Countries	Obs.	Mean
CHN	174	−0.540
IDN	333	−0.560
IND	389	−0.275
JPN	1,071	1.175
KOR	102	0.721
LKA	104	−0.344
MYS	129	0.359
PHL	168	−0.449
SGP	78	1.489
THA	131	−0.148
TWN	232	0.884
Total	2911	0.406

Panel B				
VARIABLES	Model 1	Model 2	Model 3	Model 4
	High standards	Low standards	High standards	Low standards
Constant	−0.00618**	0.0239*	−0.00854***	0.00161
	(0.000378)	(0.00265)	(0.000508)	(0.00249)
NIM_{t-1}	0.696***	0.578***	0.684***	0.537***
	(0.00245)	(0.0141)	(0.00271)	(0.0125)
CAP	0.0104**	0.226*	0.0181**	0.210**
	(0.000913)	(0.0110)	(0.000692)	(0.00967)
CAP^2	0.0291***	−0.750**	0.0212***	−0.691**
	(0.00153)	(0.0495)	(0.00206)	(0.0452)
Critical value CAP	–	0.1507	–	0.1520
INSOWN	0.00956***	−0.000649	0.00953**	−0.00677**
	(0.000148)	(0.00197)	(0.000157)	(0.00211)
$INSOWN^2$	−0.00992*	−'0.00222	−0.0110***	0.00336*
	(0.000181)	(0.00222)	(0.000194)	(0.00203)
Critical value INSOWN	0.4819	–	0.4332	–
LNTA	0.000137**	−0.00107***	0.000284**	−0.000564*
	(1.73e−05)	(8.65e−05)	(2.65e−05)	(9.75e−05)
LTA	0.00411**	0.00304*	0.00435**	0.00946***
	(0.000119)	(0.000761)	(0.000153)	(0.000784)
DEPTA	−0.00358*	−0.00946**	−0.00505***	−0.0136**
	(0.000114)	(0.00220)	(0.000128)	(0.00189)
CREDRISK	0.156***	0.437***	0.135***	0.442***
	(0.00138)	(0.0146)	(0.00135)	(0.0133)
DIVER2	−0.000183*	−0.00416*	−0.000943**	−0.00321*
	(5.05e−05)	(0.000593)	(6.35e−05)	(0.000581)
FinDevFact			−0.000258**	−0.00181***
			(2.96e−05)	(0.000640)
LegalSysFact			−0.00169***	−0.0132**
			(4.01e−05)	(0.000737)
Observations	1291	943	1291	943
Number of idem	121	114	121	114
Temporal effect	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes
Wald-test	120.61***	126.54***	162.43***	146.26***
AR(2)	−0.40	−1.44	−0.30	−2.334
Hansen-test	118.04	93.32	118.13	93.32
Lind–Mehlum CAP	EOI	12.94***	EOI	13.16***
Lind–Mehlum INSOWN	45.74***	EOI	51.90***	EOI

Note: EOI: Extremum outside interval – trivial rejection of H0.

standards (see Model 4 in Table 3). In this case, as insider ownership increases, it causes a decline in the bank's performance due to severe managerial entrenchment problems which dilute the profitability.[9]

5. Conclusions

Unlike the traditional research on banking performance, this paper examined the joint impact of bank-based and institutional-based drivers of performance of Asian banks. The findings reveal that, contrary to previous literature, there is a non-linear relationship between banks' profitability and the capital ratio. In the Asian context, bank's profitability increases as the capital-assets ratio increases but only up to a certain level, where excessive capital becomes detrimental to banks' profitability. This quadratic relation explains some features of Asian banking such as that the positive capital-profitability relationship is explained by the expected bankruptcy costs and the signaling arguments, while reductions in banks' profitability as capital level increases is endorsed by the opportunity cost of equity capital arguments and by a risk averse, overly conservative management that prevents banks from taking advantage of money-making growth opportunities.

The ownership of insiders also showed a quadratic relationship with banks' profitability, behaving as a double-edged sword concerning agency conflicts. On the one hand, more active insiders can reduce the conflicts of interests between managers and shareholders; but at excessively high insiders' ownership levels the risk of expropriation of minority shareholders' wealth increases, shrinking the banks' performance. Other significant findings are linked to the functional diversification, which suggested that non-traditional banking activities raise the operating costs and increase earnings volatility by eroding the banks' profits.

Concerning the institutional variables, the findings indicate a need for better enforcement of the law and regulatory systems in the Asian region. When the legislation which protects the interests of investors is weak and when the institutions lose credibility as regulators, the banks might generate abnormal profits by increasing their markups. In a nutshell, bank-level and country-level variables reveal that internal and external corporate governance mechanisms are still weak in the Asian context, causing a detriment in value for the minority shareholders and higher prices paid for banking services.

Policy implications are derived from these conclusions. First, better legislations aimed to improve the internal and external governance systems need to be developed. The Asian banking systems are operating with excessively concentrated insider ownership which allows managers and controlling shareholders to expropriate minority shareholders. Additionally, there are abnormal bank profits which burden the customers' pockets. Higher enforcement of the law as well as codes of good corporate practices might help to mitigate these problems. Second, additional measures must be taken to enhance market competition. The removal of barriers to competition should be expected to benefit the Asian banking system without being detrimental to customers. The results are quite consistent across different models and through alternative measures of banks' profitability.

Notes

1. We considered this variable as a bank-based variable, although we recognize that it can be partially determined by regulatory capital (e.g. Basel I and Basel III) and be considered as a

country-based determinant of banks' profitability. According to the scope of this study, the capital ratio is used to compute a reciprocal measure of leverage in the banking industry, and consequently it is considered as a bank-based variable (Saona 2016). The regulatory capital, however, differently from the capital ratio, corresponds to the minimum required capital to cover risk-weighted assets (e.g. subordinated debt, non-deferrable assets, and hybrid instruments, among other risky assets) which unfortunately we are unable to determine.

2. Dealing with the endogeneity of banks' corporate governance is one of the biggest challenges in recent empirical studies (Nguyen, Locke, and Reddy 2014). The literature on corporate governance has found three main sources of such endogeneity problems –unobserved characteristics of corporations, simultaneity, and dynamic endogeneity (Wintoki, Linck, and Netter 2012; Hermalin and Weisbach 1998).

3. Information on the financial development can be downloaded from the permanent URL http://go.worldbank.org/X23UD9QUX0. The latest update took place in November 2013.Information on the development of the legal and regulatory systems can be obtained from www.govindicators.org. The latest update took place in September 2014.

4. Alternatively, as robustness checks for the major findings, return on assets (ROA) was used as dependent variable. For space saving reasons tables are not exhibited. In all the cases however, the most important findings remained unchanged.

5. Not tabulated for space-saving reasons, but available upon request to the authors.

6. Descriptive statistics were computed for all the variables used in the econometric analyses. Among the most important findings we observed that the average net interest margin was 2.45%, and the capital ratio showed an average of 17.17%. Concerning the ownership structure features, we observed that a typical controlling stockholder held about 24.65% of the outstanding shares.

7. The estimation of the critical value in the first regression of Table 1 is done by calculating the first derivative of this regression with respect to the CAP variable, and then by making this equal to zero. Subsequently, we solve for CAP which represents the point at which the net interest margin (NIM) is maximized. Specifically speaking, this solution takes the form: $\partial NIM/\partial CAP = 0.0315 + 2(-0.0343 \times CAP) = 0$. Consequently, when CAP = 45.92% the NIM is maximized. Idem calculations are done for all the other regressions which include CAP^2.

8. The critical values of INSOWN were calculated similarly to those for CAP variable as described in Footnote 7.

9. Principal Component Factoring technique was used to create noncorrelated factors from the financial development variables (FinDevFact) and from variables measuring the development of the legal and regulatory systems (LegalSysFact). Subsequently, these factors were used in the regressions as robustness checks of the most important findings (see Table 3, Panel B). In all the cases, the results regarding the country-level variables measured by these factors remained unchanged as evidence of the consistency of the major findings.

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