Bank Ownership Concentration and Stock Price Informativeness

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ABSTRACT

This paper examines the relation between ownership concentration and bank stock price informativeness around the world. Using the sample of listed commercial banks from 59 countries between 2002 and 2014, we find strong and robust evidence that ownership structure plays a significant role in shaping the bank's information environment. Our results support the entrenchment effect when the linear model is used. However, using the nonlinear model, the control rights shows a U-shaped curve on the information of stock price. Further analysis shows that the significant effect is more prominent for small banks, and the impact of economic development was more pronounced in developed countries.

Keywords: Bank ownership; Stock price informativeness; Financial institutions; Bank regulation; Governance

1. Introduction

Stock prices commonly contain both market-wide and firm-specific information, where the market-wide information is measured by the stock price synchronicity. Morck, Yeung, and Yu (2000), Wurgler (2000), Durnev, Morck, and Yeung (2004) suggest that companies with higher stock return synchronicity tend to have less firm-specific information. In contrast, when the firm-specific information dominates the stock price, the stock price synchronicity is lower. Hence, inverse of the stock price synchronicity can mirror the relative amount of firm-specific information impounded into stock prices.

Many studies are interested in what factors affect the firm-specific information of stock price information (SPI). The issue is important because SPI, or the extent to which a stock co-moves with aggregate factors, is of fundamental concern to investors and portfolio managers. Due to its portfolio implications, information is costly, stock prices reflect only a subset of all relevant information. As the cost of private information declines, informed trading increases, which leads to more informative pricing. More trading by informed investors results in increased stock return variation; as Roll (1988) documents, it follows that firm-specific return variation could be associated with trading based on private information. Following these studies, a growing body of literature documents a link between firm-specific return variation and stock price informativeness (Morck et al. 2000; Durnev et al. 2003). Jin and Myers (2006) develop a theory linking management opportunism, transparency, and firm-specific return variation that supports this interpretation. They argue that transparency prevents insiders from hiding bad news (which smooths returns but requires that insiders absorb bad-news costs), allowing for unimpeded firm-specific return variation. Recent empirical evidence supports this informational interpretation of firm specific return variation. High levels of firm-specific return variation are associated with more efficient capital allocation; US industry-level evidence is provided by Durnev et al. (2004) and Chen et al. (2006) and international evidence by Wurgler

(2000). Furthermore, US industries with high levels of firm-specific return variation have stock prices that are more informative about future earnings (Durnev et al., 2003). Cross-country patterns of firm-specific return variation correspond to likely patterns of price informativeness. Morck et al. (2000) find low firm-specific return variation in emerging markets but high firm-specific stock return variation in developed markets. In addition, low levels of firm-specific return variation are explained by minimal shareholder protection and corporate opaqueness (Jin and Myers, 2006).

Among many determinants that could affect SPI, one important factor is the ownership concentration. There are two contrasting hypotheses to interpret the relationship. The incentive alignment hypothesis suggesting the positive relation, argues that controlling shareholders have little incentive to conceal information and are willing to disseminates firm-specific information (Shleifer and Vishny, 1986; Gomes, 2000). By contrast, the entrenchment hypothesis suggests the negative relation. This hypothesis argues that whenever controlling shareholders are able to control the production of the firm's accounting information, they would be likely to manage the reporting of earnings to conceal their private control benefits from outsiders, and thus leading to less firm-specific information. Consequently, which effect has the dominant strength on SPI is an empirical question.

Empirical studies reach the mixed results. Boubaker et al. (2014) and Jian et al. (2014) using non-financial sector, support the entrenchment argument that controlling shareholders tend to disclose less firm-specific information. In contrast, using Chinese non-financial firms, Gul et al. (2010) SPI is an inversed U-shaped curve function of the percentage of shares held by the largest shareholder.

This study continues this line of research with three improvements. First, our ownership concertation differs from those in the literature. Previous studies commonly using the percentages of the shares directly controlled by the largest shareholder as a proxy for

ownership concentration. Instead, we consider the "the whole structure of the voting rights" of ultimate ownership as a proxy for ownership concentration.[2] Namely, we consider both direct and indirect shareholdings of the ultimate ownership because pyramidal and cross-holdings shareholding are also important for the controlling shareholding. Thus, considering only direct shareholding may underestimate the true ownership concentration because only the ultimate ownerships reflect the full-fledged power of controlling shareholders.

Next, we use global banking sector because this issue is more appropriately examined by using bank sample. Theoretically, the entrenchment hypothesis arising from concentrated ownership structure could be severer in the banking sector than in non-financial sector for three reasons. First, banks with concentrated control are typically connected to business conglomerates comprising many member firms. Banks are more likely to serve as "house banks" and become an easy tool for tunneling. For example, in banking sector, banks play the role as credit suppliers, controlling owners may lend credits with more favorable terms to connected firms, prop up distressed group firms with unsecured loans, or adopt liberal lending policies for related parties. Second, unlike other industries, the banking sector is subject to heavy regulations. In contrast, market discipline, such as takeover, market competition, and other private monitoring, has limited scope in monitoring banks. Regulators that aim to ensure the safety and stability of banking systems may not serve the best interests of minority shareholders. Third, Morgan (2002) argues and empirically shows that the financial nature of bank assets and their high leverage make them inherently more opaque and riskier than other firms. The great information asymmetry arising from the opacity of banking assets and proprietary information makes it more difficult to monitor insiders and detect insider expropriation.

Finally, our study provides international evidence in contrast to the past results are country-specific. In other words, the results of using one single country may not be applicable

[2] Using voting rights allows us to trace ownership concentration back to the ultimate owner and, hence, to accurately assess the severity of agency problems between controlling and minority shareholders. As evidenced in previous empirical studies, the relevant agency problem shapes the corporate information environment (e.g., Fan and Wong, 2002; Attig et al., 2006).

to other countries as different regions have different culture of concentration. For example, East Asian countries commonly show concentrated corporate ownership as compared to diffuse corporate ownership in the U.S. and the U.K. As some related studies investigate mainly the US (e.g., Brockman and Yan, 2009; Chan and Chan, 2014) and a few studies focus on other single countries such as France (Boubaker et al., 2014) and China (Gul et al., 2010; Feng et al., 2016). Our knowledge with regard to a wide range of countries, remains limited.

Considering the direct and indirect shareholdings is a formidable work in data collection because we use international banking data. Our sample use a sample of 636 commercial banks from 59 countries around the world over the period 2002–2014. While the consideration of large number of countries increase our bank-year observations, they also bring country and bank heteroscedasticity. To minimize country heteroscedasticity, we consider macroeconomic variables (e.g., GDP per capita) and country governance, such as effectiveness of the rule of law) (Kaufmann, Kraay, and Mastruzzi, 2010, 2012, and country institutional difference, such as restrictions on banks' engagement in security, insurance, and real estate activities (Barth, Caprio, and Levine, 2006, 2008). Furthermore, we consider six bank-specific characteristics to minimize the heteroscedasticity. We also consider fixed effects using bank dummies to control unobserved bank heteroscedasticity.

Our results support the entrenchment effect when the linear model is used. However, using the nonlinear model, the control rights shows a U-shaped curve on the information of stock price. At lower levels of ownership concentration, the entrenchment effect dominates; at higher ownership levels, the incentive management effect dominates.

Our study contributes to the literature is threefold. First, this study is related in spirit to the approach of Brockman and Yan (2009) and Jiang et al. (2014), which provide evidence on the relationship between ownership structure and corporate information environment by analyzing if ownership structure is an important determinant of SPI. However, we consider both direct and indirect shareholding of ultimate controlling shareholders, whereas they consider only the direct shareholding.

Next, unlike past studies that focus on non-financial firms, we investigate a broad sample size of banking firms. As mentioned above, because banking firms' performance is generally affected by a number of institutional factors including banking regulation and supervision, audit quality and investor protection, our empirical work is expected to shed light on the differential effect of corporate governance mechanisms between non-financial and banking firms. Francis et al. (2015) use a sample of commercial banks to test how bank regulation and supervision affect the stock returns synchronicity, but fail to describe the influence of controlling shareholders incentives to bank-specific information. Our study fills this void.

Third, we find the nonlinear influence between ownership concentration and SPI. Our results confirm Gul et al.'s (2010) finding that the link between ownership concentration and SPI using non-financial firms in China. However, our ownership concentration captures the ultimate control rights, which consist of direct and indirect controlling rights, of the largest shareholders, whereas their study focuses on only the direct share ownership.

The remainder of this paper is organized as follows. Section 2 reviews relevant literature and develops research questions we address. Section 3 describes the data and methodology in measuring ultimate ownership and bank SPI. Section 4 analyzes empirical results. Section 5 conducts additional robustness checks. Finally, section 6 concludes the paper with a discussion the policy implications.

2. Literature Review

2.1 Evidence of Stock Price Informativeness

While many studies are interested in various effect on SPI, they focus on non-financial sectors. Few studies examining the determinants of SPI on high leverage financial institutions. Francis et al. (2015) document that the more the level of a country's capital stringency regulation and private-monitoring power, the lower the stock price synchronicity for banks. They point out that high government supervision power with restrictions on banking activities confines banks

to act in a similar behavior, such as responding similar to macroeconomic conditions. Owing to the dominating position of state-owned enterprises in China's equity market, Wang and Yu (2013) argue that government can intervene in the credit decisions of state-owned banks and require them to lend to state-owned enterprises. Therefore, state-owned enterprises disclose less private information as the fraction of loans from state-owned banks increases more. Nevertheless, most of these studies are likely to be more oriented toward providing effects of macroeconomic environment and/or government's policy to bank stock price returns rather than to concentrate on the role of bank's corporate governance in concentrated ownership environments.

2.2 Effects of Ownership Concentration on Stock Price Informativeness

Under the agency theory, ownership concentration is one of critical corporate governance mechanisms that helps to limit the conflict of interests between principal and agency. The principal and agency are different in different regions and mainly affected by the structure of the firm's share ownership. When ownership is diffuse as is typical in the U.S. and the U.K., agency problems stem from the conflicts of interest between managers and shareholders (Berle and Means, 1932; Jensen and Meckling, 1976; Roe, 1994). As ownership concentration increases to a level where an owner obtains effective control of the firm, the nature of agency problems shifts away from the manager-shareholder conflicts to conflicts between the controlling owner and minority shareholders (Shleifer and Vishny, 1997). So agency problems arising from control-ownership wedge motivate controlling shareholders to manipulate the flow of firm-specific information to outside minority shareholders by withholding value-relevant, firm-specific information.[3]

2.3 Hypothesis building

[3] This is consistent with Fama (1980) and Diamond (1989), who contend that reputation plays a disciplinary role in financial markets and helps mitigate agency problems and information asymmetry between managers and outside investors.

In principle, concentrated ownership could have two opposing effects on SPI, depending on whether the managerial entrenchment effect or the incentive alignment effect is dominant. Under the managerial entrenchment perspective, concentrated ownership provides controlling shareholders with an incentive and/or opportunity to divert firm resources at the expense of outside shareholders (e.g., Morck, Yeung, and Yu, 2000; Claessens, Djankov, Fan, and Lang, 2002; Fan and Wong, 2002). Entrenched controlling shareholders have an incentive to cover up their self-serving behaviors, or to limit related information leakage, by withholding unfavorable information or selectively disclosing such information that helps them camouflage their self-serving behaviors, and/or opportunistically timing the release of value- relevant, private information to the market. Dheera-aumpon (2016) shows the excess control rights of the banks' controlling owners apparently can tempt them to engage more in connected lending, because the excess control rights give them controlling power without the cost of a greater stake in the potential loss from connected loans.

Finally, unlike other industries, the banking sector is subject to heavy regulation. Market discipline, such as takeover, market competition, and other private monitoring, has limited scope in monitoring banks. Regulators that aim to ensure the safety and stability of banking systems may not serve the best interests of minority shareholders. Meanwhile, outside investors without adequate protection may have to bear the relatively higher costs of acquiring and processing private information to overcome the information opacity related to concentrated ownership, and to avoid the risk of being exploited by the controlling shareholders. The high cost associated with private information search, however, discourages informed trading, and thus, impedes the incorporation of firm-specific information into share prices (e.g., Roll, 1988; Morck, Yeung, and Yu, 2000; Fernandes and Ferreira, 2009). As a result, the stock prices of bank with high ownership concentration become less informative. One can thus expect that

under the entrenchment perspective, stock price informativeness is negatively associated with ownership concentration, ceteris paribus.

Hypothesis 1A (entrenchment effect). Bank ownership concentration adversely affects bank SPI.

Studies argue that the presence of controlling shareholders may lead to the better monitoring of incumbent managers and thus curbs the extraction of private benefits (Demsetz and Lehn, 1985). Grossman and Hart (1980) also document that firms with more concentrated ownership are likely to mitigate the free-rider problem to some extent by giving controlling shareholders incentives to effectively control firm's operations. As argued by Gomes (2000), large shareholders are less likely to pursue opportunistic rent-seeking activities, to preserve their reputation, and are consequently more inclined to disclose credible and high quality information for the benefit of minority shareholders.

Hypothesis 1B (incentive alignment effect) Bank ownership concentration favorably affects bank SPI.

Recent studies suggest that the relation between bank SPI and the ownership concentration may also be affected by the regimes of the ownership concentration. Gomes (2000) suggests that concentrated ownership in high concentration ownership regime may encourage the controlling shareholders to voluntarily disclose more and better firm specific information for the benefit of minority shareholders. This facilitates more informed trading, which, in turn, leads to more information being impounded into stock prices (Grossman and Stiglitz, 1980). Hence, before the ownership concentration exceeding a certain threshold (i.e., at the low ownership regime), the negative relation could exist as suggested by managerial entrenchment effect. After this threshold (i.e., at the high ownership regime), ownership concentration increase could have an incentive to shift towards reduce risk levels, showing a positive relation

as suggested by incentive alignment effect. Consequently, it is plausible to expect a U-shaped relation between ownership concentration and bank SPI(Gul et al., 2010).

Hypothesis 2. Bank ownership concentration reduces SPI when the ownership is smaller than a certain level and increases SPI when the ownership exceeds the level.

3. Data and Methodology

3.1 Data collection

To construct the panel data set with a time-varying dimension of each bank's ultimate ownership and accounting data, we identify all listed commercial banks in 57 countries around the world during 2002–2014 appearing in the *Bankscope* database of *Bureau van Dijk*. As our study focuses on commercial banks, we drop central banks, investment banks, securities houses, multilateral government banks, non-banking credit institutions, specialized government financial institutions, and branches and subsidiaries of foreign banks. Our bank level variables are collected from *Bankscope*'s unconsolidated financial statements. We delete observations with missing financial information and banks with less than five subsequent years of accounting time series. Our panel is unbalanced.

We use weekly market- and bank-level returns to be consistent with previous studies. We select a bank if has at least 200 trading days in a particular year. The stock prices from the *Datastream* database. We collect the national institution and regulatory variables, such as countrys' bank regulations and supervisions, from Barth et al. (2006; 2008; 2013). The country governance, such as effective of law, are collected from Kaufmann et al, 2011. [4]

The macroeconomic variables, such as GDP per capita and Customer Price Index are taken from the International Financial Statistics.

3.2 **Measurement of Bank SPI**

[4] Kaufmann et al. (2011) summarize the Worldwide Governance Indicators (WGI) project that covers over 200 countries and territories with different dimensions of governance starting in 1996.

This section defines the *SPI*. Consistent with Piotroski and Roulstone (2004) and Brockman and Yan (2009), we measure stock price synchronicity by estimating the following expanded market and industry model:

$$Return_{i,w} = \alpha + \beta_1 MarketReturn_{w\text{-}1} + \beta_2 MarketReturn_w + \beta_3 IndustryReturn_{i,w\text{-}1} + \beta_4 IndustryReturn_{i,w} + e_{i,w} \quad (1)$$

where $Return_{i,w}$ is bank *i's* return in week *w*. We use Wednesday to Wednesday return to avoid thin trading problems and potential seasonal effects (i.e. the Monday Effect). The $MarketReturn_w$ is the value-weighted market return for week *w*, and $IndustryReturn_{i,w}$ is the banking industry value-weighted return excluding bank *i's* weekly return. We control industrial returns to avoid spurious correlation between individual bank and industry returns in case of an industry contains few banks. We also use the lag returns to account for that fact that information in market and banking industry may be incorporated into stock price with a delay.

Morck et al. (2000) measure stock return synchronicity by using the regression's goodness of fit (i.e., *R*-square) . The higher the *R*-square an individual bank is, the stronger the synchronicity of bank stock price with market and /or industry returns will be.[5] Therefore, stock prices for companies with a higher *R*-square are less informative about the stocks. Since *R*-square value obtained from the above regression is bounded within [0, 1], we define bank *SPI* as a logistic transformation that allows us to transform the *R*-square to range from negative infinity to positive infinity:

$$SPI = \log\left(\frac{1 - R_{i,t}^2}{R_{i,t}^2}\right) \quad (2)$$

where $R_{i,t}^2$ is obtained by conduct regression (1). Lower stock price synchronicity ($R_{i,t}^2$) indicates higher *SPI*. To avoid problems of outliers, we winsorize *SPI* at the 1st and 99th percentiles.

[5] Theory and a large, growing body of empirical evidence supports informational interpretation of this proxy, such as Durnev et al. (2003), Jin and Myers (2006), Fernandes and Ferreira (2008) and Gul et al. (2011).

3.3 Measurement of Ultimate Ownership

We adopt the same measure as La Porta et al. (1999) and Faccio and Lang (2002) to construct the ownership of the ultimate controlling shareholder.

To calculate the controlling and cash flow rights of the controlling shareholders, we map out the complete chain of ultimate controlling shareholders. First, we calculate the direct holding shares of ultimate controlling shareholder. To do so, we collect the first tier ownership structure of each bank from *Bankscope* database. If there is missing information, we also search *Orbis* database[6] (Caprio et al., 2007), which provides direct ownership information for more than 50 million non-financial and banking firms around the world that satisfy minimum size threshold. If there are still missing information, we search the website of each bank.

Next, we calculate the indirect holding shares of the controlling shareholders. To do so, we examine the pyramidal and cross-sectional ownership of the controlling shareholders. We trace each of these shareholders through multiple layers of ownership along the chain. We follow Lang et al (2004) approach to calculate this indirect holding. We collect this information from Orbis. However, when the ownership structures are not available in *Orbis*, we search over Bankers' Almanac and each bank's website.

Third, we sum the direct and indirect shareholding to yield the final controlling rights. See appendix for detailed derivation of ultimate controlling shares.

Table 2 reports descriptive statistics for the variables of bank's stock price informativeness and ultimate control rights across countries. Panel A reports averages for developed countries and Panel B for developing countries. The average relative bank stock price informativeness (*SPI*) varies widely across countries, from a minimum of -0.460 in China to a maximum of 1.403 in Ecuador. From Panel B of the table, banks of developing countries exhibit high levels of concentration of control: the mean level of *UCO* is 33.6%. This is in contrast to banks of developed countries studied by most prior research, which are

[6] *Orbis* database is also publsiehd by *Bureau van Dijk*.

characterized by diffuse ownership and control. Brazil banks display the most concentrated voting rights, 68.8% on average, followed by Columbia banks (59.0%) and Indonesian banks (51.1%). The minimum level of voting rights is 5% across the economies, with the exception of Australia, Japan, Netherlands and Slovakia, where a level of zero indicates the existence of widely held banks. We report average values for country level bank regulation, including activities restrictiveness (*ACR*), official supervisory power (*OSP*) and overall capital stringency (*OCS*) for each country in Table 2.

3.4 Baseline Econometric Model

To test for the effects of ownership concentration on bank's SPI (Hypothesis 1), we specify our model as follows:

$$\begin{aligned} SPI_{i,j,t} = \beta_0 + \beta_1 UCO_{i,j,t} + \eta' \mathbf{Bank\ Characteristics}_{i,j,t} \\ + \phi' \mathbf{Regulation}_{j,t} + \rho' \mathbf{Macro}_{j,t} \\ + \text{C}ountry\ Dummies + Year\ Dummies + \varepsilon_{i,j,t} \end{aligned} \quad (3)$$

where the subscripts *i, j* and *t* represent the bank, the country and the year, respectively. *SPI* is the stock price informativeness (Eq. (2)). *UCO* represents the ownership concentration proxied by the percentage of shares held by the ultimate controlling shareholder. The fixed effects of countries are capture by *Country Dummies* and fixed effects of time is captured by *Year Dummies* is a vector of each year's dummy variable, and the vector's coefficients β_1 are our primary interest of *UCO* and Hypothesis H1 translates as $\beta_1 < 0$. ε is the error term.

Our three vectors of control variables are related to *SPI*. **Bank Characterizes** is the vector of control bank-level variables including *SIZE, OVER*, and *ROA*. *SIZE* is the bank size, defined as the natural logarithm of total assets; *OVER* is bank overhead cost divided by assets; *ROA* is the ratio of net income to total assets, representing bank profitability. Larger S*IZE* can act as leading market indicators for small banks by revealing or signaling macroeconomic event, which results in lower variations in bank-specific fundamentals and *SPI* (Francis et al., 2015). *OVER* reflects variation in employment as well as wage levels, differences in overhead may equally capture differences in banks' revenue diversification and the quality of services

(Demirgüç-Kunt and Huizinga, 1999). Overhead would enter the regression positively if banks with high overhead offer high quality services, and thus can attract more professional arbitrageurs. About *ROA*, similar to Gul et al. (2011), we also control for banks with more profitable that tend to have less informative stock prices using the ratio of net income to total assets.

Furthermore, to reduce country heteroscedasticities, we first control bank regulations and supervisions. **Regulation**, deemed to influence stock price synchronicity. Stressing by the Basel Committee, bank regulation and supervision factors are released by surveys of World Bank for each country in 2001, 2003, 2007, and 2011 (Barth et al., 2008; 2013). Accordingly, three variables are gleaned from previous relevant studies, including Activities Restrictiveness *(ACR)*, Overall Capital Stringency (*OCS)*, and Official Supervisory Power *(OSP)* (Francis et al., 2015).[7] Following Morck et al. (2000), Jin and Myers (2006), and Ferreira and Laux (2007), bank regulation and supervision are known to influence the banking system stability, corporate governance standards, and information transparency of financial markets, which all affect investors' cost-benefit balance of collecting bank-specific information. " The main point we wish to check is whether better regulation and supervision, as measured by three complementary indexes each on capture a different dimension of market empowering quality, may have affected banks' SPI. Hence, we want to prevent our indexes of national governance quality capturing the effects of these regulation and supervision indicators.

MACRO is the control variables related to three different types of macroeconomic variables. First, we control for the level of economic development *(GDP)* using the natural

[7] According to Barth et al. (2004; 2006), *ACR* measures "the extent to which banks are allowed to engage in securities, insurance, and real estate activities", of which a higher value indicates greater restrictiveness. *OCS* measures overall capital stringency which is primarily drawn from the sum of the answers from several survey questions, such as "Is the minimum capital-asset ratio requirement risk weighted in line with the Basel I guidelines?" A higher value of this index indicates greater capital stringency. *OSP* measures "the extent to which supervisory agencies directly monitor and discipline banks" and reflects "whether the supervisory agency has the authority to take specific actions to prevent and correct problems in the banking sector". Higher values indicate more direct supervisory powers.

logarithm of Gross Domestic Product per capita based on Purchasing Power Parity, which may affect stock price synchronicity. Next, we control for domestic inflation *(CPI)* using the deflated Consumer Price Index for each country with the base year 2010. According to Loureiro and Taboada (2012) and Ben-Nasr and Cosset (2014), both *GDP* and *CPI* play an important role in determining the levels of stock price synchronicity. Country and year dummies are also included to control for country and time fixed effects. See Table 1 for the definition of each variable and its sources.

3.5 Nonlinear Model

This section examines the nonlinear relation between ownership concentration and bank SPI (Hypothesis 2). We include a quadratic term, UCO^2, to test this hypothesis. . Our model is specified as follows.

$$\begin{aligned} SPI_{i,j,t} = \beta_0 + \beta_1 UCO_{i,j,t} + \beta_2 UCO^2{}_{i,j,t} + \eta' \mathbf{Bank\ Characteristics}_{i,j,t} \\ + \phi' \mathbf{Regulation}_{j,t} + \rho' \mathbf{Macro}_{j,t} + Country\ Dummies \\ + Year\ Dummies + \varepsilon_{i,j,t} \end{aligned} \quad (4)$$

When their relationship is U-shaped, then $\beta_1 < 0$ and $\beta_2 > 0$. The managerial entrenchment effect dominates when the ownership concentration is smaller than the turning point and when the incentive alignment effect dominates when the concentration ownership exceeds the turning point.

Table 3 provides basic statistics of all variables. The statistics based on annual data for the year 2002 –2014. Our *SPI* measurement has mean and median values of 0.279 and 0.199, respectively. These values are lower than those reported by Ben-Nasr and Cosset (2014), who use non-financial firms sample from 41 countries and report a mean and a median of 0.957 and 0.852, respectively. Hence, stock prices of banks are more likely affected by industry and market information than those of non-financial firms. The *SPI* has a standard deviation of 0.644, demonstrating a wide variation of bank stock price informativeness across countries The mean value of UC is 0.225, which is lower than that of 0.319 reported by Jiang et al. (2014). This

indicates that bank ultimate ownership is more concentrated than ultimate ownership of non-financial firms.

Table 4 presents the pair-wise correlation coefficients between main independent.[8] Banks with larger size of assets tend to have lower ownership concentration and overhead expenses. Banks with highly concentrated ownership, however, tend to have higher overhead expenses. A significantly positive association is shown for correlation between *UCO* and regulation and supervision variables, indicating that ultimate ownership of banks in countries with stronger banking regulations is likely to be more concentrated. Besides, *UCO* variable is negatively correlated with *GDP* and *CPI*, which suggests that an increase in economic growth and domestic inflation rates might reduce banks' ownership concentration.

4. Empirical Results

4.1 Basic model

Table 5 presents the estimation results using pooled OLS. The coefficient on *UCO* is -0.075) and significant at the 10% level, suggesting that banks with high ownership concentration tend to disclose less bank-specific information. The results confirm the expropriation effect that when the controlling shareholders are concentrated, then tend to conceal opportunistic practices, and thus leading to low transparency and low bank-level stock price variation. The result is also consistent with Hypothesis 1 that below a threshold of concentrated ownership, managerial entrenchment effect is higher than incentive alignment effect, under which SPI of banks initially decreases as the percentage of shares held by the largest shareholder increases.

Consistent with Filatotchev et al. (2013) and Bouvatier et al. (2014), we can interpret this evidence as implying that controlling shareholders may use their influence on bank managers'

[8] The matrix of correlations helps us detect problems of potential multicollinearity that could lead to spurious estimation. Our untabulated test results report that variance inflation factors (VIFs) of the explanatory variables range from 1.12 to 1.89 and are hence below the rule of thumb threshold of 10 (Chatterjee and Hadi, 2006). This indicates that multicollinearity is unlikely to be a problem in our estimation.

behavior to manipulate earnings or disclose selected financial information as an effort to hide the extraction of private benefits. The latter non-blockholders access acquiring private information costly and discourage informed trading, diminishing the amount of bank-specific information impounded into stock prices.

The coefficient on *UCO* also indicates that a one-standard-deviation increase in level of controlling ownership is associated with an 8.091% decrease in bank *SPI*.[9] This finding is in line with the findings of Ben-Nasr and Cosset (2014), who find the evidence that state ownership is associated with lower *SPI* by using non-financial firms.

The negative association between ownership concentration and *SPI* is also in the line with Boubaker et al. (2014) and Jiang et al. (2014), who show that a significant control-ownership wedge undermines the firm's information environment, thereby making observed stock prices less informative. They argue that the wedge between the control and cash flow rights creates the conflict of interest between large controlling shareholder and small minority shareholders, through which controlling shareholders may abuse their power and attempt to extract a control premium at the expense of minority shareholders. As a result, controlling shareholders that have incentives to hide any egregious opportunistic behavior tend to opt for poor disclosure policies by either limiting flow of firm-specific information to outsiders or publishing irrelevant or untimely information.

A potential issue with our pooled OLS regressions is cross-sectional dependence. Accordingly, not correcting for this problem may lead to biased standard errors, resulting in incorrect inferences. To resolve this issue, we re-estimate the equation of Model 1 using fixed-effects regression, including bank- and year-fixed effects. As suggested by Allison (2009), "fixed-effects regression automatically eliminates the impact of all preexisting differences,

[9] The mean value of *SPI* in our full sample period is 0.279. The coefficient on *Ownership Concentration* is equal to –0.075. The standard deviation of ownership concentration in our sample is 0.301. A one-standard-deviation increase in Ownership Concentration is associated with an 8.091% decrease in bank *SPI* (–0.075*0.301/0.279 = –8.091%).

which arguably provides the most rigorous causal test outside of experiments". Model 3 of Table 4 provides fixed-effects estimation results as a robustness check of our main results. Although using alternative estimation approach, the results show that the coefficient on *UCO* is negative and statistically significant, in line with our prior finding.

The coefficient is also economically significant, with a one-standard-deviation increase in *UCO* is associated with an 8.739% decrease in *SPI*. This implies that our inferences on the relation between the ownership concentration and bank stock price informativenesss are not affected by our choice of econometric approach.

4.2 Nonlinear Model

Table 5, columns 2 and 4 present the estimated results using OLS and fixed effect estimation for our non-linear specification (Equation 4), respectively. The coefficients of *UCO* remain significantly negative, whereas the coefficients of UCO^2 are 0.466 and 0.449 and both are significant respectively. Hence, a U-shaped curve exists between *SPI* and *UCO*, and the turning point is 41.31%[10]. Hence, *UCO* reduces and increases *SPI* before and after the concentration of 41.31%, respectively. Namely, when ownership concentration is below this threshold, the results support managerial entrenchment effect and when *UCO* exceeds this threshold, the results support incentive alignment effect, supporting Hypothesis 2.

5 Robustness checks: Endogeneity issue

5.1 Endogeneity issue

We also consider the endogeneity issue of our ownership concentration (*UCO)*. For example, ultimate controlling ownership may be governed by unobserved factors that also affect bank-specific variations in bank stock returns, which can lead to inconsistent estimates. The analysis of ownership concentration in the previous section ignores the fact that block

[10] Holding everything else constant, we differentiate *SPI* with respect to ownership concentration and set the first derivative equal to zero. The solution yields the inflection points at 41.31% for Model 2 and at 47.89% for Model 4 of Table 4.

shareholders are not randomly controlled the bank's accounting information. In other words, some large controlling shareholders such as institutions and government agencies may retain a stake in a bank in a strategic industry for monitoring and maintaining financial system stability, which may disclose private information endogenously, and the decision whether or not to provide an internal information available to the market could result in a relationship between ownership concentration and stock price infromativeness. While we address this issue above using bank- and year-fixed effect models, in this section we further minimize potential endogeneity concerns conducting two-stage least squares (2SLS) random effect IV regression.

Table 6, the first two columns present the estimated results of the 2SLS method. The results are in line with our prior finding in which the coefficients of UCO and UCO^2 are -0.466 and 0.357, respectively, and all are significant. Therefore, the U-shaped curve still exists between SPI and UCO and the turning point is 47.34% (Model 2).

5.2 Dynamic panel model

We also consider the lagged dependent variable as one of the dependent variables to examine the robustness of the results. This is because the *SPI* may have persistence effect. We carry out the system generalized-method-of-moments (GMM) as an alternative estimate technique to alleviate the concerns about dynamic panel bias and endogeneity. See Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bonds (1998) discussed applications to dynamic panel model specifications. As suggested by Windmeijer (2005), we carry out the two-step estimator including a finite-sample correction, so that the two-step estimates can be used to gauge the robustness of the results provided by the one-step GMM estimator. To reduce instrumental weakness of the specification, we also follow Roodman (2009) to limit the number of instruments by restricting the lag range used in generating them at four. For this, the GMM instruments are only used to the lagged dependent variable $\left(SPI_{t-1}\right)$, while other variables are considered as strictly exogenous. Finally, we employ the AR(2) test

and Hansen test to check the validity of system GMM estimator. Corresponding to Arellano and Bond (1991), AR(2) test is used for checking the absence of second-order serial correlation in the first-differenced residuals, while Hansen overidentification test is used to check the validity of GMM's entire set of instruments.

The results of dynamic GMM regression are reported in Models 3 – 6 of Table 6. While models 3 and 4 report the estimation results that include the effects of ownership concentration on *SPI* without the lagged dependent variable. The coefficients on *UCO* and UCO^2overall appear to corroborate the key findings reported in Table 4. Specifically, we still find that at lower levels of *UCO*, an increase in *UCO* would have reduced *SPI*; at higher ownership levels, greater *UCO* would have increased *SPI*.[11] This implies that the impacts of *UCO* on bank *SPI* are robust to potential endogeneity concerns. The results of AR(2) second-order serial correlation tests and Hansen test are also reported at the bottom of the Table 6. As can be observed, Models 3 – 6 show the *p*-values of AR(2) tests that range from 0.580 to 0.734, indicating that the null hypothesis of no second-order serial correlation cannot be rejected. The Hansen tests display p-values that range from 0.475 to 0.594, suggesting that the subset of instruments employed is exogenous.

5.3 Bank size: large and small banks

To gauge the reliability of the results across bank sizes, we now deepen the analysis by differentiating the impact of ownership concentration on the SPI between large and small banks. We split the sample into two major groups: large banks and small banks, and use the same estimation method as for prior specifications. In this regard, the group of large banks is set for banks with its assets are greater than US $30 billion, whereas the small bank group consists of banks with its assets are less than or equal to US $30 billion. Table 7 presents the estimate results for the two subsamples of large and small banks. Models (1) and (2) report the results of

[11] The inflection points corresponding to dynamic GMM and 2SLS models are calculated equal to 35.65% and 47.34%, respectively.

SPI regression for large banks, whereas the results for small bank group are reported in models (3) and (4). For all model specifications, the key variables of *UCO* and UCO^2 continues to provide negative and positive significant coefficients, respectively, indicating that the main finding for the U-shaped relation between ownership concentration and bank stock price informativenss is robust to various subsamples. It is worth noting that coefficients of *UCO* and UCO^2 of small banks are more sensitive than large banks'. We find suggest that stock price of large banks are less imformativeness and stock returns are more aligned with the whole market.

5.4 Economic development: developed and developing countries

Table 8 examines whether economic development affect the relationship between ownership concentration and bank stock price informativeness. We still find the U-shaped relation between ownership concentration and bank stock price informativeness in developed and developing countries, but coefficients *UCO* and UCO^2 are more sensitive in developed countries. Our regression results suggest that bank stock returns exhibit more imformativeness (less synchronicity) in countries with developed economics.

6 Conclusion

Motivated by a growing literature providing evidence that corporate governance explains variations in stock returns, we analyze the impact of ownership concentration as a governance mechanism on bank stock price informativeness. We find that ownership concentration would have been a significant determinant of bank stock price informativeness. More interestingly, bank stock price infornamtiveness would have been nonlinearly related to ownership concentration. At lower levels, concentrated ownership would have diminished stock price informativeness. On the other hand, at higher levels, concentrated ownership would have enhanced stock price informativeness. We show the robust evidence that stock price informativeness decreases as concentration increases, up to around 35.65% – 47.89%. Beyond 47.89%, however, the decreasing trend in stock price informativeness tapers off and begins to

increase. Put otherwise, bank stock price informativeness appears to be a concave function of ownership concentration.

While at lower levels of ownership concentration, our results are consistent with the entrenchment hypothesis, complementing findings reported by Jiang et al. (2014) and Boubaker et al. (2014); at higher ownership levels, the results are consistent with the incentive alignment hypothesis, supporting the finding of Brockman and Yan (2009). The finding provides evidence on the role of bank ownership structure in explaining the bank-specific variations in bank stock returns and thus contributes to better understanding the importance of corporate governance in concentrated ownership environments for banking industry.

Appendix. Computation method of ultimate control rights

See Figs. 1 and 2.

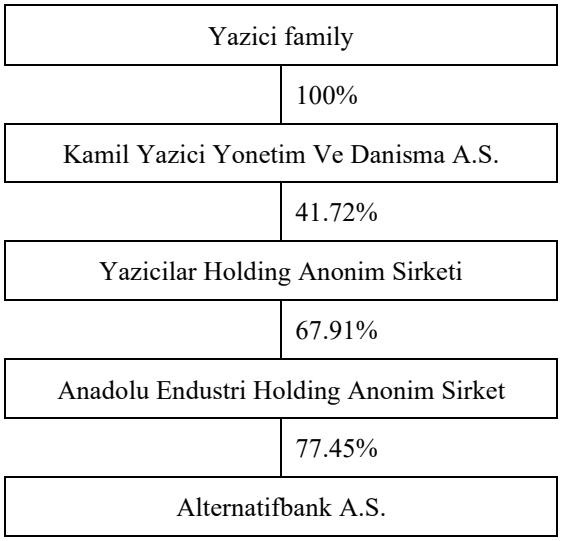

Fig. 1. Stylized example of Alternatifbank A.S ownership pyramid. This figure describes major listed firms controlled by Yazici family. The ultimate cash flow stake (at the 10% threshold) held by Yazici family in Alternatifbank A.S. equals (100% × 41.72% × 67.91% × 77.45%) = 21.94%. The Yazici family's ultimate control stake (at the 10% threshold) is the weakest link in the pyramidal chain. It is min (100%; 41.72%; 67.91%; 77.45%) = 41.72%

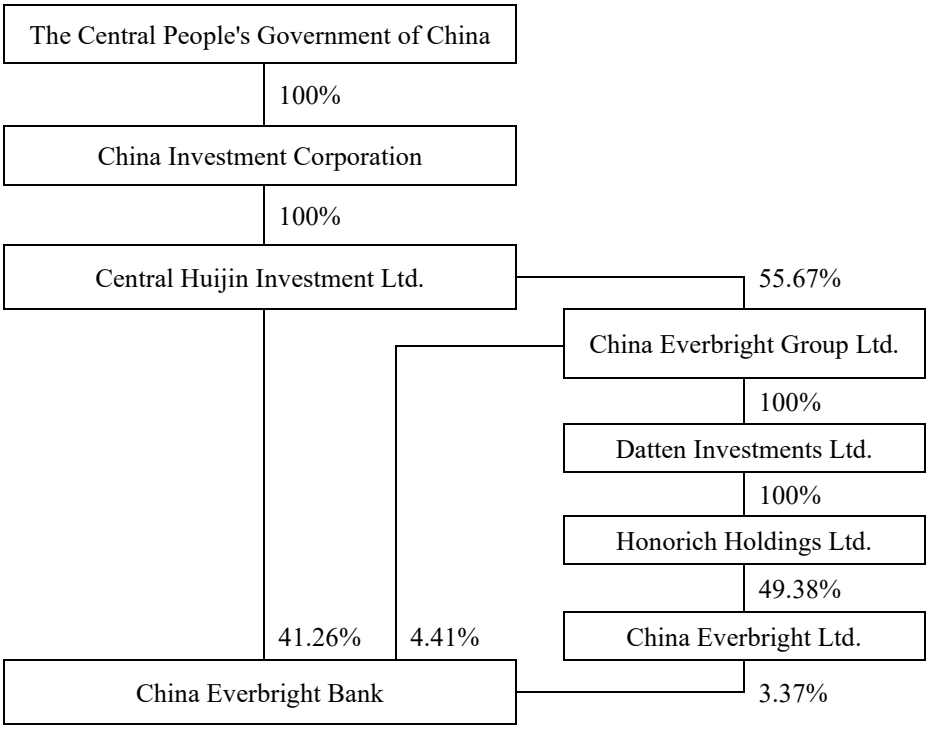

Fig. 2. Stylized example of multiple control chain of China Everbright Bank. This figure describes major listed firms controlled by Government of China. The ultimate cash flow stake (at the 10% threshold) held by Government of China in China Everbright Bank equals 44.64% = 100% × 100% × [41.26% + (55.67% × 4.41%) + (55.67% × 100% × 100% × 49.38% × 3.37%)]. The Government of China's ultimate control stake (at the 10% threshold) is the sum of the weakest links along each control chain. It equals 49.04% = [min (100%; 100%; 41.26%) + min (55.67%; 4.41%) + min (55.67%; 100%; 100%; 49.38%; 3.37%)].

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Table 1
Variables: descriptions and sources.

Variable	Description	Sources
UCO	The ultimate control rights of the largest controlling shareholder.	Authors' calculation based on *Bankscope* and *Orbis*
SPI	Annual bank-specific return variation proxy (log(1 - R^2 / R^2) estimated by regressing the bank's weekly.	Datastream
SIZE	The natural logarithm of the banks total assets in millions of U.S. dollars.	Authors' calculation based on *Orbis*
OVER	The non-interest bank expenses divided by assets.	Authors' calculation based on *Orbis*
ROA	The ratio of net income to total assets.	Authors' calculation based on *Orbis*
ACR	The index of activities restrictiveness, defined by "the extent to which banks are allowed to engage in securities, insurance, and real estate activities".	Barth et al. (2013)
OCS	The index of overall capital stringency, defined by "the minimum capital-asset ratio requirement risk weighted in line with the Basel I guidelines"	Barth et al. (2013)
OSP	The index of official supervisory power, defined by "the extent to which supervisory agencies directly monitor and discipline banks".	Barth et al. (2013)
CPI	The deflated Consumer Price Index for each country with the base year 2010=1.00	World Development Indicators
GDP	The logarithm of the Gross Domestic Product per capita based on Purchasing Power Parity (PPP)	World Development Indicators

Table 2

Descriptive statistics by country. The economic development classification is in the line with World Economic Outlook reported by International Monetary Fund (2012). The definitions of the variables are provided in Table 1.

Countries	*SPI*	*UCO*	*ACR*	*OCS*	*OSP*	No. banks
Panel A – Developed countries						
Australia	-0.128	0.000	7.846	5.538	11.308	7
Canada	0.161	0.019	5.538	2.692	9.385	11
Cyprus	0.116	0.064	7.692	4.308	10.154	3
Denmark	0.572	0.097	7.000	4.846	9.846	18
Finland	0.923	0.081	5.923	4.308	6.692	2
France	0.380	0.002	5.923	4.308	7.846	20
Germany	0.501	0.226	5.000	4.769	9.077	11
Greece	-0.269	0.092	6.923	4.077	10.308	5
Hong Kong	0.358	0.263	6.538	6.462	13.000	5
Ireland	-0.023	0.158	4.692	3.692	10.000	2
Italy	0.089	0.134	7.923	3.385	8.846	20
Japan	-0.241	0.000	8.000	3.462	12.000	50
Korea	0.893	0.424	8.538	2.769	10.538	4
Netherlands	0.042	0.000	0.000	0.000	0.000	5
Norway	0.690	0.025	5.692	5.692	8.154	21
Portugal	-0.039	0.165	6.846	4.923	11.077	3
Slovakia	0.763	0.000	7.385	5.462	12.538	4
Spain	-0.282	0.180	5.000	6.154	9.769	7
Sweden	0.012	0.103	7.538	2.000	6.385	5
Switzerland	0.739	0.300	4.615	5.000	12.769	6
Taiwan	-0.073	0.161	10.000	4.677	13.435	10
United Kingdom	0.064	0.186	1.923	2.615	3.692	13
United States	0.896	0.036	8.308	4.615	13.000	50
Developed countries mean	**0.283**	**0.077**	**6.839**	**4.178**	**10.207**	282
Panel B – Developing countries						
Bahrain	0.775	0.260	7.385	4.308	12.923	10
Bangladesh	0.188	0.497	9.308	2.231	11.692	17
Bosnia and Herzegovina	0.995	0.207	7.692	4.692	13.231	5
Brazil	0.576	0.688	6.077	3.846	13.231	13
Bulgaria	0.222	0.089	6.385	4.769	11.000	3
China	-0.460	0.405	10.231	2.692	10.000	26
Colombia	0.624	0.590	9.385	3.000	12.077	7
Croatia	1.058	0.410	6.000	2.923	11.538	10
Ecuador	1.403	0.270	8.923	5.385	12.923	5
Hungary	-0.190	0.042	7.308	3.538	13.692	2
India	-0.092	0.484	8.769	4.769	10.308	39
Indonesia	0.490	0.511	10.462	4.615	13.000	19
Jordan	0.439	0.377	7.692	4.538	12.846	15
Kenya	0.269	0.149	7.462	5.231	13.308	6
Lebanon	0.717	0.436	7.923	4.538	9.077	5
Malaysia	0.211	0.441	6.769	2.077	11.769	6
Nigeria	0.206	0.011	8.154	4.538	11.000	11
Pakistan	0.105	0.313	8.923	5.231	13.231	16
Peru	0.957	0.114	6.462	3.769	12.615	8

Countries	*SPI*	*UCO*	*ACR*	*OCS*	*OSP*	No. banks
Panel B – Developing countries (continued)						
Philippines	0.447	0.262	5.000	4.769	11.538	11
Poland	0.022	0.101	7.769	2.692	9.154	7
Qatar	0.064	0.153	5.692	5.000	10.000	8
Romania	-0.273	0.126	7.231	2.692	10.231	3
Russian	0.378	0.427	5.692	5.231	7.385	8
Saudi Arabia	-0.151	0.162	8.538	3.000	13.462	11
South Africa	0.726	0.115	6.462	6.462	7.538	3
Sri Lanka	0.043	0.162	8.077	3.769	8.538	12
Tanzania	0.638	0.202	6.385	2.231	13.308	2
Thailand	-0.102	0.055	8.923	2.846	11.231	8
Tunisia	0.450	0.176	8.538	3.385	10.308	9
Turkey	-0.150	0.311	7.615	4.615	12.385	14
Ukraine	0.758	0.276	5.000	4.615	9.846	8
United Arab Emirates	0.561	0.465	7.154	4.462	11.846	19
Venezuela	0.910	0.221	8.000	2.462	12.077	8
Developing countries mean	**0.276**	**0.336**	**7.812**	**4.098**	**11.420**	354
Full sample mean	**0.279**	**0.225**	**7.388**	**4.133**	**10.891**	636
Panel C – Means by country characteristics						
Developing countries	0.283	0.336				
Developed countries	0.276	0.077				
Difference	-0.007	0.259				
t-stats	*-0.45*	*43.49****				

Notes: Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 3

Descriptive statistics for regression variables. The definitions of the variables are provided in Table 1.

Variable	Mean	SD	Median	Minimum	Maximum
SPI	0.279	0.644	0.199	-2.093	3.523
UCO	0.225	0.301	0.000	0.000	1.000
SIZE	9.024	2.246	9.043	0.043	15.153
OVER	0.031	0.052	0.021	0.000	1.792
ROA	0.011	0.044	0.010	-1.480	0.786
ACR	7.387	2.079	8.000	0.000	12.000
OCS	4.133	1.559	4.000	0.000	8.000
OSP	10.892	2.621	12.000	0.000	14.000
CPI	0.934	0.203	0.968	0.184	3.482
GDP	4.088	0.641	4.235	2.722	5.165

Notes: The overall sample is an unbalanced panel which consists of 6975 bank-year observations (636 commercial banks), covering 13 years period 2002–2014.

Table 4

Correlation coefficients. The definitions of the variables are provided in Table 1.

	SPI	*UCO*	*SIZE*	*OVER*	*ROA*	*ACR*	*OCS*	*OSP*	*CPI*	*GDP*
SPI	1.000									
UCO	0.055***	1.000								
SIZE	-0.401***	-0.162***	1.000							
OVER	0.161***	0.074***	-0.314***	1.000						
ROA	-0.009	0.008	-0.005	-0.107***	1.000					
ACR	-0.094***	0.129***	0.012	-0.101***	-0.026**	1.000				
OCS	0.106***	0.001	-0.062***	-0.011	-0.007	0.057***	1.000			
OSP	0.065***	0.092***	-0.090***	-0.076***	0.032***	0.427***	0.238***	1.000		
CPI	-0.023*	-0.047***	0.251***	-0.056***	-0.069***	0.024**	0.091***	-0.040***	1.000	
GDP	0.098***	-0.351***	0.337***	-0.056***	-0.011	-0.360***	0.041***	-0.177***	0.212***	1.000

Notes: Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5
This table reports pooled OLS and FE regression results of the effect of ownership concentration on bank stock price informativeness for a sample of 636 commercial banks from 2002 to 2014. The definitions of the variables are provided in Table 1.

	Dependent variable: *SPI*			
	OLS		FE	
Independent variables	(1)	(2)	(3)	(4)
Intercept	1.145	0.902	1.155	1.084
	(0.644)	(0.518)	(1.630)	(1.492)
UCO	-0.075*	-0.385***	-0.081*	-0.430***
	(-1.787)	(-4.690)	(-1.891)	(-4.130)
UCO^2		0.466***		0.449***
		(6.692)		(3.626)
SIZE	-0.129***	-0.128***	-0.117***	-0.116***
	(-6.536)	(-6.439)	(-11.53)	(-10.64)
OVER	-0.507**	-0.496**	-0.374**	-0.372**
	(-2.196)	(-2.170)	(-2.513)	(-2.504)
ROA	-0.620*	-0.598*	-0.435***	-0.420***
	(-1.754)	(-1.685)	(-3.234)	(-3.127)
ACR	-0.006	-0.007	-0.008*	-0.008*
	(-0.751)	(-0.811)	(-1.806)	(-1.828)
OCS	-0.002	-0.002	-0.002	-0.002
	(-0.175)	(-0.157)	(-0.456)	(-0.388)
OSP	-0.011**	-0.010**	-0.010***	-0.009**
	(-2.564)	(-2.326)	(-2.676)	(-2.471)
CPI	0.202**	0.195**	0.225***	0.236***
	(2.633)	(2.560)	(4.957)	(5.375)
GDP	0.072	0.114	0.013	0.022
	(0.193)	(0.300)	(0.116)	(0.143)
Country	YES	YES	YES	YES
Year	YES	YES	YES	YES
R^2	0.519	0.521		
observations	6975	6975	6975	6975

Notes: Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. *t*-Values are shown between brackets.

Table 6

This table reports 2SLS and two-step system GMM regression results of the effect of ownership concentration on bank stock price informativeness for a sample of 636 commercial banks from 2002 to 2014. The definitions of the variables are provided in Table 1.

	Dependent variable: SPI			
	2SLS		Dynamic GMM	
Independent variables	(1)	(2)	(3)	(4)
Intercept	0.849	0.750	0.919	0.680
	(1.205)	(1.063)	(1.080)	(0.808)
SPI_{t-1}			0.040***	0.042***
			(2.644)	(2.790)
UCO	-0.101**	-0.338***	-0.077*	-0.837***
	(-2.289)	(-3.687)	(-1.815)	(-5.314)
UCO^2		0.357***		1.174***
		(3.285)		(5.694)
SIZE	-0.123***	-0.122***	-0.124***	-0.121***
	(-13.10)	(-12.60)	(-9.557)	(-10.26)
OVER	-0.403***	-0.401***	-0.556***	-0.394***
	(-2.819)	(-2.807)	(-3.511)	(-3.170)
ROA	-0.464***	-0.456***	-0.327**	-0.400**
	(-3.572)	(-3.508)	(-2.057)	(-2.298)
ACR	-0.006	-0.006	-0.010*	-0.008*
	(-1.374)	(-1.393)	(-1.950)	(-1.784)
OCS	-0.002	-0.001	0.003	0.001
	(-0.364)	(-0.325)	(0.627)	(0.109)
OSP	-0.009**	-0.009**	-0.009**	-0.011**
	(-2.491)	(-2.372)	(-2.032)	(2.422)
CPI	0.209***	0.207***	0.197***	0.208***
	(4.882)	(4.826)	(3.061)	(3.994)
GDP	0.087	0.107	0.203	0.266
	(0.572)	(0.703)	(0.919)	(1.393)
Country	YES	YES	YES	YES
Year	YES	YES	YES	YES
R^2	0.518	0.520		
observations	6975	6975	6317	6317
P-value AR(2) test			0.682	0.580
P-value Hansen test			0.530	0.476

Notes: Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. *t*-Values are shown between brackets.

Table 7
This table reports FE regression results of the effect of ownership concentration on bank stock price informativeness for a sample of 636 commercial banks from 2002 to 2014. Models (1) and (2) show the estimated results for large banks, while models (3) and 4) provide the regression results for small banks. The definitions of the variables are provided in Table 1.

	Dependent variable: *SPI*			
	Large banks		Small banks	
Independent variables	(1)	(2)	(3)	(4)
Intercept	2.227*	2.329**	3.198***	3.005***
	(1.948)	(2.037)	(3.131)	(2.940)
UCO	0.037	-0.183**	-0.120**	-0.526***
	(0.575)	(-2.029)	(-2.531)	(-4.315)
UCO^2		0.298***		0.434***
		(2.667)		(3.023)
SIZE	-0.073***	-0.073***	-0.124***	-0.124***
	(-4.049)	(-4.077)	(-11.64)	(-11.63)
OVER	-0.627**	-0.610**	-0.368**	-0.368**
	(-2.342)	(-2.333)	(-2.319)	(-2.321)
ROA	-0.842	-0.867	-0.366**	-0.354**
	(-1.129)	(-1.147)	(-2.566)	(-2.486)
ACR	-0.008	-0.007	-0.011*	-0.011**
	(-0.892)	(-0.804)	(-1.943)	(-1.978)
OCS	0.051***	0.052***	-0.020***	-0.020***
	(6.826)	(6.874)	(-3.441)	(-3.415)
OSP	-0.024***	-0.023***	-0.001	0.001
	(-4.327)	(-4.287)	(-0.178)	(0.048)
CPI	0.193**	0.204**	0.279***	0.278***
	(1.986)	(2.096)	(4.827)	(4.804)
GDP	0.412	0.440*	-0.295	-0.257
	(1.629)	(1.737)	(-1.354)	(-1.177)
Country	YES	YES	YES	YES
Year	YES	YES	YES	YES
Observations	2116	2116	4859	4859

Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. *t*-Values are shown between brackets.

Table 8
This table reports FE regression results of the effect of ownership concentration on bank stock price informativeness for a sample of 636 commercial banks from 2002 to 2014. Models (1) and (2) show the estimated results for developed countries, while models (3) and (4) provide the regression results for developing countries. The definitions of the variables are provided in Table 1.

	Dependent variable: *SPI*			
	Developed countries		Developing countries	
Independent variables	(1)	(2)	(3)	(4)
Intercept	-1.102	-1.256	2.405***	2.329***
	(-1.341)	(-1.435)	(2.979)	(2.891)
UCO	0.038	-0.190*	-0.124**	-0.562***
	(0.594)	(-1.800)	(-2.347)	(-4.194)
UCO^2		0.281*		0.484***
		(1.713)		(3.139)
SIZE	-0.102***	-0.104***	-0.114***	-0.112***
	(-9.020)	(-9.200)	(-10.72)	(-10.64)
OVER	-0.305**	-0.312**	-0.667**	-0.613**
	(-1.969)	(-2.022)	(-2.516)	(-2.394)
ROA	-0.482***	-0.462***	-0.356*	-0.350*
	(-2.708)	(-2.594)	(-1.890)	(-1.863)
ACR	-0.014*	-0.013	-0.008	-0.008
	(-1.665)	(-1.620)	(-1.394)	(-1.461)
OCS	0.005	0.006	-0.020***	-0.020***
	(0.811)	(0.829)	(-3.061)	(-3.024)
OSP	-0.016***	-0.015***	0.005	0.004
	(-3.133)	(3.023)	(1.460)	(1.392)
CPI	0.619***	0.641***	0.201**	0.206**
	(4.721)	(4.832)	(2.014)	(2.120)
GDP	0.342	0.372	-0.078	-0.089
	(1.469)	(1.555)	(-0.286)	(-0.304)
Country	YES	YES	YES	YES
Year	YES	YES	YES	YES
Observations	3381	3381	3594	3594

Notes: Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. *t*-Values are shown between brackets.