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# What Determines Bank Stock Price Synchronicity?
# Global Evidence

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This paper examines what institutional and bank-specific factors determine bank stock price synchronicity. Using data on 37 countries from 1996-2007, we find that bank stocks are more aligned with the whole market (1) during the financial crisis; (2) in countries that have more credit provided by banks; (3) in countries that do not have explicit depository insurance; and (4) in countries that have lower bank-level disclosure. The results hold for both emerging and developed economy subsamples. Furthermore, in emerging economies, bank stocks in countries with higher degree of state-owned bank are more synchronized with the whole market, similarly, in developed markets, lower banking freedom enhances bank stock price synchronicity. Finally, the effects of state ownership, protection of property rights, and bank size are all more pronounced when determining bank stock price synchronicity during the financial crisis period.

**Keywords:** stock price synchronicity; financial crisis, bank ownership; deposit insurance; banking freedom; bank disclosure

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## 1. Introduction

In recent years, finance and economics literature has shown increasing interest in the determinants of business firms' stock price synchronicity (e.g., Morck et al, 2000; Jin and Myers, 2006). However, precisely what factors influence stock price synchronicity in the banking industry remains an open question. Such a question demands an answer, as banks are a major and significant source of financing in economies around the world, and perform important functions, such as the allocation of resources, firm monitoring, and the promotion of economic growth (see Levine, 2005 for a survey). In this study, we attempt to answer this question by examining what institutional and bank-specific factors determine bank stock price synchronicity.

This research question is very important because of the following reasons. First, the extant literature (e.g., Durnev et al., 2004; Tehranian et al., 2009; Wurgler, 2000) has found that high firm-specific stock return variation or low stock prick synchronicity can enhance the efficiency of capital allocation, reduce the cost of capital, and decrease crash risk by alleviating information asymmetry problems for business firms. However, the role of lower stock price synchronicity in reducing information asymmetry is more important for the banking industry, as it is one of the most opaque industries (Morgan, 2002). Specifically, banks' financial statements are difficult to read and evaluate, especially for outside investors, because bank loans are customized, privately negotiated agreements (Greenspan, 1996). Extremely complex financial derivatives make this situation even worse.[2] Thus, for banks with publicly traded securities, stocks provide the most obvious

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[2] On Oct.28, 2008, Dr. Andrew Lo, a MIT professor, testified before Congress that the recent financial crises are partly a result of the fact that we do not have enough well-trained financial experts to evaluate new financial innovations.

and direct source of market information about the conditions of those banks.[3] Similar to business firms, capital markets use a bank-specific stock return variation to reflect the performance of a particular bank. Moreover the banking industry is a highly regulated industry when compared with other major industries. Supervisory systems need bank-specific information content in bank stock price to assess the condition of the bank before implementing any disciplinary action (Meyer, 1999 and Greenspan, 2001).[4]

There are large variations in the extent to which bank stocks synchronize with the whole market. That bank stock price movements are more aligned with the whole market suggests that bank stock returns are less influenced by bank-specific information (Roll, 1988). For example, as shown in Panel A of Figure 1, in the U.S., in the period before the government bailed out Wachovia in 2008, the bank's stock price had a huge negative deviation from the Dow Jones Index.[5] This result suggests that the downward bank-specific variation of its stock price already reflected Wachovia's recent poor performance and high probability of bankruptcy. In contrast, as shown in Panel B of Figure 1, one of the big four banks in China, Bank of China, has maintained a stock price alignment with the whole market even after *The New York Times* reported its heavy exposure to the subprime crisis. There is no significant bank-specific variation of its stock return, which implies that very little of Bank of China's recent financial information is reflected in its stock price.

More importantly, unlike nonfinancial sectors, some level of comovements within banking sector stocks may be optimal if banks are actively engaging in trade and offer

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[3] The majority of big banks are listed in stock exchanges. For example, in 1995, U.S. banks with stock trading held three-quarters of the total assets of the U.S. banking system (Flannery, 1998).
[4] For example, the Federal Reserve Board considers market information such as stock prices and interest rate spreads as activities related to bank supervision (Federal Reserve Study Group on Disclosure, 2000).
[5] When we use the S&P 500 index as the market index, the result is similar.

diversified risk for one another. From a policy perspective it quickly becomes clear that it is not wise to only push bank stocks to have lower and lower stock price synchronicity, as might be optimal with business firms. Thus it is worthwhile to revisit this research question in the banking industry by examining the institutional and bank specific factors that influence bank stock price synchronicity around the world.

We propose several predetermined institutional and bank specific factors as sources of bank stock price synchronicity based on the existing literature. These factors are: (i) a financial crisis; (ii) credit provided by banks; (iii) the existence of explicit deposit insurance; (iv) bank-level and country-level disclosure; (v) bank ownership structure; and (vi) banking freedom. We expect some of these variables to exhibit symmetric effects on bank stock price synchronicity in emerging markets and developed markets, while other variables will exhibit asymmetric effects. We therefore investigate how each category of variable affects a particular bank's stock price synchronicity with the whole market.

In terms of empirical methodology, we collect bank data from 37 countries over the period 1996-2007 and measure bank stock price synchronicity by $R^2$ statistics of the expanded market model. First, we aggregate bank-level $R^2$ into the country-level dependent variable and examine the impact of the institutional factors. We then estimate similar regressions using bank-level data in order to control for the effect of bank-specific factors. Finally, we break down our sample into an emerging economy subsample and a developed country subsample. We re-estimate our equations to check whether our results still hold in subsamples and with different regression specifications.

We find that bank stocks are more aligned with the whole market during the financial crisis period. This may suggest that financial contagion effects and government bailouts in the financial crisis period increase fundamentals co-movement. We also find that countries with a greater degree of credit provided by banks have higher bank stock price synchronicity. This may suggest that banks wield significant influence over the entire economy as the dominant finance suppliers in these countries. Our next finding is that banks in countries with explicit deposit insurance have more bank-specific stock return variation. This may suggest that protected banks can pursue more diverse business lines that will result in greater firm-specific outcomes.

We also find that bank-level disclosure can reduce bank stock price synchronicity. This is consistent with the findings by Jin and Myers (2006). However, we did not find a significant relationship between the country-level disclosure index and bank stock price synchronicity, which is consistent with the findings of Morck et al. (2000). We argue that the inherent opacity of banks insulates them from the requirement of the country-level disclosure standards.

Our next finding is that emerging countries with higher degree of state-owned bank have higher bank stock price synchronicity. This may suggest that government ownership of banks is associated with poor corporate governance and lower transparency, which can increase stock price synchronicity (Ferreira and Laux, 2007; Morck et al., 2000; Jin and Myers, 2006). In addition, government ownership also conveys considerable protection from performance risk, which will absorb bank-specific variations.

We also find that in developed markets, higher banking freedom decreases bank stock price synchronicity. This is consistent with the notion that banks that pursue more diverse operations (and maintain greater freedom to pursue non-traditional activities) will enjoy (or suffer) greater firm-specific outcomes. There is no such effect on banking freedom as seen in the emerging market subsample. It seems that there is a threshold effect. A certain level of property rights is a prerequisite for banking freedom to result in enhancement of bank-specific stock return variations.

Our final finding is that the effects of state ownership, protection of property rights, and bank size are more pronounced when determining bank stock price synchronicity during the financial crisis period. This may suggest that a crisis could lead investors to increasingly value the protection of property rights (Rajan and Zingales, 1998), and that large banks are more likely to be supported by the government.

This paper makes several important contributions to the existing literature, although we acknowledge that our interpretation remains a conjecture and that other explanations may exist. First, our research expands on the emerging empirical literature on the determinants of stock price synchronicity, as pioneered by Morck et al. (2000). Morck et al. demonstrate that stock price synchronicity is higher in countries that have weaker public investor property rights. Jin and Myers (2006) indicate that besides poor governance, the opacity of firms may result in stock prices failing to accurately reflect specific information and events occurring in the firm. Moreover, "opaque" stocks are more likely to crash (Tehranian et al., 2009). Jin and Myers (2006) also point out that future research may need to focus on one single industry to find more concrete factors to

explain the stock price synchronicity. This is because the degree of opacity may vary across industries in a country. In following this line of thinking, our article focuses on a single industry and examines the specific factors that influence worldwide bank stock price synchronicity.

Additionally, our results contribute to the literature about government supervision of the banking industry, one of the very most opaque industries (Morgan, 2002). Regulators are more interested to use market-related oversight to supplement their own supervision (Greenspan, 2001). For example, the Federal Reserve Board includes market information such as stock prices and interest rate spreads in activities related to bank supervision (Federal Reserve Study Group on Disclosure, 2000). This suggests that the process of enhancing bank-specific information content in the bank stock price becomes an important policy question, as it makes the bank supervisory system more effective in overcoming the inherent opacity of the banking industry.

Finally, our results contribute to the literature about the market discipline of the banking industry. Government regulations and market provides alternative devices for supervising banking firms (Meyer, 1999). A high degree of bank stock informativeness can reduce the information asymmetry between investors and banks, which will consequently enhance the efficiency of capital allocation, reduce the cost of capital, and decrease the crash risk for these financial firms. For business firms, the existing literature (Durnev et al., 2004; Wurgler, 2000) shows that firms' capital budgeting and capital allocation are more efficient when firm-specific return variation is larger. Chen et al. (2006) argue that managers use the private information incorporated in stock price to make corporate investment decisions. For the banking industry, numerous studies have

shown that markets can accurately reflect bank conditions and bank investors can rationally make their equity trading decisions based on announced banking problems (Musumeci and Sinkey, 1990; Karafiath, et al., 1991; Aharoney and Swary, 1996). Ellis and Flannery (1992) further argue that information on bank stock price can also be reflected by the bank's operations, as based on the finding that the information in the bank stock price can be immediately incorporated into bank CD rates. To the best of our knowledge, this paper is the first to examine the factors that influence bank specific stock price variations, which is the first step toward studying how effectively market discipline impacts bank efficiency.

This paper is organized as follows. Section 2 presents the criteria followed in the construction of the bank stock price synchronicity measure and the control variables, and provides summary statistics. Section 3 presents the estimation methodology and the empirical results. Finally, we present our conclusions in section 4.

**2. Data**

We now investigate the bank-specific and economy-wide factors that influence bank stock price synchronicity. In this section, we discuss the variables used in our analysis. The definition of the variables and their respective sources are also presented in the Appendix.

**2.1. Description of bank stock price synchronicity variables**

Following the extant literature (e.g., French and Roll, 1986; Roll, 1988; Morck et al., 2000), we use $R^2$ statistics of the expanded market model to measure stock price synchronicity.

$$r_{it} = \alpha_i + \beta_{1,i} r_{ind,jt} + \beta_{2,i} r_{m,jt} + \beta_{3,i}[r_{US,t} + e_{jt}] + \varepsilon_{it} \qquad (1)$$

In Equation (1), $i$ is the bank index, $j$ is the country index, $t$ represents a one-week period time index. $r_{it}$ represents the weekly rates of return (Wednesday to Wednesday). We calculate Wednesday to Wednesday return to avoid thin trading problems and the potential seasonal effect such as the Monday Effect using DataStream's total return index. Stocks that do not have 30 weeks trading data during a particular year are excluded. The stock returns are trimmed at ± 25% to exclude coding errors in DataStream. $r_{ind,jt}$ is the value-weighted banking industry index, excluding the bank in question. This exclusion prevents spurious correlations between individual bank and banking industry returns if the banking industry contains few banks. To construct the banking industry index, country-year observations with less than 3 banks are excluded. $r_{m,jt}$ is the domestic market index return, and $r_{US,t}$ is the U.S market return.[6] We use one-day lag U.S. market returns to deal with time zone differences for stock markets in the Far East. The rate of change in the exchange rate per U.S. dollar is $e_{it}$. When we calculate Equation (1) using U.S. data, we set $\beta_{3,i}$ to zero.

The regression statistic for Equation (1), $R_i^2$, measures the percentage of the variation in the weekly returns of bank stock $i$, explained by the variation in the banking industry return, the domestic market return, and the U.S. market return. (1- $R_i^2$) measures

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[6] We calculate the domestic market index returns using DataStream's associated market index and calculate the U.S market return using the S&P 500 index.

how much bank-specific stock return variation. Given this statistic for each bank $i$ in country $j$, we aggregate $R_i^2$ into country-level stock price synchronicity measure following Jin and Myers (2006) and Morck et al. (2000). Specifically, we define

$$R_j^2 = \frac{\sum_i R_{i,j}^2 * SST_{i,j}}{\sum_i SST_{i,j}} \tag{2}$$

where $SST_{i,j}$ is the sum of squared total variations.

Because $R_i^2$ and $R_j^2$ are both bounded within the interval [0, 1], we apply logistic transformations to it as shown in Equation (3) and (4).

$$SYNCH_i = \log(\frac{R_i^2}{1 - R_i^2}) \tag{3}$$

$$SYNCH_j = \log(\frac{R_j^2}{1 - R_j^2}) \tag{4}$$

## 2.2. Plausible sources of bank stock price synchronicity

In the context of the banking industry, there are several factors that might influence bank stock price synchronicity besides the existing determinants for nonbank firms.

### 2.2.1. Financial crisis

In the financial crisis period, the fundamentals of the banking sector are more correlated because of financial contagion effects, and this increased correlation may cause bank stock prices to move more synchronously. One of the classical ways for the government and central banks to respond to crises is to bail out the whole banking system. This will also increase fundamentals co-movement. Thus, we speculate that bank stock

price synchronicity will rise during crises. We create a variable *Crisis* based on the database provided by Laeven and Valencia (2010). It is equal to one if there is a banking crisis in a specific year and a given country, and zero otherwise.

### 2.2.2. Credit provided by banks

If banks are dominant finance suppliers in a country, they will have a strong influence on the entire economy, and their exposure to large client firms may create stronger comovements. Thus bank stocks in a country where banks provide a higher degree of credit toward the country's economic development efforts may exhibit higher synchronicity with the whole market. We create a variable *Credit by Banks* using a country-level index of domestic credit provided by the banking sector (Percentage of GDP) from the World Development Indicator Database.

### 2.2.3. Banking freedom (Regulations)

Banking freedom means relative openness of the banking systems of a country. For example, the banking systems have more freedom if there are fewer restrictions and banks are able to operate freely (Barth et al., 2001). If these banking restrictions keep banks from entering lines of business that are too risky for them to operate, a banking system with greater restrictions may be more stable and transparent. Thus, this results in fewer bank failures and further reduces fundamentals comovement due to financial contagions. If, however, restrictions prevent banks from diversifying outside their traditional lines of business (which may have more growth potential), they may cause the banks to have a uniform growth pattern. This further reduces the bank-specific variation

in bank stock price and increases bank stock price synchronicity because banks pursuing more diverse operations (greater freedom to pursue non-traditional activities) will enjoy (or suffer) greater firm-specific outcomes. Therefore, the effects of banking freedoms and restrictions need further empirical investigation. To this end, we deploy a general measure of the degree of restrictions in the banking industry (*Banking Freedom*). The data for this source comes from the Heritage Foundation.

### 2.2.4. Government and foreign ownership

The banking literature concludes that ownership matters. Government ownership of banks in particular is thought to be less efficient than private ownership (Bonin et al., 1998; Barth et al., 2001). One such reason is that government ownership of banks is associated with poor corporate governance and lower transparency (see Megginson, 2005 for a survey), both of which will increase stock price synchronicity (Ferreira and Laux, 2007; Morck et al., 2000; Jin and Myers, 2006). In addition, the government is more likely to bail out state-owned banks when they are in trouble. Thus, government ownership also conveys considerable protection from performance risk, which will absorb bank-specific variations and increase bank stock price synchronicity. In our paper, we employ a country-level index *State Ownership* from Barth et al. (2005), which is measured as the percentage of banking assets in banks that are fifty percent or more government-owned.

Foreign-owned banks may also have a greater ability to diversify risks by offering some services to multinational clients that are not easily offered by domestically-owned banks. Such offerings will also cause foreign-owned banks to enjoy (or suffer) greater

firm-specific outcomes. We therefore expect that bank stock price synchronicity will tend to be lower in countries dominated by foreign banks. In our paper, we employ a country-level index *Foreign Ownership* from Barth et al. (2005), which is measured as the percentage of banking assets in banks that are fifty percent or more foreign-owned.

### 2.2.5. Deposit insurance

Deposit insurance systems are designed to protect small depositors and to avoid systemic bank crises, which will absorb bank-specific results and make bank stock price increasingly synchronous with the market. In addition, explicit deposit insurance reduces depositors' incentives to monitor banks. Bank managers may take advantage of such circumstances by engaging in excessive risk-taking activities (Demirguc-Kunt and Detriagiache, 1999). Such activities may create moral hazard and opacity problems for banks and lead to an increase in bank stock price synchronicity. However, Soledad et al. (2001) find that explicit deposit insurance does not necessarily reduce market discipline. In addition, the protected banks can pursue more diverse business lines that may result in a greater degree of firm-specific outcomes, which will decrease bank stock price synchronicity. In this paper, we add a deposit insurance dummy variable (*Deposit Insurance*) to our regression to test the effect of the existence of the deposit insurance mechanism on bank stock price synchronicity. We obtain this variable from Barth et al. (2005).

### 2.2.6. Financial disclosure

Jin and Myers (2006) argue that firm disclosure affects the proportion of risk responsibility assumed by the management team and investors, and correspondingly increases stock price synchronicity by shifting firm-specific risk to the management team. To test this argument in the banking industry, we obtain this measure (*Country Disclosure*) from La Porta et al. (1998), who describe the construction of this index as follows: "This index was created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. These fall into seven categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). A minimum of 3 companies in each country were studied. The companies represent a cross section of various industry groups where industrial companies numbered 70% while financial companies represented the remaining 30%".

We also employ a bank-level financial disclosure measure to test a similar conjecture. Following Nier (2005), we create a bank disclosure index (*Bank Disclosure*). Specifically, we classify a bank's annual financial reports into seventeen dimensions of accounting items. If a bank reports more dimensions, it indicates more disclosures.[7]

### 2.2.7. Control variables

Finally, we control for other national and bank-specific characteristics that the literature has identified as being closely linked to our measure of stock price

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[7] Although this index can only measure the presentation of financial reports, Lang and Lundholm (1993) find that annual report disclosure levels are highly correlated with the amount of disclosures provided via other media. Using this index, Nier and Baumann (2006) find that enhanced bank disclosure reduces banking sector risks.

synchronicity (Morck et al., 2000; Piotroski and Roulston, 2004; Chan and Hameed, 2006; Ferreira and Laux, 2007).

(1) Number of stocks listed (*Number of Stocks Listed*): Higher synchronicity might simply reflect fewer traded stocks. Thus, we define the variable *Number of Stocks Listed* as the number of securities in a country's stock market based on DataStream data.

(2) GDP per capita (*GDP per capita*): Higher synchronicity might be attributed to lower economic development. Thus, we define the variable *GDP per capita* as the logarithm of GDP per capita (constant 2000 US$), which is from the World Development Indicator database.

(3) Variance in GDP growth (*Variance in GDP Growth*): Higher synchronicity might result from higher macroeconomic instability. Specifically, if GDP volatility is a cause of market volatility, it will lead to greater dispersion in the right-hand side variables in the Equation (1), and thus necessarily increase stock price synchronicity. The variable *Variance in GDP Growth* is measured as the variance of the previous four year GDP per capita growth. [8] GDP per capita data is from the World Development Indicator database.

(4) Good government index (*Good Government Index*): Higher synchronicity might simply reflect a lesser protection of property rights. We use the variable *Good Government Index* to measure it. This variable is the sum of the three variables from La Porta et al. (1998) including government corruption, the risk of expropriation of private property by the government and the risk of the

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[8] When we replace variance in GDP growth with variance in inflation rate, the result does not qualitatively change.

government repudiating contracts. High values for each variable indicate more protection for private property.

(5) Banking industry Herfindahl index (*Industry Concentration*): The banking industry in some economies may be dominated by a few very large banks, and this may cause a high degree of bank stock price synchronicity. To capture these effects, we construct a banking industry Herfindahl index for each country using banks' total assets. High values of the banking industry Herfindahl indexes indicate respectively the dominance of a few large banks.

(6) Bank size (*Size*): Stocks of large banks are more likely to be aligned with the whole market because they usually have more influence on the whole market and less opacity. We construct the variable *Size* as measured by the logarithm of total assets to control for this effect, which is from Bankscope.

(7) Number of analyst following (*Analyst*): Stocks which are covered by more analysts are more aligned with the whole market (Piotroski and Roulston, 2004; Chan and Hameed, 2006). To control for this effect, we define the variable *Analyst* as the number of analysts who issued earnings forecasts for a bank during a given calendar year, which is obtained from the IBES database.

(8) Annual trading volume turnover (*VOL*): Actively traded stocks have higher stock price synchronicity because they can quickly incorporate market information. We define the variable *VOL* as the total number of shares traded in a year, scaled by the total number of shares outstanding at the end of fiscal year, which is from DataStream.

(9) Earnings volatility (*STDROA*): Bank-level performance will be less correlated with the whole market when the volatility of the bank's profitability increases. We define the variable *STDROA* as the standard deviation of a bank's ROAs over the preceding five-year period. We obtain the ROA data from Bankscope.

(10)   Market-to-book ratio (*M/B*): The bank with more growth opportunity is hard to evaluate and has more information asymmetry problems. We define the variable *M/B* as market value of total assets divided by book value of total assets. Market value of total assets is the sum of market value of equity and total liability. We obtain these data from Bankscope.

We also control for some variables that may influence banks' opacity.

(1) Loan-to-Asset Ratio (*Loan-to-Asset Ratio*): It is usually more difficult to assess and value loans than other assets. A high loan-to-asset ratio thus could increase opacity. It is defined as net total loan divided by book value of total asset, which is from Bankscope.

(2) Equity-to-Asset Ratio (*Equity-to-Asset Ratio*): Financial leverage may increase asset quality uncertainty. This ratio is defined as total equity divided by total assets, which is from Bankscope.

(3) Loan Growth (*Loan Growth*): Faster loan growth usually is associated with more risky assets and greater opacity. The rate is defined as total loan growth rate, which is from Bankscope.

## 2.3. Descriptive statistics

After matching the available information for dependent and explanatory variables, we end up with a sample size of 729 banks across 37 countries over the period of 1996-2007. The sample constitutes over 90 percent of total banking assets of all countries and incorporates all major and important financial institutions. U.S. banks dominate our sample and constitute 44 percent of the whole sample, which motivates us to complete robustness tests in the sample without U.S. banks when we estimate using bank-level data. All variables are winsorised at the 1st and 99th percentiles to avoid the effects of outliers. We report the summary statistics for the variables used in our empirical analysis in Table 1. From summary statistics of Table 1, there perists a great deal of variation across countries in terms of bank stock price synchronicity. The minimum value of $R^2$ is 0.003 and the maximum value of $R^2$ is 0.567. The standard deviation of $R^2$ is 0.109. The summary statistics of other variables are consistent with the results reported in the existing literature.

Insert Table 1 about here.

We report country-level variable correlations in Table 2. The results show that countries that are less credit provided by banks, have more banking freedom, maintain explicit deposit insurance, and have a lower percentage of state-owned banks experience less bank stock price synchronicity. For the control variables, we observe that countries with higher economic growth, lower macro instability, superior property right protection, and lower industry concentration have less bank stock price synchronicity. These results are consistent with our predictions. The non-significant statistical correlation between bank stock price synchronicity and country-level disclosure standards shows that country-level disclosure standards do not help significantly, which is consistent with Morck et al.

(2000). We report bank-level variable correlations in Table 3. The results show that stocks of those banks with higher financial disclosure are observed as less aligned with the market. We also note that larger banks, banks with more analyst following, banks with less liquid stocks, banks with a low standard deviation of ROA, and banks with more growth opportunity are more aligned with the market.

<div align="center">Insert Table 2 about here.</div>

<div align="center">Insert Table 3 about here.</div>

## 3. Empirical results

In this section, we first report the results for the impact of institutional factors on bank stock price synchronicity using country-level data. We also report the results for the impact of institutional and bank-specific factors on bank stock price synchronicity using bank-level data. Besides the institutional factors mentioned above, we add a series of bank-specific factors into the equation. Finally, we report the results in subsamples and with different regression specifications.

All regression models include dummy variables to account for fixed year effects. Because some of our country-level variables have no time variation, we drop them when we control for country fixed effects. The coefficients of country and year fixed effects are not reported. To capture the correlation of bank stock price synchronicity within the same country, we cluster standard errors at the country-level.

### 3.1. An aggregate specification

We now use a multivariate approach to investigate the factors that influence bank stock price synchronicity across countries by employing country-level data. Table 4 reports the results of the OLS regression of logistic transformed country-level average $R^2$

on our key variables such as *Crisis*, *Credit by Banks*, *Banking Freedom*, *Deposit Insurance, State Ownership*, *Foreign Ownership*, and *Country Disclosure*, along with the selected set of control variables.

Insert Table 4 about here.

As shown in column (1), we add the variable *Crisis* and find that financial crises will cause higher bank stock price synchronicity. This may suggest that financial contagion effects and government bailouts in the financial crisis period increase fundamentals co-movement. Then we include the variable *Credit by Bank* and find that countries that are more dependent on banks have higher bank stock price synchronicity. Next, we include the variable *Banking Freedom*, and the coefficient is significant and negative. This result is consistent with the argument that banks that pursue more diverse operations (and maintain greater freedom to pursue non-traditional activities) will enjoy (or suffer) greater firm-specific outcomes. In column (4), we add the variable *Deposit Insurance*, and this measure is negatively correlated with our country-level average $R^2$ measure. This may suggest that protected banks can pursue more diverse business lines that will result in greater firm-specific outcomes. As shown in column (5), we add the variable *State Ownership*, and this measure is positively correlated with our country average $R^2$ measure. This may suggest that government ownership of banks is associated with poor corporate governance and lower transparency, which can increase stock price synchronicity (Ferreira and Laux, 2007; Morck et al., 2000; Jin and Myers, 2006). In addition, government ownership also conveys considerable protection from performance risk, which will absorb bank-specific variations. In column (6), we add the variable *Foreign Ownership*, and this measure is not significantly correlated with our country-

level average $R^2$ measure. As shown in the last column of the table, we add the variable *Country Disclosure*, and the coefficient is not statistically significant. We argue that banks may be highly opaque, and that they are insulated from the requirements of country-level disclosure standards, which is consistent with Morck et al. (2000).

The effect of these institutional factors on bank stock return synchronicity is not only statistically significant, but also economically relevant. In order to assess the economic importance of these institutional variables for bank stock return synchronicity, we use the results reported in column (7) of Table 4 to quantify these effect. Specifically, we compute the change of the level in bank stock return synchronicity when changing these institutional factors based on the coefficients reported in column (7) of Table 4. For example, the estimates imply that one standard deviation increase in *Crisis* increases bank stock return synchronicity by 0.213*0.312 or 0.067, roughly 1.2 percent (0.067/5.730) of stock price synchronicity across banks. One standard deviation increase in *Credit by Bank* increases bank stock price synchronicity by 0.627*0.302 or 0.189, 3.3 percent (0.189/5.730) of stock return synchronicity across banks (the range of $SYNCH_j$ is the difference between the maximum value 0.384 and the minimum value -5.346 or 5.730). One standard deviation increase in *Banking Freedom* decreases bank stock return synchronicity by 0.713*0.286 or 0.204, roughly 3.6 percent (0.204/5.730) of stock price synchronicity across banks. Banks in countries with explicit deposit insurance have lower bank stock price synchronicity 0.577 than those in countries without explicit deposit insurance, roughly 10 percent (0.577/5.730) of stock return synchronicity across banks. One standard deviation increase in *State Ownership* increases bank stock price synchronicity by 0.191*1.195 or 0.228, 4 percent (0.228/5.730) of stock price

synchronicity across banks. Taken together, these examples underline the importance that different supervisory policies have for bank stock return synchronicity.

## 3.2. A disaggregate specification

Previous estimations did not control for the influence of bank-specific characteristics on the level of bank stock price synchronicity. For example, it is possible that large banks wield greater influence over both the market and the banking industry, and thus have higher stock price synchronicity and such a size effect varies across countries by the level of banking freedom, bank ownership, and so on. We therefore include bank specific variables as additional control variables, and run the estimations at the bank-level data. We also try to use bank-level data to test whether the higher level of bank disclosure brings more firm-specific public information and further reduces stock price synchronicity.

Insert Table 5 about here.

Table 5 reports the results for similar regressions with logistic transformed bank-level $R^2$ as the dependent variable. In column (1), we include the bank-level disclosure index (*Bank Disclosure*), and find that it is significant and negatively correlated with the bank stock price synchronicity. This result implies that bank disclosure can help increase bank specific stock return variation. In columns (2) to (8), we include the variables such as *Crisis*, *Credit by Banks*, *Banking Freedom*, *Deposit Insurance*, *State Ownership*, *Foreign ownership*, and *Country Disclosure*. We find that the coefficients of *Bank Disclosure* are still significantly negative. The effect of bank-level information disclosure in reducing bank stock price synchronicity is still economically significant, and substantial. Additionally, we find the same results as shown in the country-level analysis.

Specifically, those countries with less credit provided by banks, with explicit deposit insurance, and with a lower percentage of state-owned banks have lower bank stock price synchronicity. A point of deviation in the result, as noted here when compared to Table 4, is that the coefficient of the *Banking Freedom* is not significant, although it is still negative. In column (9), we add a country dummy to control for all the unobservable country effects. We still find that banks with a lower disclosure index are more aligned with the whole market.

The effect of *Bank Disclosure* on bank stock return synchronicity is not only statistically significant, but also economically relevant. In order to assess the economic importance of *Bank Disclosure* for bank stock return synchronicity, we use the results reported in column (8) of Table 5 to quantify these effect. Specifically, we compute the change of the level in bank stock return synchronicity when changing *Bank Disclosure* based on the coefficients reported in column (8) of Table 5. For example, the estimates imply that one standard deviation increase in *Bank Disclosure* increases bank stock return synchronicity by 0.140*0.987 or 0.138, roughly 2 percent (0.138/6.005) of stock return synchronicity across banks (the range of $SYNCH_i$ is the difference between the maximum value 0.398 and the minimum value -5.607 or 6.005).

<center>Insert Table 5 about here.</center>

Because U.S. banks dominate the whole sample, we employ bank-level data to perform the estimation to check if this influences our results. We rerun the same regression in the sample without U.S. banks and report the results in Table 6, finding that our results do not qualitatively change.

Insert Table 6 about here.

### 3.3. Developing economy vs. developed economy

By dividing the whole sample into developing and developed markets, Morck et al. (2000) find that a threshold level of institutional development exists to determine stock price synchronicity. To test whether our results hold within subsamples, we divide the sample into two parts by splitting the data at the median value of the *Good Government Index.* A developed economy subsample containing 19 countries and an emerging economy subsample including 18 countries are developed. [9]

We report the regression results using logistic transformed country-level average $R^2$ as a dependent variable in Table 7. We find that bank stocks are more aligned with the whole market in the financial crisis period across these two subsamples. We also observe that countries with more credit provided by banks and with explicit deposit insurance have higher bank stock price synchronicity across these two subsamples. The coefficient of *Banking Freedom* is only significant in the developed country subsample, and not significant in the emerging countries. This means that there is a threshold effect, and the above result is seen only in countries that have a certain level of property rights protection. In emerging markets, lower property rights protection might offset the positive effect of increased banking freedom. The coefficient of bank state ownership is only significant in the emerging market sample. We argue that superior property rights protection can offset the agency and information asymmetry problems caused by bank state ownership.

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[9] We obtain the same results when we use per capita GDP to divide our sample into subsamples.

Insert Table 7 about here.

The regression results using logistic transformed bank-level $R^2$ as a dependent variable are reported in Table 8. We still find the same result: banks with less disclosure are more aligned with the whole market. These results are observed across the developed economy subsample and the emerging economy subsample. [10]

Insert Table 8 about here.

## 3.4. Interaction term between financial crisis and other variables

In this subsection, we first test whether the effects of state ownership on stock price synchronicity become stronger during crises. One of the reasons is that poor corporate governance and lower transparency associated with government ownership of banks may become worse during crises and further increase stock price synchronicity. In addition, the protection from performance risk conveyed by government ownership (which will absorb bank-specific variations and increase bank stock price synchronicity) may increase during crises. As shown in Column (1) of Table 9, we find that the effects of state ownership on stock price synchronicity are more pronounced during crises.

We then explore whether the effects of the variable *Good Government Index* become stronger during crises. Morck et al. (2000) find that superior protection of property rights can reduce stock price synchronicity. A crisis could cause investors to increasingly value the protection of property rights (Rajan and Zingales, 1998). As shown

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[10] In unreported results, when the variables used to define the subsamples are omitted to avoid biased estimates, we obtain the same results.

in Column (2) of Table 9, we find that the effects of *Good Government Index* on stock price synchronicity are more pronounced during crises.

Finally, we investigate whether large bank stocks become more synchronized during crises as a result of the likelihood that large banks may be supported by the government. As shown in Column (3) of Table 9, we find that the stock price of large banks is more synchronized with the whole market during crises.

Insert Table 9 about here.

## 3.5. Robustness tests

This section examines whether our results are robust when we use alternative regression specifications. The following alternatives are considered:[11]

First, we use alternative regression specifications to calculate stock price synchronicity. We obtain the same results to the measure of stock price synchronicity when we use monthly data instead of weekly data, local currency instead of US dollars, local market model instead of expanded market model. We also try to add Dimson betas to the equation (1) following Jin and Myers (2006) and obtain the same results.

Second, our institutional factors such as *Crisis*, *Credit by Banks*, *Banking Freedom*, *Deposit Insurance*, *State Ownership*, *Foreign Ownership*, and *Country Disclosure* are less likely to suffer endogeneity problems. However, if an unobservable variable determines both the information disclosure information and the level of bank stock price synchronicity, the *Bank Disclosure* variable might be endogenous. In order to deal with this concern, we run instrumental variables regressions. First, the disclosure

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[11] Although not reported, these results are available upon request.

variable was regressed on a number of observable exogenous regressors. Second, we use the predicted value of this regression in the second stage regression. The variables used in the first stage regressions include a number of bank-specific variables (*Size, Analyst, M/B, Loan-to-Asset Ratio, Equity-to-Asset Ratio,* and *Loan Growth)*. In addition, we exploit the cross-country dimension of our dataset and include country dummy variables that would reflect the average level of the disclosure in each country. Since we know that disclosure varies over time, we also include a year dummy as an explanatory variable. We obtain similar results in instrumental variables regressions. The coefficients of the key variables have the same signs and similar magnitude. Third, results in the paper are reported after winsorizing the data at the 1 and 99 percentiles to control for possible outliers. To ensure that the results reported were not an artifact of our method, we also winsorized our variables at the 2 and 98 percentiles and the 5 and 95 percentiles. The results indicate that our results are not dependent on winsorizing cut-offs. We also truncate, rather than winsorize, the data and the results are robust. Fourth, it is possible that results could be driven by different bank types (investment banking, savings banks, etc.). To eliminate this concern, we run the analysis using only commercial banks and our results are robust.

## 4. Conclusions

In this paper, we examine the determinants of bank stock price synchronicity using cross-country data on 37 countries over the period 1996-2007. Our results document several institutional and bank-specific factors affecting bank stock price synchronicity. In particular, we find that bank stocks are more aligned with the whole market (1) during the financial crisis period; (2) in countries that have more credit

provided by banks; (3) in countries that do not have explicit depository insurance; and (4) in countries that have lower bank-level disclosure, are more aligned with the whole market. The results hold for both emerging and developed economy subsamples. Furthermore, in emerging economies, bank stocks in countries with higher degree of state-owned bank are more synchronized with the whole market, similarly, in developed markets, lower banking freedom enhances the bank stock price synchronicity. Finally, the effects of state ownership, protection of property rights, and bank size are all more pronounced to when determine determining the bank stock price synchronicity during the financial crisis period.

Our results also have important policy implications. For one, supervisory systems need bank-specific information content in bank stock price to assess the condition of the bank before implementing any disciplinary action (Meyer, 1999 and Greenspan, 2001). Thus, it seems that lower stock return synchronicity is better. On the other hand, some level of comovements within banking sector stocks may be optimal if banks are engaging in trade actively with each other and offer opportunities for diversified risk. Thus, it is important for regulators to know the determinants of bank stock price synchronicity and push bank stock price synchronicity to its optimal level.

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Figure 1
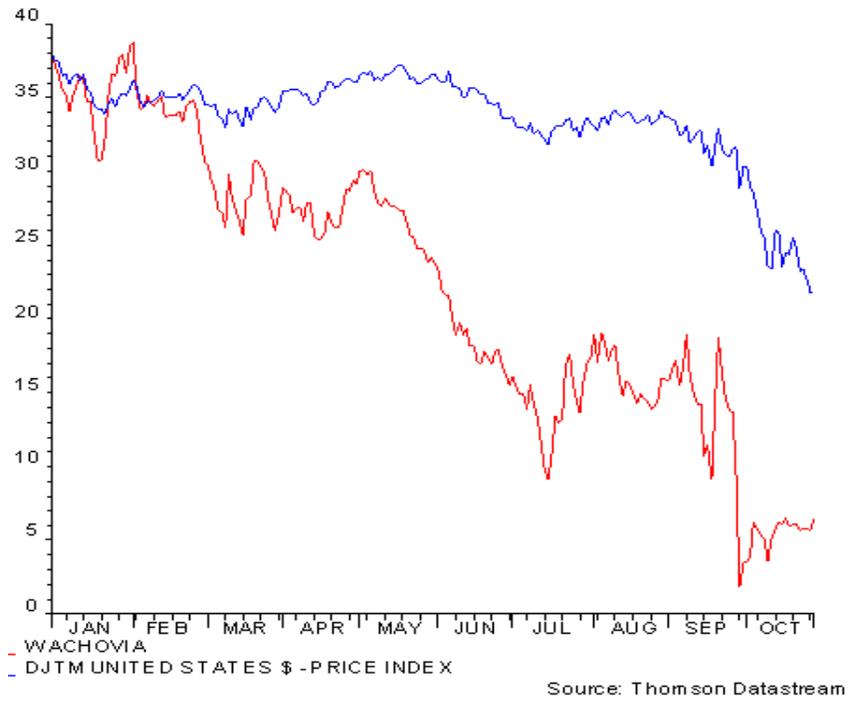


**Panel A: Year 2008**
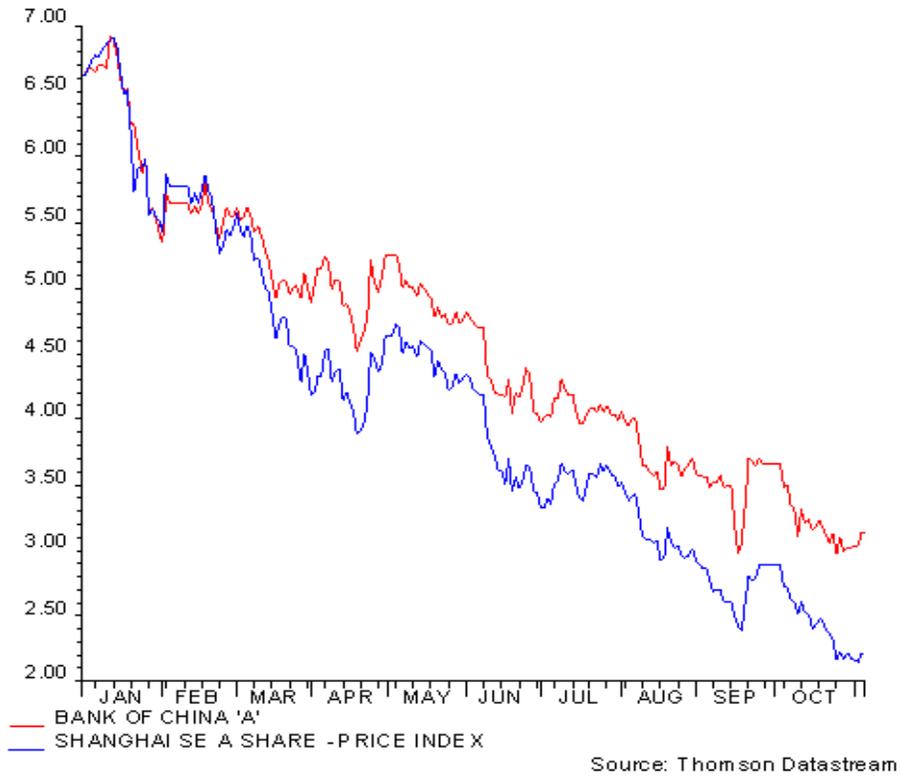


**Panel B: Year 2008**

Table 1 Summary statistics

This table presents summary statistics for the variables used in our empirical analysis. Number of observations, mean, median, minimum, maximum, and standard deviation are reported. The details of definitions and sources of all the explanatory variables are reported in the Appendix.

| | Observations | Mean | Median | Min | Max | SD |
|---|---|---|---|---|---|---|
| **Bank-level variables** | | | | | | |
| $R_i^2$ | 4852 | 0.271 | 0.242 | 0.003 | 0.567 | 0.109 |
| SYNCH$_i$ | 4852 | -1.399 | -1.089 | -5.607 | 0.398 | 1.549 |
| Bank Disclosure | 4852 | 0.752 | 0.811 | 0.203 | 0.901 | 0.140 |
| Total Assets $ Millions | 4852 | 316.237 | 39.735 | 0.501 | 14,972.035 | 1,110.543 |
| Size | 4852 | 2.500 | 1.599 | -0.300 | 4.175 | 1.010 |
| Analyst | 4852 | 7.453 | 8.530 | 0.000 | 14.503 | 3.568 |
| VOL | 4852 | 0.978 | 0.620 | 0.109 | 3.004 | 1.219 |
| STDROA | 4852 | 0.030 | 0.012 | 0.0005 | 0.115 | 0.135 |
| M/B | 4852 | 4.210 | 1.789 | 0.055 | 9.063 | 1.478 |
| Loan-to-Asset Ratio | 4852 | 0.581 | 0.592 | 0.001 | 0.913 | 0.162 |
| Equity-to-Asset Ratio | 4852 | 0.080 | 0.071 | 0.001 | 0.970 | 0.081 |
| Loan Growth | 4852 | 0.081 | 0.090 | -0.341 | 0.652 | 0.243 |
| | | | | | | |
| **Country-level variables** | | | | | | |
| $R_j^2$ | 313 | 0.253 | 0.231 | 0.004 | 0.542 | 0.107 |
| SYNCH$_j$ | 313 | -1.408 | -1.087 | -5.346 | 0.384 | 1.535 |
| Crisis | 313 | 0.102 | 0.000 | 0.000 | 1.0000 | 0.213 |
| Credit by Banks | 313 | 1.134 | 1.056 | 0.107 | 3.058 | 0.627 |
| Industry Concentration | 313 | 0.480 | 0.340 | 0.260 | 0.880 | 0.130 |
| Number of Stocks Listed | 313 | 5.689 | 5.683 | 3.723 | 8.425 | 1.152 |
| GDP per capita | 313 | 9.201 | 9.832 | 6.313 | 10.588 | 1.282 |
| Variance in GDP growth | 313 | 0.0009 | 0.0008 | 0.0007 | 0.0014 | 0.0001 |
| Good Government Index | 37 | 19.372 | 20.190 | 12.983 | 27.592 | 3.437 |
| Country Disclosure | 37 | 64.632 | 65.032 | 36.000 | 83.000 | 11.846 |
| Banking Freedom | 37 | 3.442 | 3.345 | 2.000 | 5.000 | 0.713 |
| Deposit Insurance | 37 | 0.810 | 1.000 | 0.000 | 1.000 | 0.380 |
| State Ownership | 37 | 0.145 | 0.208 | 0.000 | 0.753 | 0.191 |
| Foreign Ownership | 37 | 0.260 | 0.302 | 0.000 | 0.864 | 0.272 |

Table 2

Correlations between logistic transformation of country-level average $R^2$ and country characteristics

This table reports correlations of country characteristics and logistic transformation of country-level average $R^2$. The details of definitions and sources of all the variables are reported in the Appendix. P-values are reported in parentheses. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| | | a. | b. | c. | d. | e. | f. | g. | h. | i. | j. | k. | l. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. | SYNCH$_j$ | 1 | | | | | | | | | | | |
| b. | Crisis | 0.1322*** | 1 | | | | | | | | | | |
| | | (0.0004) | | | | | | | | | | | |
| c. | Credit by Banks | 0.0412*** | 0.3012 | 1 | | | | | | | | | |
| | | (0.0002) | (0.2516) | | | | | | | | | | |
| d. | Banking Freedom | -0.1225*** | -0.1461 | 0.3312 | 1 | | | | | | | | |
| | | (0.0008) | (0.3203) | (0.2401) | | | | | | | | | |
| e. | Deposit Insurance | -0.1412*** | -0.2134 | 0.2812*** | 0.2315*** | 1 | | | | | | | |
| | | (0.0000) | (0.4521) | (0.0002) | (0.0000) | | | | | | | | |
| f. | State Ownership | 0.0892** | 0.0531 | -0.5556 | -0.5355 | -0.3011*** | 1 | | | | | | |
| | | (0.0202) | (0.4213) | (0.2513) | (0.5612) | (0.0001) | | | | | | | |
| g. | Foreign Ownership | -0.0411 | -0.1245 | 0.4401 | -0.4004 | 0.1001*** | -0.0112*** | 1 | | | | | |
| | | (0.2400) | (0.3623) | (0.3112) | (0.2512) | (0.0001) | (0.0001) | | | | | | |
| h. | Country Disclosure | -0.0067 | -0.1325 | 0.2412 | 0.3705 | -0.2112*** | 0.3722 | -0.3109 | 1 | | | | |
| | | (0.7912) | (0.5621) | (0.1921) | (0.1912) | (0.0001) | (0.1912) | (0.2112) | | | | | |
| i. | Number of Stocks Listed | -0.0312 | -0.1242 | 0.7252 | 0.4121 | -0.3712*** | -0.3501 | 0.2202 | (0.2311) | 1 | | | |
| | | (0.3703) | (0.4723) | (0.9804) | (0.2406) | (0.0092) | (0.2408) | (0.3412) | 0.3712 | | | | |
| j. | GDP per capita | -0.1304*** | 0.3415 | 0.7011 | 0.5907 | 0.5201*** | -0.7805 | 0.6212 | 0.3941 | 0.5473 | 1 | | |
| | | (0.0003) | (0.3221) | (0.3406) | (0.1374) | (0.0004) | (0.1306) | (0.2807) | (0.4524) | (0.4308) | | | |
| k. | Variance in GDP Growth | 0.1301*** | 0.1204*** | -0.2572 | -0.0215 | -0.3803*** | 0.2609 | -0.1527 | -0.2406 | -0.1437 | -0.3151 | 1 | |
| | | (0.0004) | (0.0012) | (0.1403) | (0.4662) | (0.0003) | (0.7898) | (0.6503) | (0.2508) | (0.2374) | (0.1208) | | |
| l. | Good Government Index | -0.2102*** | -0.1326 | 0.5501 | 0.6498 | 0.4272*** | -0.5976*** | 0.2931*** | 0.4601 | 0.7305 | 0.7608 | -0.2950*** | 1 |
| | | (0.0000) | (0.3032) | (0.3419) | (0.4512) | (0.0072) | (0.0000) | (0.0000) | (0.2401) | (0.3401) | (0.4309) | (0.0000) | |
| m. | Industry Concentration | 0.1145*** | 0.2431 | 0.0035 | 0.0046 | 0.0041 | 0.0017 | 0.0124 | 0.0531 | 0.0146 | 0.0036 | 0.0019 | 0.0018 |
| | | (0.0000) | (0.3400) | (0.4321) | (0.4500) | (0.2600) | (0.4310) | (0.1400) | (0.1700) | (0.1800) | (0.2000) | (0.2100) | (0.2500) |

Table 3

Correlations between logistic transformation of bank-level $R^2$ and bank-level variables

This table reports correlations of bank-level variables and logistic transformation of bank-level $R^2$. The details of definitions and sources of all the variables are reported in Appendix. P-values are reported in parentheses. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| | | a. | b. | c. | d. | e. | f. | g. | h. | i. |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | SYNCH$_i$ | 1 | | | | | | | | |
| b. | Bank Disclosure | -0.0914*** | 1 | | | | | | | |
| | | (0.0000) | | | | | | | | |
| c. | Size | 0.5702*** | 0.0814*** | 1 | | | | | | |
| | | (0.0000) | (0.0000) | | | | | | | |
| d. | Analyst | 0.0123*** | 0.1456 | 0.1838 | 1 | | | | | |
| | | (0.0000) | (0.2591) | (0.2567) | | | | | | |
| e. | VOL | -0.1235*** | 0.2567 | -0.2134 | -0.1245 | 1 | | | | |
| | | (0.0012) | (0.4156) | (0.4532) | (0.4192) | | | | | |
| f. | STDROA | -0.1256*** | 0.1573 | -0.2134 | -0.1426 | 0.1134 | 1 | | | |
| | | (0.0000) | (0.2510) | (0.3421) | (0.5167) | (0.2145) | | | | |
| g. | M/B | 0.2432*** | -0.3521 | 0.1456 | 0.1524 | -0.1156 | -0.1134 | 1 | | |
| | | (0.0001) | (0.3521) | (0.3121) | (0.4167) | (0.3215) | (0.2511) | | | |
| h. | Loan-to-Asset Ratio | 0.1456 | -0.0014 | 0.1456 | 0.0078 | -0.1156 | 0.2451 | 0.0018 | 1 | |
| | | (0.3422) | (0.2102) | (0.2134) | (0.2156) | (0.2345) | (0.2516) | (0.2678) | | |
| i. | Equity-to-Asset Ratio | 0.2451 | -0.0018 | 0.3145 | 0.0026 | -0.0036 | 0.1526 | 0.0028 | 0.1345*** | 1 |
| | | (0.3501) | (0.3156) | (0.2145) | (0.1578) | (0.3728) | (0.2512) | (0.4325) | (0.0000) | |
| j. | Loan Growth | 0.2412 | -0.0015 | 0.2145 | 0.0028 | -0.0035 | 0.0027 | 0.0019 | 0.0012 | 0.0015 |
| | | (0.3014) | (0.2190) | (0.4251) | (0.5167) | (0.3526)_ | (0.3215) | (0.2671) | (0.2516) | (0.4325) |

Table 4

Regression Relating Logistic Transformation of Country-level Average $R^2$ to Country Characteristics Using Country-level Data

Dependent variable is logistic transformation of country average $R^2$. The details of definitions and sources of all the explanatory variables are reported in the Appendix. Robust standard errors are reported in parentheses. In computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| Dependent Variable | Logistic Transformation of Country-level Average $R^2(SYNCH_j)$ | | | | | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Crisis | 0.313*** | 0.314*** | 0.312*** | 0.316*** | 0.308*** | 0.319*** | 0.312*** |
| | [0.191] | [0.192] | [0.188] | [0.177] | [0.168] | [0.171] | [0.201] |
| Credit by Banks | | 0.302*** | 0.302*** | 0.302*** | 0.302*** | 0.302*** | 0.302*** |
| | | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] |
| Banking Freedom | | | -0.180*** | -0.178*** | -0.172*** | -0.173*** | -0.286*** |
| | | | [0.047] | [0.048] | [0.048] | [0.046] | [0.089] |
| Deposit Insurance | | | | -0.477*** | -0.604*** | -0.603*** | -0.577*** |
| | | | | [0.103] | [0.204] | [0.206] | [0.102] |
| State Ownership | | | | | 0.962** | 0.964*** | 1.195*** |
| | | | | | [0.403] | [0.204] | [0.401] |
| Foreign Ownership | | | | | | -0.840 | -0.878 |
| | | | | | | [0.999] | [1.001] |
| Country Disclosure | | | | | | | 0.004 |
| | | | | | | | [0.009] |
| Number of Stocks Listed | -0.130*** | -0.132*** | -0.089 | -0.102 | -0.073 | -0.079 | -0.089 |
| | [0.032] | [0.034] | [0.060] | [0.069] | [0.068] | [0.060] | [0.077] |
| GDP per capita | -0.004 | -0.003 | -0.076 | -0.006 | -0.092 | -0.090 | -0.186* |
| | [0.092] | [0.090] | [0.088] | [0.099] | [0.104] | [0.105] | [0.106] |
| Variance in GDP Growth | 0.012*** | 0.010*** | 0.026*** | 0.024*** | 0.027*** | 0.024*** | 0.025*** |
| | [0.002] | [0.001] | [0.004] | [0.006] | [0.003] | [0.005] | [0.004] |
| Good Government Index | -0.079*** | -0.075*** | -0.070*** | -0.072*** | -0.071*** | -0.072*** | -0.0076*** |
| | [0.012] | [0.010] | [0.018] | [0.014] | [0.016] | [0.014] | [0.018] |
| Industry Concentration | 0.019 | 0.020 | 0.025 | 0.022 | 0.027 | 0.023 | 0.027 |
| | [0.069] | [0.070] | [0.063] | [0.062] | [0.065] | [0.064] | [0.069] |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 313 | 313 | 313 | 313 | 313 | 313 | 313 |
| Adjusted R-squared | 0.32 | 0.32 | 0.33 | 0.36 | 0.49 | 0.51 | 0.55 |

# Table 5

## Regression Relating Logistic Transformation of bank-level $R^2$ to Country and Bank Characteristics Using Bank-level Data

Dependent variable is logistic transformation of bank-level $R^2$. The details of definitions and sources of all the explanatory variables are reported in the Appendix. Robust standard errors are reported in parentheses. In computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| Dependent Variable | Logistic Transformation of bank-level $R^2$ ($SYNCH_i$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Bank Disclosure | -1.560*** | -1.561*** | -1.539*** | -1.414*** | -0.971*** | -0.984*** | -0.983*** | -0.987*** | -1.136*** |
| | [0.144] | [0.149] | [0.152] | [0.152] | [0.160] | [0.160] | [0.162] | [0.163] | [0.172] |
| Crisis | | 0.345*** | 0.348*** | 0.347*** | 0.349*** | 0.351*** | 0.349*** | 0.371*** | 0.280*** |
| | | [0.175] | [0.170] | [0.169] | [0.172] | [0.176] | [0.168] | [0.167] | [0.101] |
| Credit by Banks | | | 0.302*** | 0.302*** | 0.302*** | 0.302*** | 0.302*** | 0.302*** | 0.301*** |
| | | | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] |
| Banking Freedom | | | | -0.181 | -0.179 | -0.173 | -0.174 | -0.290 | |
| | | | | [0.286] | [0.287] | [0.287] | [0.286] | [0.282] | |
| Deposit Insurance | | | | | -0.478** | -0.608*** | -0.603*** | -0.580*** | |
| | | | | | [0.204] | [0.201] | [0.202] | [0.110] | |
| State Ownership | | | | | | 0.962** | 0.964** | 1.197*** | |
| | | | | | | [0.402] | [0.404] | [0.407] | |
| Foreign Ownership | | | | | | | -0.843 | -0.881 | |
| | | | | | | | [1.003] | [1.004] | |
| Country Disclosure | | | | | | | | 0.005 | |
| | | | | | | | | [0.009] | |
| Number of Stocks Listed | 0.114*** | 0.115*** | -0.032 | -0.107*** | -0.093*** | -0.109*** | -0.108*** | -0.109*** | -0.290 |
| | [0.019] | [0.020] | [0.033] | [0.030] | [0.031] | [0.035] | [0.034] | [0.029] | [0.309] |
| GDP per capita | -0.019*** | -0.020*** | -0.022*** | -0.035*** | -0.036*** | -0.037*** | -0.038*** | -0.039*** | -0.015*** |
| | [0.001] | [0.001] | [0.001] | [0.003] | [0.004] | [0.004] | [0.004] | [0.005] | [0.003] |
| Variance in GDP Growth | 0.380*** | 0.382*** | 0.544*** | 0.672*** | 0.520*** | 0.485*** | 0.484*** | 0.480*** | 0.552*** |
| | [0.021] | [0.023] | [0.033] | [0.040] | [0.040] | [0.042] | [0.040] | [0.041] | [0.032] |
| Good Government Index | -0.030*** | -0.034*** | -0.072*** | -0.110*** | -0.104*** | -0.105*** | -0.108*** | -0.107*** | |
| | [0.004] | [0.008] | [0.013] | [0.014] | [0.015] | [0.014] | [0.015] | [0.014] | |
| Industry Concentration | 0.020 | 0.021 | 0.023 | 0.024 | 0.023 | 0.026 | 0.023 | 0.022 | 0.024 |
| | [0.046] | [0.065] | [0.061] | [0.062] | [0.064] | [0.062] | [0.071] | [0.064] | [0.072] |
| Size | 0.511*** | 0.515*** | 0.522*** | 0.523*** | 0.542*** | 0.539*** | 0.541*** | 0.540*** | 0.568*** |
| | [0.011] | [0.012] | [0.011] | [0.009] | [0.011] | [0.008] | [0.011] | [0.012] | [0.013] |
| Analyst | 0.112*** | 0.114*** | 0.132*** | 0.110*** | 0.093*** | 0.109*** | 0.102*** | 0.103*** | 0.107 |
| | [0.021] | [0.022] | [0.013] | [0.032] | [0.031] | [0.030] | [0.023] | [0.022] | [0.312] |
| VOL | -0.309*** | -0.311*** | -0.510*** | -0.612*** | -0.537*** | -0.490*** | -0.493*** | -0.484*** | -0.349*** |
| | [0.014] | [0.016] | [0.022] | [0.026] | [0.027] | [0.038] | [0.039] | [0.019] | [0.052] |
| STDROA | -0.112 | -0.113 | -0.134 | -0.112 | -0.094 | -0.111 | -0.103 | -0.105 | -0.108 |
| | [0.522] | [0.534] | [0.421] | [0.643] | [0.735] | [0.803] | [0.724] | [0.625] | [0.513] |
| M/B | 0.116 | 0.119 | 0.164 | 0.114 | 0.088 | 0.112 | 0.115 | 0.136 | 0.117 |
| | [0.760] | [0.768] | [0.677] | [0.628] | [0.716] | [0.843] | [0.744] | [0.645] | [0.533] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Loan-to-Asset Ratio | 0.153 | 0.154 | 0.140 | 0.126 | 0.186 | 0.137 | 0.119 | 0.137 | 0.115 |
| | [1.243] | [1.248] | [1.226] | [1.318] | [1.737] | [1.821] | [1.724] | [1.625] | [1.527] |
| Equity-to-Asset Ratio | 0.132 | 0.135 | 0.158 | 0.126 | 0.090 | 0.118 | 0.119 | 0.150 | 0.129 |
| | [0.770] | [0.778] | [1.215] | [1.247] | [1.149] | [0.883] | [0.779] | [0.686] | [0.599] |
| Loan Growth | 0.101 | 0.103 | 0.108 | 0.109 | 0.089 | 0.106 | 0.112 | 0.135 | 0.120 |
| | [0.980] | [0.989] | [0.986] | [0.987] | [0.987] | [0.987] | [0.983] | [0.987] | [0.990] |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Effect | No | No | No | No | No | No | No | No | Yes |
| Observations | 4852 | 4852 | 4852 | 4852 | 4852 | 4852 | 4852 | 4852 | 4852 |
| Adjusted R-squared | 0.441 | 0.442 | 0.449 | 0.463 | 0.474 | 0.476 | 0.478 | 0.480 | 0.524 |

Table 6

Regression Relating Logistic Transformation of $R^2$ to Country and Bank
Characteristics Using Bank-level Data without U.S. Banks

Dependent variable is logistic transformation of bank-level average $R^2$. The details of definitions and sources of all the explanatory variables are reported in the Appendix. Robust standard errors are reported in parentheses. In computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| Dependent Variable | Logistic Transformation of bank-level $R^2$ ($SYNCH_i$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Bank Disclosure | -1.555*** | -1.560*** | -1.534*** | -1.412*** | -0.972*** | -0.982*** | -0.980*** | -0.983*** | -1.135*** |
| | [0.150] | [0.158] | [0.152] | [0.150] | [0.157] | [0.158] | [0.155] | [0.158] | [0.166] |
| Crisis | | 0.387*** | 0.366*** | 0.364*** | 0.361*** | 0.372*** | 0.372*** | 0.388*** | 0.300*** |
| | | [0.167] | [0.153] | [0.158] | [0.163] | [0.161] | [0.165] | [0.170] | [0.103] |
| Credit by Banks | | | 0.301*** | 0.301*** | 0.301*** | 0.301*** | 0.301*** | 0.301*** | 0.302*** |
| | | | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] |
| Banking Freedom | | | | -0.181 | -0.178 | -0.172 | -0.173 | -0.288 | |
| | | | | [0.285] | [0.287] | [0.286] | [0.284] | [0.285] | |
| Deposit Insurance | | | | | -0.478** | -0.608*** | -0.606*** | -0.577*** | |
| | | | | | [0.201] | [0.202] | [0.202] | [0.101] | |
| State Ownership | | | | | | 0.962** | 0.962** | 1.198*** | |
| | | | | | | [0.401] | [0.401] | [0.400] | |
| Foreign Ownership | | | | | | | -0.843 | -0.880 | |
| | | | | | | | [1.002] | [1.000] | |
| Country Disclosure | | | | | | | | 0.005 | |
| | | | | | | | | [0.010] | |
| Number of Stocks Listed | 0.112*** | 0.114*** | -0.029 | -0.108*** | -0.091*** | -0.112*** | -0.109*** | -0.107*** | -0.286 |
| | [0.020] | [0.021] | [0.031] | [0.033] | [0.031] | [0.032] | [0.032] | [0.029] | [0.309] |
| GDP per capita | -0.020*** | -0.021*** | -0.022*** | -0.034*** | -0.036*** | -0.032*** | -0.034*** | -0.035*** | -0.019*** |
| | [0.001] | [0.001] | [0.001] | [0.001] | [0.002] | [0.002] | [0.002] | [0.002] | [0.002] |
| Variance in GDP Growth | 0.381*** | 0.382*** | 0.542*** | 0.672*** | 0.521*** | 0.482*** | 0.482*** | 0.481*** | 0.625*** |
| | [0.020] | [0.022] | [0.033] | [0.038] | [0.042] | [0.042] | [0.043] | [0.042] | [0.031] |
| Good Government Index | -0.035*** | -0.036*** | -0.074*** | -0.107*** | -0.104*** | -0.105*** | -0.106*** | -0.106*** | |
| | [0.002] | [0.005] | [0.009] | [0.011] | [0.010] | [0.010] | [0.011] | [0.010] | |
| Industry Concentration | 0.014 | 0.019 | 0.020 | 0.021 | 0.020 | 0.020 | 0.020 | 0.021 | 0.024 |
| | [0.065] | [0.066] | [0.064] | [0.066] | [0.067] | [0.068] | [0.075] | [0.061] | [0.072] |
| Size | 0.510*** | 0.518*** | 0.524*** | 0.523*** | 0.544*** | 0.533*** | 0.537*** | 0.538*** | 0.566*** |
| | [0.010] | [0.011] | [0.010] | [0.010] | [0.009] | [0.008] | [0.009] | [0.009] | [0.011] |
| Analyst | 0.117*** | 0.118*** | 0.138*** | 0.107*** | 0.090*** | 0.108*** | 0.101*** | 0.102*** | 0.105 |
| | [0.020] | [0.021] | [0.010] | [0.009] | [0.019] | [0.024] | [0.019] | [0.020] | [0.302] |
| VOL | -0.307*** | -0.308*** | -0.502*** | -0.603*** | -0.532*** | -0.492*** | -0.495*** | -0.484*** | -0.344*** |
| | [0.009] | [0.010] | [0.024] | [0.022] | [0.018] | [0.027] | [0.028] | [0.014] | [0.042] |
| STDROA | -0.105 | -0.107 | -0.125 | -0.103 | -0.084 | -0.101 | -0.100 | -0.101 | -0.103 |
| | [0.510] | [0.513] | [0.402] | [0.624] | [0.713] | [0.803] | [0.722] | [0.602] | [0.498] |
| M/B | 0.110 | 0.111 | 0.161 | 0.102 | 0.081 | 0.101 | 0.102 | 0.125 | 0.112 |
| | [0.770] | [0.773] | [0.677] | [0.612] | [0.756] | [0.821] | [0.703] | [0.678] | [0.541] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Loan-to-Asset Ratio | 0.150 | 0.152 | 0.139 | 0.184 | 0.184 | 0.133 | 0.114 | 0.135 | 0.121 |
| | [1.288] | [1.290] | [1.255] | [1.311] | [1.716] | [1.811] | [1.709] | [1.615] | [1.515] |
| Equity-to-Asset Ratio | 0.132 | 0.134 | 0.152 | 0.124 | 0.082 | 0.117 | 0.114 | 0.149 | 0.124 |
| | [0.776] | [0.779] | [1.214] | [1.245] | [1.141] | [0.878] | [0.775] | [0.677] | [0.593] |
| Loan Growth | 0.100 | 0.102 | 0.106 | 0.102 | 0.083 | 0.102 | 0.111 | 0.132 | 0.113 |
| | [0.980] | [0.988] | [0.982] | [0.980] | [0.985] | [0.980] | [0.983] | [0.987] | [0.988] |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Effect | No | No | No | No | No | No | No | No | Yes |
| Observations | 2717 | 2717 | 2717 | 2717 | 2717 | 2717 | 2717 | 2717 | 2717 |
| Adjusted R-squared | 0.395 | 0.396 | 0.406 | 0.432 | 0.454 | 0.455 | 0.456 | 0.457 | 0.548 |

Table 7

Regression Relating Logistic Transformation of Country-level Average $R^2$ to Country Characteristics Using Country-level Data in Subsample

Dependent variable is logistic transformation of country-level average $R^2$. The details of definitions and sources of all the explanatory variables are reported in the Appendix. Robust standard errors are reported in parentheses. In computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.

| Dependent Variable | Logistic Transformation of country-level $R^2$ ($SYNCH_i$) | |
| --- | --- | --- |
| | Emerging Market Subsample | Developed Market Subsample |
| Crisis | 0.401*** | 0.259*** |
| | [0.178] | [0.100] |
| Credit by Banks | 0.305*** | 0.306*** |
| | [0.008] | [0.007] |
| Banking Freedom | -0.192 | -0.338** |
| | [0.119] | [0.147] |
| Deposit Insurance | -0.719*** | -0.838*** |
| | [0.211] | [0.181] |
| State Ownership | 1.905*** | 1.534 |
| | [0.554] | [1.072] |
| Foreign Ownership | -1.904 | -1.532 |
| | [3.556] | [3.071] |
| Country Disclosure | -0.005 | -0.026 |
| | [0.009] | [0.016] |
| Number of Stocks Listed | -0.179 | -0.012 |
| | [0.171] | [0.136] |
| GDP per capita | -0.247** | -0.168 |
| | [0.105] | [0.267] |
| Variance in GDP Growth | 0.021*** | 0.008 |
| | [0.005] | [0.040] |
| Good Government Index | -0.062 | -0.057 |
| | [0.065] | [0.061] |
| Industry Concentration | 0.020 | 0.022 |
| | [0.082] | [0.083] |
| Year Effect | Yes | Yes |
| Observations | 144 | 169 |
| Adjusted R-squared | 0.624 | 0.454 |

Table 8

Regression Relating Logistic Transformation of bank-level $R^2$ to Country and Bank
Characteristics Using Bank-level Data in Subsample

Dependent variable is logistic transformation of bank-level $R^2$. The details of definitions and
sources of all the explanatory variables are reported in the Appendix. Column (1) and (2) include
only banks in emerging markets and column (3)-(5) include only banks in developed markets.
Column (4) excludes U.S. banks. Robust standard errors are reported in parentheses. In
computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5,
and 1 percent, respectively.

| Dependent Variable | Logistic Transformation of bank-level $R^2$ ($SYNCH_i$) | | | | |
| --- | --- | --- | --- | --- | --- |
| | Emerging Market Subsample | | Developed Market Subsample | | |
| | (1) | (2) | (3) | (4) | (5) |
| Bank Disclosure | -0.701* | -0.746** | -1.370*** | -2.574*** | -1.902*** |
| | [0.407] | [0.375] | [0.192] | [0.277] | [0.300] |
| Crisis | 0.400*** | 0.399*** | 0.256*** | 0.251*** | 0.253*** |
| | [0.170] | [0.174] | [0.102] | [0.107] | [0.100] |
| Credit by Banks | 0.302*** | 0.303*** | 0.307*** | 0.305*** | 0.303*** |
| | [0.007] | [0.004] | [0.001] | [0.001] | [0.003] |
| Banking Freedom | -0.174 | | -0.351*** | -0.686*** | |
| | [0.190] | | [0.080] | [0.082] | |
| Deposit Insurance | -0.964*** | | -0.881** | -1.634*** | |
| | [0.157] | | [0.371] | [0.366] | |
| State Ownership | 0.843** | | -0.508 | -0.273 | |
| | [0.382] | | [0.425] | [0.407] | |
| Foreign Ownership | -0.820 | | -0.510 | -0.274 | |
| | [0.384] | | [0.424] | [0.404] | |
| Country Disclosure | 0.006 | | 0.008 | 0.005 | |
| | [0.011] | | [0.010] | [0.011] | |
| Number of Stocks Listed | -0.095 | -0.751* | -0.305*** | -0.094 | -2.621*** |
| | [0.114] | [0.397] | [0.053] | [0.072] | [0.501] |
| GDP per capita | -0.027*** | -0.003 | -0.014 | -0.038* | -0.106** |
| | [0.004] | [0.003] | [0.021] | [0.021] | [0.044] |
| Variance in GDP Growth | 0.191** | 1.718 | 0.310*** | 0.337*** | 2.338 |
| | [0.088] | [1.250] | [0.111] | [0.077] | [2.578] |
| Good Government Index | -0.062 | | -0.187*** | -0.443*** | |
| | [0.050] | | [0.016] | [0.060] | |
| Industry Concentration | 0.020 | 0.022 | 0.023 | 0.021 | 0.024 |
| | [0.070] | [0.071] | [0.074] | [0.072] | [0.072] |
| Size | 0.418*** | 0.466*** | 0.584*** | 0.472*** | 0.434*** |
| | [0.031] | [0.028] | [0.017] | [0.020] | [0.024] |
| Analyst | 0.122*** | 0.141*** | 0.116*** | 0.100*** | 0.114*** |
| | [0.019] | [0.013] | [0.014] | [0.034] | [0.026] |
| VOL | -0.312*** | -0.512*** | -0.613*** | -0.534*** | -0.495*** |
| | [0.011] | [0.021] | [0.023] | [0.018] | [0.028] |
| STDROA | -0.111 | -0.132 | -0.106 | -0.080 | -0.108 |

| | | | | | |
|---|---|---|---|---|---|
| | [0.521] | [0.413] | [0.632] | [0.722] | [0.828] |
| M/B | 0.116 | 0.164 | 0.108 | 0.082 | 0.107 |
| | [0.784] | [0.676] | [0.623] | [0.705] | [0.845] |
| Loan-to-Asset Ratio | 0.157 | 0.134 | 0.185 | 0.184 | 0.134 |
| | [1.282] | [1.243] | [1.316] | [1.710] | [1.816] |
| Equity-to-Asset Ratio | 0.136 | 0.156 | 0.121 | 0.082 | 0.117 |
| | [0.770] | [1.212] | [1.247] | [1.141] | [0.886] |
| Loan Growth | 0.102 | 0.104 | 0.101 | 0.082 | 0.100 |
| | [0.981] | [0.982] | [0.981] | [0.981] | [0.983] |
| Year Effect | Yes | Yes | Yes | Yes | Yes |
| Country Effect | No | Yes | No | No | Yes |
| Observations | 1011 | 1011 | 3571 | 1706 | 3571 |
| Adjusted R-squared | 0.489 | 0.522 | 0.483 | 0.492 | 0.550 |

Table 9


Regression Relating Logistic Transformation of bank-level $R^2$ to Country, Bank Characteristics, and Interaction Terms Using Bank-level Data


Dependent variable is logistic transformation of bank-level $R^2$. The details of definitions and sources of all the explanatory variables are reported in the Appendix. Robust standard errors are reported in parentheses. In computing standard errors, we cluster by country. *, **, *** indicate significance levels of 10, 5, and 1 percent, respectively.


| Dependent Variable | Logistic Transformation of bank-level $R^2$ ($SYNCH_i$) | | |
|---|---|---|---|
| | (1) | (2) | (2) |
| Bank Disclosure | -0.981*** | -0.982*** | -0.980*** |
| | [0.163] | [0.162] | [0.160] |
| Crisis | 0.265*** | 0.479*** | 0.168*** |
| | [0.046] | [0.155] | [0.143] |
| Crisis * State Ownership | 0.223*** | | |
| | [0.024] | | |
| Crisis * Good Government Index | | -0.014*** | |
| | | [0.001] | |
| Crisis * Size | | | 0.134*** |
| | | | [0.019] |
| Credit by Banks | 0.301*** | 0.302*** | 0.300*** |
| | [0.001] | [0.001] | [0.001] |
| Banking Freedom | -0.172** | -0.287*** | -0.288*** |
| | [0.083] | [0.086] | [0.080] |
| Deposit Insurance | -0.603*** | -0.577*** | -0.570*** |
| | [0.203] | [0.102] | [0.100] |
| State Ownership | 0.873*** | 1.193*** | 1.190*** |
| | [0.212] | [0.405] | [0.401] |
| Foreign Ownership | -0.842 | -0.881 | -0.882 |
| | [1.001] | [1.002] | [1.000] |
| Country Disclosure | 0.003 | 0.005 | 0.002 |
| | [0.009] | [0.007] | [0.009] |
| Number of Stocks Listed | -0.105*** | -0.106*** | -0.102*** |
| | [0.032] | [0.031] | [0.030] |
| GDP per capita | -0.034*** | -0.031*** | -0.036*** |
| | [0.003] | [0.004] | [0.005] |
| Variance in GDP Growth | 0.481*** | 0.480*** | 0.483*** |
| | [0.046] | [0.043] | [0.044] |
| Good Government Index | -0.105*** | -0.098*** | -0.100*** |
| | [0.012] | [0.014] | [0.011] |
| Industry Concentration | 0.021 | 0.022 | 0.025 |
| | [0.075] | [0.060] | [0.059] |
| Size | 0.537*** | 0.536*** | 0.433*** |
| | [0.012] | [0.011] | [0.017] |
| Analyst | 0.102*** | 0.103*** | 0.101*** |
| | [0.022] | [0.021] | [0.019] |

| | | | |
|---|---|---|---|
| VOL | -0.496*** | -0.485*** | -0.482*** |
| | [0.035] | [0.013] | [0.014] |
| STDROA | -0.102 | -0.101 | -0.100 |
| | [0.720] | [0.622] | [0.620] |
| M/B | 0.110 | 0.130 | 0.128 |
| | [0.740] | [0.640] | [0.637] |
| Loan-to-Asset Ratio | 0.118 | 0.137 | 0.133 |
| | [1.720] | [1.623] | [1.614] |
| Equity-to-Asset Ratio | 0.116 | 0.146 | 0.140 |
| | [0.777] | [0.685] | [0.680] |
| Loan Growth | 0.111 | 0.133 | 0.129 |
| | [0.980] | [0.982] | [0.981] |
| Year Effect | Yes | Yes | Yes |
| Country Effect | No | No | No |
| Observations | 4852 | 4852 | 4852 |
| Adjusted R-squared | 0.479 | 0.480 | 0.476 |

# Appendix Variable Definition and Sources

| Variable | Description | Sources |
|---|---|---|
| **Bank-level variables** | | |
| $SYNCH_i$ | Logistic Transformation of bank-level $R^2$, which is from expanded market model (Equation (1)). | DataStream |
| Bank Disclosure | A bank disclosure index for each bank in the sample. The details of definitions and sources of this index can be found in Nier (2005). | Bankscope |
| Size | The logarithm of bank's total assets. | Bankscope |
| Analyst | The number of analysts who issued earnings forecasts for a bank during a given calendar year. | IBES |
| VOL | The total number of shares traded in a year, divided by the total number of shares outstanding at the end of fiscal year | DataStream |
| STDROA | The standard deviation of a bank's ROAs over the preceding five-year period | Bankscope |
| M/B | Market value of total assets divided by book value of total assets. Market value of total assets is the sum of market value of equity and total liability. | Bankscope |
| Loan-to-Asset Ratio | Net total loan divided by book value of total assets. | Bankscope |
| Equity-to-Asset Ratio | Total equity divided by total assets. | Bankscope |
| Loan Growth | The logarithm of total loan growth rate. | Bankscope |
| **Country-level variables** | | |
| $SYNCH_j$ | Logistic Transformation of country-level average $R^2$, which is from Equation (2). | DataStream |
| Number of Stocks Listed | The logarithm of the number of listed securities. | DataStream |
| GDP per capita | The logarithm of GDP per capita (constant 2000 US$). | World Development Indicators |
| Variance in GDP Growth | The variance of the previous four year GDP per capita growth (annual %). | World Development Indicators |
| Good Government Index | The sum of three variables from La Porta et al. (1998) including government corruption, the risk of expropriation of private property by the government, and the risk of the government repudiating contracts. Higher values for each variable indicate more protection for private property. | La Porta et al. (1998) |
| Crisis | It is equal to one if there is a banking crisis in a specific period and a given country and zero otherwise. | Laeven and Valencia (2010) |
| Credit by Banks | Domestic credit provided by banking sector (% of GDP) | World Development Indicators |
| Banking Freedom | It measures relative openness of banking and financial system of the country. | Heritage Foundation |
| Deposit Insurance | It is equal to one if a country has explicit deposit insurance and zero otherwise. | Barth et al. (2005) |
| State Ownership | The percentage of banking assets in banks that are 50 percent or more government owned. | Barth et al. (2005) |
| Foreign Ownership | The percentage of banking assets in banks that are 50 percent or more government owned. | Barth et al. (2005) |
| Country Disclosure | "Index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items by Center for International Financial Analysis and Research (CIFAR). These items fall into seven categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). A minimum of three companies in each country was studied. The companies represent a cross section of various industry groups; industrial companies represented 70 percent, and financial companies represented the remaining 30 percent. Scale from zero to 100; low scores indicate low accounting standards." | La Porta et al. (1998) |
| Industry Concentration | A banking industry Herfindahl index for each country calculated using banks' total assets. | Bankscope |

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