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Financial development, role of government, and bank profitability: evidence from the 2008 financial crisis

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Abstract This study investigates the effects of financial development and government involvement on bank profitability during the 2008 financial crisis. First, it demonstrates that a large banking sector improves bank profitability and asset quality, which supports the hypothesis of financial development improvement. Second, financial liberalization is negatively associated with bank profitability and asset quality, which supports the view of external capital dependence. Finally, results confirm the role of the government during the financial crisis. The positive effect of financial development improvement is stronger on banks with weak government involvement than on banks with strong government involvement. By contrast, the negative effect of external capital dependence is less significant on banks with strong government involvement than on banks with weak government involvement. The results have two implications. First, the negative effect of financial liberalization on the banking sector is prominent during an unstable economic period and not just under a weak institutional environment. Second, although a bank cannot determine the financial development level of its country, it can adjust the involvement of its government to offset macroeconomic impact.

Keywords Financial liberalization · Government involvement · Bank profitability · Asset quality · Financial development improvement · External capital dependence

JEL Classification G01 · G18 · G21 · G28

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1 Introduction

Under the ongoing processes of financial market development, financial liberalization, and internationalization of banking operations, the 2008 financial crisis exerted an unprecedented negative effect on the global banking system. The subprime mortgage aftereffect in the United States soon expanded into a global financial crisis because of the tight interconnectedness and complexity of financial markets in which an enormous amount of collateralized debt obligations, which turned out to be toxic, were distributed. Although banks could help mobilize resources and reduce risk (Beck and Levine 2004; Levine 2002; Levine 2005), the credit contraction that occurred hampered the global financial system and brought it to the brink of collapse during the crisis. Several major financial institutions, including Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, and AIG, collapsed and were either bought out or bailed out by the government. Previous empirical studies have documented the existence of a strong positive link between a functioning financial system and various aspects of economic activities such as investment, employment, and economic growth (Al-Yousif 2002; Demirgüç-Kunt and Detragiache 1999; King and Levine 1993; Levine 2003; Levine 2005; Rajan and Zingales 1998).[1] Does the effect of the global financial crisis influence the relationship between financial development and bank profitability?

Financial liberalization, which is widely considered critical in providing an efficient and competitive banking sector, has been criticized for its consequent financial instability, particularly in institutions where the rule-of-law and regulations are weak (Arestis and Demetriades 1999; Demirgüç-Kunt and Detragiache 1999; Kaminsky and Reinhart 1999). Demirgüç-Kunt and Detragiache (1999) argue that financial liberalization has been clouded to a certain extent by the marked increase in financial fragility experienced by both industrial and developing countries in the 1980s and the 1990s. Given that financial liberalization develops faster than the regulatory regime, the instability of a financial system dramatically increases; for example, banking sector problems emerged shortly after the financial sector of Chile was deregulated in 1981. A more recent and significant evidence is the 2008 global financial crisis. This widespread crisis provides a good opportunity to review the effect of financial liberalization on banking sectors worldwide. Does financial liberalization exert a negative effect on bank profitability during the post-crisis period?

The credit freeze that resulted from the 2008 financial crisis brought the global financial system to the brink of collapse and elicited immediate and dramatic responses from the United States Federal Reserve, the European Central Bank, and many other central banks worldwide. During the last quarter of 2008, central banks purchased a total of US$2.5 trillion in government debt and troubled private assets from banks. This amount was the largest liquidity injection into credit markets and the largest monetary policy action in world history. Governments bailed out a variety of firms and subsequently incurred large financial obligations. Previous studies have shown that political connections influence the allocation of capital through the

[1] Levine (2005) suggests that financial development involves improvements in the (1) production of ex ante information on possible investments; (2) monitoring of investments and implementation of corporate governance; (3) trading, diversification, and management of risk; (4) mobilization and pooling of savings; and (5) exchange of goods and services. Each of the aforementioned financial functions may influence savings and investment decisions, and consequently, economic growth.

mechanism of financial assistance when companies with connections experience economic distress (Faccio et al. 2006); therefore, politics matters in financial development (Becerra et al. 2012).[2] This study examines the role of the government in the post-crisis period and investigates whether government involvement influences bank profitability and asset quality.

In this study, we focus on two factors in bank profitability and asset quality during the post-crisis period: (1) the financial development of the country, including banking sector size and financial liberalization level; and (2) government involvement, which is a bank-specific characteristic. We further investigate how government involvement affects financial development in influencing bank performance.

One study that is closely related to the current research is that of Wu et al. (2007), who examine the effect of financial development (measured through moneterization (M2/GDP), financial interrelation ratio, and capitalization level) on the operational performance of 14 commercial banks in China and conclude that a high moneterization level improves bank performance, that is, return on assets (ROA). Significant differences exist between this previous research and the present study. First, we adopt a sample of 521 banks from 42 countries, including both developed and developing countries. The different financial development levels in these countries enable us to provide an overall view of the relationship between financial development and bank performance. Second, we use two comprehensive proxies to determine financial development in each country. The first proxy measures the overall size of the banking sector, whereas the second proxy measures financial liberalization. Finally, this study considers the role of the government, that is, whether government involvement affects bank profitability under a given financial development level.

This study determines that banks from developed countries have a slightly lower ROA (0.15 % versus 0.69 %) and slightly lower non-performing loan (NPL) ratio (5.01 % versus 6.10 %) than banks from developing countries during the period of 2008 to 2009; however, the differences are insignificant. The size of the banking sector is positively, whereas financial liberalization is negatively, associated with bank asset quality. Moreover, financial liberalization reduces bank profitability. In line with the arguments of King and Levine (1993); Rajan and Zingales (1998), and Levine (2005), the fact that the size of the banking sector facilitates a sound banking industry supports the financial development improvement hypothesis. To supplement the points of Arestis and Demetriades (1999) and Demirgüç-Kunt and Detragiache (1999), we determine that the negative effect of financial liberalization on the banking sector is prominent during an unstable economic period and not only under a weak institutional environment.

This study provides evidence that government involvement is positively associated with profitability for banks in developed countries, but negatively associated with profitability and asset quality for banks in developing countries. This negative

[2] Becerra et al. (2012) argue that although financial development increases overall welfare in the long run, it also affects the distribution of rents in the short run. Incumbents may observe their profit margins shrink, countries may face a high probability of a negative shock, and governments may lose some of their revenue sources. The combination of interest groups attempting to safeguard their rents and governments vying for political survival may prove lethal for financial development. Becerra et al. conclude that low opposition to financial development leads to an effective increase in credit market development only in countries with high government capabilities. Moreover, improvements in government capabilities significantly affect credit market development in countries with high credit dependency.

association observed in developing countries may be attributed to political consideration (Micco et al. 2007) or the lack of "soft information" and "external liquidity" (Mian 2003). Micco et al. (2007) determine that the difference in performance between public and private banks in developing countries widens during election years, which illustrates that the difference in performance is driven by political consideration. Mian (2003) argues that private domestic banks have an advantage in lending to "soft information" firms, which allows them to lend more and at higher rates without substantially increasing default rates. Foreign-owned banks have the advantage of access to "external liquidity" from their parent banks, which reduces their deposit cost. However, government-owned banks in emerging economies perform poorly and only survive because of strong government support. Finally, we identify the interaction effects of financial development and government involvement on banks in developed countries. Although a bank cannot determine the financial development level of its country, it can adjust its government involvement to offset macroeconomic impact.

The remainder of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data sources, variables, and methodology. Section 4 examines the effects of financial development and government involvement on bank profitability and asset quality. Finally, Section 5 concludes the paper.

2 Literature review and empirical hypotheses

2.1 Financial development improvement hypothesis

Several recent studies have not only proven that Granger causality runs from financial development to economic growth (Bojanic 2012), but have also suggested that financial development facilitates the efficient allocation of resources (Bena and Ondko 2012), contributes to the effectiveness of R&D investment (Chowdhury and Maung 2012), increases the benefits of foreign direct investment in South Asia (Anwar and Cooray 2012), and reduces corruption in both developed and developing countries (Altunbas and Thornton 2012). The aforementioned studies support the concept that a well-developed financial system can facilitate the economic growth of a country. Economic growth tends to stimulate the development of the banking sector. For example, the banking sector becomes more specialized, and consequently, more cost-effective (Harrison et al. 1999).

The role of financial development in economic growth is highlighted in theories on financial structure. Financial systems that have been developed well ease the external financing constraints face by firms, which indicates a mechanism through which financial development influences economic growth (Levine 2005). Financial development can enhance the benefits of foreign direct investment (Hermes and Lensink 2003; Kose et al. 2009) and play an important role in influencing firm survival. When stock markets become larger or more liquid, the survival chances of firms improve (Tsoukas 2011). The financial system of a country affects saving and investment decisions, which are the major determinants of long-run economic growth (Anwar and Cooray 2012). The financial sector provides real services, and its development does not only help identify profitable business opportunities, but also improve corporate governance, risk management, and diversification (Levine 2005; Roubini and Sala-i-Martin 1992).

Supporting the concentration fragility hypothesis, Bozos et al. (2013) state that newly consolidated large banks that result from mergers entail high systematic risk and commove with the market (high price synchronicity). They further suggest that a high concentration in the banking industry possibly destabilizes the financial system and makes it susceptible to shocks in the financial system. Their evidence is based on the size and concentration of banks. By contrast, we focus on the size of the entire banking sector. A larger banking sector strengthens financial development level and can better tolerate instability in financial markets than a small one. Our conjecture is inclined toward the concentration stability hypothesis, that is, a high concentration is associated with high market power and profits, and consequently, a high degree of resilience to adverse market shocks. Thus, the financial development improvement hypothesis is proposed in this study, which argues that the effect of a crisis is less negative or even positive on banks when the banking sector is large.

2.2 External capital dependence hypothesis

Financial liberalization can increase the growth rate of an economy in the long run by fostering financial development (King and Levine 1993). At the international level, financial globalization contributes to improving the allocation of financial resources, not only by channeling capital to its most productive uses but also by allocating financial resources efficiently, and thus, reducing the vulnerability of a country to economic, financial, and currency crises (Anwar and Cooray 2012). However, the benefits of financial liberalization have to be weighed against the cost of increased financial fragility (Demirgüç-Kunt and Detragiache 1999). In a panel of 53 countries for the period of 1980–1995, Demirgüç-Kunt and Detragiache (1999) find that banking crises are likely to occur in liberalized financial systems. The effect of financial liberalization on the fragility of a banking sector is weak when the institutional environment is strong.

Using data from 38 developed and developing countries that experienced financial crises during the period of 1980–2000, Kroszner et al. (2007) note that sectors that are highly dependent on external finance tend to experience a substantially larger contraction of added value during a banking crisis in countries with deep financial systems than in countries with shallow financial systems. Financial globalization increases both capital inflow and outflow. The 2008 global financial crisis was triggered by a liquidity shortfall in the US banking system that eventually damaged financial institutions globally. Given that an economy experiences considerable contraction during a crisis, the need for capital is extraordinarily essential. Banks in countries with a high level of financial liberalization can rely on external capital to satisfy their capital requirements. In addition, they are likely to be influenced by negative spillover effects during a crisis. We propose the external capital dependence hypothesis and expect that a banking sector is likely to be impaired when a country is dependent on external finance because of its high level of financial liberalization, which is easily influenced by spillover effects.

2.3 Government involvement

La Porta et al. (2002) summarize two broad views on government participation in financial markets: the development view versus the political view. The development view argues that state-owned banks are better in promoting economic development

than privately owned banks because projects funded by state-owned banks may generate positive externalities, particularly in strategic economic sectors. Public banks are less profitable because they address market imperfections that will leave socially profitable but financially unprofitable investments underfinanced (Gerschenkron 1962).

The political view argues that the main motivation of governments in controlling banks is to provide employment, subsidies, and other benefits to supporters, who return the favor in the form of votes, political contributions, and bribes.[3] State-owned banks are inefficient because they are controlled by politicians who are only interested in maximizing their personal objectives (Dinç 2005; La Porta et al. 2002).[4] State ownership of banks allows the government to exercise extensive control over which projects to finance; however, the projects financed by the government are likely to be inefficient and can adversely affect productivity growth (Xiao and Zhao 2012). Cole (2009) also rejects the development view on the state ownership of banks.[5] He concludes that state ownership initially increases the quantity and substantially reduces the quality of financial intermediation.[6] Numerous tests have been conducted on the negative effect of the state ownership of banks on profitability, margins, and efficiency on samples of transitional nations or emerging economies (Berger et al. 2009; Bonin et al. 2005; Drakos 2003; Garcia-Herrero et al. 2009; Lin and Zhang 2009; Mian 2003; Micco et al. 2007).[7]

During the 2008 financial crisis, various US government agencies committed or spent trillions of dollars in loans, asset purchases, guarantees, and direct payments. Given the aforementioned opposing views in the literature, what role does the government play during a financial crisis? Does the participation of a government in banks

[3] For example, Faccio et al. (2006) determine that politically connected firms are significantly more likely to be bailed out than similar non-connected firms. Moreover, politically connected firms are disproportionately more likely to be bailed out when the International Monetary Fund or the World Bank provides financial assistance to the home government of the firm.

[4] Dinç (2005) provides evidence that politicians can reward their allies and punish their opponents by using their influence on state-owned banks. La Porta et al. (2002) report that government ownership of banks is associated with low subsequent economic growth and argue that politicians use state-owned banks to further their political goals.

[5] Barth et al. (2000) provide empirical evidence that government ownership of banks is associated with a low level of financial development. Beck and Levine (2002) also fail to find a positive effect of government ownership of banks on industry growth.

[6] Cole (2009) suggests that state ownership has a lasting effect on the sectoral allocation of credit, which increases lending to agricultural and rural areas. It also has a substantial effect on the price and quality of intermediation: markets with more state-owned banks have considerably higher delinquent loan rates and lower average interest rates than markets with only a few state-owned banks. Nevertheless, development lending goals are satisfied, but have no effect on the real economy.

[7] Using data from over 1600 banks in 100 emerging eocnomies, Mian (2003) compares bank performance among privately owned domestic, foreign-owned, and government-owned banks. Given that government-owned banks have poor cash flow incentives and suffer from the moral hazard problem of the government being both the owner and the regulator, government-owned banks perform uniformly poorly and only survive because of strong government support. Drakos (2003) analyzes reform in transition banking and determines that the net interest rate margins of banks are affected by ownership status, where state-owned banks typically set significantly narrower margins than privately owned banks. Bonin et al. (2005) report that foreign-owned banks are more cost efficient compared with state-owned banks in providing services in transitional countries. Micco et al. (2007) suggest that state-owned banks in developing countries tend to have lower profitability and higher costs than their privately owned counterparts. Public banks in industrial countries have ceased to play a development role. Lin and Zhang (2009) observe that the "Big Four" state-owned commercial banks in China are less profitable and efficient, as well as exhibit worse asset quality, than other types of banks.

provide obligations and confidence to the public during a turmoil period when weaknesses in the global financial system appear and trust in the entire financial system starts to fail? If the answer to this question is yes, then we expect a positive effect of government involvement on bank profitability in the post-crisis period.

3 Methodology

3.1 Data

We obtain details on bank ownership, size, assets, and balance sheets from the BankScope data set, which provides bank-level annual financial information.[8] Following previous studies (La Porta et al. 2002; Laeven and Levine 2009; Micco et al. 2007), we collect information on the 10 largest banks (as defined by their total assets at the end of 2007) in each country. If these banks represent less than 70 % of total assets in a country's banking system, then we code all banks up to 70 % of total assets in that banking system. We code all banks when the total number of banks from countries (Afghanistan, Anguilla, Barbados, Belize, Bhutan, Chad, Chile, Cuba, Gambia, Haiti, and Zimbabwe) in the database is less than 10.

We collect the country-level financial development data from the Financial Development Report (2008; The Financial Development Report 2009) published by the World Economic Forum. After the data from this report and BankScope are merged and missing data are excluded, 521 banks from 42 countries remain. We take macroeconomic variables (real GDP growth and inflation rate) from the World Bank. We winsorize the top and bottom 1 % of each variable to exclude the effect of outliers.

3.2 Variables

3.2.1 Bank profitability and asset quality

Previous studies use ROA (Garcia-Herrero et al. 2009; Micco et al. 2007), ROE (Goddard et al. 2004), or both (Vennet 2002) as the bank profit proxy. However, we consider ROA more than ROE because the capital adequacy ratio, which affects the level of bank equity, differs among countries (Schuser 1984). This case is particularly true in a cross-country study. Many developing countries use fiscal incomes to support the banking system. Therefore, ROE may be overvalued because the equity fund is relatively low. In addition to using bank profitability, we refer to the method of Garcia-Herrero et al. (2009) and use the NPL ratio (non-performing loans over total loans) to measure bank asset quality.

3.2.2 Financial development

Previous studies use different proxies to measure financial development. Particularly, the ratio of deposits (commercial banks plus saving banks) to GDP

[8] The version of the data set used in this study covers 30,475 banks located in 190 countries over the period of 2001–2009.

(Rajan and Zingales 2003) and domestic credit from the private sector to GDP (Hassan et al. 2011; Rajan and Zingales 2003; Tsoukas 2011) are used as the measures of banking sector development. Private credit provided by the banking sector to GDP proxies the extent to which firms have opportunities to obtain bank finance (Altunbas and Thornton 2012; Baltagi et al. 2009; Kroszner et al. 2007; Tsoukas 2011). The ratio of broad money stock (M2) to GDP, which is often called the monetization variable, is used as a proxy for market size (Al-Yousif 2002). An increase in the M2-to-GDP ratio implies an expansion in the financial sector relative to the rest of the economy. Other studies use financial sector liberalization to measure financial development. Rajan and Zingales (2003) take the sum of trade volume (including exports and imports of goods) to GDP to measure openness. Baltagi et al. (2009) employ the financial globalization indicator (volume of a country's foreign assets and liabilities to GDP) constructed by Lane and Milesi-Ferretti (2006) to measure capital account openness.

This paper uses the Financial Development Index (FDI) from the Financial Development Report[9] as the financial development proxy. The FDI constitutes seven pillars for 55 countries: (1) institutional environment, (2) business environment, (3) financial stability, (4) banking financial services, (5) non-banking financial services, (6) financial market, and (7) financial access. In accordance with the financial development literature, the proxies used are two aggregate indicators that are standardized to a scale of 1 to 7. The first indicator is extracted from one of the sub-pillars from the banking financial services, that is, the size index. Unlike single measure used in previous studies, the size index provides a comprehensive profile of the banking sector size. This index[10] includes seven items: (1) the ratio of deposit money bank assets to GDP denotes the claims on the domestic real non-financial sector by deposit money banks as a share of GDP; (2) the ratio of central bank assets to GDP denotes the claims on the domestic real non-financial sector by the central bank as a share of GDP; (3) the ratio of financial system deposits to GDP denotes the demand, time, and savings deposits in deposit money banks and other financial institutions as a share of GDP; (4) the ratio of M2 to GDP denotes money and quasi-money supply as a percentage of GDP; (5) the ratio of private credit to GDP is the private credit by deposit money banks and other financial institutions as a percentage of GDP; (6) bank deposits to GDP show the demand, time, and savings deposits in deposit money banks as a share of GDP; and (7) money market instruments to GDP show total money market instruments (in US$ billion) as a percentage of GDP. A higher index value

[9] The weight regime and sub-pillars of the FDI are described in The Financial Development Report (2008), pp. 24–25 and 331–338 and The Financial Development Report (2009), pp. 25–27 and 351–359.

[10] Each item of the size index except money market instruments is calculated using the deflation method: $\frac{0.5\times\left[\frac{F_t}{Pe_t}+\frac{F_{t-1}}{Pe_{t-1}}\right]}{\frac{GDP_t}{Pa_t}}$, where F denotes the measure for each item, that is, deposit money bank claims, central bank claims, demand and time and savings deposits, money and quasi-money, credit to the private sector, and demand and time and savings deposits, respectively; P_e is end-of-period CPI; and P_a is average annual CPI. Money market instruments to GDP are total money market instruments (in US$ billion) as a percentage of GDP; the figures are based on the residence of the issuer. The size index is standardized to a 1-to-7 scale by the following formula: $6\times\frac{(\text{country score}-\text{sample minimum})}{(\text{sample maximum}-\text{sample minimum})}+1$, where the sample minimum and sample maximum are respectively the lowest and highest country scores in the sample of countries covered by the FDI.

implies a larger size of banking financial services and indicates that investors have confidence in the ability of the financial sector to channel funds into the most efficient projects. We use this index to examine the financial development improvement hypothesis.

Countries ease or lift bank interest rate ceilings and floors, lower compulsory reserve requirements and entry barriers, and allow deposits in foreign currency. Some countries actively encourage the entry of foreign financial intermediaries. The second indicator is extracted from one of the sub-pillars of an institutional environment, that is, financial sector liberalization. This indicator measures the degree of domestic financial sector liberalization within a country. It includes the following three items: (1) capital account liberalization measures specifically the level of capital controls based on information from the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions; (2) the index of commitments to the WTO agreement on trade in services measures the extent of commitments to the WTO's General Agreement on Trade in Services within the financial services sector; and (3) the index of domestic financial sector liberalization is calculated on the basis of whether or not controls (ceilings and floors) on interest rates and credit exist, and whether or not deposits in foreign currency are allowed. The indicator of financial sector liberalization provides a useful summary of a country's financial openness. It overcomes the doubt of Rodrik (1998) who questions the use of capital account liberalization as a sole indicator of financial liberalization. We use this indicator to examine the external capital dependence hypothesis. Although the literature widely uses stock market capitalization to GDP (Baltagi et al. 2009; Tsoukas 2011) to capture capital market development, it fluctuates excessively over time, reflecting excess volatility in stock prices (Baltagi et al. 2009). Therefore, stock market capitalization to GDP is particularly unsuitable in the sample period of a financial crisis.

3.2.3 Government involvement

Countries have reduced government interference in credit allocation decisions by privatizing banks and insurance companies. According to Boubakri et al. (2008), a company is politically connected if at least one of the directors or supervisory board members is or was a politician. They find that political connections are positively related to government residual ownership and consider political connections as an indirect means of control, as opposed to direct control exerted by the government through residual ownership. Several studies in the banking-related literature (Dinç 2005; Micco et al. 2007) show significant governmental influence on state-owned banks. Accordingly, we use state ownership of the bank to measure the government involvement of the bank.

3.3 Methodology

To examine the effects of financial development and government involvement on bank profitability and asset quality during the post-crisis period, we use financial development measures from the Financial Development Report 2009, and other variables adopted in the cross-sectional regression are the values for the year 2009. We employ

the following ordinary least squares model that considers the White (1980) heteroskedasticity standard error and covariance to cope with heteroskedasticity:

$$RO\quad A_{ij}\text{ or }NP\quad L_{ij} = \quad \beta_0 + \quad \beta_1 \text{Financial Development}_{ij} + \beta_2 \text{Government Involvement}_{ij} + \sum \delta \text{Control variables} + \varepsilon_{ij}, \tag{1}$$

where *i* denotes bank *i* and *j* denotes country *j*. Following Garcia-Herrero et al. (2009), we use ln(*ROA*) and ln(*NPL ratio*/1-*NPL ratio*) as the dependent variables to estimate *ROA* and *NPL* regressions, respectively. The main independent variables are financial development and government involvement. Financial development is measured by the size of the banking sector (*Size*) and financial sector liberalization (*FinLiber*), and government involvement is measured by state ownership (*State ownership*). If the financial development improvement hypothesis is supported, then we expect an insignificant negative or even a positive coefficient on *Size*. We rely on important prior contributions, such as the work of Garcia-Herrero et al. (2009), for guidance on control variables. Macroeconomic and bank-specific variables that are known to influence bank profitability and asset quality are used as control variables. Macroeconomic variables include real GDP growth and the inflation rate, where GDP and inflation rate data are collected from the World Bank. Bank-specific control variables include loan growth, deposits to assets, equity to assets, total loans, and loans to assets. Table 6 describes the variable definitions and data sources.

4 Empirical results

Table 1 presents the mean values of the main variables for the total sample of banks. According to the classification of the IMF (2011), we categorize the sample into developed and developing countries (251 and 270 banks, respectively). The average ROA is 0.48 % for the full sample, 0.15 % for the banks from developed countries, and 0.69 % for those from developing countries. Among the sample countries, Indonesia has the highest average ROA at 2.85 % and Kazakhstan has the lowest at −12.04 %. The average NPL is 5.01 % for banks from developed countries, 6.10 % for those from developing countries, and 5.66 % for the full sample. The highest NPL value is from the banks in Japan (23.14 %) and the lowest is from the banks in the Netherlands (0.62 %). The average banking sector size index (*Size*) is 2.83 for the full sample. The largest banking sector size is in the United Kingdom at 5.40. The mean value of the financial sector liberalization index (*FinLiber*) is 4.37 for all banks. The banking sector size (3.91 vs. 2.10) and financial liberalization (6.54 vs. 2.89) are significantly higher in developed countries than in developing countries ($t = 7.15$ and 8.67, respectively, both $p < 0.01$). Among the sample countries, seven countries[11] have reached the highest scale of 7 in the financial sector liberalization index. Bangladesh has the smallest banking sector size of 1.20 and the lowest financial sector liberalization of 0.5. The average state ownership is 12.73 % for the full sample. State ownership is significantly lower for banks from developed countries than those from developing countries (8.93

[11] These countries are Austria, Belgium, Germany, Ireland, Netherlands, Spain, and the UK.

% vs. 15.31 %, $t = -2.26$, $p < 0.05$). Table 7 presents the mean values of control variables for the entire sample by region and by country.

Table 2 presents the matrix of Pearson pairwise correlations between the major variables. Since banking sector assets and financial sector liberalization capture different aspects of financial development, their correlation coefficient of 0.76 is the highest absolute value in the correlation matrix. However, Studenmund (2006) indicates that a significant multicollinearity problem exists when the absolute value of the correlation coefficient is higher than 0.8. Thus, multicollinearity among the regressors should not be a concern.

4.1 Bank profitability and asset quality

To investigate the effects of financial development and government involvement on bank profitability and asset quality after the crisis, we estimate the regressions of *ROA* and *NPL*. Table 3 presents the result of the cross-sectional regression using data from 2009. The size index shows a negative effect on *NPL*, which indicates that banks from countries with larger banking sector have better asset quality. The financial liberalization index shows a negative effect on *ROA* and a positive effect on *NPL*. The result supports the external capital dependence hypothesis. A country's financial openness reduces its bank profitability and asset quality in the post-crisis period. When the financial liberalization index increases by one scale, the ROA decreases by 3.58 % and the NPL ratio/(1 - NPL ratio) increases by 6.50 %, respectively. Rajan and Zingales (2003) suggest that openness brings foreign competitors to domestic markets. The entry of foreign competition drives down domestic profits, which results in established firms having lower internal cash flow, thereby increasing their reliance on external finance. Our findings echo their argument.

The effect of government involvement is limited. We only find a significantly positive coefficient on state ownership in the NPL model, which indicates that banks with strong government involvement have poor asset quality.

The extent to which financial development affects economic growth depends significantly on the quality of governance (Anwar and Cooray 2012). In a robustness check, to control for government governance in each country, we augment the baseline regressions with the worldwide governance indicator constructed by Kaufmann et al. (2009).[12] The indicator includes six aspects of governance: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. The results remain the same. We also eliminate deposits to assets and equity to assets from the ROA model as well as loan growth and total loans from the NPL model to exclude any possible multicollinearity among the control variables. The results remain unchanged.

4.2 Government involvement: developed and developing countries

Public banks in developing countries still play a developmental role and their low profitability is due to the fact that they respond to a social mandate, whereas public

[12] ROA_{ij} *or* $NPL_{ij} = \beta_0 + \beta_1$ Financial Development$_{ij} + \beta_2$ Government Involvement$_{ij} + \beta_3$ Governance$_{ij} + \sum\delta$ Control variables $+ \varepsilon_{ij}$.

Table 1 Number of banks and their mean value in the period of 2008–2009

		No. of banks	ROA	NPL	Size	FinLiber	State ownership
All banks		521	0.48	5.66	2.83	4.37	12.73
By region							
Developed		251	0.15	5.01	3.91	6.54	8.93
Developing		270	0.69	6.10	2.10	2.89	15.31
t statistics			−0.76	−0.73	7.15**	8.67**	−2.26*
By country							
1	Argentina	10	1.80	7.28	1.25	2.20	32.38
2	Austria	11	−0.27	1.16	3.90	7.00	18.26
3	Bahrain	10	−0.28	1.97	2.70	6.75	25.78
4	Bangladesh	14	1.38	4.01	1.20	0.50	31.75
5	Belgium	10	−0.34	6.12	3.45	7.00	11.98
6	Brazil	10	1.41	4.45	2.25	2.75	17.80
7	Colombia	10	2.26	4.23	1.55	2.55	20.00
8	Czech Republic	10	1.54	1.54	2.40	5.30	0.00
9	Denmark	10	0.11	7.47	2.05	3.50	0.00
10	Egypt	10	1.47	8.52	2.80	5.15	21.00
11	Finland	9	0.71	5.07	2.80	6.50	3.69
12	France	14	0.02	5.16	3.20	6.95	6.74
13	Germany	25	−0.17	4.87	3.95	7.00	8.13
14	Hungary	10	0.86	13.75	2.25	5.50	20.00
15	India	17	1.18	1.46	1.95	1.45	1.45
16	Indonesia	10	2.85	7.79	2.20	3.50	12.41
17	Ireland	10	−0.72	2.02	4.50	7.00	10.00
18	Israel	10	0.31	1.64	3.40	5.80	2.17
19	Japan	28	0.01	23.14	4.65	6.75	12.00
20	Jordan	10	1.48	12.87	2.35	3.15	6.71
21	Kazakhstan	10	−12.04	1.41	1.80	1.60	0.00
22	Malaysia	14	1.20	8.36	4.30	4.10	6.05
23	Mexico	10	1.33	1.43	1.30	3.50	20.00
24	Netherlands	10	−0.28	0.62	4.90	7.00	27.13
25	Nigeria	10	−1.61	17.01	1.60	2.95	12.50
26	Norway	10	0.36	0.70	3.60	6.85	25.15
27	Pakistan	10	2.54	3.67	2.05	1.45	8.44
28	Peru	10	1.95	11.13	2.00	5.20	14.29
29	Philippines	10	1.01	3.92	2.05	3.20	9.09
30	Poland	10	1.21	5.10	1.85	2.85	18.18
31	Russian Federation	14	0.12	2.83	1.70	1.80	24.41
32	Singapore	10	0.74	1.25	4.15	6.85	8.33
33	Slovakia	10	0.18	7.67	2.10	3.40	13.35
34	South Africa	10	1.08	2.19	3.00	2.05	0.00

Table 1 (continued)

		No. of banks	ROA	NPL	Size	FinLiber	State ownership
35	Spain	11	0.60	7.16	4.80	7.00	0.00
36	Switzerland	10	0.37	3.58	5.15	6.75	18.22
37	Turkey	10	2.82	8.40	1.60	1.80	6.46
38	Ukraine	11	−0.69	3.95	2.20	1.55	20.00
39	U.K.	13	−0.22	4.39	5.40	7.00	0.00
40	U.S.A.	50	−0.13	9.32	4.20	6.90	0.00
41	Venezuela	10	2.31	1.16	1.35	1.30	22.00
42	Vietnam	10	1.51	7.94	3.05	2.10	18.66

The definitions of variables are listed in Table 6. The superscripts ** and * indicate that the mean values between developed and developing countries are statistically significant at the 1 % and 5 % levels, respectively

banks in developed countries merely imitate the behavior of private banks (Micco et al. 2007). Therefore, we run separate regressions for developed and developing countries in Table 4 to clarify the influence of government involvement. Although Andrianova et al. (2008) suggest that state banks naturally die when they are less efficient and no longer useful, the empirical result suggests that these banks increase depositors' confidence in banking institutions by preventing or curbing any default tendencies that are likely to occur in the aftermath of a crisis. We find that banks with high state ownership from developed countries tend to have higher bank profitability but not better asset quality during the post-crisis period. Banks with high state ownership from developing countries tend to have lower profitability and asset quality. Overall, we do not find that government participation provides the public any comfort for banks in developing countries during the post-crisis period because state ownership still deteriorates profitability and asset quality in banks from developing countries.

4.3 Interactions of financial development and government involvement

Barth et al. (2000) argue that state ownership of banks is associated with a low level of financial development. The openness to trade and the capital flows of a country are also matters of government policy (Rajan and Zingales 2003). Thus, we consider the interaction effect of financial development and government involvement. Since government involvement shows different effects on banks from developed and developing countries, we run separate regressions including interaction terms for developed and developing countries. For banks in developing countries, we do not find a significant interaction effect of financial development and government involvement on bank profitability or on asset quality.[13] Table 5 only presents the estimated results for banks in developed countries.

The interaction term of the size index and state ownership enters negatively in model (1) and positively in model (3). Stronger government involvement is particularly positive for the profitability and asset quality of banks in a small banking sector. The

[13] The estimated results are available upon request.

Table 2 Correlation matrix

		ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	NPL ratio	−0.32***										
(2)	Size	−0.16*	−0.15*									
(3)	FinLiber	−0.25***	0.03	0.76***								
(4)	State ownership	0.04	−0.04	−0.06	−0.06							
(5)	Real GDP growth	0.10	−0.17*	−0.02	−0.09	0.03						
(6)	Inflation rate	0.16**	0.14*	0.04	0.18**	0.20**	−0.37***					
(7)	Loan growth	0.22***	−0.20**	0.01	−0.05	0.09	0.12	−0.12				
(8)	Deposits to assets	−0.29***	0.21***	0.13	0.14*	0.10	−0.07	−0.12	−0.10			
(9)	Equity to assets	0.29***	0.10	−0.42***	−0.34***	0.06	−0.05	0.47***	−0.09	−0.25***		
(10)	Total loans	−0.12	−0.26***	0.36***	0.16*	0.00	0.19**	−0.56***	0.22***	0.17**	−0.63***	
(11)	Loans to assets	0.07	−0.10	−0.29***	−0.21***	0.12	0.15*	−0.04	0.08	0.03	0.35***	−0.10

This table reports the matrix of Pearson pairwise correlations between the major variables. Those variables are: ROA; (1) NPL ratio; (2) Banking sector assets (Size); (3) Financial sector liberalization (FinLiber); (4) Government involvement (State ownership); (5) Real GDP growth; (6) Inflation rate; (7) Loan growth; (8) Deposits to assets; (9) Equity to assets; (10) Total loans; (11) Loans to assets. The definitions of variables are listed in Table 6. The superscripts ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % levels, respectively

Table 3 Bank profitability and asset quality

	Ln (*ROA*)			Ln (*NPL ratio*/(1-*NPL ratio*))		
	(1)	(2)	(3)	(4)	(5)	(6)
Size	0.0190		−0.0096	−0.0675		−0.1283**
	(0.7490)		(−0.3111)	(−1.4922)		(−2.1974)
FinLiber	−0.0365**		−0.0294	0.0254		0.0630**
	(−2.0416)		(−1.3686)	(0.9621)		(2.0164)
State ownership		−0.0010	−0.0006		0.0022*	−0.0011
		(−1.0345)	(−0.5597)		(1.7205)	(−0.6906)
Real GDP growth	0.0032	0.0066***	0.0039	−0.0090**	−0.0065***	−0.0030
	(1.2184)	(3.3760)	(1.3881)	(−2.2031)	(−2.7756)	(−0.6218)
Inflation rate	0.0068*	0.0120***	0.0130**	0.0001	0.0001	0.0020
	(1.7551)	(4.8322)	(2.0867)	(0.0168)	(0.0135)	(0.1447)
Loan growth $_{t-1}$	0.0694	0.0229	0.1368	−0.0749	−0.2930*	−0.0936
	(0.6009)	(0.2408)	(0.9372)	(−0.4914)	(−2.2837)	(−0.7530)
Ln (Deposits to assets)	−0.0846***	−0.0624***	−0.0818**	0.1323**	0.0870**	0.1969***
	(−3.1182)	(−2.6256)	(−2.5573)	(2.3138)	(2.1796)	(3.6148)
Ln (Equity to assets$_{t-1}$)	0.7610***	0.6149***	0.6316***	0.1435	0.4225**	0.0368
	(6.5969)	(6.6961)	(4.6892)	(0.7384)	(2.5869)	(0.1903)
Ln (Total loans)	−0.0829***	−0.0630***	−0.0468	−0.0827**	−0.0489	−0.0998*
	(−3.4933)	(−2.6245)	(−1.3261)	(−2.1812)	(−1.4978)	(−1.9226)
Ln (Loans to assets)	−0.2466**	−0.1674	−0.3749***	−0.3475	−0.4204	−0.5981
	(−1.9745)	(−1.5436)	(−2.6142)	(−1.1131)	(−1.5908)	(−1.6331)
Constant	−3.7717***	−3.5943***	−3.6503***	−1.1078	−2.2733***	−0.5718
	(−8.3397)	(−9.2496)	(−5.9323)	(−1.5160)	(−3.5098)	(−0.6964)
Adjusted *R*-squared	0.4531	0.3204	0.4173	0.0988	0.0764	0.1503
F-statistic	23.2811***	28.5765***	11.9576***	3.6080***	5.6753***	3.5826***
Durbin-Watson statistic	1.7558	1.6489	1.9175	1.2801	0.9757	1.0602
No. of observations	243	469	154	215	453	147

This table presents the effect of financial development and government involvement on bank profitability and asset quality, respectively, using the sample period of 2009. The cross-sectional regression model is estimated using the least squares approach. The definitions of variables are listed in Table 6. Figures in the first rows are estimated coefficients. Values of *t*-statistics based on White (1980) heteroskedasticity standard error and covariance are reported in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % levels, respectively

financial liberalization index shows a significantly negative effect on ROA. The interaction term of the financial liberalization index and state ownership is significantly positive in the ROA regression. The result indicates that increased government involvement alleviates the negative effect of financial liberalization on the profitability of banks. The financial development improvement hypothesis is stronger for banks with less government involvement and the external capital dependence hypothesis is less important for banks with increased government involvement.

Table 4 Government involvement: developed and developing countries

	Ln (*ROA*)		Ln (*NPL ratio*/(1-*NPL ratio*))	
	Developed countries (1)	Developing countries (2)	Developed countries (3)	Developing countries (4)
State ownership	0.0031**	−0.0024**	0.0005	0.0022*
	(2.2069)	(−2.1517)	(0.1271)	(1.7357)
Real GDP growth	−0.0037	0.0065	0.0093*	−0.0082***
	(−0.4933)	(3.2007)	(1.0124)	(−3.2377)
Inflation rate	0.0128	0.0088**	0.0208**	−0.0042
	(0.5697)	(3.4569)	(0.7241)	(−0.8843)
Loan growth $_{t-1}$	−0.2083	0.0644***	−0.4960**	−0.2948***
	(−0.6881)	(0.6461)	(−1.6892)	(−2.7534)
Ln (Deposits to assets)	−0.0177	−0.0678***	0.0736	0.0786*
	(−0.2344)	(−3.0463)	(0.8381)	(1.9176)
Ln (Equity to assets $_{t-1}$)	0.4415**	0.5381	0.7044	−0.0397
	(2.1423)	(3.9956)	(2.0679)	(−0.2167)
Ln (Total loans)	−0.0601	−0.3628***	0.0882	−0.0654*
	(−1.2843)	(−2.5226)	(1.2152)	(−1.7587)
Ln (Loans to assets)	0.0466	0.0043***	−1.4235	0.0400
	(0.2195)	(0.1685)	(−2.6120)	(0.1605)
Constant	−3.2395***	−3.7835***	−4.3758***	−0.6053
	(−4.6192)	(−7.1159)	(−3.2031)	(−0.8970)
Adjusted *R*-squared	0.0524	0.1645	0.0991	0.0606
F-statistic	1.8507*	9.3902***	2.7880***	3.5811***
Durbin-Watson statistic	1.7419	1.5486	1.1281	1.0915
No. of observations	124	342	131	321

This table presents the effect of government involvement on bank profitability and asset quality, respectively, using the sample period of 2009. The cross-sectional regression model is estimated using the least squares approach. The definitions of variables are listed in Table 6. Figures in the first rows are estimated coefficients. Values of *t*-statistics based on White (1980) heteroskedasticity standard error and covariance are reported in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % levels, respectively

5 Conclusions

The main advantage of the research strategy in this study is that it allows us to examine the impact of financial development on bank profitability and asset quality following the global financial crisis of 2008. The size of a banking sector improves bank profitability and asset quality, thereby strengthening the role of banking sector development. Financial sector liberalization reduces bank profitability and asset quality. This condition contributed to one of the main reasons for the 2008 global financial crisis, that is, financial markets were

Table 5 The interaction effect of financial development and government involvement: developed countries

	Ln (*ROA*)		Ln (*NPL ratio*/(1-*NPL ratio*))	
	(1)	(2)	(3)	(4)
Size	0.1619***	0.1411***	−0.0425	0.0136
	(3.6391)	(3.4516)	(−0.5595)	(0.2204)
FinLiber	−0.2835***	−0.2954***	0.0020	−0.0347
	(−4.0008)	(−3.7824)	(0.0183)	(−0.3870)
State ownership	0.0190**	−0.0405	−0.0340*	0.0203
	(2.6207)	(−1.5313)	(−1.8610)	(0.2931)
Size × State ownership	−0.0035**		0.0076*	
	(−2.0465)		(1.8621)	
FinLiber × State ownership		0.0068*		−0.0031
		(1.6771)		(−0.2890)
Real GDP growth	−0.0063	−0.0057	0.0136	0.0145*
	(−0.7138)	(−0.6377)	(1.1054)	(1.7098)
Inflation rate	0.0317	0.0443*	0.0015	−0.0075
	(1.3272)	(1.8926)	(0.0393)	(−0.2356)
Loan growth $_{t-1}$	−0.3963	−0.4254	−0.6660**	−0.6394*
	(−1.0884)	(−1.1700)	(−2.0055)	(−1.9009)
Ln (Deposits to assets)	0.1886**	0.1597**	−0.0168	0.1230
	(2.1192)	(2.0031)	(−0.1201)	(1.2961)
Ln (Equity to assets $_{t-1}$)	0.5214**	0.3963*	0.7026*	0.8845***
	(2.1246)	(1.7996)	(2.1626)	(2.8002)
Ln (Total loans)	−0.0405	−0.0405	0.1988	0.1859
	(−0.5490)	(−0.5456)	(1.4303)	(1.6407)
Ln (Loans to assets)	−0.0832	−0.0264	−1.5934***	−1.5361**
	(−0.4282)	(−0.1297)	(−3.6363)	(−2.5793)
Constant	−2.2399***	−1.7941*	−5.1713***	−5.3296***
	(−2.6655)	(−1.9747)	(−3.5802)	(−3.9327)
Adjusted *R*-squared	0.2084	0.2051	0.1672	0.1378
F-statistic	3.3219***	3.2748***	2.9344***	2.5407***
Durbin-Watson statistic	2.1536	2.1830	1.0122	1.2059
No. of obs.	98	98	107	107

This table presents the effect of government involvement on bank profitability and asset quality, respectively, for developed countries using the sample period of 2009. The cross-sectional regression model is estimated using the least squares approach. The definitions of variables are listed in Table 6. Figures in the first rows are estimated coefficients. Values of *t*-statistics based on White (1980) heteroskedasticity standard error and covariance are reported in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % levels, respectively

tightly interconnected and many banks around the world held internationally traded toxic securities. The result of this study is in accordance with the argument of Demirgüç-Kunt and Detragiache (1999) that financial liberalization

should be approached cautiously when the institutions that are necessary to enforce laws and contracts as well as to ensure effective prudential regulation and supervision are not fully developed even if macroeconomic stabilization has been achieved.

Although a bank cannot determine the level of financial development in its home country, banks in developed countries can try to attract appropriate government involvement to better steer their country-level situations. For example, banks from countries with a small banking sector or high financial liberalization should attempt to push for stronger government involvement to boost bank profitability. However, this is not the case for banks in developing countries.

Appendix

Table 6 Definitions of variables

Variables	Measures	Type	Units	Source
Dependent variable				
Ln (*ROA*)	(Net income after tax/total assets) × 100 %	Bank	Ratio	BankScope
Ln (*NPL ratio*/(1-*NPL ratio*))	NPL ratio = non-performing loans/total loans	Bank	Ratio	BankScope
Financial development				
Size	The size index is scaled from 1 to 7. A higher index value means a larger proportion of banking assets to GDP.	Country	Score	The Financial Development Report
FinLiber	The financial sector liberalization index is scaled from 1 to 7. A higher index value means a higher level of financial liberalization.	Country	Score	The Financial Development Report
Government involvement				
State ownership	Percentage of government shareholdings	Bank	Ratio	BankScope
Control variable				
Real GDP growth	$((GDP_t\text{-}GDP_{t-1})/GDP_{t-1}) \times 100$ %	Country	Ratio	World Bank
Inflation rate	Annual growth rate of CPI	Country	Ratio	World Bank
Equity to assets	(Total equity/total assets) × 100 %	Bank	Ratio	BankScope
Total loans	Total loans of the bank	Bank	Millions	BankScope
Loan growth	$((\text{Total loans}_t\text{-total loans}_{t-1})/\text{total loans}_{t-1}) \times 100$ %	Bank	Ratio	BankScope
Loans to assets	(Total loans/total assets) × 100 %	Bank	Ratio	BankScope
Deposits to assets	(Total deposits/total assets) × 100 %	Bank	Ratio	BankScope

Table 7 Mean values for the control variables in the period of 2008–2009

		Real GDP growth	Inflation rate	Loan growth	Deposits to assets	Equity to assets	Total loans	Loans to assets
All banks		−5.65	6.11	1.74	8.27	7.66	7.20	42.62
By region								
Developed		−4.54	1.86	4.01	9.18	4.90	7.78	39.45
Developing		−6.41	9.00	0.19	7.65	9.54	6.81	44.78
By country								
1	Argentina	−31.18	3.09	0.01	0.64	10.09	6.49	37.29
2	Austria	0.10	1.58	0.15	20.76	5.51	7.72	43.07
3	Bahrain	0.56	0.79	0.03	4.20	13.61	6.52	30.44
4	Bangladesh	6.78	3.72	0.16	0.88	6.82	6.06	64.28
5	Belgium	0.21	1.31	−0.05	7.99	3.41	7.89	33.07
6	Brazil	−6.18	5.80	0.42	0.44	9.34	7.93	33.46
7	Colombia	−2.17	6.04	0.10	6.04	11.02	6.73	48.46
8	Czech Republic	4.89	2.87	0.12	9.33	7.62	6.60	29.28
9	Denmark	−1.28	1.89	67.05	13.23	5.68	7.83	57.01
10	Egypt	15.71	15.04	0.15	3.28	7.13	6.58	35.34
11	Finland	−9.74	3.73	0.39	8.90	5.37	6.86	27.21
12	France	−6.61	1.41	0.10	13.95	3.39	8.42	25.36
13	Germany	−0.86	1.15	0.07	17.30	2.39	8.14	32.82
14	Hungary	−16.62	5.14	0.01	23.03	7.19	6.71	37.19
15	India	7.90	9.61	0.12	2.77	5.80	7.28	51.77
16	Indonesia	5.83	8.24	0.17	1.64	12.10	6.92	49.93
17	Ireland	−14.69	−0.21	0.04	14.14	1.65	7.93	49.41
18	Israel	−3.32	3.96	0.05	1.39	6.18	7.11	45.98
19	Japan	3.01	−0.18	0.06	1.94	4.42	8.14	43.81
20	Jordan	10.36	6.47	0.06	6.28	11.89	6.29	35.01
21	Kazakhstan	−12.35	11.79	−0.18	17.76	11.22	6.67	68.56
22	Malaysia	−12.95	3.01	0.10	7.06	7.62	7.19	44.94
23	Mexico	−19.73	5.21	0.64	0.35	9.31	7.34	41.27
24	Netherlands	−6.47	2.09	0.14	11.01	3.52	8.26	42.87
25	Nigeria	−16.47	11.56	0.75	4.32	14.39	6.54	32.89
26	Norway	−15.34	2.97	0.09	4.82	3.48	7.46	40.21
27	Pakistan	−1.10	16.11	−0.06	6.53	9.53	6.48	49.73
28	Peru	1.16	4.17	0.16	10.77	8.92	6.49	41.74
29	Philippines	−3.24	6.27	0.10	0.70	10.30	6.51	31.87
30	Poland	−17.46	4.14	0.10	8.52	8.81	7.10	57.10
31	Russian Federation	−26.10	12.88	1.11	18.75	10.98	7.18	41.52
32	Singapore	−5.74	3.56	0.04	5.26	12.80	6.97	36.56

Table 7 (continued)

		Real GDP growth	Inflation rate	Loan growth	Deposits to assets	Equity to assets	Total loans	Loans to assets
33	Slovakia	−10.99	3.11	0.19	5.98	7.65	6.53	48.81
34	South Africa	3.22	9.33	0.01	7.96	6.15	7.49	37.17
35	Spain	−5.54	1.77	0.01	3.31	5.52	8.17	69.27
36	Switzerland	3.02	0.33	0.03	10.57	5.05	7.98	37.82
37	Turkey	−15.85	8.35	0.04	8.37	10.58	7.24	34.13
38	Ukraine	−34.84	19.96	0.18	34.06	10.42	6.65	74.65
39	U.K.	−17.26	1.64	−0.03	8.53	2.70	8.67	31.93
40	U.S.A.	−1.58	1.71	−0.04	3.60	4.63	8.16	24.91
41	Venezuela	4.70	30.01	0.23	1.12	9.76	6.71	41.18
42	Vietnam	10.85	15.09	0.27	9.83	7.78	6.51	50.69

The definitions of variables are listed in Table 6

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