Financial crisis, structure and reform

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Abstract

In this study, we examine the relationship between the structure of financial systems and financial crises. Using cross-country data on financial structures and crises, we find that there is a significant short-term reversal in development of the banking sector and the stock market during both bank crises and market crashes, with the corporate bond market moving in the same direction as bank credit. However, the results are significant for countries with market-based financial systems but not for countries with bank-based financial systems. Emerging markets have mainly bank-based financial systems, which may explain why these markets require more time to recover from economic downturns after a financial crisis. Therefore, we argue that governments should emphasize a balanced financial system structure as it helps countries to recover from financial crises more quickly compared with countries that lack such balanced structures.

*JEL classification***:** G10; G20; G28

*Keywords***:** Financial system structure; Financial crises, Financial reform

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1. Introduction

The existing studies on the structure of financial systems and economic growth provide ambiguous results. In a review of those studies, Allen and Oura (2004) suggest that the information acquisition and the risk allocation roles of a financial system are the two channels that connect the financial system's structure and development to economic growth. However, the roles of stock markets and financial intermediaries in allocating resources seem to be different. According to Allen and Gale (2000), compared with market-based financial systems, bank-based financial systems provide better inter-temporal and worse cross-sectional risk sharing, whereas Holmstrom and Tirole (1997) indicate that bank-based and market-based financial systems are distinguished according to their information content. Boot and Thakor (2000) show that bank monitoring can better resolve moral hazard problems at the firm's level. Therefore, highly leveraged firms should rely on bank monitoring, whereas firms with substantial net worth should rely on market-based financial systems.

Nevertheless, there is still no consistent view on whether one financial system structure is better than the other for the real economy in the long term. Some authors highlight the role of stock markets in creating incentives and the distortions in bank finance. Rajan and Zingales (2001) show that relationship-based financial system intermediaries may transmit poor price signals, lead to concentrated information and make the financial assets more illiquid. In contrast, in arm's-length financial systems, intermediaries are protected by explicit contracts and transparency, which help them

to make worthwhile investments. Allen and Gale (2000) argue that bank-based financial systems are more helpful in economies in which most of the major industries are associated with conventional manufacturing and technology. Hence, moving towards market-based financial systems may not be helpful for all economies.

However, some authors argue that the structure of financial systems does not matter for economic growth. Chakraborty and Ray (2006) use an endogenous growth model to show that it is difficult to conclude that one type of financial system is invariably better than the other. What matters for growth is the efficiency with which a country's financial system and legal institutions resolve agency problems rather than the structure of the financial system the country relies on.

In addition to this theoretical literature, empirical studies have shed light on the performances of these two types of financial system structures. Allen and Gale (2000) discuss the financial systems in five industrial countries and find that different structures of the systems show similar long-term growth rates. Demirgüç-Kunt and Levine (2001) classify countries into bank-based and market-based financial systems and document the tendency for financial systems to become more market-based as their economies develop. Levine (2002) confirms the findings of Allen and Gale (2000) and documents that distinguished financial structures cannot help to explain cross-country differences in long-term economic performance. However, he finds that bank-based financial systems promote faster economic growth than market-based financial systems in the short term for countries that are at an early stage of development. Similar conclusions are also found in some research at the industry or

firm level. For example, Rajan and Zingales (1998) confirm that greater financial development accelerates the growth of financial-dependent industries, but financial structure does not matter. However, Luintel et al. (2008) have recently shown that the complete absence of cross-country support for financial structures reported by some panel or cross-section studies may exist because the studies do not sufficiently account for cross-country heterogeneity. Accounting for the problems of existing studies and using a time series and dynamic heterogeneous panel method, the authors show that the structure and the development of the financial systems matter for output levels and economic growth.

However, in our study, we do not consider the nexus of the financial system structure and economic growth. Instead, we concentrate only on the changes in the structure of the financial system during a financial crisis, which has not been addressed in the existing literature. In our opinion, a financial crisis might lead to changes in the structure of a financial system; however, the question is whether those changes are long term or merely temporary. Moreover, interesting questions are whether bank-based or market-based financial systems are more likely to change as a result of a financial crisis and whether the magnitude and duration of those transformations differ across different financial systems.

Using a cross-country dataset consisting of developed and emerging countries, we document that the financial structures experience short-term reversals after banking crises or market crashes. We show that in most emerging markets, which generally do not have well-developed stock markets, changes in the financial structures are of a

smaller magnitude compared to countries with balanced structure of the financial system after a crisis. In contrast, we find that in developed countries, the changes are more significant and of longer duration. In our opinion, those changes might reflect access to finance by the real sector of the economy during the crisis, which is much easier in developed countries because of a more balanced financial system structure. The existence of a balanced structure might also explain why the declines in real GDP are larger and why it takes longer for emerging market countries than for developed economies to recover after banking crises (Reinhart and Rogoff, 2009).

Our results explain the findings of Dell'Ariccia et al. (2008) and Claessens et al. (2010). Dell'Ariccia et al. (2008) show that if banking crises exogenously hinder real activity, the sectors more dependent on external finance tend to have a great contraction during the crisis, and the differential effects are stronger in developing countries. Claessens et al. (2010) document that when compared with developed countries, the recessions and financial disruptions in emerging markets are often more costly, and it takes more time for their economies to recover. The authors attribute this difference to the fact that emerging countries have less developed financial systems than developed countries and, more importantly, do not have sound and developed financial system regulations. Hence, when financial disruptions occur, the regulators have less power to control and regulate the financial system. As Demirgüç-Kunt and Levine (2001) have shown, emerging markets are more likely to have a bank-based financial system, which could also mean that the structure of the financial system matters for the extent of the output loss and the duration of the crisis.

Moreover, our results on short-term reversals of financial system structures show that a more balanced structure would enhance financial stability. This finding is especially true for emerging economies as they tend to be more dependent on banks and less dependent on stock markets. Our findings on this point are also supported by Laeven and Valencia (2011), who document that government bank recapitalization disproportionately supports firms dependent on external finance. However, we find that countries with well-developed stock markets, which we assume also have a well-developed banking sector, recover from the crises much faster than countries without these features. In our opinion, these results are important from a policy viewpoint and support the development of a balanced financial system structure. However, we also find that previous financial reforms do not impact the structure of the financial system after crises. This finding could indicate that financial regulations and reforms often cannot prevent financial crises and, furthermore, that the structure of the financial system reverts to its previous composition after a crisis. This conclusion is consistent with that of Beck et al. (2006), who study the impact of bank concentration and regulation on the likelihood of a country suffering a systemic banking crisis. The authors show that crises are less likely to occur when a country has a more concentrated banking system. However, the authors also find that regulatory policies might hinder competition, which might trigger greater bank instability.

Macroeconomic factors also influence the stability of financial systems. Eichengreen and Hausmann (1999) demonstrate a close connection between the

exchange rate and financial fragility from three points of view: the moral hazard hypothesis, the original sin hypothesis and the commitment problem hypothesis. Chang and Velasco (2000) develop a general equilibrium model, showing that in a world in which banks play a well-defined microeconomic role, different nominal exchange rate regimes induce varying degrees of financial fragility. Thus, we also control for the factor of exchange markets as it may influence financial system stability in an interconnected world. Girton and Roper (1977) define exchange market pressure (EMP) as the sum of exchange rate depreciation and the movements of international reserves. On the basis of that definition, Eichengreen et al. (1994, 1995) add the interest rate differential as a factor to compute the EMP index. Using this definition, we also investigate the impact of EMP on the structure of financial systems during crises.

In addition to the exchange market pressure, we also consider inflation as an external factor. Honohan (2003) argues that inflation has two contrasting effects on the financial system. One effect is that inflation increases the demand for financial services and the profitability of banks. Second, the interaction of inflation with a non-indexed tax system is often associated with an effective rate of taxation on financial intermediation, resulting in wide intermediation margins and a reduced scale of intermediation. Moreover, Demirgüç-Kunt and Huizinga (1999) and Claessens et al. (2001) demonstrate a positive relationship between inflation and bank profitability.

La Porta et al. (1997, 1998) argue that common law countries generally provide the strongest protection for investors, whereas French civil law countries have the

weakest protection, which might influence the development of financial systems. Indeed, Beck et al. (2001) show that the efficiency of the legal system matters more than financial structure for inducing higher economic growth. Based on this, the work of Beck et al. (2003) and La Porta et al. (2008) provides qualified support for both law and finance theory and endowment theory. The authors suggest that historical differences in legal origin can explain current cross-country differences in financial development, whereas geographical endowments as measured by settler mortality tend to account more significantly for financial development.

In addition, Beck et al. (2001) examine the nexus of politics and financial system development. The authors find that political structure variables do not directly explain most differences in financial development among different countries, whereas both the law and finance theory and the endowment theory still work through political forces. In contrast, Roe and Siegel (2011) argue that political instability is another primary determinant of the differences in financial development around the world. According to these authors, political instability influences financial system development and hence economic growth.

Therefore, using these studies, we decide to control for legal origin and the enforcement of laws as these factors may influence the development and structure of the financial system after a crisis. Indeed, our results show that the rights of creditors are always beneficial for the development of banking systems before and after banking crises. Moreover, financial reforms appear to support the increase in bank credit during crises, whereas the effects seem to be quite mixed during normal periods.

Additionally, we add the factors of legal origin and political stability into our regressions and find that the statistical results are not altered, which confirms the robustness of the main results.

Our work contributes to the literature in several ways. Most importantly, our study advances knowledge of the development and structure of financial systems. Therefore, our work shows the impact of an additional factor on the development of financial system structures, which has been ignored in previous work. Second, by studying how a crisis influences the structure of financial systems, we provide new evidence on the financial system relation to the real sector of the economy. Finally, our study is important from a regulatory point of view as we show that authorities should focus not only on the development of the financial system but also on creating a more diversified financial system structure.

The rest of the paper is organized as follows: Section 2 presents the data and the descriptive statistics. Section 3 discusses the econometric model we employ and the empirical results. Section 4 presents the results of our sensitivity analysis and the discussion. Section 5 offers conclusions.

2. Data and descriptive statistics

Our data set consists of observations for 69 countries, including developed and developing countries, over the period 1970-2009. First, we construct indicators for the structure of the financial system using the methodology and revised database of Beck et al. (2010). In the event of missing information, we use the data from Demirgüç-Kunt and Levine (2001). We use the database of Laeven and Valencia (2010) to establish the

year of the banking crises, and we use the data from Sornette (2002) on the market crises. We also employ data from Abiad and Mody (2005) and Abiad et al. (2010) for the set of the control variables on financial regulations. Table 1 presents the description and sources of all the variables used in this study.

[Table 1]

As many financial crises persist for multiple years, it is often difficult to determine an exact end date of the crises. Furthermore, Beck et al. (2006) argue that during a crisis, it likely takes time to affect the behavior of some of the explanatory variables. Therefore, we use data both on the initial and second year of the crisis to represent the start of the banking or market crisis, where year $\in[0,1]$ stands for the initial years of the financial crises. Using this period, we establish the structure of the financial system for five years prior to the crises and ten years after it.

2.1. Variable definitions

2.1.1. Definitions of banking crises and market crashes

In this paper, we differentiate between banking crises and market crashes. We follow Laeven and Valencia (2008) and refer to a systemic banking crisis when a country's corporate and financial sectors experience numerous defaults. In a systemic banking crisis, non-performing loans increase dramatically, and most of the aggregate banking system capital is shorty exhausted. As a result, this process always leads to many output losses. However, during banking crises, there may also be a concurrent decline in stock market prices. Nevertheless, the reasons for stock market crashes are more subtle and diversified. Sornette (2002) indicates that a stock market crash occurs

because the market has entered an unstable phase, and any small disturbance may trigger the instability. A stock market crash fundamentally has an endogenous or internal origin, whereas exogenous or external shock may function only as triggering factors. Mishkin and White (2002) document that stock market crashes may be attributed to the expectation of an economic downturn or a loss of "irrational exuberance". Therefore, the origin of market crashes is more diversified and may not always be related to problems present in the banking system. Moreover, a market crash is more likely to be associated with the irrational expectations of investors, not only economic fundamentals. Consequently, banking crises may not always occur concurrently with stock market crashes and vice versa.

Because minor alterations in economic fundamentals are always successive, it is not easy to provide an exact definition and differentiation of a banking crisis. In this paper, we use the starting dates of systemic banking crises provided by Laeven and Valencia (2010). However, we focus only on those banking crises with an output loss of over 10 percent because we assume that only a large banking crisis might lead to significant changes in the structure of the financial system. Using this criterion, we are able to identify 75 major systematic banking crises in 65 countries, with 10 countries experiencing two crisis episodes during the past 39 years.

To identify stock market crashes, we use the data of Sornette (2002) on stock market crashes, which analyzes most of the regional market crashes from 1980 to 2002. Based on this data, our study includes 17 market crashes, which occurred in 15 countries. The countries and the years of with the systemic banking crises and market

crash in our sample are presented in Table 2.

[Table 2]

Sornette (2002) indicates that stock markets around the world are strongly influenced by trends in the U.S. market. Thus, the 1987 October crash in the U.S. almost immediately became an international event. In contrast, stock market crashes in Latin America in the 1990s, Asia in 1997, and Russia in 1998 were mainly related to a subsequence of regional crises. Hence, market crises are more dependent on contagion and correlations across markets, which directly lead to the pronounced synchronization of a bubble collapse within one region. As a result, a systematic banking crisis might differ significantly from a market crisis. Nevertheless, we assume that this difference will not impact our results. Moreover, recent studies document that a banking crisis can be transmitted through lending channels across countries (Allen et al., 2010).

2.1.2. Measures of financial structure

We employ indicators for banking and market size in a country to measure the structure of the financial system. In addition, we add the size of the corporate bond market as a control variable, which we measure relative to GDP. Corporate bonds are similar in construction to loans, but may provide better cross-sectional risk sharing than bank loans (Allen and Gale, 2000). As a result, we treat corporate bonds as a separate part of the financial system and do not classify it as a component of the bank-based or market-based financial systems.

To control for the size of the banking sector, we use three variables: bank credit to

GDP, private credit to GDP, and bank assets to GDP. The ratio of bank credit to GDP equals the domestic credit by deposit money banks to the private sector as a share of GDP, whereas private credit to GDP equals all the credit issued by financial institutions to the private sector as a share of GDP but excludes the credit by central banks. Table 3 shows that all three indicators for the size of the banking sector are highly correlated during the crises.

[Table 3]

In addition to the size of the banking sector, we also use bank concentration as an indicator of the banking sector's market structure. Allen and Gale (2000, 2004) document that a less concentrated banking system with more banks is more prone to financial crises than a concentrated banking system with a few banks. Moreover, Boyd and De Nicolo (2005) show that a more concentrated banking structure enhances banking fragility. Beck et al. (2006) demonstrate that when controlling for the factors of banking regulation, bank competition and macroeconomic conditions, crises are less likely to occur in economies with more concentrated banking structures.

We use five variables to measure the development of equity markets: stock market capitalization to GDP, stock market total value traded to GDP, stock market turnover ratio, the number of listed companies per 10k population and raised capital to GDP. Our data show that all the indicators increase with countries' income level, with higher-income countries having significantly larger stock markets by size and volume than middle and low-income countries, which is consistent with the findings of

Demirgüç-Kunt and Levine (2001).

The stock market capitalization to GDP is a measure of the size of the stock market and is widely used in the literature as a measure of stock market development. However, Allen et al. (2006) have indicated that this measure has several drawbacks. First, this measure only captures the present value of the listed equity but cannot reflect the amount of funding actually obtained by all the listed companies in the economy. Second, the indicator may be influenced by some highly capitalized companies in the equity market, which may cause the market to appear very developed when it is not. Third, this measure may also be influenced by the highly frequent movement in the stock market. Therefore, we decide that the ratio of raised capital to GDP would be a better measure, and we retrieved the information from the World Federation of Exchanges. However, the data cover only the period from 1996-2008. Therefore, we decide to use the number of listed companies per 10k population as an alternative indicator of market size. Stock markets could be sizable because of numerous listings, but they may be illiquid or shallow because of a lack of active trading. Hence, in the regressions, we use the variables on the stock market value traded to GDP and the stock market turnover ratio to control for stock market illiquidity.

In recent years, financial system structures around the world have more developed market-based financial systems (Beck and Demirgüç-Kunt, 2009). The situation is more present in high-income countries and less pronounced in developing countries. In developed countries, the rapid increase in stock market capitalization was largely

related to the development of securitization techniques, which has transformed the way in which many types of transactions, which would previously have been conventional bank loans, are structured (Allen and Santomero, 2001). In the last decade, the growing importance of securitization was especially obvious in the transformation of traditional mortgages, which finally led to the financial crisis of 2007-2008. Hence, our paper may also indicate whether countries' financial system structures may change again after the recent crisis.

2.1.3. Financial structure determinants

Existing studies show that macroeconomic conditions and financial and institutional frameworks may determine countries' financial system structures. Therefore, in the regressions, we employ the following macroeconomic indicators: GDP per capita, the percentage change in the GDP deflator, or inflation rate, and the EMP index. The macroeconomic data were retrieved from the World Bank WDI database, whereas we follow Tanner (2001) and define the EMP index as the sum of the exchange rate depreciation and reserve outflows (scaled by base money). Tanner (2001) uses the EMP index, which was first defined by Girton and Roper (1977) and later extended by Eichengreen et al. (1994, 1995) with the weighted average of the exchange rate, reserve and interest rate changes.

We control for financial reforms using the database of Abiad and Mody (2005) and Abiad et al. (2010), who constructed an index of financial reforms along seven different dimensions: credit controls and reserve requirements, interest rate control, entry barriers, state ownership, policies on equity markets, banking regulations and

restrictions on financial accounts. The database also includes the subindex of banking regulation and equity market policies, but it does not vary significantly across the crisis periods. Therefore, we decide to employ only the financial reform index.

The financial reform index shows that reforms have advanced substantially in many countries in the past 30 years. However, we find that during or following crises, the index does not change significantly. This finding is consistent with that of Barth et al. (2004), who argue that the regulatory restrictions on bank activities do not change significantly after systemic banking crises. Moreover, Barth et al. (2008) report that some countries imposed additional restrictions on bank activities, which appeared to increase the probability of a systemic banking crisis between 20 and 40 percent, whereas other countries relaxed restrictions on bank activities by allowing banks to diversify their income sources, which has positive impacts on banking system stability. Tressel and Detragiache (2009), who also examine the impact of financial reforms on financial system development, show that the effectiveness of reforms on financial deepening has materialized only if the institutional environment was sufficiently favorable. Specifically, in that study, the response of bank credit to reforms was not significantly positive. Hence, there is no consistent evidence that financial reforms increase the effectiveness of the financial system.

La Porta et al. (1997, 1998) document that the structure of a financial system is a product, not a cause, of legal structure. Following La Porta et al. (1997), we employ four variables: legal origin, rule of law, antidirector rights and creditor rights. La Porta et al. (1997) report that countries legal systems originate from a limited number of

legal traditions: English common law or French, German and Scandinavian civil law. The authors find that the common law system tends to grant the best protection to external private investors. As a result, the system facilitates the development of a market-based financial system. In contrast, countries with French legal origin tend to grant the worst protection of private property rights; therefore, a bank-based financial system is more likely to emerge in those countries.

The other three indexes indicate legal enforcement from the perspectives of investors, shareholders and creditors. A rule of law index is built based on a survey, which is an assessment by investors in different countries of the legal environment and the quality of law enforcement. An antidirector rights index describes minority shareholder rights, such as votes, control power and the availability of mechanisms for making legal claims against the directors, whereas a creditor rights index aggregates the various rights of creditors in liquidation and reorganization. The first two indexes facilitate the development of the stock markets, whereas the last index facilitates the development of a bank-based financial system.

Finally, Roe and Siegel (2011) mention that periods of political instability may also impede the development of financial systems. Hence, we also use the annual polity scores from the Polity IV Project[2] to control for the quality and stability of political institutions. The polity score is a consolidated index describing the political regime characteristics and stability of a country.

2.2. Descriptive statistics

[2] The Political IV Database can be found at http://www.systemicpeace.org/polity/polity4.htm.

In Tables 3 and 4, we present the summary statistics and correlations among different indicators of banking sectors and stock markets during crises.

[Table 4]

We find that the main index of banking system size, bank credit to GDP, has a pair-wise correlation with private credit to GDP of 0.82, but this index has a much higher correlation of 0.97 with bank assets to GDP. In the regression, we use all three proxies for banking system size as private credit includes the credits issued by non-bank financial institutions. Allen et al. (2006) mention that credit granted by non-bank financial institutions to the private sector grows more as a proportion of the total credits by financial systems as a country develops. However, bank assets to GDP show only the size of the banking system itself, whereas bank credit to the private sector is more related to the role of the banking system in the real economy. We find, however, that bank concentration is not significantly correlated with any of those three proxy indicators for the size of the banking system.

The indicators of stock market development all show positive correlations with one other, whereas the stock market turnover ratio has lower correlations with stock market capitalization and the number of listed companies, which is consistent with the definition as this indicator measures stock market trading. Similarly, we employ all the indicators of stock market development with banking system proxies to examine how the structure of the financial system evolves during banking crises and market crashes.

3. Methodology and results

We employ the ordinary least squares (OLS) panel regressions to analyze the changes in the structure of the financial system structure.

3.1. Methodology

In the study, we use different regression models to assess the impact of financial crises on the structure of financial systems in different countries. First, we use a model with country-fixed effects to address the time consistency of the variables. In our regression, it is crucial to partial out the time inconsistency of the variables that might explain the evolvement of the financial system structure. As argued by Rajan and Zingales (2003), it is imperative to test whether the variables have a consistently positive or negative impact on the dependent variables over time. However, the test is not easy as financial system development indicators show quite different performances during crises than during normal periods. Therefore, to address possibly unobserved heterogeneity, we first employ country-fixed effects to partial out the time-invariant factors. Additionally, we add time-fixed effects to further address endogeneity concerns. As a result, we estimated the following model:

$$\text{Bank Credit/ GDP}_i = \beta_0 + \beta_1 * \text{Stock Market Indicator}_i + \beta_2 * \text{Bank Concentration Indicator} + \beta_3 * X_i + \beta_4 * Y_i + \varepsilon_i \quad (1)$$

where the banking sector development for country *i* is jointly determined by the development of the stock market, the concentration of the banking sector, a series of macroeconomic indicators shown by X_i, which includes a log of GDP per capita, the inflation rate and the exchange market pressure index, and a series of other

explanatory variables shown by Y_i, which includes variables of financial reforms, legal origin, law enforcement, and political stability; additionally, ε_i is the error term in the equation. We also use bank assets to GDP or total private credit to GDP as the dependent variable and estimate the same model.

Then, using (1), we further estimate the effects of the corporate bond market on the banking systems during the crises by adding the indicator of corporate bond market capitalization to GDP to our previous model:

$$\text{Bank Credit/ GDP}_i = \beta_0 + \beta_1 * \text{Stock Market Indicator}_i + \beta_2 * \text{Bank Concentration Indicator} + \beta_3 * \text{Bond Market Indicator}_i + \beta_4 * X_i + \beta_5 * Y_i + \varepsilon_i \quad (2)$$

To address the possibility of unobserved heterogeneity, we use country-fixed effects to partial out time invariant factors, although when we fit legal origin dummies into our models, only random country-effects work.

Another solution to address the unobserved heterogeneity would be to employ the GMM dynamic method. Roodman (2007), however, shows that for short-panel econometrics, difference and system GMM regressions may often suffer from weak instrumentation, generating estimators that are invalid yet appear valid in specification tests.

3.2. Main results

3.2.1. Structure of financial systems and banking crises

Table 5 presents the changes in the financial system structures of countries that experienced a banking crisis in the years 1970-2009. The coefficients for the proxies

for stock market development, including stock market capitalization, stock market total value traded and stock market turnover ratio, have a positive sign before the banking crises and become negatively related to the dependent variable during the crises. This reversal of stock market development does not last for a long period, so we call this “short-term reversal” in the structure of the financial system. Two years following the occurrence of banking crises, the trend returns to the situation of the pre-crises periods, but the coefficients for proxies showing the development of the stock market are not significant until five years after the crises. This result indicates that during the third to the fifth years after the crises, the stock market has not shown a significantly and strongly positive relationship with the banking sector as it does during a normal period, whereas after five years of the banking crises, the stock market evolves significantly in the same way as the banking system as in the pre-crises periods.

[Table 5]

In Table 6, we show the results for the regressions when we employ the subsample of countries with severe banking crises. The results show that after a severe banking crisis, the short-term reversal in the structure of the financial system lasts longer as we find that both stock market capitalization and stock market total value traded begin to reverse to pre-crisis development after four years.

We find, however, that the variable of the number of listed companies per 10k population is significant and negatively correlated to bank credit before the crises. Additionally, this variable remains negative after the crisis until the fourth year,

whereas it is also statistically significant. In the fifth year, the sign changes, but the variable is insignificant. However, this variable behaves the same way as other variables for stock market development when we employ the subsample of severe banking crises.

In contrast to the main results, this indicator of stock market development is not tainted by the fluctuations of stock prices and possible mismeasurement of the GDP level. Indeed, this indicator may show better than market capitalization the importance of equity markets in the financial system (Rajan and Zingales, 2003). However, some drawbacks remain as the variable may be too slow to capture the highly frequent changes in stock markets and cannot show the actual number of the raised capital in the market. Moreover, some countries with more concentrated industrial structures will have fewer but larger companies listed, which may reduce the number according to this measurement. Other countries may have many companies listed, but the equity market may be shallow.

Hence, we use the ratio of total raised capital to GDP as an alternative proxy, which may overcome some of the drawbacks. However, in this case, the number of observations is reduced, and we cover only ten crises as we have data only for the period 1995 to 2009. Using this proxy, we find that the reversal appears to last longer and be significant even during the fifth to tenth years after the crises. This result should indicate that the stock market will require more time to recover after a severe banking crisis, especially for the equity market, although our results could be biased due to the sample selection.

[Table 6]

3.2.2. Structure of the financial system and market crashes

Using a similar approach, we also examine the changes in the financial system structures during market crashes in the years 1980-2008. The results are presented in Table 7. A difference from our previous results is that the reversal now lasts for nearly five years after a market crash, which means that after a market crash, the financial intermediaries require more time to recover than equity markets after a banking crisis. This finding is reasonable as market crashes often have a direct impact on financial intermediaries and their assets' value. Consequently, financial intermediaries may take more time to return to assets levels observed prior to the crisis.

This explanation is also consistent with the arguments provided by Claessens et al. (2010), who show that the recessions associated with equity price busts are always much deeper and longer than those without market crashes in emerging markets. A similar situation can also be observed in developed countries, although the effect is not as significant as in emerging economies.

Another explanation for the results is that stock market disruptions are often regional through strong linkages and stock market co-movements. King and Wadhwani (1990) show that correlations tend to increase in times of large shocks to returns, such as a stock market crash. However, using nonparametric estimation, Hartmann et al. (2004) demonstrate that simultaneous crashes in stock markets are very likely and that extreme cross-border linkages are surprisingly similar to national linkages.

[Table 7]

3.2.3. Subsamples

As our results show differences in the impact of the bank and market crashes on the structure of the financial systems, we decide to divide the countries in our sample according to their financial system structure. We follow Levine (2002) and differentiate countries as either having a bank-based or a market-based financial system.

Using this subsample, we test again the changes in the structure of the financial system after a banking crisis, whereas the dependent variables remain the bank credit/GDP and the bank assets/GDP. The results in Table 8 show that a country's prior financial system structure determines its evolution after a banking crisis. In countries with market-based financial systems, the changes in the equity market are strongly related to the situation in the banking sector. Prior to the crisis, the variable of stock market capitalization is positive and significant. After the banking crisis, the coefficient changes its sign, but the variable is insignificant. However, the variable market capitalization is again positive and significant in the fifth year. In contrast, in countries with bank-based financial systems, the crisis seems not to have a strong effect on the equity market as the coefficient for market capitalization is insignificant in all the specifications.

We assume that a country with a bank-based financial system may not have a well-developed stock market, which is often the case in emerging markets. In contrast, in countries with market-based financial systems, it is very likely that the banking

industry is also well developed. Hence, in countries with balanced financial system structures, enterprises can more easily shift financing from banks to markets or vice versa during a crisis. The change of financial channels might explain our results and would confirm the findings of Classens et al. (2010). The authors show that the temporal dynamics of macroeconomic and financial indicators during a crisis are very different in emerging economies than in developed economies. In emerging markets, the economic recessions and financial disruptions are often more costly, and the markets take more time to recover after the crises. As Demirgüç-Kunt and Levine (2001) document, in most emerging markets, the financial system is bank-based. Consequently, in those countries, it is more difficult for enterprises to use different financing channels, which would explain the long and costly duration of the crisis. In contrast, developed countries have either balanced or market-based financial systems, which allow the companies to shift more easily from one channel to another during a crisis; consequently, the economy may recover much faster.

Moreover, the results show that the reversal of the financial system structures is economically much larger in the subsample of the market-based countries than in the full sample. The coefficient estimates show that a rise in stock market capitalization is associated with a 30 percent reduction in bank credit and a 34 percent reduction in bank assets in countries with market-based financial systems. When we use the full sample for the same period, the results show that an increase in the market capitalization is only associated with a 17 percent reduction in bank credit. Hence, in addition to being statistically significant, the empirical results suggest that an

undeveloped stock market will make the financial system more fragile in an economically important manner.

[Table 8]

3.3. Structure of the financial system and macroeconomic indicators

Macroeconomic indicators may determine the structure of the financial system and its changes during and after the crises. Therefore, in the regression, we employ additional macroeconomic indicators, including GDP per capita, the inflation rate and the exchange market pressure index. We also control for bank concentration because in an interconnected global financial system, the high level of industry concentration would make the financial sector more vulnerable to extreme events.

Table 9 shows that the relationship between banking credit and stock market capitalization remains unchanged and significant when we control for more macroeconomic variables. The indicator of GDP per capita has an insignificantly negative impact on the bank credit during the crises but the opposite effect during normal periods. Inflation tends to have a negative impact on bank credit during most periods, a result consistent with the finding that a higher level of inflation would lead to a reduced scale of intermediation (Honohan, 2003). The effect of the exchange market pressure seems to be quite mixed, but the coefficient is insignificant in all the regressions.

[Table 9]

3.4. The role of corporate bond markets

As mentioned, we also decide to examine the impact of the corporate bond

market on banking systems during a crisis. Herring and Chatusripitak (2001) argue that the undeveloped state of the corporate bond market in the financial system may induce a country's economy to rely on bank lending. As an example, the authors present Thailand's corporate bond market, which is heavily undeveloped relative to the equity market and the banking sector, which might explain the large economic costs of the Asian crisis in 1997. In contrast, Arteta (2005) indicates that a stronger reliance on the corporate bond market relative to the banking sector can lead to faster growth of output in normal periods, whereas such reliance does not show any benefits during a banking crisis. Therefore, the role of the corporate bond market during a financial crisis is rather inconclusive.

To consider the role of the corporate bond market during a banking crisis, we run the ratio of corporate bond market capitalization to GDP as another explanatory variable in model (2). We first use stock market capitalization as an indicator of stock market size. We find that the coefficient for corporate bond market capitalization is significant in almost all the specifications, as shown in Table 12. This finding means that the corporate bond market is moving the same way as the banking sector, rather than substituting for bank loans as we may have expected. The results remain unchanged when we use the number of listed companies per 10k population as the indicator.

Furthermore, we find that the coefficient for corporate bond market capitalization is economically quite large in the regressions. A rise of one unit of change of bond market capitalization will result in a 59 percent increase in bank credit in normal

periods and a 72 percent increase during the crises. Hence, our results indicate that the development of corporate bond markets may not help to alleviate a downturn during banking crises. One explanation for the results is that the corporate bond market is dominated by financial institutions, especially in recent years through the securitization process of loans. Consequently, our result shows that a better choice is to develop a balanced financial system with strong stock markets, especially for emerging countries, which are more vulnerable to banking crises; nonetheless, the role of the corporate bond market should not be ignored.

4. Sensitivity analysis and discussion

We test the sensitivity of our results and control for other variables suggested in the literature, which may also influence a country's financial system structure and development. Finally, we discuss the implications of our results from a policy point of view.

4.1. Did reforms change financial structures during crises?

First, we add the indicator of financial reform as an explanatory variable to our regressions. Table 10 shows that the coefficient for stock market capitalization does not change and remains significant in the specification after we have added the control variable for the financial reform. The financial reform variable, however, enters the regression with an insignificantly negative sign before and after the banking crises and with an insignificantly positive sign during the crises. The result is consistent with the existing findings, which argue that financial reforms have quite mixed influences on the deepening and the stability of financial systems (Tressel and

Detragiche, 2009).

The relationship between the degree of regulatory restrictiveness and banking sector development is also inconclusive. Barth et al. (2008) have demonstrated that a financial system does not develop very differently after reforms. Moreover, Barth et al. (2004) show that countries with more restrictive regulation systems — especially restrictions on the securities activities of banks — have a higher probability of suffering a banking crisis. Consequently, the effects of financial reforms and restrictions on financial system development seem to be uncertain.

However, the results indicate that one reason might be the problem of enforcement, which could mean that new regulations are in place but do not take effect. As a result, according to the estimations, the effectiveness of financial reforms still needs to be improved in the future.

[Table 10]

4.2. Legal environment

In the next regression, we first add the variable of credit rights with financial reforms to check the robustness of our results. Similarly, as shown in Table 10, the coefficient for financial reforms enters with a positive sign during banking crises but a negative sign before and after the crises. Again, the results are not very significant. The indicator of creditor rights enters the regression with positive signs, and the results are significant in most specifications except the years during the occurrence of banking crises. Therefore, we assume that the rights of creditors are always beneficial for the development of banking systems, and the impact of these rights may not be

sufficiently strong enough only during banking crises. Hence, the effect of financial reforms on financial structures is inconclusive.

Next, we control for several other legal variables, including rules of law, antidirector rights, credit rights and legal origin, and find that the results do not change for the short-term reversal of financial system structures during banking crises. The coefficients of stock market capitalization to GDP are significant during different time periods. Hence, the results are statistically stronger compared with our main estimation.

In the regression, the coefficients for English common law and French civil law are not significant, whereas the German civil law dummy is positive and significant after crises. Hence, our result shows that German civil law is more beneficial for banking systems to recover after banking crises.

To check the robustness of the results, we also change the dependent variable with the ratio of bank assets to GDP and run the regressions again. Table 13 shows that the results are not altered. We find again that German civil law may help the impaired banking systems to recover better after banking crises.

[Table 13]

4.3. Political regime

Rajan and Zingales (2003) propose a theory of financial development based on controlling interest group politics and argue that incumbents' opposition will be weaker when studies allow for cross-border capital flows. La Porta et al. (2008) argue that political changes may provide the impetus for countries to improve their laws and

regulations. Based on these studies, the work of Roe and Siegel (2011) demonstrates that political stability has a significant, consistent and substantial impact on financial development over many decades, especially debt and stock market development. Therefore, we decide to check the robustness of the results by adding political regime characteristics into the regressions. Table 11 shows that our main results are not altered by those factors.

Finally, we use the total private credit to GDP instead of bank assets to GDP as a dependent variable in the robustness test. The result in Table 14 again documents short-term reversal in the structure of the financial system during a banking crisis, but financial reform does not play an important role in the process.

[Table 14]

Finally, the inclusions of the control variables for legal origin and political regime characteristics show that our results for the short-term reversal of financial system structures during banking crises are robust and consistent.

5. Conclusions

In our paper, we use data on 75 banking crises and 17 market crashes over the period 1970 to 2009 to examine the link between changes in the structures of financial systems and financial crisis. Our results show that there is a short-term reversal in the structure of the financial system during both banking crises and market crashes. However, we do not find that the corporate bond market is a substitute for the banking sector as it moves in the same direction as bank credit during a financial crisis. An explanation for the results could be the securitization process of loans, which has

resulted in the dominance of financial institutions in the corporate bond market in recent years.

We argue that our results have important implications for financial reforms, especially in emerging markets. First, our results show that regulators need to pay more attention to the architecture of a financial system to make the entire financial system safer. According to our evidence, after a bank crisis, the stock markets develop faster, and the financial system evolves toward a market-oriented financial system. Therefore, financial regulations should not only focus on the banking sector because it experiences problems but should also monitor the development of the stock markets.

In addition, our results show that compared with countries with bank-based financial systems, countries with market-based financial systems appear to have a more significant reversal during banking crises. Hence, changes in financial structure are not the same among different countries during and after crises. This result means that countries may have to coordinate financial reforms and regulations to ensure consistency after a crisis.

Second, significant changes in the structure of a financial system are difficult even during banking crises and market crashes. As the banking sector and equity market appear to substitute for each other during a financial crisis, a better developed banking system or equity market will help to recover from financial disruption and economic downturn. However, for emerging economies, changing to a market-oriented financial system to avoid too much vulnerability during crises in the short term may not be a feasible option; thus, a stronger focus on equity market

development should be established in developing countries.

Finally, in this paper, we have not considered the economic growth of countries with different financial system structures during a crisis. The short-term reversal within a financial system may impact the growth of the real economy. As Allen et al. (2006) have already demonstrated the empirical link between the economic structure and the financial structure, the economic structure may also influence the recovery of the real economy after a banking crisis or market crash. Hence, in future research, it will be interesting to examine the relationship between financial structure and recovery after a crisis occurs.

Acknowledgements

We would like to thank an anonymous referee and the participants of the Workshop Reforming Finance: Balancing Domestic and International Agendas for their very helpful comments. Xian Gu and Oskar Kowalewski are grateful to the Wharton Financial Institutions Center at the Wharton School for the support of their research.

References

Abiad, A., Mody, M., 2005. Financial liberalization: What shakes it? What shapes it?. American Economic Review 95, 66–88.

Abiad, A., Detragiache, E., Tressel, T., 2010. A new database of financial reforms. IMF Staff Papers 57(2).

Allen, F., 2001. Financial structure and financial crisis. International Review of Finance 2, 1-19.

Allen, F., Gale, D., 2000. Comparing financial systems. MIT Press, Cambridge, MA.

Allen, F., Gale, D., 2004. Competition and financial stability. Journal of Money, Credit, and Banking 36, 433-480.

Allen, F., Oura, H., 2004. Sustained economic growth and the financial system. IMES Discussion Paper Series No. E-17.

Allen, F., Santomero, A. M., 2001. What do financial intermediaries do?. Journal of Banking and Finance 25, 271-294.

Allen, F., Bartiloro, L., Kowalewski, O., 2006. Does economic structure determine financial structure. AFA 2007 Chicago Meetings Paper.

Allen, F., Hryckiewicz, A., Kowalewski, O., Tumer-Alkan, G., 2010. Transmission of bank liquidity shocks in loan and deposit markets: The role of interbank borrowing and market monitoring. Wharton Financial Institutions Center Working Paper 10-28.

Arteta, C.O., 2005. Does bond market development help reduce the cost of crises? Evidence from developing countries. Working Paper, Centro de Estudios Monetarios Latinoamericano.

Barth, J.R., Caprio, Jr.G., Levine, R., 2004. Bank regulation and supervision: What works best?. Journal of Financial Intermediation 13(2), 205-248.

Barth, J.R., Caprio, Jr.G., Levine, R., 2008. Bank regulations are changing: For better or worse?. World Bank Policy Research Working Paper No. 4646.

Beck T., Demirgüç-Kunt, A., 2009. Financial institutions and markets across countries and over time - Data and analysis. World Bank Policy Research Working Paper No. 4943.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2010. Financial institutions and markets across countries and over time: The updated financial development and structure database. The World Bank Economic Review 24(1), 77-92.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2006. Bank concentration, competition, and crises: First results. Journal of Banking and Finance 30(5), 1581-1603.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2003. Law, endowments and finance. Journal of Financial Economics 70, 137-181.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2001. Law, politics, and finance. World Bank Policy Research Working Paper No. 2585.

Beck, T., Demirgüç-Kunt, A., Levine, R., Maksimovic, V., 2001. Financial structure and economic development: Firm, industry and country evidence. In: Demirgüç-Kunt, A., Levine, R. (Eds.), Financial structure and economic growth: A cross country comparison of banks, markets, and development, Oxford University Press, New York.

Boot, A.W.A., Thakor, A.V., 2000. Can relationship banking survive competition?. Journal of Finance 55(2), 679-713.

Boyd, J.H., De Nicolo, G., 2005. The theory of bank risk-taking and competition revisited. Journal of Finance 60(3), 1329-1343.

Chakraborty, S., Ray, T., 2006. Bank-based versus market-based financial systems: A growth-theoretic analysis. Journal of Monetary Economics 53(2), 329-350.

Chang, R., Velasco, A., 2000. Financial fragility and the exchange rate regime. Journal of Economic Theory 92, 1-34.

Claessens, S., Kose, M.A., Terrones, M.E., 2010. Recessions and financial disruptions in emerging markets: A bird's eye view. Central Bank of Chile Working Papers No. 585.

Claessens, S., Demirgüç-Kunt, A., Huizinga, H., 2001. How does foreign entry affect domestic banking markets?. Journal of Banking and Finance 25(5), 891-911.

Dell' Ariccia, G., Detragiache, E., Rajan, R., 2008. The real effect of banking crises. Journal of Financial Intermediation 17, 89-112.

Demirgüç-Kunt, A., Huizinga, H., 1999. Determinants of commercial bank interest margins and profitability: Some international evidence. The World Bank Economic Review 13(3), 379-408.

Demirgüç-Kunt, A., Levine, R., 2001. Bank-based and market-based financial systems: Cross-country comparisons. In: Demirgüç-Kunt, A., Levine, R. (Eds.), Financial structure and economic growth: A cross country comparison of banks, markets, and development, Oxford University Press, New York.

Eichengreen, B., Hausmann, R., 1999. Exchange rates and financial fragility. NBER Working Paper No. 7418.

Eichengreen, B., Rose, A.K., Wyplosz, C., 1994. Speculative attacks on pegged exchange rates: An empirical exploration with special reference to the European Monetary System. NBER Working Paper No. 4898.

Eichengreen, B., Rose, A.K., Wyplosz, C., Dumas, B., Weber, A., 1995. Exchange market mayhem: The antecedents and aftermath of speculative attacks. Economic Policy 10(21), 249-312.

Girton, L., Roper, D., 1977. A monetary model of exchange market pressure applied to the postwar Canadian experience. The American Economic Review 67(4), 537-548.

Hartmann, P., Straetmans, S., de Vires, C.G., 2004. Asset market linkages in crisis period. Review of Economics and Statistics 86(1), 313–326.

Herring, R. J., Chatusripitak, N., 2001. The case of the missing market: The bond market and why it matters for financial development. Wharton Financial Institutions Center Working Paper No.01-08.

Holmstrom, B., Tirole, J., 1997. Financial intermediation, loanable funds, and the real sector. The Quarterly Journal of Economics 112(3), 663-01.

Honohan, P., 2003. Taxation of financial intermediation: Theory and practice for emerging economies, World Bank, Washington.

King, M.A., Wadhwani, S., 1990. Transmission of volatility between stock markets. Review of Financial Studies 3, 5-33.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1997. Legal determinants of external finance. Journal of Finance 52(3), 1131-1150.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and finance.

Journal of Political Economy 106(6), 1113-1155.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2008. The economic consequences of legal origins. Journal of Economic Literature 46(2), 285-332.

Laeven, L., Valencia, F., 2008. Systemic banking crises: A new database. IMF Working Papers No. 08/224.

Laeven, L., Valencia, F., 2010. Resolution of banking crises: The good, the bad and the ugly. IMF Working Papers No. 10/146.

Laeven, L., Valencia, F., 2011. The real effects of financial sector interventions during crises. IMF Working Paper 11/45.

Levine, R., 2002. Bank-based or market-based financial systems: Which is better?. Journal of Financial Intermediation 11(4), 398-428.

Luintel K.B, Khan M., Arestis P., Theodoridis, K., 2008. Financial structure and economic growth. Journal of Development Economics 86, 181-200.

Mishkin, F.S., White, E.N., 2002. U.S. stock market crashes and their aftermath: Implications for monetary policy. NBER Working Paper No. 8992.

Rajan, R., Zingales, L., 1998. Financial development and growth. American Economic Review 88, 559-586.

Rajan, R., Zingales, L., 2001. Financial systems, industrial structure and growth. Oxford Review of Economic Policy 17(4), 467-482.

Rajan, R., Zingales, L., 2003. The great reversals: The politics of financial development in the 20th century. Journal of Financial Economics 69(1), 5-50.

Reinhard, C., Rogoff, K., 2009. The aftermath of financial crisis. NBER Working

Paper No. 14656.

Roe, M.J., Siegel, J.I., 2011. Political instability: Effects on financial development, roots in the severity of economic inequality. Journal of Comparative Economics, 279-309.

Roodman, D., 2008. A note on the theme of too many instruments. Working Paper No. 125, Center for Global Development.

Sornette, D., 2002. Why stock markets crash: Critical events in complex financial systems. Princeton University Press, Princeton.

Tanner, E., 2001. Exchange market pressure and monetary policy: Asia and Latin America in the 1990s. IMF Staff Papers 47(3).

Tressel, T., Detragiache, E., 2009. Do financial sector reforms lead to financial development? Evidence from a new database. IMF Working Paper No. 08/265.

Table 1.
Description of main variables and data sources

	Banking Sector Development	
Bank Credit	Equals the amount of private credit by money banks divided by GDP	
Private Credit	Equals the amount of private credit by money banks and other financial institutions divided by GDP	Beck, Demirguc-Kunt and Levine (2008)[3]
Bank Assets	Equals deposit money bank assets divided by GDP per year	
Bank Concentration	Equals the share of total banking assets held by the three largest banks	
	Stock Market Development	
Stock Market	Equals stock market capitalization divided by GDP	
Total Value Traded	Equals stock market total value traded divided by GDP	
Turnover Ratio	A ratio measures how often stock shares change hands	Beck, Demirguc-Kunt and Levine (2008)
No. of Listed Companies	Equals the number of listed companies divided by the amount of 10k population	
Capital Raised	Equals capital newly raised plus capital already raised and then divided by GDP	World Federation of Exchanges Statistics; World Bank Statistics
	Bond Market Development	
Bond Market	Corporate Bond Market Capitalization divided by GDP	Beck, Demirguc-Kunt and Levine (2008)
	Financial Reform and Regulation	
Financial Reform Index	A conglomerate index recognizes the multifaceted nature of financial reform and regulation, including seven different dimensions: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, securities market regulation, banking regulation and restrictions on financial accounts.	Abiad, Detragiache and Tressel (2010)
	Law Origins	
Legal Origin	Index created by coding countries by legal origin, which can be divided into four categories-	

[3] We use the CEIC database and World Bank Statistics to add the missing data for China.

	English Common Law, French Civil Law, German Civil Law and Scandinavian Civil Law.	
Rule of Law	An investors' survey-based estimate of the quality of law enforcement	LLSV (1997)
Creditor Rights	An index aggregating the various rights of creditors in liquidation and reorganization	
Antidirector Rights	An index describing minority shareholder rights	

Table 2.
Sample of crises: 1980-2008

The table shows the sample we use for banking crises and market crashes. The sample of banking crises is selected according to L. Laeven and F.V. Valencia (2008) Systemic banking crises: A new Database, IMF Working Paper No. 08/224 and L. Laeven, and F.V. Valencia (2010) Resolution of banking crises: The good, the bad and the ugly, IMF Working Paper No. 10/146; all the crises in the sample have an output loss over 10%. The sample of market crashes is selected according to D. Sornette (2002) Why stock markets crash: Critical events in complex financial system, Princeton University Press, Princeton.

Banking Crises			**Market Crashes**
Algeria (1990)	Haiti (1994)	Philippines (1983)	China (1998)
Argentina (1980, 2001)	Hungary (2008)	Portugal (2008)	Indonesia (1997)
Austria (2008)	Iceland (2008)	Sierra Leone (1990)	Korea, Rep. (1994)
Belgium (2008)	Indonesia (1997)	Slovenia (2008)	Malaysia (1994)
Benin (1988)	Ireland (2008)	Spain (1977, 2008)	Thailand (1994)
Bolivia (1986)	Israel (1977)	Sri Lanka (1989)	Russian Federation (1997)
Brazil (1990)	Jamaica (1996)	Swaziland (1995)	Philippines (1994)
Bulgaria (1996)	Japan (1997)	Sweden (1991, 2008)	United States (1987; 2001)
Burundi (1994)	Jordan (1989)	Thailand (1983, 1997)	Argentina (1997)
Cameroon (1987)	Kenya (1992)	Togo (1993)	Brazil (1997)
Chile (1976)	Korea, Rep. (1997)	Turkey (1982, 2000)	Mexico (1997)
China (1998)	Kuwait (1982)	United Kingdom (2008)	Venezuela, RB (1997)
Colombia (1982, 1998)	Latvia (2008)	United States(1988. 2007)	Peru (1997)
Congo, Dem. Rep. (1991)	Lebanon (1990)	Uruguay (1981, 2002)	Chile (1994)
Congo, Rep. (1992)	Luxembourg (2008)	Yemen, Rep. (1996)	Hong Kong, China (1987; 1997)
Denmark (2008)	Malaysia (1997)	Zambia (1995)	
Djibouti (1991)	Mexico (1981, 1994)	Zimbabwe (1995)	
Ecuador (1982, 1998)	Morocco (1980)		
Finland (1991)	Netherlands (2008)		
France (2008)	Nicaragua (1990)		
Germany (2008)	Niger (1983)		
Ghana (1982)	Panama (1988)		
Greece (2008)	Paraguay (1995)		
Guinea-Bissau (1995)	Peru (1983)		

Table 5.

The short-term reversal: Bank credit and stock market development during banking crises (1970-2008)

This table reports the relationships between bank credit and stock market development before, during and after the crises. We use stock market capitalization to GDP, stock market total value traded to GDP, the stock market turnover ratio and the number of listed companies per 10k population as the indicators of stock market development. Ln (GDP per capita) is a controlled variable. The sample includes all the banking crises with output losses over 10% of GDP during 1970 to 2008. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Dependent variable: Bank Credit					
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.42***	-0.17***	0.01	0.47	0.15***
	(0.05)	(0.06)	(0.24)	(0.31)	(0.02)
GDP per capita	0.31***	-0.07*	-0.29	0.06	0.09***
	(0.06)	(0.04)	(0.11)	(0.13)	(0.02)
Constant	-2.24***	1.43***	1.88**	-0.26	-0.34**
	(0.52)	(0.32)	(0.92)	(1.00)	(0.14)
Observation	182	68	56	55	600
R^2	0.601	0.525	0.247	0.458	0.434
Total Value Traded	0.11***	-0.07*	0.24	0.06	0.12***
	(0.04)	(0.04)	(0.22)	(0.31)	(0.02)
GDP per capita	0.41***	-0.01	-0.18	0.08	0.12***
	(0.05)	(0.03)	(0.11)	(0.31)	(0.02)
Constant	-2.95***	0.79***	1.81**	-0.29	-0.54***
	(0.45)	(0.28)	(0.87)	(1.04)	(0.14)
Observation	180	65	57	61	605
R^2	0.539	0.263	0.140	0.189	0.391
Turnover Ratio	0.03	-0.05***	0.01	0.05	0.07***
	(0.04)	(0.02)	(0.02)	(0.17)	(0.02)
GDP per capita	0.49***	0.03	-0.16	0.09	0.14***
	(0.06)	(0.03)	(0.11)	(0.13)	(0.02)
Constant	-3.64***	0.48*	1.67***	-0.38	-0.68***
	(0.56)	(0.29)	(0.86)	(1.09)	(0.13)
Observation	179	64	57	61	622
R^2	0.507	0.033	0.256	0.146	0.375
No. of Listed Companies	-1.07***	-0.41	-0.13	-1.29**	0.01
	(0.13)	(0.72)	(0.42)	(0.63)	(0.01)
GDP per capita	0.35***	-0.02	-0.14	0.05	0.15***
	(0.05)	(0.04)	(0.11)	(0.12)	(0.01)
Constant	-2.14***	0.86**	1.54*	0.12	-0.80***
	(0.47)	(0.33)	(0.85)	(0.94)	(0.12)
Observation	180	66	57	57	637
R^2	0.305	0.430	0.254	0.050	0.370

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance,

respectively.

Table 6.

The short-term reversal: Bank credit and stock market development during severe banking crises (1970-2008)

This table reports the relationships between bank credit and stock market development before, during and after the crises, with a sample of severe banking crises during 1970 to 2008. All the banking crises in the sample had output losses over 30% of the countries' GDP. We use stock market capitalization to GDP, stock market total value traded to GDP, the stock market turnover ratio and the number of listed companies per 10k population as the indicators of stock market development. Ln (GDP per capita) is a controlled variable. The sample includes all the banking crises with output losses over 10% of GDP during 1970 to 2008. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Dependent variable: Bank Credit					
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.18***	-0.13***	-0.14	0.27	0.13***
	(0.04)	(0.03)	(0.10)	(0.24)	0.02
Constant	0.47***	0.68***	0.56***	0.37***	0.40***
	(0.02)	(0.02)	(0.04)	(0.09)	0.01
Observation	123	62	62	62	334
R^2	0.341	0.299	0.483	0.436	0.426
Total Value Traded	0.05	-0.11***	-0.01	0.09	0.13***
	(0.03)	(0.04)	(0.14)	(0.28)	0.02
Constant	0.54***	0.62***	0.51***	0.46***	0.43***
	(0.01)	(0.01)	(0.03)	(0.06)	0.01
Observation	126	61	62	61	325
R^2	0.190	0.053	0.185	0.189	0.257
Turnover Ratio	-0.03	-0.04**	0.01	0.06	0.07***
	(0.02)	(0.02)	(0.02)	(0.12)	0.02
Constant	0.57***	0.60***	0.51***	0.45***	0.45***
	(0.01)	(0.01)	(0.01)	(0.06)	0.01
Observation	124	62	62	61	338
R^2	0.066	0.050	0.057	0.145	0.196
No. of Listed Companies	0.99***	-0.90	-0.21	-1.17*	0.41**
	(0.27)	(0.94)	(0.40)	(0.61)	0.20
Constant	0.43***	0.72***	0.54***	0.62***	0.41***
	(0.03)	(0.11)	(0.06)	(0.08)	0.03
Observation	134	66	62	62	341
R^2	0.165	0.235	0.005	0.064	0.351
Capital Raised	2.12	-0.52	-0.15	-1.21	-0.60**
	(1.41)	(0.53)	(0.37)	(2.88)	0.28
Constant	0.72***	0.96***	0.82***	0.64***	0.64***
	(0.03)	(0.02)	(0.03)	(0.04)	0.01
Observation	34	24	20	26	110
R^2 overall	0.213	0.121	0.093	0.359	0.255

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 7.

The short-term reversal: Bank credit and stock market development during market crashes (1980-2008)

This table reports the relationship between bank credit and stock market development during market crashes. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Dependent variable: Bank Credit					
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.21***	-0.19	-0.21***	-0.07	0.23***
	(0.04)	(0.17)	(0.07)	(0.08)	(0.03)
Constant	0.52***	0.86***	0.94***	0.85***	0.41***
	(0.02)	(0.12)	(0.05)	(0.06)	(0.02)
Observation	65	30	32	32	191
R^2	0.538	0.376	0.382	0.282	0.364
Total Value Traded	0.13***	-0.11**	-0.18*	-0.02	0.28***
	(0.02)	(0.04)	(0.09)	(0.09)	(0.04)
Constant	0.59***	0.79***	0.87***	0.81***	0.46***
	(0.01)	(0.03)	(0.05)	(0.04)	(0.01)
Observation	65	31	32	32	181
R^2	0.595	0.566	0.598	0.541	0.490
Turnover Ratio	0.06	-0.09***	-0.01	-0.06	0.27***
	(0.04)	(0.02)	(0.02)	(0.15)	(0.04)
Constant	0.61***	0.80***	0.78***	0.84***	0.42***
	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)
Observation	65	31	32	32	191
R^2	0.257	0.334	0.196	0.246	0.285

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 8.

The short-term reversal during banking crises: Subsamples

The table reports the relationship between the banking sector and the stock market during banking crises, with the subsamples of market-based countries and bank-based countries. In Panel A, the dependent variable is the ratio of bank credit to GDP, whereas in Panel B, the dependent variable is the ratio of bank assets to GDP. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Panel A	**Dependent variable: Bank Credit**									
	(1) A subsample of market-based countries					(2) A subsample of bank-based countries				
	Pre-crises	Crises		Post-crises		Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.17***	-0.30***	-0.15	0.19	0.05*	0.10	-0.04	-0.04	-0.04	0.14***
	(0.05)	(0.11)	(0.14)	(0.26)	0.03	(0.09)	(0.07)	(0.17)	(0.18)	0.03
Constant	0.61***	1.14***	0.87***	0.49**	0.56***	0.35***	0.41***	0.36***	0.37***	0.33***
	(0.05)	(0.09)	(0.11)	(0.20)	(0.03)	(0.01)	(0.02)	(0.04)	(0.04)	(0.01)
Observation	59	27	24	24	141	62	35	38	38	196
R^2	0.312	0.312	0.366	0.478	0.418	0.014	0.013	0.145	0.281	0.281
Panel B	**Dependent variable: Bank Assets**									
	(1) A subsample of market-based countries					(2) A subsample of bank-based countries				
	Pre-crises	Crises		Post-crises		Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.17***	-0.34***	-0.12	0.23	0.08*	0.11	-0.06	0.002	-0.11	0.14***
	(0.05)	(0.11)	(0.14)	(0.26)	(0.03)	(0.09)	(0.09)	(0.14)	(0.14)	(0.03)
Constant	0.74***	1.29***	0.99***	0.64***	0.68***	0.35***	0.42***	0.40***	0.41***	0.38***
	(0.05)	(0.09)	(0.11)	(0.20)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.01)
Observation	59	27	24	24	141	57	33	36	36	194
R^2	0.191	0.260	0.315	0.385	0.366	0.076	0.009	0.107	0.278	0.340

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 9.

The short-term reversal: Financial structure, inflation and exchange market pressure during banking crises (1970-2008)

The table reports the relationship between the bank credit and stock market capitalization, taking into account bank concentration and some macroeconomic indicators, such as the inflation rate and the exchange market pressure index. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Dependent variable: Bank Credit					
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.22***	-0.15***	0.62***	0.75***	0.06
	(0.1)	(0.05)	(0.19)	(0.22)	(0.05)
GDP per capita	0.26***	-0.03	0.12	0.02	0.08*
	(0.09)	(0.03)	(0.07)	(0.05)	(0.04)
Bank Concentration	-0.02	0.37	-0.48	0.01	-0.13
	(0.08)	(0.24)	(0.38)	(0.06)	(0.15)
Inflation	-0.12*	-0.01**	-0.09***	-0.02	-0.06
	(0.07)	(0.005)	(0.03)	(0.04)	(0.12)
Exchange Market Pressure	0.04	-0.00	0.10***	0.03	0.00
	(0.03)	(0.01)	(0.04)	(0.05)	(0.00)
Constant	-1.71**	0.97***	-0.35	-0.01	-0.23
	(0.72)	(0.35)	(0.57)	(0.42)	(0.40)
Observation	66	31	33	37	98
R^2	0.468	0.216	0.617	0.461	0.323

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 10.

Financial reforms and financial structure during banking crises

This table reports the relationships between financial reforms and financial structure during crises. Additionally, the factor of "creditor rights" is included as an independent variable. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

	Dependent variable: Bank Credit									
	(1)					(2)				
	Pre-crises	Crises	Post-crises			Pre-crises	Crises	Post-crises		
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.14***	-0.14***	0.63***	0.75***	0.04	0.13***	-0.16***	0.54***	0.61***	0.03
	(0.03)	(0.04)	(0.23)	(0.22)	(0.04)	(0.04)	(0.06)	(0.21)	(0.22)	(0.04)
Financial Reform Index	-0.11	0.37	-0.16	-0.22	-0.04	-0.17	0.31	-0.27	-0.45	-0.05
	(0.14)	(0.20)	(0.19)	(0.25)	(0.06)	(0.16)	(0.20)	(0.35)	(0.38)	(0.08)
Creditor Rights						0.11**	0.08	0.08	0.09*	0.11***
						(0.05)	(0.08)	(0.06)	(0.05)	(0.03)
GDP per capita	0.20***	-0.03	0.10	0.06	0.10*	0.22***	-0.06	0.14*	0.12*	0.10***
	(0.07)	(0.03)	(0.08)	(0.05)	(0.04)	(0.04)	(0.04)	(0.08)	(0.07)	(0.03)
Inflation	-0.16*	-0.02***	-0.07***	-0.05	-0.00***	-0.16**	-0.10	-0.06	-0.07	-0.00
	(0.09)	(0.01)	(0.03)	(0.04)	(0.00)	(0.07)	(0.07)	(0.04)	(0.06)	(0.00)
Exchange Market Pressure	0.02	0.01	0.08***	0.07	0.00***	0.02	0.01	0.07	0.10	0.00
	(0.02)	(0.01)	(0.03)	(0.06)	(0.00)	(0.04)	(0.01)	(0.05)	(0.08)	(0.00)
Constant	-1.09***	0.66	-0.42	-0.14	-0.42	-1.40***	0.77	-0.77	-0.67	-0.60**
	(0.42)	(0.26)	(0.55)	(0.35)	(0.32)	(0.32)	(0.41)	(0.57)	(0.49)	(0.29)
Observation	94	41	46	42	88	94	39	44	40	82
R^2	0.506	0.011	0.528	0.498	0.205	0.599	0.039	0.547	0.561	0.473

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 11.

Financial structure, legal environment and political regime characteristics (robustness tests)

The table reports the results of the robustness tests, which include legal environment, legal origin and political regime characteristics as controlling variables. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

	Dependent variable: Bank Credit									
	(1)					(2)				
	Pre-crises	Crises	Post-crises			Pre-crises	Crises	Post-crises		
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.17***	-0.16***	0.40**	0.58***	0.06*	0.18***	-0.17**	0.61***	0.72***	0.06*
	(0.05)	(0.06)	(0.21)	(0.20)	(0.04)	(0.05)	(0.06)	(0.19)	(0.20)	(0.03)
GDP per capita	0.21***	-0.08*	-0.07	-0.04	0.03***	0.20***	-0.07*	0.07	0.03	0.09***
	(0.04)	(0.04)	(0.10)	(0.08)	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)	(0.03)
Inflation	-0.13*	-0.13*	-0.05	-0.04	-0.00	-0.15*	-0.01	-0.07	-0.03	-0.00
	(0.08)	(0.08)	(0.04)	(0.06)	(0.00)	(0.08)	(0.01)	(0.04)	(0.05)	(0.00)
Exchange Market Pressure	0.01	-0.00	0.07	0.05	0.00	0.01	-0.00	0.08*	0.05	0.00
	(0.04)	(0.01)	(0.04)	(0.08)	(0.00)	(0.04)	(0.01)	(0.05)	(0.08)	(0.00)
Rule of Law	-0.05	0.12	0.07	0.05	0.02					
	(0.05)	(0.08)	(0.06)	(0.04)	(0.02)					
Antidirector Rights	0.03	0.05	-0.02	-0.02	0.01					
	(0.08)	(0.13)	(0.07)	(0.05)	(0.03)					
Creditor Rights	0.09	0.07	-0.04	0.00	0.04					
	(0.07)	(0.10)	(0.07)	(0.05)	(0.03)					
English Common Law	-0.20	-0.19	0.19	0.25	0.19					
	(0.34)	(0.51)	(0.36)	(0.24)	(0.18)					
French Civil Law	-0.30	-0.40	-0.10	0.08	-0.04					

	(0.37)	(0.55)	(0.36)	(0.24)	(0.18)					
German Civil Law	0.03	0.31	0.87**	0.73***	0.51***					
	(0.38)	(0.57)	(0.40)	(0.27)	(0.19)					
Political Regime						0.00	0.00	0.00	0.00	0.00
						(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
Constant	-1.00*	-0.42	0.55	0.17	-0.15***	-1.14***	1.25***	-0.31	-0.08	-0.35
	(0.38)	(0.63)	(0.86)	(0.68)	(0.33)	(0.30)	(0.34)	(0.46)	(0.41)	(0.23)
Observation	98	44	44	43	103	98	46	46	45	110
R^2	0.646	0.311	0.656	0.738	0.675	0.533	0.372	0.519	0.481	0.260

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 12.

Bank credit, stock market and bond market development during banking crises

This table reports the relationship between the banking sector, the stock market and the corporate bond market during banking crises. Panel A uses stock market capitalization to GDP as the indicator of the stock market,, whereas Panel B uses the number of listed companies per 10k population as the indictor. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Panel A	**Dependent variable: Bank Credit**				
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.10**	-0.13**	0.26	0.63	0.13*
	(0.05)	(0.06)	(0.31)	(0.42)	(0.08)
GDP per capita	0.23**	0.01	-0.01	0.01	0.02
	(0.09)	(0.05)	(0.17)	(0.15)	(0.06)
Bond Market	0.59**	0.72**	1.17**	0.53	0.91***
	(0.28)	(0.34)	(0.79)	(0.66)	(0.34)
Financial Reform Index	-0.14	0.23	0.07	-0.71	0.12
	(0.18)	(0.43)	(0.81)	(0.60)	(0.18)
Bank Concentration	-0.02	0.00	-0.47	0.04	0.15
	(0.07)	(0.24)	(0.47)	(0.04)	(0.12)
Constant	-1.4**	0.58	0.61	0.57	-0.08
	(0.68)	(0.45)	(1.31)	(1.24)	(0.45)
Observation	85	18	22	23	239
R^2	0.370	0.264	0.443	0.382	0.169
Panel B	**Dependent variable: Bank Credit**				
No. of Listed	0.82	9.52	-0.27	-7.19***	-0.21
	(0.62)	(6.48)	(15.13)	(1.13)	(0.19)
GDP per capita	0.24***	0.01	-0.40	0.42*	0.11
	(0.06)	(0.06)	(0.44)	(0.19)	(0.08)
Bond Market	0.89***	1.15**	1.53	3.05**	1.56***
	(0.21)	(0.42)	(5.71)	(1.11)	(0.21)
Financial Reform Index	-0.07	0.66	4.29	-4.71**	0.10
	(0.22)	(0.65)	(4.79)	(1.46)	(0.12)
Bank Concentration	0.04	-0.06	-0.19	-0.05	0.24**
	(0.09)	(0.38)	(0.82)	(0.08)	(0.10)
Constant	-1.79*	-1.02	0.85	0.50	-0.97
	(0.51)	(1.12)	(4.04)	(1.25)	(0.68)
Observation	85	18	22	23	242
R^2	0.359	0.353	0.062	0.017	0.155

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 13.

Bank assets and stock market development during banking crises

The table reports the relationship between the banking sector and the stock market during banking crises, with the ratio of bank assets to GDP as a dependent variable. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

Dependent variable: Bank Assets					
	Pre-crises	Crises		Post-crises	
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.16*	-0.18***	0.38	0.72***	0.07**
	(0.10)	(0.06)	(0.26)	(0.28)	(0.03)
Bank Concentration	-0.00	0.40*	-0.26	0.06	-0.00
	(0.13)	(0.23)	(0.51)	(0.12)	(0.10)
GDP per capita	0.28***	-0.15***	-0.04	-0.15	-0.05
	(0.07)	(0.05)	(0.15)	(0.14)	(0.03)
Inflation	-0.14	-0.17	-0.07	-0.02	-0.18
	(0.09)	(0.11)	(0.05)	(0.07)	(0.15)
Exchange Market Pressure	0.08	0.00	0.08	0.03	-0.00
	(0.07)	(0.02)	(0.05)	(0.10)	(0.00)
Rule of Law	0.01	0.17	0.16	0.10	0.07**
	(0.18)	(0.18)	(0.10)	(0.07)	(0.03)
Antidirector Rights	-0.06	0.08	0.04	-0.06	-0.04
	(0.25)	(0.29)	(0.15)	(0.09)	(0.05)
Creditor Rights	0.14	-0.00	-0.08	-0.05	-0.02
	(0.16)	(0.17)	(0.12)	(0.08)	(0.04)
English Common Law	-0.16	-0.07	0.77	0.37	0.43*
	(0.92)	(1.01)	(0.69)	(0.38)	(0.26)
French Civil Law	-0.18	-0.51	0.41	0.28	0.14
	(1.08)	(1.12)	(0.63)	(0.37)	(0.25)
German Civil Law	0.27	0.46	1.14*	1.11***	0.97***
	(0.97)	(1.02)	(0.65)	(0.39)	(0.26)
Constant	-1.88	0.97	-0.39	0.76	0.40
	(1.73)	(1.77)	(1.63)	(1.19)	(0.42)
Observation	66	29	31	35	91
R^2	0.595	0.263	0.732	0.702	0.711

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.

Table 14.

Private credit, stock market capitalization and financial reforms during banking crises

The table reports the relationship between the banking sector and the stock market during banking crises, with the ratio of private credit to GDP as a dependent variable. On the assumption that banking crises occur at time=0, "Year<0" stands for pre-crisis time; "Year=0|1" stands for during the crisis; "Year=2|3" stands for two years after the crisis; "Year=4|5" stands for four years after the crisis; "Year>5" stands for six years after the crisis.

	Dependent variable: Private Credit									
	(1)					(2)				
	Pre-crises	Crises	Post-crises			Pre-crises	Crises	Post-crises		
	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5	Year<0	Year=0|1	Year=2|3	Year=4|5	Year>5
Stock Market	0.15*	-0.16*	0.68***	0.81***	0.06	0.09	-0.34***	0.42*	0.43*	0.05
	(0.08)	(0.09)	(0.24)	(0.23)	(0.05)	(0.09)	(0.13)	(0.24)	(0.26)	(0.05)
Bank Concentration	-0.01	0.23	-0.48	-0.03	-0.13	-0.02	-1.61***	-0.31	-0.07	0.04
	(0.11)	(0.33)	(0.49)	(0.15)	(0.15)	(0.12)	(0.38)	(0.65)	(0.16)	(0.17)
GDP per capita	0.33***	-0.05	0.21**	0.15**	0.18***	0.33***	-0.04	-0.09	0.15	0.20***
	(0.06)	(0.06)	(0.11)	(0.07)	(0.04)	(0.08)	(0.12)	(0.18)	(0.16)	(0.07)
Inflation	-0.15*	-0.01	-0.11*	-0.05	-0.22	-0.14*	-0.45**	-0.08	-0.07	-0.05
	(0.08)	(0.02)	(0.06)	(0.09)	(0.21)	(0.08)	(0.22)	(0.06)	(0.09)	(0.19)
Exchange Market Pressure	0.04	-0.00	0.11*	0.07	0.00	0.05	0.08	0.09	0.10	0.00
	(0.06)	(0.03)	(0.06)	(0.12)	(0.00)	(0.06)	(0.06)	(0.07)	(0.13)	(0.00)
Financial Reform Index	-0.20	0.89	-0.38	-0.45	-0.10	-0.20	2.78***	0.33	-0.19	0.00
	(0.23)	(0.55)	(0.82)	(0.54)	(0.21)	(0.23)	(1.06)	(1.04)	(0.45)	(0.20)
Rule of Law						-0.00	0.12**	0.11	0.04	-0.02
						(0.10)	(0.06)	(0.08)	(0.05)	(0.03)
Antidirector Rights						0.06	-0.11*	-0.01	-0.03	0.06
						(0.14)	(0.06)	(0.11)	(0.07)	(0.05)
Creditor Rights						0.08	0.14***	-0.03	0.04	0.02

						(0.09)	(0.04)	(0.10)	(0.07)	(0.04)
English Common Law						0.15	0.61**	-0.01	0.37	0.44*
						(0.51)	(0.28)	(0.54)	(0.31)	(0.23)
French Civil Law						-0.11	-0.33	-0.36	-0.03	-0.04
						(0.60)	(0.27)	(0.48)	(0.25)	(0.23)
German Civil Law						0.29	0.02	0.74	0.56**	0.41*
						(0.53)	(0.25)	(0.58)	(0.27)	(0.23)
Constant	-2.06	0.50	-0.80	-0.65	-0.80**	-0.28**	-0.39	0.68	-1.00	-1.42
	(0.49)	(0.62)	(0.68)	(0.45)	(0.37)	（1.05）	(0.84)	(1.50)	(1.17)	(0.62)
Observation	62	26	33	34	77	62	24	31	32	71
R^2	0.665	0.050	0.706	0.686	0.553	0.798	0.960	0.863	0.889	0.867

Robust standard errors are reported in parentheses. ***, ** and * correspond to 1%, 5%, and 10% level of significance, respectively.