



**ADB Working Paper Series**

**WILL FINANCIAL LIBERALIZATION  
TRIGGER THE FIRST CRISIS IN THE  
PEOPLE'S REPUBLIC OF CHINA?  
LESSONS FROM CROSS-COUNTRY  
EXPERIENCES**

---

Qin Gou and Yiping Huang

No. 818  
March 2018

**Asian Development Bank Institute**

Qin Gou is an associate professor in the School of Finance, Central University of Finance and Economics in Beijing, People's Republic of China. Huang Yiping is Jin Guang chair professor of economics and deputy dean of the National School of Development and director of the Institute of Digital Finance of Peking University.

The views expressed in this paper are the views of the author and do not necessarily reflect the views or policies of ADBI, ADB, its Board of Directors, or the governments they represent. ADBI does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.

Working papers are subject to formal revision and correction before they are finalized and considered published.

The Working Paper series is a continuation of the formerly named Discussion Paper series; the numbering of the papers continued without interruption or change. ADBI's working papers reflect initial ideas on a topic and are posted online for discussion. Some working papers may develop into other forms of publication.

The Asian Development Bank recognizes "China" as the People's Republic of China.

In this report, "\$" refers to US dollars.

Suggested citation:

Gou, Q. and Y. Huang. 2018. Will Financial Liberalization Trigger the First Crisis in the People's Republic of China? Lessons from Cross-Country Experiences. ADBI Working Paper 818. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/will-financial-liberalization-trigger-first-crisis-prc-lessons>

Please contact the authors for information about this paper.

Email: [twinsgou@vip.sina.com](mailto:twinsgou@vip.sina.com), [yhuang@nsd.pku.edu.cn](mailto:yhuang@nsd.pku.edu.cn)

The paper is part of the research project on *China and the Middle-Income Challenge*, which the Chinese Academy of Social Sciences and the Asian Development Bank Institute support. We benefited greatly from the discussion by the participants in the ADBI workshop on the *Middle Income Trap in Asia* held on 12–13 December 2016 in Kobe, Japan.

Asian Development Bank Institute  
Kasumigaseki Building, 8th Floor  
3-2-5 Kasumigaseki, Chiyoda-ku  
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500  
Fax: +81-3-3593-5571  
URL: [www.adbi.org](http://www.adbi.org)  
E-mail: [info@adbi.org](mailto:info@adbi.org)

© 2018 Asian Development Bank Institute

**Abstract**

The People's Republic of China (PRC) is beginning a new wave of financial liberalization, which is necessary to support strong economic growth, but will financial liberalization lead to major financial crises, as happened in many middle-income countries? The empirical examinations conducted in this study suggest that financial liberalization generally lowers financial risks, especially for middle-income economies. Nevertheless, the pace of liberalization, quality of institutions, and regulatory structure also matter for outcomes of financial instability. From these findings, we draw some policy implications for the PRC: (1) further liberalization is important not only for economic growth but also for financial stability; (2) a gradual liberalization approach should work better, focusing on the sequencing of reforms; (3) the quality of institutions, especially strong market discipline, is also important for containing financial risks; and (4) it is better for the central bank to participate in financial regulation.

**Keywords:** financial liberalization, financial crisis, financial instability

**JEL Classification:** G01, G18

## Contents

1.	INTRODUCTION .....	1
2.	LITERATURE REVIEW .....	3
3.	QUANTITATIVE MEASURES OF FINANCIAL LIBERALIZATION AND INSTABILITY .....	5
3.1	Financial Instability Indicators.....	5
3.2	Financial Liberalization Indicator .....	8
4.	DOES FINANCIAL LIBERALIZATION REDUCE OR INCREASE INSTABILITY? ....	11
4.1	Event Study .....	11
4.2	Statistical Analyses .....	13
5.	IMPORTANCE OF THE PACE OF REFORM, SUPERVISION, AND INSTITUTIONS.....	19
5.1	Pace of Liberalization .....	19
5.2	Institutional Environment .....	20
5.3	Regulatory Structure of the Financial Sector.....	21
6.	CONCLUDING REMARKS.....	25
	REFERENCES .....	27
	APPENDIX.....	31

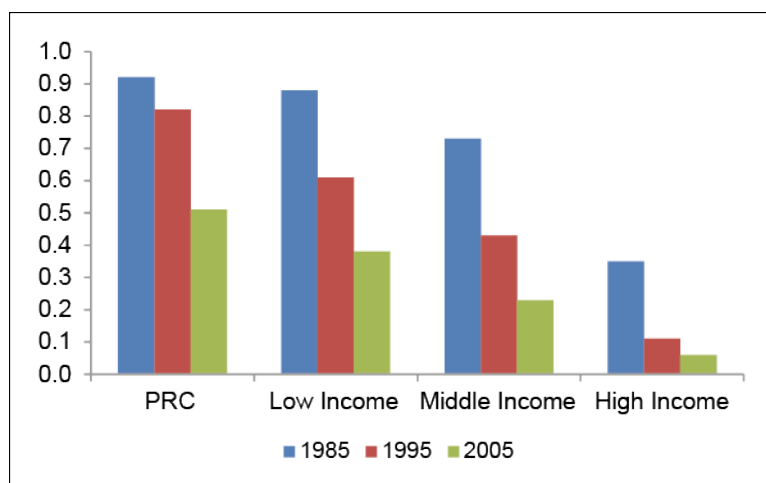
## 1. INTRODUCTION

Since the early 1980s, financial liberalization has been a consistent policy theme in the emerging market world; the only brief disruptions resulted from major financial crises. The reform, however, has yielded mixed results for economic growth and financial stability. On the one hand, almost all successful emerging market economies have more open and liberalized financial systems. On the other hand, economists have yet to reach a consensus on the consequences of financial liberalization. These points indicate that simple-minded pushing of the financial liberalization agenda might not be a sensible policy strategy. International experiences and economic analyses suggest that the liberalization of the financial sector in some form should be important for economic development, but the questions of when, how, and under which conditions to liberalize could be even more critical for the outcome.

The Chinese experience during the reform period offers an interesting case. For nearly four decades, the People's Republic of China (PRC) has been the fastest-growing economy in the world, transforming from a poor agrarian economy into a new economic superpower. Nevertheless, the Chinese financial system remains highly repressed. It is still unclear whether the PRC achieved extraordinary growth performance because of or despite financial repression. Recently, however, there is growing evidence that repressive financial policies have become drags on economic growth. The government has already devised a new program for further financial reform, but this raises a bigger question: even if financial liberalization is necessary to sustain the PRC's strong growth, will it cause significant spikes in financial risks? During the past decades, many emerging market economies, including Indonesia, Thailand, and Mexico, have suffered from major financial crises after drastic financial liberalization. Today, they are still stuck in the so-called middle-income trap.

When the PRC began its economic reform in 1978, it had only one financial institution, the People's Bank of the PRC (PBC), which served as both the central bank and a commercial bank. In a centrally planned economy, there was little need for financial intermediation. Once the government had decided to develop the non-planned, non-state economy, it quickly set out to rebuild a new financial system by re-establishing three large state-owned commercial banks in 1978, splitting the old PBC into a commercial bank operation and a new central bank at the start of 1984, and even creating the two stock exchanges in Shenzhen and Shanghai in 1991 and 1992, respectively.

However, the PRC's financial reform in the following decades exhibited a unique pattern, which Huang and his coauthors characterized as "strong in establishing institutions and growing assets, but weak in liberalizing markets and improving governance" (Huang et al. 2013). On the one hand, the PRC quickly developed a comprehensive financial system, with a complete set of financial institutions and gigantic financial assets. Its broad money supply (M2) already exceeded that of the United States in absolute volume, and its proportion of the GDP, about 200% currently, is among the highest in the world. The PRC's corporate bond market is ranked number three in the world, according to the market capitalization measure. On the other hand, the government is continuing to intervene heavily in the operation of the financial system, especially in the areas of the interest rate, the exchange rate, fund allocation, and cross-border capital flows. According to one indicator, the PRC's degree of financial repression was greater not only than the average of the middle-income countries but also than the average of the low-income countries (Abiad, Detragiache, and Tressel 2008; Figure 1).

**Figure 1: Financial Repression Indices: The PRC and Other Countries**

PRC = People's Republic of China.

Sources: Abiad, Detragiache, and Tresselt (2008); Huang, Gou, and Wang (2014).

According to Huang (2010) and Huang et al. (2013), this unique pattern of financial reform is deeply rooted in the PRC's broad economic reform strategy. Unlike the "big-bang" reform approach that the former Soviet Union adopted, the Chinese government pursued a gradualist, dual-track reform approach between the state and the non-state sectors. Protection of the relatively less efficient state-owned enterprises (SOEs) was a necessary political compromise, but it was also useful for achieving a smooth transition by creating the situation of Pareto improvement. To support the SOEs, the government had to intervene in the allocation and pricing of production factors, effectively devising the dual-track liberalization approach between product and factor markets (Huang 2010). Widespread distortions in labor, capital, land, and energy markets ensured that SOEs continue to receive the necessary inputs on favorable terms. Repressive financial policies are a form of factor market distortion (Huang and Wang 2017).

Surprisingly, heavy financial repression did not prevent the Chinese economy from growing rapidly, at least during the early years of economic reform. Huang and Wang (2011) attempted to quantify the impact of financial repression on economic growth during the period 1979–2008 by constructing a financial repression index. They first examined the entire sample and found a positive impact; that is, repressive financial policies promoted economic growth. They then divided the sample into three sub-periods and repeated the above exercise for each sub-period. They found that, while financial repression promoted economic growth in the 1980s and 1990s, it became a negative drag on growth in the 2000s. According to their estimation, if there had been full financial liberalization, it would have reduced real GDP growth by 0.79 percentage points in 1979–88 and by 0.31 percentage points in 1989–99, while it would have raised growth by 0.13 percentage points in 2000–8.

Huang and Wang (2011) argued that the positive effect that they discovered for the 1980s and 1990s was consistent with Stiglitz's (1994) reasoning, while the negative impact that they identified for the 2000s was in line with McKinnon's (1973) analyses. Later, Huang and his coauthors coined the terms the "McKinnon effect" and the "Stiglitz effect" and suggested that the two effects exist simultaneously in any economy, although the net outcome depends on their relative importance (Huang et al. 2013). In the 1980s and the 1990s in the PRC, the contribution of financial repression to

economic growth through the maintaining of financial stability and the conversion of savings into investment was greater than its cost in terms of inefficiency and risks. Therefore, the “Stiglitz effect” dominated. As the financial system matured and the income level rose in the 2000s, the negative impact could outweigh its positive contribution. Then, the “McKinnon effect” dominated. The recent transition from the “Stiglitz effect” to the “McKinnon effect” suggests that repressive financial policies have become the main drag on economic growth in the PRC. If this situation continues, the PRC could suffer continuously from sluggish growth and fall into the middle-income trap.

Through comprehensive analyses of cross-country experiences, Huang et al. (2014) concluded that financial liberalization is a necessary step towards overcoming the middle-income challenge. Nevertheless, the causal relationship between financial liberalization and financial instability is still a controversial subject. In this study, we attempt to answer the following two questions by considering international experiences: first, does financial liberalization reduce or increase financial risk, and second, what are the important conditions that could help to minimize financial risks during financial liberalization? Our purpose is to gauge the likely scenarios in the PRC and draw some useful policy implications.

The remainder of the paper is organized as follows. Section 2 surveys the literature on the relationship between financial liberalization and financial instability. Section 3 introduces some quantitative measures for financial liberalization and financial instability, including both crisis occurrence indicators and fragility indicators. Section 4 examines the impacts of financial liberalization on financial risks in detail, using both the event study approach and the statistical analysis method. Section 5 analyzes the importance of the pace of liberalization, the regulatory structure, and the quality of institutions for financial instability. We conclude the paper by drawing some policy implications for the PRC in the last section.

## 2. LITERATURE REVIEW

The benefits and costs of financial liberalization have been one important subject of the academic and policy debate in recent decades. A large number of empirical studies have focused on the effects of financial liberalization on economic growth and financial fragility but discovered mixed results. For instance, while some studies have found robust evidence that financial liberalization enhances growth (Quinn 1997; Edwards 2001; Quinn, Inclan, and Toyoda 2001; Bekaert, Harvey, and Lundblad 2005; Quinn and Toyoda 2008), most others have been inconclusive (Eichengreen 2001; Edison et al. 2004; Kose et al. 2009). The impacts of financial liberalization on the likelihood of financial crises are even more ambiguous in the literature. Demirguc-Kunt and Detragiache (1998), Kaminsky and Reinhart (1999), and Glick and Hutchinson (2001), among others, confirmed that financial liberalization increases the probabilities of banking and currency crises in the aftermath of financial liberalization. Others, such as Rossi (1999) and Glick, Guo, and Hutchison (2004), found that countries tend to be associated with lower probabilities of currency crises after financial liberalization.

A similar divide exists at the theoretical level. McKinnon (1973) first coined the term “financial repression,” referring to the strict regulation of interest rates and the mandatory allocation of financial resources. Such repressive policies would impede financial deepening and hinder financial efficiency and therefore should dampen economic growth (Shaw 1973; Roubini and Sala-i-Martin 1992; Pagano 1993). According to the endogenous growth literature, financial liberalization should lead

to more efficient allocation of savings by promoting financial deepening (Greenwood and Jovanovic 1990; Bencivenga and Smith 1991). In addition, the literature has claimed that financial liberalization helps in cross-country risk diversification, promotes transparency and accountability, reduces adverse selection and moral hazard problems, alleviates liquidity problems in financial markets, and disciplines policy makers (Stulz 1999; Mishkin 2003; Kose et al. 2009). In short, financial liberalization should lower financial risks.

However, opponents have argued that financial liberalization might actually increase vulnerability by causing over-lending, volatile international capital flows, and banking and currency crises. Some have blamed premature financial liberalization as the main trigger of banking crises in many countries (Demirgüç-Kunt and Detragiache 1998; Kaminsky and Reinhart 1999). Financial liberalization could intensify banking competition and reduce banks' profits, which, in turn, might erode banks' franchise value, lower their incentives to be prudent, and encourage risk taking (Keeley 1990; Hellman, Murdock, and Stiglitz 2000; Repullo 2004; Cubillas and Gonzalez 2014). Similarly, some economists have argued that financial liberalization may lead to financial crashes due to the "excessive" boom–bust nature of capital flows and financial markets (Rodrik 1998; Stiglitz 2000). In particular, the reduction of controls on international capital movements could increase foreign exchange risk and exacerbate the currency mismatch problem.

On the other hand, Boyd and De Nicolò (2005) and Cubillas and Gonzalez (2014) challenged the view of a positive association between bank competition and instability. They argued that competition might reduce risk if banks charge lower interest rates and reduce the incentive to shift to riskier projects. A rich literature has articulated that financial liberalization should reduce incentive distortions, agency problems, and asset bubbles (Stulz 1999, 2005; Mishkin 2003). Kaminsky and Schmukler (2008) further claimed that liberalization is followed by greater financial cycles only in the short run and that, with institutional improvement, financial markets tend to stabilize in the long run.

Moreover, the relationship between financial liberalization and financial instability may differ across countries. According to Allen and Gale (2000) and Tornell and Westermann (2005), emerging market economies, in which asymmetric information, the agency problem, and other distortions are prevalent, are more likely to experience "excessive" financial cycles in asset markets. Therefore, the probabilities of excessive cycles, bubbles, and instability are probably higher in these economies than in mature financial markets. Tornell and Westermann (2005) found that excessive risk taking by banks after financial liberalization is more likely to happen in economically less developed countries. If these observations are accurate, then emerging market economies should take extra caution when liberalizing their financial sector, possibly by paying more attention to the prerequisite conditions, such as prudent regulation, fiscal discipline, perfect competition, and complete information (Stiglitz and Weiss 1981; Fry 1997; Arestis and Demetriades 1999). Otherwise, emerging market economies might be more able to maintain financial stability under repressive financial policies (Stiglitz 1994; Hellmann, Murdock, and Stiglitz 1997).

Another group of studies has explored the effects of different paces of financial reform and offered some insights into how countries can reap the benefits and minimize the costs of capital account liberalization (IMF 2012). Some studies have favored a gradual reform approach (McKinnon 1993), but others have supported the case of simultaneous reform for three reasons. First, full liberalization promotes flexibility in both the exchange rate and the interest rate, which, in turn, could support capital account reforms (Quirk and Evans 1995). Second, simultaneous reform involves no



reform cost but produces a great economic benefit in the absence of market distortions and externalities (Choksi and Papageorgiou 1986). Third, a “big-bang” reform can avoid the delays that interest groups impose and thus reduce the costs of reform.

The literature offers a useful starting point for thinking about this issue of financial liberalization and financial stability in the PRC. However, it is very difficult to draw any direct implications, as the literature is inconclusive on almost every subject. To make the study relevant to the PRC, we take the literature forwards in three steps. First, we separate financial risks into banking, currency, and sovereign debt risks. These risks may respond differently to financial liberalization. Second, we divide the sample into low-, middle-, and high-income groups in the empirical analyses. The PRC was a low-income economy during the early years of economic reform, but it is now already a high-middle-income country. Third, we investigate further whether the pace of liberalization, the regulatory structure, and the quality of institutions make a difference to the risk consequences of financial liberalization. These should provide some pointers for gauging likely scenarios.

### **3. QUANTITATIVE MEASURES OF FINANCIAL LIBERALIZATION AND INSTABILITY**

#### **3.1 Financial Instability Indicators**

Financial instability is conceptually easy to understand but difficult to define because of the complex interdependence of different elements within the financial system (Dattels et al. 2010). To map the risk to the global financial system, the IMF defined financial instability as a situation in which system-wide episodes cause the financial system to fail to function and in which the institutional underpinnings of the economy are impaired (Dattels et al. 2010). Most other studies have tended to define financial instability as the antithesis—namely as stability, which they define theoretically in terms of its ability to facilitate and enhance economic processes, manage risks, and absorb shocks (Schinasi 2004).<sup>1</sup>

There are a number of approaches to measuring financial instability. The first considers the occurrence of financial crises in individual market segments, such as the banking, currency, debt, and equity markets (Kaminsky and Reinhart 1999; Glick, Guo, and Hutchison 2004; Ghosh, Ostry, and Mahvash 2014; Qin and Luo 2014). Various early warning indicators are also available to monitor financial stability and predict crises (Kaminsky, Lizondo, and Reinhart 1998; Berg, Eduardo, and Catherine 1999; Aspachs et al. 2006). This approach has several drawbacks: (1) it often focuses on one segment of the financial system (the banking sector or currency market) and a single dimension of risk (credit risk or currency risk); (2) it only recognizes explicit crisis events and ignores crises that prompt policies successfully contained; and (3) the identification of crises (e.g., timing) is rather subjective (Demirgüç-Kunt and Detragiache 2005; Klomp and De Haan 2009).

---

<sup>1</sup> Schinasi (2004) discussed and proposed the theoretical concept of financial stability.

The second approach assesses financial instability based on subsets of risk in individual market segments. For instance, Kaminsky and Schmukler (2008) developed an index of stock market boom–bust cycles by applying the NBER methodology to identify business cycles. Loayza and Rancière (2006) measured financial fragility as the standard deviation of the growth rate of the private credit to GDP ratio. In addition, Andrianova et al. (2015) devised a financial fragility index for the banking sector.

Rather than focusing only on individual market segments, the third approach quantifies broadly defined financial instability. In the Global Financial Stability Report (GFSR), the IMF interpreted the risks and conditions that exert an impact on financial stability, including macroeconomic risk, emerging market risk, credit risk, market risk, monetary and financial conditions, and investors' risk appetite (Dattels et al. 2010). The Bank of England sought to assess a similar set of vulnerabilities in the UK financial system, including credit, market, funding, income generation, and operational risks (Haldane, Hall, and Pezzini 2007).

The final approach formulates aggregate indicators by combining a number of financial instability indicators. For example, Klomp and De Haan (2009) constructed an aggregate financial instability index by applying the principal component analysis method to a number of financial instability indicators.<sup>2</sup>

In this study, we compile two measures of financial instability – the first is a financial crisis index and the second is a financial fragility index.

The data for the financial crisis index are from Laeven and Valencia (2013) and cover all the banking, currency, and sovereign debt crises in 161 economies during the period 1970–2012. Here, we define a banking crisis as either significant signs of financial distress in the banking system or a severe banking policy intervention; a currency crisis as nominal depreciation of the currency against the US dollar of at least 30% and depreciation of more than 10% in the preceding year; and a sovereign debt crisis as being characterized by sovereign debt default and restructuring.

During the sample period, the occurrence of a financial crisis accounts for 7.10% of the total observations. Banking, currency, and sovereign debt crises account for 2.57%, 3.49%, and 1.04%, respectively. The unconditional probabilities of banking and currency crises decrease as the income level rises (Figure 2). Furthermore, the probabilities are 2.03% for a banking crisis, 3.04% for a currency crisis, and 1.42% for a sovereign debt crisis in middle-income economies. The data reveal that the financial system is more vulnerable in low- and middle-income economies than in high-income economies.

The data for the financial fragility index are from the database of 124 countries for the period 1998–2012 that Andrianova et al. (2015) constructed. This database covers all banks, including commercial, investment, real estate and mortgage, cooperative, savings, and Islamic banks.<sup>3</sup> We obtain four sub-measures of the FFI: asset quality, measured using impaired loans divided by total loans<sup>4</sup>; risk exposure, measured using net charge-offs as a fraction of total loans<sup>5</sup>; liquidity, measured using liquid assets

<sup>2</sup> In Klomp and De Haan's (2009) study, the aggregate indicator consisted of commonly used financial instability indicators, including changes in the balance sheet of the banking system, credit growth, banking crises, risk and returns, and the balance sheet of monetary authorities.

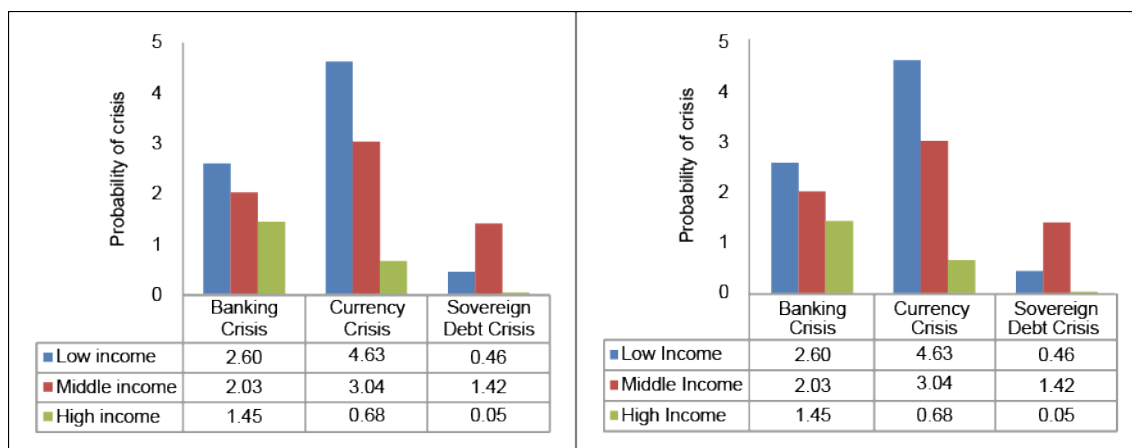
<sup>3</sup> The total value of financial assets in Andrianova et al.'s (2015) database is around 50% higher than the amount that commercial banks account for alone.

<sup>4</sup> Specifically, we define asset quality as  $\frac{\text{Impaired Loans}}{\text{Loans} + \text{Loan Loss Reserves}}$ .

<sup>5</sup> Specifically, we define risk exposure as  $\frac{\text{Net Charge-Offs}}{\text{Loans} + \text{Loan Loss Reserves}}$ .

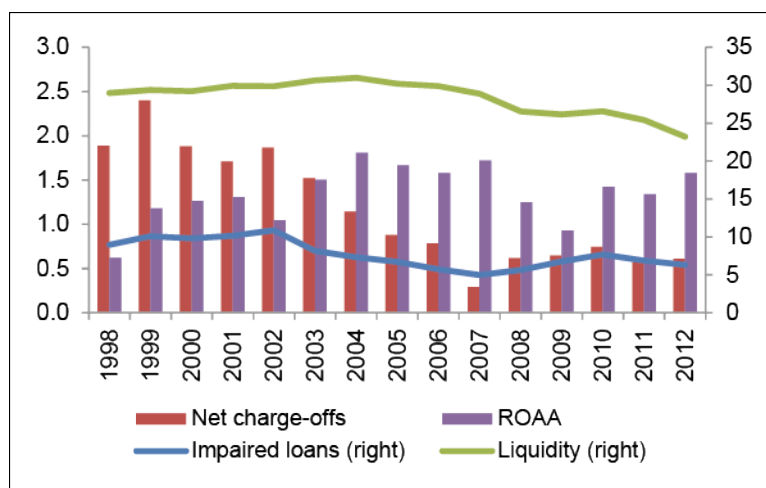
divided by total assets; and earnings capacity, measured by returns to average assets (ROAA). The impaired loans ratio declined after 2002, until it started to increase during the global financial crisis (Figure 3). The net charge-offs ratio followed a very similar pattern. The liquidity ratio fell steadily after 2004. In addition, the returns to assets experienced a sharp decline during the 2008 crisis period. These measures indicate that they are able to capture risks before and during the global financial crisis.

**Figure 2: Unconditional Probability of a Financial Crisis by Income Group (%)**



Source: Laeven and Valencia (2013) and authors' calculation.

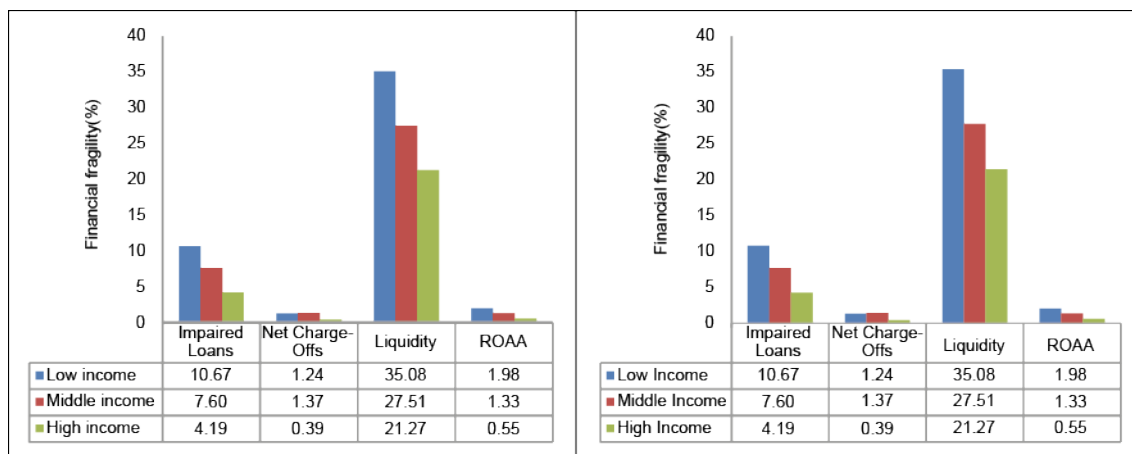
**Figure 3: Financial Fragility over Time: 1998–2012 (%)**



Source: Andrianova et al. (2015) and authors' calculation.

Compared with high-income economies, low- and middle-income economies on average have a higher impaired loans ratio and net charge-offs ratio, which indicate greater risks (Figure 4). At the same time, these economies enjoy a relatively higher liquidity ratio and asset returns.

**Figure 4: Financial Fragility by Income Group (%)**



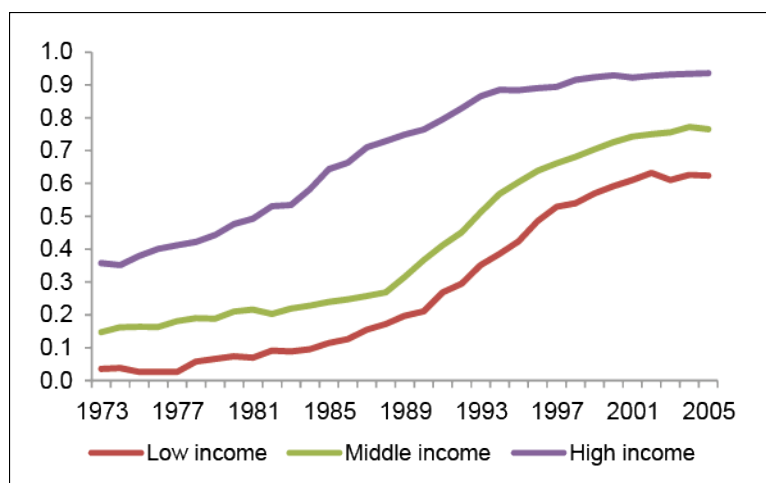
Source: Andrianova et al. (2015) and authors' calculation.

### 3.2 Financial Liberalization Indicator

We draw the financial liberalization index from Abiad, Detragiache, and Tressel (2008), and it includes 90 countries during the period 1973–2005. This index captures repressive financial policies in seven dimensions: (1) credit controls and reserve requirements, (2) interest rate controls, (3) entry barriers to the banking industry, (4) state ownership of banks, (5) policies for securities markets, (6) banking regulations, and (7) restrictions on the capital account. Each indicator is assigned a score between zero and three, with a higher score indicating greater liberalization. An aggregate index is also constructed by adding up all the seven sub-indices. We normalize these scores to between zero and one by dividing each sub-index by three and dividing the aggregate index by 27.

As expected, higher-income economies have less repressive financial policies (Figure 5). The average reading of the financial liberalization index is 0.72 for high-income economies but only 0.43 and 0.37, respectively, for middle- and low-income economies. We also observe gradual relaxation of the policy restrictions, as the income level rises within each income group. The index ranges from 0.36 to 0.94 among high-income economies, from 0.15 to 0.77 among middle-income economies, and from 0.04 to 0.62 among low-income economies. The liberalization trajectories also differ across income groups, with the middle- and low-income economies experiencing more pronounced reversals.<sup>6</sup>

<sup>6</sup> Such characteristics are consistent with the results of another index that Kaminsky and Schmukler (2008) constructed.

**Figure 5: Financial Liberalization Dynamics**

Note: The index of financial repression is from Abiad, Detragiache, and Tresselt (2008) and captures financial reform along seven different dimensions. A higher score indicates more liberalization.

Following the literature (Kaminsky and Schmukler 2008), we also identify liberalization events, when an economy starts to liberalize at least two-thirds of its financial markets, that is, when the financial liberalization index increases to above two-thirds. If the liberalization index of an economy in a year is below two-thirds, we classify the economy as repressed in that year; otherwise, we classify it as liberalized.

Most economies' financial sectors became "liberalized" during the middle-income stage (Table 1). Of these, only 10 of the 40 middle-income economies later successfully advanced to high-income status. Very few low-income economies turned into "liberalized" economies, and only 2 out of the 9 low-income economies later advanced to middle-income status. Finally, about 22 economies became "liberalized" in their financial sectors when they were already at the high-income stage.

A large number of economies remained either "repressed" or "liberalized" throughout the entire 1973–2005 period. Switzerland's financial system was already "liberalized" before the sample period, while 11 low-income economies and 9 middle-income economies remained "repressed" in their financial sectors during the sample period. Nearly half of the "repressed" low-income countries rose to the middle-income level before 2015. However, none of the "repressed" middle-income economies jumped to the high-income stage. These results indicate tentatively that a "repressed" financial system might not stop low-income economies from moving to the next income level but could do so for middle-income economies.

**Table 1: Liberalization Episodes**

<b>Liberalizing Country</b>	<b>Liberalizing Year</b>	<b>Liberalizing Country</b>	<b>Liberalizing Year</b>
<b>Low Income (9)</b>		Philippines	1994
Kenya	1999	Poland*	1996
Kyrgyz Republic	1996	Portugal*	1992
Madagascar	1996	Romania	2000
Mozambique	1998	Russian Federation	1996
Nicaragua <sup>#</sup>	1997	South Africa	1994
Nigeria <sup>#</sup>	1999	Sri Lanka	2004
Senegal	2004	Thailand	1996
Tanzania	2000	Tunisia	2003
Uganda	1998	Tunisia	2005
<b>Middle Income (40)</b>		Turkey	1996
Albania	2000	Ukraine	2003
Argentina	1993	Uruguay*	1995
Azerbaijan	2004	Venezuela, RB	1996
Bolivia	1993	<b>High Income (22)</b>	
Bulgaria	2000	Australia	1988
Chile*	1987	Austria	1994
Colombia	1999	Belgium	1991
Czech Republic*	1996	Canada	1980
Dominican Republic	2004	Denmark	1988
Ecuador	2001	Finland	1988
Egypt, Arab Rep.	2000	France	1987
El Salvador	1997	Germany	1975
Estonia*	1994	Hong Kong, China	1978
Georgia	1996	Ireland	1986
Greece*	1993	Israel	1995
Guatemala	2002	Italy	1993
Hungary*	1996	Japan	1991
Jamaica	2002	Korea, Rep. of	1995
Jordan	1990	Netherlands	1978
Kazakhstan	2002	New Zealand	1986
Latvia*	1994	Norway	1987
Lithuania*	1997	Singapore	1974
Malaysia	1989	Spain	1988
Mexico	1991	Sweden	1986
Paraguay	1993	United Kingdom	1981
Peru	1993	United States	1980

Note: This table reports the countries and years of liberalization episodes, which we define as the year in which Abiad, Detragiache, and Tressel's (2008) financial liberalization index starts to take on the value of two-thirds. For each country, we classify the income group in this table according to the World Bank income group classification in the liberalizing year identified. Those low-income countries denoted with <sup>#</sup> have advanced to the middle-income level by the year 2015. Those middle-income countries denoted with \* have advanced to the high-income level by the year 2015. All the other countries stayed in the same income group from their liberalization year until 2015.

**Table 2: Countries Remaining Repressed or Liberalized during the Whole Sample Period**

Low Income (11)		Middle Income (9)		High Income (1)	
Repressed	Sample Period	Repressed	Sample Period	Liberalized	Sample Period
Bangladesh	1973–2005	Algeria	1973–2005	Switzerland	1973–2005
Burkina Faso	1973–2005	Belarus	1992–2005		
Cote d'Ivoire <sup>#</sup>	1973–2005	Brazil	1973–2005		
Ethiopia	1973–2005	Cameroon	1973–2005		
Ghana <sup>#</sup>	1973–2005	PRC	1981–2005		
India <sup>#</sup>	1973–2005	Costa Rica	1973–2005		
Nepal	1973–2005	Indonesia	1973–2005		
Pakistan	1973–2005	Morocco	1973–2005		
Uzbekistan <sup>#</sup>	1991–2005	Nicaragua	1973–2005		
Viet Nam <sup>#</sup>	1990–2005				
Zimbabwe	1973–2005				

Note: Columns 1 to 4 of this table report the countries and sample periods for those countries that remained repressed during the whole sample period, while Columns 5 and 6 report the countries and sample periods for those that remained liberalized during the whole sample period. We define financial repression as Abiad, Detragiache, and Tressel's (2008) index taking on a value below two-thirds and financial liberalization as Abiad, Detragiache, and Tressel's (2008) index taking on a value above two-thirds. We classify the income groups in this table according to the World Bank income group classification in 2005. Those low-income countries denoted with # have reached the middle-income level by the year 2015. All the other countries stayed in the same income group from 2005 until 2015.

## 4. DOES FINANCIAL LIBERALIZATION REDUCE OR INCREASE INSTABILITY?

### 4.1 Event Study

We now investigate the characteristics of financial instability around the time when financial markets became liberalized. The unconditional probability of each type of financial crisis declined substantially following financial liberalization (Table 3). Specifically, the probability of a banking crisis decreased from 4.05% to 1.99%, that of a currency crisis fell from 6.11% to 1.57%, and that of a sovereign debt crisis declined from 1.81% to 0.42%. These changes are statistically significant and confirm that financial crisis risks actually become lower after financial liberalization.

The pictures for different income groups are different. For middle-income economies, financial liberalization often leads to a significant decline in the probabilities of currency and sovereign debt crises. Interestingly, the decline for banking crises is not significant. For low-income economies, only the probability of a banking crisis falls significantly. In addition, for high-income economies, only the probability of a currency crisis declines significantly.

**Table 3: Average Unconditional Probability of Financial Crises**

		Unconditional Prob. Crisis				Obs. of	Obs. of	Total
		Repressed	Liberalized	Difference	P Value	Repressed	Liberalized	Obs.
All	BC	4.05	1.99	2.06	0.00	1,604	955	2,559
	CC	6.11	1.57	4.54	0.00	1,604	955	2,559
	SDC	1.81	0.42	1.39	0.00	1,604	955	2,559
Low income	BC	4.59	1.16	3.42	0.07	436	86	522
	CC	5.96	3.49	2.47	0.18	436	86	522
	SDC	0.46	1.16	-0.70	0.78	436	86	522
Middle income	BC	4.64	3.26	1.38	0.13	927	368	1,295
	CC	7.12	2.72	4.40	0.00	927	368	1,295
	SDC	2.91	0.82	2.10	0.01	927	368	1,295
High income	BC	0.83	1.20	-0.37	0.67	241	501	742
	CC	2.49	0.40	2.09	0.00	241	501	742
	SDC	0.00	0.00	0.00	/	241	501	742

Note: This table reports the characteristics of financial crises around financial liberalization. The p values that column 6 reports are to test the hypothesis that the unconditional probability of a crisis in the repressed sample is larger than that in the liberalized sample. BC stands for banking crisis, CC stands for currency crisis, and SDC stands for sovereign debt crisis.

The financial fragility measures exhibit very similar changes (Table 4). The average impaired loans ratio declined by 7.26% from 13.99% and the average net charge-offs ratio fell by 1.64% from 2.92%, while the liquidity ratio and asset returns experienced only insignificant changes. These indicate that financial liberalization improves the soundness of the financial system in terms of reducing the credit risk in the banking sector.

**Table 4: Financial Fragility around Financial Liberalization**

		Unconditional Prob. Crisis				Obs.	Obs.	Total
		Repressed	Liberalized	Difference	P Value	Repressed	Liberalized	Obs.
All	Impaired loans	13.99	6.72	7.26	0.00	175	432	607
	Net charge-offs	2.92	1.29	1.64	0.00	130	358	488
	Liquidity	26.72	28.04	-1.31	0.87	236	480	716
	ROAA	1.22	1.00	0.21	0.20	236	481	717
Low income	Impaired loans	13.87	11.34	2.53	0.07	436	86	522
	Net charge-offs	2.46	1.89	0.57	0.28	436	86	522
	Liquidity	26.67	42.45	-15.78	1.00	436	86	522
	ROAA	1.56	2.37	-0.80	0.85			
Middle income	Impaired loans	14.12	7.56	6.56	0.00	81	214	295
	Net charge-offs	3.28	1.82	1.46	0.00	74	183	257
	Liquidity	26.78	29.65	-2.87	0.96	116	223	339
	ROAA	0.85	0.97	-0.11	0.64	116	223	339
High income	Impaired loans	/	4.16	/	/	0	165	165
	Net charge-offs	/	0.45	/	/	0	141	141
	Liquidity	/	21.72	/	/	0	196	196
	ROAA	/	0.62	/	/	0	197	197

Note: This table reports the characteristics of financial fragility around financial liberalization. The p values that column 6 reports are to test the hypothesis that the value of the fragility measures in the repressed sample is larger than that in the liberalized sample.



Similarly, the impacts are most evident in middle-income economies. Both the impaired loans ratio and the net charge-offs ratio decreased substantially for middle-income economies after financial liberalization, while the liquidity ratio and asset returns in the banking sector experienced insignificant changes. Although low-income economies also showed declining impaired loans and net charge-offs ratios, they were not as substantial.

## 4.2 Statistical Analyses

The preliminary results presented so far suggest that financial liberalization has some favorable impacts on financial stability. However, some shocks other than financial liberalization may affect financial stability or instability (Kaminsky and Schmukler 2008; Ghosh, Ostry, and Mahvash 2014). These factors, as well as financial instability, may affect the level of policy repression and the timing of liberalization. To avoid the so-called omitted variable problem, we now apply the econometric method to control for the other factors.

As we have two types of measures of financial instability, one dichotomous and the other continuous, we adopt two separate equations. Following Edwards (2009), Ghosh, Ostry, and Mahvash (2014), and others, we specify the following benchmark panel probit model of a financial crisis (Equations 1 and 2).

$$Crisis_{it} = \begin{cases} 1, & \text{if } Crisis_{it}^* > 0 \\ 0, & \text{Otherwise} \end{cases} \quad (1)$$

$$Crisis_{it}^* = \beta_0 + \beta_1 Finlib_{it} + \beta_2 X_{it} + \varepsilon_{it} \quad (2)$$

where  $Crisis_{it}$  is a dummy variable that equals one if country  $i$  in period  $t$  experiences a financial crisis (banking, currency, or debt crisis) and zero otherwise. Whether a country experiences a crisis is the result of an unobserved latent variable,  $Crisis_{it}^*$ , which is a function of financial liberalization ( $Finlib_{it}$ ) and a group of other control variables, which vector  $X_{it}$  represents;  $\mu_{it}$  is an error term; and  $[\mu_{it}] \sim N(0,1)$ . The control variables include the GDP per capita (in log terms), annual growth rate of the GDP per capita, inflation rate measured by the consumer price index (CPI), growth rate of the ratio of broad money to foreign reserves, real interest rate, and proportions of the current account balances to the GDP and of the budget balance to the GDP. We lag all the control variables by one year to avoid the potential endogeneity problem arising from a reverse causal effect from a crisis on the control variables.

Following Kaminsky and Schmukler (2008), Klomp and de Haan (2009), and others, we establish another equation to explore the determinants of financial fragility:

$$Fragility_{it} = \gamma_0 + \gamma_1 Finlib_{it} + \gamma_2 Z_{it} + \alpha_i + \gamma_t + u_{it} \quad (3)$$

where  $Fragility_{it}$  represents indicators of financial fragility, as Andrianova et al. (2015) constructed, which financial liberalization ( $Finlib_{it}$ ) and other factors, represented by vector  $Z_{it}$ , determine. We also control for time and country fixed effects. Table A1 in the Appendix summarizes the definitions of all the variables used in Equations (1), (2), and (3) and their sources.

To examine the impact of financial liberalization on the probability of a financial crisis, we start with the baseline random-effect probit model (Table 5). For the financial liberalization indicator, we first apply the reform index of Abiad, Detragiache, and Tressel (2008), and later we check the influences of the liberalization event identified earlier.

For the three types of financial crises, namely systemic banking, currency, and sovereign debt crises, the results are almost identical: the estimated coefficient for the financial liberalization variable is negative and significant in all three columns of Table 5. This suggests that financial liberalization reduces the likelihood of each type of financial crisis. These results are generally in line with Glick et al.'s (2004) and Rossi's (1999) findings. The estimated coefficients for the other variables are mostly significant and have the expected signs. For instance, faster GDP growth could reduce while a higher real interest rate could increase the likelihood of (currency and sovereign debt) crises.

The marginal effect shows that a one unit increase in financial liberalization leads to a decline in the probability of a banking crisis of 3.86 percentage points, a decline in the probability of a currency crisis of 6.69 percentage points, and a decline in the probability of a sovereign debt crisis of 6.4 percentage points.

**Table 5: Financial Liberalization and Financial Crises**

Variables	Crisis	Full Sample	Full Sample	Full Sample
		Banking Crisis (1)	Currency Crisis (2)	Sovereign Debt Crisis (3)
Financial liberalization		-0.5245* (0.2838)	-0.9447*** (0.2780)	-1.0640** (0.4442)
GDP growth		-0.5781 (1.5318)	-3.6018** (1.5244)	-8.5697*** (2.2017)
Log (GDP)		-0.0069 (0.0528)	0.0108 (0.0523)	0.0846 (0.0876)
Inflation		0.0262*** (0.0098)	-0.0089 (0.0366)	-0.4129 (0.5546)
Growth of M2 over reserve		0.0394 (0.1554)	0.3757*** (0.1212)	-0.0199 (0.2001)
Real interest rate		0.6693 (0.4595)	1.0967*** (0.4183)	1.2775** (0.6447)
Current account over GDP		-1.3984 (1.3225)	-1.8393 (1.4225)	-4.9707** (2.2424)
Government debt		-0.0037* (0.0019)	-0.0005 (0.0017)	-0.0050 (0.0033)
Constant		-1.8943*** (0.5304)	-2.4740*** (0.5050)	-3.3396*** (0.8769)
Observations		1,472	1,472	1,472

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

Table 6 reports the impacts of financial liberalization on financial crises for economies of different income groups. The results vary. Liberalizing the financial system leads to a significant decline in the likelihood of a banking crisis in low-income economies and a significant fall in the probabilities of both currency and sovereign debt crises in middle-income economies. The impact on the probability of a banking crisis in middle-income economies is not as significant.

The impacts measured by the financial fragility indicator also show a very similar pattern (Table 7 and Table 8). Following the relaxation of repressive financial policies, financial risks decrease significantly, whether using impaired loans or net charge-offs as the measure. The results show that a one unit increase in the financial liberalization index reduces the impaired loans and net charge-offs ratios by 9.87 percentage points and 26.99 percentage points, respectively (Table 7). Again, these impacts are even greater in magnitude in middle-income economies, 29.95 percentage points and 36.19 percentage points, respectively (Table 8). The impacts on the liquidity ratio and asset returns appear to be unstable and insignificant.

We also wonder whether the financial liberalization event has an important influence on crises and fragility. To investigate this issue, we use a dichotomous dummy variable indicating the liberalization event as a substitute for the original index of financial liberalization in the regressions (Tables 9 and 10). The negative coefficients of the event dummy in the first three columns of Table 9 suggest that the probabilities of financial crises decrease following financial liberalization events, consistent with the results in Table 5. The only exception is that the influence on banking crises is insignificant in the full-sample analysis. The marginal effects show that a financial liberalization event significantly reduces the probability of a currency crisis by 3.63 percentage points and decreases the probability of a sovereign debt crisis by 1.36 percentage points. These findings also hold for middle-income economies, but the marginal effects on the probabilities of currency and sovereign debt crises are even greater, 5.04 percentage points and 2.01 percentage points, respectively.

As reported in Table 10, significant decreases in the impaired loans ratio and net charge-offs ratio also follow a financial liberalization event in both the full sample and the middle-income economy sub-sample. Still, liberalization has an insignificant effect on the liquidity ratio and asset returns.

We can summarize the findings of this section as follows: financial liberalization reduces the probabilities of currency and sovereign debt crises and lowers the degrees of financial fragility, measured using the impaired loans ratio or net charge-offs ratio. These results are more significant statistically and greater in magnitude among the middle-income economies. The impacts on the probability of banking crises and on banks' liquidity and asset return indicators are not significant or stable.

**Table 6: Financial Liberalization and Financial Crises by Income Group**

Crisis	Banking Crisis			Currency Crisis			Sovereign Debt Crisis	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Low Income	Middle Income	High Income	Low Income	Middle Income	High Income	Low Income	Middle Income
Financial liberalization	-1.7311** (0.8605)	-0.5178 (0.3705)	0.4734 (1.1030)	-0.6058 (0.6427)	-1.1891*** (0.4070)	-1.3477 (1.2773)	78.2703 (0.0000)	-1.3134** (0.5326)
GDP growth	-1.2381 (3.2493)	-0.2366 (1.8680)	3.7841 (9.6013)	-5.5213* (2.8667)	-3.0994 (2.0241)	-20.6423** (10.2066)	-234.5151 (0.0000)	-6.7843*** (2.5031)
Log (GDP)	0.4538 (0.3036)	0.1383 (0.1283)	0.9622 (0.7685)	0.5439** (0.2641)	0.2877** (0.1366)	-0.0720 (1.0847)	52.0406 (0.0000)	0.1887 (0.1771)
Inflation	1.5435** (0.7609)	0.0240** (0.0103)	-0.2502 (2.2007)	0.0285 (0.7835)	-0.0393 (0.1396)	-0.1664 (1.0768)	-22.6280 (0.0000)	-1.3175 (0.9515)
Growth of M2 over reserve	-0.0458 (0.3142)	0.1679 (0.1808)	-2.3145** (1.0494)	0.1962 (0.2310)	0.4524*** (0.1625)	-0.8998 (1.1144)	-30.9625 (0.0000)	-0.0463 (0.2184)
Real interest rate	2.7713* (1.5445)	0.5144 (0.5168)	3.7426 (5.6222)	-0.0344 (1.4470)	0.9733* (0.5381)	2.0035 (3.8892)	-166.8412 (0.0000)	1.5115** (0.7562)
Current account over GDP	3.7072 (2.7064)	-2.2316 (1.8687)	-7.2462 (5.4732)	-0.0747 (2.5273)	-2.2293 (2.1457)	-14.0027 (8.8355)	-108.7791 (0.0000)	-5.9870** (2.8058)
Government debt	-0.0003 (0.0043)	-0.0023 (0.0025)	-0.0125 (0.0082)	-0.0009 (0.0037)	-0.0038 (0.0029)	0.0058 (0.0063)	-0.3333 (0.0000)	-0.0056 (0.0040)
Constant	-5.880*** (2.0881)	-3.0069*** (1.0975)	-11.5074 (7.8038)	-5.0966*** (1.7311)	-4.4865*** (1.1697)	-2.6516 (10.8957)	-316.6058 (0.0000)	-3.9747*** (1.5285)
Observations	308	713	451	308	713	451	308	713

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 7: Financial Liberalization and Financial Fragility (Fixed Effects)**

Fragility	Fixed Effects				Random Effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns
Financial liberalization	-9.8763 (10.8907)	-26.9903*** (4.7061)	-6.1343 (8.2085)	1.1842 (3.6897)	-12.4627*** (4.6242)	-8.6093*** (2.0761)	-2.1978 (6.9696)	3.1620** (1.2944)
Inflation	0.0025 (0.0196)	-0.0157** (0.0074)	-0.0314** (0.0152)	0.0153** (0.0069)	0.0050 (0.0163)	-0.0032 (0.0062)	-0.0022 (0.0144)	0.0166*** (0.0052)
Log (GDP)	-22.7577*** (6.9700)	-8.0484*** (3.0067)	-31.2637*** (5.2677)	1.9301 (2.3680)	-1.0806** (0.5069)	0.1500 (0.2341)	-3.3947*** (1.0479)	-0.3409** (0.1425)
Real interest rate	0.0782** (0.0350)	-0.0184 (0.0128)	0.0110 (0.0257)	0.0388*** (0.0116)	0.0671** (0.0293)	-0.0001 (0.0109)	0.0400 (0.0253)	0.0376*** (0.0087)
Constant	193.0807*** (58.2772)	62.6219** (25.5775)	283.0016*** (43.9937)	-16.3568 (19.7853)	14.7103*** (5.3327)	-1.1888 (2.4369)	54.8440*** (9.9816)	2.8756* (1.5162)
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	493	403	580	581	493	403	580	581
R-squared	0.1204	0.1717	0.0962	0.0766				
Number of countries	77	69	79	79	77	69	79	79

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 8: Financial Repression and Financial Fragility by Income Group  
(Fixed Effects)**

Fragility	Low Income				Middle Income	
	(1) Impaired Loans Ratio	(2) Net Charge- Offs Ratio	(3) Liquid Ratio	(4) Asset Returns	(5) Impaired Loans Ratio	(6) Net Charge- Offs Ratio
Financial liberalization	31.4158 (25.6997)	1.1253 (15.9958)	-43.4441*** (16.0750)	-0.5264 (11.5397)	-29.9538*** (10.1000)	-36.1893*** (5.4433)
Inflation	0.0006 (0.0319)	-0.0176 (0.0157)	-0.0479** (0.0227)	-0.0010 (0.0163)	0.0313 (0.0255)	-0.0482*** (0.0134)
Log (GDP)	-19.4666 (16.1469)	-11.4729 (8.7980)	-3.1178 (10.6376)	-5.2487 (7.6363)	-21.4379*** (6.8142)	-5.6292 (3.7788)
Real interest rate	0.0898* (0.0482)	-0.0046 (0.0228)	0.0893*** (0.0337)	0.0741*** (0.0242)	0.1315*** (0.0503)	-0.1238*** (0.0327)
Constant	148.1383 (100.5628)	73.0706 (57.9059)	30.5823 (66.3479)	29.8804 (47.6288)	167.4894*** (55.3344)	39.8539 (30.7479)
Country	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	112	78	133	133	245	209
R-squared	0.1641	0.1452	0.2812	0.2138	0.2978	0.3526
Number of countries	21	15	21	21	40	35
Fragility	Middle Income		High Income			
	(7) Liquid Ratio	(8) Asset Returns	(9) Impaired Loans ratio	(10) Net Charge- Offs Ratio	(11) Liquid Ratio	(12) Asset Returns
Financial liberalization	-2.5178 (10.0345)	-5.4987 (4.1777)	89.6207 (78.1493)	-11.2321 (14.2583)	66.7984 (44.7982)	-3.0362 (4.4807)
Inflation	-0.0482* (0.0249)	-0.0150 (0.0104)	-1.0215 (1.0921)	0.0307 (0.1969)	1.6232** (0.6562)	0.0492 (0.0656)
Log (GDP)	-42.1363*** (6.5955)	9.4869*** (2.7460)	-40.2524 (42.7091)	4.3409 (8.2927)	-29.0209 (25.8620)	-3.8982 (2.5835)
Real interest rate	-0.1062** (0.0492)	-0.1020*** (0.0205)	-0.1784 (0.5275)	0.0067 (0.0899)	0.4576 (0.3181)	0.0304 (0.0318)
Constant	365.6096*** (53.4063)	-75.8466*** (22.2351)	434.6450 (442.1727)	-45.2821 (85.4326)	320.4683 (266.6246)	40.2516 (26.6345)
Country	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	280	280	136	116	167	168
R-squared	0.1981	0.1736	0.1028	0.0558	0.0959	0.1741
Number of countries	41	41	23	23	25	25

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 9: Financial Liberalization Events and Financial Crises**

Crisis \ Variables	Full Sample			Middle Income		
	(1) Banking Crisis	(2) Currency Crisis	(3) Sovereign Debt Crisis	(4) Banking Crisis	(5) Currency Crisis	(6) Sovereign Debt Crisis
Liberalization event dummy	-0.1401 (0.1592)	-0.3946** (0.1634)	-0.6037** (0.2772)	-0.2245 (0.2039)	-0.4108* (0.2257)	-0.7568** (0.3301)
GDP growth	-1.0185 (1.7655)	-1.8459 (1.7539)	-8.1051*** (2.3929)	-0.7652 (1.9769)	-3.3174 (2.1340)	-6.2024** (2.6037)
Log (GDP)	-0.0448 (0.0592)	-0.0589 (0.0582)	-0.0564 (0.0993)	0.0840 (0.1383)	0.2223 (0.1473)	0.1516 (0.1888)
Inflation	0.0251** (0.0101)	-0.0060 (0.0350)	-0.6712 (0.6963)	0.0231** (0.0104)	-0.0754 (0.2169)	-1.6302 (1.0144)
Growth of M2 over reserve	0.0411 (0.1725)	0.4408*** (0.1288)	-0.0104 (0.2137)	0.1011 (0.2031)	0.5177*** (0.1743)	0.0093 (0.2322)
Real interest rate	0.5210 (0.5222)	0.8926* (0.4688)	1.3201* (0.7481)	0.4934 (0.5610)	0.4426 (0.6073)	1.8417** (0.8741)
Current account over GDP	-0.8961 (1.4530)	-0.8219 (1.4663)	-3.2692 (2.2893)	-2.8998 (1.9967)	-1.7411 (2.1397)	-5.6714** (2.7396)
Government debt	-0.0041* (0.0022)	0.0000 (0.0018)	-0.0059* (0.0036)	-0.0025 (0.0027)	-0.0018 (0.0028)	-0.0042 (0.0039)
Constant	-1.2079** (0.5104)	-1.2793*** (0.4843)	-1.2534 (0.8558)	-2.2371** (1.0866)	-3.2406*** (1.1534)	-2.7518* (1.4638)
Observations	1,112	1,112	1,112	613	613	613

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 10: Financial Liberalization Events and Financial Fragility (Fixed Effects)**

Fragility \ Variables	Full Sample				Middle Income			
	(1) Impaired Loans Ratio	(2) Net Charge- Offs Ratio	(3) Liquid Ratio	(4) Asset Returns	(5) Impaired Loans Ratio	(6) Net Charge- Offs Ratio	(7) Liquid Ratio	(8) Asset Returns
Financial liberalization event dummy	-3.1851* (1.7628)	-3.2781*** (0.8197)	1.5490 (1.3458)	-0.4637 (0.6052)	-5.3419*** (1.4678)	-4.2308*** (0.9327)	1.7426 (1.4971)	-0.3708 (0.6270)
Inflation	0.0031 (0.0195)	-0.0128* (0.0075)	-0.0306** (0.0152)	0.0151** (0.0068)	0.0295 (0.0252)	-0.0455*** (0.0142)	-0.0470* (0.0249)	-0.0149 (0.0104)
Log (GDP)	-22.4298*** (6.7007)	-10.6561*** (3.0094)	-33.0015*** (5.1064)	2.3380 (2.2964)	-22.4888*** (6.5398)	-8.7809** (3.9621)	-44.1502*** (6.4220)	8.7498*** (2.6894)
Real interest rate	0.0809** (0.0349)	-0.0144 (0.0132)	0.0109 (0.0257)	0.0389*** (0.0115)	0.1449*** (0.0497)	-0.1022*** (0.0347)	-0.1072** (0.0489)	-0.0998*** (0.0205)
Constant	194.6178*** (54.8855)	93.1202*** (25.0478)	298.2464*** (41.9358)	-19.8177 (18.8673)	186.9787*** (51.9137)	77.6518** (31.4697)	381.7407*** (50.9160)	-68.1411*** (21.3225)
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	493	403	580	581	245	209	280	280
R-squared	0.1256	0.1304	0.0976	0.0775	0.3128	0.2692	0.2026	0.1686
Number of countries	77	69	79	79	40	35	41	41

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

## 5. IMPORTANCE OF THE PACE OF REFORM, SUPERVISION, AND INSTITUTIONS

If financial liberalization significantly reduces the likelihood of currency and sovereign debt crises, especially in middle-income economies, why did some middle-income economies fall into traumatic financial crises following liberalization? Such examples include Mexico's "Tequila" crisis, the East Asian financial crisis during the 1990s, and the Latin American debt crises in the 1980s (World Bank 2001). In this section, we attempt to dissect the dynamics of financial liberalization further. Specifically, we investigate whether the pace of liberalization, the supervisory structure, and the institutional environment matter for outcomes of financial liberalization.

### 5.1 Pace of Liberalization

As shown in Figure 5, the liberalization trajectories of developing economies are much more volatile and display more reversals. Since the 1980s, some developing economies have undertaken rapid, nearly simultaneous, aggressive reforms, such as Chile and Mexico; meanwhile, others have adopted more gradual approaches.

To determine whether the pace of financial liberalization matters, we incorporate a variable of the initial level of financial repression into the regression model of liberalization events. We define initial financial repression as the three-year average of the repression index before the event year, in which we construct the repression index using one minus the normalized financial liberalization index. If the initial level of financial repression is very high, then financial liberalization is more likely to be aggressive; otherwise, it is probably gradual. Accordingly, we reduce the sample size to only 61 economies that experienced a liberalization event during the sample period (Table 11).

The full-sample analysis shows that the estimated coefficients for the liberalization event variable are still negative but that their significance declines to around 20% (except for banking crises). The coefficients of the initial repression level are positive and significant (also except for banking crises), suggesting that economies with a higher level of initial repression before the liberalization event are more likely to experience financial crises, especially currency and sovereign debt crises. The overall effect of a financial liberalization event depends on both the negative effect of the financial event and the positive effect of the initial repression level.

For currency crises, the marginal effects show that a liberalization event decreases the likelihood of a currency crisis by 1.92 percentage points, while a 1 unit increase in the initial financial repression would increase the likelihood of a currency crisis by 7.23 percentage points. Therefore, if the initial level of financial repression is 0.265 units higher than our threshold for identifying the liberalization event (one-third of the repression index), which is 0.60, a financial liberalization event would induce a higher likelihood of a currency crisis. Every increase of 0.1 units of initial repression above 0.60 could increase the likelihood of a currency crisis by 0.73 percentage points. Mexico's liberalization in 1991 is one of the typical examples of such an aggressive reform,<sup>7</sup> as Mexico liberalized its repressive policies in 1991, which reduced the initial level of repression from 0.714 to 0.286. During the early 1990s, Mexico experienced a traumatic currency crisis.

---

<sup>7</sup> In our sample, we identify five cases of such aggressive liberalization: the liberalization events of Argentina in 1992, Estonia in 1994, France in 1985, Mexico in 1991, and New Zealand in 1985.

We repeat this analysis for sovereign debt crises. The marginal effects show that a liberalization event decreases the likelihood of a sovereign debt crisis by 1.53 percentage points, while a 1 unit increase in the initial financial repression would increase the likelihood of a currency crisis by 3.63 percentage points. As a result, if the initial level of financial repression before the liberalization event is 0.42 units higher than the threshold for identifying a liberalization event (one-third of the repression index), which is about 0.755, an event of financial liberalization would induce a higher likelihood of a sovereign debt crisis. Every increase of 0.1 units of initial repression above 0.755 could increase the likelihood of a currency crisis by 0.34 percentage points. However, we do not find any typical examples of such an aggressive reform in our sample.

Then, we narrow our focus to the middle-income economies. The sign and significance of the coefficients of both the liberalization event dummy and the initial repression level are the same as those for the full sample, with only one exception – a liberalization event has a significant influence on sovereign debt crises. For the net effect of a financial liberalization event, the marginal-effect analysis suggests that a liberalization event decreases the likelihood of a currency crisis (sovereign debt crisis) by 2.59 (3.48) percentage points, while a 1 unit increase in the initial financial repression would increase the likelihood of a currency crisis by 8.08 (6.72) percentage points. As a result, if the initial financial repression level of a liberalization event is 0.32 (0.52) units higher than our threshold for identifying a liberalization event (one-third of the repression index), which is about 0.65 (0.85), an event of financial liberalization would induce a higher likelihood of a currency crisis (sovereign debt crisis). For these aggressive reform events, every increase of 0.1 units of initial repression could increase the likelihood of a currency crisis (sovereign debt crisis) by 0.81 (0.67) percentage points. Mexico is also among the middle-income economies that experienced a currency crisis following aggressive liberalization in the early 1990s.

In addition, we analyze the influence of reform pace on financial fragility (Table 12). The results are in line with the findings on financial crises. Although financial liberalization reduces financial fragility, which negative coefficients for the impaired loans ratio and net charge-offs ratio indicate, a high level of initial financial repression may offset this effect, as it significantly and substantially increases financial fragility.

## 5.2 Institutional Environment

The quality of institutions in a country experiencing financial liberalization may also affect the outcomes. Here we incorporate the following institutional variables, which we obtain from the International Country Risk Guide (ICRG) data set: (1) “law and order” is a proxy for the security of property and contract rights (Knack and Keefer 1995) and measures both the strength and impartiality of the legal system and the popular observance of the law on a scale from zero to six, where a higher score implies better mechanisms for adjudicating disputes; (2) “democracy” reflects political freedom (La Porta et al. 1999) and measures the types of governance that a country enjoys on a scale from zero to six, the score becoming higher as the regime moves from autarchy, de jure one-party state, de facto one-party state, or dominated democracy to alternating democracy; (3) “corruption” is an assessment of corruption within the political system with a maximum score of six and a minimum score of zero points, where a score of six indicates very low corruption and a score of zero points to very high corruption; (4) “investment” assesses the factors affecting risks to investment and encompasses three subcomponents of contract viability or expropriation, profit repatriation, and payment delays on a scale from zero to twelve, where a score of



twelve indicates very low investment risk and a score of zero points to very high investment risk. We convert all the measures into a scale from zero to one. The data show that higher-income economies have higher degrees of law and order and democracy, a lower degree of corruption, and lower investment risk.

We incorporate the interaction terms of the above four institutional variables and financial liberalization into the crisis and fragility models (Tables 13 and 14). As shown in Table 13,<sup>8</sup> only investment protection significantly decreases the effect of financial liberalization on the probability of a financial crisis. Only when the protection of investors is strong enough could there be a decrease in the likelihood of a financial crisis following financial reform.

In Table 14, except for corruption, the estimated coefficients for all the interaction terms between the other three institutional variables and the liberalization event are negative in the model of the impaired loans ratio and significantly negative in the model of the net charge-offs ratio. These results suggest that, with a higher level of law, democracy, and investment protection, the financial system becomes less fragile following financial liberalization reform.

### 5.3 Regulatory Structure of the Financial Sector

Finally, we examine whether the structures of financial regulation play any role in the process of financial liberalization. We obtain the data for the regulatory structure from the data set of the Organization of Financial Sector Supervision that the World Bank constructed. This data set encompasses both prudential and business conduct regulation of the financial sector, with particular emphasis on the role of central banks in financial supervision and integration of the regulators.

We construct two variables to indicate the regulatory structure of the financial sector from two dimensions. The first dimension concerns whether each type of intermediary, that is, banks, insurance, or capital market, has a separate supervisor or whether the same supervisor, either the central bank or another agency other than the central bank, oversees them all. The second dimension relates to whether the central bank conducts supervision of the financial sector, either as the single supervisor or as part of the separate sector supervision.

According to the above two dimensions of the financial supervisory structure, we conduct subsample analyses. As the supervisory structure data set only covers 98 economies over the period 1999–2010, incorporating these data reduces the total number of observations in the financial crisis analysis by more than two-thirds. The changes to the sample for the financial fragility analysis are much smaller. Therefore, here we only use the fragility data.

As reported in the first two columns in Table 15, if central banks play the role of a financial supervisor, financial liberalization generally leads to a decrease in financial fragility, measured using negative and significant estimated coefficients. In contrast, if the central bank does not supervise the financial industry, then financial liberalization could lead to increases in financial fragility (columns 5 and 6, Table 15). These results suggest that the central bank's participation in financial regulation is very important for lowering financial risks during the process of financial liberalization. One possible explanation is that the central bank's financial liberalization policy or monetary policy may be more cautious or prudent if it is also responsible for financial stability.

---

<sup>8</sup> To save space, in Table 13 we only report the results of the determinants of financial crises, while we do not report the results of each type of financial crisis.

**Table 11: Financial Liberalization, Reform Pace, and Financial Crises**

Variables	Full Sample			Middle Income		
	(1)	(2)	(3)	(5)	(6)	(7)
	Banking Crisis	Currency Crisis	Sovereign Debt Crisis	Banking Crisis	Currency Crisis	Sovereign Debt Crisis
Liberalization event dummy	-0.0474 (0.1828)	-0.2463 (0.1868)	-0.4474 (0.3078)	-0.1532 (0.2246)	-0.2998 (0.2473)	-0.6467* (0.3595)
Initial repression	0.4393 (0.5262)	0.9346* (0.4836)	1.0618* (0.5676)	0.1714 (0.5985)	0.9342* (0.5154)	1.2484* (0.7588)
GDP growth	-0.1429 (1.8432)	-1.7531 (1.7954)	-8.3864*** (2.4504)	0.0708 (2.0866)	-3.2825 (2.1820)	-6.0690** (2.6956)
Log (GDP)	-0.0506 (0.0619)	-0.0497 (0.0595)	-0.0412 (0.1039)	0.0166 (0.1442)	0.2552* (0.1505)	0.2070 (0.1973)
Inflation	0.0267*** (0.0101)	-0.0094 (0.0380)	-0.6537 (0.7033)	0.0258** (0.0106)	-0.0652 (0.2005)	-1.7738* (1.0774)
Growth of M2 over reserve	-0.0660 (0.1964)	0.4334*** (0.1303)	-0.0268 (0.2138)	-0.0233 (0.2308)	0.5143*** (0.1764)	-0.0131 (0.2337)
Real interest rate	0.6409 (0.5523)	1.0551** (0.4774)	1.6002** (0.7707)	0.6270 (0.6025)	0.6632 (0.6267)	2.3605** (0.9616)
Current account over GDP	-1.0523 (1.5107)	-0.3094 (1.5146)	-2.7381 (2.3960)	-3.4749* (2.0960)	-1.1006 (2.2373)	-5.4982* (2.9465)
Government debt	-0.0053** (0.0024)	-0.0003 (0.0019)	-0.0065* (0.0037)	-0.0044 (0.0030)	-0.0027 (0.0030)	-0.0059 (0.0043)
Constant	-1.4385** (0.6545)	-1.9294*** (0.5949)	-2.0422** (1.0084)	-1.8370 (1.2209)	-4.0516*** (1.2667)	-3.9381** (1.6717)
Observations	1,102	1,102	1,102	613	613	613

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 12: Financial Liberalization, Reform Pace, and Financial Fragility**

Fragility Variables	Full Sample				Middle Income			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns
Financial liberalization event	-1.6604 (2.1668)	-0.5936 (0.8116)	3.4952** (1.6010)	-0.3062 (0.5080)	-4.1749** (1.6017)	0.2090 (1.0796)	4.0560** (1.6782)	-0.6034 (0.8257)
Initial repression	46.2740 (29.0376)	74.3835*** (10.5565)	38.9648* (21.6749)	12.2762* (6.8769)	56.8699** (22.4112)	105.0483*** (14.6427)	52.8628** (23.1762)	9.3001 (11.4024)
Log (GDP)	0.0383 (0.0736)	-0.0438* (0.0241)	-0.0642 (0.0586)	-0.0543*** (0.0186)	0.0121 (0.0533)	-0.0783*** (0.0289)	-0.1161** (0.0568)	-0.0507* (0.0279)
Real interest rate	-20.4621** (9.1142)	-5.8907* (3.1957)	-28.0637*** (6.6871)	8.8096*** (2.1214)	-17.4856** (7.8147)	-12.9486*** (4.5186)	-43.8667*** (7.8847)	14.7377*** (3.8792)
Constant	0.1380* (0.0726)	-0.1267*** (0.0304)	-0.1033* (0.0570)	-0.1022*** (0.0181)	0.1695*** (0.0529)	-0.1090*** (0.0391)	-0.1253** (0.0563)	-0.1215*** (0.0277)
Constant	170.5676** (84.3476)	28.5537 (29.6853)	260.5427*** (62.0275)	-80.6413*** (19.6849)	126.6725* (65.9078)	69.7188* (37.5361)	367.3920*** (66.4159)	-121.2357*** (32.6759)
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321	269	369	370	164	133	172	172
R-squared	0.1365	0.3731	0.1131	0.1974	0.4018	0.5614	0.3049	0.2723
Number of countries	50	47	51	51	24	22	24	24

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 13: Financial Liberalization, Institutions, and Financial Crises**

Crisis	Full Sample				Middle Income			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Crisis	Crisis	Crisis	Crisis	Crisis	Crisis	Crisis	Crisis
Financial liberalization	-0.8292** (0.3812)	-0.5484 (0.4448)	-0.7710** (0.3051)	0.9118** (0.4182)	-0.9415* (0.5224)	0.1631 (0.5342)	-0.1471 (0.4720)	1.3438** (0.5861)
GDP growth	-2.5694 (1.7188)	-2.5578 (1.7054)	-2.3289 (1.7252)	-2.2287 (1.6828)	-2.9860 (2.3210)	-2.7389 (2.2807)	-2.7452 (2.2911)	-2.4180 (2.2581)
Log (GDP)	-0.1011 (0.0675)	-0.0613 (0.0649)	-0.1077 (0.0672)	-0.0267 (0.0552)	0.1604 (0.1544)	0.2461 (0.1602)	0.2146 (0.1570)	0.2660* (0.1552)
Inflation	0.0206** (0.0097)	0.0198** (0.0097)	0.0205** (0.0097)	0.0203** (0.0097)	0.0214** (0.0103)	0.0206** (0.0103)	0.0207** (0.0103)	0.0229** (0.0102)
Growth of M2 over reserve	0.3537*** (0.1353)	0.3550*** (0.1359)	0.3629*** (0.1363)	0.4019*** (0.1408)	0.7747*** (0.2252)	0.7694*** (0.2287)	0.7703*** (0.2279)	0.8218*** (0.2395)
Real interest rate	0.5896 (0.4481)	0.4859 (0.4410)	0.5477 (0.4421)	0.4511 (0.4412)	0.3534 (0.5662)	0.2072 (0.5599)	0.2258 (0.5588)	0.3386 (0.5671)
Government debt	-1.3408 (1.3568)	-1.3307 (1.3631)	-1.2391 (1.3717)	-1.5268 (1.3441)	-4.0592* (2.0918)	-4.6501** (2.0747)	-4.4861** (2.1008)	-5.1024** (2.1302)
Current account over GDP	-0.0032* (0.0019)	-0.0031* (0.0018)	-0.0032* (0.0019)	-0.0036* (0.0018)	-0.0039 (0.0029)	-0.0039 (0.0028)	-0.0040 (0.0029)	-0.0050* (0.0028)
Lib*law and order	0.8334 (0.5331)				1.1620 (0.7767)			
Lib*democratic		0.3455 (0.5651)				-0.5850 (0.7229)		
Lib*corruption			0.4195 (0.4953)				-0.2117 (0.9437)	
Lib*investment_profile				-1.8743*** (0.6312)				-2.4455*** (0.8885)
Constant	-0.4714 (0.5328)	-0.7548 (0.5179)	-0.4221 (0.5331)	-0.9830** (0.4549)	-2.5588** (1.2364)	-3.2032** (1.2794)	-2.9639** (1.2567)	-3.3346*** (1.2419)
Observations	905	905	905	905	505	505	505	505

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1. We do not report the results of the other control variables and constant here to save space.

**Table 14: Financial Liberalization, Institutions, and Financial Fragility**

Variables	(1)	(2)	(5)	(6)	(9)	(10)	(13)	(14)
	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns	Impaired Loans Ratio	Net Charge-Offs Ratio	Liquid Ratio	Asset Returns
Financial Liberalization	-3.7443 (3.8911)	2.4579 (2.0367)	0.4473 (4.4747)	0.4250 (2.0898)	-5.8694** (2.9398)	-2.8167** (1.3979)	1.9101 (3.7835)	-0.0352 (1.8365)
Inflation	0.0017 (0.0195)	-0.0130* (0.0076)	0.0019 (0.0195)	-0.0135* (0.0077)	0.0025 (0.0195)	-0.0133* (0.0077)	0.0030 (0.0195)	-0.0122 (0.0077)
Log (GDP)	-24.0737*** (6.9890)	-10.3563*** (3.1699)	-23.5582*** (6.8855)	-11.1688*** (3.1991)	-22.9422*** (6.8901)	-11.1024*** (3.2474)	-22.7357*** (6.9080)	-10.1392*** (3.2149)
Real interest rate	0.0775** (0.0348)	-0.0122 (0.0133)	0.0774** (0.0348)	-0.0143 (0.0134)	0.0780** (0.0347)	-0.0141 (0.0135)	0.0803** (0.0348)	-0.0132 (0.0134)
Lib*law and order	-2.1351 (6.2368)	-10.1137*** (3.2080)						
Lib*democratic			-4.5544 (6.2099)	-5.5259** (2.7801)				
Lib*corruption					8.4315 (5.9549)	-1.3182 (2.7260)		
Lib*investment_profile							-6.7674 (5.0493)	-4.9331** (2.4037)
Constant	208.7487*** (57.5133)	92.4839*** (26.5643)	205.1982*** (56.7897)	98.4036*** (26.8368)	198.4736*** (56.9085)	97.6295*** (27.2874)	198.1134*** (56.9760)	89.4837*** (26.9533)
Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	477	387	477	387	477	387	477	387
R-squared	0.1354	0.1550	0.1364	0.1388	0.1396	0.1284	0.1391	0.1395
Number of countries	74	67	74	67	74	67	74	67

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1. We do not report the results of the other control variables and constant here to save space.

**Table 15: Financial Repression, Prudential Supervision Structure, and Financial Fragility for Middle-Income Countries**

Variables	Central Bank Supervision				Central Bank without Supervision			
	(1) Impaired Loans Ratio	(2) Net Charge- Offs Ratio	(3) Liquid Ratio	(4) Asset Returns	(5) Impaired Loans Ratio	(6) Net Charge- Offs Ratio	(7) Liquid Ratio	(8) Asset Returns
Financial liberalization	-30.6018* (18.1822)	-39.9801*** (7.5674)	-11.7233 (17.8585)	-3.9517 (4.5207)	6.4182 (18.2262)	16.6938* (10.5641)	1.1181 (17.8133)	-1.6810 (6.4123)
Inflation	0.0189 (0.0353)	-0.0325* (0.0187)	-0.0659* (0.0342)	-0.0301*** (0.0086)	0.1024 (0.0661)	-0.0424 (0.0407)	-0.0075 (0.0550)	-0.0478** (0.0198)
Log (GDP)	-48.9944*** (13.3187)	-11.7360** (5.4921)	-36.7266*** (12.8832)	6.3020* (3.2612)	-4.8031 (16.8627)	1.0098 (10.2183)	-53.6493*** (16.8339)	1.1856 (6.0597)
Real interest rate	0.2113** (0.0884)	-0.0242 (0.0609)	-0.1626* (0.0876)	-0.1712*** (0.0222)	0.1443 (0.0886)	0.0109 (0.0782)	-0.1736** (0.0786)	0.0551* (0.0283)
Constant	390.7816*** (109.1128)	86.1209* (44.9220)	321.7241*** (105.2830)	-47.4094* (26.6514)	47.8815 (136.1801)	-1.8456 (83.3674)	458.6520*** (136.1055)	-10.8278 (48.9939)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	139	126	157	157	70	58	77	77
R-squared	0.3912	0.4747	0.1607	0.4088	0.3916	0.2448	0.2918	0.2950
Number of countries	26	26	28	28	14	12	14	14

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

**Table 16: Financial Repression, Prudential Supervision Structure, and Financial Fragility for Middle-Income Countries**

Variables	Integrated Supervision				Sector-by-Sector Supervision			
	(1) Impaired Loans Ratio	(2) Net Charge- Offs Ratio	(3) Liquid Ratio	(4) Asset Returns	(5) Impaired Loans Ratio	(6) Net Charge- Offs Ratio	(7) Liquid Ratio	(8) Asset Returns
Financial liberalization	-374.5571*** (67.8934)	121.9774 (113.6807)	-69.5607 (114.051)	119.0923*** (27.6950)	-19.5436 (13.2597)	-19.9061*** (7.0021)	-8.7515 (12.2575)	-2.1838 (3.7648)
Inflation	-0.2120 (0.1620)	0.4369 (0.2303)	0.9709** (0.3127)	0.0607 (0.0759)	0.0103 (0.0281)	-0.0452*** (0.0156)	-0.0581** (0.0257)	-0.0024 (0.0079)
Log (GDP)	43.8515** (14.7253)	-32.0390 (17.8794)	5.4089 (29.7602)	-19.2774** (7.2267)	-37.3660*** (10.5509)	-14.6298*** (5.5364)	-50.9018*** (9.3662)	0.7337 (2.8767)
Real interest rate	0.3120*** (0.0313)	-0.1262 (0.1837)	-0.3205*** (0.0690)	-0.1895*** (0.0168)	0.1052 (0.0755)	-0.0774 (0.0492)	-0.1298* (0.0689)	-0.0264 (0.0212)
Constant	-433.7084** (134.7681)	291.7622 (169.9357)	-15.9925 (272.7165)	190.4434** (66.2235)	301.9514*** (84.9946)	115.6673** (44.8065)	428.1664*** (75.3702)	-5.2363 (23.1492)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25	19	26	26	184	165	208	208
R-squared	0.9818	0.9648	0.8647	0.9752	0.3366	0.2606	0.2230	0.0381
Number of countries	8	6	8	8	34	34	36	36

Note: Standard errors in parentheses; p<0.01, \*\* p<0.05, \* p<0.1.

The results in Table 16 are more mixed. For economies with an integrated regulatory structure, although the impaired loans ratio decreases significantly, the net charge-offs ratio displays insignificant but positive changes. For economies with a separate supervision structure, the net charge-offs ratio decreases significantly while the decline in the impaired loans ratio is insignificant. As the subsample of the integrated supervisory structure only contains 8 countries and 26 observations, we should not overemphasize these findings.

## 6. CONCLUDING REMARKS

International experiences of financial liberalization, especially those of middle-income economies, should offer important lessons to the PRC. The PRC has been liberalizing its financial system for nearly four decades. While it now has a very comprehensive financial system with a large number of financial institutions and gigantic financial assets, its financial policies are still highly repressive. Fortunately, this unique pattern of financial reform has not stopped the economy from achieving extraordinary growth performance.

However, our earlier studies discovered that repressive financial policies are now a major drag on the PRC's economic growth (Huang and Wang 2011). This factor may be partly responsible for the recent deceleration of GDP growth in the PRC. Further evidence is the rapidly rising incremental capital–output ratio (ICOR), from 3.5 in 2007 to 5.9 in 2015. Declining capital efficiency points to an urgent need for further financial liberalization. This is also consistent with the finding of Huang et al. (2014) that financial liberalization is a necessary condition for overcoming the middle-income trap.

Chinese leaders have already unveiled a comprehensive program of financial reform, including 11 specific reform measures in three broad areas: creating a level-playing field (such as allowing private banks and developing inclusive finance), freeing the market mechanism (such as reforming the interest rate and exchange rate regimes and achieving capital account convertibility), and improving regulation.

Unfortunately, many middle-income economies fell into serious financial crises after they liberalized their financial system. Most of them remain as middle-income economies today. What will be the consequences for financial stability as the PRC moves to liberalize its financial system further? In particular, would it trigger the PRC's first major financial crisis? The PRC's direct motivation for further financial reform is to sustain strong economic growth to advance successfully to the high-income status. However, if the PRC repeats the painful experiences of Mexico, Indonesia, and Thailand, it might not be able to achieve its original goal of overcoming the middle-income trap. Needless to say, there are many reasons why most countries stay at the middle-income level for decades. Finance is only one of them.

We can summarize the international experiences discovered in this study as follows. First, financial liberalization, in general, reduces rather than increases financial instability. This powerful conclusion is valid whether we measure financial instability using crisis occurrence or fragility indicators, such as impaired loans and net charge-offs. The only exception is that financial liberalization does not appear to lower significantly the probability of systemic banking crises, although it does lower the risk indicators for banks. All this evidence is more significant statistically and greater in magnitude for the middle-income group than for the entire sample.

We should probably interpret the insignificant impact on banking crises with caution. One of the possible explanations is that, under a repressed financial regime, the government supports the banks with an implicit or an explicit blanket guarantee. This reduces the probability of an explicit banking crisis, although the banking risks could even be greater because of the moral hazard problem. In fact, government protection of banks could also lead to higher probabilities of sovereign debt crises or even currency crises before financial liberalization.

Second, too rapid a pace of financial liberalization may increase financial risks. The net impact on financial instability depends on the relative importance of the “liberalization effect” and the “pace effect.” In essence, what the “pace effect” captures could simply be prerequisite conditions and reform sequencing, which the literature has discussed well. Abrupt abandonment of government controls over financial transactions may not result in immediately well-functioning financial markets. Some market functions can work well only with certain prerequisite conditions. Finally, an effective regulatory system, which is a necessary device of a modern financial system for controlling financial risks, also takes time to evolve and develop.

Third, the quality of institutions, such as investor protection and law and order, also matters. The international experiences indicate that investor protection can significantly reduce the probabilities of financial crises. Often, better investor protection implies greater efforts to reduce information asymmetry to eliminate the adverse selection and moral hazard problems. Meanwhile, law and order, democracy, and investor protection are also useful for reducing banking fragility following financial liberalization.

Finally, the central bank’s participation in financial regulation is helpful for reducing financial risks during financial liberalization. This is probably because central banks always play central roles in financial liberalization, especially the liberalization of the interest rate, exchange rate, and capital account. If a central bank has responsibilities for financial regulation, its liberalization policies could be more cautious and prudent. The coordination between liberalization and regulation could also improve.

These findings offer important policy implications for the PRC. First, further financial liberalization is necessary not only for sustaining strong economic growth but also for containing or reducing financial risks. Dual-track systems and especially repressive financial policies have become the main sources of economic inefficiency and financial risks in the PRC. It is time for market forces to play a decisive role in the allocation and pricing of financial resources. Without further financial liberalization, it would be almost impossible for the PRC to overcome the middle-income trap.

Second, gradual reform may still work better than the “big-bang” approach. Obviously, the pace of financial liberalization needs to accelerate compared with its historical record. Still, however, sequencing is very important for avoiding the painful financial volatilities seen in many other middle-income countries. For instance, without effectively enforcing market disciplines on both borrowers’ and lenders’ sides, it is not advisable to lift all the restrictions on interest rates. Similarly, without a well-functioning domestic financial market, it could be dangerous to liberalize the capital account completely.

Third, the government should also focus more on improving other institutions, such as law and order and investor protection. The financial system does not work in isolation. In fact, the most important institution that the Chinese economy lacks is market discipline. A large number of zombie firms continue to receive financial resources. This not only hurts the overall economic efficiency but also distorts the market behavior. The government put the bankruptcy law in place years ago but never sufficiently enforced it.

Finally, it is better for the central bank to participate in financial regulation. This appears to be the direction in which the PRC is heading at the moment. The expected new regulatory model is likely to give the PBC greater responsibilities in the whole regulatory system. However, the regulatory reform should not stop there. The new regulatory system should focus exclusively on financial stability by giving up the responsibility for financial industry development. It should shift from regulating institutions towards regulating functions, and it should become relatively independent, increasing accountability.

## REFERENCES

- Abiad, A., E. Detragiache, and T. Tressel. 2008. *A New Database of Financial Reforms*. IMF Working Paper.
- Allen, F., and D. Gale. 2000. "Financial Contagion." *Journal of Political Economy* 108: 1–33.
- Andrianova, S., B. H. Baltagi, T. Beck, P. Demetriades, D. Fielding, S. G. Hall, S. F. Koch, R. Lensink, J. Rewilak, and P. L. Rousseau. 2015. *A New International Database on Financial Fragility*. Working Paper No. 15/18 from Department of Economics, University of Leicester.
- Arestis, P., and P. O. Demetriades. 1999. "Finance Liberalization: The Experience of Development Countries." *Eastern Economic Journal* 25: 441–57.
- Aspachs, O., C. Goodhart, M. Segoviano, D. Tsomocos, and L. Zicchino. 2006. *Searching for a Metric for Financial Stability*. Financial Markets Group Special Papers SP167.
- Bekaert, G., C. R. Harvey, and C. Lundblad. 2005. "Does Financial Liberalization Spur Growth?" *Journal of Financial Economics* 77: 3–55.
- Bencivenga, V., and B. Smith. 1991. "Financial Intermediation and Endogenous Growth." *Review of Economic Studies* 58: 195–209.
- Berg, A., B. Eduardo, and P. Catherine. 2004. *Assessing Early Warning Systems: How Have They Worked in Practice?* IMF Working Paper 04/52. Washington, DC: International Monetary Fund (IMF).
- Boyd, J., and G. De Nicolò. 2005. "The Theory of Bank Risk Taking and Competition Revisited." *Journal of Finance* 60: 1329–43.
- Choksi, A., and D. Papageorgiou, eds. 1986. *Economic Liberalization in Developing Countries*. New York: Basil Blackwell.
- Cubillas, E., and F. Gonzalez. 2014. "Financial Liberalization and Bank Risk-Taking: International Evidence." *Journal of Financial Stability*: 32–48.
- Dattels, P., R. McCaughrin, K. Miyajima, and P. J. Forne. 2010. *Can You Map Financial Stability?* Working Paper 10/145. Washington, DC: IMF.
- Demirgüç-Kun, A., and E. Detragiache. 1998. "Financial Liberalization and Financial Fragility." In *Annual World Bank Conference on Development Economics*, 303–31. Washington, DC: World Bank.
- Demirgüç-Kunt, A., and E. Detragiache. 2005. *Cross-Country Empirical Studies of Systemic Bank Distress: A Survey*. IMF Working Paper 05/96. Washington, DC: IMF.
- Edison, H. J., M. W. Klein, L. Ricci, and T. Sløk. 2004. "Capital Account Liberalization and Economic Performance: Survey and Synthesis." *IMF Staff Papers* 51 (2): 220–56.
- Edwards, S. 2001. *Capital Mobility and Economic Performance: Are Emerging Economies Different?* NBER Working paper No. w8076, Cambridge, MA: The National Bureau of Economic Research.
- . 2009. "Sequencing of Reforms, Financial Globalization, and Macroeconomic Vulnerability." *Journal of the Japanese and International Economies* 232: 131–48.

- Eichengreen, B. J. 2001. "Capital Account Liberalization: What Do Cross-Country Studies Tell Us?" *World Bank Economic Review* 15 (3): 341–65.
- Fry, M. 1997. "In Favour of Financial Liberalisation." *Economic Journal* 107: 754–70.
- Ghosh, A. R., J. D. Ostry, and S. Q. Mahvash. 2014. *Exchange Rate Management and Crisis Susceptibility: A Reassessment*. IMF Working Papers 14/11. Washington, DC: IMF.
- Glick, R., X. Guo, and M. M. Hutchison. 2004. "Currency Crises, Capital Account Liberalization, and Selection Bias." *Review of Economics and Statistics* 884: 698–714.
- Glick, R., and M. M. Hutchison. 2001. "Banking and Currency Crises: How Common are Twins?" In *Financial Crises in Emerging Markets*, edited by R. Glick, R. Moreno, and M. M. Spiegel. New York: Cambridge University Press.
- Greenwood, J., and B. Jovanovic. 1990. "Financial Development, Growth, and the Distribution of Income." *Journal of Political Economy* 98: 1076–107.
- Haldane, A., S. Hall, and S. Pezzini. 2007. *A New Approach to Assessing Risks to Financial Stability*. Bank of England Financial Stability Paper No. 2.
- Hellmann, T. F., K. C. Murdock, and J. E. Stiglitz. 2000. "Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?" *American Economic Review* 90 (1): 147–65.
- Hellmann, T., K. Murdock, and J. Stiglitz. 1997. "Financial Restraint: Toward a New Paradigm." In *The Role of Government in East Asian Economic Development: Comparative Institutional Analysis*, edited by M. Aoki, H.-K. Kim, and M. Okuno-Fujiwara. Oxford: Clarendon Press.
- Huang, Y. 2010. "Dissecting the China Puzzle: Asymmetric Liberalization and Cost Distortion." *Asia Economic Policy Review* 5 (2): 281–95.
- Huang, Y., and X. Wang. 2011. "Does Financial Repression Inhibit or Facilitate Economic Growth: A Case Study of China's Reform Experience." *Oxford Bulletin of Economics and Statistics* 73 (6): 833–55, December.
- . 2017. "Building an Efficient Financial System in China: In Need for Market Discipline." *Asian Economic Policy Review*, forthcoming.
- Huang, Y., Q. Gou, and X. Wang. 2014. "Financial Liberalization and the Middle-Income Trap: What Can China Learn from Multi-country Experience?" *China Economic Review* 31 (C): 426–40.
- Huang, Y., X. Wang, B. Wang, and N. Lin. 2013. "Financial Reform in China: Progress and Challenges." In *How Finance is Shaping Economies of China, Japan and Korea*, edited by Y. Park and H. Patrick, 44–142. New York: Columbia University Press.
- International Monetary Fund (IMF). 2012. "Sequencing Financial Sector Reform." In *Financial Sector Assessment: A Handbook*. Washington, DC: IMF. [www.imf.org/external/pubs/ft/fsa/eng/pdf/ch12.pdf](http://www.imf.org/external/pubs/ft/fsa/eng/pdf/ch12.pdf).
- Kaminsky, G., and C. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review* 893: 473–500.
- Kaminsky, G., S. Lizondo, and C. Reinhart. 1998. *Leading Indicators of Currency Crises*. IMF Staff Papers, Vol. 45, No. 1, Washington, DC: IMF.



- Kaminsky, G., and S. L. Schmukler. 2008. "Short-Run Pain, Long-Run Gain: Financial Liberalization and Stock Market Cycles." *Review of Finance* 122: 253–92.
- Keeley, M. C. 1990. "Deposit Insurance, Risk, and Market Power." *American Economic Review* 80: 1183–200.
- Klomp, J., and J. De Haan. 2009. "Central Bank Independence and Financial Instability." *Journal of Financial Stability* 54: 321–38.
- Knack, S., and P. Keefer. 1995. "Institutions and Economic Performance: Cross Country Tests Using Alternative Measures." *Economics and Politics* 73: 207–27, November.
- Kose, M. A., R. Prasad, K. Rogoff, and S. J. Wei. 2009. "Financial Globalization: A Reappraisal." *IMF Staff Papers* 561: 8–62.
- La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R. Vishny. 1999. "The Quality of Government." *Journal of Law, Economics and Organization* 15 (1): 222–79.
- Laeven, L., and F. Valencia. 2013. "Systemic Banking Crises Database." *IMF Economic Review* 612: 225–70.
- Loayza, N., and R. Rancière. 2006. "Financial Development, Financial Fragility, and Growth." *Journal of Money, Credit and Banking* 384: 1051–76.
- McKinnon, R. I. 1973. *Money and Capital in Economic Development*. Washington, DC: The Brookings Institution.
- . 1993. *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*. Baltimore: Johns Hopkins University Press.
- Mishkin, F. 2003. "Financial Policies and the Prevention of Financial Crises in Emerging Market Countries." In *Economic and Financial Crises in Emerging Market Countries*, edited by M. Feldstein, 93–130. Chicago: University of Chicago Press.
- Pagano, M. 1993. "Financial Markets and Growth: An Overview." *European Economic Review* 37: 613–22.
- Qin, X., and C. Luo. 2014. "Capital Account Openness and Early Warning System for Banking Crises in G20 Countries." *Economic Modelling* 39: 190–4.
- Quinn, D. P. 1997. "The Correlates of Change in International Financial Regulation." *American Political Science Review* 531–51.
- Quinn, D. P., C. Inclan, and A. M. Toyoda. 2001. *How and Where Capital Account Liberalization Leads to Economic Growth*. Unpublished manuscript, Georgetown University.
- Quinn, D. P., and A. M. Toyoda. 2008. "Does Capital Account Liberalization Lead to Growth?" *Review of Financial Studies* 213: 1403–49.
- Quirk, P. J., and O. Evans. 1995. *Capital Account Convertibility: Review of Experience and Implications for IMF Policies*. IMF Occasional Paper No. 131. Washington, DC: IMF.
- Repullo, R. 2004. "Capital Requirements, Market Power, and Risk-Taking in Banking." *Journal of Financial Intermediation* 13: 156–82.
- Rodrik, D. 1998. *Who Needs Capital-Account Convertibility? Essays in International Finance* No. 207, Department of Economics, Princeton University.

- Rossi, M. 1999. *Financial Fragility and Economic Performance in Developing Economies: Do Capital Controls, Prudential Regulation and Supervision Matter?*, IMF Working Paper No. 99/66, Washington, DC: IMF.
- Roubini, N., and X. Sala-i-Martin. 1992. "Financial Repression and Economic Growth." *Journal of Development Economics* 39: 5–30.
- Schinasi, G. 2004. *Defining Financial Stability*. IMF Working Paper 04/187. Washington, DC: IMF.
- Shaw, A. S. 1973. *Financial Deepening in Economic Development*. New York: Oxford University Press.
- Stiglitz, J. E. 1994. "The Role of the State in Financial Markets." In *Proceeding of the World Bank Annual Conference on Development Economics, 1993: Supplement to the World Bank Economic Review and the World Bank Research Observer*, edited by M. Bruno and B. Pleskovic. Washington, DC: World Bank.
- . 2000. "Capital Market Liberalization, Economic Growth and Instability." *World Development* 28: 1075–86.
- Stiglitz, J. E., and A. Weiss. 1981. "Credit Rationing in Markets with Imperfect Information." *American Economic Review* 71: 393–410.
- Stulz, R. 1999. "Globalization of Capital Markets and the Cost of Capital." *Journal of Applied Corporate Finance* 123: 8–25.
- . 2005. "The Limits of Financial Globalization: Presidential Address to the American Finance Association." *Journal of Finance* 604: 1595–638.
- Tornell, A., and F. Westermann. 2005. *Boom–Bust Cycles and Financial Liberalization*. Cambridge, MA: MIT Press.
- World Bank. 2001. *Finance for Growth: Policy Choices in a Volatile World*. World Bank Policy Research Report. New York: The World Bank and Oxford University Press.

## APPENDIX

**Table A1: Variables' Definition and Data Sources**

Variable	Definition	Source
Crisis	A dummy variable taking the value one if at least one systemic banking, currency, or sovereign debt crisis arises and zero otherwise.	Laeven and Valencia (2013)
Banking crisis	We define a systemic banking crisis as either a significant sign of financial distress in the banking system or a severe banking policy intervention. The dummy variable is equal to one when any of these arise and zero otherwise.	Laeven and Valencia (2013)
Currency crisis	We define a currency crisis as nominal depreciation of the currency against the US dollar of at least 30% that is also at least 10 percentage points higher than the rate of depreciation in the preceding year. The dummy variable is equal to one in these cases and zero otherwise.	Laeven and Valencia (2013)
Sovereign debt crisis	We define a sovereign debt crisis as a sovereign debt default and a need for sovereign debt restructuring. The dummy variable is equal to one in these cases and zero otherwise.	Laeven and Valencia (2013)
GDP growth	The growth rate of real GDP per capita (purchasing power parity)	WDI (2015)
Log (GDP)	The log term of real GDP per capita (purchasing power parity)	WDI (2015)
Inflation	The inflation rate as measured using the consumer price index	WDI (2015)
Growth of M2 over reserve	M2/reserve	WDI (2015)
Real interest rate	The real interest rate	WDI (2015)
Current account surplus	The surplus of current account/GDP	WDI (2015)
Financial development	Private credit/GDP	WDI (2015)
Impaired loans	$\frac{\text{Impaired Loans}}{\text{Loans} + \text{Loan Loss Reserves}}$	Andrianova et al. (2015)
Net charge-offs	$\frac{\text{Net Charge} - \text{Offs}}{\text{Loans} + \text{Loan Loss Reserves}}$	Andrianova et al. (2015)
Liquidity	Liquid assets divided by total assets	Andrianova et al. (2015)
ROAA	Returns to average assets	Andrianova et al. (2015)
Law and order	This measures both the strength and impartiality of the legal system and the popular observance of the law on a scale from zero to six, where a higher score implies better mechanisms for adjudicating disputes.	ICRG
Democratic	This reflects political freedom on a scale from zero to six. The score becomes higher as the regime moves from autarchy, de jure one-party state, de facto one-party state, or dominated democracy to alternating democracy.	ICRG
Corruption	This assesses corruption within the political system with a maximum score of six and a minimum score of zero points, where a higher score indicates lower levels of corruption.	ICRG
Investment_profile	This assesses the factors affecting risks to investment, which encompass three subcomponents of contract viability, or expropriation, profit repatriation, and payment delays, on a scale from zero to twelve, where a higher score indicates lower investment risk.	ICRG