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# Role of financial regulation and innovation in the financial crisis

Teakdong Kim[a], Bonwoo Koo[b], Minsoo Park[c,*]

[a] Korea Deposit Insurance Corporation, 30 Cheonggyechun-no, Jung-gu, Seoul, Republic of Korea
[b] Department of Management Sciences, University of Waterloo, 200 University Avenue West, Waterloo, ON, Canada N2L 3G1
[c] Department of Economics, Sungkyunkwan University, 25-2 Sungkyunkwan-Ro, Jongnogu, Seoul, Republic of Korea

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ABSTRACT

Using the financial and macroeconomic dataset of 132 countries, this study empirically analyzes the effects of financial regulations and innovations on the global financial crisis. It shows that regulatory measures such as restrictions on bank activities and entry requirements have decreased the likelihood of a banking crisis, while capital regulation and government ownership of banks have increased the likelihood of a currency crisis. Financial innovation has contributed to the banking crisis but contained the currency crisis. This study also shows that judicious implementation of regulatory measures is critical to financial stability because some regulations, if implemented simultaneously, can further aggravate or alleviate a crisis.



## 1. Introduction

The global financial crisis, starting with the housing bubble and credit boom in 2007 and peaking with the housing bust and collapse of Lehman Brothers in September 2008, has led to a global recession and a loss of confidence in the financial system. In spite of a few positive signs in key economic indicators, the world economy in 2012 remains fragile and uncertain. Recent financial crises have been characterized by their global scale in which a downward economic spiral in one country quickly spreads to other countries. The recent sovereign debt crisis in Greece has had severe contagious effects on other countries in Europe and beyond. The extent and impact of these crises vary by country, which raises an important research question of examining the determinants that affect the degree and frequency of financial crises.

Several studies show that deregulation and hyperactive financial innovations in the financial sector have caused various types of financial crises during the past few decades (Morris and Shin, 1998; Reinhart and Rogoff, 2008). Regulatory and supervisory agencies in many countries have failed to keep abreast of the rapidly evolving development of the financial industry and its myriad products and practices. Risky lending and investment practices by financial institutions in the recent crisis might have stemmed from lax regulations on the financial sector. While Eichengreen and Portes (1987) argue that strong regulations and sound institutional frameworks help stabilize financial markets by reducing the moral hazard problems associated with asymmetric information, Barth et al. (2004) show that restrictions on bank activities may contribute to financial crises because banks are not able to diversify into other financial activities to reduce risks.

In addition, recent financial crises might also have been caused by excessive reliance on financial innovations such as mortgage-backed securities (MBS), collateralized debt obligations (CDO) and credit default swaps (CDS). Securitizations such as MBS and CDO led to the credit boom and asset bubble because the risks associated with the underlying assets are transferred to investors (Keys et al., 2010). Derivatives such as CDS are used as protection against defaults on bonds or loans but have exposed the financial sector to systemic risks through excessive leveraging and speculative investments (Dodd, 2002).

The objective of this study is to empirically analyze how (de)regulatory measures and financial innovation have contributed to the recent global financial crisis, using the financial and macroeconomic data of 132 countries. This study examines the fundamental role of regulations to explain the causes of the recent global crisis and discusses long-term structural reforms in the financial sector. This study is close to those of Barth et al. (2004) and Beck et al. (2006), which use cross-country data to examine the role

* Corresponding author. Tel.: +82 02 760 0427; fax: +82 02 760 0946.
*E-mail address:* minsoopark@skku.edu (M. Park).

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of regulation in financial crises. However, those studies might have the reverse causality problem in which the financial crises data were collected for the 1980s and 1990s, while the regulatory data were from 1999. With the dataset of more recent financial crises for 132 countries that reflect a variety of preceding regulatory systems, this study systematically examines the effects of regulations on the global financial crises. This study also analyzes the relation between financial innovation and the recent global financial crisis using an aggregate index for assessing the extent of financial innovation in a country.

By examining the roles of several types of regulatory measures and financial innovations, this study provides the following main results. First, in terms of individual regulatory measures, this study shows that countries with strong restrictions on bank activities and entry requirements are less likely to experience a banking crisis. Second, various regulatory measures, if implemented simultaneously, can have aggravating or alleviating effects on a crisis, suggesting that partial analysis of the effect of individual measures may lead to misleading policy implications. This study illustrates the complex mechanisms of regulations in influencing the banking sector and foreign exchange market. Third, while financial innovation increased the chance of the banking crisis, it alleviated the risk of the currency crisis.

This study is organized as follows. Section 2 reviews the literature on the various types of financial crises and their relationships with financial regulations and innovations, followed by several testable hypotheses drawn from the literature. Section 3 describes the sources of data and explains each variable used in the empirical model. After presenting the estimation methodology, Section 4 uses several regression models to analyze the effects of each variable on the financial crises. Section 5 provides the conclusion and a few policy implications.

## 2. Financial crises and their determinants

### 2.1. Types of financial crises

A financial crisis is broadly defined as a situation when a large number of financial contracts are broken in a short period of time and the financial sector undergoes a wide range of turmoil, such as a significant decrease in asset values, bankruptcy of financial institutions, and disruption in foreign exchange markets (Allen and Snyder, 2009). The turmoil in a country's financial sector has major repercussions on the real economy and often leads to a widespread recession with low investment rates and high unemployment rates. Financial crises can be classified into three broad types: banking crisis, currency crisis, and debt crisis.[1] However, this classification is not necessarily exclusive since some crises are "twin crises" when currency depreciation exacerbates the banking sector problems through banks' exposure to foreign currency (Laeven and Valencia, 2008).

A *banking crisis* occurs when banks and financial institutions face difficulties in repaying contracts on time and experience a large number of defaults. A banking crisis is often accompanied by bubbles in credit and assets, sharp increases in debt, current account deficits and financial liberalization (Reinhart and Rogoff, 2008). A banking crisis is identified by specific events such as bank runs, mergers, takeovers and government interventions (Kaminsky and Reinhart, 1999), or by quantitative thresholds such as the ratio of nonperforming assets to total assets exceeding 10% or the cost of rescue operations being more than 2% of GDP (Demirgüç-Kunt and Detragiache, 1997).

A *currency crisis* occurs when the value of a country's currency depreciates substantially in a short period of time. The potential causes of a currency crisis include a weak banking sector, a bank run, and asymmetric information about financial fundamentals (Obstfeld, 1995). Defining an appropriate index that captures a currency crisis has been a focus of several studies; some studies emphasize the magnitude of currency depreciation (Frankel and Rose, 1996), while others include speculative pressure and government interventions (Eichengreen et al., 1995).

Several anecdotal studies of the 2008 financial crisis have found that the crisis was preceded by low real interest rates, a credit boom and a rise in asset prices (Taylor, 2009; World Bank, 2009). Low interest rates and loose mortgage lending practices in the early 2000s accelerated investments in the housing market. As housing prices began to drop in 2006 due to tightening credit and negative housing price expectations, defaults on mortgage loans increased and the subprime mortgage industry experienced large losses. Bad loans and assets caused a number of bank failures and the collapse of several financial institutions such as Lehman Brothers. Those events triggered a global financial crisis that negatively affected the real economy. To rebuild confidence in the financial system and to avert a severe global recession, several governments intervened by nationalizing banks and implementing temporary guarantees of money market funds and various other monetary and fiscal measures.

### 2.2. Determinants of financial crises

Among the several factors that might have contributed the global financial crisis of 2008, both regulatory measures and financial innovations are most widely discussed in the literature. Financial liberalization and deregulation could play a large role in creating financial crises because regulators often fail to control the high leverage or detect its risks. For example, "shadow banking system" activities by non-bank financial institutions such as investment banks, hedge funds, and venture capital and private equity are not subject to the same (strict) regulations as depository banks. Consequently, they tend to have high levels of leverage and might have exacerbated the recent crisis (World Bank, 2009). Financial innovations such as securitization and derivatives can accelerate asset booms and lead to sharp increases in leverage.

#### 2.2.1. Regulation

Consumers have limited capacity to effectively monitor complex financial products, so prudent financial regulations are critical to maintaining the stability of the financial sector. Diverse views about the role of financial regulations exist; some support stringent financial regulations and supervision (Skott, 1995), while others support lax oversight (Gordy and Howells, 2006). Several types of regulatory measures are implemented in different economies, and the definition of each measure varies by country.

Among the various regulatory measures, three pillars of the Basel II Accord – capital regulation on the minimum required amount, the extent of a government's supervisory power, and private-sector monitoring of banks – are most commonly

[1] A debt crisis occurs when a country defaults on its sovereign debts, and it can be caused by a sharp increase in the proportion of short-term debt, a sudden decrease in foreign exchange reserves, an exchange rate policy that affects a country's financial openness, and other political factors (Georgievska et al., 2008). A debt crisis is identified by the presence of a debt rescheduling agreement or negotiation, arrears (amount past due and unpaid) on principal repayments or interest payments, and an International Monetary Fund (IMF) debt rescheduling loan agreement (Lestano et al., 2003). While a debt crisis is important in its impact, it is not included in our empirical analysis due to the infrequent occurrences (only 7 occurrences in the 132 country samples).

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