The Impact of the 2008 Global Crisis on the Banking System

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Abstract

This paper examines the impact of the 2008-2009 Global Crisis on the banking systems of the countries around the world. Nine variables are examined which include bank concentration, bank deposits, 5-bank asset concentration, liquid liabilities, net loans from non-resident banks, outstanding loans from non-resident banks, offshore bank deposits, remittances, and consolidated foreign claims. The paper looks at how each of these banking system variables had changed before the crisis, during the crisis, and after the crisis. The results show that during the run-up to the crisis, 8 out of the 9 variables had not changed significantly (only net loans from non-resident banks had declined significantly), therefore we argue that there was almost no sign of an upcoming crisis during the run-up period. Still, policymakers may use such a sudden significant decline in loans from non-resident banks as a warning sign. The results show that, during the crisis period, the net loans from non-resident banks continued to decline. Also, during the crisis period, offshore deposits significantly declined. During this period, there was no significant change in the other variables. Therefore, we conclude that the crisis mainly affected the loans from non-resident banks and the offshore deposits. When the post-crisis period is examined, the results show that bank deposits and loans from non-resident banks had increased significantly. There was no significant change in the other variables. We suggest policymakers to use these findings when developing strategies to protect their country's banking system in the face of an economic crisis.

Keywords: banks, banking, global crisis, financial crises.

JEL Classification: G01, G20, G21, G23, G28.

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Introduction

In this study, the impact of the 2008-2009 Global Crisis on countries' banking systems is examined. Nine banking system-related variables are examined. These are provided on World Bank's GFDD (i.e. Global Financial Development Database). The database has data on 203 countries.

There are several previous papers that focus on the relationship between economic growth and financial development. While some of these papers (i.e. Bagehot (1873), Hicks (1969), and King and Levine (1993), and others) focus on the impact of financial development on economic growth, others (i.e. Odhiambo (2008) and Ang and McKibbin (2007) focus on the impact of economic growth on financial development. Yet, a few other studies (i.e. Arestis and Demetriades (1997), Demetriades and Hussein (1996), Arestis and Demetriades (1999), and Levine (1999)) argue that the causal relationship between the two is unclear.

As we know, economic crises negatively affect growth, therefore according to Odhiambo (2008) and Ang and McKibbin (2007), one would expect the 2008-2009 Crisis to have a significant effect on financial development. In this current paper, we focus on the impact of the Global Crisis on one aspect of financial development, which is the banking system. This paper examines how the Global Crisis had affected the banking systems of the countries around the world. The paper first looks at the run-up period to see if there were any signs of an upcoming economic crisis in countries' banking systems. Then, it examines how the crisis had affected these variables during the crisis. Finally, the post-crisis period is examined. The paper attempts to answer the following question: How had these variables changed after the crisis?

The paper makes two contributions to the literature. First, it has more breadth and depth when compared to the previous papers. Instead of just looking at bank concentration or competition like most of the previous studies do, this paper focuses on nine variables which include bank concentration, bank deposits, 5-bank asset concentration, liquid liabilities, net loans from non-resident banks, outstanding loans from non-resident banks, offshore bank deposits, remittances, and consolidated foreign claims. Also, instead of focusing on a single country or region, the paper examines the banking systems of 203 countries. Second, it not only looks at the changes during the crisis, it also looks at the changes during the run-up period, the crisis period, and the post-crisis period. This will be helpful, because the results for each sub-period have different implications. The results for the run-up period will tell us if there were any warning signs of an upcoming economic crisis in the countries' banking systems. The results for the crisis period will tell us which aspects of the banking systems are more affected by the crisis. Finally, the results for the post-crisis period will show us how the countries recovered from the initial effects of the crisis. We believe that policymakers can use these findings when preparing for a possible crisis, when facing the actual crisis, and when recovering from the crisis.

Section 2 goes over the previous literature. Section 3 explains the data, Section 4 shows the results. Finally, Section 5 concludes.

2. Literature Review

The relationship between economic growth and financial development has been studied in both directions. While some of the studies like Bagehot (1873), Hicks (1969), and King and Levine (1993) focus on the impact of financial development on economic growth, other studies like Odhiambo (2008) and Ang and McKibbin (2007) focus on the impact of economic growth on financial development.

Bagehot (1873), Hicks (1969), and King and Levine (1993) argue that financial development causes economic growth. If a country's financial system develops over time, this will promote economic activity and growth. Other papers like Shaw (1973), Fry (1988), and Pagano (1993) also focus on the impact of financial development on economic growth.

Odhiambo (2008) and Ang and McKibbin (2007) look at the issue from the other side and examine how economic growth makes a country's financial system more developed. Economic growth increases savings and this in turn leads to the development of a better and more advanced financial system.

A few other studies (i.e. Arestis and Demetriades (1997), Demetriades and Hussein (1996), Arestis and Demetriades (1999), and Levine (1999)) argue that the causal relationship between the two is unclear.

Besides all of these studies, a few other papers argue that economic growth and financial development are unrelated. This view is mainly taken by Lucas (1988), Stern (1989), and Chandavarkar (1992). According to these papers, since there is no relationship between the two, researchers need to ignore this relationship in their analyses.

Other than the research on the relationship between economic development and financial development, there is a separate stream of research that focuses on the banking systems of countries (i.e. mainly bank concentration and/or bank competition). For example, Duke and Cejnar (2013) argue that the 2008 Global Crisis was detrimental to the banking systems around the world due to its role in banking sector consolidation (i.e. reduced competition). Foer and Resnikoff (2014) argue that governments' actions to protect the largest banks during this period negatively affected the competition in the sector.

A few recent papers focus on the impact of changes in bank concentration (i.e. bank competition) on the stability of the financial system. For example, Ali, Intissar, and Zeitun (2015) contend that bank concentration does not affect financial stability for developed countries. According to the authors, for developing countries, bank concentration actually increases financial stability. Kokkoris (2014) argues that more bank competition has a negative impact on financial stability due to excessive risk taking behavior by banks.

Hüfner (2010) examine the impact of the 2008 Crisis on the German banking system and argue that government support has helped stabilize the system in the short-run. According to the author, in the long-run, more government support may be needed.

Bordo et al. (2015) compare the impact of the 2008 Crisis on Canadian banking system to the impact on the U.S. banking system. According to the authors, Canada did much better because of its more concentrated and tightly regulated banking system.

Maredza and Ikhide (2013) examine the impact of the 2008 Crisis on the South African banking system. The authors argue that the country's financial sector did well because of its strong macroeconomic policies and sound regulatory framework. They show that the crisis caused bank efficiency and productivity to go down significantly.

Dungey and Gajurel (2015) examine the international contagion in banking due to the 2008 crisis. They examine systematic, volatility, and idiosyncratic contagion, and conclude that policymakers should especially focus on preventing idiosyncratic contagion which is more harmful to the domestic economy.

Lysandrou and Nesvetailova (2015) examine the role of the shadow banking entities in the 2008 crisis. They show that shadow banking has played an important role in the crisis due to their involvement with toxic assets and due to their ties with the regulated banks.

Liang (2012) argues that the Chinese banking system did well during the 2008 crisis because of its capital control policies, its focus on traditional banking, and the domination of state-owned banks in the system.

Castro (2013) examine the relationship between macroeconomic factors and credit risk in Greece, Ireland, Spain, Portugal, and Italy. They show that macroeconomic factors explain banking credit risk in these countries.

A few studies focus on how the recent Greek crisis affected the banking systems in the region. Vogiazas and Nikolaidou (2011) examine the impact of the recent Greek crisis on nonperforming loans in Romania. They show that both Romania's macroeconomic factors and the Greek Crisis affected the credit risk in the Romanian banking system. Nikolaidou and Vogiazas (2014) looks into the determinants of credit risk in the Bulgarian banking system. They show that the 2008 Global crisis and the country's regulations have affected nonperforming loans, while the Greek crisis was not a significant factor. Provopoulos (2014) looks into the Greek financial crisis. The author argues that external and fiscal imbalances (i.e. deficits) started the crisis but later Bank of Greece's actions made the banking system more competitive and efficient.

In our study, we examine how an economic crisis affects bank concentration and other banking system variables like bank asset concentration, liabilities, deposits, liabilities, loans, offshore deposits, remittances, and consolidated foreign claims. In other words, we follow the footsteps of Odhiambo (2008) and Ang and McKibbin (2007) while focusing on the 2008 Global Crisis and its impact on the banking systems of 203 countries.

2. Data and Methodology

We use World Bank's Global Financial Development Database for the 2001-2011 period. As mentioned above, our variables are bank concentration (%), bank deposits to GDP (%), 5-bank asset concentration (%), liquid liabilities in billion 2000 USD, net loans from non-resident banks to GDP (%), outstanding loans from non-resident banks to GDP (%), offshore bank deposits to domestic bank deposits (%), remittance inflows to GDP (%), and foreign claims of BIS-reporting banks to GDP (%).

Bank concentration (%) is the amount of assets of three largest commercial banks divided by total commercial banking assets. 5-bank asset concentration (%) is the amount of assets of five largest banks divided by total commercial banking assets. Foreign claims of BIS-reporting banks to GDP (%) is the amount of the consolidated foreign claims divided by GDP (for the banks that are reporting to BIS). The other variables are self-explanatory.

There are 203 countries in the dataset. Using non-parametric tests (i.e. Mann-Whitney-Wilcoxon tests), we first examine how each of these variables had changed during the run-up to the crisis (i.e. the 2006-2007 period). Then, we examine how each variable had changed during the crisis period (i.e. the 2007-2008 period). Finally, we examine how each variable had changed during the post-crisis period (i.e. the 2008-2009 period).

Table 1 shows the summary statistics for our variables. We show the mean, the median, the minimum and the maximum values. Table 2 shows the trend in each variable over the 2001-2011 period. Figures 1-9 show how each variable had changed over time (i.e. the trend in each variable).

Table 1. Summary Statistics

Variable	Mean	Std	Min	Max
Bank concentration	69.93	19.92	27.07	100.00
Bank deposits	57.13	48.83	4.83	325.18
5-bank asset concentration	81.41	16.12	40.15	100.00
Liquid liab. in bil. 2000 USD	351.86	1,451.31	0.06	11,100.00
Loans non-res. banks (net)	0.09	3.74	-26.76	6.60
Loans non-res. Banks (outst.)	83.53	483.65	0.11	6,060.98
Offshore bank deposits	86.06	679.57	0.54	8,393.59
Remittance inflows	4.65	6.96	0.00	46.91
Foreign claims of BIS-rep.	48.46	83.98	0.17	626.10

Source: Author's own work

Table 2. Banking System Variables over Time

Year	01	02	03	04	05	06	07	08	09	10	11
Bank concentration	73	72	72	73	71	70	70	70	70	70	70
Bank deposits	44	45	45	45	48	49	50	53	59	56	57
5-bank asset concentration	81	81	81	81	80	81	81	81	80	80	81
Liquid liab. in bil. 2000 USD	161	175	199	213	207	232	263	284	308	333	352
Loans non-res. banks (net)	1.0	0.8	1.0	1.5	1.8	2.2	0.5	0.4	0.9	0.4	0.1
Loans non-res. Banks (outst.)	67	68	81	86	96	111	81	79	79	84	84
Offshore bank deposits	90	88	80	83	86	93	105	89	75	67	86
Remittance inflows	4.0	4.3	4.5	4.8	4.6	4.8	5.0	4.8	4.7	4.6	4.7
Foreign claims of BIS-rep.	32	32	40	38	39	46	53	47	54	51	48

Source: Author's own work.

Figure 1. Bank Concentration (%)

Source: Author's own work.

Figure 2. Bank Deposits to GDP (%)

Source: Author's own work.

Figure 3. 5-Bank Asset Concentration

Source: Author's own work.

Figure 4. Liquid Liabilities in Millions 2000 USD

Source: Author's own work.

Figure 5. Loans from Non-Resident Banks (Net) to GDP (%)

Source: Author's own work.

Figure 6. Loans from Non-Resident Banks (Amounts Outstanding) to GDP (%)

Source: Author's own work.

Figure 7. Offshore Bank Deposits to Domestic Bank Deposits (%)

Source: Author's own work.

Figure 8. Remittance Inflows to GDP (%)

Source: Author's own work

Figure 9. Consolidated Foreign Claims of BIS-reporting Banks to GDP (%)

Source: Author's own work

The next section shows the results of our tests for the run-up period, the crisis period, and the post-crisis period.

3. Empirical Results

Table 3 shows the results of our tests for the run-up period. We are seeing that the net loans from non-resident banks to GDP (%) had declined significantly during this period. In 2006, these loans amounted to 2.21% of GDP for the average country. In 2007, they amounted to just 0.51% of GDP for the average country. The difference is statistically significant ($p=0.0027$).

For the other variables, we do not see any significant change during the run-up period. Bank concentration (%) was around 70% throughout the period. The average bank deposits was around 50%. The 5-bank asset concentration was around 80-81%. The liquid liabilities went up but the change was statistically insignificant. The outstanding loans went down, but again the change was statistically insignificant. The offshore bank deposits went up, but the change was statistically insignificant. The remittance inflows were around 5%. The foreign claims of the banks that are reporting to BIS went up, but the change was statistically insignificant.

Table 3. The Run-Up to the Global Crisis

Variable	2006		2007		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Bank concentration	70.36	70.08	70.10	72.03	0.4543
Bank deposits	49.37	35.56	50.46	36.96	0.3579
5-bank asset concentration	80.53	81.72	80.58	84.01	0.4997
Liquid liab. in bil. 2000 USD	232,207	6,613	262,590	8,035	0.2255
Loans non-res. banks (net)	2.21	0.61	0.51	0.23	0.0027
Loans non-res. Banks (outst.)	111.23	9.32	81.42	9.46	0.2659
Offshore bank deposits	93.25	27.88	104.85	32.44	0.2150
Remittance inflows	4.85	1.67	4.99	1.87	0.4557
Foreign claims of BIS-rep.	46.44	18.86	53.05	21.53	0.2260

Source: Author's own work.

Table 4 shows the results of our tests for the crisis period. We are seeing that the net loans from non-resident banks to GDP (%) had declined significantly during this period. In 2006, these loans amounted to 0.51% of GDP for the average country. In 2007, they amounted to just 0.37% of GDP for the average country. The difference is statistically significant ($p=0.0071$). Also, the offshore bank deposits went down significantly. For the average country, the figure was 104.85% in 2006. The corresponding percentage is 89.20% in 2007. This difference is statistically significant ($p=0.0001$). We are seeing that none of the other variables has changed significantly during the crisis period.

Table 4. The Impact of the Global Crisis

Variable	2007		2008		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Bank concentration	70.10	72.03	70.40	71.72	0.4568
Bank deposits	50.46	36.96	53.13	39.85	0.2615
5-bank asset concentration	80.58	84.01	80.64	84.80	0.4779
Liquid liab. in bil. 2000 USD	262,590	8,035	283,743	8,696	0.4108
Loans non-res. banks (net)	0.51	0.23	0.37	-0.08	0.0071
Loans non-res. Banks (outst.)	81.42	9.46	79.08	9.34	0.3266
Offshore bank deposits	104.85	32.44	89.20	18.86	0.0001
Remittance inflows	4.99	1.87	4.80	1.77	0.4505
Foreign claims of BIS-rep.	53.05	21.53	46.75	17.11	0.2351

Source: Author's own work.

Table 5 shows the results of our tests for the post-crisis period. We are seeing that the net loans from non-resident banks to GDP (%) had increased (i.e. reversed its decline) significantly during this period. In 2006, these loans amounted to 0.37% of GDP for the average country. In 2007, they amounted to 0.93% of GDP for the average country. The difference is statistically significant ($p<0.0001$). Also, bank deposits went up significantly. For the average country, the figure was 53.13% in 2006. The corresponding percentage is 58.55% in 2007. This difference is statistically significant ($p=0.0890$). We are seeing that none of the other variables has changed significantly during the post-crisis period.

Table 5. The Reaction after the Crisis

Variable	2008		2009		Mann-W.
	Mean	Med.	Mean	Med.	p-value
Bank concentration	70.40	71.72	70.02	70.19	0.4298
Bank deposits	53.13	39.85	58.55	44.52	0.0890
5-bank asset concentration	80.64	84.80	80.01	83.73	0.3500
Liquid liab. in bil. 2000 USD	283,743	8,696	307,821	10,298	0.3139
Loans non-res. banks (net)	0.37	-0.08	0.93	0.69	<0.0001
Loans non-res. Banks (outst.)	79.08	9.34	78.77	9.08	0.3740
Offshore bank deposits	89.20	18.86	74.85	20.13	0.2692
Remittance inflows	4.80	1.77	4.66	1.90	0.4110
Foreign claims of BIS-rep.	46.75	17.11	54.07	20.29	0.2306

Source: Author's own work.

Conclusion

In this study, we examine how banking systems around the world were affected before, during, and after the 2008-2009 Global Crisis. We look at the impact of the Global Crisis on nine different variables which include bank concentration, bank deposits, 5-bank asset concentration, liquid liabilities, net loans from non-resident banks, outstanding loans from non-resident banks, offshore bank deposits, remittances, and consolidated foreign claims.

We find that, during the run-up period, the net loans from non-resident banks variable had declined significantly. In other words, during this period, the loans given by non-resident banks to customers had gone down significantly. This is a sign that these banks were in fact aware of the deteriorating situations in the markets. On the other hand, we do not find any significant change in the other variables during this period.

Our results for the crisis period show that these banks continued to offer fewer and fewer loans to their customers as the crisis progressed. We also find that there were less and less offshore deposits during the crisis period. We do not see any significant change in the other variables.

For the post-crisis period, we find that the loans from non-resident banks reversed. They started offering significantly more loans during this period. Also, bank deposits started to go up (i.e. recovered) significantly. During this period, we do not find any significant change in the remaining variables.

Overall, we conclude that the decline in loans offered by non-resident banks was a sign of an upcoming economic crisis. Policymakers could have started taking precautions earlier if they knew that this was a sign of an upcoming economic crisis. This decline in loans from non-resident banks continued during the crisis along with a decline in offshore deposits. Therefore, we know that firms struggled in getting loans during the crisis period, and also the offshore banks struggled in getting deposits. Later, a recovery was seen in loans and domestic bank deposits.

We believe that all of these findings will be helpful to policymakers around the world. First, the results for the run-up period tell us that the decline in loans from non-resident banks was a sign of an upcoming economic crisis. Appropriate and timely precautions could have been taken which would lessen the impact of the crisis. Second, we now know that precautions regarding new loans could have been taken. Also, offshore banks could have taken some precautions for the upcoming deposit crunch. Third, policymakers would have known which aspects of the banking system would recover after the crisis.

Future studies may focus on the impact of financial/economic crises on different aspects of financial development, which may include the depth of the system, the efficiency of the system, or the stability of the system. Also, future studies may look into the impact of the crises on developed versus developing nations.

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