

THE IMPACT OF THE 2008-2009 GLOBAL CRISIS ON THE COLLATERAL REQUIREMENT FOR LOANS: THE CASE OF MANUFACTURING FIRMS

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Abstract: *This paper summarizes the arguments and counterarguments within the scientific discussion on the issue of changes in financing conditions due to a global financial or economic crisis. The main purpose of the research is to examine how the loan collateral requirement for manufacturers in Eastern Europe and Central Asia had changed after the 2008-2009 Global Crisis. Systematization of the literary sources and approaches for solving the problem of changes in collateral requirement after the 2008-2009 Global Crisis indicates that there were some significant changes in terms of the collateral requirement and the type of collateral used post-crisis. The study is important because its findings will guide manufacturing firms, as well as lenders and government agencies in the region in case of an upcoming financial or economic crisis. Investigation of the topic of collateral requirement in the paper is carried out in the following logical sequence: First, the percentage of manufacturers that were required to show a collateral for obtaining a new loan is examined pre- and post-crisis. Then, the type of collateral that was used pre- and post-crisis is examined. The study uses six years of research data: the 2007 survey responses were used as the pre-crisis data and the 2010-2014 data were used as the post-crisis data. We focus on manufacturing firms in Eastern Europe and Central Asia because we have detailed data from the BEEPS IV and BEEPS V surveys of EBRD-World Bank. The paper presents the results of an empirical analysis of collateral requirement and type of collateral used, which shows that fewer manufacturers reported a collateral requirement for new loans post-crisis. When we examine the different types of assets that were used as collateral, we find that there were some significant changes from the pre-crisis period to the post-crisis period. We find that, post-crisis, fewer manufacturers used lands and buildings, machinery and equipment, or other items as collateral for new loans. There was no significant change in the percentage of manufacturers that used accounts receivable and inventories as collateral. On the other hand, our results show that, post-crisis, more manufacturers used personal assets of the owner as collateral. Overall, although fewer firms reported a collateral requirement for new loans post-crisis and fewer firms needed to show lands and buildings, machinery and equipment, or other items as collateral, more firms had to show their owner's personal assets. The research empirically confirms and theoretically proves that governments and lenders reduced the collateral requirement in this region and that in these times of deteriorating financial conditions, as a last resort, manufacturers had to use the owner's personal assets as collateral. The results of this research can be useful for manufacturing firms, as well as for lenders and government agencies in the region.*

Keywords: collateral, loan, global crisis, eastern Europe, central Asia, personal assets.

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1. Introduction

The 2008-2009 Global Financial Crisis originated as a mortgage-related crisis where some borrowers in the United States could not make their mortgage payments. This crisis resulted in a havoc in financial markets and banking systems which included the collapse of one of the largest investment banks in the world (i.e. Lehman Brothers). Later, the crisis spread to other countries. This period (i.e. 2008-2009) is later termed the “Great Recession”.

This study examines how the 2008-2009 Global Crisis affected new loans which are borrowed by manufacturing firms in Eastern Europe and Central Asia. The Global Crisis created havoc in the financial markets, but was it all bad? In other words, were all dimensions of financing negatively affected? Or although the terms of the loan including the interest rate and duration were negatively affected, did financial institutions try to make it easier for firms to borrow (due to their profit motivation or due to the governments’ push)?

In this current study, we examine how financial institutions changed their collateral requirement for new loans after the Global Crisis. Did they increase their requirement or reduce their requirement? We also look at the type of collateral that was used more frequently after the Global Crisis. Did manufacturing firms have to show more of their hard assets as collateral? Or did they have to show some of their personal assets as well? Our data were from the World Bank Business Environment and Enterprise Performance Surveys (BEEPS IV and BEEPS V surveys). We compare the pre-crisis and the post-crisis responses using these two surveys that were done in 32 countries in the region.

Due to governments’ support of firms through more bank lending in the post-crisis period, we expect to find more lenient lending requirements by financial institutions in this period. In other words, we expect to find fewer firms that faced a collateral requirement when applying for a new loan. In terms of the type of collateral that is shown to financial institutions (if needed), due to the reduced values of hard assets, receivables and inventories, we expect to find more firms showing personal assets of owner(s) as collateral (if needed).

While we find evidence of a less strict collateral requirement after the crisis, the use of more personal assets as collateral post-crisis shows the level of financial distress that was experienced among these firms. Future studies may focus on other aspects of financing including the impact on overdraft facilities, the number of new loans, the number of new credit lines, the types of new loans, and the type of the financial institution that is more likely to offer new loans to these firms.

In the next section, we will go over the literature. Section 3 explains our hypotheses. In Section 4, we explain our data and methodology. Section 5 shows our results. Section 6 will conclude.

2. Literature review

Prior studies including Bordo et al. (2015), Dungey and Gajurel (2015) Hüfner (2010), Lysandrou and Nesvetailova (2015), Liang (2012), and Maredza and Ikhide (2013) indicate that the 2008-2009 Global crisis had a detrimental effect on the banking and insurance sectors around the world. Generally, interest rates were higher and the amount borrowed were smaller due to the crisis. During this period, the value of firms’ assets that could be used as collateral went down. Because of that, in order to still make money from new loans at these higher rates, one would expect financial institutions to be less strict in terms of their collateral requirement.

In the past, multiple studies have looked into the effects of financial/economic turmoil on banking systems across countries. Liang (2012) argued that China's banking system was stable throughout the crisis due to the capital control strategies, the focus on conventional banking, and the influence of state-owned banks. Hüfner (2010) proposed that the German banking industry could be restored by strengthening state institutions, dividing the banking system, and applying proper banking laws and supervision. Maredza and Ikhide (2013) discovered that the crisis had a negative influence on the efficiency of South Africa's banks. Dungey and Gajurel (2015) highlighted the importance of lessening the chances of idiosyncratic contagion as opposed to systematic contagion. Lysandrou and Nesvetailova (2015) studied the role of shadow banking during the crisis. Other papers, such as Vogjazas and Nikolaidou (2011) and Nikolaidou and Vogiazas (2014), have examined the effect of the Greek crisis on the banking systems of several European countries. Bordo et al. (2015) argued that the crisis and

contagion were caused by the fragmented nature of the U.S. banking system. Kaya (2017) analyzed the consequence on the stability of the financial system and found that banks' non-performing loans went up while their liquid assets went down. Kaya (2021) examined the impact on the efficiency of the financial system and discovered that the global crisis had a substantial effect on return on assets and return on equity.

While these papers focused on banking, other papers like Njegomir et al. (2010), Bastürk and Sayin (2009), Baluch et al. (2011), and Kilic et al. (2014) conducted research to evaluate the effects of the 2008-2009 economic recession on the insurance sector. Njegomir et al. (2010) examine the impact on the ex-Yugoslavian countries and find that the 2008-2009 Global Crisis resulted in negative premium growth in Serbia, Croatia and FYR Macedonia while the growth in Slovenia and Bosnia and Herzegovina declined. There were also lower investment returns and a higher number of claims in this period. In less developed markets (Serbia, FYR Macedonia, and Bosnia and Herzegovina), non-life insurance premiums were negatively affected while in Slovenia and Croatia, life insurance premium growth was negatively affected. Kilic et al. (2014) show that the Turkish banking and insurance industries were significantly affected. The authors argue that this was due to the domination of these Turkish industries by international firms. Baluch et al. (2011) argue that, systemic risk in insurance industry has grown in recent years, partly as a consequence of insurers' increasing links with banks. Basturk and Sayin (2009) contend that while the 2008-2009 Global Crisis negatively affected premium generation and growth rate in the world insurance industry, in Turkey, growth rate continued to be high in the post-crisis period.

Saiedi and Broström (2019) studied small and medium sized European companies and found that during the crisis, those businesses followed the pecking order theory when it comes to funding. They noticed that new firms were more likely to seek debt, yet had difficulty obtaining it, while doing better in equity financing. Kaya (2016) investigated the repercussions of the 2008-2009 Crisis on three aspects of attaining finance. The author concluded that, post-crisis, stock trading was more concentrated in a few firms and there was no considerable effect on the number of banks nor on the market capitalization outside the top 10 largest firms. Isatayeva et al. (2019) looked at young knowledge-based firms in Kazakhstan and revealed that these enterprises had a higher chance of loan rejection compared to other firms. Moreover, this probability of refusal increased even further after the global crisis. Lee et al. (2015) examined small and medium sized firms in the U.K. and demonstrated that innovative firms were more likely to be denied than other firms. Furthermore, the worsening in credit conditions was more noticeable for non-innovative firms throughout the global crisis. Tran (2021) investigated 17 countries and showed that economic policy uncertainty raised the cost of debt financing as a consequence of information asymmetry and default risk. This effect on the expense of debt was more intense during the global crisis.

Numerous studies have explored the consequences of the global economic crisis on access to finance. Cowling et al. (2018), on the other hand, looked into how the age of the firm and the experience of the entrepreneur impacted performance after the crisis and found that prior experience was not as useful in this situation. However, younger companies still had a high growth rate. Carbo et al. (2016) studied small to medium sized companies in Spain and uncovered that businesses with limited credit extended more trade credit while those that were not credit-constrained leaned towards bank loans. Leitner and Stehrer (2013) examined Latin American enterprises and found that, during the economic emergency, bigger companies used fewer inside funds and foreign companies made use of more internal funds. As a whole, firms utilized bank loans and trade credit more. Fernando et al. (2017) looked into firms in Europe and found that those located in financially strained countries were more likely to be capital rationed and charged higher interest rates. These companies began to count more on debt securities instead of bank loans. Álvarez and Görg (2012) explored Chile and noted that manufacturing plants dismissed a large number of workers in the course of the economic crisis. Multinational companies were likely to leave the country and those that stayed were less likely to reduce workers compared to domestic companies. Martinez-Sola et al. (2017) examined Spanish firms and detected a positive relationship between supplier financing and company worth. Companies with more financial resources and lower cost did not value supplier financing as much as others. Andries et al. (2018) studied capital rationing in Europe and discovered that banking markets with more concentration had more credit rationing and that this affected small firms the most. Anton and Bostan (2017) looked into Europe and found a positive relationship between access to finance and entrepreneurial activities.

In this current study, we extend these studies by examining the impact of a global economic crisis on the collateral requirement for manufacturing firms in the EECA region. In the next section, we will go over our data and methodology.

3. Hypotheses

Since governments around the world started supporting companies by encouraging or in some cases even forcing financial institutions to give loans to firms, we expect more lenient lending requirements post-crisis. This includes fewer firms having to show a collateral when applying for a loan. Therefore, our first hypothesis is as follows:

Hypothesis 1: "After the global crisis, significantly fewer manufacturing firms faced a collateral requirement when applying for a new loan".

Since the values of hard assets including lands, buildings, machinery and equipment generally fell after the crisis, we expect fewer firms to show these as collateral when applying for a new loan. Therefore, our next hypothesis is as follows:

Hypothesis 2: "After the global crisis, significantly fewer manufacturing firms showed hard assets like lands, buildings, machinery and equipment as collateral when applying for a new loan".

Since the values of other assets including accounts receivable and inventories also went down (although not as much as hard assets) after the crisis, we expect fewer firms to show these as collateral when applying for a new loan. Therefore, our next hypothesis is as follows:

Hypothesis 3: "After the global crisis, significantly fewer manufacturing firms showed accounts receivable or inventory as collateral when applying for a new loan".

Finally, since firms struggled to show hard assets or other assets as collateral (due to their reduced values), we expect them to resort to their last choice, which is personal assets of owner(s). We expect more firms to show personal assets as collateral when applying for a new loan. Our final hypothesis is as follows:

Hypothesis 4: "After the global crisis, significantly more manufacturing firms showed personal assets of owner as collateral when applying for a new loan".

4. Data and methodology

The BEEPS IV and BEEPS V surveys of EBRD-World Bank are very detailed surveys that include questions on manufacturing firms' financing activities. These surveys cover 32 countries in Eastern Europe and Central Asia, therefore our study focuses on these countries. We use the BEEPS IV survey which was done in fiscal year 2007 as our pre-crisis period, and the BEEPS V survey which was done in fiscal years 2010-2014 as our post-crisis period.

Related to our research objectives, the surveys ask manufacturers the following questions:

"Referring only to this most recent loan or line of credit, did the financing require collateral? Yes/No"

"Are lands, buildings used as collateral for the most recent loan or line of credit? Yes/No"

"Are machinery and equipment including movables used as collateral for the most recent loan or line of credit? Yes/No"

"Are accounts receivable and inventories used as collateral for the most recent loan or line of credit? Yes/No"

"Are personal assets of owner (house, etc.) used as collateral for the most recent loan or line of credit? Yes/No"

"Are other forms of collateral not included in the categories above used as collateral for the most recent loan or line of credit? Yes/No"

In order to compare the responses before and after the crisis, we use the Chi-square test. All of the Chi-square test assumptions (having categorical variables, having two or more groups for each variable, independence of observations, random sampling, and expected value of cells is five or greater) are satisfied.

5. Empirical results

Table 1 compares the collaterals required for new loans from manufacturers in the pre- and post-crisis periods. As we can see from the table, post-crisis, there was a significant drop in the percentage of manufacturers that were required to show a collateral ($p=0.0569$). Pre-crisis, 79.33% of manufacturers had to show a collateral when applying for a new loan. The corresponding percentage is only 77.08% post-crisis. In other words, the collateral requirement was less common post-crisis.

Table 1. Did the Most Recent Financing Require Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	1,953	79.33	1,873	77.08
No	509	20.67	557	22.92
Total	2,462	100%	2,430	100%
Statistic	df	Value	Prob	
Chi-Square	1	3.6249	0.0569	

Source: author’s own work.

Table 2 examines whether lands and buildings were used as collateral by manufacturers before and after the crisis. As we can see from the table, post-crisis, there was a significant drop in the percentage of manufacturers that used lands and buildings as collateral ($p=0.0584$). Pre-crisis, 62.78% of manufacturers showed lands and buildings as collateral. The corresponding percentage is only 59.76% post-crisis.

Table 2. Are Lands, Buildings Used as Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	1,191	62.78	1,087	59.76
No	706	37.22	732	40.24
Total	1,897	100%	1,819	100%
Statistic	df	Value	Prob	
Chi-Square	1	3.5825	0.0584	

Source: author’s own work.

Table 3 examines whether machinery and equipment were used as collateral by manufacturers before and after the crisis. As we can see from the table, post-crisis, there was a significant drop in the percentage of manufacturers that used machinery and equipment as collateral ($p=0.0063$). Pre-crisis, 47.57% of manufacturers showed machinery and equipment as collateral. The corresponding percentage is only 43.09% post-crisis.

Table 3. Are Machinery and Equipment Used as Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	900	47.57	777	43.09
No	992	52.43	1,026	56.91
Total	1,892	100%	1,803	100%
Statistic	df	Value	Prob	
Chi-Square	1	7.4549	0.0063	

Source: author’s own work.

Table 4 examines whether accounts receivable and inventories were used as collateral by manufacturers before and after the crisis. As we can see from the table, there was no significant change in this measure post-crisis ($p=0.1529$). Pre-crisis, 18.72% of manufacturers showed accounts receivable and inventories as collateral. The corresponding percentage is 16.91% post-crisis.

Table 4. Are Accounts Receivable and Inventories Used as Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	348	18.72	303	16.91
No	1,511	81.28	1,489	83.09
Total	1,859	100%	1,792	100%
Statistic	df	Value	Prob	
Chi-Square	1	2.0431	0.1529	

Source: author's own work.

Table 5 examines whether personal assets of owner were used as collateral by manufacturers before and after the crisis. Post-crisis, there was a significant increase in the percentage of firms that used personal assets of owner as collateral ($p=0.0331$). Pre-crisis, 21.80% of manufacturers used personal assets as collateral. The corresponding percentage is 24.78% post-crisis.

Table 5. Are Personal Assets of Owner Used as Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	405	21.80	445	24.78
No	1,453	78.20	1,351	75.22
Total	1,858	100%	1,796	100%
Statistic	df	Value	Prob	
Chi-Square	1	4.5421	0.0331	

Source: author's own work.

Table 6 examines whether other items were used as collateral by manufacturers before and after the crisis. Post-crisis, there was a significant decline in the percentage of firms that used other items as collateral ($p=0.0324$). Pre-crisis, 17.08% of manufacturers used other items as collateral. The corresponding percentage is 14.47% post-crisis.

Table 6. Are Other Items Used as Collateral?

Variables	Pre-Crisis		Post-Crisis	
	N	%	N	%
Yes	313	17.08	255	14.47
No	1,520	82.92	1,507	85.53
Total	1,833	100%	1,762	100%
Statistic	df	Value	Prob	
Chi-Square	1	4.5779	0.0324	

Source: author's own work.

6. Conclusions

What is the impact of the global crisis on new loans? In this study, we try to answer this question for manufacturing firms operating in Eastern Europe and Central Asia. We use the BEEPS IV survey responses as our pre-crisis data and the BEEPS V responses as our post-crisis data.

Our results show that fewer post-crisis loans to manufacturers in this region required a collateral. This can be regarded as a positive change in these tough economic times. However, when we go deeper and look at different types of assets used as collateral, our findings are not as positive. More specifically, post-crisis, while fewer manufacturers used lands and buildings, machinery and equipment, or other items as collateral, more firms used owner's personal assets as collateral. This finding may indicate that some firms did not have enough other assets to use as collateral (a sign of financial distress).

The main limitation in this study is the use of the chi-square test, rather than regression analysis. Future studies may do a regression analysis where other firm-level factors including firm age, size, profitability, leverage, and other variables are used as control variables. One result that some readers may find surprising is our finding of

fewer firms reporting a collateral requirement post-crisis. We believe that this is due to governments' support for new loans post-crisis. Banks were generally encouraged or even forced to extend loans to firms after the crisis happened.

Future studies may focus on other aspects of financing. For example, they may focus on how crisis affects overdraft facilities with a financial institution, the reasons for applying or not applying for a new loan, any new credit lines, or the type of institution that are more lenient. Future studies may also focus on the impact of a crisis on other types of financing like private placements and bond offerings by larger firms.

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