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DID THE GLOBAL FINANCIAL CRISIS LEAD TO THE BREAKDOWN OF CROSS-BORDER LENDING? AN EMPIRICAL ANALYSIS

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Abstract

This paper is an empirical analysis of cross-border lending. We examine their evolution from 1999 to 2018. We divide the years into three phases (1999-2006, 2007-2011, and 2013-2018) to examine the impact of the global financial crisis on country credit relations. The work includes both Western and Eastern countries. After the analysis, we can see how more relations between Westerners are taking place. However, these credit relationships were reduced due to the 2007 crisis. Another of our findings is that the connection of banking institutions can collapse a whole set of countries. This is dangerous because if banks are too connected, the systemic risk increases and the imbalance can be transmitted to other sectors and areas. When examining the loans that the selected countries make to other countries, it highlights that Japan is the main lender. In contrast, the United States is the main borrower.

INDEX

1. INTRODUCTION	4
3. MODEL.....	16
3.1. ECONOMETRIC MODEL SPECIFICATION	16
3.2. THE SETUP OF THE ECONOMETRIC MODEL.....	17
3.3. ECONOMETRIC MODEL BY STAGES OG THE BUSINESS CYCLE	22
4. CONCLUSION.....	27
APÉNDICE A.....	28
1.1 SOURCE OF DATA.....	28
1.2 DESCRIPTIVE STUDY OF THE EXPLANATORY VARIABLES	29
5. REFERENCES	33

LIST OF TABLES, FIGURES AND EQUATIONS

<i>Table 1: Countries' cross-border loans according to their position as a lender or borrower ...</i>	9
<i>Table 2: Statistics describing the position of countries' lenders or borrowers for the entire time period of interest.....</i>	10
<i>Table 3: Lender Preference Index to 2000, 2008 and 2018.....</i>	13
<i>Table 4: Estimation by individual fixed effects and random effects.....</i>	18
<i>Table 5: Estimation by random effects for each stage.....</i>	23
<i>Table 6: Model variables and its sources</i>	28
<i>Table 7: Main statistics.....</i>	30
<i>Table 8: Correlation matrix.....</i>	31
<i>Figure 1: Evolution of loans granted by countries.....</i>	11
<i>Figure 2: Evolution of loans received by countries</i>	11
<i>Figure 3: Evolution of loans granted and received by each country.....</i>	13
<i>Equation 1: Lender's Preference Index (LPI).....</i>	13
<i>Equation 2: Econometric model</i>	16

TITLE: DID THE GLOBAL FINANCIAL CRISIS LEAD TO THE BREAKDOWN OF CROSS BORDER LENDING? AN EMPIRICAL ANALYSIS

1. INTRODUCTION

The 2007 financial crisis has supposed to make a difference for world economies. The first major bankruptcy, by the Lehman Brothers on September 15, 2008, caused a collapse of the financial system. It triggered a cascade of bankruptcies that quickly spread through the majority of banks and financial institutions. From this moment on, how did lending change between the different countries since the financial crisis? This is the main issue addressed in this paper. One of the reasons for financial contagion was the strong interconnection between institutions. The flagrant imbalance in the United States' financial sector spread to the real economy. The collapse extended to the other advanced economies of the world in a short time. The financial crisis also hit the emerging countries. Thus, the 2007 crisis led to a catastrophic situation that demonstrates without a doubt the fragility of the financial system. The goals of this study are to analyze how financial sector connectivity can harm an entire economy and how it has affected different countries.

To answer the question raised, we examined the development of cross-border lending. If credit relations between countries increase, the connectivity of their financial systems will be greater. In this situation, economies are very sensitive to financial contagion, and the systemic risk increases. This can lead to the collapse of an entire economy. Therefore, the objective is to analyze how credit relationships between various groups of countries have changed. To this end, we have carried out an econometric model estimated by random effects in which we examine the evolution of cross-border lending. The work includes an overall model estimate covering 20 years (1999-2018) and also a stepwise model estimate (1999-2007; 2008-2013; 2014-2018). In this way, we can see how cross-border lending has changed before, during, and after the global financial crisis.

The analysis is based on 9 countries, both developed and emerging. Specifically, we have separated the countries into two groups. One group consists of Western countries (Belgium, Denmark, Spain, France, the United Kingdom, and the United States). The other group is made up of Eastern countries (Japan, Turkey, and Taiwan). The reason for this separation is that the 2007 financial crisis began in the United States and Western Europe but over time spread to Eastern countries (Dietrich et al. (2011)). It is therefore interesting to examine how bank lending changed between the group of Western countries and the group of Eastern countries. From the results of the estimation, we get that the western countries are the ones that lend the most money to each other during these years.

Systemic risk refers to a shock in the financial system that generates enough uncertainty to spread to other areas and affect the entire real economy (Nicolo et al. (2002)). The banks' interconnection plays a leading role in explaining systemic risk. If banks are highly interconnected in the whole economy, one's lack of liquidity can spread to others. This is one reason why that triggered the 2007 financial crisis (Jeffers et al. (2013)). Because of these developments, former Federal Reserve Chairman Paul Volcker emphasized the need to reduce the size of large financial institutions, limit their interconnections or limit their activities. His purpose was to minimize the risk of bankruptcy (2012). At the international level, systemic risk and financial contagion are also relevant. Globalization means that the financial crisis in a given country can be transmitted to other countries through the financial markets. Therefore, a shock to a country's finances implies an imbalance in its economy and those of other countries.

The financial crisis made the difference in the conception of the effects of systemic risk. Before the financial crisis, there was a strong belief based on the interdependence between banks reduced uncertainty by diversifying risk among several institutions. Besides, increased bank connectivity could also be seen as a way to achieve greater global financial stability (Battiston et al. (2012)). Bartram et al. (2007) analyzed the effect of different financial crises on banks in 28 countries. From this study, they concluded that in developed economies there is little evidence that a shock is systemically transmitted throughout the economy. In 2007 it was demonstrated that if the financial system is highly connected, systemic risk is greater (Battiston et al. (2012)). The years preceding the crisis were characterized by the low quality of bank loans and high bank risk. In this context, default rates are higher (Bedendo et al. (2012)). An example of this was the collapse of the securitization market in 2008. The banks converted their assets into credit derivatives. Therefore, they could not sell it when liquidity was needed. As a result, chain failures occurred. This becomes clear the strong systemic risk faced by all banks (Nijskens et al. (2011)).

Given the importance of systemic risk, many theoretical models have been developed to better understand its functioning. One of the first is the application by Diamond and Dybvig (1983). It aims to determine the risk aversion of banks. They concluded that self-fulfilling panic led to a cascade of bank failures and caused damage to the real economy. In the model, the Nash equilibrium could emerge in which the distribution of risk was optimal. So the economy was functioning properly. On the other hand, agents could panic and withdraw their deposits in the first period. If everyone anticipated this, the only optimal balance possible was the early withdrawal of deposits. This demonstrates the delicacy of the financial system. Using this framework, Freixas et al. (2000) developed another model with

several regions. Depositors in one region could decide whether to consume in the region of origin. The more risk-averse, given the uncertainty of available consumer resources in the new region, could withdraw their deposits early. This generated blockages on solvent banks and liquidity problems. Thus, interbank links exposed the system to inefficient outcomes.

Allen and Gale (2000) developed another important model to explain financial contagion. They used the interbank network structure for the first time. This was an extension of the previous model. Its objective was to assess whether the increased interconnection between banks had advantages because of risk sharing, or disadvantages because of increased systemic risk. In the model, they connected four regions or banks and they introduced shock into one of them. If this region could not cope with the shock it could become insolvent and go bankrupt. To solve this, the bank could turn to other institutions and the shock would spread, causing a chain of bankruptcies. Thus, the liquidity imbalance between regions increases and the systemic risk appears. Duffy et al. (2018) used this model but introduce two types of interbank network structures: complete and incomplete. With high settlement rates or complete structure, equilibrium could be maintained. If they are low and the structure is incomplete, there were runs on all banks and the whole system was collapsing. Yang et al. have empirically demonstrated that the effects of systemic risk are more severe than the benefits of bank diversification (2019).

It is also interesting to review the effect of systemic risk on agent dynamics and the economic cycle. Tedeschi et al. (2012) studied it in their model, in which the goods market interacted with the credit and interbank market. Specifically, to increase their production, companies could ask for money from banks that provide them with lower interest rates. When banks had a lack of liquidity they borrow from other banks. If a company could not pay its debt, the bank raises the interest rate for the rest and defaults can occur. This led to the bankruptcies of borrowers' banks and lenders' banks. Thus, the interest rate played a key role because defaults depend on it. If it was too high, borrowers became insolvent and could not repay their loans. In response, lenders reduced their credit supply and borrowers had to increase their rationing. On the other hand, if the interest rate was too low, banks would not make a profit (Berardi et al. (2017)).

When explaining the reasons for a financial crisis, mention must be made of deregulation. According to Allen et al. (2000), financial crises have three phases. First, there is deregulation or financial release, which leads to an expansion of credit. This causes an increase in the price of assets, such as real estate. The second phase is the bursting of the bubble. This is the rapid fall in prices caused by a change in the real economy or by the failure to meet expectations of interest rates and the level of credit. Finally, there are defaults

by agents who are unable to repay their loans. At this time there are banking crises and the investment and real activity fall. This is what happened in 2007. Faced with the deregulation of previous years, banks transferred credit risk by increasing their connectivity. As a result, banks eliminated individual credit risk but systemic risk increased (Nijskens et al. (2011)). Thus, there is a need for improved macro-prudential regulation to control systemic risk (Huang et al. (2012), Kabundi et al. (2019)). However, deregulation leads to increased competition that improves the efficiency of banks (Laeven et al. (2016)). For this reason, models have also been developed that include an external regulator to control the contribution of banks to a systemic crisis (Acharya et al. (2017)).

From all the above, it is clear that the interconnections maintained by the banks have a great influence on the economies. This paper will examine how loans change between different countries, taking into account key factors such as interest rates, the external debt accumulated by the countries, and the level of connection they maintain, among others. To better understand the role played by the interbank connection in the 2007 financial crisis, special attention will be paid to previous and next years. On the other hand, the countries on which the study focuses are both industrialized and emerging countries. According to a report by the Bank for International Settlements (BIS): 'cross-border bank lending was one of the channels through which the crisis spread to emerging markets' (Takáts (2010)). According to Tanveer et al. (2013), the crisis had different effects on different areas. It deeply affected the industrialized countries, but in the emerging ones the shock was temporary and they were able to recover quickly. Therefore, it is important to pay attention to the level of development of countries.

In the following points, we try to resolve the issues raised. It is structured as follows. Firstly, section 1 is a descriptive analysis of the data used for the variable explained. Specifically, this variable is the loan that countries grant to other countries. This is therefore cross-border lending. Secondly, there is the econometric model. This includes the general specification and also the step-by-step specification of the model. Finally, there are the conclusions.

2. DATASET DESCRIPTION

Inter-country loans are a key feature in assessing the risk of financial contagion at the global level. The objective of this study is to have a clearer picture of their evolution over the years. Specifically, the countries chosen are Belgium (BEL), Denmark (DNK), Spain (ESP), France (FRA), United Kingdom (GBR), Japan (JPN), Turkey (TUR), Taiwan (TWN) and the United States (USA). These are both advanced and emerging countries. The data used can be found in the consolidated banking statistics provided by the Bank for International Settlements (BIS). It is of particular interest to examine how lending between these countries has evolved during the subprime crisis that led to a global financial crisis. Therefore, the range of years from 1999 to 2018 will be taken into account. The original frequency of the data is quarterly, although later they have been converted to an annual frequency.

Firstly, a static analysis of the data has been carried out. Table 1 shows the amount of money that countries have lent on average during the chosen period. The data are shown according to their status as lenders (L) or borrowers (B). This table is used to find out which countries have the most credit relationships. The highest amount of loans granted by Belgium, Denmark, Spain, France, Turkey, and the United States is directed to the United Kingdom. Therefore, the United Kingdom is the main recipient of loans on average. On the other hand, the United States is the main recipient of loans from the United Kingdom, Japan, and Taiwan. As for borrowers, Denmark, France, Japan, and Taiwan receive loans mainly from the United States. Belgium and the United Kingdom receive more loans from France, and Spain and Turkey receive more money from the United Kingdom. Finally, the United States receives more loans from Japan.

From the results obtained, it can be concluded that Japan is the lender par excellence. It has been the country that has lent the most in total to the others. In contrast, Turkey is the lender with the lowest amount of money borrowed. In terms of borrowers, the United States is the country that has borrowed the most. Turkey is the borrower that has received the least amount on average during the selected period. To improve the descriptive analysis, Table 2 shows the mean and standard deviation of lenders and borrowers. Here again, it can be corroborated that the main lender is Japan.

Table 1: Countries' cross-border loans according to their position as a lender or borrower

BORROWERS										LENDERS										
JPN	GBR	FRA	ESP	DNK	BEL															
2.520.613	67.846.625	44.648.088	16.745.713	2.564.075		BEL														BEL
233.938	19.914.563	5.624.800	1.946.588		1.797.713															DNK
3.355.171	46.945.310	32.013.374		2.136.285	6.937.493															ESP
60.709.088	210.972.988		70.076.900	9.364.638	51.648.288															FRA
47.231.950		100.785.025	35.141.150	9.360.325	23.826.313															GBR
	134.934.339	98.986.505	19.863.956	8.016.824	16.335.580															JPN
91.009	4.834.865	599.610	101.982	93.589	348.198															TUR
4.411.855	8.578.461	3.467.763	188.421	131.434	458.882															TWN
81.200.338	186.916.213	107.468.788	26.994.038	12.438.800	17.735.638															USA

MAIN BORROWER BY COUNTRY

MAIN LENDER BY COUNTRY

	USA	TWN	TUR
	31.756.038	268.557	2.659.650
	9.215.250	22.243	374.157
	25.299.779	73.914	9.312.546
	142.873.875	5.339.500	10.753.175
	297.200.850	10.722.525	11.793.938
	667.008.430	7.276.489	5.956.061
	2.040.405		
	30.943.882		233.908
		14.970.538	11.780.525

Table 2: Statistics describing the position of countries' lenders or borrowers for the entire time period of interest

	BEL	DNK	ESP	FRA	GBR	JPN	TUR	TWN	USA
LENDERS									
MEAN	21.126.170	4.891.156	15.759.234	70.217.306	67.007.759	119.797.273	1.158.523	6.051.826	57.438.109
STD.	24.885.551	6.855.425	17.040.490	72.677.893	97.790.435	226.434.751	1.763.149	10.487.577	63.525.548
BORROWERS									
MEAN	14.886.013	5.513.246	21.382.343	49.199.244	85.117.920	85.117.920	6.607.995	5.524.824	150.792.313
STD.	17.302.304	17.302.304	23.590.386	46.603.642	81.936.079	32.862.001	4.980.682	5.873.095	231.279.081

A dynamic analysis of the data has also been carried out to gain a better understanding of the credit relationships between countries. The evolution of countries in terms of their status as lenders or borrowers can be seen in Figures 1 and 2 respectively. Turkey and Taiwan have exchanged the least amount of loans with the other countries. In general, Japan is the country that lends the most money during the period analyzed. In contrast, the US is the one that receives the most loans in these years. Both amounts have been increasing quarter after quarter. This highlights Japan's powerful financing capacity. One of the reasons for this is the rapid growth of its economy over the years. As a result, Japan has large financial markets. In addition, it is a capital-intensive country (Shirai (2017)).

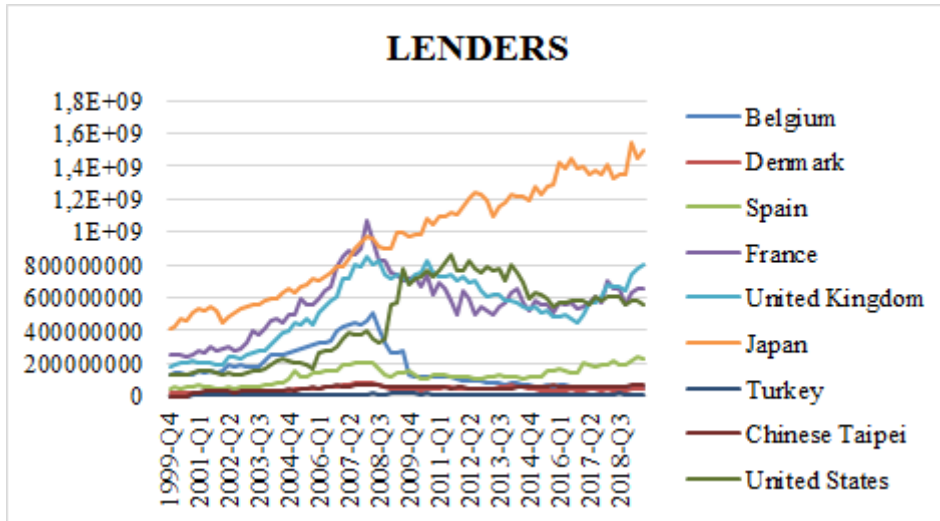


Figure 1: Evolution of loans granted by countries

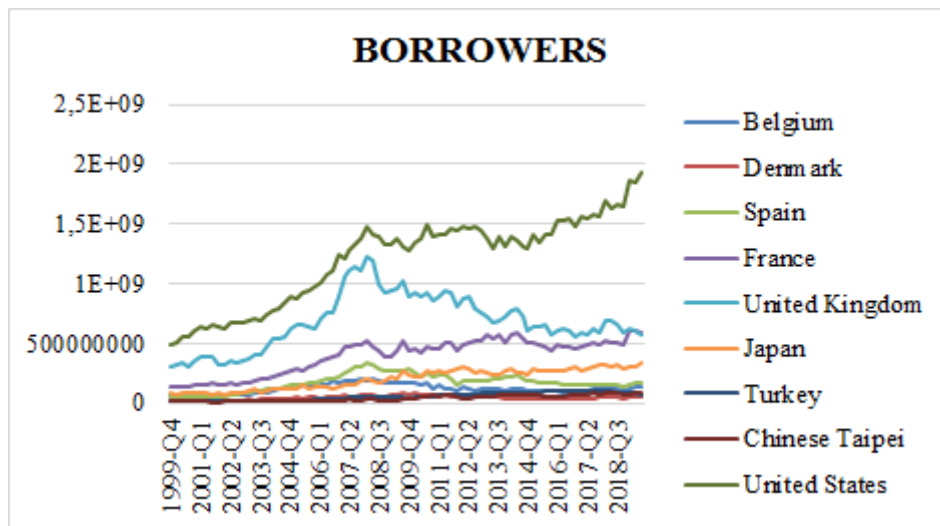
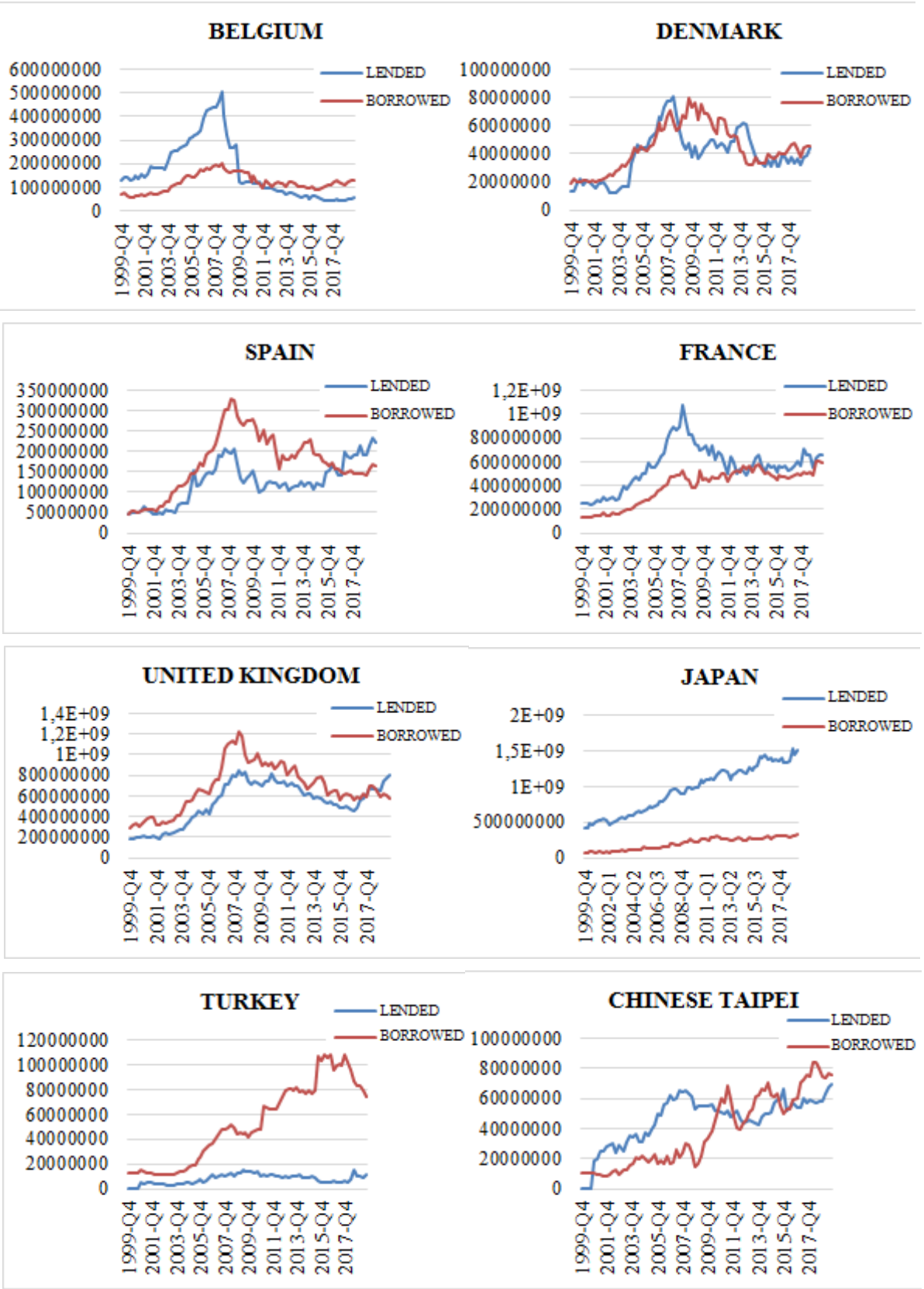


Figure 2: Evolution of loans received by countries

Specifically, Belgium lent money until the outbreak of the financial crisis in 2007. France also reduced bank lending to other countries with the onset of the crisis but has continued to be a lender in subsequent years. Spain and the United Kingdom have been borrowing countries until 2017 and 2018 respectively when they started lending money. Japan is the largest lender in the period of time studied. However, the USA and Turkey have been borrowers throughout these years. Taiwan and Denmark have been alternating lenders and borrowers periods. It should be noted that Denmark changed from lending to borrowing in 2007 but in 2013 became a lender again. This may be an indication of its rapid recovery from the crisis. Cross-border bank lending generally declined with the outbreak of the financial crisis. One reason for the reduction in supply is the stress experienced by major international banks (Takáts (2010)). The evolution of cross-border lending for each country can be seen individually in the following set of charts.



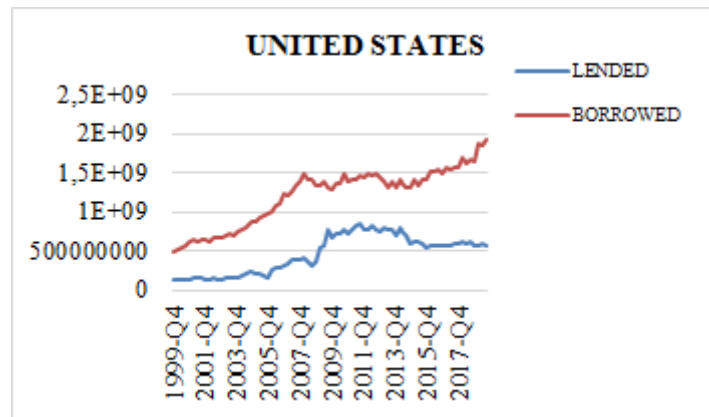


Figure 3: Evolution of loans granted and received by each country

To better assess credit relationships between countries, the Lender's Preference Index (LPI) can be used. This is a measure of the proportion of money a country has lent to each of its borrowers about its total borrowing (Cocco et al. (2009)). The LPI is calculated for each year studied. Table 3 shows 3 years, in particular, 2000, 2008, and 2018. It is a way of capturing the credit links that countries maintained before, during, and after the subprime crisis. From these results, it can be concluded that 2008 was the year in which there were more credit relationships. These figures were considerably reduced following the spread of the financial crisis. On the other hand, it is important to emphasize that emerging countries are not the main borrowers of any other country. The United Kingdom and the United States are the two countries that have the greatest relationships. As far as continental European countries are concerned, they are mainly lenders from the United Kingdom. Finally, the data shows that all countries have maintained their credit relationships with the same borrowers throughout the years studied.

Equation 1: Lender's Preference Index (LPI)

$$LPI_{B,L,t} = \frac{\sum_{i \in t} F_i^{L \rightarrow B}}{\sum_{i \in t} F_i^{L \rightarrow all}}$$

Table 3: Lender Preference Index to 2000, 2008 and 2018

		LENDERS								
		BEL			DNK			ESP		
BORROWERS		2000	2008	2018	2000	2008	2018	2000	2008	2018
BEL					4.74%	6.32%	3.65%	9.63%	8.85%	2.23%

DNK	2.62%	1.67%	0.74%				1.24%	1.59%	0.70%
ESP	5.81%	10.14%	13.00%	1.13%	9.68%	4.80%			
FRA	25.67%	23.78%	33.91%	6.38%	10.20%	34.21%	19.73%	28.87%	21.60%
GBR	38.90%	42.62%	32.23%	69.09%	53.31%	31.29%	37.21%	42.96%	28.92%
JPN	2.14%	0.96%	1.83%	-0.12%	0.37%	0.98%	0.83%	0.27%	5.16%
TUR	0.40%	2.43%	1.84%	0.58%	0.55%	2.22%	1.02%	0.27%	16.02%
TWN	0.43%	0.06%	0.07%	0.02%	0.05%	0.09%	0.00%	0.03%	0.26%
USA	25.74%	18.35%	16.38%	17.45%	19.52%	22.76%	25.85%	17.15%	25.13%

LENDERS									
	FRA			GBR			JPN		
BORROWERS	2000	2008	2018	2000	2008	2018	2000	2008	2018
BEL	10.72%	8.17%	9.47%	6.51%	5.56%	1.65%	1.16%	2.56%	1.51%
DNK	0.98%	1.17%	1.53%	2.46%	1.74%	1.03%	0.67%	1.28%	1.24%
ESP	8.78%	14.17%	7.80%	4.13%	8.85%	3.30%	1.50%	2.80%	2.05%
FRA				15.31%	16.77%	17.49%	6.67%	10.20%	11.56%
GBR	29.91%	44.30%	35.25%				21.27%	19.58%	10.85%
JPN	11.39%	8.79%	11.31%	10.98%	7.86%	10.04%			
TUR	1.61%	1.06%	2.83%	1.03%	1.54%	2.16%	0.34%	0.39%	0.97%
TWN	0.85%	0.32%	2.26%	1.37%	0.90%	3.04%	0.61%	0.64%	1.16%
USA	35.02%	22.01%	29.56%	51.36%	56.79%	61.28%	60.18%	62.55%	70.67%

BORROWERS	LENDERS								
	TUR			TWN			USA		
	2000	2008	2018	2000	2008	2018	2000	2008	2018
BEL	1.45%	6.40%	4.66%	0.85%	1.45%	0.30%	6.38%	5.19%	3.47%
DNK	0.38%	3.29%	0.15%	1.35%	0.27%	0.24%	3.99%	4.22%	1.42%
ESP	0.09%	1.30%	0.43%	0.40%	0.23%	0.68%	4.35%	7.29%	6.12%
FRA	2.89%	7.39%	10.51%	2.75%	5.72%	11.56%	15.32%	17.17%	25.82%
GBR	48.87%	66.06%	51.67%	13.81%	18.06%	19.64%	44.25%	50.68%	31.28%
JPN	0.28%	0.20%	2.04%	16.43%	4.30%	13.99%	16.77%	9.97%	24.57%
TUR				0.51%	0.24%	0.92%	3.28%	3.33%	2.27%
TWN	0.00%	0.00%	0.00%				1.11%	2.16%	5.05%
USA	46.05%	15.36%	30.53%	63.90%	69.72%	52.68%			

The Lender Preference Index shows how credit relationships generally increased until the financial crisis. In subsequent years, credit relationships were reduced in most cases. This is reminiscent to the Minskyan financial instability hypothesis. It is based on the fact that a high debt-income ratio reduces the stability of the financial structure (Minsky (1964)). The years preceding the crisis were marked by a major economic expansion that prompted agents to take on debt to increase their income. As Minsky argues, the disproportionate increase in debt threatens the fragility of the financial sector. As long as the debt can be paid off it has a positive effect because it stimulates economic growth. In other words, as long as the debt-to-GDP ratio is positive, borrowing will be beneficial. However, if the debt-to-GDP ratio is excessively high, it can lead to severe recessions such as the one experienced after the outbreak of the 2007 financial crisis.

3. MODEL

3.1. ECONOMETRIC MODEL SPECIFICATION

The study aims to analyze the evolution of cross-border bank lending. The same countries are monitored at different points in time. It is therefore an econometric model based on panel data. It includes advanced (Belgium, Denmark, France, Spain, the United Kingdom, Japan, and the United States) and emerging economies (Turkey, and Chinese Taipei). The countries have been divided into two groups: the area where the crisis began (the West) and the area to which it spread (the East) to examine how credit relationships between the two groups have changed. The West includes Belgium, Denmark, France, Spain, the United Kingdom, and the United States, and the East includes Japan, Turkey, and Chinese Taipei. The period chosen is from 1999 to 2018, with a special focus on the period of the subprime crisis. The frequency of the data has been converted to annual frequency to estimate the model.

First, the regression has been estimated for the entire range of years using fixed and random effects. In this model, it is preferable to use the fixed-effect estimation. However, the focus is on random-effects estimation to examine how credit relationships between Western and Eastern countries change. Second, the regression has been estimated using random-effects but distinguishing between three stages: before, during, and after the global financial crisis. This estimate aims to examine the impact of the financial crisis on lending from one country to another.

Following the work of Vidal-Tomás et al. (2019), all the variables used are bi-directional, i.e. the same variable is included for two countries according to their status as lender (B) or borrower (L). Because some variables have very high numbers, logarithms will be used to facilitate the handling of these variables. Specifically, the amounts borrowed between countries, the GDP of each country, and the numbers of reserves held are expressed in logarithms. The model also includes dummy variables. Its purpose is to understand how credit relations between advanced Western countries and Eastern countries have changed. Therefore, the econometric model used is the following:

Equation 2: Econometric model

$$\begin{aligned} \ln(LENDED_{L,B,t}) = & \\ & = \beta_0 + \beta_1 \ln(GDP_{L,t}) + \beta_2 \ln(GDP_{B,t}) + \beta_3 BOND_{L,t} + \beta_4 BOND_{B,t} + \beta_5 INTER_{L,t} \\ & + \beta_6 INTER_{B,t} + \beta_7 \ln(RES_{B,t}) + \beta_8 \ln(RES_{L,t}) + \beta_9 GOV_{L,t} + \beta_{10} GOV_{B,t} \\ & + \beta_{11} CORRU_{L,t} + \beta_{12} CORRU_{B,t} + \beta_{13} REG_{L,t} + \beta_{14} REG_{B,t} + \beta_{15} UN_{L,t} + \beta_{16} UN_{B,t} \\ & + \beta_{17} d(A - A) + \beta_{18} d(E - E) + \beta_{19} d(E - A) + \alpha_{L,B} + \varepsilon_{L,B,t} \end{aligned}$$

The variable explained ($LENDED_{L,B,t}$), measures the amount of money that countries have lent to others. As for the explanatory variables, $GDP_{L,t}$ and $GDP_{B,t}$, indicate the nominal GDP in millions of US dollars of the countries according to their status as lenders or borrowers respectively. $BON_{L,t}$ and $BON_{B,t}$ refer to the interest rate on government bonds. This variable has been included because it is useful as an indicator of the health of the financial market. $INTER_{L,t}$ and $INTER_{B,t}$ represent the interbank rate maintained by the countries. It measures the level of connectivity between their banks and financial institutions. $RES_{L,t}$ and $RES_{B,t}$ show the reserves in millions of US dollars, except for gold, available to countries. The objective of including them is to know the international liquidity of the different areas. $GOV_{L,t}$ and $GOV_{B,t}$ is the sovereign debt of each government expressed in terms of GDP. $CORRU_{L,t}$, $CORRU_{B,t}$ indicate the corruption that exists in the countries and $REG_{L,t}$, $REG_{B,t}$ show the quality of their regulation. Both estimates vary between -2.5 (weak) and 2.5 (strong). $UN_{L,t}$ and $UN_{B,t}$ is the unemployment rate expressed as a percentage of the total labour force.

Furthermore, the model also includes dummy variables: $d(W - W)$, $d(E - E)$ and $d(E - W)$. The first $d(W - W)$ dummy variable shows the loans that countries with Western economies make to other countries with Western economies. Secondly, $d(E - E)$ shows the level of cross-border lending between Eastern countries. Thirdly and lastly, the dummy variable $d(E - W)$ shows the level of lending by Eastern countries to Western countries. To avoid a problem of perfect collinearity, the dummy variable which measures the loans granted by Western economies to Eastern countries is omitted. Finally, $\alpha_{L,B}$ represents the fixed effects of the selected countries and is $\varepsilon_{L,B,t}$ the term for the disturbance.

3.2. THE SETUP OF THE ECONOMETRIC MODEL

Each country has its individual and unobservable behaviour. These characteristics can be taken into account in the model through individual fixed-effect estimation. Specifically, the fixed effects of the various countries are represented by the expression $\alpha_{L,B}$. Spain, for example is characterized by a structural unemployment rate. Another particularity includes is the distance between countries. Table 4 exposes all results which have been obtained by fixed-effects. It is important to corroborate the existence of these fixed effects. The F statistic and the p-value are used to prove this existence. Since they have values of 60.775 and 3.82539e-104 respectively, it is demonstrated that the countries have individual fixed effects. This conclusion is reached through the following contrast:

- Null hypothesis (H0): There is no joint significance of the individual effects.
- Alternative hypothesis (H1): There is joint significance of the individual effects.
- $F(55, 213.8) = 60.775$.

Another way of estimating the regression treated in the work is through random effects (Table 4). This procedure considers that the individual effects are not independent of each other. Instead of considering a fixed value of the individual effects that remain constant over time (α), it considers a random variable that revolves around a central value (v_i). Therefore, it includes that the characteristics of each state are different and also contemplates the impact of independent variables. The advantage of using a random-effects model is that it allows for the inclusion of variables that are constant over time because it ensures that the unobservable effect is not correlated with any independent variable. The existence of random effects is confirmed by the Breusch-Pagan test. The value of the Chi-square statistic (3822.99) is higher than its critical value. Consequently, there is evidence that there is an unobservable component of variance associated with each individual. The contrast used is as follows:

- Null hypothesis (H0): $\text{Var}(v_i) = 0$.
- Alternative hypothesis (H1): The null hypothesis is not fulfilled.
- Chi-square (1) = 3822.99.

Table 4: Estimation by individual fixed effects and random effects

	Fixed effects, coefficients	Random effects, coefficients
const	-5.171 (3.960)	-6.966 (***) (2.627)
$\ln(GDP_{L,t})$	1.018 (***) (0.236)	0.908 (***) (0.118)
$\ln(GDP_{B,t})$	0.884 (***) (0.266)	0.997 (***) (0.091)
$BON_{L,t}$	-0.0036 (0.0053)	-0.0093 (0.0057)
$BON_{B,t}$	0.0068 (**) (0.0026)	0.009 (***) (0.0029)
$INTER_{L,t}$	0.0139 (**) (0.0059)	0.0104 (*) (0.0056)

$INTER_{L,t}$	-0.0035 (0.0034)	-0.0012 (0.0034)
$\ln(RES_{L,t})$	0.037 (0.181)	0.067 (0.157)
$\ln(RES_{B,t})$	-0.596 (***) (0.167)	-0.535 (***) (0.141)
$GOV_{L,t}$	0.0038 (0.0043)	0.0055 (*) (0.0033)
$GOV_{B,t}$	0.0045 (0.0044)	0.0029 (0.0034)
$CORRU_{L,t}$	-1.586 (***) (0.305)	-1.275 (***) (0.283)
$CORRU_{B,t}$	-0.045 (0.248)	-0.021 (0.209)
$REG_{L,t}$	1.027 (***) (0.237)	1.034 (***) (0.258)
$REG_{B,t}$	0.496 (**) (0.198)	0.519 (**) (0.205)
$UN_{L,t}$	-0.065 (***) (0.021)	-0.064 (***) (0.021)
$UN_{B,t}$	0.047 (**) (0.0204)	0.036 (*) (0.019)
$d(W - W)$	-	0.796 (*) (0.441)
$d(E - E)$	-	-2.980 (***) (0.911)
$d(E - W)$	-	-1.499 (**) (0.723)

From the results obtained, it is possible to know the explanatory variables that have the greatest effect on the one explained, i.e. on cross-border credit loans. The most relevant if the model is estimated by individual fixed effects is the GDP of the lender and the borrower, the reserves of the borrowers, corruption and the regulatory quality of the lending countries and the unemployment rate of the lender. Its significance level is 99%. Also important, at a significance level of 95%, are the rate of return on the borrower's government bonds, the interbank rate of the lenders, the regulatory quality, and the unemployment rate of the borrowers. The remaining independent variables do not explain the changes in cross-border credit lending. The coefficient of determination should also be taken into account. According to R^2 , the independent variables explain 93.671% of the variation in cross-border credit relationships.

Most explanatory variables positively affect the explained one. If the GDP of the lender and the borrower increase by 1%, cross-border loans increase by 1.018% and 0.885% respectively. On the other hand, a 1 percentage point increase in the rate of return on borrowers' government bonds leads to a 0.689% increase in cross-border loans. The interbank rate of lending countries also has a positive effect. The more connectivity, the more loans they can make abroad. Specifically, a 1 percentage point increase in the interbank rate increases cross-border lending by 1.391%. Another variable that has a positive influence is regulation. If the quality of regulation of both lenders and borrowers is high, security will be greater and more loans will be made across borders. An increase in 1 unit of regulatory quality for both lender and borrower implies an increase in cross-border concessions of 102.714% and 49.604% respectively. Finally, cross-country lending increases by 4.742% if the unemployment rate of borrowers increases by 1 percentage point.

On the other hand, the independent variables that have a negative effect are the reserves held by the borrowers, the corruption of the lenders, and the unemployment rate of the lending countries. If total reserves held by borrowers increase by 1%, cross-border lending decreases by 0.596%. If there is an increase of 1 unit of corruption of the lenders, the credits between countries are reduced by 158.632%. Finally, with an increase of 1 percentage point in the lending countries' unemployment rate, cross-border loans experience a decrease of 6.528%. The unemployment rate is an indicator of the economic situation of a country. If countries have a high unemployment rate, their economy will not be in a good place. Therefore, it is likely that during this time they will lend less to other countries.

Secondly, there are the results of the model estimated by random effects. According to these results, the independent variables that explain most cross-border lending are the lenders' and borrowers' GDP, the interest rate on government bonds and reserves of borrowers, and the level of corruption, regulatory quality, and unemployment of lenders. These variables are relevant at a level of 99%. On the other hand, borrowers' regulatory quality is relevant at a significance level of 95%. Finally, the lenders' interbank rate and the sovereign debt of the lenders and the unemployment rate of the borrowers also explain the model at 90%. Thus, most of the variables included in the model are important to explain cross-border lending.

It is important to interpret the model coefficients. The GDP of the lenders and borrowers has a positive effect on the dependent variable. If the lender's GDP increases by 1%, cross-border loans increase by 0.908%. The loans between countries increase by 0.997% if the borrowers' GDP increases by 1%. The interest rate on borrowers' government bonds also has a positive effect. With an increase in 1 percentage unit of this explanatory variable, cross-border loans increase by 0.906%. Fourthly, a 1 percentage unit increase in the lenders' interbank rate leads to a 1.04% increase in cross-border loans. If the lenders' sovereign debt increases by 1 percentage unit, the dependent variable increases by 0.555%. Another variable that has a positive effect is the quality of regulation of lenders and borrowers. If the lenders' regulatory quality increases by 1 unit, the explained variable increases by 103.4%, and if the borrowers' regulatory quality increases by 1 unit, the explained variable increases by 51.95%. Finally, an increase in 1 percentage unit in the borrowers' unemployment rate increases of 3.65% in loans granted abroad.

In this case, there are also explanatory variables with a negative effect. One of these is the level of reserves held by countries with a borrower position. A 1% increase in this explanatory variable implies a 0.535% decrease in the granting of external credit. If a country maintains large reserves, it will have less money available for lending. An increase of 1 unit in corruption maintained by the governments of the lenders implies a reduction of 127.509% in cross-border credits. Finally, the unemployment rate in the lending countries also has a negative impact. If this rate increases by 1 percentage point, loans to other countries decreased by 6.409%. Again, it has a negative effect because if the unemployment rate is high, the country will not be doing well and its lending capacity will be reduced.

The countries have western or eastern economies during all the years analyzed. These characteristics are already included in the estimation of fixed effects through the term $\alpha_{L,B}$. Therefore, dummy variables reflecting this characteristic are only taken into account when estimating the model with random effects. These variables are relevant in the model.

Specifically, the dummy variable relating to western countries explains cross-border lending by 90%. It presents a result of 79.62%. Therefore, western countries have continued to lend money to each other during the period analyzed. In contrast, the dummy variable that measures the connections between eastern countries shows that loans between them have decreased (-298.09%). This variable is important at a level of 99%. Finally, the dummy variable referring to loans that eastern countries grant to western countries is important at a level of 95%. From its result, it can be concluded that targeted lending from eastern to western countries is decreasing (-149.95%). Thus, eastern countries cut off their relations with the other eastern countries and also with the western countries.

Hausman's test is used to evaluate which is the best method to estimate the model. The p-value obtained with this contrast is low and the null hypothesis can be rejected. This indicates that the random-effects model is less consistent. Thus, Hausman's test indicates that the fixed-effects model is the best choice. However, random-effects estimation is useful for examining how cross-border credit relationships have evolved between countries according to their characteristic of poverty or wealth. This is not a problem because the results of both estimates are similar. Specifically, the contrast made is as follows:

- H0: Random effects.
- H1: Fixed effects.
- $H = 131.978$ with $p\text{-value} = 2.64927e-020$.

3.3. ECONOMETRIC MODEL BY STAGES OG THE BUSINESS CYCLE

This study extends from 1999 to 2018. As mentioned above, three different stages of the business cycle can be identified during this time. The years between 1999 and 2006 were marked by strong growth. During these years the banking systems recorded solid balance sheets and large profits (Cabral (2013)). In 2007 the financial system began to collapse. As a result, the economic expansion came to an end and the countries entered a period of crisis. Two years later, in 2009, economies began to recover. Some studies determine that this year is the end of the global financial crisis. However, other analyses show that the crisis did not end until 2011 (Do et al. (2018)). Besides, each country experienced a different recession and some recovered later. It is therefore not possible to determine an exact year as the end of the financial crisis. In this case, the recession years are considered to have ended in 2011. During the following years, the economies had already recovered.

The results obtained when estimating the model by separating the data by stages are shown below (Table 5). Firstly, the growth period 1999-2006 is taken into account. Secondly, the years of recession marked by the sovereign debt crisis, 2007-2011. Third and last, the model is estimated for the years when economies have already recovered, 2012-2018. The objective is to assess how cross-border lending has changed following the financial crisis that began in 2007. Once again, the focus is on the credit relationships between western and eastern countries.

Table 5: Estimation by random effects for each stage

	1999-2006	2007-2011	2012-2018
const	-8.212 (***) (1.922)	3.263 (3.185)	-16.418 (***) (5.151)
$\ln(GDP_{L,t})$	0.989 (***) (0.118)	0.176 (0.201)	0.359 (0.265)
$\ln(GDP_{B,t})$	0.717 (***) (0.088)	0.595 (***) (0.183)	0.794 (***) (0.251)
$BON_{L,t}$	-0.0045 (0.005)	-0.195 (*) (0.113)	-0.450 (*) (0.262)
$BON_{B,t}$	0.0023 (0.0025)	0.189 (**) (0.089)	0.302 (0.273)
$INTER_{L,t}$	0.0105 (**) (0.0046)	0.115 (*) (0.0609)	0.092 (0.109)
$INTER_{B,t}$	0.0053 (**) (0.0024)	0.034 (0.056)	-0.133 (0.130)
$\ln(RES_{L,t})$	-0.056 (0.085)	0.564 (**) (0.277)	0.949 (***) (0.334)
$\ln(RES_{B,t})$	-0.0072 (***) (0.095)	0.087 (0.264)	-0.0002 (0.295)
$GOV_{L,t}$	0.0103 (0.0026)	0.012 (**) (0.004)	0.025 (**) (0.012)
$GOV_{B,t}$	-0.0003 (0.0023)	-0.001 (0.0055)	0.011 (0.0089)

$CORRU_{L,t}$	-0.158 (0.153)	-1.758 (***) (0.4006)	-1.065 (*) (0.630)
$CORRU_{B,t}$	-0.172 (0.195)	-0.974 (**) (0.396)	0.837 (**) (0.350)
$REG_{L,t}$	0.087 (0.139)	-0.763 (0.558)	0.839 (*) (0.496)
$REG_{B,t}$	-0.188 (0.124)	-0.270 (0.453)	-0.187 (0.305)
$UN_{L,t}$	-0.082 (0.019)	-0.092 (***) (0.023)	-0.055 (0.043)
$UN_{B,t}$	0.047 (***) (0.021)	-0.037 (**) (0.017)	0.066 (**) (0.027)
$d(W - W)$	2.382 (***) (0.558)	1.260 (***) (0.391)	1.484 (***) (0.526)
$d(E - E)$	-2.816 (***) (0.893)	-3.362 (***) (0.614)	-2.897 (***) (0.985)
$d(E - W)$	0.169 (0.638)	-0.901 (0.639)	-0.652 (0.747)

The model's estimation by random effects for each stage shows that cross-border lending and the variables that explain it have changed. Lenders' GDP has become irrelevant since the outbreak of the crisis. In contrast, borrowers' GDP has remained relevant in explaining cross-border lending. Its effect is positive, i.e. borrowers with higher GDP will receive more loans from other countries. Government bond yields were not relevant before the financial crisis. In the period of economic recession, this variable became important for lenders and borrowers. In the case of lenders, this variable had a negative influence and has continued to be relevant. In contrast, in the case of borrowers, this variable had a positive effect during the crisis but ceased to be important in the years following the recession.

The interbank rate of lenders and borrowers was relevant in the period of strong growth before the crisis. This variable was positive on both sides. It is an indication of the strong connectivity that the banks maintained. If banks in one nation lend money to each

other, they can lend more to other countries. As mentioned above, when the crisis broke out, there were many defaults. Thus, relations between banks were broken. This explains why as of 2007 the borrowers' interbank rate was no longer relevant. In the case of lenders, this variable ceased to be relevant in the last period. On the other hand, lenders' reservations became relevant during the crisis. After the recession period, their importance even increased. The reason may be that, in a situation where there were many defaults, having reserves was positive for the banks. In contrast, borrowers' reserves were only relevant in the first period. In this case, their effect was negative, i.e. cross-border lending decreased if borrowers' reserves increased.

The following three variables are characteristics of the government: sovereign debt, level of corruption, and the quality of regulation. As for sovereign debt, it was relevant for lenders from 2007 to 2018. It had a positive effect on cross-border lending. The influence of corruption changed dramatically. Before the financial crisis, it was not important, but after the outbreak of the crisis, it became very relevant. From 1999 to 2007 the presidents and directors of the major US banks held political positions. It was a form of corruption because they made decisions according to their own interests. The consequence was devastating. Therefore, from 2007 onwards, countries took into account the level of corruption of others when granting loans. The effect was negative, i.e. cross-border loans decreased if corruption increased. The quality of regulation had no effect except on lenders during the last period.

The importance of the unemployment rate has also changed over the years. In the case of lenders, it is relevant during the period of economic recession. In contrast, the unemployment rate of borrowers has been relevant over all these years examined. Its effect has been positive except in the years of the financial crisis. During these years all the countries included in the model went through times of recession. As a result, unemployment rates were high. In a situation like this, it is usual that countries did not have the capacity to lend money to other areas. Therefore, from 2007 to 2011, cross-border lending decreased if the unemployment rate was high.

Again, it is important to focus on the dummy variables to see how the relationships between different countries have changed. The results show that the strongest relationships are between countries in the same group. Thus, the relevant dummy variables to explain cross-border loans are $d(W - W)$ and $d(E - E)$. They are important at a 99% level in all three stages. In general terms, western countries have borrowed money because the coefficients of their dummy variables are positive in all years (238,264% in the 1999-2006 stage; 126,073% in the 2007-2011 stage and 148,420% in the stage from 2012-2018). These results indicate that the level of loans exchanged between western countries was high

during the growth stage. With the outbreak of the crisis this magnitude was reduced. During the new growth years after the collapse, the relationship between them has increased again. However, it has not been as high as before the crisis.

On the other hand, account must also be taken of how credit relationships have evolved between eastern countries. The coefficient of the corresponding dummy variable for this group of countries is negative (-281% in the 1999-2006 stage, -336% in the 2007-2011 stage and -289% in the 2012-2018 stage). Therefore, eastern countries are not the main destination for loans from other eastern countries. Despite maintaining negative relationships in all the years analyzed, some changes can be seen between the stages. Its cross-border loans decreased as it moved from the growth stage (first) to the crisis stage (second). After the crisis, i.e. in the years when economies had already recovered, credit relations between Eastern countries increased. However, their bond was not as strong as in the first stage.

4. CONCLUSION

In this paper, we have examined how lending has changed from one country to another in recent years (from 1999 to 2018). We have focused on the changes in credit relationships between countries before and after the global financial crisis because of the impact it had. This has been done using BIS data from the countries' domestic banks. The work includes 9 countries. They are separated into a group of Western countries and a group of Eastern countries to examine how their credit relationships have changed. The methodology used has been estimation by random effects. The work also includes the estimation of the model by fixed effects. The results obtained by both methods are similar.

From the relevant analyzes, we can conclude that Belgium, Denmark, France, Spain, the United Kingdom, and the United States (Western countries) exchanged a large number of loans. However, the credit relations between Japan, Turkey, and Chinese Taipei (Eastern countries) were quite minor. Both groups were affected, sooner or later, by the 2007 crisis. This led to a reduction in lending by all the countries in the sample. Western countries continued to lend, although to a lesser extent. In contrast, Eastern countries cut off their relations with the other Eastern countries and also with Western countries. Thus, the 2007 collapse decreased cross-border lending. However, Japan has been the lender par excellence. It has lent more than the other countries during the period under review. In contrast, the United States has been the largest lender in general terms.

On the other hand, from the data obtained we can conclude that the connection of the banks before the financial crisis was high. The strong connection between the countries' financial institutions led to an increase in cross-border lending. In principle this was beneficial, but the strong connection caused the imbalance in the United States to be passed on to the other countries. Thus, this work shows that financial connection led to financial contagion and it increased systemic risk. Second, the characteristics of the government were very important. Among them, corruption stands out. The results show that since the outbreak of the crisis, countries have placed greater value on corruption. Thus, cross-border lending was lower if corruption was high. Finally, we can also conclude that the unemployment rate was fundamental.

Finally, we will mention the limitations of the work. Due to the lack of data, we have only been able to include three eastern countries. It would be useful to include other countries of this type in the study. On the other hand, in the future, it would be interesting to carry out an analysis similar to the one in the present work but differentiating between advanced and emerging countries.

APÉNDICE A

1.1 SOURCE OF DATA

When analyzing credit relationships it is useful to include indicators representative of the demand and supply of bank loans. Both GDP and unemployment are a sign of countries' economic activity. Therefore, they can be used to measure demand (Kapounek et al. (2017)). The GDP data have been obtained from the United Nations Conference on Trade and Development (UNCTAD). The database for the unemployment rate is the World Bank. On the other hand, the interest rate on government bonds and the interbank rate vary the supply of loans from countries. Besides, it should also be noted that both government bonds and the interbank rate determine long-term risk (Fontana et al. (2016) Iori et al. (2006)). Data on individual government bond yields are drawn from the International Monetary Fund (IMF), Eurostat, investing.com & Federal Reserve Economic Data (FRED). Country interbank rates are taken from FRED. Reserves and sovereign debt are other country-specific determinants that influence the possibility of default on their loans (Dimitrios et al. (2016)). Data on reserves have been obtained from the MFI. Data on government debt have been obtained from both the FRED and Eurostat. Finally, the level of corruption and regulatory quality is an indicator of the type of government that countries have. Data for both variables can be found in World Governance Indicators data (WGI).

Table 6: Model variables and its sources

LENDED	Cross-border credits.	Bank for International Settlements (BIS).
GDP	Nominal GDP in millions of US dollars.	United Nations Conference on Trade and Development (UNCTAD).
BON	Financial, interest rates, government securities, government bonds, percent per annum.	International Monetary Fund (IMF).
	Government bond yields, 10 years' maturity.	Eurostat.
	Government bond yields, 10 years' maturity.	investing.com
	Interest Rates, Government Securities, Treasury Bills for Turkey, Percent per Annum.	Federal Reserve Economic Data (FRED).
INTER	3-Month or 90-day rates and yields:	Federal Reserve Economic Data

	Interbank Rates.	(FRED).
RES	International liquidity, total reserves excluding gold, US dollars.	International Monetary Fund (IMF).
GOV	General government gross debt, percent of GDP.	Federal Reserve Economic Data (FRED).
	Government consolidated gross debt, percent of GDP.	Eurostat.
CORRU	Control of Corruption. Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).	World Governance Indicators data (WGI).
REG	Regulatory Quality. Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).	World Governance Indicators data (WGI).
UN	Unemployment, total (% of total active population) (ILO modeled estimate).	World Bank.

1.2 DESCRIPTIVE STUDY OF THE EXPLANATORY VARIABLES

Once the model has been estimated and the necessary data structure, a descriptive study of the explanatory variables is carried out. For this purpose the main statistics have been calculated. It can be seen in Table 7. It should be noted that the sample chosen includes a total of 922 observations. The variable that represents the foreign debt-to-GDP ratio has 272 unobservable observations. The variable representing the unemployment rate has 160 unobservable observations. The remaining independent variables have data for all countries and all years of interest. As indicated by the standard deviation, sovereign debt is the explanatory variable with the greatest variability in the entire sample. Therefore, external debt is the most dispersed variable to the average. According to the coefficient of variation, the variable that presents the greatest variability is the interbank rate. The less dispersed variables are regulatory quality according to the standard deviation and GDP according to the coefficient of variation.

The results of the mean and median are similar. According to these statistics, the average GDP of all countries during the years studied is 14.089 million dollars. Its smallest

value in the entire sample is \$12.009 million, and its largest value is \$16.845 million. The interest rates on government bonds are 5.5% according to the average, and 3.5% according to the median. The difference between these values is very large, since the minimum rate is -0.0066%, and the maximum is 94.485%. The interbank rate is, on average, 2.96%. Under the median, the interbank rate is 1.22%. Again, the range of values is extensive. The smallest interbank rate is -0.329% and its maximum value is 69.96%. The average and median reserves are \$11.199 and \$11.002 respectively. Their minimum value is \$9.016 and their maximum value is \$14.045. Corruption has an average of 1.28 points and a median of 1.37 points. Its minimum value is -0.52 and its maximum value are 2.47 points. The regulation quality is 1.37 points according to its average and 1.5 according to its median. Its minimum value is -0.26 points and its maximum value are 2.35 points. Finally, the average and the median of the unemployment rate are 7.9% and 7.4% respectively. The minimum value is 2.4% and the maximum value is 26%.

Table 7: Main statistics

	Mean	Median	Minimum	Maximum	Std. Dev.	C.V.	Missing obs.
<i>In_GDP</i>	14.089	14.067	12.009	16.845	1.279	0.090	0
<i>BON</i>	5.502	3.543	-0.066	94.485	11.294	2.052	0
<i>INTER</i>	2.965	1.221	-0.329	69.960	7.697	2.595	272
<i>In_RES</i>	11.199	11.002	9.016	14.045	1.259	0.112	0
<i>GOV</i>	78.005	64.291	23.663	236.34	49.809	0.638	0
<i>CORRU</i>	1.289	1.377	-0.52	2.470	0.673	0.522	0
<i>REG</i>	1.372	1.505	-0.26	2.354	0.538	0.392	0
<i>UN</i>	7.969	7.494	2.400	26.094	4.187	0.525	160

It is also important to consider how some variables influence others. Therefore, the correlation between them must be taken into account. For this purpose, the correlation matrix has been included. It shows in Table 8. The variables with the highest correlation are the regulatory quality of the borrowers and the control of corruption by the borrowers. In the case of borrowers, both variables also show a high correlation. Two other variables that are correlated are the rate of return on government bonds with the interbank rate of the borrowers' countries. The same is true on the borrower side. The remaining variables have a low correlation between them.

Table 8: Correlation matrix

$LENDED_{L,B,t}$	$\ln(GDP_{L,t})$	$\ln(GDP_{B,t})$	$BON_{L,t}$	$BON_{B,t}$	
1.000	0.547	0.422	-0.291	-0.132	$LENDED_{L,B,t}$
	1.000	-0.052	-0.255	-0.040	$\ln(GDP_{L,t})$
		1.000	-0.037	-0.255	$\ln(GDP_{B,t})$
			1.000	-0.004	$BON_{L,t}$
				1.000	$BON_{B,t}$

$INTER_{L,t}$	$INTER_{L,t}$	$\ln(RES_{L,t})$	$\ln(RES_{B,t})$	$GOV_{L,t}$	$GOV_{B,t}$	
-0.234	-0.122	0.153	-0.061	0.377	0.081	$LENDED_{L,B,t}$
-0.247	-0.042	0.401	-0.024	0.476	0.021	$\ln(GDP_{L,t})$
-0.045	-0.243	0.010	0.410	-0.019	0.455	$\ln(GDP_{B,t})$
0.725	0.024	-0.221	-0.059	-0.155	-0.045	$BON_{L,t}$
0.024	0.725	-0.062	-0.220	-0.041	-0.157	$BON_{B,t}$
1.000	0.046	-0.200	-0.080	-0.171	-0.061	$INTER_{L,t}$
	1.000	-0.083	-0.202	-0.057	-0.173	$INTER_{L,t}$
		1.000	-0.031	0.464	0.020	$\ln(RES_{L,t})$
			1.000	0.012	0.488	$\ln(RES_{B,t})$
				1.000	-0.059	$GOV_{L,t}$
					1.000	$GOV_{B,t}$

$CORRU_{L,t}$	$CORRU_{B,t}$	$REG_{L,t}$	$REG_{B,t}$	$UN_{L,t}$	$UN_{B,t}$	
0.294	0.183	0.332	0.175	-0.200	-0.052	$LENDED_{L,B,t}$
0.113	0.041	0.124	0.031	-0.168	0.045	$\ln(GDP_{L,t})$
-0.017	0.101	-0.018	0.122	0.046	-0.180	$\ln(GDP_{B,t})$
-0.480	0.064	-0.534	0.067	0.080	-0.059	$BON_{L,t}$
0.069	-0.485	0.071	-0.538	-0.059	0.079	$BON_{B,t}$
-0.422	0.051	-0.429	0.070	0.021	-0.090	$INTER_{L,t}$
0.055	-0.420	0.072	-0.428	-0.091	0.020	$INTER_{L,t}$
-0.105	0.008	-0.062	-0.003	-0.341	0.107	$\ln(RES_{L,t})$
-0.0006	-0.094	-0.013	-0.056	0.117	-0.342	$\ln(RES_{B,t})$
0.120	-0.017	0.162	-0.030	-0.214	0.082	$GOV_{L,t}$
-0.017	0.095	-0.026	0.142	0.074	-0.208	$GOV_{B,t}$
1.000	-0.117	0.922	-0.107	-0.447	0.056	$CORRU_{L,t}$
	1.000	-0.102	0.920	0.042	-0.447	$CORRU_{B,t}$
		1.000	-0.101	-0.370	0.037	$REG_{L,t}$
			1.000	0.025	-0.371	$REG_{B,t}$
				1.000	-0.042	$UN_{L,t}$
					1.000	$UN_{B,t}$

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