Interbank Market as a Channel for the Transmission of Financial Crises (Greek sovereign debt crisis as a model)

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سوق ما بين المصارف كقناة لانتقال الأزمات المالية

(أزمة الديون السيادية اليونانية أنموذجاً)

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Abstract

Any bank depends heavily on other banks to provide the liquidity it needs in addition to other financial transactions between banks and this represents an interbank market, but this may be a reason to facilitate the transmission of financial crises when they occur. The Greek sovereign debt crisis is a model. Therefore, it is through direct and indirect correlation between banks inside the state and between banks inside and outside the country that led to the crisis affecting other countries in the euro area, including (Italy, Spain, Ireland, Cyprus) which is the research sample that was studied. For the period 2010-2017, using the Pearson correlation model and the legal correlation model, and it was concluded that this correlation in the interbank market helped the spread of the Greek sovereign debt crisis, so it is necessary to set limits for the banks 'transactions among them in such a market.

Key words: interbank market, Greek sovereign debt crisis, financial crisis, financial infection.

المستخلص

يعتمد أي مصرف بشكل كبير على المصارف الاخرى في توفير السيولة التي يحتاجها فضلاً عن غير ذلك من التعاملات المالية بين المصارف وهذا يمثل سوق ما بين المصارف، إلا أن ذلك قد يكون سبباً في تسهيل انتقال الأزمات المالية عند وقوعها. وتعد أزمة الديون السيادية اليونانية نموذجاً، لذلك فمن خلال الارتباط المباشر وغير المباشر بين المصارف داخل الدولة وبين المصارف داخل الدولة وخارجها ادى ذلك الى ان تطال الازمة دول اخرى في منطقة اليورو ومنها (ايطاليا، اسبانيا، ايرلندا، قبرص) وهي عينة البحث التي تم دراستها للمدة 2010-2017 باستخدام نموذج ارتباط بيرسون ونموذج الارتباط القانوني وتم التوصل الى ان هذا الارتباط في سوق ما بين المصارف ساعد على انتشار أزمة الديون السيادية اليونانية، لذلك لا بد من وضع حدود لتعاملات المصارف فيما بينها في مثل هذه السوق.

الكلمات المفتاحية: سوق ما بين المصارف، أزمة الديون السيادية اليونانية، أزمة مالية، عدوى مالية.

Introduction:

The interbank market is a self-regulating mechanism for regulating liquidity in the banking sector, and this is usually done through what banks with distinct financial resources lend to banks that need liquidity. Despite the importance that the inter-bank market has in terms of providing liquidity as well as sharing risks in a way that reduces their exposure to shocks and crises, at the same time this market is a major channel that facilitates the transmission of financial crises by exposing the network of banking transactions to risk It is transmitted from one bank to another as the risk of infection, and accordingly, any negative shock to a bank or group of banks spreads to other interconnected banks in the interbank market network.

The global financial crisis 2008 is the beginning of the sovereign debt crisis in Greece and the repercussions of the Greek crisis on the euro area. As with the beginning of the 2008 crisis, the deficit increased with the Greek budget, which placed Greece in high indebtedness, and in return it had a negative impact on the Greek economy and a clear impact on the budgets of Greek banks and due to the inter-bank market and its dealings affected most of the banks in the eurozone countries.

Research importance

The importance of research comes in that it sheds light on the inter-bank market and clarifies the mechanism for the transmission of crises through this market through banking transactions that appear in the banks' budgets, through the adoption of the sovereign debt crisis in Greece and the transition of this crisis towards the euro area, and because this market has generated A crisis within a crisis. Banks must be cautious and have limits in their dealings in this market in order to avoid the risks of this type of dealings.

Research problem

Despite the positive aspect that the interbank market provides through the liquidity it provides to banks and its great role in the ease of borrowing and lending, and because banking transactions cannot create a bank that works separately from other banks, this works at the same time to transfer the shock of liquidity or Inability to pay easily from one bank to another due to the interconnection between banks in this market, as the insolvency of a bank may facilitate the transfer to the other banks through the opposite party, and thus leads to the transfer of this financial

hardship to other banks within the market between Banks, which j He worked to expose the banking system to complete risk, and thus this market becomes a channel for the transmission of financial shocks and crises.

Research hypothesis

The research assumes the following:

The first hypothesis: that increasing the correlation in the interbank market facilitates the transmission of financial crises, and, in turn, the lower correlation reduces the risks of financial crises.

The second hypothesis: The effects of the crisis are transmitted directly within the state, and from the crisis state to the other countries through what is known as the domino effect on the interbank market.

The third hypothesis: The effects of the crisis are transmitted indirectly within the state and from the country that was hit by the crisis to other countries through what is known as the herd behavior in the interbank market.

Research objective

The research aims to clarify the importance of the inter-bank market and the role it plays in providing liquidity on the one hand and its other role in facilitating the transmission of financial shocks and crises within one country and between countries, by addressing the Greek sovereign debt crisis, and considering the state of Greece as the country of the crisis and the mechanism for the transfer of this crisis to Other countries.

Research Methodology

The research dealt with the analytical method to prove the research hypotheses, and to adopt the Greek sovereign debt crisis as a model and then choose four other countries that were affected by the Greek sovereign debt crisis (Italy, Spain, Ireland, Cyprus) in order to clarify the role of the inter-bank market in the transmission of the crisis , And was based on a set of indicators that were chosen from the budgets during the period 2010-2017 using the correlation models, which are both Pearson model and the canonical correlation model (legal correlation).

1. Interbank market: concept and structures

Banking systems, as a result of their interconnected transactions, tend to spread crises further from one institution to another, and this trend is referred to as (the overall risk), which leads to the failure of the banking system, and the sources of failure in the banking system are three types, the first is the panic in which depositors and investors attempt Withdrawing funds, which leads to the collapse of the system, and the second is that banks invest in similar types of assets, and the third is insurance operations between financial institutions. Any of the previous three sources of failure leads to creating the possibility of failure of one institution and in turn leads to affecting the financial integrity of institutions For another and then the entire banking system (Iori & et.al, 2006,525), the occurrence of international financial crises in recent years has highlighted the need to understand and assess the comprehensive risks that allow mitigation and crisis prevention (Tabak & et.al, 2013,4), and here a market appears Among the banks that clarifies the impact of financial crises and comprehensive risks.

And the interbank market has a role in spreading and amplifying crises, as happened in the sovereign debt crisis (Cheng & et.al, 2014,1), as any imbalance in the interbank market leads to an exaggeration of the lack of liquidity in the banking system caused by a lack of synchronization Between liquidity needs and availability on the other hand, and ultimately leads to insolvency and rescue operations (Tirole, 2011,287), and the liquidity risk is that the bank does not have sufficient financial resources to allow it to meet its obligations when they are due, or it can only obtain these funds at costs Exorbitant (Vodová, 2015,663), as a set of theories stress the importance of liquidity in turbulence Lending in the interbank market (Gara & et.al, 2011,3), Banks often working to retain the largest portion of its reserves of liquidity, which is the best insurance for banks, to cope with shocks and financial crises (Fung, 2014,12).

On the other hand, (Bluhm, 2016) and others emphasized that interbank markets play an important role in providing credit for the real economy and financial stability (Bluhm & et.al, 2016,1), and (Auray, 2016) and others emphasized that the interbank market It has an important role in facilitating the work and

management of monetary policy, as central banks implement open market operations to control the interest rate in the interbank market overnight, so it can be said that the interbank market plays a central role in transmitting monetary policy decisions, and in turn, The interbank market has a large and clear role in the transmission of potential financial crises (Auray & et.al, 2017,1) (Frutos & Garcia, 2016,2), as confirmed by this opinion and clarified by (Vari) in the year 2016 when it proved that the fragmentation of the inter-bank market disrupts the transfer of monetary policy decisions (Vari, 2016,1), and explains (Brunetti & et.al 2015) The risk of the interbank market in transferring financial shocks when banks carry the same assets in their portfolios (Brunetti & et.al, 2015,5), and Allen and Gale stressed that the primary role of interbank markets is to allow redistribution of liquidity between Banks, especially with the increase in banks that suffer from deficits (Allen & Gale, 2009,1).

From the above, it is clear that the inter-bank market has two directions or two effects. The interconnected banks may work to improve the sharing and diversification of risks, and thus reduce their exposure to shocks. On the other hand, the banking transactions network exposes all banks to the risk of infection, thus any negative shock to one of the banks or a group of Banks spread to other interconnected banks, and this interconnection is a major driver of systemic risk in the banking system (Fink & et.al, 2015,1).

Thus, the interbank market has two functions, the first is to deal with shocks and financial crises through the liquidity provided by banks, and the second is the ease of borrowing and lending in the interbank market, and in exchange for these jobs, the interbank market also has a risk is the transmission of shocks and financial crises between banks, which Known as financial infection.

The inter-bank market may be within one country or between a number of countries. Hence, the inter-bank market can be divided into two types (de Winter, 2012,7):

A- A market among local banks: It is a market that is within a single country and which represents a form of linkages between local banks through a set of exchanges and financial transactions.

B- A market among international banks: It is the market that is among a number of countries represented by the connections between banks that are not only within one country but extends to a number of other countries, which is called the inter-bank market, and here the issue of financial contagion and the role of Its biggest cross-border.

These functions can be clarified for the interbank market, with the risk of the interbank market by examining the structures of the interbank market by laying out the main forms of these structures. From a practical point of view, it is difficult to define the exact structure of the interbank market, because it does not know much about technology Banking networks, in addition to the exposure dimensions and interactions between different types of banks (Chang & et.al, 2008,164) (Silva & et.al, 2015,4).

According to the definition of (Allen) and (Gale) in the year 2000 for the interbank market, the spread of liquidity shock risks depends on two distinct market characteristics: completeness and interdependence.

The complete market condition is achieved between the banks when each of the participating banks has a contractual financial relationship with all other banks in that market, in other words, each bank is directly contracted with each of the other banks in the banking system as in Figure(1).

This type of structure is not realistic, as the integration of the banking sector depends on a variety of behaviors, for example the availability of transaction and information costs.

In order to realize the impact between banks, in light of the unreality of the integrated market, there is an interconnected market, which is based on the assumption that a particular bank must maintain financial relations not with all banks in the banking system, but with some of them at a minimum.

Accordingly, the imperfect markets are interconnected, and even when not all banks are directly linked with each other, they are linked through indirect communications using different types of networks (transactions). In this case, the market is considered incomplete, although it is completely interconnected, as in Figure 2 can be considered as a measure of the domino effect.

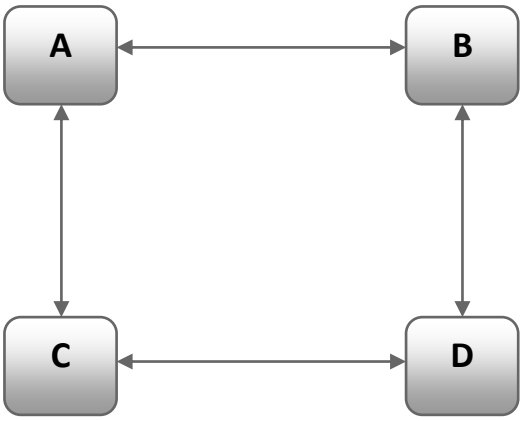

Figure number (2)

Incomplete market structure linked to the market

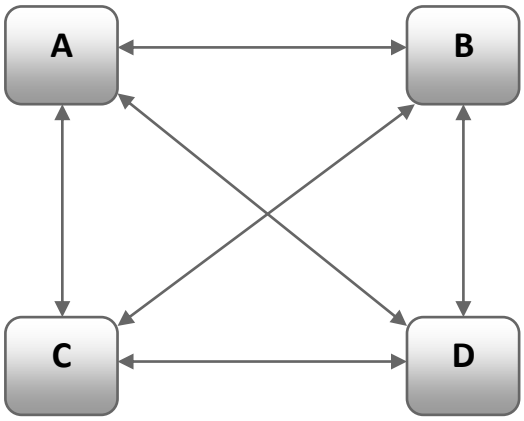

Figure number (1)

Perfect and perfectly linked

Source : Chang, Eui Jung & Lima, Eduardo Jos´e Ara´ujo & Guerra, Solange M. & Tabak, Benjamin M., 2008, Measures of Interbank Market Structure: An Application to Brazil, Brazilian Review of Econometrics, Vol. 28, No. 2, 2008,p 166.

In addition to the previous types of interbank market structures, there is another type, which is represented by the presence of two ideal and isolated markets, as in Figure 3.

Figure number (3)

The market structure is incomplete and not separate from the market

Source : Chang, Eui Jung & Lima, Eduardo Jos´e Ara´ujo & Guerra, Solange M. & Tabak, Benjamin M., 2008, Measures of Interbank Market Structure: An

Application to Brazil, Brazilian Review of Econometrics, Vol. 28, No. 2, 2008,p 167.

From observing these three forms of inter-bank market structures, it is noted that there is a relationship between completeness and interconnection, because if the market is completed, it will necessarily be fully interconnected, however, the fully interconnected market will not necessarily be complete (Chang & et.al, 2008,167).

In light of the relationships between completeness and the level of interconnection, Allen and Gale concluded in the year 2000 that the spread of the financial crisis and the transmission of the risk of infection mainly depends on the interconnection structure between the banks that make up the market. For a better understanding of this relationship, the representative structures can be compared In Figures (1) and (2), while both are completely interconnected, one differs from the other in terms of completeness, in other words, the whole market allows banks to diversify credit risk between banks more than an incomplete market, however, it must emphasize That the complete structure does not necessarily mean that there will be no risk of infection, because completeness does not eliminate the possibility of an option Clear the correlation that can cause infection, so the risk of infection will be smaller when the market is less connected, as in Figure 3 (Chang & et.al, 2008,168), and the risk of infection is greater when the market is more closely related, as in Figure 2. The strongest risk of infection is in Figure 1.

Degryse and Nguyen explained that the financial contagion in the interbank market is in three forms, the first when the total liquidity is not sufficient, the second when the market expectations generate indirect repercussions, and the third when the collapse of a bank occurs due to the emergence of an effect Dominoes (Degryse & Nguyen, 2004,4).

The interbank market had a big role as the costs of cross-border lending increased dramatically during the sovereign debt crisis (Blattner & Swarbrick, 2018,2), meaning that the interbank market had a large and important role for the transmission of the sovereign debt crisis (Lakdawala & et.al, 2017,1).

From all of the above, a balance must be struck between the benefits of interconnecting banks against the cost of infection, by studying the various frictions in the market that can lead to excessive interconnection seen during the

crisis, and the financial crisis that struck the global economy in 2007-2008 The interconnected nature of the global financial system, what quickly started in the mortgage market in the United States quickly escalated and moved to markets around the world, the benefits of financial links and networks are well known and primarily due to better liquidity sharing and diversification (Deb, 2016,3).

The global financial crisis (the American mortgage crisis) in 2007-2008 highlighted the crucial role of inter-bank lending markets in the financial system and the entire economy, especially after the fall of Lehman Brothers (Blasques & et.al, 2015,5), as the global financial crisis began (American mortgage crisis), with the failure of the bank (Lehman Brothers) on September 15, 2008, and intensified in the euro area after April 2010 with the sovereign debt crisis (Abbassi & et.al, 2017,1), and the euro zone faced at that time three overlapping crises, namely (banking crisis , Sovereign Debt Crisis, Growth Crisis) (Shambaugh, 2012,157).

We conclude from the above that the interbank market has a major role in the growth and growth of global financial crises, including the sovereign debt crisis and its transmission to European countries in a large way, and the transition was direct between countries, which represents the complete and ideally linked market structure, and indirectly, as in the market structure Incomplete and related to the market, then the transition to the crisis may be directly and represented by the domino effect and it may be indirect and represented by the behavior of the herd and this will be clarified in the applied analytical aspect represented in the third topic.

2.The sovereign debt crisis, its concept and effects

Sovereign Debts are defined as debt that is in the form of bonds that government's issue, and governments issue these bonds in two ways (Hisham and Hana, 2016, 2021):

The first method: The bonds are issued in the local currency of the country, and the debts resulting from this method are called Government Debt.

The second method: bonds are issued in a currency other than the local currency of the country, and the debts resulting from this method are called Sovereign Debt.

That is, there are two types of debts, the first is known as local debt, which consists of issuing bonds in the local currency and provided to local investors, while the second is external debt because bonds that are issued are in a currency other than the state's currency, and here bonds are sold to foreigners, and this distinction between domestic debt and external debt is considered It is important and necessary to get to know the concept of the sovereign debt crisis (Shaibut, 2014,145) (Khubeibah, 2016, 38).

The sovereign debt crisis is represented in bonds that the government is issuing in a currency other than the local currency of the state is in a foreign currency, and put them up for sale abroad to foreign investors. In the event that the government fails to pay its debts which are represented by the sovereign debts, a serious crisis will arise called the sovereign debt crisis (Noureddine 2013, 60).

The sovereign debt crisis occurs when the state faces a steady increase in the levels of debt that it has to the point where these levels of debt become unpayable, which leads the country to stop paying its debts, declaring deficits, and sometimes bankruptcy. The stages of the sovereign debt crisis are represented in five stages: (Khaled, 2013,5960):

The first stage: It is the stage where the state-based debt levels rise due to a number of factors that cause debt escalation.

The second stage: In this stage, the degree of anxiety in the markets rises due to the exacerbation of the levels of state-based debt.

The third stage: As for this stage, the cost of debt service rises due to two reasons, the first is the rise in the levels of state-based debt and the second is the rise in interest rates on new bonds.

Fourth stage: At this stage, the high cost of borrowing results in an attempt to control its public spending, either through trying to increase taxes or raising the degree of collection efficiency for it.

Fifth stage: As a result of these developments that occurred in the previous four stages, it becomes difficult for the state to service its existing debt, which reduces the appetite of investors to buy state bonds, which may lead to the state ceasing to service its debts.

The sovereign debt crisis is one of the most dangerous crises on the euro area represented by Greece, Ireland, Portugal, Spain, Italy (Al-Jayashi, 2014,1), and this was confirmed by the European Commission, and explained that the main reason for the sovereign debt crisis in the euro area is due to the global financial crisis (American mortgage crisis) for the year 2008, which had a great and rapid impact on the collapse of the European banking system, as evidenced by the banking crisis, which was one of the main reasons for the emergence of the sovereign debt crisis, as the governments of the European Union spent at least two trillion euros to save European banks Between 2009 and 2010, the following figure shows the risk of the vicious circle between banks and sovereign debt in the euro area:

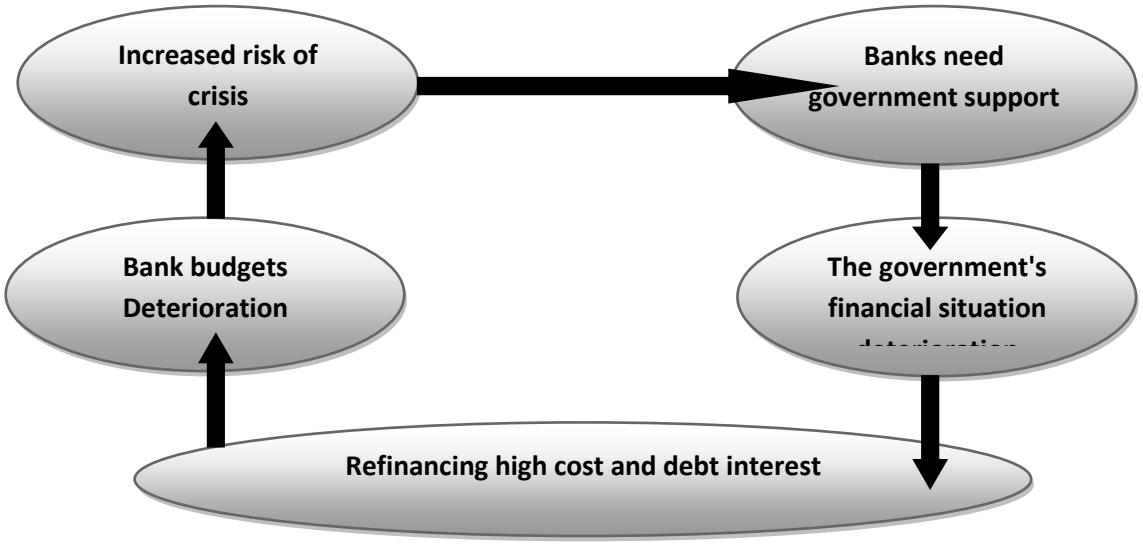

Figure number (4)

The vicious circle between banks and sovereign debt in the euro area

Source: European commission, Banking union: restoring financial stability in the Eurozone, MEMO, Brussels, http://www.ec.europa.eu, 2014, p 3.

The series of bailouts for the financial sector during the global financial crisis (the US mortgage crisis) of 2008 sparked a sovereign debt crisis that affected all of Europe, and sovereign credit risks spread to almost all European countries, so this crisis became a major concern, and this crisis intensified with a crisis Greek debt.

From the above it is clear that the sovereign debt crisis led to the explosion of government debt for most European countries, and the high cost of debt service in some countries significantly (Tichy, 2012.95).

Greece is the first country in which the alarm of the crisis has sounded (Noureddine, 2013, 59), and there are internal and external factors that have led to the emergence of this crisis in Greece, represented by the following (Habash, 2011, 12):

1- **Internal factors**: The Greek economy achieved a recovery during the period 2007 - 2008, where the economy grew by 4%, thereby facilitating the expansion of loans and credit facilities granted by banks.

2- **External factors**: These are represented in the following reasons (entering the membership of the European currency, the global financial crisis 2008, exaggerating public debt).

3. Descriptive and analytical aspect of research and discussion of results

For the purpose of completing the aspects of the research and to achieve the goals of the research and prove its hypotheses, the third topic came to address the link between the interbank market and the Greek sovereign debt crisis through some banking indicators of the research sample, by explaining how this interconnection between banks led to the transmission of the impact of the crisis to other countries, and will be from During this topic, specifying data for the study, and describing study variables, with presentation of study tools and analysis of results, as in the following paragraphs:

3.1 Describing the Research Population and Sample

The roots of the European sovereign debt crisis in 2009 in the euro area go back to the global financial crisis (the American mortgage crisis) for the years 2007 and

2008, and in order to achieve the objectives of the research and test its hypotheses and clarify how the infection of the European sovereign debt crisis was selected five countries were Greece, Italy, Spain, Ireland and Cyprus To represent the research sample, and for the purpose of clarifying the process of transmission of infection through banks' budgets, only two banks were chosen from each of the countries of the research sample except for Greece, which was chosen on four banks as the country of the crisis, the choice of Greece to be the country of the crisis because B Lader crisis emerged in November 2009, specifically when the Greece to announce the general budget plan so as to avoid falling into bankruptcy and inability to meet debt owed to them،

Hence the focus of the whole world on Greece, because the matter threatens the stability of the euro area monetary union and then its collapse, which led to the transmission of the infection of this crisis to the European Union countries, especially Italy, Spain, Ireland and Cyprus as a result of the accumulation of government debt.

Table number (1)

Research sample banks

	Country	Bank name	Year Founded	Capital in 31/12/2017	Asset size in 31/12/2017

				One thousand euros	One thousand euros
1	**Greece**	Nantional Bank Of Greece	**1841**	**2,744,000**	**64,768,000**
2		Eurobank Ergasias S.A	**1990**	**8,711,000**	**60,029,000**
3		Attica Bank	**1925**	**802,006**	**3,560,371**
4		Aegean Baltic Bank	**2002**	**37,980**	**237,896**
5	**Italy**	Unicredit Group	**1998**	**20,880,000**	**836,790,000**
6		Intesa Sanpaolo Group	**2007**	**8,732,000**	**796,861,000**
7	**Spain**	Banco De Sabadell, S.A. Group	**1881**	**703,371**	**221,348,315**
8		Ibercaja Banco Group	**2010**	**2,552,409**	**53,106,969**
9	**Ireland**	Bank Of Ireland Group Plc	**1783**	**1,079,000**	**122,554,000**
10		Permanent Tsb Group Holdings PLC	**1884**	**1,257,000**	**22,773,000**
11	**Cyprus**	Bank Of Cyprus Group	**1899**	**892,294**	**23,598,414**
12		Hellenic Bank Group	**1976**	**99,000**	**6,847,000**

Source: Prepared by the researcher, based on the annual reports issued by the banks.

3.2 Study indicators

Banks' indicators have been relied on to clarify the impact of the sovereign debt crisis on the banking sector in the sample countries through the interbank market, and that each of the data was affected by the crisis and affected it at the same time, and each one has a strong correlation with the other, This transition had a reflection of the banks' budgets and items. The ratios adopted in the analysis are:

1- **Capital adequacy ratio**: This ratio measures the capital adequacy of the bank by (total capital / credit risk + market risk + operational risk) on the basis of Basel (II), and in the case of this high percentage indicates the ability of the bank to meet Financial difficulties (Hasan, 2005,7).

2- **The ratio of non-performing debt to capital**: this ratio implies that with an increase in the volume of non-performing loans, the bank will bear the high cost of capital, given that the bank's capital is the wall to absorb potential bank losses and avoid bankruptcy (Chiesa & Fernández, 2018,4).

3- **The ratio of capital to total assets**: This ratio indicates the extent of the bank's ability to use the capital to finance its total assets (Abbas, 2012,336).

4- **The ratio of bad debts to total facilities**: This ratio is one of the indicators of financial safety and indicates the quality of bank loans, and the rise of this ratio negatively affects risk management and investment, by increasing the probability of banks themselves being exposed to default on loans from borrowers (li & Zou, 2014,42).

5- **The ratio of the sectoral distribution of credit facilities to the total facilities**: This ratio is one of the indicators that reflects the degree of concentration of facilities granted for a particular sector or economic activity, as the high degree of concentration of facilities granted for a particular sector or activity increases the degree of potential risks to which the sector may be exposed Banking, given the ability to pay to be linked to unforeseen developments and fluctuations associated with this sector or activity, especially in light of the different structural structure of each of the economic sectors, and the different problems and risks that may be exposed to it separately from other sectors, with strong potentials Of the rest of the sectors affected by the problems that may be facing a particular sector, and as a result of the close interrelationship between those sectors (Atallah, 2017.16).

6- **The ratio of liquid assets to total assets**: This ratio indicates the bank's ability to finance increases in the assets and to fulfill the liabilities when due, without incurring unacceptable losses (Vodová, 2013,26).

7- **Ratio of liquid assets to total short-term liabilities**: This ratio indicates the bank's ability to meet short-term liabilities when they are due (Vodová, 2013,26).

8- **The return on assets ratio**: This ratio indicates the bank's ability to fully utilize the funds, meaning that it measures the effectiveness of the bank's management in the use of its entire assets (li & Zou, 2014,30).

9- **The rate of return on property rights**: This ratio measures the bank's ability to generate returns from investing shareholders 'money, which is represented by capital, reserves, and retained earnings, and the rise in this ratio indicates the soundness of the bank's performance, and the ability of its management to make investment and operational decisions in the bank, that is, the ratio that It measures the relationship between yield and risk (Saleh and Fadel, 2012, 149).

3.3 Presenting and Describing the Study Tools

To test the research hypotheses and analyze the behavioral relationships between the variables, two statistical models of correlation models were used to clarify the correlations between the variables of the research, the first is Pearson Correlation. This correlation is used to measure the strength of the relationship between the values of two variables and calculate the Pearson correlation coefficient. In terms of readings of the data of the variables (x) and (y) using the following formula (quality, 2008, 256):

$$rp = \frac{N\left(\sum XY\right) - \sum X \sum Y}{\sqrt{\left(n\sum X^2 - \left(\sum X\right)^2\right)}\sqrt{\left(n\sum Y^2 - \left(\sum Y\right)^2\right)}}$$

From the above equation, (R) indicates Pearson's correlation coefficient, (X) indicates the first variable, and (Y) indicates the second variable.

As for the second model of correlation, it is the canonical correlation or legal correlation that uses this type of correlation to study the strength of correlation between two groups of variables. This analysis focuses on the relationship between the linear structures of the first group variables and the linear structures of the other group variables. Canonical correlation can me calculated as the following equation: (Abdullah, 2008,199):

$$CC = \frac{Cov(X*, Y*)}{\sqrt{Var(X*)Var(Y*)}}$$

$$X* = \alpha_1 X_1 + \alpha_2 X_2 + \ldots\ldots\ldots\ldots + \alpha_P X_P$$
$$Y* = \beta_1 Y_1 + \beta_2 Y_2 + \ldots\ldots\ldots\ldots + \beta_P Y_P$$

The Pearson correlation coefficient shows the measurement of the degree of correlation between research indicators in Greek banks with other countries, the sample of which is Italy, Spain, Ireland and Cyprus, through the banks' budgets of the sample banks.

The canonical correlation coefficient measures the degree of correlation between banking indicators in Greece with Italy, Spain, Ireland and Cyprus because this correlation works to link a group of variables with a group of other variables.

The following table shows some of the results of the canonical correlation analysis that will be adopted in the interpretation of the research results:

Table number (2)

Interpretation of the results of the canonical correlation analysis to be adopted

Interpretation of the result	Canonical correlation results
It is the value confined to field (1 and 1) and is the	Correlation

same simple correlation coefficient.	Canonical value (CC)
It defines the strong variables that are sufficient to clarify the relationship between two sets of variables, and compares the tabular (χ^2) with a degree of freedom at an appropriate level of significance.	Chi Square (χ^2)
The interpretation of the results of the canonical correlation can be relied on by the structural coefficients, the value of which is confined to the period (1, + 1), which are known as the correlations between the original variables and the solid variables, since the square of the correctional structural parameter represents the percentage of its contribution to the explanation of the variance in the canonical variable.	Structural coefficients (SC)
It is the ratio of the variance that occurs in the variables of a particular group and is explained by the variables of another group, that is, it indicates the percentage of the contribution of explanatory variables (X'S) in the interpretation of the variance of the dependent variables (Y'S).	Overflow factor
It is defined as the proportions of the interpretation of the straight variable in the total variance occurring in the variables of one group, and its value ranges between zero and one.	Adequacy Coefficient

Source: Prepared by the researcher, based on

- Al-Shubr, Haider Hussain Dakhil, Using Correlation Canonical to Study the Relationship between a Child's Character and the Method and Type of Lying, Uruk Journal for Humanities, College of Education for Humanities, Muthanna University, Iraq, 2018, p. 184.

- Jalawi, Hussein Space, Using the Canonical Link to Find Out the Impact of Facebook's Methods on the Personality of the Individual, Al-Qadisiyah Journal of Administrative and Economic Sciences, Volume 15, No. 1, College of Administration and Economics, Al-Qadisiyah University, Iraq, 2013, p. 166.

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3.4 Analyzing and Discussing the Results

3.4.1 The First Beginnings of the Crisis

From the foregoing it becomes clear that the sovereign debt crisis first appears based on one of the variables of the financial system, then quickly spread in the interbank market through the budgets of banks, and the following figure shows the research model

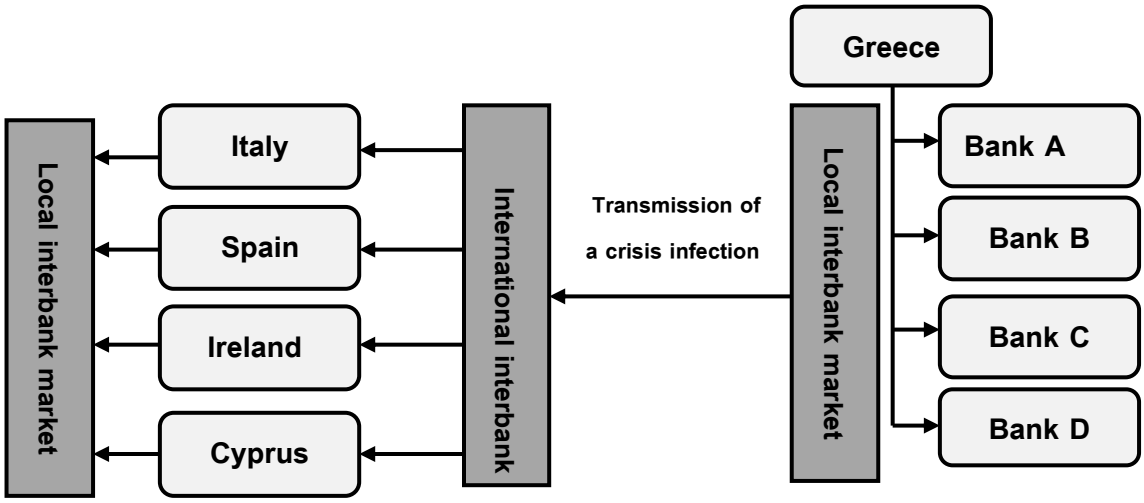

Figure number (5)

Research form

Source: The form prepared by the researcher

The previous figure shows that the sovereign debt crisis appeared in one part of the eurozone intensively and later moved to other parts through the interbank market by means of the banks ’budget in an infection form. In the research sample, the crisis was centered in Greece, which was considered the country of the crisis and

then after This moved to other countries, which are represented in Italy, Spain, Ireland and Cyprus.

3.4.2 Transfer of the effects of the sovereign debt crisis in Greece (inter-local market)

For the purpose of proving the research hypotheses that assumed the transmission of the impact of the sovereign debt crisis through infection from one country to another through the banks' budgets, therefore the effect of the crisis and its transfer within the first countries and then to other countries must be proven, analysis of the Pearson correlation coefficient will be used for the period of 2010 2017, and the following figure shows the impact of the crisis on bank budgets in the interbank market by Pearson correlation:

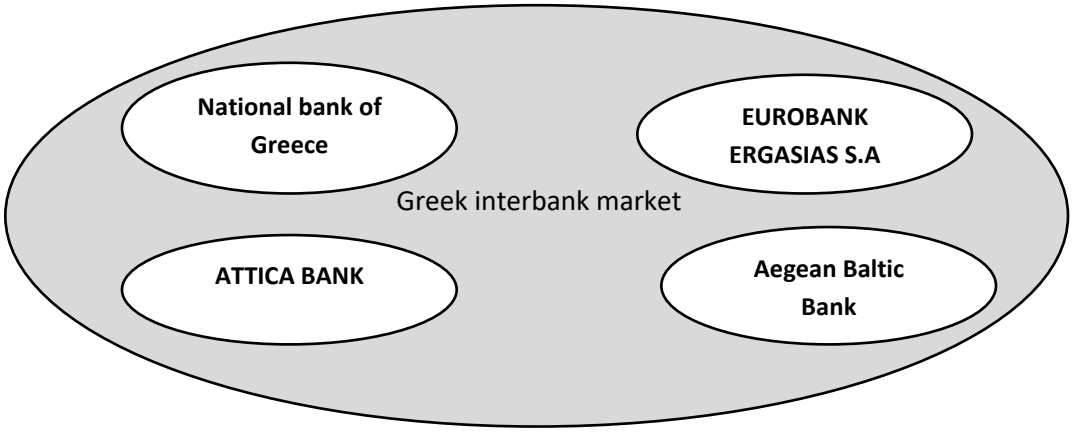

Figure number (6)

Pearson correlation between Greek banks sample research in the interbank market

Source: The form prepared by the researcher

The following table shows the correlation results for Pearson correlation:

Table number (3)
Results of Pearson correlation coefficients between Greek banks for the period 2010-2017

IR2017	IR2016	IR2015	IR2014	IR2013	IR2012	IR2011	IR2010	Variables	
0.682	0.685	0.345	0.504	0.710	-0.081	0.004	1.000	Pearson Correlation	IR2010
0.000	-0.051	0.030	0.031	0.025	0.987	1.000	0.004	Pearson Correlation	IR2011
-0.083	-0.133	-0.021	-0.035	-0.059	1.000	0.987	-0.081	Pearson Correlation	IR2012
0.917	0.952	0.568	0.737	1.000	-0.059	0.025	0.710	Pearson Correlation	IR2013
0.914	0.846	0.969	1.000	0.737	-0.035	0.031	0.504	Pearson Correlation	IR2014
0.801	0.701	1.000	0.969	0.568	-0.021	0.030	0.345	Pearson Correlation	IR2015
0.983	1.000	0.701	0.846	0.952	-0.133	-0.051	0.685	Pearson Correlation	IR2016
1.000	0.983	0.801	0.914	0.917	-0.083	0.000	0.682	Pearson Correlation	IR2017

Source: The table was prepared by the researcher using electronic computer outputs using the spss / 20 program

The above table shows that most Pearson correlation coefficients were significant And positively, and this indicates that there is an association between Greek banks, which helps to transfer the impact of the crisis in an infection through the market between Greek banks during the period of the research, which is to prove the first part of the second hypothesis of the research.

3.4.3 Transfer of the effects of the Greek sovereign debt crisis to other eurozone countries (inter-bank market)

For the purpose of clarifying that the impact of the Greek sovereign debt crisis was not within one country but rather moved to other countries and the euro area has been greatly affected by the crisis and this transition through the inter-bank market within the euro area, and to prove the research hypotheses a number of countries of the eurozone have been used to clarify the impact of the crisis The stronger the degree of correlation, the faster the crisis will move to the eurozone. In order to prove this hypothesis, the canonical correlation method that measures the relationship between two different sets of variables according to the previous equation will be used.

In order to calculate the canonical correlation coefficient, Greece is linked once with the countries (Italy and Spain), and the second time with the countries (Ireland and Cyprus) in order for the number of banks to coincide with the four Greek banks for the research sample.

The first group of the canonical correlation includes the Greek banks and represents (the independent variables). As follow:

Number	Research sample banks (Greece)
1	National bank of Greece
2	Eurobank Ergasias S.A
3	Attica Bank
4	Aegean Baltic Bank

As for the second group of straight correlation, it comprises the first group of countries and represents the (approved variables). My agencies are:

Number	Research sample banks	country
1	UniCredit Group	Italy

2	Intesa Sanpaolo Group	
3	Banco de Sabadell, S.A. Group	Spain
4	Ibercaja Banco Group	

The following figure shows the canonical relationship between the two sets of variables:

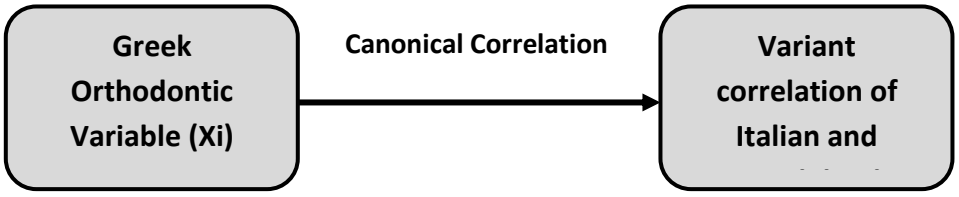

Figure number (7)

Canonical correlation between the first group of variables (Greek banks) and the second group of variables (Italian and Spanish banks)

Source: The form prepared by the researcher

From the application of the canonical correlation equation, the results of the following table appeared:

Table number (4)

The results of the canonical correlation coefficient of the banks of Greece with the first group of banks (Italy and Spain)

For the period 2010 - 2017

Canonical Analysis Summary				
CC	**Calculated χ^2**	**d,f**	**Tabular χ^2**	**P**
0.989	551.089	64	79.08	≤ 0,05
Variable	**Structural coefficients**	**Structural coefficients box**	**Quality sufficiency rate**	**Overflow factor**
	Px	**Px2**	**(%)**	**(%)**
2010	0.4201	0.1765	50.66	88.36
2011	0.0848	0.0072		
2012	0.0214	0.0005		
2013	0.7078	0.5009		
2014	0.9916	0.9832		
2015	0.9665	0.9342		
2016	0.8179	0.6689		
2017	0.8838	0.7811		

Source: Table prepared by the researcher in the light of the electronic computer outputs using the STATISTICA program.

It is clear from the table that the value of the legal correlation coefficient reached (0.989), that is, there is a strong positive relationship with statistical significance between the variables of the first group (Greek banks) with the variables of the second group (the banks of Italy and Spain).

A square test, such as (χ^2), determines the strong, significant variables that are sufficient to clarify the relationship between two sets of variables, as the calculated value (χ^2) indicates that it is higher than the tabular, indicating the significance of the test as a whole.

The table shows that the surplus factor reached its value (88.36%), which indicates that (88.36%) of the changes in the first group (the banks of Italy and Spain) are due to the independent variables (Greek banks).

Greek banks also managed the independent variables to explain (50.66%) of the discrepancies in the approved variables, the banks of the first group of countries, the Italian and Spanish banks.

Structural coefficients show that the percentage of the contribution of each of the explanatory variables in their effect is explained by the variation in the adopted variables, and this is achieved when the value of the structural coefficient is greater than (0.30) and it is the adopted standard for determining the effectiveness of the variables, where most researchers indicate in the canonical analysis that the structural transactions It should not be less than this amount in order to promise that it has an active contribution to the formation of the group's straight variable. The table shows that the structural transactions for the years (2010, 2013-2017) had a significant effect on the changes taking place in the approved variables, and this indicates that there is a correlation between Mai indicators The banks of the research sample in the market between the international banks in the crisis state Greece and between the banks of Italy and Spain, and this link helped to transfer the effects of the crisis to the other country, represented by Italy and Spain through the banks budgets in the form of a banking infection, which is a proof of the first part of the first hypothesis to search.

And the years 2011 and 2012 appeared with an unimportant effect on the set of variables, and this indicates the crisis overrun. In the year 2010, there was an association between banks, which led to the transmission of the crisis, but after that the crisis was overlooked by the research sample banks through the interbank market, which is a proof of the part The second of the first hypothesis for research, and if this indicates something, it is that liquidity in the interbank market was able to bypass the crisis for a specified period in addition to the assistance shown by

banks in that market, but after 2012 the banks increased the link in the interbank market, which led to the transition of the crisis once Other.

In order to complete the analysis, it is necessary to link the Greek banks with the rest of the research sample, which is represented in the banks of each of Ireland and Cyprus, the research sample, the same analysis will be used, as the first group includes the Greek banks themselves and in the same sequence, while the second group includes the second section of the banks in each From Ireland and Cyprus, as follows:

Number	Research sample banks	country
1	Bank Of Ireland Group Plc	Ireland
2	Permanent Tsb Group Holdings PLC	
3	Bank Of Cyprus Group	Cyprus
4	Hellenic Bank Group	

The following figure shows the canonical correlation between the two sets of variables:

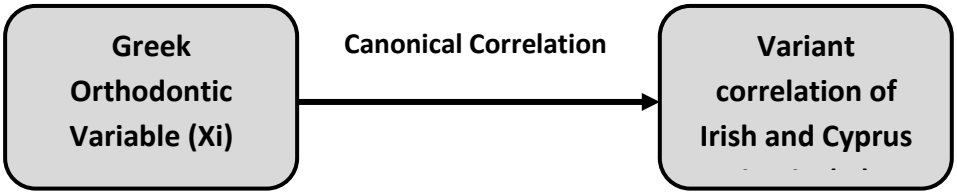

Figure number (8)

Canonical correlation between the first set of variables (Greek banks) and the second set of variables (Irish banks and Cyprus)

Source: The form prepared by the researcher

From the application of the results of the correlation equation, the following results appeared:

Table number (5)
The results of the canonical correlation coefficient of the banks of Greece with the second group of banks (Ireland and Cyprus)
For the period 2010 - 2017

Canonical Analysis Summary				
CC	**X^2 calculated**	**d,f**	**X^2 الجدولية**	**P**
0.998	487.85	64	79.08	≤ 0,05
Variable	**Structural coefficients**	**Square Structural coefficients**	**Quality sufficiency rate**	**Overflow factor**
	Px	**Px2**	**(%)**	**(%)**
2010	0.4363	0.1903	44.47	72.9
2011	0.0542	0.0029		
2012	0.0053	2.8123		
2013	0.5588	0.3123		
2014	0.9621	0.9255		
2015	0.9659	0.9329		
2016	0.7261	0.5272		
2017	0.8162	0.6662		

Source: Table prepared by the researcher in the light of the electronic computer outputs using the STATISTICA program.

From the above table it is clear that the value of the legal correlation coefficient reached (0.998), that is, there is a strong positive relationship with statistically

significant between the variables of the first group (Greek banks) with the variables of the second group (Ireland and Cyprus banks).

A square test, such as (χ^2), determines the strong, significant variables, which are sufficient to clarify the relationship between two sets of variables, as the calculated value (χ^2) indicates that it is higher than the tabular, indicating the significance of the test as a whole.

The table shows that the surplus factor reached its value (72.9%), which indicates that (72.9%) of the changes in the second group (banks of Ireland and Cyprus) are due to the independent variables of Greek banks.

As for the interpretation of structural transactions, it was the same result with the first group of countries, as the structural transactions for the years (2010, 2013-2017) had a significant effect on the changes taking place in the approved variables, and this indicates that there is a correlation between the balance sheets of banks in the research sample in The market between the international banks in the crisis state Greece and between the banks of Ireland and Cyprus, and this link helped to spread the crisis.

It is clear to us from the above that the transition of the effects of the crisis was already present, which was the transition that was directly from the crisis state to other countries in the euro area, which was known as the domino effect, and is a confirmation of the second part of the second hypothesis of research.

3.4.4 Analyzing the relationship within the same country in each country in the sample

After clarifying how the impact of the crisis was transmitted by infection to other countries in the eurozone, it is necessary to know how this infection (Greek sovereign debt crisis) was transmitted within the same country later on. Pearson analysis will be used for Italy, Spain, Ireland and Cyprus to illustrate this. , And the following tables show the results of this correlation:

Table number (6)

Results of Pearson correlation between Italy's banks for the period 2010-2017

IR2017	IR2016	IR2015	IR2014	IR2013	IR2012	IR2011	IR2010	Variables	
0.479	0.804	0.889	0.909	0.915	0.946	0.997	1.000	**Pearson Correlation**	**IR2010**
0.518	0.805	0.886	0.904	0.913	0.941	1.000	0.997	**Pearson Correlation**	**IR2011**
0.589	0.942	0.984	0.994	0.995	1.000	0.941	0.946	**Pearson Correlation**	**IR2012**
0.634	0.969	0.994	0.999	1.000	0.995	0.913	0.915	**Pearson Correlation**	**IR2013**
0.624	0.969	0.997	1.000	0.999	0.994	0.904	0.909	**Pearson Correlation**	**IR2014**
0.655	0.981	1.000	0.997	0.994	0.984	0.886	0.889	**Pearson Correlation**	**IR2015**
0.732	1.000	0.981	0.969	0.969	0.942	0.805	0.804	**Pearson Correlation**	**IR2016**
1.000	0.732	0.655	0.624	0.634	0.589	0.518	0.479	**Pearson Correlation**	**IR2017**

Source :The table was prepared by the researcher using electronic computer outputs using the spss / 20 program

Table number (7)

Results of Pearson correlation coefficients between Spanish banks for the period 2010-2017

IR2017	IR2016	IR2015	IR2014	IR2013	IR2012	IR2011	IR2010	Variables	
0.609	0.865	0.947	0.964	0.961	0.943	0.999	1.000	Pearson Correlation	IR2010
0.636	0.860	0.945	0.949	0.946	0.924	1.000	0.999	Pearson Correlation	IR2011
0.389	0.833	0.891	0.997	0.998	1.000	0.924	0.943	Pearson Correlation	IR2012
0.440	0.852	0.914	1.000	1.000	0.998	0.946	0.961	Pearson Correlation	IR2013
0.447	0.854	0.917	1.000	1.000	0.997	0.949	0.964	Pearson Correlation	IR2014
0.759	0.979	1.000	0.917	0.914	0.891	0.945	0.947	Pearson Correlation	IR2015
0.780	1.000	0.979	0.854	0.852	0.833	0.860	0.865	Pearson Correlation	IR2016
1.000	0.780	0.759	0.447	0.440	0.389	0.636	0.609	Pearson Correlation	IR2017

Source :The table was prepared by the researcher using electronic computer outputs using the spss / 20 program

Table number (8)

Results of Pearson correlation between Irish banks for the period 2010-2017

IR2017	IR2016	IR2015	IR2014	IR2013	IR2012	IR2011	IR2010	Variables	
0.790	0.748	0.634	0.639	0.613	0.752	1.000	1.000	Pearson Correlation	IR2010
0.784	0.743	0.626	0.631	0.605	0.745	1.000	1.000	Pearson Correlation	IR2011
0.977	0.952	0.979	0.977	0.968	1.000	0.745	0.752	Pearson Correlation	IR2012
0.965	0.964	0.996	0.998	1.000	0.968	0.605	0.613	Pearson Correlation	IR2013
0.969	0.965	0.997	1.000	0.998	0.977	0.631	0.639	Pearson Correlation	IR2014
0.968	0.959	1.000	0.997	0.996	0.979	0.626	0.634	Pearson Correlation	IR2015
0.987	1.000	0.959	0.965	0.964	0.952	0.743	0.748	Pearson Correlation	IR2016
1.000	0.987	0.968	0.969	0.965	0.977	0.784	0.790	Pearson Correlation	IR2017

Source :The table was prepared by the researcher using electronic computer outputs using the spss / 20 program

Table number (9)

Results of Pearson correlation between banks of Cyprus for the period 2010-2017

IR2017	IR2016	IR2015	IR2014	IR2013	IR2012	IR2011	IR2010	Variables	
0.429	0.370	0.866	0.457	0.560	0.426	0.964	1.000	Pearson Correlation	IR2010
0.490	0.473	0.712	0.643	0.728	0.481	1.000	0.964	Pearson Correlation	IR2011
0.996	0.969	0.332	0.345	0.504	1.000	0.481	0.426	Pearson Correlation	IR2012
0.553	0.648	0.120	0.980	1.000	0.504	0.728	0.560	Pearson Correlation	IR2013
0.401	0.521	-0.019	1.000	0.980	0.345	0.643	0.457	Pearson Correlation	IR2014
0.311	0.175	1.000	-0.019	0.120	0.332	0.712	0.866	Pearson Correlation	IR2015
0.983	1.000	0.175	0.521	0.648	0.969	0.473	0.370	Pearson Correlation	IR2016
1.000	0.983	0.311	0.401	0.553	0.996	0.490	0.429	Pearson Correlation	IR2017

Source: The table was prepared by the researcher using electronic computer outputs using the spss / 20 program

The results of the Pearson correlation coefficients in Tables (6), (7) and (8) show that there is a strong and direct correlation between banks within the same country in the period 2010-2017 in each of the countries of the research sample, Italy, Spain and Ireland, and this strong relationship explains Among the variables of banks for a year with the other years of the rest of the banks, and this also indicates that there are correlations between banks in one country by their association with the indicators selected from each bank's budget, and this correlation was one of the main reasons that helped in the ease and speed of transmission of the effects of the crisis as an infection within the sector Banker in each country of the sample study, It is also indicative of the degree of correlation between the strength of banks, which increases the degree of infection, which prove the second hypothesis for research.

The results show that the banks of countries (Italy, Spain and Ireland) had positive results of their commitments, with the exception of the banks of Cyprus, as the results of their banks showed that the value of the Pearson correlation coefficient was fluctuating between the correlation and non-correlation during the period 2010-2017, as the values between were greater than (0.5) And less than (0.5), which also indicates that there is also a correlation in banks' budgets in most years of the research period.

3.4.5 The reciprocal relationship between the first group of banks in each of (Italy and Spain) with the second group of banks in each of (Ireland and Cyprus)

In order to complete the previous analysis and achieve the goals of the research and prove its hypotheses, it is necessary to search in the relationship between the two banks in the sample countries in the euro area, and the following figure shows that:

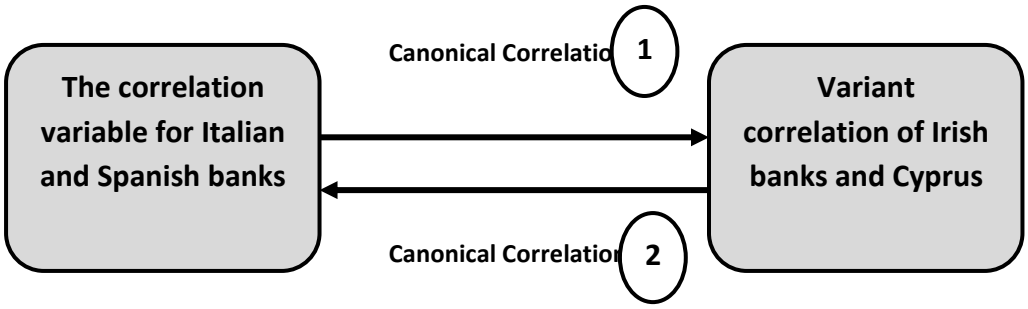

Figure number (9)

Canonical correlation between the first group and the second group of banks, the research sample

Source: The form prepared by the researcher

The following is an illustration of this reciprocal relationship between the two groups of countries in the euro area:

A- Relationship of the first group of banks (Italy and Spain) with the second group of banks (Ireland and Cyprus): For the purpose of measuring the strength of canonical correlation between the banks of the first group and the banks of the second group, it is necessary to use the canonical correlation model, as: The first group of the canonical correlation includes the banks of (Italy and Spain), namely:

Number	Research sample banks	country
1	UniCredit Group	Italy
2	Intesa Sanpaolo Group	
3	Banco de Sabadell, S.A. Group	Spain
4	Ibercaja Banco Group	

As for the second group of the canonical correlation, it includes the banks of (Ireland and Cyprus), which are:

Number	Research sample banks	country
1	Bank Of Ireland Group Plc	Ireland
2	Permanent Tsb Group Holdings PLC	
3	Bank Of Cyprus Group	Cyprus
4	Hellenic Bank Group	

The following figure shows that:

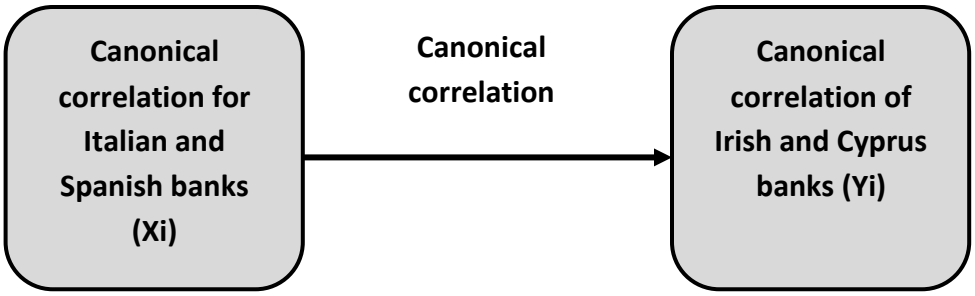

Figure number (10)

Canonical correlation between the first group of variables (Italian and Spanish banks) and the second group of variables (Irish banks and Cyprus)

Source: The form prepared by the researcher

The results of the canonical correlation analysis are shown in the following table:

Table number (10)

Results of the canonical correlation coefficient between the first group of banks (Italy and Spain) with the second group of banks (Ireland and Cyprus) for the period 2010-2017

Canonical Analysis Summary				
CC	**X^2 calculated**	**d,f**	**X^2 Tabular**	**P**
0.998	721.22	64	79.08	≤ 0,05
Variable	**Structural coefficients**	**Square Structural coefficients**	**Quality sufficiency rate**	**Overflow factor**
	Px	**Px2**	**(%)**	**(%)**
2010	0.4276	0.1828	25.34	88.04
2011	0.4720	0.2228		
2012	0.2036	0.0415		
2013	0.2547	0.0649		
2014	0.2458	0.0604		
2015	0.5352	0.2865		
2016	0.5371	0.2885		
2017	0.9381	0.8801		

Source :Table prepared by the researcher in the light of the electronic computer outputs using the STATISTICA program.

It is clear from Table (10) a summary of the results of the canonical correlation analysis, as the value of the legal correlation coefficient reached (0.998), meaning that there is a strong positive relationship with statistically significant between the variables of the first group (banks of Italy and Spain) with the variables of the second group (the banks of Ireland and Cyprus).

A square test, such as (χ^2), determines the strong, significant variables, which are sufficient to clarify the relationship between two sets of variables, as the calculated value (χ^2) indicates that it is higher than the tabular, indicating the significance of the test as a whole.

The table shows that the surplus factor reached its value (88.04%), which indicates that (88.04%) of the changes in the second group (banks of Ireland and Cyprus) are due to the independent variables of the banks of the first group (Italy and Spain).

The banks of the first group (Italy and Spain) also managed the independent variables to explain (25.34%) of the variations in the approved variables, the banks of the second group (the banks of Ireland and Cyprus).

As for the value of structural transactions, it exceeded (0.3) in the years (2010, 2011, 2015, 2016, 2017) and this indicates that these years in the banks of the first group contributed effectively in explaining the changes in the banks of the second group, and this matter supports the hypothesis that The crisis may also be transmitted indirectly, that is, it does not come from the crisis state, but rather comes from the state affected by the crisis state, which is known as the herd behavior, which is a proof of the third hypothesis of research.

As for the years (2012, 2013, 2014), it appears that the structural transactions were less than (0.3), which indicates that the impact of the crisis did not appear on the banks of the second group because the interbank market has exceeded the crisis through inter-bank liquidity.

B- The relationship of the second group of banks (Ireland and Cyprus) with the first group of banks (Italy and Spain): In order to find the mutual effect, we must find the relationship between the second group (independent variables) and the first group (the approved variables), and the following figure shows that:

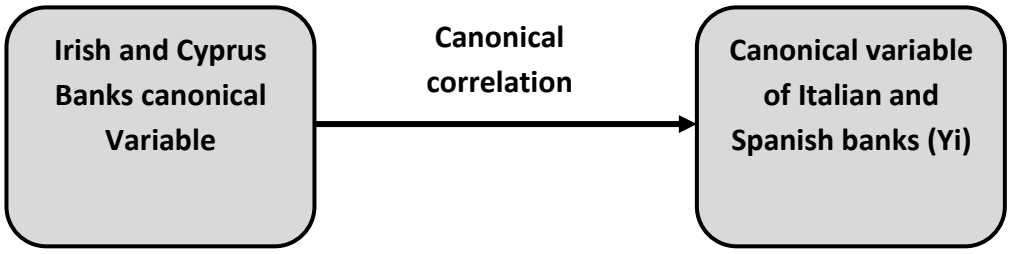

Figure number (11)

Canonical correlation between the first group of variables (Irish banks and Cyprus) and the second group of variables (Italian and Spanish banks)

Source: The form prepared by the researcher

From the results of the canonical correlation analysis of this relationship, it was found that the canonical correlation coefficient (the second group and the first group) is the same value as the canonical correlation coefficient (the first group and the second group) because the correlation of the group (X'S) with the group (Y'S) is the same as the correlation of group (Y'S) with X'S Collection.

4.Conclusions and recommendations

4.1 Conclusions

4.1.1 The roles of the interbank market flow in two important directions. The interconnected banks in the interbank market network may share and diversify risks, which works to reduce their exposure to shocks, or the other direction, the interbank market network may lead to exposing all banks to the risk of infection.

4.1.2 The degree of transmission of shocks and crises in this market depends on the degree of completeness and interdependence in the market.

4.1.3 The results of the canonical correlation coefficient between the banks of Greece and all of the banks of Italy, Spain, Ireland and Cyprus for the years (2010, 2013-2017) in the special part showed structural transactions that there is a significant effect on the changes taking place for the approved variables, and this indicates that there is a correlation between the banks budget indicators The

research sample in the market between the international banks in the crisis state Greece and between the aforementioned countries, and this link helped to transfer the effects of the crisis to the other country in the form of a banking infection.

4.1.4 From the correlation results that were reached from the analysis of the indicators of the banks, the research sample showed that the transmission of the effects of the crisis was already present, which was the transition directly from the crisis state to other countries in the euro area, which was known as the domino effect, and at the same time the analysis showed that the crisis It may also be transmitted indirectly, meaning that it does not come from the crisis state, but rather comes from the state affected by the crisis state, which is known as the herd behavior.

4.1.5 The results of the Pearson correlation coefficients in the tables showed that there is a strong and direct correlation between banks within the same country in the period 2010-2017 in the sample countries, and this was one of the main reasons that helped in the ease and speed of transmission of the effects of the crisis as an infection within the banking sector.

4.2 recommendations

4.2.1 Giving greater importance to the interbank market because of its importance in providing liquidity and lending in addition to diversifying risks and avoiding them in a big way.

4.2.2 Giving a greater role to the monetary authorities in regulating the interbank market by setting limits for banking transactions in a way that does not lead to the ease of spreading the crisis if it occurs.

4.2.3 The infection that is transmitted in the interbank market should be considered where there may be a direct infection, which is known as the domino effect, and the infection may be indirect, which is known as the behavior of the herd, because each type of infection has an effect that differs from the other and the way of confrontation differs from one To the next.

4.2.4 When we consider the interbank market as a method or method that is used to reduce and reduce the exacerbation of crises and their transmission, we must

choose the structure that works to provide liquidity in addition to the ability that this structure possesses to reduce the effects and risks of crises as an infection.

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