

## FINANCIAL INTEGRATION AND FINANCIAL CONTAGION, A PROBLEM FOR FINANCIAL STABILITY?

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**Abstract:** *The aim of this paper is to highlight the relation between financial integration and financial contagion, with the desire of financial stability. For this purpose we reviewed the literature in this field and then we did an analysis in order to draw relevant conclusions and to provide a clearer picture of the relationship between the two phenomena. For our analysis, we retrieved data from the Eurostat and World Development Indicators (World Bank) including the EU 28 member states over the time span 2000-2014. Our results show that is a significant relationship between the variables considered, and also financial integration and financial contagion are inversely proportional, financial contagion having a negative influence on the financial integration. It is consensual that a higher level of financial integration in partner economies can promote a process of strengthening the domestic markets involved, which is essential for the domestic corporate environment and also contributes to capital accumulation and technological innovation, key elements for economic growth, and the crisis contagion poses a systemic threat to the stability of the global financial system. For these reasons, studies about financial integration and contagion are relevant.*

**Keywords:** *financial integration, crisis, financial contagion, financial stability.*

**JEL Classification:** *F15, F36, G01, G10.*

### 1. INTRODUCTION

It is consensual that a higher level of financial integration in partner economies can promote a process of strengthening the domestic markets involved, which is essential for the domestic corporate environment and also contributes to capital accumulation and technological innovation, key elements for economic growth, and the crisis contagion poses a systemic threat to the stability of the global financial system. For these reasons, studies about financial integration and contagion are relevant.

The financial contagion became more and more the main idea of many studies in this field because it is often associated with the financial crises and it is perceived as a real problem.

Also, financial integration, financial contagion and financial stability are closely linked. This way was supported by the Ms Gertrude Tumpel Gugerell, Member of the Executive Board of the European Central Bank, at the ECB colloquium "European integration and stability" held on the 19th of May 2011. He said that „an integrated financial market is the basis for a smooth and equal transmission of monetary policy, it increases the efficiency and overall welfare of the economy, and enhances the resilience of the financial system from risk diversification. But despite our commitment and our

support for financial integration, we also had to learn– with the experience of the past 4 years in mind – that financial integration and financial stability do not always go hand in hand. Indeed we have witnessed that in a financially integrated market risks can spread and spillover to other segments of the financial market, increasing the likelihood of contagion of financial fragilities and systemic risks.” (Tumpel- Gugerell, 2011)

The aim of this paper is to highlight the relation between financial integration and financial contagion, with the desire of financial stability. For this purpose we reviewed the literature in this field and then we did an analysis in order to draw relevant conclusions and to provide a clearer picture of the relationship between the two phenomena.

## **2. LITERATURE REVIEW**

According to Karunaratne (2002) crisis contagion could be defined as the phenomenon of the currency crisis in one nation precipitating a currency crisis in another nation, often in the same region. He said that because the crisis contagion poses a systemic threat to the stability of the global financial system, the reform of the international financial architecture is matter of utmost importance in order to minimize the occurrence of crises and crises contagion.

Ben Rejeb (2015) aimed in his study to examine the volatility relationship that exists between emerging and developed markets in normal times and in times of financial crises, using the Vector Autoregressive methodology. So, it has been shown that financial liberalization contributes significantly in amplifying the international transmission of volatility and the risk of contagion.

Matos et al (2015) had in their study the purpose to measure how financially integrated and how strong is the financial contagion in BRIC, one of the most famous acronyms that stands for heterogeneous emerging economies: Brazil, Russia, India and China. According to their result, because we can evidence a contagion effect with Brazilian and Chinese financial markets playing a leading role, the economic linkages and information asymmetry within BRIC may be strong. Their evidence that BRIC establish a mutual relationship of long-term equilibrium and are also under contagion effect is robust to a structural break identified due to the recent global crisis, in 2008.

Armeanu et al (2014) studied the financial contagion of the capital markets, as a result of instability or financial shocks, such as financial crisis, and also the way financial contagion occurs. They find that the contagion issue is more profound, as it expands through many regions, and, therefore, it is important to find correlations between the countries, in order to reduce contagion effects, proving that the financial markets have underestimated this type of risk generated by the interconnections between countries.

Zhaoqi (2009) examined in his phd thesis the evolution of the financial integration and contagion of international stock and bond markets. His main results showed that large (/growth) stock portfolios are more integrated with the world than small (/value) portfolios, financial integration, and for testing contagion, he found that the conditional variance of assets returns and the increased level of integration are excellent variables for

identifying the crisis period, focusing on the transmission of price shocks at times of financial crisis.

Burzala (2016) presented in his research the deals with the process of contagion in selected capital markets during the financial crisis of 2007–2009. The research that was carried out indicates that rates of return in the studied European markets react simultaneously to a much greater extent as a result of interdependencies than as a result of mutual contagion.

Frexedas (2005) studied in his paper the financial contagion in times of crisis, one of the consequences of the integration of markets. The autor used the implementation of Spatial Econometrics. According to the results, in each crisis the market more closely controlled by governments show similar channels of contagion, and also the market more dependent on market forces show a distinctive trend.

Mollah et all (2014) studied the phenomenon of financial market contagion using the Dynamic Conditional Correlation-Generalized Autoregressive Conditional Heteroskedasticity (DCC-GARCH) and vector error correction (VEC) models. The empirical results demonstrate the existence of contagion in the financial markets during the global crisis.

Inci et all (2010) used the local correlation is used to examine financial contagion. They have detected contagion from U.S. futures to other futures markets, and also there is no reverse contagion from any of the German, British, Japanese, and Hong Kong spot or index futures markets to those of the U.S.

Bekaert et all (2005) defined contagion as a correlation between markets in excess of that implied by economic fundamentals. They said that, however, there is considerable disagreement regarding the definition of the fundamentals, how they might differ across countries, and the mechanisms that link them to asset returns.

Gencer et Demiralay (2016) analized financial contagion in the emerging markets during the European sovereign debt crisis and the global financial crisis at the aggregate and disaggregate level. At the aggregate level, their results document contagion incidences only during the European sovereign debt crisis. They said that, with regard to the idiosyncratic contagion effects, the real economy sectors are heterogeneous in the sense that they display co-movements at varying magnitudes during both of the crises.

Piffaut and Rey Miro (2016) aimed in their study to detect and capture the spread between the main stock indices in the Europe, Asia and United States markets. Using the Garch model, they noticed that the stock markets were highly corelated during the financial crisis creating a full-fledge contagion process.

Devereux and Yu (2014) said that financial integration helps to diversify risk but also may increase the transmission of crisis across countries. Their results showed that the financial integration leads to a significant increase in global leverage, doubles the probability of balance sheet crises for any one country, and dramatically increases the degree of 'contagion' across countries.

Ye et all (2016) developped a quantile regression model to measure the financial contagion. Their empirical results showed that the contagion existed during the Euro crisis between Greece and all tested European markets and during the US banking crisis between the US and all tested markets.

You et al (2014) tried to explain the phenomenon about how the China stock market exhibited a very different level of performance during the financial crises, using a composite index for the economic integration and a dynamic conditional correlation model to capture the correlations between stock returns of China and those of other important markets around the world. Their results showed a positive influence for the aim of the study.

Devereux and Shuterland (2011) developed a simple two-country model in which financial liberalisation across countries takes place in the presence of credit market distortions within countries. Their main conclusion was that it is necessary to identify the financial structure that most efficiently exploits the trade-off between the cost of financial contagion and the gains of financial market integration.

Gallegati (2012) used a wavelet-based approach to test for financial market contagion. His results indicate that Brazil and Japan are the only countries in which contagion is observed at all scales, because all stock markets have been affected by the US subprime crisis.

Luchtenberg and Vu (2015) studied in their paper the phenomenon of contagion and its determinants during the 2008 financial crisis. They discovered that both economic fundamentals such as interest rates, industrial production, trade structure, inflation rates and regional effects, and investors' risk aversion contribute to international contagion.

### **3. DATA AND METHODOLOGY**

Since the objective of the study was to highlight the relation between financial integration and financial contagion, we did my analyses by identifying the key definitions, approaches, statistical methods of the two topics, found in the literature regarding analyzed topics. Then we synthesized in this paper some of the key points of view and results found in the literature, and we did an regression analysis in order to draw relevant conclusions and to provide a clearer picture of the relationship between the two phenomena.

Also, empirical studies realised so far on this subject have used methodologies that measured separately the two phenomena, not their relationship or influence on his neighbour. In this regard, the financial integration was measured by CAPM (Zhaoqi, 2009), multivariate cointegration (Matos et al, 2015), two-country model (Devereux, 2010), while the financial contagion was measured by VAR model (Vector Autoregressive) (Rejeb and Boughrara, 2015, Matos et al, 2015, Burzala, 2016, Ye et al, 2016) GARCH model (Zhaoqi, 2009, Mollah et al, 2014, Piffaut and Rey Miro, 2016, You et al, 2016), an exploratory spatial analysis (Frexedas and Esther, 2004), wavelet-based approach (Gallegati, 2012), local correlation analysis (Inci and McCarthy, 2010). I have not attended one of this methodologies because my purpose is to study the relationship between the two phenomena, and not separately.

Our empirical analysis was performed based on a multiple linear regression between the dependent variable and the independent variables, and as econometric

software will be used the programs Eviews Statistics and SPSS, which helped us to create a clearer picture on the correlations between variables.

The dependent variable was financial integration, expressed by gross capital formation, and the independent variables will be financial contagion, expressed by unemployment rate, inflation rate, and bank's Z score and government expenditures. We chose these variables because they were used in others studies (Racickas & Vasiliauskait, 2012, ECB, 2005) concerning the two phenomena.

The data used for empirical analysis focuses on the period 2000 - 2014, with an annual frequency. These informations were obtained from the Eurostat and World Development Indicators databases.

The equations for the regression are expressed by the following formulas:

$$GROSS\_CAPITAL\_FORMATION = C(1) * BANKS\_Z\_SCORE + C(2) * GENERAL\_GOVERNMENT\_EXPENDITURE + C(3) * INFLATION\_RATE + C(4) *$$

$$PUBLIC\_DEBT + C(5)*UNEMPLOYMENT\_RATE + C(6)$$

$$GROSS\_CAPITAL\_FORMATION = C(1) * BANKS\_Z\_SCORE + C(2) * GENERAL\_GOVERNMENT\_EXPENDITURE + C(3) * UNEMPLOYMENT\_RATE + C(4)*CRISIS + C(5)$$

$$GROSS\_CAPITAL\_FORMATION = C(1) * UNEMPLOYMENT\_RATE + C(2) * GENERAL\_GOVERNMENT\_EXPENDITURE + C(3) * BANKS\_Z\_SCORE + C(4) * EUROZONE + C(5)$$

#### 4. RESULTS

Considering to the literature, we can say that financial integration has led to the financial contagion, especially in times of crisis. Financial integration has both benefits and costs. According to Chiwira and Tadu (2012), the most frequently mentioned benefits of financial market integration include:

- consumption smoothing due to international diversification of risks (reduction of the large country-specific shocks) ;
- the positive effect of capital flows on domestic investment and economic growth;
- improving efficiency of the financial system;
- increasing prudence of financial market agents;
- the attainment of a high level of financial stability.

Conversely the major costs of financial integration include:

- insufficient access to funding at times of financial instability inappropriate allocation of capital flows;
- loss of macroeconomic stability;
- herd behavior among investors;
- financial contagion and high volatility of cross-border capital flows.

So, the most significant cost of financial integration is the risk of financial contagion.

Even if it received a lot of definition in the literature until the present, financial contagion is a very complex and multivariate process, without an accepted definition and an accurate measurement methodology.

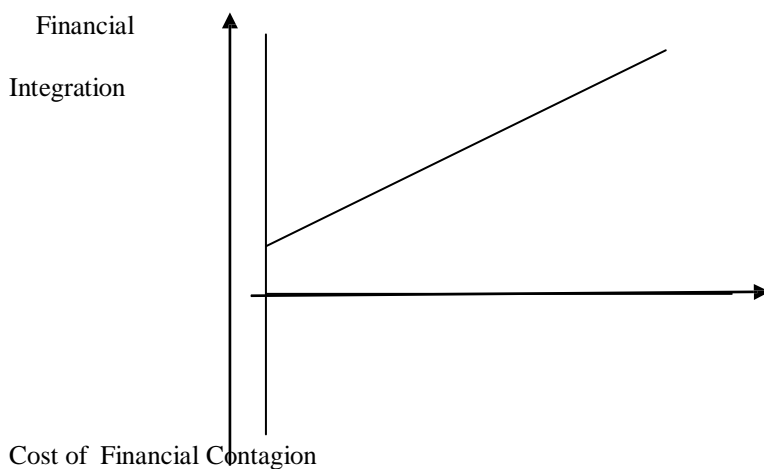
According to Chiwira and Tadu (2012) financial integration can be defined as a transmission of a crisis across borders whose reasons can't be explained by macroeconomic fundamentals.

According to OECD Economics Department (2012), the extent and nature of international banking integration, which led to unprecedented transmission of financial instability, is one important factor that made the recent financial crisis so widespread and deep. The international financial integration led to increase of economic efficiency and growth, but it may also increase the vulnerability to contagion. So, the growth of the cross-border loans of the banks led to a higher risk of contagion.

The hypothesis that financial integration can help the financial stability and as well as extend a financial crisis through financial contagion effects means that it is a "double edge sword". So, the phenomenon of financial integration can move as a mechanism in which a crisis can be transferred, and the financial stability can be attained. This thing lead to the affirmation of the idea that a deeper financial integration lead to a greater cost of financial contagion, implying a concession between them.

Figure 1 shows the relationship that exists between financial integration and financial contagion in a simplified representation.

**Figure 1. The relationship between financial integration and financial contagion**



Source : Chiwira, O. & Tadu, R., 2013. Financial integration and the risk of financial contagion in Africa : Empirical Review. , 3(4), p. 131.

According to Racickas and Vasiliauskaite (2012), financial contagion could be measured by several indicators:

**Table 1 Indicators of financial contagion**

Financial contagion			
indicator			Interpretation
			<i>External sector (current account)</i>
			A measure for the change in international

<i>Real exchange rate</i>		competitiveness and a proxy for over(under)valuation. Overvalued real exchange rate is expected to produce higher probability of financial crisis.				
<i>Export growth</i>		An indicator for a loss of competitiveness in international good market. Declining export growth may be caused by an overvalued domestic currency and hence a proxy for currency overvaluation. On the other hand, if export growth slows due to reasons unrelated to the exchange rate, this may cause devaluation pressure. In both cases, declining export growth can be a leading indicator for a sizeable devaluation.				
<i>Import growth</i>		Weak external sector is part of currency crises. Enormous import growth could lead to worsening in the current account and have been often related with currency crises.				
<i>Terms of trade</i>		Increases in terms of trade should strengthen a country's balance of payments position and hence lower the probability of crisis. Terms of trade deteriorations may precede currency crisis.				
<i>Ratio of the current account to GDP</i>		A rise in this ratio is generally associated with large external capital inflows that are intermediated by the domestic financial system and could facilitate asset price and credit booms. Increases in the current account surplus are expected to indicate a diminished probability to devalue and thus to lower the probability of a crisis.				
<i>External sector (capital account)</i>						
<i>Growth of foreign exchange reserves</i>		Declining foreign reserves is a reliable indicator that a currency is under devaluation pressure. A drop in reserves is not necessarily followed by devaluation, central bank may be successful in defending a peg, spending large amounts of reserves in the process. On the other hand, most currency collapses are preceded by a period of increased efforts to defend the exchange rate, which are marked by declining foreign reserves. Total value of foreign reserves are also used as indicators of a country's financial difficulty dealing with debt repayment.				
<i>External sector (capital account)</i>						
<i>Ratio of M2 to foreign exchange Reserves</i>		Captures to what extent the liabilities of the banking system are backed by foreign reserves. In the event of a currency crisis, individuals may rush to convert their domestic currency deposits into foreign currency, so that this ratio captures the ability of the central bank to meet their demands.				

					<i>Financial sector</i>			
<i>M1 and M2 growth</i>		These indicators are measures of liquidity. High growth of these indicators might indicate excess						
		liquidity which may fuel speculative attacks on the currency thus leading to a currency crisis.						
	<i>M2 money multiplier</i>	An indicator associated with financial liberalization. Large increases in the money multiplier can be explained by draconian reductions in reserve requirements.						
<i>Ratio of domestic credit to GDP</i>		Very high growth of domestic credit may serve as a crude indicator of the fragility of the banking system. This ratio usually rises in the early phase of the banking crisis. It may be that as the crisis unfolds, the central bank may be injecting money to the bank to improve their financial situation.						
	<i>Excess real M1 Balance</i>	Loose monetary policy can lead to currency crisis.						
	<i>Domestic real interest rate</i>		Real interest rate can be considered as proxy of financial liberalization, in which the liberalization process itself tends to lead to high real rates. High real interest rates signal a liquidity crunch or have been increased to fend off a speculative attack.					
<i>Lending and deposit rate spread</i>		An increase of this indicator above some threshold level possibly reflects a deterioration in credit risk as banks are unwilling to lend or decline in loan quality.						
<i>Commercial bank Deposits</i>			Domestic bank run and capital flight occur as crisis unfolds.					
	<i>Ratio of bank reserves to bank Assets</i>	Adverse macroeconomic shocks are less likely to lead to crises in countries where the banking system is liquid.						
<i>Domestic real and public sector</i>								
<i>Ratio of fiscal balance to GDP</i>		Higher deficits are expected to raise the probability of crisis, since the deficits increase the vulnerability to shocks and investor's confidence.						
	<i>Ratio of public debt to GDP</i>	Higher indebtedness is expected to raise vulnerability to a reversal in capital inflows and hence to raise the probability of a crisis.						
	<i>Growth of industrial</i>	Recessions often precede financial crises.						



<i>production</i>												
			Burst of asset price bubbles often precede financial									
<i>Changes in stock</i>			crises.									
<i>Prices</i>												
			The inflation rate is likely to be associated with high									
			nominal interest rates and may proxy macroeconomic									
<i>Inflation rate</i>			mismanagement which adversely affects the economy									
			and the banking system.									
			High income countries may be less likely to reschedule									
			their debt than poorer countries since the costs of									
			rescheduling would tend to be more onerous for more									
<i>GDP per capita</i>												
			advanced economies. Deterioration of the domestic									
			economic activity are expected to increase the									
			likelihood of a banking crisis.									
<i>National saving</i>			High national savings may be expected to lower the									
<i>Growth</i>			probability of debt rescheduling.									
<i>Unemployment rate</i>			The unemployment rate is the share of the labor force that is jobless,									
			expressed as a percentage.									
<i>Government</i>			Are the current spending and investment by central									
<i>expenditure</i>			government and and local authorities on the provision of									
			social goods and services.									
			<i>Global economy</i>									
<i>Growth of world oil</i>			High oil prices are associated with recessions.									
<i>Prices</i>												
			International interest rate increases are often associated									
			with capital outflows.									
<i>US interest rate</i>												
			Higher foreign output growth should strengthen									
<i>OECD GDP growth</i>			exports and thus reduce the probability of a crisis.									

Source: Racickas, E. & Vasiliauskait, A., 2012. Model of Financial Risk Contagion, 17(1), pp. 95-97.

Of these, we tried to choose three indicators that would correlate with financial integration to see the relationship between the two phenomena. The two indicators are: government expenditure, inflation rate and unemployment rate. We chose these variables because government expenditures are very important to ensure the well-being of the population, and the living standards, which leads to the reduction of migrations and favors economic growth. Also the unemployment rate is an important indicator because it specifies the percentage of the unoccupied population, which requires employment. The employment of the population is very important because it leads to the growth and development of the economy as a whole and to the maintenance of financial stability. The inflation rate is also important because it affects the economy and the banking system. As

independent variables, we used also the Banks Z score, which is a measuring indicator of bank's solvency risk, It explicitly compares buffers (capitalization and returns) with risk (volatility of returns), and because of this it can be used as an indicator of financial contagion. Also, as control variable we used public debt, which is a good way for countries to get extra funds to invest in their economic growth. They were the independent variables. The dependent variable was the financial integration, expressed by gross capital formation. For financial integration we used gross capital formation because, according to the literature, this is an important indicator of stock market integration. Also, based on a previous study, we found that it is the most important factor through which financial integration influences economic growth. We created a two dummy variables, crisis, which take the value 0 before 2008 and 1 otherwise, and euro zone, which take the value 0 for the non-euro zone countries and the value 1 for the euro zone countries.

**Table 2 Results of regression estimation of gross capital formation and the independent variables for the EU 28**

Variables	Model 1	Model 2	Model 3
C	31.32788***(1.468650)	36.93665***(1.297653)	33.72442***(1.246629)
Crisis			-2.424302***(0.360804)
Eurozone		0.368169(0.362471)	
Bank's Z score	-0.001299***(0.000327)	-0.001612***(0.000357)	-8.29E-05***(2.32E-05)
General government expenditure	-0.105075***(0.032512)	-0.267224***(0.026907)	-0.172170***(0.027032)
Inflation rate	0.090488*(0.046827)		
Public debt	-0.049655***(0.006458)		
Unemployment rate	-0.156437***(0.038963)	-0.265005***(0.039548)	-0.204177***(0.039667)
R-squared	0.351851	0.253685	0.310718
Adjusted R-squared	0.344023	0.246492	0.304074
Total panel (balanced) observations	420	420	420
Standard error in parentheses, *** p<0.01, ** p<0.05, * p<0.1			

Source: Author calculation

In the table no.2 we can see the results of the regression analysis. In the first model, as it can be seen the variables which refers to financial contagion (unemployment rate, government expenditure, bank's Z score) are significant and negatively correlated with the variable which refers to financial integration (gross capital formation), which means the higher is the level of unemployment rate, government expenditure, or bank's Z score, the lower is the level of gross capital formation, this being demonstrated by the probability of T-test statistic (< 0.05) and the negatives values of the variables

coefficients. Also in the first model we can see that the public debt has a significant and negative influence on the gross capital formation, and the inflation rate does not have a significant influence. In the second model, we can see that the dummy variable EUROZONE does not have a significant influence on the dependent variable, so we can say that the independent variables have a greater influence on the dependent variable in the non-euro zone countries. In the third model, we can see that the dummy variable CRISIS has a significant and negative influence on the dependent variable, so we can say that the independent variables have a greater influence on the dependent variable in the post-crisis period. Thus we can say that the two phenomena, financial integration and financial contagion are inversely proportional, financial contagion having a negative influence on the financial integration. Because of this others authors (Chiwira and Tadu, 2012) stated that financial contagion is considered a cost of financial integration.

**Table 3 Pearson's Correlations**

		Gross capital formation	General government expenditure	Unemployment rate(% of labor force)	Inflation rate	Public debt	Banks Z score	Z
Gross capital formation	Pearson Correlation	1	-,383**	-,254**	,251**	-,537**	-,084	
	Sig. (2-tailed)		,000	,000	,000	,000	,085	
	N	420	420	420	420	420	420	
General government expenditure	Pearson Correlation	-,383**	1	-,030	-,354**	,565**	-,195**	
	Sig. (2-tailed)	,000		,535	,000	,000	,000	
	N	420	420	420	420	420	420	
Unemployment rate(% of labor force)	Pearson Correlation	-,254**	-,030	1	-,065	,253**	-,082	
	Sig. (2-tailed)	,000	,535		,181	,000	,094	
	N	420	420	420	420	420	420	
Inflation rate	Pearson Correlation	,251**	-,354**	-,065	1	-,249**	,000	
	Sig. (2-tailed)	,000	,000	,181		,000	,994	
	N	420	420	420	420	420	420	
Public debt	Pearson Correlation	-,537**	,565**	,253**	-,249**	1	-,078	
	Sig. (2-tailed)	,000	,000	,000	,000		,110	
	N	420	420	420	420	420	420	
Banks Z score	Pearson Correlation	-,084	-,195**	-,082	,000	-,078	1	
	Sig. (2-tailed)	,085	,000	,094	,994	,110		
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	N	420	420	420	420	420	420
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	N	420	420	420	420	420	420
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	N	420	420	420	420	420	420
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	N	420	420	420	420	420	420
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	Sig. (2-tailed)	,085	,000	,094	,994	,110	
	N	420	420	420	420	420	420

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Author calculation

In base of Pearson's correlation coefficient that is the covariance of the two variables divided by the product of their standard deviations, we relate the results of our test. Depending on the size of Pearson between of the six variables, we can see that it is a low negative correlation between the dependent variable, gross capital formation, and the independent variables (general government expenditures, unemployment rate, and public debt) for a risk of 1%. The negative correlation means that as one independent variable increases in value, the dependent variable decreases in value. This justified the earlier claim that financial integration and financial contagion are inversely proportional.

## 5. CONCLUSIONS

Both financial integration and financial contagion are multivariate processes which were strongly debated in the literature until the present. The most authors have dealt with the definition of the two concepts and then with the search of different methodologies to measure separately each phenomenon. The main ideas discovered by the literature were that financial contagion is the most important cost of financial integration, because the financial integration helps to diversify risk but also may increase the transmission of crisis. The crisis contagion poses a systemic threat to the stability of the global financial system.

Because the empirical studies realized so far on this subject have used methodologies that measured separately the two phenomena, not their relationship, we did a regression analysis which suggest the fact that the factors used, have what can be considered as the expected significant coefficient signs, there is a significant relationship between the variables, namely financial integration, expressed by gross capital formation, and financial contagion, expressed by general government expenditure, unemployment rate, bank's Z score, public debt, and also financial integration and financial contagion are inversely proportional, financial contagion having a negative influence on the financial integration. Also, the results show that the independent variables through which financial integration affects financial contagion have a greater influence in the post-crisis period and in non-euro zone countries. So, the fiscal policies should search measures for reduce the risk of crisis transmission (which determines the financial contagion), and for increase the benefits of financial integration, with the desire of financial stability.

The phenomenon of financial integration can move as a mechanism in which a crisis can be transferred, and the financial stability can be attained. This thing leads to the affirmation of the idea that a deeper financial integration lead to a greater cost of financial contagion, implying a concession between them.

We will concentrate the future research directions on this topic to find others methodologies through which can be measured the relationship between the two, phenomena, financial integration and financial contagion.

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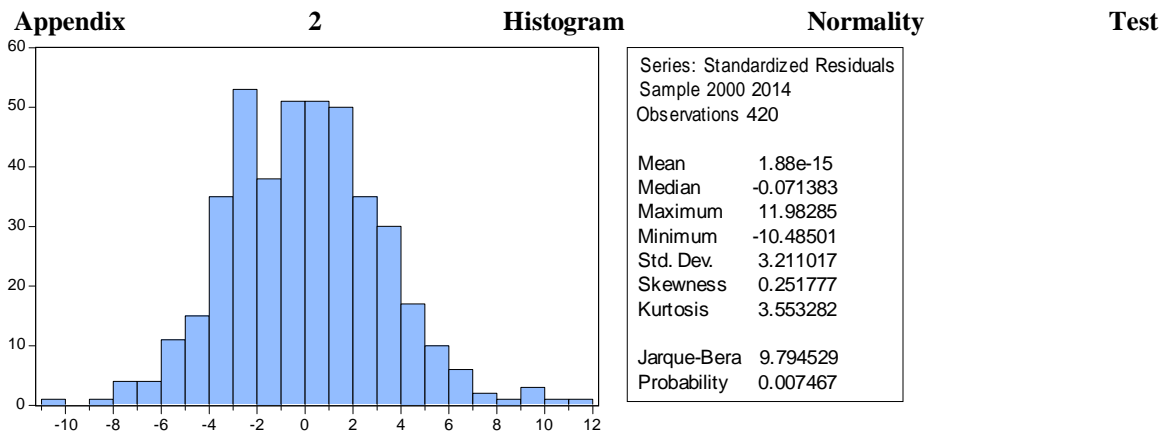
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**Appendix**

**Appendix 1 Descriptives statistics**

	GROSS_CAPITAL_FORMATION	BANKS_Z_SCORE	GENERAL_GOVERNMENT_EXPENDITURE	INFLATION_RATE	PUBLIC_DEBT	UNEMPLOYMENT_RATE
Mean	22.61019	169.4352	44.54952	3.055896	54.39952	9.000714
Median	22.12500	25.90809	44.70000	2.450731	49.35000	7.850000
Maximum	38.40000	4628.803	65.30000	45.66659	179.7000	27.50000
Minimum	10.82000	-222.2614	32.10000	-4.479938	3.700000	1.900000
Std. Dev.	3.988460	496.2831	6.419925	3.630506	31.44322	4.325412
Skewness	0.681334	5.330456	0.075761	6.184820	0.856701	1.419245
Kurtosis	4.585876	35.77721	2.500880	62.20738	4.003134	5.315914
Jarque-Bera	76.50763	20790.01	4.761392	64024.14	68.98548	234.8585
Probability	0.000000	0.000000	0.092486	0.000000	0.000000	0.000000
Sum	9496.280	71162.77	18710.80	1283.476	22847.80	3780.300
Sum Sq. Dev.	6665.373	1.03E+08	17269.27	5522.661	414255.3	7839.150
Observations	420	420	420	420	420	420

Source: Author calculation



Source : Author calculation

**Appendix 3. One-Sample Test ANOVA**

	Test Value = 0.05					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Gross capital formation	115,921	419	,000	22,560	22,18	22,94
General government expenditure	142,053	419	,000	44,4995238	43,883766	45,115281
Unemployment rate(% of labor force)	42,409	419	,000	8,9507143	8,535849	9,365580
Inflation rate	16,968	419	,000	3,0059	2,658	3,354
Public debt	35,424	419	,000	54,350	51,33	57,37
Banks Z score	6,995	419	,000	169,3851771	121,784924	216,985430

Source: Author calculation



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