



FINANCIAL SYSTEMS INTEGRATION: A LITERATURE SURVEY

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Abstract

This theoretical study examines the concept of financial systems integration based on a critical analysis of numerous research studies published in the literature. A complex summary of multiple studies provides the necessary knowledge for more proper understanding of financial integration, within the European Union and, in particular, in the Euro area. The findings contribute to synthesize in an organized and integrated manner already published materials regarding financial systems integration. Moreover, this analytical assessment is essential when engaging in quantitative research studies.

Key Words: Financial Integration, Financial System, European Union, Euro Area, Financial Stability, Literature Studies;

I. INTRODUCTION

Integration is an essential pillar of robust growth. In addition, it provides a real recovery of gaps compared to developed countries. In fact, integration is at the core of the European Monetary Union project. The importance of integration within a monetary and economic union is supported by numerous studies in the literature (European Council, 1989, Eichengreen, 1991, Bayoumi and Eichengreen, 1994, Dobrinsky and Havlik, 2014, Praet, 2014, Franks et al. , 2018).



In our opinion, the integration of financial systems, together with economic convergence, are the most important mechanisms in the integration process.

The importance of financial integration is also recognized by the EU authorities. To this end, the authorities have taken steps to reform the financial system (creation of the banking union, resolution mechanisms, etc.) and, implicitly, in order to increase the degree of integration within the EU and, in particular, in the Euro area. In recent years, the European Commission has proposed about 50 legislative and non-legislative measures¹, the main purpose of which is to create a more integrated financial system in the European Union and to improve the degree of financial stability. The measures proposed by the European Commission have been delineated in three main pillars: i) new rules for the global financial system; ii) creation of a solid, responsible financial system that will help boost growth in the EU; iii) completing the banking union and strengthening the Euro. Through these legislative initiatives, the financial systems in the European Union, at least in terms of regulation, should become more integrated, the development gaps should be reduced and financial stability should become more robust.

Under these circumstances, we propose to analyze in detail the literature on issues related to the integration of financial systems. The integration of financial systems is one of the most dynamic topics addressed in the literature. The high number of studies can be explained either by the different nature of the sample being studied and the objectives proposed, or by the importance that financial systems have in the macroeconomic framework.

II. FINANCIAL SYSTEMS INTEGRATION: A SURVEY

Taking into account the studied sample, most studies analyzing the integration of financial systems focus on a regional sample: Dajcman et al. (2012); Lee and Mercurelli (2014); Oplotnik et al. (2011); Casu and Girardone (2010); Pozzi and Wolswijk (2012); Berben and Jansen (2009); Kenourgios and Samitas (2011); Higson et al. (2013); Worthington and Higgs (2010); Askari and Chatterjee (2005); De Guevara et al. (2007); Pungulescu (2013) - Europe; Chi et al. (2006); Yu et al. (2010); Park and Lee (2011); Ji (2011); Holmes et al. (2011); Narayan et al. (2014) - Asia.

Of the studies mentioned, a significant number of studies limited the sample to emerging financial systems in Europe: Kenourgios and Samitas (2011); Guesmi and Nguyen (2014); Horvath and Petrovski (2013); Caporale and Spagnolo (2012); to developed financial systems in Europe: Lee and Mercurelli (2014); Pozzi and Wolswijk (2012); Berben and Jansen (2009); Worthington and Higgs (2010); De Guevara et al. (2007).

In literature, there are also a number of studies that analyze the degree of integration of financial systems at international level: Morana (2008); Kenourgios and Padhi (2012); Fung (2009); Herrmann and Winkler (2009); Bruno et al. (2012); Heckelman and Mazumder (2013); Tam and Tam (2012); Wang and Moore (2012); Claeys et al. (2012); Chambet and Gibson (2008); Volosovych (2011); Frijns et al. (2012).

A second criterion for the delimitation of studies on the integration of financial systems is the segment in the financial system under review. Thus, most of the studies in this segment investigate the integration of: (i) stock exchange - Dajcman et al. (2012); Morana (2008);

¹ https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-reforms-and-their-progress_en.



Kenourgios and Padhi (2012); Tam and Tam (2012); Chi et al. (2006); Kenourgios and Samitas (2011); Higson et al. (2013); (ii) bond market - Herwartz and Roestel (2011); Kiran (2012); Pozzi and Wolswijk (2012); Berben and Jansen (2009); Ji (2011); (iii) interest rates - Oplotnik et al. (2011); Claeys et al. (2012); Holmes et al. (2011); Arnold and Van Ewijk (2014); Rughoo and Sarantis (2012); Rughoo and Sarantis (2014). In addition, there are studies that also look at other segments of the financial system, such as the integration of CDS quotations (Wang and Moore, 2012); the integration of the mortgage market (Stephens, 2000; Kim and Rous, 2012) or the integration of the insurance market (Apergis et al., 2012).

In general, the number of studies investigating the integration of banking systems, with reference interest rates, is limited. From our knowledge, the most representative in this respect are: Sørensen and Werner (2006); De Guevara et al. (2007); Oplotnik et al. (2011); Rughoo and Sarantis (2012); Rughoo and Sarantis (2014); Arnold and van Ewijk (2014); Paries et al. 2014).

As we can see, in the literature there is a significant number of studies investigating the integration of financial systems. In order to observe the objectives of these studies and the results obtained, we selected some of them and presented some descriptive elements in Table 1. In the analysis of the studies, we had as criteria the sample used, the method, and the main results.

The results obtained in the studies in Table 1 are mixed. The differences between the results obtained are determined by the different time sample or the different methodologies applied. Thus, some studies indicate the integration of stock exchanges - Morana and Beltratti (2008), Fonseca (2008), Berben and Jansen (2009), Bruno et al. (2012), Wälti (2011), Büttner and Hayo (2011), Babetskii et al. (2008); Syllignakis and Kouretas (2010); Kenourgios and Samitas (2011). In other studies, the results show convergence for some stock exchanges and divergence for others -Guesmi and Nguyen (2014), Savva and Aslanidis (2010), Chambet and Gibson (2008). In the case of the bond market, most studies have indicated convergence (Kim et al., 2006; Berben and Jansen, 2009, Herwartz and Roestel, 2011, Volosovych, 2011, Kiran, 2012, Pozzi and Wolswijk, 2012). And in the case of interest rate convergence, the results are mixed. The high heterogeneity of financial system integration analysis and results can be seen in Table 1.



Table 1: Specialist literature studies analysing the integration of financial systems

Authors	Countries	Date and period	Method	Main results
Dajcman et al. (2012)	Slovenia, Czech Republic, Hungary, Austria, France, Germany and the United Kingdom	Daily output for stock exchange indices; 01/04/1997 - 12/05/2010	Wavelet analysis	The results show that stock exchanges in developed countries are more interdependent compared to Central and Eastern European stock exchanges. The latter have a lower synchronization degree, both with each other and with the stock exchanges in developed countries.
Lee and Mercuri (2014)	France, Germany and Italy	Industrial output, inflation rate and real effective exchange rate; January 1992 - June 2012	Model SVAR; DCC-GARCH	The adoption of the Euro led to an increase in the symmetry of shocks and accelerated the convergence process in the three analyzed countries. Also, even if the effects of the global financial crisis have affected this process, it continues to work.
Oplobnik et al. (2011)	EU15, EU10, Romania, Bulgaria, Croatia and Albania	Interest rate spread, industrial output, inflation rate, M1 monetary aggregate; January 1995 - December 2003	Convergence analysis model Ben-David (1995)	The results obtained by the authors indicate macroeconomic convergence in all three groups of countries (EU15, EU10 and Romania, Bulgaria, Croatia and Albania). Under these circumstances, the authors claim that the benefits of integration are positive.
Bruno et al. (2012)	23 OECD member countries	Bank deposit rates in GDP; public debt ratio in GDP; rate of private bonds in GDP; market capitalization compared to GDP; insurance market in terms of GDP.	Convergence β and convergence σ	The results indicate the existence of convergence β for the stock market and the insurance market. Instead, the authors obtain mixed results for securities and bank deposits, which imply differences in the degree of indebtedness and the role of banks in the countries under review.
Fung (2009)	57 countries	GDP per capita; loans granted to the private sector; quasi-money (M2 - M1)	Conditional convergence	The results support the hypothesis of conditional convergence. Thus, both developing and developed countries converge both in GDP per capita and in financial systems. The results also indicate that developing countries, which benefit from a developed financial system, are quicker to catch up with development countries.
Heckelman and Mazumder (2013)	Developed and developing countries (over 100 countries), grouped by regions	Financial liberalization index; 1973 - 2005	Convergence β	The results indicate that convergence exists in some regions, but developed economies and Sub-Saharan Africa countries do not converge. In addition, while for most countries there is evidence of convergence within the region, there are exceptions. The authors believe that the results indicate increased financial integration, given the homogeneity of reforms in this sector.
Tam and Tam (2012)	51 countries	Price per share - profit per share ratio, dividend per share - price per share ratio, and market value and book value of capitals ratio; January 1973 - July 2011	Convergence β , test log t, convergence σ	The results obtained by the authors indicate that the convergence process is one that varies over time. Capital markets in emerging countries are undergoing significant transformations in the recovery of gaps in developed markets. In addition, many global and idiosyncratic shocks affect the integration process.
Casi and Girardone (2010)	EU15	Bank efficiency; 1997-2003	Convergence β and convergence σ	The results indicate a convergence of banks' efficiency towards the EU average. However, there is no evidence to support an improvement in efficiency. Thus, the authors point to an integration by "lagging behind" and not an integration by recovering the gaps.
Fozzi and Wolswijk (2012)	Belgium, France, Germany, Italy and the Netherlands	Weekly yields on government bonds; 06-01-1995 to 25-12-2009	Spatial convergence models	The results indicate that idiosyncratic factors have disappeared until 2006 in most countries, but have re-emerged in Italy with the outbreak of the global financial crisis. The results also indicate that countries' exposure to international risk tends to converge. In conclusion, the degree of integration into the bond market has increased, but the effects of the crisis have had a reversal effect in some countries.
Berben and Jansen (2009)	Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, Switzerland, United Kingdom and the USA	Weekly yields for the stock market index; weekly yields on government bonds; 3/01/1980 - 24/12/2003	STC-GARCH	The results indicate an increase in timing for both stock exchanges and bond markets. Integrating stock exchanges is a more gradual process, compared to bond integration. In the opinion of the authors, the monetary union had a minor effect on the integration of stock exchanges and only affected the synchronization of correlations on the bond market, not its size.
Wang and Moore (2012)	38 countries	CDS Spread (credit default-swap) for government bonds; January 2007 - December 2009	DCC-GARCH	The results indicate that shocks generated by Lehman bankruptcy have led to increased integration, especially for developed markets. For both developed markets and emerging markets, low interest rates in the US are the main determinant of the high level of synchronization.
Clay's et al. (2012)	50 countries	Short-term and long-term interest rate, government debt, inflation rate, GDP; 1990-2005	Spatial model	The authors point out that there is a high degree of financial integration among Member States in the OECD, particularly between EU members. Also, emerging markets do not have a high degree of integration with international capital markets.



Authors	Countries	Date and period	Method	Main results
Kenourgios and Samitas (2011)	Turkey, Romania, Bulgaria, Croatia, Serbia, USA, Great Britain, Germany and Greece	Daily yield of stock market; January-February 2009	AG-DCC-GARCH	The degree of synchronization indicates that Balkan stock exchanges have become more integrated with international markets. The degree of integration has also increased at regional level.
Hieson et al. (2013).	26 EU countries	Monthly index of stock exchange, normalized; January 1985 - December 2007	Phillips and Sul Model (2007)	The results indicate the rejection of the convergence assumption for the EU stock exchanges. However, the model indicates the existence of three distinct convergence clusters. The authors point out that the single currency has not accelerated the integration of stock exchanges.
Worthington and Higgs (2010)	Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Spain and the United Kingdom	Stock exchange index; 1 January 1993 to 31 June 2006	Unit root tests; multivariate integration; Granger causality; VAR	The results highlight the existence of long-term equilibrium and short and long-term causal relationships between the studied markets. Under these circumstances, the authors consider that there is a high level of financial integration in the region.
Chambet and Gibson (2008)	25 emerging countries	Daily yield of stock market; 01/01/1995 - 30/06/2004	GARCH-M	The results show that emerging markets remain segmental and the degree of financial integration has diminished during the 1990s crises. In addition, the authors' analysis indicates that countries with a low degree of openness are more segmented and less integrated with the global market.
De Guevara et al. (2007)	EU15	Interest rate on loans for house purchase; interest rate on consumer loans; interest rate on short-term loans and on medium- and long-term loans to the non-financial sector; interest rate on time deposits; interest rate on government bonds; 1993-2000	Convergence σ ; the Lerner index	The authors point out that financial integration in the EU15 is incontestable, but it is uneven. Specifically, some of the most visible effects imply the reduction of interest rates and their convergence. However, although the integration process has manifested itself in both the bond market and the banking market, the integration speed is lower for the latter. Consequently, the authors conclude that the retail banking market has a lower level of integration than the wholesale market.

Authors	Countries	Date and period	Method	Main results
Volosevych (2011)	Austria, Belgium, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, USA	Monthly yield of government bonds; 1875 - 2009	PCA Correlation Index	The results obtained by the author indicate that the bond market integration in the analyzed countries is higher at the end of the 20 th century compared to previous periods. Also, the degree of financial integration evolved in the form of the letter "J", with a minimum point in the 1920s. Consequently, in the author's opinion, we can conclude that in recent times government bond yields had similar dynamics.
Fungulescu (2013)	EU15 (the old EU Member States); EU12 (new EU Member States)	Interest rate on the interbank market; interest rate on government bonds issued in the short and long term; stock market index; rate of investment in GDP; rate of savings in GDP;	Convergence β and convergence σ	The results are mixed. On the one hand, it indicates an increase in the degree of integration in the credit market, the bond market and the capital market both for the old EU and for the new EU countries. On the other hand, the effects of the financial crisis have led to a reversal of the integration process, with the divergence being present in both the EU15 and the EU12.
Kiran (2012)	Canada, France, Germany, Italy, Japan, United Kingdom, USA;	Return on government bonds with a maturity of 10 years; January 1990 - May 2010	ADF cointegration tests, unit root tests	The results show that interest rates are cointegrated for bivariate systems from Canada to France; Canada - Japan and Canada - United Kingdom and for a system consisting of four countries - Canada - USA - France - Great Britain. These records indicate the integration of those markets.
Guesmi and Nguyen (2014)	Czech Republic, Greece, Poland and Romania;	Monthly stock exchange yield; January 1996 - December 2007	CAPM model, HP filter	The results indicate that the integration of the Czech stock market with the regional market has increased in recent years, while Greece has seen a decline in integration. For Poland and Romania there is no pattern, indicating a low degree of integration with the regional market.
Horvath and Pehovskij (2013)	Czech Republic, Hungary, Poland, Croatia, Macedonia and Serbia	Daily yield stock market; January 2006 - May 2011	GARCH	The degree of synchronization and, implicitly, integration of the three markets in Central Europe with the STOXX Europe 600 index is much higher compared to the three countries in South-Eastern Europe, where the synchronization degree is close to zero. The financial crisis has not influenced the degree of synchronization between these groups of countries.



Authors	Countries	Date and period	Method	Main results
Kim et al. (2006)	France, Germany, Italy, Spain, UK, USA and Japan	Daily yield of stock market; daily yield of bonds with maturity at 10 years; 03/02/1994 - 19/09/2003	EGARCH	The results show an increase in integration between stock exchanges and bond markets. However, the degree of synchronization between stock exchanges and bond markets has fallen to zero, becoming even negative in some countries. This finding supports the assumption of investment in secure assets.
Büttner and Hayo (2011)	16 EU countries	Daily yield of stock market; exchange rate; January 1999 - December 2007	DCC-MGARCH	The results indicate the tendency of integrating stock exchanges, both in the old EU Member States and in the new EU Member States.
Syllignakis and Kouretas (2010)	Czech Republic, Estonia, Poland, Romania, Slovenia and Slovakia	Weekly stock exchange yield; 19/09/1997 - 07/11/2008	Model VAR, VECM	The results show that the level of financial integration of Central and Eastern European markets with global markets (Germany and the USA) has increased with EU adhesion. Consequently, the authors assert that the analyzed CEE markets are partially integrated at a global level. The authors point out that the effects of the global financial crisis have led to a reduction in the convergence process.
Caporale and Spagnolo (2012)	Czech Republic, Hungary and Poland	Weekly stock exchange yield; 12/01/1996 - 12/03/2008	VAR-GARCH	The results suggest that, as a result of the EU accession, regional synchronization has become stronger. The authors explain this trend by increasing the degree of integration of the three markets with the old EU member states.
Sørensen and Werner (2006)	Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands and Portugal	Interest rate on loans for house purchase; interest rate on consumer loans; interest rate on short-term loans and on medium- and long-term loans to the non-financial sector; interest rate on time deposits; interest rate on government bonds; January 1999 - June 2004	Unit root and cointegration tests, SURECM model	The obtained results indicate a high level of heterogeneity in the transmission mechanism from market rates to bank rates. Both the multiplier effect and the adjustment speed are different in the Member States studied, which implies a degree of interest rate fragmentation and a lack of integration in the Euro area. The authors explain the low degree of integration through the elements of each banking system.

Authors	Countries	Date and period	Method	Main results
Rughoo and Sarantis (2012)	EU15	Interest rate on term deposits from the non-financial sector with maturities of up to one year, between one and two years and over two years; the interest rate on loans to the non-financial sector with maturities of up to one year, between one year and five years and over five years; January 2003 - November 2011	Phillips and Sul Model (2007)	The empirical results indicate the convergence of the active and passive interest rates applied by banks to the non-financial sector by 2007. In contrast, after the outbreak of the 2008 financial crisis, the convergence hypothesis is rejected. Thus, although the authors identify a number of convergence clubs, the interest rate dynamics becomes very divergent. Moreover, the authors point out that the active interest rates are more heterogeneous compared to passive interest rates.
Rughoo and Sarantis (2014)	EU15	Interest rate on term deposits from households with maturities of up to one year, between one year and two years and over two years; the interest rate on consumer loans with a maturity of up to one year and between one and five years; the interest rate on loans for the purchase of houses with a maturity of up to one year, between one year and five years and over five years; January 2003 - December 2013	Phillips and Sul Model (2007)	Similarly to the results obtained for the non-financial sector, and in this case by 2007, the convergence process for interest rates applied by households of population is supported. However, the global financial crisis has had a negative effect on bank integration, so that after 2008 the convergence process turns into a divergence. And in this case, the credit market is more heterogeneous than the deposit market.
Arnold and van Eyck (2014)	Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands and Portugal	Interest rate on time deposits for the non-financial sector and for households; the interest rate on consumer credit and loans for the purchase of dwellings for households; the interest rate on loans to the non-financial sector; January 2003 - November 2013	Convergence β , convergence α , spatial model	The authors get evidence showing that the level of convergence was negatively affected by the global financial crisis and sovereign debt crisis. Under these circumstances, the authors quantified the influence of sovereign risk and credit risk in financial fragmentation. The results have shown that sovereign risk has a significant influence on increasing dispersion between asset and liability rates, while credit risk has a negligible influence.

Source: synthesis carried out by the author based on studies in the literature



In the literature, there are other studies that have analyzed the integration of banking systems in the European Union with other benchmarks. For example, among others, Kılınç et al. (2017) investigated the integration of banking systems in the EU, having as criteria financial development and liquidity; Weill (2009); Casu and Girardone (2010) analyzed the integration of banking systems in the European Union with reference to the efficiency of commercial banks; Evans et al. (2008) analyzed the influence of regulations on the level of integration of the banking systems in the EU; Pérez et al. (2005) investigated the integration of banking systems, given the cross-border financial flows and the activity of foreign-owned banks.

III. CONCLUSIONS

In this study, we intend to identify the main studies in the literature that have as main objective the analysis of the integration of financial systems. The main prerequisites for this objective are related to the importance of integration, mainly and financial integration in particular to the realistic development of economies.

The analysis carried out allowed us to identify a number of conclusions. Firstly, the number of studies analyzing the integration of financial systems is very high, which underlines the importance of the topic. Secondly, the investigated studies differ according to the criteria of the sample or the pillar of the analyzed financial system. Thirdly, the results of the studies are heterogeneous. Thus, on the one hand, integration of financial systems is indicated, and, on the other hand, a high degree of heterogeneity is integrated. In our opinion, the main explanation for the high heterogeneity of the results is related to the methodology, sample and period used. In these conclusions, we propose that, in a future study, we analyze the degree of financial integration in a sample of the Member States of the European Union.

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