

THE IMPACT OF REGULATORY QUALITY ON DEEPENS LEVEL OF FINANCIAL INTEGRATION: EVIDENCE FROM THE EUROPEAN UNION COUNTRIES (NMS-10)

Azra Ahmić¹, Ilma Isović²

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¹ International University Sarajevo, Faculty of Business and Administration, Sarajevo, Bosnia and Herzegovina

² International University Sarajevo, Faculty of Business and Administration, Sarajevo, Bosnia and Herzegovina

Corresponding Author:

Azra Ahmić

Email: azraahmic30@gmail.com

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ABSTRACT

This study seeks to empirically explore whether the regulatory quality in the NMS-10 impacts deepening international financial integration and whether the strengthening of regulatory quality for NMS-10 has a causal effect on the level of international financial integration (IFI) in NMS-10. The study covers NMS-10 between 1995 and 2020. The estimation of parameters was made with descriptive statistics, the Breusch-Pagan test, the Pesaran test, the Granger causality test, and OLS regression to analyze the impact of REQ on IFI. The findings of the study reveal that regulatory quality has a statistically significant effect in deepening the process of financial integration for both periods, in the pre-accession and post-accession EU process. In addition, the results demonstrate that the regulatory quality of NMS-10 provides sound laws and policies that support the business environment, encourage cross-bordering financial transactions. Moreover, the results of the Granger causality test show that the level of global financial integration is causally impacted by the improvement in NMS-10 regulatory quality. This indicates that regulatory effectiveness might predicts international financial integration.

Keywords: *regulatory quality, financial integration, international financial integration, Granger causality, New member states (NMS-10)*

1. INTRODUCTION

The late 1990s saw a rise in international financial integration, which was accompanied by an increase in international business and a loosening of regulations on domestic financial markets. Author Ristić (2020) pointed out that there has been a shift towards huge lessening of regulations on an international scale, allowing powerful corporations to take advantage of unlimited market freedom. Some experts believe that the liberalization of capital flows played a major role in this increased integration (Mirdala, 2008; Brezigar-Masten et al., 2011). Similarly, in terms of globalization, as the process of international integration of business, government, civilization and culture, whenever capital can move freely across borders, there is financial integration. Introduction of considerable amount of financial innovations in the recent decades accelerated the growth of financial markets and the types and volumes of businesses conducted in them (Bašić & Ćurić, 2021). Due to globalization of the financial market, business has become universal, competition has increased amongst non-banking financial entities and banks, and financial markets have been undergoing restructuring and consolidation (Vunjak, Dragosavac, Vitomir & Stojanović, 2020).

Integrating financial markets is seen as a way to promote economic growth. Financial integration refers to the process by which financial markets in one economy become more closely connected with those in other economies or with the global market. It leads to an increase in capital flows and a tendency for prices and returns on financial assets. Sharing equal levels of risk is another meaningful part of financial integration throughout the EU (Kreiken, 2017). There are some aspects that should be considered when discussing financial integration. The first is the independence of financial structures within a region, including all financial intermediaries, and how they interact with each other in terms of the flow of funds among households, governments, and corporations. The second aspect is that full financial integration requires equal access to banks or trading, clearing, and settlement platforms for both domestic and foreign investors and firms.

Financial integration can take many forms, not just the integration of financial markets and services. These forms do not need to be linked and are not necessarily incremental steps in the integration process. According to Liebscher et al. (2007), integration can take many forms and have different aspects such as: (1) Monetary union through currency union or dollarization; (2) Liberalization of capital movement; (3) Outsourcing financial services or infrastructure abroad; (4) International entry of financial institutions; (5) Regulatory convergence and harmonization.

Recently, many countries have been working towards adhering to EU standards in order to improve political stability and economic growth. Even though some progress has been made, there are still economic disparities between countries. It will take a while for these countries to catch up and close the gap in economic development with EU member states. Despite this, there is still a push to align with EU standards for political stability and economic development (Ganić, 2020a).

Research has shown a link between foreign direct investment and economic growth. However, the relationship between financial integration, financial development, and economic growth is a subject of debate and no clear consensus has been reached. One of the initial studies on financial integration was done by Feldstein and Horioka in 1980, which examined the relationship between domestic savings and investment in the context of financial integration during the 1970s. They also studied the long-term effects of capital market liberalization on the relationship between investment and saving in OECD countries (Ganić, 2020a). To open up the domestic economy and attract foreign capital, a favorable regulatory environment must be in place. Without a suitable regulatory environment, financial integration and access to foreign capital flows will not occur (Mishkin, 2007).

In the recent years, there has been a growing interest in the field of economics on the relationship between the quality of regulation and financial integration. It is acknowledged that clear and well-defined regulations can promote business and facilitate the integration of the national economy with the rest of the world, leading to financial integration and a lower cost of capital. Despite the various theoretical approaches and empirical studies on this topic, this study aims to understand the process of financial integration and the quality of regulation through an empirical analysis. The main objective of this paper is to provide an analytical framework for financial integration and regulation by comparing the previous development and current level of financial integration in the NMS-10.

This study conducts an empirical investigation of the link between quality regulation and international financial integration in NMS-10 countries (Cyprus, Czech Republic, Malta, Slovenia, Slovakia, Poland, Latvia, Lithuania, Estonia, and Hungary) in pre-EU and post-EU accession process. The countries chosen for this research are those that joined the EU in 2004, which represents the biggest enlargement in the history of European integration. It is worth noting that these countries had a tumultuous history under communism, which affected their economic and financial performance. The enlargement of the EU through the accession of NMS-10 European countries is an important policy tool used by the EU to promote stability, security, conflict prevention, and increased economic prosperity.

The study aims to conduct an empirical investigation and progress that has been made toward

harmonization business environment in NMS-10 and discusses about empirical and theoretical literature related to the role of quality regulation in deepening of international financial integration. The research objectives of this study are:

To investigate whether the regulatory quality in the NMS-10 impacts deepening international financial integration.

To investigate whether the strengthening of regulatory quality for NMS-10 has a causal effect on the level of international financial integration in NMS-10.

Due to this phenomenon, the research aims to explore and explain, through previous studies and statistical information obtained through secondary official sources a link between international financial integration and quality regulation in NMS-10.

2. LITERATURE REVIEW

The process of financial integration in Europe began several decades ago with the Treaty of Rome in 1957 which set out the foundation for creating a single European market for financial services. The use of the Euro in 1999 also played a significant role in furthering financial integration within the European Union, as it is a key aspect of a common financial system and promotes financial integration. Studies have demonstrated that the Euro served as a strong incentive for financial integration in Europe (Liebscher et al., 2007). By exiting the Eurozone, the European Union would lose credibility and threaten its ability to financially integrate and cooperate with other countries, diminishing its impact in acceding membership countries regarding the consolidation of European democracy (Aslett & Caporaso, 2016).

Cross-border or international financial integration is considered as the most important form of financial integration. In recent years, one of the most notable developments in the financial market has been the trend towards internationalization, financial innovation, and securitization. These developments are interrelated, but internationalization has played a vital role in creating conditions that allow for financial innovation and securitization. The level of international financial integration can be measured by various indicators that promote the free flow of capital and financial services across national borders (Ganić, 2020a).

Establishing a standard measure of financial integration represents a real challenge. One of the reasons is that there are different types of financial transactions, complex regulations in some countries that make it hard to measure differences in barriers to international capital flows across countries.

There are several ways to measure the level of financial integration in literature, mainly related to expanding investment opportunities. For example, Bekaert et al. (2013) studied equity, Christiansen (2014) looked at bonds, and Sander & Kleimeier (2004) examined the banking sector. These studies examined the empirical characteristics of asset price convergence and changes related to significant policy or institutional changes. In addition to using equity markets and debt indicators for measuring financial integration, Kreiken (2017) emphasized also merger and acquisition cross-border activities as part of corporation's decision-making process.

Previous studies have demonstrated that countries with comparable financial regulations encounter fewer obstacles with regards to obtaining information and have lower expenses associated with compliance. This results in increased cross-border investment (Okawa and Wincoop, 2012). The research suggests that variations in regulations impose additional expenses on businesses as they are required to invest more effort in understanding and implementing new laws and regulations.

Some empirical studies, such as the one by Kalemli-Özcan et al. (2010) have established a correlation between EU financial regulation and the growth of cross-border banking and financial operations. Similarly, Hail and Leuz (2006), La Porta, Lopez-de-Silanes, and Shleifer (2008) have found that improved regulatory quality and legal institutions result in better protection for outside investors and lower costs of capital.

However, some empirical studies have also suggested that variations in the quality of regulations and laws can result in the distortion of capital flows between countries or the movement of capital from jurisdictions with more restrictive requirements to those with less restrictive requirements (Houston et al. 2012; Bremus and Fratzscher, 2015).

Additionally, some literature studies have examined the factors that influence asset price convergence and divergence in Europe, with a specific focus on a particular type of asset. For instance, Bekaert et al. (2013) concentrate on equity, Christiansen (2014) on bonds, and Sander & Kleimeier (2004) on the banking sector. These studies have analyzed the empirical characteristics of asset price convergence as well as structural changes linked to significant policy or institutional changes. This approach provides a more comprehensive understanding of how certain types of assets and markets are affected by financial integration and any potential changes in policy or institutions.

In addition, Aizenman et al. (2012) investigated the relationship between economic growth and lagged international capital flows, with a focus on foreign direct investment, portfolio investment, equity investment, and short-term debt. The study included a sample of 100 countries between 1990 and 2010. The findings indicate that the coefficient of portfolio investment is negative and not statistically significant.

However, Vo and Daly (2004) performed a study that looked into potential factors of international financial integration, including capital control policies and other components of financial structure such as level of economic and educational development, economic growth, institutional and legal environment, trade openness, financial development, and tax policy. The study employed GDP as a control variable to assess the impact of economic growth on the level of international financial integration. Vo found that variables such as GDP and economic growth are likely drivers of international financial integration.

Milesi-Ferretti and Lane (2003) examined the trends in international financial integration using a sample of 18 member countries of the Organization for Economic Cooperation and Development (OECD) from 1978 to 2001. They analyzed the behavior of the rates of return on foreign assets and liabilities and compared them to “market” returns. The study used three indicators of domestic financial development - the ratio of liquid liabilities to GDP, the ratio of stock market capitalization to GDP, and the ratio of cumulative privatization revenues to GDP - as potential factors that may contribute to economic growth. The regression results indicate that the ratio of liquid liabilities to GDP is positive and statistically marginally significant.

Overall, the existing literature generally supports the idea that financial integration within the Eurozone is apparent and increasing. However, the evidence on financial integration between the groups of old and new EU member states is more varied. The European Commission (2009) concludes that integration between the old and new parts of the EU has been advancing rapidly, but in a different form than that among the Eurozone members. This suggests that while financial integration is happening, it may be taking different forms or progressing at different rates among the different groups of EU member states.

Recent studies have found a number of variables, such as a country’s level of trade openness, the size of its market, and the depth of its financial markets, that have a significant impact on international financial investments (IFI). These include studies by Alfaro et al. (2006), Vo and Daly (2007), Aizenman and Noy (2004), and Ganić (2020a). Alfaro et al. (2006) specifically looked at the relationship between highly developed financial markets and foreign direct investment (FDI) inflows for 20 developed countries and 51 developing countries between 1975 and 1995. Their findings indicate that there is a statistically significant link between advanced financial markets and FDI inflows.

Several studies have aimed to understand the factors that influence international financial integration in countries undergoing transition (Voronkova, 2004; Kučerová, 2009; Rusek, 2005). Voronkova (2004) used Gregory and Hansen’s co-integration approach to examine the effects of IFI in several European countries including the Czech Republic, Hungary, Poland, the United Kingdom, France,

Germany, and the United States, and found that the markets in Central and Eastern Europe (CEE) were becoming increasingly integrated with the global economy. In recent years, economists have identified certain “drivers” or variables that accelerate IFI, including capital account liberalization, the level of financial development and access to international markets, a country’s level of risk, and the absence of perfect capital mobility.

Kučerová (2009) used panel regressions and harmonized data between 1994 and 2006 to study the degree of financial integration in eight new EU member states (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia). The study focused on changes in a country’s financial position abroad, using foreign assets and liabilities as dependent variables. The research found that the explanatory variables, real GDP per capita and international trade, were statistically significant in determining the level of financial market integration in these new EU member states.

Furceri et al. (2012) aimed to study the medium-term factors that influence foreign investment positions in a sample of 70 developed and developing countries, as a general view of international financial integration. They found that changes in institutional quality, capital account openness, financial liberalization, and domestic financial development all have an impact on capital flows.

Alotaibi and Mishra (2015) used external assets and liabilities positions as a dependent variable to study the financial integration in seven Gulf Cooperation Council (GCC) countries between 1980 and 2010. They found that several factors, such as domestic credit, financial openness, and trade openness, have a statistically significant impact on the level of global financial integration in the GCC region.

Ganić and Hrnjić (2021) examined the relationship between international financial integration and growth in ten Central and Eastern European (CEE) countries between 1995 and 2017. Their findings revealed a reversal relationship between growth and international financial integration, measured by Gross Foreign Assets and Liabilities to GDP. The study suggests that the effect of international financial integration can boost a country’s growth in the CEE-10 countries, but only at a higher level of financial integration.

3. DATA AND METHODOLOGY

3.1. DATA

As stated in the introduction, the empirical analysis covers ten European countries that accessed the EU in 2004 (NMS-10: Cyprus, Czechia, Malta, Slovenia, Slovakia, Poland, Latvia, Lithuania, Estonia, and Hungary). The study uses one dependent proxy variable to measure the level of international financial integration, such as the international financial indicator (IFI 1) in NMS-10, then the independent variable: regulatory quality, and the control variable: economic growth (GDP). Further, to understand the correlation, it is important to define the regulatory quality. It represents the implementation and adoption of sound laws and policies are important together with regulative mechanisms that will carry this out and provoke good incentives to private sectors. This variable is included because regulatory quality tends to strengthen property rights’ protections, thus enhancing the confidence and level of international financial integration. Also, it means that government will be able to create and implement sound policies to act in the interest of citizens primarily but also that the government will make hard work to accomplish always better and more efficient yet ethical business environment.

3.2. SPECIFICATION

In this study, NMS-10 countries are explored to be the subject of empirical analysis. The study uses secondary data to explore the relationship between the quality of regulation and international

financial regulation. Breusch-Pagan and LM tests are utilized in this study to validate the study and provide a more accurate estimation. The model employed in this study is based on data from the World Bank, IMF, and OECD, and panel data techniques were utilized to estimate the results. Additionally, descriptive statistics estimations are used to compare the performance of the selected NMS-10 countries, and OLS regression is used to assess the impact of the independent variable REQ on the dependent variable IFI 1, keeping the control variable GDP. In addition, Granger's Causality test is used for determining causality among dependent and independent variables.

Previous research has extensively examined cross-sectional dependence, which refers to the interaction between different cross-sectional units, such as households, firms, states, etc. Furthermore, this research has concentrated on cross-sectional dependence among unobservable common variables in economics. Thus, this study proposed three tests. One of them is the **Breusch-Pagan Test (1979)** which was developed by Trevor Breusch and Adrian Pagan. The Breusch-Pagan Test assumes that the error terms are normally distributed and is utilized to check for heteroskedasticity in a linear regression model. It examines if the values of the independent variables have any impact on the variance of the errors resulting from a regression.

The Lagrange multiplier (LM) test, developed by Breusch and Pagan in 1980, is a method that assesses the level of correlation between residuals by taking the average of the squared pair-wise residual correlation. In addition, the Pesaran CD-test from 2004, is used to identify whether there is correlation between variables or residuals in a dataset that is organized in a panel format. This test was also employed in this study. The study focuses on using ordinary least squares regression (OLS), a widely used technique for determining the coefficients of linear regression equations, which show the relationship between a dependent variable and one or more independent quantitative variables. This can include simple linear regression or multiple linear regression.

This study also employs the Granger causality test, which is an econometric technique used to establish if one variable can be used to predict another. The Granger causality test is used to investigate the forecasting capability of one variable and does not provide an understanding of the true causal relationship between two variables. Therefore, it is particularly useful when the data is stationary and the focus is on forecasting performance rather than the underlying theoretical model.

3.3. DEFINING VARIABLES

The author created financial indicators that test financial uprising and flow pre and post the EU accession process. The level of financial integration can be evaluated by using the IFI 1 indicator, which measures the ratio of a country's assets and liabilities to its GDP. This indicator is commonly used to gauge the level of financial integration and openness in a country, and has been used in various studies to assess financial integration (Vo & Daly, 2004; Bekaert et al., 2005; Ganić and Hrnjić, 2021).

As capital flows become more fluid, international financial integration tends to improve. Capital account openness represents the degree to which a country allows the free flow of capital in and out of its economy. This can be measured by the ratio of foreign assets and liabilities to GDP, or by the degree to which a country has removed restrictions on foreign investment.

Regulatory Quality (REQ) – The significance of this indicator is vital for both economic growth and financial integration in different countries. Additionally, the capacity to govern complex, open, and varied communities and economies is crucial. Regulatory systems have played a vital role in the development of democracy and the modern state as it enables decision-makers to reconcile conflicting interests. The data for Regulatory Quality (REQ) are sourced from the WGI database. The quality of regulation is demonstrated in the application of regulations that make it easy to conduct business, such as starting a new business, paying taxes and investing. If a country has policies that encourage business investment, it will attract foreign investment and promote financial openness.

Historically, regulatory systems have grown organically and spread into new sectors in response to issues and the complexity of social and economic activities. Improving regulation is a key goal of public-sector management reform, as it is essential for society and the economy as a whole. Researchers from the OECD (Rodrigo, 2005) have made this claim after assessing the quality of regulatory systems in member nations. Studies have shown that effective regulation is necessary for boosting economic performance and improving the quality of life for citizens. The regulatory variable is used in this study as previous research by Hail and Leuz (2006), Porta & Shleifer, (2008) support its use in determining financial integration.

A control variable in the model, the GDP Growth Rate, measures how the nation's Gross Domestic Product (GDP) has changed over time. An indicator of the country's economic health and potential future growth is the amount of change, which is expressed in (percentage). In research, a control variable is a factor that is held constant or kept within certain limits in order to isolate its impact on the results. Even if it is not directly related to the goals of the study, it is kept under control because it may have an effect on the outcome. The selection of the control variable can be influenced by the relationship between economic growth and factors such as financial integration and regulatory quality. Determining the causal impact of regulatory quality on financial integration is a key aspect of the analysis. A number of recent studies, such as those by Vo and Daly (2004), Kučerová (2009), Ganić (2020b), Ganić and Hrnjić (2021), have also used this variable in their models of the factors affecting international financial integration.

3.4. METHODOLOGY

The study explores a level of financial integration in NMS-10 countries in the last 25 years. In fact, the study compares two sub-periods: the EU pre-accession period from 1995 to 2004 and the EU post-accession period from 2005 to 2020. The year 2004 marks the EU accession of these countries. The analysis includes the following NMS-10 countries: Cyprus, Czech Republic, Malta, Slovenia, Slovakia, Poland, Latvia, Lithuania, Estonia, and Hungary.

In the following there are hypotheses that are tested through this research:

H0: There is no statistically significant relationship between regulatory quality and the level of international financial integration in NMS.

H1: There is a statistically significant relationship between regulatory quality and the level of international financial integration in NMS.

If all considered determinants are taken into consideration, below we present the initial theoretical model for determining the impact of regulatory quality and growth on the level of international financial integration. The study follows one of the models used by Ganić (2020b) as follows:

$$IFI_{it} = f(REQ_{it}, GDP_{it}) \quad (1)$$

Or

$$IFI_{it} = \alpha_i + \beta' x_{it} + u_{it} \quad (2)$$

Where IFI expresses a proxy for international financial integration of country i in year t , x_{it} represents $K \times 1$ vector of explanatory variables (Regulatory quality and GDP) for country i in year t , α marks intercept, coefficient β is a $K \times 1$ parameter vector, and u_{it} - the usual disturbance term. The formula above for regression analysis represents the key to the estimation output of results for a given hypothesis. Furthermore, the data that came out as the result of the regression analysis underwent additional tests such as the Breusch-Pagan and Pesaran test. They employed to ensure that the estimated output results can explain some response in international financial integration, by checking heteroskedasticity among data. It also underwent the OLS regression model for two sub-periods, measuring the impact of independent variable x , on dependent variable y . Additionally,

the data is used in the Granger Causality test to determine if there is a causal effect of independent variable x , on dependent variable y .

By using multiple regression models, the effects of the independent parameters on the dependent parameter are considered for estimating the simultaneous effects on the dependent variable IFI 1 and growth rate.

4. RESULTS AND DISCUSSION

Table 1 contains the overview of the descriptive statistics of each of the dependent and independent variables for all NMS-10 countries.

Table 1. Descriptive Statistics.

	IFI 1	REQ	GDP
Mean	6.552084	1.036123	83817.56
Std. Dev.	13.16411	0.235500	121764.0
Minimum	0.449149	0.481640	3366.552
Maximum	58.41711	1.695029	594318.6

Source: (Authors' calculation, 2023).

The minimum and maximum level is used to determine the lowest and highest points in IFI 1 estimation, REQ a GDP estimation. According to the results, the minimum value of IFI 1 is (0.45) found in Lithuania. The maximum value of IFI 1 is (58.42) found in Malta. The minimum value of REQ (0.48) was found in Hungary, while the maximum value of REQ (1.70) was found in Estonia. The minimum value of GDP (3.366) was found in Malta, and the maximum value of GDP (594.319) was found in Poland.

These results indicate that even though, all of these countries entered at the same time, there is a difference in the level of international financial integration, and regulatory quality of NMS-10. Moreover, according to the research estimates for all countries from 1994 to 2020 the standard deviation outputs for IFI 1 reveal that there is an increase of around 7% from the average. It indicates that data for IFI 1 is slightly dispersed, allowing the prediction of results. In addition, the standard deviation for REQ is below the average (0.235) which is close to 0. It means that data output is close to the mean for REQ, implicating the low variability.

Table 2. Residual Cross-Section dependence test.

Test	Statistic	DF	Probability
Breusch-Pagan LM	322.2487	45	0.0000
Pesaran LM	29.22458		0.0000
Pesaran CD	10.24988		0.0000

Source: (Authors' calculation, 2023).

Panel-data models are likely to show strong cross-sectional dependence in the errors, which may be caused by the presence of common shocks and unobserved components. It might lead eventually end up in the error term and unusual correlation dependence in the disturbances. **Robertson and Symons (2007), Anselin (2010), Baltagi and Pesaran (2007)** have discovered the rising economic and financial integration of nations and financial institutions over the past few decades. It implies

significant interdependencies between cross-sectional units, which may be one factor contributing to this result. Therefore, findings in table 2 illustrate that the null hypothesis of “no cross-sectional dependence” is rejected even at a 1% level of significance because the results of all three tests, namely Breusch-Pagan LM, Pesaran scaled LM and Pesaran CD cross-sectional probability values are lower than (0.05).

Table 3 displays the findings of the OLS Regression estimation. There is no noticeable difference between the regulatory quality performance in the period before and after the EU accession process, although the probability value for REQ and GDP is statistically significant and below (0.05) in both periods. The regression equation for the empirical OLS model has a very low R-squared (5.5%); and it indicates to have very low explanatory power for the whole period, as well for the pre-accession period (R-squared is 14.3%) and post-accession EU process (R-squared is 7.7%). In fact, according to data presented in Table 3 variations in financial integration for NMS-10 mostly depends from other independent variables not included in this study and a small percentage from changes in regulatory quality.

Table 3. Estimation output for OLS Regression.

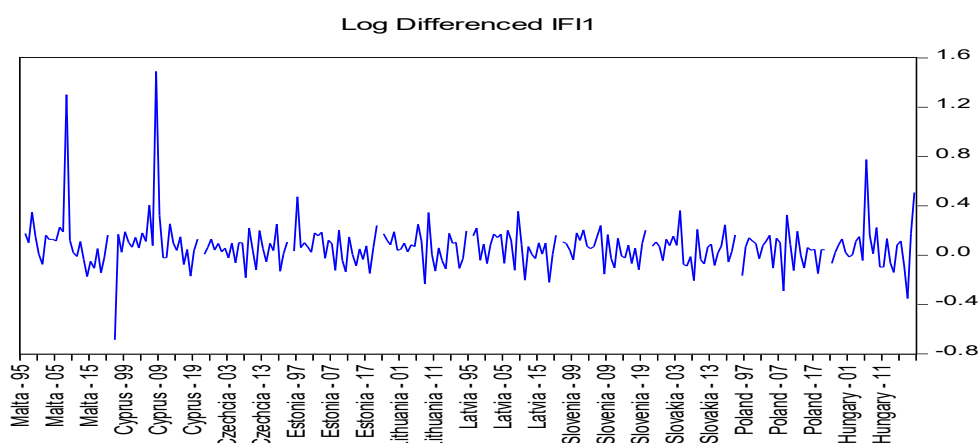
	Full period				1995-2004				2005-2020			
	Coefficient	Std. Error	t-Statistic	p-value	Coefficient	Std. Error	t-Statistic	p-value	Coefficient	Std. Error	t-Statistic	p-value
REQ	8.388.8	0.9719	8.630.6	0.0000	1.978.1	0.183592	1.077.4	0.0000	1.130.873	1.339.391	8.443.188	0.0000
GDP	-1.91E-05	6.64E-06	-2.870.77	0.0045	-4.32E-06	2.60E-06	-1.664.442	0.1006	-2.65E-05	8.05E-06	-3.294.271	0.0012
R-squared	0.055562				0.143707				0.077907			
Adjusted R-squared	0.051419				0.131297				0.072034			
S.E. of regression	1.329.249				1.314.883				1.525.517			
Akaike info criterion	8.020.933				3.413.137				8.300.213			
Schwarz criterion	8.050.829				3.476.874				8.338.816			
Hannan-Quinn criteria.	8.032.992				3.438.483				8.315.889			

Source: (Author's calculations, 2023).

Regulatory quality is estimated to have a probability value of (0.000) across the entire period, indicating that the null hypothesis has been rejected. This demonstrates that there is a statistically significant impact on financial integration and regulatory quality in both periods. The regression results are consistent with the hypothesis that regulatory quality has a positive and causal impact on financial integration, resulting in the deepening of financial integration in the NMS-10. In addition, [Kirkpatrick \(2014\)](#) used the WGI database that provides panel data for cross-country rankings on six indicators of governance impact: voice and accountability, political instability, governance effectiveness, regulatory quality, rule of law, and control of corruption in econometric analysis. He found a positive relationship between the overall measure of regulatory governance and aggregate investment (and economic growth), suggesting that “relatively well-managed poor countries stand to gain from a broad push for streamlining regulations and procedures affecting business and financial flows”.

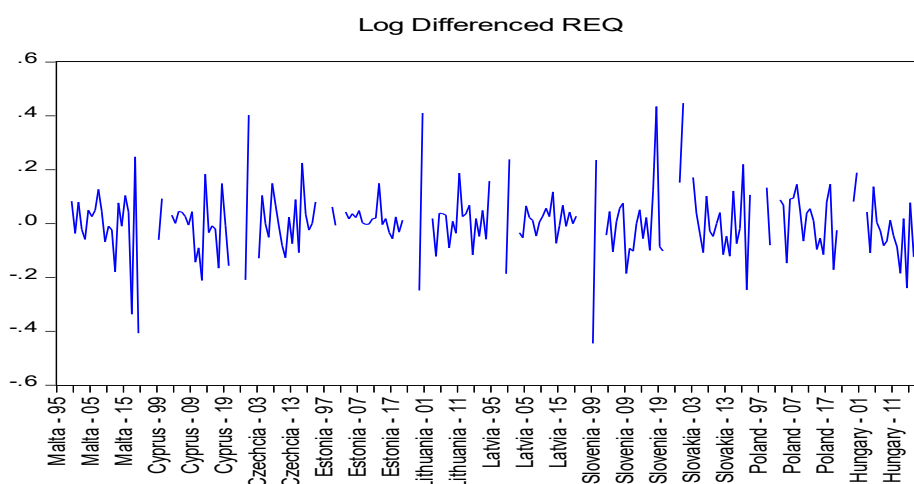
In pre- Granger causality stage of examination, we need to determine whether the above time series are stationary or non-stationary. If we look at the trends in Figure 1, Figure 2 and Figure 3, it is more than indicative to draw some conclusions.

Figure 1. Selected IFI time series in first difference.

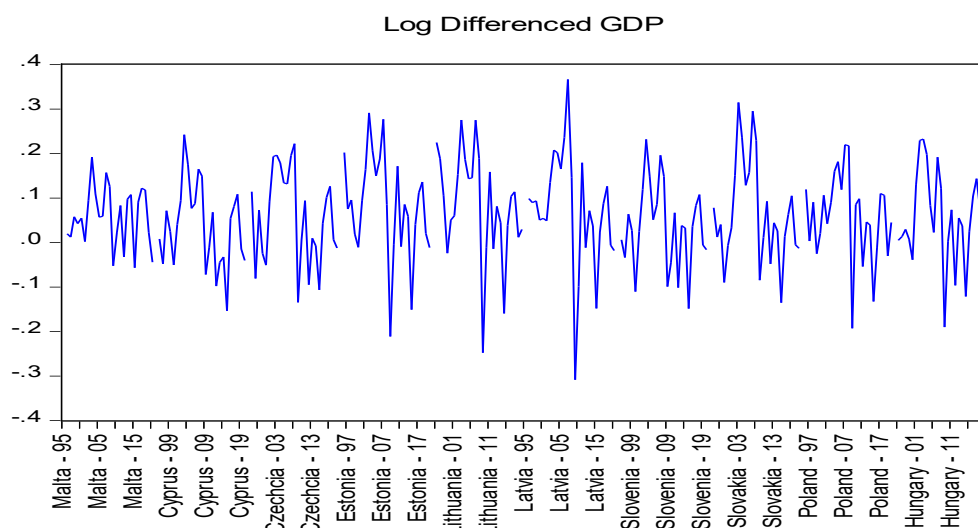


Source: (Author's calculation, 2023).

Figure 2. Selected REQ time series in first difference.



Source: (Author's calculation, 2023).

Figure 3. Selected GDP time series in first difference.

Source: (Author's calculation, 2023).

All three time series in levels show no tendency to return to their mean value. In addition, with all series in the first differences, one can notice that their values move around the mean value, which leads to the conclusion that all series are $I(1)$. After determining the order of integration, causality testing was performed. In fact, the results of the Granger test reveal whether the value of an individual variable from previous periods (with a shift) can affect the value of another variable in the current period.

Table 4. Pairwise Granger Causality test.

Null Hypothesis:	Obs	F-Statistic	Prob.
REQ does not Granger Cause IFI1	182	2.70986	0.0693
IFI1 does not Granger Cause REQ		3.50511	0.0321
GDP does not Granger Cause IFI1	240	0.38857	0.6785
IFI1 does not Granger Cause GDP		0.27328	0.7611
GDP does not Granger Cause REQ	182	2.16564	0.1177
REQ does not Granger Cause GDP		0.93906	0.3929

Source: (Author's calculations 2023).

According to the Granger causality test the variable of REQ helps to explain causality with IFI1. According to estimations, the probability less than (0.05) indicates that we are rejecting the null hypothesis, concluding that REQ does have a causal effect on IFI 1. This means that for both periods, before and after accession the variable of REQ causes International Financial Integration in the NMS. However, the estimation results showed a bidirectional effect, where IFI 1 also has a causal effect on REQ.

5. CONCLUSION

This study conducted an empirical analysis of financial integration and regulatory quality in New Member States (NMS-10) in two sub-periods. More specifically, this research focuses on the examination of the impact regulatory quality on deepens international financial integration in the NMS-10 countries. Also, this research aimed to conduct whether the strengthening of regulatory quality has a causal effect on the level of international financial integration.

Even though these nations underwent the same European accession process, descriptive statistics estimate that each one has a different level of global financial integration and regulatory quality. The performance of the regulatory system is influenced by institutional policies in each nation, which are correlated with these results. The results show that Malta had the highest financial integration after accession, while Lithuania had the lowest. As a result, in the NMS-10, Hungary experiences the least impact from regulatory quality, while Estonia experiences the most. Because there are no two countries within NMS-10 group that have the same capacity for implementing regulations, these results show that even after EU accession process, the performance of each nation varied.

Additionally, the results of the hypothesized testing OLS Regression of the impact of REQ on IFI 1 were used to determine whether there is a significant correlation between regulatory quality and the degree of international financial integration in the NMS-10. According to the results, there is a meaningful relationship. This means that each country's process of deepening international financial integration must prioritize the implementation of high-quality regulations because regulatory systems influence the development of democracy by enabling national decision-makers to balance competing interests. It is the process of putting regulations into action that makes investing, starting a business, and paying taxes easier. The strengthening of the process of global financial integration, which increases capital inflows and outflows, depends on these processes. Therefore, it has been established that the regulatory quality of NMS-10 produces sound policies that support investors' business operations, encourage foreign investment, and advance financial openness. The expected increase in capital flows into and out of the economies of these countries, as well as an increase in production and business opportunities, all increase the GDP Growth Rate (percent) of each nation. However, some empirical studies (Houston et al., 2012; Bremus and Fratzscher, 2015) show that variations in the standard of laws and regulations can cause distortions in capital flows between nations or the movement of capital from jurisdictions with more restrictive requirements to jurisdictions with less restrictive requirements. This is contradictory to the viewpoint of this study where it is considered that regulatory standards and the NMS-10 international financial integration are positively correlated.

The results of the Granger causality test show that the level of global financial integration is causally impacted by the improvement in NMS-10 regulatory quality. This means that regulatory effectiveness is predicting international financial integration. According to this estimation, if the regulatory framework in these nations improves, so will international financial integration, and vice versa.

The region's potential and proximity to the European Union, along with the New Member States NMS-10 accession, strengthened economic and financial integration, leading to rapid economic growth supported by sizable capital inflows. Being a member of the EU helped the NMS-10 develop robust macroeconomic and financial stability frameworks. Therefore, in several empirical studies such as the one by Kalemli-Özcan et al. (2010), it was confirmed a positive relationship between EU financial regulation and the rise of cross-bordering banking and financial operation.

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