

Caporale, Guglielmo Maria; Sova, Anamaria Diana; Sova, Robert

**Working Paper**

## Financial Integration and Economic Growth in Europe

CESifo Working Paper, No. 10563

**Provided in Cooperation with:**

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

*Suggested Citation:* Caporale, Guglielmo Maria; Sova, Anamaria Diana; Sova, Robert (2023) : Financial Integration and Economic Growth in Europe, CESifo Working Paper, No. 10563, Center for Economic Studies and ifo Institute (CESifo), Munich

This Version is available at:

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# Financial Integration and Economic Growth in Europe

*Guglielmo Maria Caporale, Anamaria Diana Sova, Robert Sova*

## **Impressum:**

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email [office@cesifo.de](mailto:office@cesifo.de)

Editor: Clemens Fuest

<https://www.cesifo.org/en/wp>

An electronic version of the paper may be downloaded

- from the SSRN website: [www.SSRN.com](http://www.SSRN.com)
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# Financial Integration and Economic Growth in Europe

## Abstract

This study examines the impact of financial integration on economic growth in the case of 31 European countries over the period from 2000 to 2021 using dynamic panel data models. The estimation results provide evidence of significant positive effects of financial integration on economic growth. They also suggest that the financial integration – economic growth relationship depends on country-specific characteristics such as the level of financial development and the quality of institutions. More precisely, financial integration appears to exert a greater positive influence on growth in the case of the European countries with a higher level of financial development and better institutions.

JEL-Codes: C330, F360.

Keywords: financial integration, economic growth, Europe, financial development, quality of institutions, dynamic panel models, GMM estimator.

*Guglielmo Maria Caporale\**  
*Department of Economics and Finance*  
*Brunel University London*  
*United Kingdom – Uxbridge, UB8 3PH*  
*Guglielmo-Maria.Caporale@brunel.ac.uk*  
*<https://orcid.org/0000-0002-0144-4135>*

*Anamaria Diana Sova*  
*Brunel University of London*  
*Uxbridge / United Kingdom*  
*[anamariadiana.sova@brunel.ac.uk](mailto:anamariadiana.sova@brunel.ac.uk)*

*Robert Sova*  
*Bucharest University of Economic Studies*  
*Bucharest / Romania*  
*[robertsova@yahoo.com](mailto:robertsova@yahoo.com)*

\*corresponding author

July 2023

## **1. Introduction**

Financial market integration is a central topic in international finance and in the analysis of the linkages between different financial markets. Numerous studies have provided evidence on one of its key aspects, namely the extent to which international financial markets co-move and asset returns are interdependent (see, e.g., Kim et al., 2006; Graham and Nikkinen, 2011). An equally important issue is the impact of financial integration on economic growth. Theory has identified various possible channels, both direct and indirect, through which the former can boost the latter (see Kose et al., 2003). The direct ones include increasing domestic savings in countries with a lower capital stock; reducing the cost of capital through a more efficient global allocation of risk, which lowers the risk premium; increasing FDI inflows, which results in technological and know-how transfers; facilitating the development of the financial sector through greater competition and better institutions. The indirect ones comprise promoting specialisation in production, which increases productivity; providing an incentive to adopt more effective macroeconomic policies which encourage capital inflows; signalling a more friendly attitude towards foreign investment and thus attracting more of it in the future.

Various papers have analysed the specific channels through which financial integration can have beneficial effects on economic growth; for instance, according to Obstfeld (1994) and Acemoglu and Zilibotti (1997), these are due to the fact that financial integration enhances production and specialisation and improves capital allocation, whilst Levine (2001) and Klein and Olivei (2008) stress that it makes the financial sector more efficient by increasing competition with foreign providers of financial services. However, other studies conclude that financial integration boosts growth only in countries with sound institutions and policies (Boyd and Smith, 1992; Bekaert et al. 2005). Moreover, it is possible that it makes economies more vulnerable to financial crises. In particular, Tasdemir (2023) argues that beyond a certain threshold financial integration might be risky, and provides evidence that economies with an excessive degree of international integration are more vulnerable to and more severely affected by global financial crises.

The existing empirical evidence is rather mixed. Studies finding significant positive effects of financial integration on economic growth have provided different explanations. For instance, some have emphasised the removals of capital controls and other restrictions, which boosts foreign capital inflows and growth in developing countries (see, e.g., Reisen and Soto, 2001); others have reported similar effects in the case of the developed economies, specifically the European ones (see, e.g., Giannetti et al., 2002). Further evidence suggests that in both types of countries the impact is positive; in particular, financial integration can boost growth by reducing volatility, and also make economies more stable through improvements in corporate governance (see De Nicolo' and Juvenal, 2014). Investment and productivity are two further channels through which growth can be enhanced by financial integration, as found in the case of the EU countries (Gehring, 2015).

However, there is also evidence against financial integration making any contribution to economic growth (see Edison et al., 2002). Macroeconomic imbalances might need to be eliminated first if opening the capital account is to have a positive impact on growth (see Arteta et al., 2001). In addition, as already mentioned, financial openness can also have negative consequences by spreading “financial fear” and increasing vulnerability to external shocks (see Schmukler, 2004, and Obstfeld, 2009). Finally, the effects of financial integration might differ depending on whether or not some threshold for domestic structural conditions (such as governance, financial development, trade openness, and macroeconomic policies) has been reached (see, e.g., Kose et al., 2010; Chen and Quang, 2014; Broner and Ventura, 2016).

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The present paper aims to provide new evidence on the financial integration-economic growth nexus in the specific case of Europe. Compared to earlier studies, such as Giannetti et al. (2002) and Gehring (2015), it considers a wider set of 31 European countries including both European Union (EU) members and non-members, and a much longer time span going from 2000 to 2021. In particular, dynamic panel data models also including a set of control variables are estimated using the General Method of Moments (GMM) developed by Arellano and Bover (1995) to deal with any potential endogeneity issues. To check robustness, various measures of financial integration are considered, namely total assets and liabilities, as well as FDI, equity and debt assets and liabilities. The analysis also sheds light on whether or not the relationship

of interest depends on country-specific characteristics (such as the level of financial development or the quality of institutions) by incorporating suitably defined interaction terms into the model.

The layout of this paper is the following: Section 2 describes the data and the methodology; Section 3 presents the empirical results; Section 4 offers some concluding remarks.

## 2. Econometric Methodology

### 2.1 The Impact of Financial Integration on Economic Growth

To study the impact of financial integration on economic growth we estimate a growth regression which includes financial integration variables and takes the following form:

$$GRR_{i,t} = \alpha + \beta_{1,k} FIN_{i,t}^k + \beta_{2,n} CV_{i,t}^n + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (1)$$

where:  $GRR_{i,t}$  is the growth rate of real GDP per capita,  $FIN_{i,t}^k$  stands for various financial integration measures in turn,  $CV_{i,t}^n$  denotes a set of control variables, and  $\mu_i$  stands for the fixed effects.

A number of measures of international financial integration ( $FIN_{i,t}^k$ ) are used in this study to assess the financial integration - economic growth relationship, namely (i) total liabilities, (ii) total assets, (iii) FDI liabilities and equity liabilities, (iv) debt liabilities, (v) FDI assets and equity assets, and (vi) debt assets. These series are extracted from the data set constructed by Lane and Milesi-Ferretti (2007). Variable definitions and data sources are provided in Table A1 in the Appendix.

A set of control variables (CV) is also included in the model, their selection being based on the theoretical and empirical literature discussed before; they are the following: GOV\_EXP – government expenditure/GDP; CPI – Consumer price index; CRISIS – a financial crisis

dummy which is equal to 1 during the Global Financial Crisis (GFC) of 2007-2009 and zero elsewhere; TRD\_OP – trade openness; SCHOL- secondary school rate enrolment ratio; WGI – World Governance Indicator; COVID – a Covid-19 pandemic dummy which is equal to 1 during 2020-2021 and zero elsewhere; DCPS – domestic credit to the private sector as a percentage of GDP. These data have been obtained from the World Development Indicators (WDI) and World Governance Indicators (WGI) Data Bank of the World Bank (see Table A2 in the Appendix for details).

The empirical analysis is carried out by using the following dynamic panel data framework:

$$GRR_{i,t} = \alpha + \beta_{i,0}GDPC_{i,t-1} + \sum_{k=1}^K \beta_{i,k}FIN_{i,t}^k + \sum_{n=1}^N \beta_{i,k+n}CV_{i,t}^n + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (2)$$

As already mentioned, our focus is on the impact of financial integration on economic growth in the case of European countries, more precisely we are interested in establishing what type of assets or liabilities affect economic growth. For this purpose we estimate three model specifications: in the first one two aggregate measures of financial integration are used, whilst the second and third one include respectively four and six sub-categories of financial integration to shed further light on its effects on economic growth.

The first dynamic model, which includes two aggregate measures of financial integration (TAS and TLB), is specified as follows:

$$\begin{aligned} GRR_{i,t} = & \alpha + \beta_{i,0}GDPC_{i,t-1} + \beta_{i,1}TAS_{i,t} + \beta_{i,2}TLB_{i,t} + \beta_{i,3}TRD\_OP_{i,t} + \beta_{i,4}CPI_{i,t} \\ & + \beta_{i,5}CRISIS_{i,t} + \beta_{i,6}COVID_{i,t} + \beta_{i,7}GOV\_EXP_{i,t} + \beta_{i,8}SCHOL_{i,t} + \beta_{i,9}WGI_{i,t} \\ & + \beta_{i,10}DCPS_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \quad (3a)$$

where: TAS= Total assets; TLB = Total liabilities.



In the second dynamic model we consider instead four different sub-categories of financial integration (EQFDL, DBL, EQFDA, DBA) in order to establish which types of assets or liabilities have a greater impact on economic growth:

$$\begin{aligned}
GRR_{i,t} = & \alpha + \beta_{i,0}GDPC_{i,t-1} + \beta_{i,1}EQ\_FDA_{i,t} + \beta_{i,2}EQ\_FDL_{i,t} \\
& + \beta_{i,3}DBA_{i,t} + \beta_{i,4}DBL_{i,t} + \beta_{i,5}TRD\_OP_{i,t} + \beta_{i,6}CPI_{i,t} + \beta_{i,7}CRISIS_{i,t} \\
& + \beta_{i,8}COVID_{i,t} + \beta_{i,9}GOV\_EXP_{i,t} + \beta_{i,10}SCHOL_{i,t} + \beta_{i,11}WGI_{i,t} + \beta_{i,12}DCPS_{i,t} \\
& + \mu_i + \gamma_t + \varepsilon_{i,t}
\end{aligned} \tag{3. b}$$

where: EQFDL=FDI liabilities and equity liabilities; DBL=debt liabilities, EQFDA= FDI assets and equity assets, and DBA= debt assets.

The third dynamic model includes six measures of financial integration:

$$\begin{aligned}
GRR_{i,t} = & \alpha + \beta_{i,0}GDPC_{i,t-1} + \beta_{i,1}PQA_{i,t} + \beta_{i,2}PQL_{i,t} \\
& + \beta_{i,3}FDA_{i,t} + \beta_{i,4}FDL_{i,t} + \beta_{i,5}DBA_{i,t} + \beta_{i,6}DBL_{i,t} + \beta_{i,7}TRD\_OP_{i,t} + \beta_{i,8}CPI_{i,t} \\
& + \beta_{i,9}CRISIS_{i,t} + \beta_{i,10}COVID_{i,t} + \beta_{i,11}GOV\_EXP_{i,t} + \beta_{i,12}SCHOL_{i,t} \\
& + \beta_{i,13}WGI_{i,t} + \beta_{i,14}DCPS_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t}
\end{aligned} \tag{3. c}$$

where: FDL=FDI liabilities; PQL= portfolio equity liabilities; DBL= debt liabilities; FDA =FDI assets; PQA= portfolio equity assets; DBA = debt assets

Equation (3a) is the benchmark model used to analyse the financial integration-economic growth nexus. This is then augmented to take into account the level of financial development and the quality of the institutions of the European countries with the aim of shedding further light on the relationship of interest.

## 2.2 The Financial Integration – Economic Growth Relationship and the Level of Financial Development

To assess whether the financial integration - economic growth relationship depends on the level of financial development in the case of our sample we introduce an interaction term between the financial integration variables used and a measure of financial development. The existing empirical literature proposes various indicators capturing the size, activity and efficiency of the financial sector ( Beck et al., 2000). The most common one is the ratio of credit to the private sector to GDP (DCPS - loans from banks to private enterprises), which is also used in the present study.

An interaction variable is then added to model (2), which yields the following specification:

$$GRR_{i,t} = \alpha + \beta_{i,0}GDPC_{i,t-1} + \sum_{k=1}^K \beta_{i,k}FIN_{i,t}^k + \sum_{n=1}^N \beta_{i,k+n}CV_{i,t}^n + \sum_{k=1}^K \beta_{i,k}FIN_{i,t}^k \times DCPS_{i,t}^n + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (4a)$$

where  $DCPS_{i,t}^n \times FIN_{i,t}^k$  is the interaction term between DCPS and the measures of financial integration used. More precisely, the following regressors are included in the augmented model:

$$\begin{aligned} GRR_{i,t} = & \alpha + \beta_{i,0}GDPC_{i,t-1} + \beta_{i,1}EQ\_FDA_{i,t} + \beta_{i,2}EQ\_FDL_{i,t} \\ & + \beta_{i,3}DBA_{i,t} + \beta_{i,4}DBL_{i,t} + \beta_{i,5}TRD_{OP,i,t} + \beta_{i,6}CPI_{i,t} + \beta_{i,7}CRISIS_{i,t} \\ & + \beta_{i,8}COVID_{i,t} + \beta_{i,9}GOV\_EXP_{i,t} + \beta_{i,10}SCHOL_{i,t} + \beta_{i,11}WGI_{i,t} \\ & + \beta_{i,12}DCPS_{i,t} + \beta_{i,13}DCPS_{i,t} \times EQ\_FDA_{i,t} + \beta_{i,14}DCPS_{i,t} \times DBA_{i,t} \\ & + \beta_{i,15}DCPS_{i,t} \times EQ\_FDL_{i,t} + \beta_{i,16}DCPS_{i,t} \times DBL_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (4b) \end{aligned}$$

## 2.3 The Financial Integration – Economic Growth Relationship and the Quality of Institutions

The quality of institutions could also affect the relationship under examination. To analyse its possible impact we introduce an interaction term between the various measures of financial integration used and an index for individual countries constructed by Kaufmann et al. (2010), which is available from the World Governance Indicators Data Bank of the World Bank; it includes six dimensions of governance (namely, voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, control of corruption), and its value ranges between  $-2.5$  (weak) and  $2.5$  (strong), higher values indicating better quality of institutions.

By augmenting model (2) with this interaction variable the following specification is obtained:

$$GRR_{i,t} = \alpha + \beta_{i,0}GDPC_{i,t-1} + \sum_{k=1}^K \beta_{i,k}FIN_{i,t}^k + \sum_{n=1}^N \beta_{i,k+n}CV_{i,t}^n + \sum_{k=1}^K \beta_{i,k}FIN_{i,t}^k \times WGI_{i,t}^n + \mu_i + \gamma_t + \varepsilon_{i,t} \quad (5a)$$

where:  $WGI_{i,t} \times FIN_{i,t}^k$  is the interaction term between WGI and the measures of financial integration used.

More explicitly, equation (5a) can be written as follows:

$$\begin{aligned} GRR_{i,t} = & \alpha + \beta_{i,0}GDPC_{i,t-1} + \beta_{i,1}EQ\_FDA_{i,t} + \beta_{i,2}EQ\_FDL_{i,t} \\ & + \beta_{i,3}DBA_{i,t} + \beta_{i,4}DBL_{i,t} + \beta_{i,5}TRD\_OP_{i,t} + \beta_{i,6}CPI_{i,t} + \beta_{i,7}CRISIS_{i,t} \\ & + \beta_{i,8}COVID_{i,t} + \beta_{i,9}GOV\_EXP_{i,t} + \beta_{i,10}SCHOL_{i,t} + \beta_{i,11}WGI_{i,t} + \beta_{i,12}DCPS_{i,t} \\ & + \beta_{i,13}WGI_{i,t} \times EQ\_FDA_{i,t} + \beta_{i,14}WGI_{i,t} \times DBA_{i,t} + \beta_{i,15}WGI_{i,t} \times EQ\_FDA_{i,t} \\ & + \beta_{i,16}WGI_{i,t} \times DBL_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \quad (5.b)$$

The above models are estimated using yearly data for the period 2000-2021 for 31 European Countries.<sup>1</sup> In all cases we employ the system GMM estimator developed by Arellano and Bover (1995), which combines a regression in differences with one in levels. The consistency of this estimator depends on the validity of the instruments used in the model as well as the assumption that the error term does not exhibit serial correlation. The instruments are chosen from the lagged endogenous and explanatory variables. In order to test the validity of the selected instruments, we perform the Sargan test of overidentifying restrictions proposed by Arellano and Bond (1991).

### **3. Empirical Results**

The GMM estimates for the various dynamic panel data models are displayed in Tables 1-3. In particular, in Table 1 column (1) reports the growth regression results without any financial integration variables, column (2) those based on the aggregate financial integration measures (TAB, TLB), and column (3) and (4) those obtained by using the disaggregate measures.

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<sup>1</sup> The list of countries is displayed in Table A3.

**Table 1: GMM Estimates of the Impact of Financial Integration on Economic Growth**

Variable	(1)	(2)	(3)	(4)
	GRR	GRR	GRR	GRR
L.GDPC	-0.102 (6.41)***	-0.131 (7.46)***	-0.147 (8.23)***	-0.167 (9.26)***
TRD-OP	0.030 (8.10)***	0.022 (5.03)***	0.025 (5.23)***	0.047 (7.18)***
CPI	-0.170 (2.37)**	0.100 (1.31)	-0.027 (0.34)	-0.033 (0.41)
CRISIS	-0.026 (5.62)***	-0.025 (5.41)***	-0.020 (5.56)***	-0.022 (5.24)***
COVID	-0.001 (0.21)	-0.002 (0.27)	-0.005 (0.76)	-0.004 (0.66)
GOV-EXP	0.014 (3.73)***	0.006 (1.92)*	0.010 (2.62)***	0.014 (3.96)***
DCPS	0.013 (2.52)**	0.006 (1.78)*	0.010 (1.67)*	0.007 (1.82)*
SCHOL	0.057 (3.81)***	0.083 (4.75)***	0.100 (5.57)***	0.094 (5.27)***
WGI	0.026 (3.27)***	0.030 (3.57)***	0.048 (5.03)***	0.060 (6.20)***
TAS		-0.002 (1.47)		
TLB		0.004 (1.84)*		
EQ-FDA			-0.006 (0.47)	
EQ-FDL			0.010 (2.01)**	
DBA			-0.004 (1.14)	-0.002 (0.38)
DBL			0.001 (0.49)	0.002 (0.27)
PQA				0.007 (0.94)
FDA				-0.009 (1.41)
PQL				0.015 (1.87)*
FDL				0.025 (2.15)**
Constant	0.436 (6.92)***	0.553 (7.91)***	0.615 (8.65)***	0.695 (9.66)***
Observations	682	682	682	682
AR(1)	-9.55 (0.000)	-9.51 (0.000)	-9.54 (0.000)	-9.52 (0.000)
AR(2)	0.03 (0.975)	0.15 (0.877)	0.27 (0.788)	0.39 (695)
Sargan	0.58 (0.445)	0.70 (0.703)	0.83 (0.361)	0.55 (0.456)
Absolute value of z statistics in parentheses				
* significant at 10%; ** significant at 5%; *** significant at 1%				

Note: The Sargan test confirms the validity of the selected instruments. Besides, the Ljung Box test indicates that the error term not exhibit serial correlation.

It can be seen that the estimated impact of financial integration on economic growth varies depending on the measure used. Specifically, FDI and equity liabilities (EQ-FDA) appear to have a positive and significant impact on economic growth, while the positive effect of debt liabilities is statistically insignificant. The former finding can be explained by the fact that through FDI technology, knowledge and managerial skills are transferred to the host country, thereby increasing its competitiveness and productivity - FDI can create new jobs, increase income and generate tax revenue, and thus boost economic growth. By contrast, FDI, equity assets (EQ-FDL) and debt assets do not seem to contribute significantly to economic growth in the countries holding them, a potential explanation being that investment abroad may lead to a decrease in domestic production (Osada and Saito, 2010). Finally, the coefficients on the control variables are mostly significant and have the expected signs - in particular, trade openness, schooling, financial development and good governance have a positive sign, whilst the GFC and Covid-19 pandemic dummies have a negative one. In other words, greater trade openness, a higher level of financial development and schooling and sound institutions all lead to higher economic growth. By contrast, both the GFC and the Covid-19 pandemic were detrimental to economic growth.

Table 2 reports the results from the models including an interaction term between the various financial integration measures and credit to the private sector (DCPS). In particular, it displays the estimates for the models including assets (column 1), liabilities (column 2), and both variables (column 3) in turn.

**Table 2: GMM Estimates for the Financial Integration-Economic Growth Relationship Taking into Account Financial Development**

Variable	(1)	(2)	(3)
	GRR	GRR	GRR
L.GDPC	-0.145	-0.152	-0.133
	(7.63)***	(7.89)***	(6.77)***
EQ-FDA	-0.003		-0.002
	(0.34)		(1.12)
DBA	-0.001		-0.003
	(1.13)		(0.23)
EQ-FDL		0.004	0.005
		(2.12)**	(3.20)***
DBL		0.002	0.001
		(0.60)	(1.07)
TRD-OP	0.027	0.024	0.022
	(5.74)***	(5.23)***	(4.41)***
CPI	0.024	-0.015	-0.102
	(0.31)	(0.18)	(1.21)
CRISIS	-0.026	-0.029	-0.025
	(5.47)***	(6.13)***	(5.09)***
COVID	-0.003	-0.006	-0.007
	(0.54)	(0.95)	(1.15)
GOV-EXP	0.013	0.008	0.011
	(3.50)***	(2.11)**	(2.84)***
DCPS	0.004	0.011	0.008
	(1.69)*	(1.72)*	(1.74)*
SCHOL	0.100	0.101	0.088
	(5.52)***	(5.42)***	(4.64)***
WGI	0.047	0.044	0.035
	(5.08)***	(4.60)***	(3.30)***
DCPS x EQ-FDA	-0.002		-0.007
	(0.16)		(0.96)
DCPS x DBA	-0.001		0.002
	(0.58)		(0.94)
DCPS x EQ-FDL		0.005	0.016
		(1.97)**	(5.19)***
DCPS x DBL		0.006	0.007
		(1.22)	(0.85)
Constant	0.602	0.633	0.546
	(8.01)***	(8.35)***	(6.95)***
AR1	-9.63	-9.91	-9.75
	(0.000)	(0.000)	(0.000)
AR2	0.22	0.41	-0.03
	(0.825)	(0.681)	(976)
Sargan	1.43	1.03	1.14
	(0.490)	(0.794)	(0.768)
Observations	682	682	682
Absolute value of z statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

Note: The Sargan test confirms the validity of the selected instruments. Besides, the Ljung Box test indicates that the error term does not exhibit serial correlation.

In the following discussion we mainly focus on the key variables of interest. On the whole, the evidence suggests that the impact of financial integration on economic growth depends on the level of financial development, and again that it varies depending on the financial integration measure used. In particular, the interaction term (EQ-FDL x DCPS) between financial integration measured as FDI + equity liabilities and the proxy for financial development (DCPS) is positive and statistically significant. In other words, European countries with a higher level of financial development appear to benefit to a greater extent from an increase in FDI and equity liabilities. By contrast, the interaction term (EQ-FDA x DCPS) between financial integration measured as FDI + equity assets and DCPS is insignificant, which indicates that in this case there is no additional boost to economic growth arising from a higher degree of financial development.

Finally, Table 3 reports the GMM estimates for the specifications including an interaction term between the various financial integration measures and a proxy for the quality of institutions (WGI). As in previous table, the displayed estimates correspond to the models including assets (column 1), liabilities (column 2), and both variables (column 3) in turn.



**Table 3: GMM Estimates for the Financial Integration-Economic Growth Relationship Taking into Account the Quality of Institutions**

Variable	(1)	(2)	(3)
	GRR	GRR	GRR
L.GDPC	-0.156 (8.32)***	-0.127 (6.93)***	-0.144 (7.35)***
EQ-FDA	0.002 (0.84)		-0.007 (0.51)
DBA	-0.001 (0.59)		-0.019 (1.13)
EQ-FDL		0.009 (4.71)***	0.021 (1.79)*
DBL		0.006 (0.95)	0.009 (1.17)
TRD-OP	0.036 (6.85)***	0.023 (4.35)***	0.028 (4.42)***
CPI	-0.004 (0.05)	-0.013 (0.16)	0.031 (0.37)
CRISIS	-0.021 (2.54)***	-0.026 (5.44)***	-0.023 (4.84)***
COVID	0.004 (0.71)	- 0.005 (0.73)	-0.009 (1.85)*
GOV-EXP	0.013 (3.55)***	0.014 (3.78)***	0.012 (3.02)***
DCPS	0.005 (1.83)*	0.002 (0.32)	0.001 (1.14)
SCHOL	0.123 (6.21)***	0.105 (5.46)***	0.101 (4.72)***
WGI	0.066 (6.02)***	0.099 (6.03)***	0.079 (4.67)***
WGI x EQ-FDA	-0.004 (1.22)		0.015 (1.31)
WGI x DBA	0.003 (0.89)		0.025 (1.51)
WGI x EQ-FDL		0.011 (5.29)***	0.026 (1.95)*
WGI x DBL		0.008 (1.30)	0.014 (1.78)*
Constant	0.640 (8.68)***	0.591 (7.91)***	0.640 (8.28)***
AR1	-9.43 (0.000)	-9.17 (0.000)	-8.96 (0.000)
AR2	0.41 (0.684)	0.22 (0.828)	0.04 (0.965)
Sargan	1.61 (0.447)	1.03 (0794)	2.71 (0.258)
Observations	682	682	682
Absolute value of z statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

Note: The Sargan test confirms the validity of the selected instruments. Besides, the Ljung Box test indicates that the error term does not exhibit serial correlation.

These results again suggest that the impact of financial integration on economic growth varies depending on the type of liabilities and assets that are considered. In particular, a beneficial impact of the quality of institutions is only detected when focusing on liabilities. More specifically, only the interaction term (EQ-FDL x WGI) between financial integration measured as FDI + equity liabilities and the proxy for the quality of institutions (WGI) has a positive and statistically significant impact on economic growth. In other words, European countries characterised by better institutions appear to benefit more from financial integration when this is defined in terms of liabilities.

#### **4. Conclusions**

This study has examined the impact of financial integration on economic growth in the case of 31 European countries over the period from 2000 to 2021 using dynamic panel data models. Compared to earlier related contributions (see, e.g., Giannetti et al., 2002; Gehringer, 2015) ours is a more extensive investigation both in terms of country coverage and time span, and also uses an econometric approach that deals with any possible endogeneity issues. In brief, the estimation results provide evidence of significant positive effects of financial integration on economic growth. In particular, FDI appears to play an important role, which confirms the previous findings of Gehringer (2015), according to whom financial integration contributed to growth in the EU countries through the investment and productivity channels.

Our results also suggest that the financial integration – economic growth relationship depends on country-specific characteristics such as the level of financial development and the quality of institutions. More precisely, financial integration appears to exert a greater positive influence on growth in the case of the European countries with a higher level of financial development and better institutions. These findings are consistent with previous evidence suggesting that financial integration can only be beneficial if a given threshold has been reached in the case of these and other variables such trade openness and macroeconomic policies (see, e.g., Boyd and Smith, 1992; Bekaert et al. 2005; Kose et al., 2010; Chen and Quang, 2014; Broner and Ventura, 2016). The

possible presence of nonlinearities in the financial integration – economic growth relationship is in fact an important issue which will be investigated further in future work.

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## APPENDIX

**Table A1: Financial Variable Definitions and Data Sources**

Code	Variable	Definition	Data Source
<b>PQA</b>	Portfolio equity assets	Stock of financial claims on nonresidents in portfolio equity securities	Lane and Milesi-Ferretti (2007)
<b>PQL</b>	Portfolio equity liabilities	Stock of financial liabilities to nonresidents in portfolio equity securities	-//-
<b>FDA</b>	FDI assets	Stock of foreign direct investment abroad	-//-
<b>FDL</b>	FDI liabilities	Stock of foreign direct investment in the reporting economy	-//-
<b>DBA</b>	Debt assets	Sum of the stocks of portfolio debt claims and other investment claims on nonresidents	-//-
<b>DBL</b>	Debt liabilities	Sum of the stocks of portfolio debt liabilities and other investment liabilities to nonresidents	-//-
<b>TAS</b>	Total assets excl. gold	Total financial claims on nonresidents (excluding gold holdings)	-//-
<b>TAB</b>	Total liabilities	Total financial liabilities to nonresidents	-//-
<b>EQ_FDA</b>	PQA + FDA	Portfolio equity + FDI assets	-//-
<b>EQ_FDL</b>	PQL + FDL	Portfolio equity + FDI liabilities	-//-

**Table A2: Control Variable Definitions and Data Sources**

Code	Variable	Data Source
<b>GDPC</b>	Real GDP per capita	WDI
<b>TRD-OP</b>	Trade Openness as a share of GDP	WDI
<b>CPI</b>	Consumer price index	WDI
<b>GOV-EXP</b>	Government expenditure/GDP	WDI
<b>SCHOL</b>	Secondary School Rate Enrolment Ratio	WDI
<b>DCPS</b>	Domestic Credit to the Private Sector as a Percentage of GDP	WDI
<b>WGI</b>	World Governance Index	WGI

Note: WDI and WGI stand respectively for World Development Indicators and World Governance; both are taken from the Data Bank of the World Bank.

**Table A3: List of Countries**

<b>Countries</b>			
Austria		Latvia	
Belgium		Lithuania	
Bulgaria		Luxembourg	
Croatia		Malta	
Cyprus		Netherlands	
Czech Republic		Norway	
Denmark		Poland	
Estonia		Portugal	
Finland		Romania	
France		Slovakia	
Germany		Slovenia	
Greece		Spain	
Hungary		Sweden	
Iceland		Switzerland	
Ireland		United Kingdom	
Italy			