Department of Economics and Finance

Working Paper No. 2501

Guglielmo Maria Caporale, Anamaria Diana Sova and Robert Sova

International Financial Integration, Economic Growth and Threshold Effects: Some Panel Evidence for Europe

January 2025

Economics and Finance Working Paper Series

http://www.brunel.ac.uk/economics

INTERNATIONAL FINANCIAL INTEGRATION, ECONOMIC GROWTH AND THRESHOLD EFFECTS: SOME PANEL EVIDENCE FOR EUROPE

Guglielmo Maria Caporale
Brunel University of London

Anamaria Diana Sova
Brunel University of London

Robert Sova
Bucharest University of Economic Studies

January 2025

Abstract

This paper applies the Seo and Shin (2016) method for estimating dynamic panels with endogenous threshold effects to obtain new, robust evidence on nonlinearities in the relationship between international financial integration (IFI) and economic growth. This approach is based on a first-differenced GMM estimator which allows both the threshold variable and the regressors to be endogenous. More specifically, the present study analyses yearly data for 40 European countries from 1996 to 2021, this European focus yielding novel insights into a region with a diverse economic landscape. The IFI–growth nexus is examined using various IFI measures and thresholds reflecting country-specific characteristics, and then the analysis is extended by comparing the impact of the 2007-2009 global financial crisis (GFC) and of the Covid-19 pandemic respectively on the relationship of interest. The results provide clear evidence of nonlinearities and suggest that the effects of financial integration on economic growth vary depending on factors such as the level of financial development, trade openness, institutional quality, political and economic uncertainty, initial income, and financial openness. Further, the 2007-2009 GFC appears to have had a more significant impact than the Covid-19 pandemic.

Keywords: International financial integration (IFI), economic growth, nonlinearities, dynamic panels, endogeneity, thresholds

JEL Classification: C33, F36

Corresponding author: Professor Guglielmo Maria Caporale, Department of Economics and Finance, Brunel University of London, Uxbridge, UB8 3PH, UK. Email: Guglielmo-Maria.Caporale@brunel.ac.uk; https://orcid.org/0000-0002-0144-4135

1. Introduction

It has long been argued that international financial integration (IFI) can bring significant benefits to countries by reducing the cost of capital, thereby increasing investment opportunities and boosting economic growth through higher cross-border capital flows and international risk sharing (see, e.g., Obstfeld, 1998, Kose et al., 2009, and Caporale et al., 2024a). IFI is also expected to increase stock market liquidity and financial market efficiency, this being another channel through which it can boost productivity and growth (Levine, 2001). However, it appears that it also increases vulnerability to external shocks and it leads to financial contagion with a negative impact on growth (see, e.g., Obstfeld, 2009). In particular, developing economies can be negatively affected if they are characterised by fear of floating, a weak currency and poor institutions (see de la Torre et al., 2012).

A number of studies have reached the conclusion that IFI can have beneficial effects only if a given "threshold" level has been reached in terms of financial and institutional development, trade openness, the stability of macroeconomic policies, and the level of IFI itself (see, among others, Kose et al., 2003; Broner and Ventura, 2016; Chen and Quang, 2014; Furceri et al., 2019; Kose et al., 2011; Nicolo` and Juvenal, 2014). For instance, only economies with a sufficient level of financial integration appear to benefit from risk sharing (see Kose et al., 2003). Recent evidence on this issue is provided by Tasdemir (2023), who estimated both panel fixed effects threshold and dynamic panel threshold models for 25 advanced and 58 emerging economies over the period 1990–2019. More precisely, the former was specified as an unconditional growth regression which was estimated using Hansen's (1999) method; the latter was instead a conditional growth regression including standard growth determinants, which followed the approached put forward by Kremer et al. (2013) to deal with possible endogeneity issues. The results indicate that IFI is in fact not beneficial beyond a certain threshold level.

Other studies focus on the impact of specific variables such as foreign direct investment (FDI), which is found to have growth benefits only if a certain threshold level of financial development has been achieved. For instance, Hermes and Lensink (2003) reported that this is the case in only about half of the developing countries they considered over the period 1970-1995. Some evidence concerning Europe is provided instead by Masten et al. (2008). These authors estimated threshold

effects by including a 0-1 dummy variable based on financial depth in a panel of macro-level data for 31 European countries over the period 1996-2004; they also analysed industry-level data, in this case first using the Rajan and Zingales (1998) measure of external finance dependence and then following Hansen's (1999) procedure to estimate a multiple threshold model with financial development as the threshold variable. Their general conclusion is that in the set of countries considered whether financial integration has a positive effect on growth depends on the degree of financial development, macroeconomic stability and institutional quality. Industry-level data for 25 middle- and low-income countries over the period 1998-2005 were also examined by Friedrich et al. (2010) using the Rajan and Zingales (1998) approach and threshold dummies for a set of variables including political integration – in fact the latter was found to be the most significant factor increasing the benefits of financial integration.

In the most extensive study on this topic to date, Kose et al. (2011) applied both parametric and semi-parametric methods to capture threshold effects. Specifically, they estimated both a linear dynamic panel model including interaction functions between the threshold and financial openness, and a partial linear model allowing for a nonlinear relationship between economic growth, financial openness and the threshold variables (in the latter case following Robinson's (1988) double residuals approach). Their analysis was carried out for 84 countries over the period 1975-2004 using a number of threshold variables, namely financial depth, institutional quality, regulation, trade openness, macro policies, and overall development. Their findings confirm the important role of thresholds in the outcomes of IFI. Interestingly, they also suggest that the thresholds are lower in the case of FDI and portfolio equity liabilities in comparison to those for debt liabilities.

It is important to note that Hansen's (1999) approach, which is used in various studies, requires strict exogeneity of the threshold variables to be valid (see also Caner and Hansen, 2004). Such an assumption cannot be made in the case of financial development, for instance, and therefore alternative estimation methods should be used to deal with possible endogeneity. As already mentioned, Kremer et al. (2013) suggested a procedure which involves, after removing the fixed effects, running reduced-form regressions for the endogenous variables with higher lags as the instruments. The predicted values can then be used to determine the value of the threshold as in

Hansen (1999). Finally, the panel threshold model can be estimated using the generalized method of moments (GMM). More recently, Seo and Shin (2016) developed a dynamic threshold panel data model which allows both regressors and threshold effects to be endogenous. Specifically, they suggested a first-differenced (FD) GMM approach to remove the unobserved individual effects before obtaining the estimates of the threshold effects. Their algorithm ensures that the estimators follow a normal asymptotic distribution, and thus valid statistical inference can be drawn by means of Wald tests on the model parameters. They also proposed a more efficient FD-2SLS procedure for cases when the threshold variable can be assumed to be strictly exogenous. In both cases the estimation can be carried out in Stata (see Seo et al., 2019).

The present paper contributes to this area of the literature by providing new, robust evidence on the nonlinear relationship between international financial integration (IFI) and economic growth based on yearly data for 40 European countries from 1996 to 2021. Specifically, it applies the Seo and Shin (2016) method to estimate dynamic panels with threshold effects in the presence of endogeneity, which allows to capture previously unexplored complexities in the relationship under investigation. The European focus yields novel insights into the IFI-growth nexus in the context of a region with a diverse economic landscape, different levels of development and distinct regulatory frameworks, by investigating regional dynamics and interdependencies often overlooked in global studies. Further contributions to the literature are represented by the use of a wide range of IFI measures and thresholds and by the examination of the effects of both the 2007-2009 global financial crisis (GFC) and of the Covid-19 pandemic in order to shed light on the issues of interest under different economic conditions.

The layout of the paper is the following: Section 2 outlines the methodology; Section 3 describes the data and discusses the empirical findings; Section 4 offers some concluding remarks.

2. Econometric Methodology

2.1 A dynamic panel threshold model for the IFI-growth nexus with an endogenous threshold variable

Dynamic panel threshold models have become increasingly popular in empirical research to capture nonlinear dynamics which are overlooked by standard linear methods. As already mentioned, one of the most recent developments is the incorporation of endogenous threshold variables as in the approach put forward by Seo and Shin (2016) which we apply below to examine the IFI-growth nexus. In particular, for the estimation of their model we use the *xthenreg* command developed by Seo et al. (2019) for first-differenced (FD) generalized method of moments (GMM) estimators and their asymptotic variance, along with tools for testing linearity to detect the presence of threshold effects. More specifically, the coefficients are estimated using a first difference GMM (FD-GMM) transformation. This is based on an algorithm which relaxes the exogeneity assumption for the regressors and the threshold variable and ensures that the estimators follow an asymptotically normal distribution, thereby validating the use of the Wald test for standard statistical inference on the threshold and the other parameters.

As in Seo and Shin (2016), the dynamic panel threshold model is specified as follows:

$$y_{it} = (1, X'_{it})\, \emptyset_1 1\{q_{it} \leq y\} + (1, X'_{it})\, \emptyset_2 1\{q_{it} > y\} + \varepsilon_{it} \qquad (1)$$

where y_{it} is the dependent variable, x_{it} the time-varying regressors that may include the lagged dependent variable, $1\{\cdot\}$ an indicator function, q_{it} the transition variable, γ the threshold parameter, and φ_1 and φ_2 the slope parameters associated with different regimes. The error, ε_{it}, comprises an unobserved individual fixed effect (α_i), and a zero mean random disturbance (υ_{it}):

$$\varepsilon_{it} = \alpha_i + \upsilon_{it} \qquad (2)$$

The model allows for endogeneity in both the regressor (x_{it}), and the threshold variable (q_{it}):

$$E(\upsilon_{it} x_{it}) \neq 0 \; or \; E(\upsilon_{it} q_{it}) \neq 0 \qquad (3)$$

First differences (Δ) are used to deal with the correlation of the regressors with individual effects in (1):

$$\Delta y_{it} = \beta' \Delta x_{it} + \delta' X'_{it} 1_{it}(y) + \Delta \varepsilon_{it} \quad (4)$$

$\delta = \emptyset_2 - \emptyset_1$;

In particular, the parameter α_i is removed with the first-difference transformation and the other parameters are then estimated using GMM.

Seo et al. (2019) also propose a fast bootstrap algorithm to test for the presence of threshold effects. The null hypothesis is H_0: $\delta = 0$ for any $\gamma \in \Gamma$ against the alternative hypothesis H_1: $\delta \neq 0$ for some $\gamma \in \Gamma$. A standard test statistic for the null is:

$$\sup W = \sup Wn(\gamma) \quad (5)$$

where $Wn(\gamma)$ is the standard Wald statistic for each fixed γ (for more details concerning the methodology, see Seo and Shin, 2016).

Following Seo and Shin (2016), the dynamic panel threshold model we estimate to examine the IFI-growth nexus (which features an endogenous threshold variable) can be written as follows:

$$y_{i,t} = \rho_{i,t} y_{i,t-1} + \beta_i^1 IFI_{i,t}^n I\left(ths_{i,t}^k \leq \gamma^k\right) + \beta_i^2 IFI_{i,t}^n I\left(ths_{i,t}^k > \gamma^k\right) + \sum_{j=1}^{J} \lambda_j^1 X_{i,t}^j I\left(ths_{i,t}^k \leq \gamma^k\right) + \lambda_j^2 X_{i,t}^j I\left(ths_{i,t}^k > \gamma^k\right) + \varepsilon_{it} \quad (6)$$

where $y_{i,t}$ stands for economic growth and $y_{i,t-1}$ for its first lag, IFI (n = 1,…,8) is a regime dependent measure of international financial integration that changes in accordance with the estimated threshold γ^k, I(_) is a (lower or higher) regime indicator, $ths_{i,t}^k$ is the threshold or transitional variable, γ^k is the threshold value, X_{it} is a j (j=1…J) vector of time-varying control variables, β and λ are the slope coefficients associated with different regimes, and ε_{it} is the error term.

We consider various measures of IFI, ranging from more aggregated to disaggregated ones and capturing both inflows and outflows; these include: (i) total liabilities, (ii) total flows, (iii) FDI liabilities and equity liabilities, (iv) total FDI and total equity; (v) FDI liabilities, (vi) FDI flows, (vii) debt liabilities, (viii) debt flows. The aggregate measures provide a broad overview of financial integration in Europe, whilst the disaggregate ones yield additional insights by focusing on its individual components; as a whole, they provide comprehensive information on the IFI-growth nexus in the region. The source is the dataset compiled by Lane and Milesi-Ferretti (2007); further details can be found in Table 1.

Insert Table 1 about here

As mentioned above, the model also includes a set of control variables (X_{it}), which have been selected drawing on the theoretical and empirical literature discussed earlier (e.g., Sala-i-Martin et al., 2004, Kose et al., 2003; Broner and Ventura, 2016; Chen and Quang, 2014; Furceri et al., 2019;). Specifically, they are the following: initial income measured as the logarithm of real per capita GDP lagged one period; human capital, proxied by secondary school enrollment ($schol_{i,t}$); the active working population ($labor_{i,t}$); government spending ($Govspend_{i,t}$).

Initial income is a key variable in growth equations as argued in the theoretical literature on convergence (Barro, 1991) and diminishing returns (Solow, 1956); empirical research (e.g., Sala-i-Martin, 1996; Klenow and Rodríguez-Clare, 1997) has confirmed that it has a substantial impact on economic growth. Human capital also plays an important role; in particular, it has been shown that higher levels of educational attainment are associated with faster economic growth (Mankiw et al., 1992; Barro and Lee, 1994). Further, countries with a larger active working population generally experience more rapid economic growth (Mankiw et al., 1992; Aghion and Howitt, 1998). Finally, government spending can also be pivotal in fostering economic growth; its impact depends on its composition and efficiency, with higher investment in infrastructure, public services, and education typically resulting in higher growth rates (Kneller et al., 1999).

Therefore, our dynamic panel threshold growth model can be written more explicitly as:

$$gdpc\_grow_{i,t} = \rho_{i,t} gdpc\_grow_{i,t-1} + \beta_i^1 IFI_{i,t}^n I\left(ths_{i,t}^k \leq \gamma^k\right) + \beta_i^2 IFI_{i,t}^n I\left(ths_{i,t}^k > \gamma^k\right) + \left(\lambda_1^1 labor_{i,t} + \lambda_2^1 schol_{i,t} + \lambda_3^1 govspend_{i,t}\right) I\left(ths_{i,t}^k \leq \gamma^k\right) + \left(\lambda_{21}^2 labor_{i,t} + \lambda_2^2 schol_{i,t} + \lambda_3^2 govspend_{i,t}\right) I\left(ths_{i,t}^k > \gamma^k\right) + \varepsilon_{it} \quad (7)$$

where: $gdpc\_grow_{i,t}$ stands for real GDP per capita growth and the other regressors are defined as before.

We employ different variables as thresholds ($ths_{i,t}^k$). Note that, since IFI is a regime dependent variable and adjusts according to the estimated threshold (γ^k), its estimated impact on growth will vary depending on the chosen threshold. On the basis of data availability for the European countries we have selected the following threshold variables:

Trade Openness ($ths_{i,t}^k$ = Trd-op): this variable measures the extent to which a country is engaged in international trade relative to the size of its economy. Specifically, it is calculated as the sum of exports and imports of goods and services, expressed as a ratio to GDP, and is a key indicator of a country's integration into the global economy. Higher trade openness generally indicates fewer barriers to trade, such as tariffs, quotas, and regulatory restrictions, which results in larger trade flows (exports + imports) relative to the size of a country's economy. Greater trade openness enables a country to benefit from the global markets by gaining access to a wider range of goods and technologies, which can enhance innovation, productivity and growth.

World Governance Index ($ths_{i,t}^k$ = WGI): this index is calculated as the average of six individual ones that proxy various aspects of institutional quality. Specifically, it includes voice and accountability, political instability and violence, government effectiveness, regulatory quality, rule of law, and control of corruption (Kaufmann et al., 2005). Together, these indices provide a comprehensive evaluation of a country's overall institutional quality. The WGI index is widely employed in academic research and policy analysis to assess the effectiveness of governance

structures across countries. It ranges from −2.5 (weak) to 2.5 (strong), with higher values indicating better quality of institutions.

Financial Development ($ths_{i,t}^{k}$ = FD): we use a comprehensive index developed by the IMF, which captures the multidimensional nature of financial development and is more informative than the standard proxy found in the empirical literature, namely the ratio of private credit to GDP (Svirydzenka, 2016). By combining the Financial Institutions and the Financial Markets Indices, it provides a more accurate measure of financial development which allows a comparative assessment of countries on the basis of the depth, access, and efficiency of their financial institutions and markets.

Word Uncertainty Index ($ths_{i,t}^{k}$ = WUI): we employ the index developed by Ahir et al. (2022) as a proxy for political and economic uncertainty. It is available quarterly from 1996 for 143 countries, and measures the frequency of the term "uncertainty" in the Economist Intelligence Unit's country reports; it ranges from 0 (indicating no uncertainty) to 1 (indicating maximum uncertainty). By relying on a single source for all countries, the WUI enables a comparative analysis of uncertainty levels across nations, effectively capturing uncertainty related to economic and political events, which reflects both short- and long-term concerns. This index is extremely useful for analysing how varying levels of uncertainty influence variables such as foreign direct investment, and for exploring the drivers of uncertainty. Additionally, it helps assess the economic impact of policies during uncertain periods. The WUI is also a useful leading indicator of economic activity, as spikes in this index are often observed before falls in output prior to GDP data becoming available.

Initial Income ($ths_{i,t}^{k} = gdpc\_grow_{i,t-1}$): this is defined as the first lag of per capita real GDP, and is included as an indicator of economic development. It provides a baseline for assessing future economic growth and changes in living standards, as well as the effects of economic policies on growth. It is also used to analyse economic trends, disparities, and growth patterns over time. Countries with lower initial per capita GDP levels often face different development challenges than those with higher ones, and also different degrees of resilience.

Financial Openness ($ths_{i,t}^{k} = FO_{i,t}$): we employ the Chinn-Ito Index, which is widely used to assess the openness of a country's capital account by evaluating restrictions on cross-border financial transactions. Financial openness is crucial for understanding how countries engage with the global financial system, which affects significantly their access to capital as well as their growth prospects and vulnerability to external shocks.

To analyse the effects of the GFC and of the Covid-19 pandemic respectively on the IFI-growth nexus, we also include (i) a dummy variable ($crisis_{i,t}$) which equals 1 during the 2007-2009 GFC and zero otherwise, and an interaction term with IFI ($crisis_{i,t}$ X IFI), and (ii) a stringency index *(str_cov_{it})*, which reflects the restrictions adopted by each country to stop the spread of the virus, and again an interaction term with IFI (str_cov_{it}X IFI). Therefore, the extended models are the following:

$$\begin{aligned} gdpc\_grow_{i,t} = {} & \rho_{i,t} gdpc\_grow_{i,t-1} + \beta_i^1 IFI_{i,t}^n I\left(ths_{i,t}^k \le \gamma^k\right) + \beta_i^2 IFI_{i,t}^n I\left(ths_{i,t}^k > \gamma^k\right) \\ & + \left\{\lambda_1^1 labor_{i,t} + \lambda_2^1 schol_{i,t} + \lambda_3^1 crisis_{i,t} + \lambda_4^1 govspend_{i,t}\right. \\ & \left. + \lambda_5^1\left(crisis_{i,t} \times IFI_{i,t}^k\right)\right\} I\left(ths_{i,t}^k \le \gamma^k\right) \\ & + \left\{\lambda_1^2 labor_{i,t} + \lambda_2^2 schol_{i,t} + \lambda_3^2 crisis_{i,t} + \lambda_4^2 govspend_{i,t}\right. \\ & \left. + \lambda_5^2\left(crisis_{i,t} \times IFI_{i,t}^k\right)\right\} I\left(ths_{i,t}^k > \gamma^k\right) + \varepsilon_{it} \end{aligned} \quad (8)$$

$$\begin{aligned} gdpc\_grow_{i,t} = {} & \rho_{i,t} gdpc\_grow_{i,t-1} + \beta_i^1 IFI_{i,t}^n I\left(ths_{i,t}^k \le \gamma^k\right) + \beta_i^2 IFI_{i,t}^n I\left(ths_{i,t}^k > \gamma^k\right) \\ & + \left\{\lambda_1^1 labor_{i,t} + \lambda_2^1 schol_{i,t} + \lambda_3^1 govspend + \lambda_4^1 str\_cov_{i,t}\right. \\ & \left. + \lambda_5^1\left(str\_cov_{i,t} \times IFI_{i,t}^k\right)\right\} I\left(ths_{i,t}^k \le \gamma^k\right) \\ & + \left\{\lambda_1^2 labor_{i,t} + \lambda_2^2 schol_{i,t} + \lambda_3^2 govspend_{i,t} + \lambda_4^2 str\_cov_{i,t}\right. \\ & \left. + \lambda_5^2\left(str\_cov_{i,t} \times IFI_{i,t}^k\right)\right\} I\left(ths_{i,t}^k > \gamma^k\right) + \varepsilon_{it} \end{aligned} \quad (9)$$

We use annual panel data over the period from 1996 to 2021 for 40 European countries[1] including both EU members [2] and non-EU members, as well as countries in the process of negotiating EU

[1] They are the following: Albania, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Belarus, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

[2] The European Union (EU) is a political and economic union with 27 member states, all of which have full access to the EU single market and are subject to EU regulations. Its members are: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

membership [3]. In addition, some of these countries have adopted the euro and are part of the Economic and Monetary Union (EMU) [4], while others are aiming to join the EMU. The European countries are relatively homogeneous economies. Nevertheless, some differences still persist among them, particularly with respect to income levels, financial development, and the quality of institutions. Income disparities are the most prominent ones. Northern and Western European countries tend to have higher GDP per capita than those in Eastern and Southern Europe. Countries such as Luxembourg, Ireland, and Norway rank among the wealthiest in Europe, with Luxembourg's GDP per capita reaching approximately $134.546 in 2021, the highest in Europe, and Ireland's following closely at around $106.351 in 2021. On the other hand, Southern and Eastern European countries such as Albania and Moldova have significantly lower income levels. In particular, Albania, has the lowest GDP per capita, which was recorded as $15,709 in 2021 (see Figure 1). [5]

Insert Figure 1 about here

Institutional quality also varies across Europe, with stronger institutions generally being found in the Western and Northern countries, while weaker ones are more prevalent in the Eastern and Southern regions. According to the Worldwide Governance Index (WGI), Northern European countries such as Finland, (1.76) Denmark (1.73), Norway (1.74), Switzerland (1.71) ranked among the top ones in terms of institutional quality in 2021. Denmark, for instance, is often recognised as one of the least corrupt countries worldwide, and is known for its strong regulatory frameworks and effective governance. By contrast, some Southern and Eastern European countries, such as Bulgaria (0.13) and Greece (0.49), face challenges related to corruption, inefficient public administration, and a weak rule of law. The lowest values are exhibited by Albania (-0.07) and Moldova (-0.49), both of which score significantly lower than their Northern European counterparts (see Figure 2).

[3] The EU candidate countries in the process of negotiating EU membership include Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, and Serbia. To secure membership, they must align their political, legal, and economic frameworks with EU standards.

[4] The eurozone members are 20 out of the 27 EU countries that have adopted the euro as a common currency and participate in the Economic and Monetary Union (EMU), following the monetary policy set by the European Central Bank (ECB). They are the following: Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland.

[5] Source: World Development Indicators (WDI)

Insert Figure 2 about here

As for financial development, according to the IMF index calculated in 2021, Western European countries such as the UK (0.84), Switzerland (0.94), Germany (0.70), and France (0.81) have highly developed financial markets characterised by a wide range of financial instruments. In particular, Germany, which hosts the European Central Bank (ECB) in Frankfurt, plays a vital role in European financial integration. By contrast, Central and Eastern European countries[6], such as Lithuania (0.20), Albania (0.20), Moldova (0.22), Estonia (0.25), and Bulgaria (0.38), tend to have less developed financial systems compared to those in Western Europe (see Figure 3). Such differences remain despite the common framework established by the European Union and the ongoing expansion of the Eurozone, with countries in Eastern and Southern Europe still striving for deeper economic convergence and integration within Europe.

Insert Figure 3 about here

3.Empirical Results

As previously mentioned, our aim is to explore possible nonlinearities in the relationship between IFI and economic growth in the European context. The empirical analysis comprises two parts. In the first, we estimate six benchmark model specifications corresponding to each of the endogenous thresholds considered and for different IFI measures. In the second, we extend those models by including an interaction term between IFI and, respectively, the 2007-2009 GFC *($crisis_{i,t}$ X IFI)* and the Covid-19 pandemic *($str\_cov_{i,t}$ X IFI)*. These two sets of empirical results are discussed in turn in the next two sub-sections.

[6] Caporale et al. (2015) reviewed the main features of the banking and financial sectors in 10 Central and Eastern European countries over the period 1994-2007 and found that the stock and credit markets remain underdeveloped compared to those in Western European countries.

3.1 GMM estimates for the benchmark dynamic panel data models using various IFI measures and thresholds

The GMM estimates for the benchmark dynamic panel data models are displayed in Tables 2-7. Each of them shows the estimates based on the various IFI measures and one of the selected threshold variables in turn. Our discussion below will focus on the main issue of interest, namely whether there exist threshold effects and how the evidence of nonlinearities in the IFI-growth nexus is affected by using different IFI measures.

Table 2 reports the estimates obtained when financial development is used as the threshold. The linearity test (p-value) confirms the presence of nonlinearities. More specifically, the results indicate the presence of two regimes for all the variables, including the IFI measures, for which the estimated threshold is generally around 55%; however, it is only 26% in the case of FDI liabilities, this being the lowest threshold, which implies positive effects of IFI on growth even in countries with a relatively low level of financial development.

Insert Table 2 about here

The coefficient on the IFI measures is generally negative below the threshold, but it becomes positive above it in some cases, which suggests that the positive impact of IFI on growth is more pronounced in countries with more developed financial systems. More specifically, higher levels of total liabilities, FDI liabilities, FDI flows and equity-FDI liabilities appear to have a beneficial impact on economic growth. FDI liabilities seems to have the strongest impact (0.093), as a developed financial system can more easily attract foreign investors and enhance an economy's integration with global capital markets. Of the countries in our sample the Northern European (e.g., Sweden, Finland) and Western European ones (e.g. Germany, France) are those characterised by higher levels of financial development and more advanced financial systems (see Figure 3). Their Eurozone membership provides further stability and promotes deeper integration. Having advanced financial infrastructure and regulatory systems allows them to manage capital flows, to reduce risks, and thus to enhance economic growth. By contrast, European countries with less

developed financial systems, such as the Southern (e.g., Greece) and Eastern European ones (e.g. Bulgaria), are more vulnerable to external shocks, experience greater volatility, and only benefit to a limited extent from financial integration. Finally, non-Eurozone countries possess greater flexibility to adjust their monetary policies but incur higher currency risks that can reduce the growth effects of financial integration.

On the whole, the evidence based on using financial development as a threshold confirms that countries with more advanced financial systems, such as those in Northern and Western Europe, along with Eurozone members with more advanced financial systems, tend to benefit more significantly from IFI. By contrast, countries in Southern and Eastern Europe, which are characterised by lower levels of financial development, face challenges that limit the growth benefits of IFI. These findings highlight the importance of strengthening financial systems in less developed regions to fully leverage the growth effects of IFI: once financial development reaches the threshold, integration can drive growth by enhancing capital allocation and access to external funding. These results are consistent with the ones reported by other empirical studies (Masten et al., 2008; Broner and Ventura, 2016)

Table 3 displays the GMM estimates for the dynamic panel data models when trade openness is used as the threshold. The linearity test (p-value) again confirms that the relationship between IFI and growth is nonlinear. The estimated threshold is around 114% for the majority of the IFI variables, with FDI liabilities and equity FDI liabilities having again the lowest threshold (67%).

Insert Table 3 about here

The results provide evidence that IFI is beneficial for economic growth only above the threshold in the case of total liabilities, total flows, FDI liabilities, FDI flows, equity-FDI liabilities, equity-FDI and also debt flows. This reflects the fact that trade openness enhances the benefits of IFI by facilitating access to international markets, promoting specialisation, and increasing productivity (Grossman and Helpman, 1991). Once again FDI liabilities and equity and FDI liabilities have the lowest thresholds.

In our sample, Western and Northern Europe have the highest levels of trade openness.[7] The former region leads in terms of trade openness owing to its export-oriented economies and well-developed infrastructure.[8] The Eastern European countries have seen rapid increases in trade openness in recent decades, especially since joining the EU.[9] Nevertheless, their degree of trade openness remains lower than in Western and Northern Europe owing to smaller domestic industries and varying levels of economic development. Finally, the Southern European countries also exhibit relatively low trade openness, which reflects larger domestic markets and less reliance on exports.[10]

The most beneficial effects on growth above the threshold level are found when FDI and portfolio equity liabilities are used as a measure of IFI. This is not surprising, as trade openness and financial integration are frequently viewed as interconnected components of globalisation. When a country reduces its trade barriers, it can also ease the movement of capital across borders by liberalising its financial markets. Consequently, enhanced trade openness may result in increased financial integration. Besides, a country engaged in international trade may need efficient financial channels to support transactions, investments, and capital flows associated with its trade activities. These results are in line with previous findings by Kose et al. (2011)

To sum up, our analysis indicates that trade openness plays a key role in the relationship between financial integration and economic growth in Europe, since it enables countries to specialise in the production of goods for which they have a comparative advantage, which leads to enhanced

[7] The regional average trade openness levels over the period from 2000 to 2021 are 150–160% and 130-140% of GDP for Western and Northern Europe respectively (source: World Bank database).
[8] Trade openness is particularly high in the case of Luxembourg (~300%), Belgium (~170%), and Germany (~90%). The latter is a global leader in industrial goods, machinery, and vehicles, with exports contributing 40-50% to its GDP. This export-driven structure highlights Germany's high level of integration into global supply chains (source: World Bank database).
[9] The regional average trade openness levels for Eastern Europe over the period from 2000 to 2021 is 100–120% of GDP. In countries such as Slovakia and Hungary trade openness exceeds 150%, largely as a result of their integration into global supply chains, particularly in the manufacturing sector (source: World Bank database).
[10] Its average values is ~70–80% of GDP, being particularly low in Italy (~60%) and Greece (~70%) (source: World Bank database).

efficiency and broader market access. Therefore, it appears that the effectiveness of financial integration policies may depend on the degree of trade openness in the European economies.

Table 4 reports the results when using the quality of institutions as the threshold. The linearity test (p-value) again suggests the presence of non-linearities. The estimated threshold ranges from 35% to 144% for the different IFI measures. It can be seen that institutions, including legal frameworks, property rights protection, and regulatory effectiveness, play a crucial role in shaping the relationship between financial integration and economic growth and determining the extent to which the former affects the latter in the European countries.

Insert Table 4 about here

Depending on the IFI measure used, the estimated effects are either positive or negative, but generally insignificant, below the threshold, whilst above it they are always positive and significant, except in the case of the debt measures. Therefore, it appears that countries with better institutions typically benefit more from financial integration in terms of economic growth, the evidence being particularly strong when using FDI liabilities to measure IFI. Well-functioning institutions create an enabling environment for more efficient capital allocation and risk management, and greater investor confidence, thereby increasing the positive effects of financial integration on growth. This evidence is again in line with previous findings reported in the empirical literature (Boyd and Smith, 1992; Bekaert et al., 2005; Masten et al., 2008).

High-quality institutions foster confidence among investors and borrowers, and thus increase capital flows. Moreover, they can enable individuals and businesses to access capital more readily, which facilitates investments and boost economic growth. Institutions also play a crucial role in managing the risks associated with financial integration. Effective governance mechanisms can mitigate systemic risks, ensuring the stability of financial markets. Furthermore, well designed institutions facilitate the efficient allocation of resources and enhance a country's competitiveness. Capital can then be directed towards its most productive uses, fostering entrepreneurship,

encouraging competition, and promoting the development of industries that contribute to overall economic growth.

Northern and Western Europe are known for the high quality of their institutions, a strong rule of law, and well-established governance structures. By contrast, Southern Europe, despite some improvements, still faces challenges related to corruption and administrative efficiency. Eastern Europe has made substantial progress but displays significant variation in institutional quality, with countries in this region still working to overcome the legacies of centralised governance (see Figure 2). In brief, financial integration, supported by high-quality institutions, can lead to economic growth in the European countries, but in the absence of an appropriate regulatory framework it results in vulnerabilities, financial imbalances, and systemic risks. That is why a synergy between financial integration and high-quality institutions is crucial to ensure stability and to minimise risks within the financial system.

Table 5 focuses on the results obtained when the chosen threshold variable is economic or political uncertainty as measured by WUI. Evidence of nonlinearities is once more provided by the linearity test (p-value). The estimated threshold ranges from 3.5% to 6.7%, which is rather low. The results indicate that, below the threshold, higher IFI, however measured, enhances economic growth. This is particularly noticeable when using total liabilities and FDI as measures of IFI. However, economic or political uncertainty affects adversely investor confidence and leads to a higher degree of risk aversion and thus to smaller cross-border investment and capital flows. As businesses postpone investment decisions owing to the uncertain market conditions a slowdown in growth occurs.

Insert Table 5 about here

On the whole, it is apparent that political and economic uncertainty affects investment decisions, capital flows, and overall economic performance by increasing market volatility. Northern and Western European countries, such as Germany, the UK, and France, generally experience lower levels of uncertainty given their stable political and economic environment. However, events such as the Brexit referendum, the sovereign debt and financial crises, and geopolitical tensions have

also resulted in heightened uncertainty in their financial markets and in the broader economy. Eastern Europe has generally exhibited higher levels of uncertainty, partly owing to the transition from centrally planned to market economies and the associated geopolitical tensions.

Table 6 reports the results with initial income as the threshold. The linearity test confirms that there exists a nonlinear relationship between IFI and growth, the estimated threshold being around 45%. It appears that countries at different stages of development experience different effects of financial integration on growth. In particular, below the threshold these are positive but insignificant, whilst above it they are estimated to be beneficial as well as significant when using total liabilities, total flows, equity and FDI liabilities, FDI liabilities and FDI flows as measures of IFI.

Insert Table 6 about here

Income in the Northern and Western European countries generally exceeds the threshold, and thus IFI is fully beneficial in their case. By contrast, in Southern Europe, where income is lower, IFI has only limited benefits owing to the structural challenges faced by the countries in this region. Finally, Eastern Europe, where initial income was the lowest, has made significant progress as a result of EU integration and foreign investment. However, in some of the countries belonging to this region income is still below the threshold; although they have benefited from foreign investment, they are still more subject to financial volatility, which can limit the long-term growth benefits of financial integration. Similar results as Kose et al., 2003

Insert Table 7 about here

Finally, Table 7 presents the results obtained when using as the threshold financial openness, namely the extent to which a country allows for the free flow of capital across its borders. In this case nonlinearities are yet again present, as indicated by the linearity test (p-value), and the estimated threshold ranges from 43% to 94% for the different IFI measures. Below the threshold the IFI coefficients are generally negative but insignificant. However, above it some of them become significant, specifically those on equity and FDI liabilities, debt liabilities, debt flows, FDI

liabilities and FDI flows. Therefore, it appears that countries with a higher level of financial openness reap greater benefits from financial integration, especially when the latter is measured as FDI liabilities and FDI flows. Higher degrees of financial openness enhance the benefits of financial integration by promoting capital accumulation, whilst lower ones limit them by restricting access to external financing.

In our sample, Western Europe and Northern Europe are characterised by high financial openness, underpinned by advanced markets, EU integration, and Eurozone membership, making them attractive for foreign investment, with Northern Europe being slightly less open as a result of some countries in this region retaining their national currencies.[11] Countries in Southern Europe and Eastern Europe have varying but generally lower degrees of financial openness, despite their EU membership. Finally, economies in non-EU Eastern Europe have low openness owing to the existence of political and economic barriers. [12]

To sum up, our panel analysis provides clear evidence of nonlinearities and thresholds effects in the relationship between IFI and economic growth. The lowest thresholds are estimated in the case of financial development and trade openness, especially when financial integration is measured using FDI liabilities, which suggests that growth can be boosted by higher IFI even when those variables are relatively low.

[11] Austria, Belgium, Denmark, Finland, and Germany have a particularly high level of financial openness, with index values around 2.299 in 2021. These countries are integrated into the global financial markets, having minimal restrictions on cross-border financial transactions (source: global economy.com).

[12] Belarus (-0.166) and Moldova (-1.242) have negative scores, which indicates more restrictions on cross-border capital flows (source: global economy.com).

3.2 The Effects of the Global Financial Crisis of 2007-2009 and of the Covid-19 Pandemic on IFI-Growth nexus

As already mentioned, to examine the possible impact of the 2007-2009 GFC and of the Covid-19 pandemic we extend the model by introducing in turn an appropriately defined dummy variable and a stringency index, and also interactive terms with IFI. In this case we use only four of the financial integration measures (total flows, equity-FDI flows, FDI flows, and debt flows) and three of the thresholds (financial development, trade openness, and the quality of institutions). The selected IFI measures, which focus solely on aggregate flows, as well as the chosen thresholds, which are the most frequently used in the literature, are sufficiently informative for our purposes. The GMM estimates for these models are displayed in Tables 8-10.

Both these crises caused widespread economic disruption, leading to a decline in financial integration as well as economic growth throughout Europe, but their impact differed across countries depending on their level of financial integration, economic and financial development, trade openness and institutional resilience. The GFC originated in the banking sector, where excessive risk-taking and subprime lending resulted in a sharp rise in the price of mortgage-backed securities and in its subsequent collapse when the bubble burst. The crisis then spread quickly to the real economy, and caused large-scale disruptions in cross-border lending and investment. By contrast, the Covid-19 pandemic crisis was triggered by a public health emergency, with the spread of the virus leading to government-imposed lockdowns, physical distancing measures, and business closures, which caused a sudden and widespread halt to economic activity. Given the very different nature of these two shocks to the world economy, it is particularly interesting to compare their effects on the IFI-growth nexus and to draw any relevant policy implications.

Table 8 reports the results obtained when financial development is used as the threshold. They show that the GFC had a greater impact on countries characterised by a higher degree of financial development such as the Western European ones, as indicated by the bigger size of the estimated coefficient on the interaction term. Deeper financial integration appears to have made them more vulnerable to contagion. In addition, direct exposure to subprime assets and reliance on interbank lending significantly magnified the financial impact of the shock.

Insert Table 8 about here

By contrast, countries in Eastern Europe with a lower degree of financial development were less severely affected, despite still experiencing sharp economic downturns resulting from lower capital inflows, currency volatility, and credit shortages, as their limited integration into the global financial markets helped them avoid direct exposure to the subprime assets that affected Western Europe's banking sector.

The Covid-19 restrictions had an impact on all countries, regardless of their level of financial development. However, since this shock did not originate in the financial sector but rather as a public health emergency, the IFI-growth nexus was affected only indirectly, despite an initial disruption in cross-border financial flows, and to a smaller extent compared to the effects of the GFC. The latter directly destabilised the financial sector and led to liquidity and solvency issues in the banking sector which posed key challenges to the European countries. By contrast, banks entered the Covid-19 crisis with higher levels of capital and liquidity, which helped maintain stability and limit disruptions to cross-border finance. Additionally, throughout the pandemic they were supported by cost and capital relief measures designed to sustain their lending (Altavilla et al., 2020). Policies focused on encouraging lending and enhancing liquidity proved to be more effective than fiscal packages in helping the economy to recover (Caporale et al., 2021). The Covid-19 pandemic also reinforced European financial integration through coordinated fiscal responses and joint recovery initiatives. Further, advances in digitalisation made the European economies less vulnerable to the pandemic shock (Caporale et al., 2024b).

Table 9 shows the evidence based on using trade openness as the threshold. As in the previous case, the effects of the GFC appear to have been widespread but less pronounced in countries with lower trade openness. Such countries tend to rely less on international trade and more on domestic demand for their economic activity, which results in reduced exposure to external shocks, such as the GFC. Consequently, the real effects of financial contagion through the international banking crisis were less severe, especially in the case of some Eastern European economies. By contrast, countries with higher trade openness are highly integrated into global trade networks, and their

experience of the financial crisis was markedly different. More precisely, the sharp contraction in global trade during the crisis led to a significant decline in exports, which account for a relatively big share of GDP in these countries. This was particularly sharp in the industrial and manufacturing sectors, especially those integrated into international supply chains, which suffered substantial disruptions. The coefficients on the interaction term in fact imply a negative and significant impact in both regimes and shows clearly that the GFI affected the IFI-growth nexus. For instance, the coefficient on the interaction term with IFI ($crisis_{i,t}$ *X FDIflows*) is negative and significant in both the lower regime (-0.056) and the higher one (-0.199).

As for the impact of the Covid-19 pandemic on the IFI-economic growth nexus, this also appears to have been negative, but less severe compared to that of the GFC. Countries with lower trade openness were significantly affected by domestic lockdowns, which reduced household consumption and disrupted business activity. However, their limited reliance on exports provided some insulation from the immediate collapse in global trade. By contrast, countries with higher trade openness experienced a markedly different trajectory during the pandemic. These economies were hit by the initial global trade disruptions, particularly in manufacturing and export-driven sectors closely tied to global supply chains, which led to a decline in international demand for goods and services. In their study on the effects of the Covid-19 pandemic on European trade patterns Caporale et al. (2024c) found that indeed lockdown restrictions and other policies adopted by national governments had a heterogeneous impact across sectors and product types, depending on countries' characteristics and degree of resilience. Moreover, tight integration with the international financial system heightened vulnerability to global economic instability. Our evidence is consistent with such previous studies, since the coefficients on the interaction terms imply a negative and significant impact on the IFI-growth nexus in both regimes, though a smaller one than during the GFC. Specifically, the estimated coefficient on $crisis_{i,t}$ *X FDI flows* is -0.199, whereas that on $str\_cov_{i,t}$ *X FDI flows* is only -0.021 in countries with higher trade openness.

Insert Table 9 about here

Finally, Table 10 reports the estimates when the quality of institutions is the selected as the threshold variable. As can be seen, there is again evidence that both the GFC and the Covid-19

pandemic significantly affected all countries, in this case regardless of the quality of their institutions, and again the former had a more pronounced effect on financial integration and economic growth. More precisely, the GFC affected adversely countries in both regimes, the coefficients on the interaction terms being negative and significant for all the IFI measures. This was also the case during the Covid-19 pandemic, but again the estimated effects are lower compared to those of the GFC. More precisely, the coefficient on the interaction term str_$cov_{i,t}$ *X FDIflows* is only -0.011 in countries with higher-quality institutions, compared to -2.617 in the case of the regressor $crisis_{i,t}$ *X FDIflows.*

Insert Table 10 about here

To conclude, the 2007-9 GFC had a more significant impact on the relationship between financial integration and growth in Europe, which led to structural changes and lower cross-border financial flows. By comparison, the Covid-19 pandemic caused only short-term disruptions as coordinated fiscal measures and digitalisation efforts were very effective in supporting the economic recovery.

4. Conclusions

This paper investigates possible nonlinearities in the relationship between international financial integration and economic growth by using a dynamic panel threshold model for the European countries. Specifically, it applies the method developed by Seo and Shin (2016) to estimate dynamic panels with endogenous threshold effects, which provides more reliable results shedding new light on the IFI-growth nexus in Europe. Moreover, it uses various measures of IFI and thresholds to obtain comprehensive evidence. Further, it examines in turn the impact of the 2007-2009 GFC and of the Covid-19 pandemic on the relationship of interest and compares their effects. The European focus is more informative than global studies about a region with varying levels of developments and a distinct regulatory framework.

The results indicate that using country-specific variables as thresholds is crucial to understand the impact of financial integration on economic growth as this can vary depending on such factors. In

particular, in our sample Northern and Western European countries (which are characterised by higher levels of financial development, trade and financial openness, initial income, and quality of institutions, and lower levels of economic and political uncertainty) appear to benefit more than Southern and Eastern ones from financial integration in terms of economic growth. Moreover, membership in the EU and Eurozone provide an advantage in leveraging these benefits. These results are in line with previous evidence suggesting that financial integration becomes beneficial only above a given threshold for country-specific variables such as trade openness and macroeconomic policies (see, e.g., Boyd and Smith, 1992; Bekaert et al. 2005; Kose et al., 2011; Chen and Quang, 2014: Broner and Ventura, 2016).

Finally, our analysis shows that the 2007-2009 GFC and the Covid-19 pandemic both affected significantly the IFI-growth nexus in Europe, but again there were differences across countries reflecting their different levels of financial integration, trade openness and institutional resilience. While the GFC primarily destabilised financial markets and cross-border financial flows, the pandemic caused a temporary economic slowdown through lockdowns and mobility restrictions. The former shock had a greater negative impact on the IFI-growth nexus in Europe since it affected financial markets directly, especially in the case of financially developed countries. Specifically, these effects were most severe in the case of the Western European economies, particularly those in the Eurozone, owing to their deep integration with global financial markets and their significant exposure to subprime assets which made them vulnerable to contagion and led to banking crises.

Our findings provide useful insights for policy formulation. Specifically, they suggest that, in order to leverage financial integration effectively, policymakers should focus on strengthening financial development by fostering inclusive financial systems and implementing robust regulatory frameworks. This approach will help create efficient and resilient financial markets, promote financial literacy, and lower barriers to financial services. Effective regulation is vital for managing risks associated with financial integration, including systemic risks and speculative capital movements. Policymakers should also aim to boost trade openness by promoting trade liberalisation and investing in trade-related infrastructure. Reducing both tariffs and non-tariff barriers can enhance economic productivity and competitiveness, maximising the benefits of financial integration. Improvements in logistics and transportation networks can further increase

trade efficiency, enabling nations to fully capitalise on the opportunities that financial integration presents.

Further, in order to manage financial openness successfully, policymakers should prioritise macroeconomic stability and adopt a phased approach to liberalisation. Creating a stable economic environment characterised by low volatility of exchange rates, anchored inflation expectations, and a sound fiscal stance is crucial to reap the benefits of financial openness while minimising the associated risks. In particular, gradual liberalisation of financial markets can help prevent capital flight and reduce vulnerability to external shocks. Strengthening institutional quality is also essential for achieving sustainable growth through financial integration. Policymakers should therefore aim to improve governance, combat corruption, and protect property rights. Transparent, accountable, and efficient institutions create an environment that promotes the fair distribution of the benefits of financial integration: policies aimed at reducing corruption and upholding the rule of law can encourage investment and entrepreneurship, further enhancing its positive impact.

Finally, reducing uncertainty by promoting political and economic stability and managing effectively external shocks is also crucial for making IFI most beneficial. Establishing strong risk management frameworks and participating in regional financial initiatives can provide a buffer against global uncertainty. Active monetary policies might also be required to manage short-term disruptions that may arise from financial integration. To conclude, in order to maximise the benefits of financial integration and achieve sustainable growth, policies should be pursued whose aim is to enhance the financial systems, institutional frameworks, and overall economic stability.

References

Aghion, P., and Howitt, P. (1998). Endogenous Growth Theory. Cambridge, MA: The MIT Press.

Ahir, H., Bloom, N., and Furceri, D. (2022). The world uncertainty index. NBER Working Paper 29763. http://www.nber.org/ papers/w29763

Altavilla, C., Barbiero, F., Boucinha, M., and Burlon, L. (2020). The great lockdown: Pandemic response, policies and bank lending conditions. ECB Working Paper no. 2465.

Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. The Quarterly Journal of Economics, 106(2), 407-443. DOI: 10.2307/2937943

Barro, R. J., and Lee, J. W. (1994). Sources of Economic Growth. Carnegie-Rochester Conference Series on Public Policy, 40, 1-46. DOI: 10.1016/0167-2231(94)90002-7

Beck, T., Demirgüç-Kunt, A and Levine, R. (2000). A new database on the structure and development of the financial sector. World Bank Economic Review 14(3). 597–605

Bekaert, G., Harvey, C.R. and C. Lundblad (2005). Does financial liberalization spur growth? Journal of Financial Economics, 77 (1). 3-55.

Boyd, J.H. and Smith, B.D. (1992). Intermediation and the equilibrium allocation of investment capital: Implications for economic development. Journal of Monetary Economics, 30 (3). 409–432.

Broner, F., and Ventura J. (2016). Rethinking the effects of financial globalization. Quarterly Journal of Economics, 131(3). 1497–1542. https://doi.org/10.1093/qje/qjw010

Caner, M., and Hansen, B.E. (2004). Instrumental variable estimation of a threshold model. Econometric Theory. 20 (5). 813-843. https://doi.org/10.1017/S0266466604205011

Caporale, G.M., Sova, A. and Sova, R. (2015). Financial Development and Economic Growth: Evidence from 10 New European Union Members. International Journal of Finance and Economics. 20 (1). 48-60 **https://doi.org/10.1002/ijfe.1498**

Caporale, G.M., Sova, A. and Sova, R. (2021). Trade Flows, Private Credit and the Covid-19-Pandemic: Panel Evidence from 35 OECD Countries, CESifo Working Paper, No. 9400.

Caporale, G.M., Sova, A.D. and R. Sova (2024a), Financial integration and economic growth in Europe, in G.M. Caporale (ed.), Handbook of Financial Integration, chapter 23, pp. 550-561, Edward Elgar Publishing.

Caporale, G.M., Sova, A. and Sova, R. (2024b). The Covid-19 pandemic and European trade flows: Evidence from a dynamic panel model. International Journal of Finance and Economics 29(3). 2563-2580. **https://doi.org/10.1002/ijfe.2797**

Caporale, G.M., Sova, A. and Sova, R. (2024c). The Covid-19 pandemic and European trade patterns: A sectoral analysis. International Journal of Finance and Economics. **https://doi.org/10.1002/ijfe.2943**

Chen, J., and Quang T. (2014). The impact of international financial integration on economic growth: New evidence on threshold effects. Economic Modelling. 42 475–48. ,https://doi.org/10.1016/j.econmod.2014.06.011

Chinn, M.D. and Ito, H. (2008). A new measure of financial openness. Comp. Policy Anal. Res. Pract.10(3). 309–322.

De la Torre, A., Ize, A., and. Schmukler S.L (2012). Financial development in Latin American and the Caribbean: The road ahead. World Bank Latin American and Caribbean Studies. The World Bank, Washington, D.C.

Friedrich, C., Schnabel, I., and Zettelmeyer J (2010). Financial integration and growth: Is emerging Europe different? European Bank for Reconstruction and Development. Working Paper no. 123.

Furceri, D., Loungani, P., and Ostry J.D. (2019). The aggregate and distributional effects of financial globalization: Evidence from macro and sectoral data. Journal of Money, Credit, and Banking. 51 163–198. https://doi.org/10.1111/jmcb.12668

Grossman, G. M., and Helpman, E. (1991). Innovation and Growth in the Global Economy. MIT Press.

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. Journal of Econometrics, 93 (2) 345–368.
https://doi.org/10.1016/S0304-4076(99)00025-1

Hermes, N., and Lensink R. (2003). Foreign direct investment, financial development and economic growth. Journal of Development Studies, 40 (1) 142-163.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2005). Governance Matters IV: Governance Indicators for 1996–2004. World Bank Policy Research Working Paper No. 3630. Available at: https://doi.org/10.2139/ssrn.588270.

Klenow, P. J., and Rodríguez-Clare, A. (1997). The neoclassical revival in growth economics: Has it gone too far? NBER Macroeconomics Annual. 12. 73-103. DOI: 10.1086/654409.

Kneller, R., Bleaney, M. F. and Gemmell, N. (1999). Fiscal Policy and Growth: Evidence from OECD Countries. Journal of Public Economics, 74(2). 171-190. DOI: 10.1016/S0047-2727(99)00022-5.

Kose, M.A., Prasad, E.S., and Terrones M.E. (2003). Financial integration and macroeconomic volatility. IMF Staff Papers, 50.

Kose, M.A., Prasad, E.S., and S.-J. Wei (2009), "Financial globalization: a reappraisal", IMF Staff Papers, 56 (1) 8-62.

Kose, M.A., Prasad, E.S. and Taylor A.D. (2011). Thresholds in the process of international financial integration. Journal of International Money and Finance. 30 147-179, https://doi.org/10.1016/j.jimonfin.2010.08.005

Kremer, S., Bick, A., and Nautz D (2013). Inflation and growth: New evidence from a dynamic panel threshold analysis. Empirical Economics. 44 (2). 861–878. https://doi.org/10.1007/s00181-012-0553-9

Lane, P. R., and Milesi-Ferretti, G. M. (2007). The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004. Journal of International Economics. 73(2) 223–250. https://doi.org/10.1016/j.jinteco.2007.02.003

Levine, R. (2001). International financial liberalization and economic growth. Review of International Economics. 9 (4) 688–702. https://doi.org/10.1111/1467-9396.00307

Mankiw, N. G., Romer, D., and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. The Quarterly Journal of Economics. 107(2) 407-437. DOI: 10.2307/2118477.

Masten, A.B., Coricelli, F., and Masten I. (2008). Non-linear growth effects of financial development: Does financial integration matter? Journal of International Money and Finance. 27. 295-313. https://doi.org/10.1016/j.jimonfin.2007.12.009

Nicolo`, G. D., and Juvenal L. (2014). Financial integration, globalization, and real activity. Journal of Financial Stability. 10. 65–75. https://doi.org/10.1016/j.jfs.2013.04.004

Obstfeld, M. (1998). The global capital market: Benefactor or menace? Journal of Economic Perspectives, 12 (4) 9-30. https://doi.org/10.1257/jep.12.4.9

Obstfeld, M. (2009). International finance and growth in developing countries:
What have we learned? IMF Staff Papers, 56 (1) 63–111.https://doi.org/10.1057/imfsp.2008.32

Rajan, R., and Zingales L. (1998). Financial dependence and growth. American Economic Review. 88.559-586.

Robinson, P.M. (1988). Root-N-consistent semiparametric regression. Econometrica, 56 (4) 931-954.

Sala-i-Martin, X. (1996). The classical approach to convergence analysis. The Economic Journal, 106(437). 1019-1036. DOI: 10.2307/2235540.

Sala-I-Martin, X., Doppelhofer, G., and Miller, R.I., (2004). Determinants of long-term growth: a Bayesian averaging of classical estimates (BACE) approach. Am. Econ. Rev. 94 (4). 813–835.

Seo, M.H., and Shin Y. (2016). Dynamic panels with threshold effect and endogeneity. Journal of Econometrics. 195. 169-186.https://doi.org/10.1016/j.jeconom.2016.03.005

Seo, M.H., Kim, S., and Kim Y.-J. (2019). Estimation of dynamic panel threshold model using Stata2, The Stata Journal. 19 (3) 685–697. https;//doi.org/10.1177/1536867X19874243

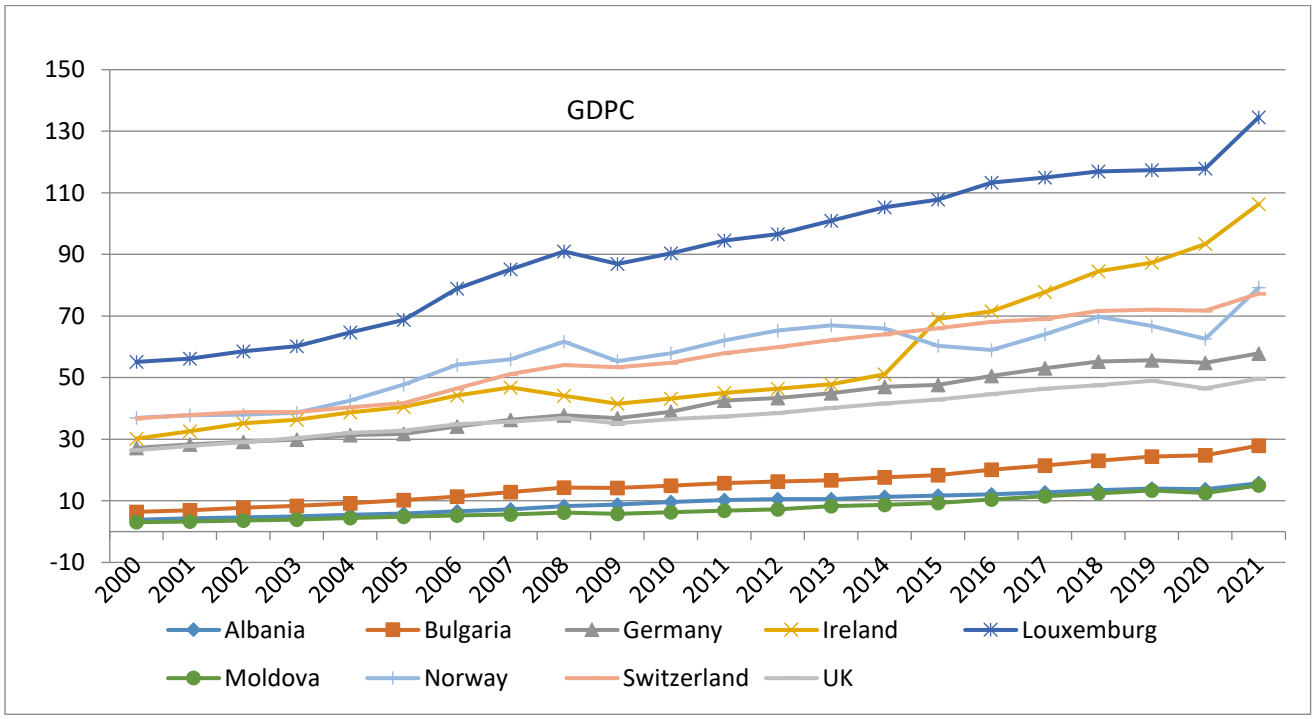
Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. The Quarterly Journal of Economics, 70(1). 65-94. DOI: 10.2307/1884513.

Svirydzenka, K. (2016). Introducing a New Financial Development Index. International Monetary Fund (IMF) Working Paper No. 16/5. Available at: https://doi.org/10.2139/ssrn.2681232.

Tasdemir, F. (2023). International financial integration: too much? Borsa Istanbul Review, 23 (2). 402-411. https://doi.org/10.1016/j.bir.2022.11.005

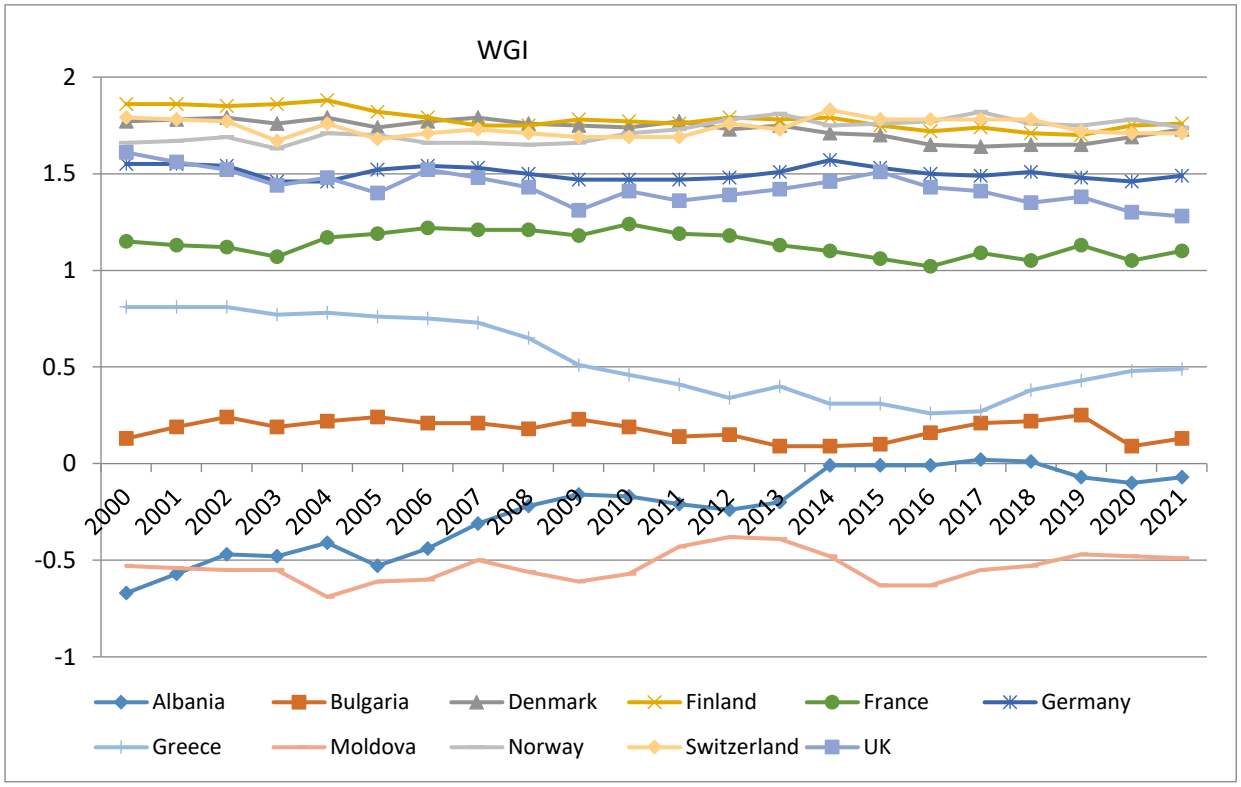
TABLES AND FIGURES

Figure 1: Growth Domestic Product per capita (GDP per capita) for selected European countries with the highest, middle, and lowest values (in thousand dollars).



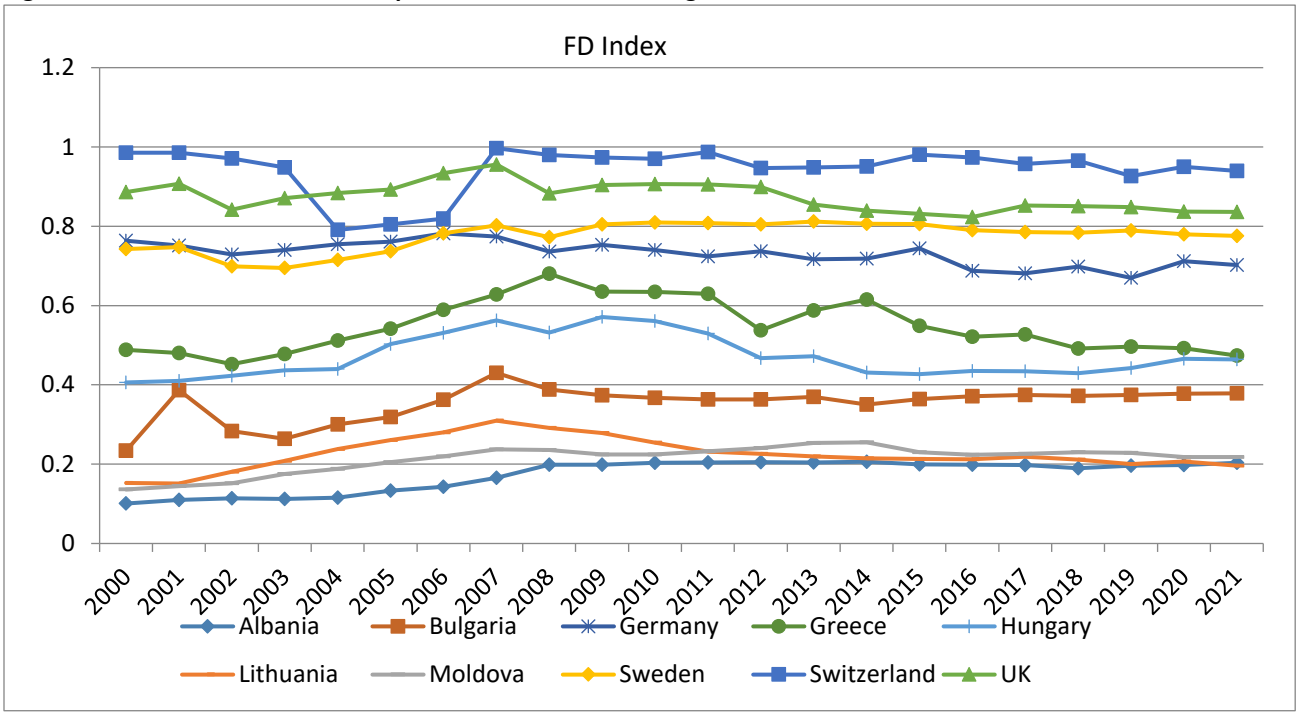
Source: World Bank database.

Figure 2: WGI index for selected European countries with the highest, middle, and lowest values.



Source: World Bank database.

Figure 3: FD index for selected European countries with the highest, middle, and lowest values.



Source: IMF.

Table 1: Variable list

Variable code	Definition	Source
TOT_LB	Total liabilities	Lane and Milesi-Ferretti (2007)
TOT_IFI	Total assets + Total liabilities	Lane and Milesi-Ferretti (2007) Author's calculation
FDI_LB	FDI liabilities	Lane and Milesi-Ferretti (2007)
FDI_FLOWS	FDI assets + FDI liabilities	Lane and Milesi-Ferretti (2007) Author's calculation
EQ_FDI_LB	Portfolio equity liabilities + FDI liabilities	Lane and Milesi-Ferretti (2007)
EQ_FDI	Portfolio equity assets + FDI assets (EQ-FDI-AS) + Portfolio equity liabilities + FDI liabilities (EQ-FDI-LB)	Lane and Milesi-Ferretti (2007) Author's calculation
DEB_LB	Debt liabilities	Lane and Milesi-Ferretti (2007)
DEB_FLOWS	Debt assets + Debt liabilities	Lane and Milesi-Ferretti (2007) Author's calculation
$GDPC\text{-}GROW_{i,t-1}$	Real per capita GDP lagged one period	World Development Indicators (WDI)
GDPC-GROW	Real GDP per capita growth	World Development Indicators (WDI) – Author's calculation
LABOR	Labor force, total	World Development Indicators (WDI)

SCHOL	School enrollment, secondary	World Development Indicators (WDI)
GOVSPEND	Government spending	World bank database
STR_COV	Stringency Index	OXCGRT*
FD	Financial Development index	IMF
WGI	World Governance Index	Worldwide Governance Indicators 2024
TRD-OP	Trade Openness	World Development Indicators (WDI) author calculus
FO	Financial Openness	http://web.pdx.edu/~ito/Chinn-Ito_website.htm
WUI	World Uncertainty Index	EPU- World Uncertainty Index **

* The Oxford COVID-19 Government Response Tracker (*OxCGRT*)

** Economic Policy Uncertainty

Table 2: The impact of Financial Integration on Economic Growth in Europe Using Financial Development as a Threshold (FD)

THR-FD	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
*Lag_y_b**	0.428 (2.04) **	-0.04 (0.72)	-0.076 (1.48)	0.089 (1.38)	0.023 (0.07)	0.119 (1.25)	0.17 (1.75) *	-0.212 (4.17) ***
IFI_b(fd<=γ)	**-0.033 (0.42)**	**-0.021 (0.38)**	**-0.015 (1.17)**	**-0.030 (2.25) ****	**-0.039 (1.24)**	**-0.046 (1.52)**	**0.006 (0.20)**	**-0.012 (0.71)**
cons_d	3.172 (2.67) ***	1.98 (1.67) *	4.956 (3.64) ***	4.928 (3.03) ***	6.632 (6.71) ***	-1.129 (0.74)	2.627 (6.34) ***	2.179 (1.62)
*Lag_y_d**	-1.02 (4.81) ***	-0.667 (7.08) ***	-0.474 (3.92) ***	-0.807 (4.77) ***	-0.346 (0.99)	-0.862 (4.53) ***	-0.661 (8.96) ***	-0.567 (5.39) ***
IFI_d(fd>γ)	**0.024 (1.84) ***	**0.089 (1.59)**	**0.032 (1.69) ***	**0.012 (0.21)**	**0.093 (2.13) ****	**0.027 (2.14) ****	**0.008 (0.16)**	**0.089 (1.17)**
Threshold estimate (r)	0.341 (6.54) ***	0.564 (9.92) ***	0.573 (6.58) ***	0.564 (10.72) ***	0.263 (3.02) ***	0.568 (7.53) ***	0.433 (6.11) ***	0.617 (8.08) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

*Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; Column (6) FDI flows; Column (7) is debt liabilities; Column (8) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

Table 3: The impact of Financial Integration on Economic Growth in Europe using trade openness as a Threshold (TRD-OP)

THR-TRD-OP	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
*Lag_y_b**	-0.435 (6.89) ***	-0.24 (2.68) ***	-0.456 (2.69) ***	0.515 (2.91) ***	-0.427 (2.86) ***	-0.514 (2.83) ***	0.035 (0.14)	-0.613 (2.63) **
IFI_b(trd-op<=γ)	**-0.068 (1.61)**	**-0.082 (1.99) ***	**-0.024 (1.14)**	**0.087 (1.25)**	**-0.022 (1.43)**	**-0.035 (1.32)**	**-0.009 (0.11)**	**- 0.032 (1.81) ***
cons_d	0.974 (1.82) *	3.404 (5.54) ***	5.958 (5.59) ***	4.622 (2.07) **	5.316 (4.36) ***	5.503 (4.8) ***	5.034 (2.26) **	3.219 (3.28) ***
*Lag_y_d**	0.393 (3.17) ***	0.583 (2.83) ***	0.818 (4.57) ***	-0.047 (0.59)	0.828 (5.26) ***	1.079 (5.29) ***	0.159 (0.39)	0.564 (3.04) ***
IFI_d(trd-op>γ)	**0.215 (1.95) ***	**0.202 (7.63) ***	**0.457 (6.27) ***	**0.109 (1.73) ***	**0.466 (5.41) ***	**0.262 (2.62) ***	**0.02 (0.23)**	**0.104 (2.50) **
Threshold estimate (r)	1.144 (6.03) ***	1.12 (6.31) ***	1.144 (4.73) ***	0.67 (3.74) ***	0.67 (2.79) ***	1.16 (5.55) ***	1.144 (4.72) ***	0.791 (3.2) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; *Column (6) FDI flows; Column (7) is debt liabilities; Column (8) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 4: The impact of Financial Integration on Economic Growth in Europe using the quality of institutions as a Threshold (WGI)

THR-WGI	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
*Lag_y_b**	0.279 (3.29) ***	0.325 (5.35) ***	-0.016 (0.17)	-0.227 (1.42)	0.148 (3.07) ***	0.166 (3.67) ***	0.354 (1.84) *	-0.146 (1.34)
IFI_b(wgi<=γ)	**0.029** **(0.56)**	**0.002** **(0.06)**	**-0.02** **(1.33)**	**-0.06** **(1.69) ***	**-0.013** **(0.46)**	**-0.009** **(0.33)**	**0.02** **(1.29)**	**0.016** **(1.31)**
cons_d	5.124 (3.16) ***	8.004 (6.32) ***	1.646 (1.32)	6.003 (5.44) ***	8.208 (3.86) ***	8.02 (5.11) ***	3.458 (4.08) ***	1.8 (1.55)
*Lag_y_d**	-1.174 (6.73) ***	-1.239 (6.36) ***	-0.74 (5.02) ***	-0.137 (0.74)	-0.793 (4.72) ***	-0.835 (5.06) ***	-0.761 (3.35) ***	-0.422 (2.94) ***
IFI_d(wgi>γ)	**0.22** **(2.21) ** **	**0.482** **(3.37) *** **	**0.125** **(2.42) ** **	**0.02** **(1.82) ***	**0.500** **(4.29) *** **	**0.477** **(3.56) *** **	**0.03** **(0.73)**	**0.003** **(0.07)**
Threshold estimate (r)	1.442 (7.63) ***	1.442 (10.12) ***	1.096 (4.37) ***	0.354 (5.88) ***	1.442 (10.27) ***	1.442 (9.48) ***	0.354 (3.66) ***	0.354 (4.06) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; Column (6) FDI flows ; Column (7) is debt liabilities ; Column (8) is debt flows; t statistics in parentheses. Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 5: The impact of Financial Integration on Economic Growth in Europe using political and economic uncertainty as a Threshold (WUI)

THR-WUI	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
*Lag_y_b**	0.586	-0.123	-0.172	-0.123	-0.348	-0.31	-0.113	-0.16
	(1.82) *	(0.72)	(1.27)	(0.64)	(2.48) **	(2.58) **	(1.27)	(1.15)
IFI_b(wui<=γ)	**0.182**	**0.059**	**0.023**	**0.002**	**0.032**	**0.049**	**0.036**	**0.041**
	(2.92) * **	**(1.59)**	**(0.87)**	**(0.12)**	**(1.51)**	**(1.78) ***	**(1.43)**	**(1.24)**
cons_d	-0.21	0.209	0.824	0.098	0.696	0.009	0.526	0.615
	(0.62)	(0.42)	(2.91) ***	(0.24)	(2.28) **	(0.02)	(2.11) **	(1.71) *
*Lag_y_d**	-1.258	-0.175	0.021	-0.597	0.291	0.141	-0.593	-0.243
	(3.76) ***	(0.48)	(0.06)	(2.73) ***	(1.12)	(0.54)	(2.97) ***	(0.82)
IFI_d(wui>γ)	**-0.235**	**-0.134**	**-0.063**	**-0.116**	**-0.061**	**-0.118**	**-0.081**	**-0.107**
	(4.06) * **	**(2.89) *** **	**(1.66) ***	**(4.51) *** **	**(2.02) ** **	**(2.37) ** **	**(2.83) *** **	**(3.23) *** **
Threshold estimate (r)	0.035	0.054	0.054	0.067	0.054	0.054	0.067	0.055
	(2.26) **	(3.85) ***	(2.98) ***	(2.78) ***	(2.89) ***	(1.79) *	(4.59) ***	(3.29) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

*Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; Column (6) FDI flows; Column (7) is debt liabilities; Column (8) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 6: The impact of Financial Integration on Economic Growth in Europe Using initial income as a Threshold (GDPC-GROW)

THR - GDPC-GROW$_{i,t-1}$	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	**3**	**4**	5	6	**7**	**8**
*Lag_y_b**	-0.191 (2.24) **	-0.165 (1.45)	-0.109 (1.06)	0.124 (0.91)	-0.132 (1.38)	-0.144 (1.26)	0.021 (0.22)	-0.151 (1.97) **
IFI_b(gdpc-grow<=γ)	**0.007 (0.22)**	**0.006 (0.45)**	**-0.016 (1.02)**	**-0.003 (0.41)**	**0.007 (0.36)**	**0.006 (0.46)**	**-0.002 (0.26)**	**-0.006 (0.47)**
cons_d	10.571 (5.59) ***	3.028 (2.45) **	6.684 (5.97) ***	5.532 (5.06) ***	3.056 (2.69) ***	2.909 (2.79) ***	4.528 (4.11) ***	8.391 (5.86) ***
*Lag_y_d**	-0.735 (3.79) ***	-0.158 (0.63)	-0.38 (1.79) *	-0.931 (5.59) ***	-0.152 (0.66)	-0.113 (0.48)	-0.853 (5.22) ***	-0.409 (2.73) ***
IFI_d(gdpc-grow>γ)	**0.226 (1.81) ***	**0.234 (4.35) *****	**0.167 (3.82) *****	**0.085 (1.62)**	**0.152 (2.38) ****	**0.17 (2.92) *****	**0.098 (1.12)**	**-0.084 (1.28)**
Threshold estimate (r)	4.557 (54.35) ***	4.485 (42.88) ***	4.491 (51.26) ***	4.535 (43.98) ***	4.485 (30.3) ***	4.485 (31.98) ***	4.535 (40.15) ***	4.546 (65.18) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; Column (6) FDI flows; Column (7) is debt liabilities; Column (8) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. *b* is lower regime; d* is higher regime*

TABLE 7: The impact of Financial Integration on Economic Growth in Europe using financial openness as a Threshold (FO)

THR-FO	***tot_lb***	***tot_ifi***	***eq_fdi_lb***	***eq_fdi***	***fdi_lb***	***fdi_flows***	***deb_lb***	***deb_flows***
	1	**2**	3	**4**	**5**	**6**	**7**	**8**
*Lag_y_b**	-0.676 (2.64) ***	-0.521 (3.83) ***	-1.007 (5.8) ***	-0.499 (3.42) ***	-0.371 (4.08) ***	-0.384 (4.38) ***	-0.976 (6.99) ***	-0.98 (5.57) ***
IFI_b(FO<=γ)	**0.031** **(1.08)**	**-0.017** **(1.29)**	**-0.001** **(0.04)**	**-0.045** **(1.51)**	**0.01** **(0.49)**	**0.006** **(0.34)**	**-0.016** **(0.98)**	**-0.01** **(0.67)**
cons_d	0.384 (0.39)	-3.811 (2.87) ***	-2.278 (3.09) ***	-3.877 (2.64) ***	-38.941 (1.71) *	-38.599 (1.43)	-2.734 (2.65) ***	-2.536 (3.22) ***
*Lag_y_d**	0.357 (1.3)	0.08 (0.33)	0.472 (2.83) ***	0.029 (0.13)	-0.008 (0.05)	0.009 (0.07)	0.437 (2.5) **	0.438 (2.55) **
IFI_d(FO>γ)	**0.238** **(1.34)**	**0.067** **(0.89)**	**0.085** **(1.82) ***	**0.055** **(1.16)**	**0.157** **(4.29) *****	**0.166** **(4.76) *****	**0.103** **(2.66) *****	**0.09** **(2.01) **
Threshold estimate (r)	0.435 (3.26) ***	0.829 (6.78) ***	0.717 (4.21) ***	0.829 (6.86) ***	0.941 (20.89) ***	0.941 (17.69) ***	0.717 (4.65) ***	0.717 (4.41) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	40	40	40	40
No. obs	1040	1040	1040	1040	1040	1040	1040	1040

*Note: Column (1) is total liabilities; Column (2) is total flows; Column (3) is equity and FDI liabilities; Column (4) is equity and FDI flows; Column (5) FDI liabilities; Column (6) FDI flows; Column (7) is debt liabilities; Column (8) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 8: The impact of the global financial crisis and of the Covid-19 pandemic on the financial integration-economic growth with financial development as a threshold

FD-STRINGENCE	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***
IFI_b(fd<=γ)	-0.041 (1.13)	-0.088 (2.06) **	-0.021 (0.87)	-0.052 (1.57)
str_cov_b(fd<=γ)	-0.081 (2.93) ***	-0.074 (3.04) ***	-0.036 (1.84) *	-0.132 (4.25) ***
IFI_str_cov_b(fd<=γ)	-0.016 (3.15) ***	-0.039 (3.24) ***	-0.017 (1.67) *	-0.028 (4.48) ***
IFI_d(fd>γ)	0.163 (1.58)	0.096 (1.14)	0.124 (1.91) *	0.014 (0.08)
str_cov_d(fd>γ)	-0.325 (3.06) ***	-0.235 (2.95) ***	-0.125 (1.91) *	-0.336 (2.74) ***
IFI_str_cov_d(fd>γ)	-0.051 (3.26) ***	-0.041 (3.05) ***	-0.048 (1.72) *	-0.06 (3.17) ***
Threshold estimate r	0.583 (9.16) ***	0.612 (8.27) ***	0.463 (3.79) ***	0.588 (8.47) ***
Bootstrap p-value	0.000	0.000	0.000	0.000
No. countries	40	40	40	40
No.obs	1040	1040	1040	1040

FD-CRISIS	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***
IFI_b(fd<=γ)	-0.056 (1.28)	-0.033 (1.18)	-0.063 (1.18)	-0.065 (1.75) *
crisis_b(fd<=γ)	-0.562 (1.89) *	-0.218 (0.43)	-2.231 (1.87) *	-4.982 (3.29) ***
IFI_crisis_b(fd<=γ)	-0.107 (1.72) *	-0.028 (0.27)	-0.615 (1.77) *	-1.026 (3.50) ***
IFI_d(fd>γ)	0.031 (0.55)	0.191 (1.83) *	0.347 (1.72) *	0.166 (1.43)
crisis_d(fd>γ)	-0.932 (1.76) *	-4.828 (3.14) ***	-8.668 (2.27) **	-9.579 (5.84) ***
IFI_crisis_d(fd>γ)	-0.167 (1.69) *	-0.774 (2.93) ***	-1.099 (1.81) *	-3.612 (5.88) ***
Threshold estimate r	0.463 (5.22) ***	0.564 (7.98) ***	0.578 (9.37) ***	0.573 (12.71) ***
Bootstrap p-value	0.000	0.000	0.000	0.000
No. countries	40	40	40	40
No.obs	1040	1040	1040	1040

*Note: Column (1) is total flows; Column (2) is equity and FDI flows; Column (3) is FDI flows; Column (4) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 9: The impact of the global financial crisis and of the Covid-19 pandemic on the financial integration-economic growth with trade openness as a threshold

TRD_OP - STRINGENCE	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***		***TRD_OP - CRISIS***	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***
IFI_b(trd_op<=γ)	-0.078 (2.53) **	-0.014 (0.46)	-0.012 (0.11)	-0.116 (2.06) **		*IFI_b(trd_op<=γ)*	-0.051 (2.36) **	-0.162 (2.13) **	0.08 (0.96)	-0.017 (0.45)
str_cov_b(trd_op<=γ)	-0.002 (0.36)	0.005 (0.88)	-0.009 (1.82) *	-0.023 (1.74) *		*crisis_b(trd_op<=γ)*	-0.464 (1.71) *	-1.125 (1.26)	-0.325 (1.91) *	-2.346 (1.85) *
IFI_str_cov_b(trd_op<=γ)	-0.011 (1.69) *	-0.002 (1.42)	-0.007 (1.65) *	-0.018 (1.96) *		*IFI_crisis_b(trd_op<=γ)*	-0.074 (1.68) *	-0.198 (1.73) *	-0.056 (1.79) *	-0.38 (1.89) *
IFI_d(trd_op>γ)	0.101 (1.72) *	0.083 (1.54)	0.094 (1.83) *	0.519 (3.87) ***		*IFI_d(trd_op>γ)*	0.509 (2.56) **	0.15 (2.48) **	0.056 (1.70) *	0.07 (1.30)
str_cov_d(trd_op>γ)	-0.023 (1.67) *	-0.006 (0.62)	-0.011 (1.69) *	-0.078 (3.13) ***		*crisis_d(trd_op>γ)*	-0.139 (2.02) **	-1.088 (2.23) **	-1.101 (2.11) **	-2.39 (1.75) *
IFI_str_cov_d(trd_op>γ)	-0.004 (1.82) *	-0.003 (0.69)	-0.021 (1.75) *	-0.013 (3.24) ***		*IFI_crisis_d(trd_op>γ)*	-0.088 (1.67) *	-0.193 (1.89) *	-0.199 (2.04) **	-0.391 (1.77) *
Threshold estimate r	1.297 (4.89) ***	0.82 (3.18) ***	0.810 (3.38) ***	1.104 (5.39) ***		*Threshold estimate r*	1.12 (3.85) ***	0.67 (2.28) **	1.313 (7.53) ***	0.67 (3.51) ***
Bootstrap p-value	0.000	0.000	0.000	0.000		*Bootstrap p-value*	0.000	0.000	0.000	0.000
No. countries	40	40	40	40		*No.countries*	40	40	40	40
No .obs	1040	1040	1040	1040		*No.obs*	1040	1040	1040	1040

*Note: Column (1) is total flows; Column (2) is equity and FDI flows; Column (3) is FDI flows; Column (4) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*

TABLE 10: The impact of the global financial crisis and of the Covid-19 pandemic on the financial integration-economic growth with the quality of institutions as a threshold

WGI - STRINGENCE	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***	***WGI-CRISIS***	***tot_ifi***	***eq_fdi***	***fdi_flows***	***deb_flows***
IFI_b(wgi<=γ)	0.031 (1.19)	-0.012 (1.82) *	-0.025 (0.68)	0.001 (0.03)	*IFI_b(wgi<=γ)*	-0.033 (2.04) **	-0.106 (3.55) ***	-0.05 (0.48)	0.001 (0.02)
str_cov_b(wgi<=γ)	-0.055 (3.62) ***	-0.079 (2.69) ***	-0.032 (2.01) **	-0.015 (2.68) ***	*crisis_b(wgi<=γ)*	-0.092 (0.17)	-0.257 (1.67) *	-5.365 (3.05) ***	-0.739 (2.41) **
IFI_str_cov_b(wgi<=γ)	-0.01 (3.77) ***	-0.016 (2.67) ***	-0.008 (2.07) **	-0.003 (2.56) **	*IFI_crisis_b(wgi<=γ)*	-0.019 (0.18)	- 0.073 (1.75) *	-2.009 (2.98) ***	-0.155 (2.45) **
IFI_d(wgi>γ)	-0.063 (0.53)	0.154 (1.99) **	0.103 (1.97) *	0.141 (1.71) *	*IFI_d(wgi>γ)*	0.023 (1.66) *	0.081 (1.91) *	0.122 (1.75) *	0.37 (3.84) ***
str_cov_d(wgi>γ)	-0.234 (3.20) ***	-0.235 (2.54) **	-0.055 (2.66) **	-0.082 (1.90) *	*crisis_d(wgi>γ)*	-0.673 (2.19) **	-0.013 (0.04)	-6.844 (4.91) ***	-5.585 (1.75) *
IFI_str_cov_d(wgi>γ)	-0.040 (3.3) ***	-0.043 (2.73) ***	-0.011 (2.49) **	-0.015 (2.01) **	*IFI_crisis_d(wgi>γ)*	-0.089 (1.77) *	-0.036 (0.48)	-2.617 (4.4) ***	-0.957 (1.79) *
Threshold estimate r	1.459 (7.32) ***	1.338 (5.05) ***	0.112 (1.92) *	1.476 (6.5) ***	*Threshold estimate r*	1.407 (4.93) ***	0.181 (1.73) *	0.117 (1.84) *	1.442 (9.74) ***
Bootstrap p-value	0.000	0.000	0.000	0.000	*Bootstrap p-value*	0.000	0.000	0.000	0.000
No. countries	40	40	40	40	*No. countries*	40	40	40	40
No.obs	1040	1040	1040	1040	*No.obs*	1040	1040	1040	1040

*Note: Column (1) is total flows; Column (2) is equity and FDI flows; Column (3) is FDI flows; Column (4) is debt flows; t statistics in parentheses. * Significant at 10%.; ** Significant at 5%.; *** Significant at 1%. b* is lower regime; d* is higher regime*