JELS Journal of Economics, Law & Society

ESREIN Economic and Social Research Institute

The Institutions-Finance-Growth Nexus: The Case Study of EU and European Transition Economies

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Abstract

This paper empirically investigates the impact of finance and institutions on economic growth using a panel data analysis covering the 2002-2019 period and focusing on three country groups: European Union (EU) member countries, European transition economies, and the overall sample taking all countries together. In contrast to the prevailing view that suggests a positive impact of finance on growth, our findings indicate that finance either decreases growth or is insignificant without evidence of non-linearity. Another finding that comes as a surprise is that institutions play no role in growth either directly or indirectly via finance in all our samples. Our findings, however, support the claim that the finance-growth nexus depends on financial development proxies and the financial and institutional development levels within sample countries.

Article History
Received: April 30, 2024
Accepted: May 07, 2024
Published: June 30, 2024

Keywords
financial development; institutional development; economic growth; developed countries; transition economies; European Union

JEL Codes
C33; D02; F43; O1; O4;

How to Cite
Smolo, E. (2024). The Institutions-Finance-Growth Nexus: The Case Study of EU and European Transition Economies. *Journal of Economics, Law and Society, 1(1)*, 5-22.

1. Introduction

The debate about what causes economic growth under different economic conditions is ongoing and is about to continue. The current and prevailing economic system is capitalism, which promotes an open economy with free capital and labor flows. Consequently, the authors started investigating reasons, factors, and patterns why some countries tend to develop faster than others. In short, studies show that several factors affect economic growth, such as the level, depth, and strength of financial sector development, government spending, monetary and fiscal stability, human capital, institutional development, a type of political system, and its stability – among others. Furthermore, some of these factors have positive and some negative effects on economic growth depending on the sample countries and the period under investigation.

Financial development is one of the most influential factors that affect economic growth. This debate with Schumpeter (1912) led to an extensive debate, resulting in several views. As this relationship is becoming more complex due to overall development, other factors are entering into this relationship. One of those factors is institutional development, which attracts considerable attention among researchers. Political stability, property rights, rule of law, accounting standards, control of corruption, and government efficiency are integral parts of institutional development that play a role in the finance-growth nexus (Anayiotos & Toroyan, 2009; Gani & Ngassam, 2008; Law & Habibullah, 2009; Hakimi & Hamdi, 2017; Slesman et al., 2019). Still, depending on the underlying

conditions of a particular state, this variable may affect economic growth differently. However, the overall effect of it is expected to be positive.

The entire sample comprises 38 European countries, while the other two subsamples cover 28 European Union (EU) member countries and 10 European TE countries. The existing literature, however, primarily focuses on developed economies, ignoring less developed ones, particularly transition economies (TE). These countries differ in many dimensions and are going through social, political, economic, and institutional changes that affect their overall performance. In short, TE is in dire need of institutions (financial and otherwise) that would support and promote economic growth. To address the literature gap, this study aims to address the finance-growth nexus using samples with different financial and institutional developments. The main objective of this study is to determine the effect of financial and institutional development on economic growth within the samples mentioned above. In particular, based on existing literature and unresolved issues, this study will test a few hypotheses, namely:

H1. Financial development affects economic growth positively.
H2. The impact of financial development on economic growth is non-linear.
H3. The effect of financial development on economic growth depends on institutions.
H4. The finance-growth nexus depends on proxies used for financial development indicators.
H5. The finance-growth nexus differs in countries with different financial and institutional development.

To investigate our main objective and test the above hypotheses, the study relies on the bias-corrected least square dummy variable estimator (LSDVC) developed by Kiviet (1995). Previous studies relied on many estimation techniques. However, compared to those, LSDVC is considered superior and provides more reliable results. The study uses GDP per capita and GDP growth as dependent economic growth variables that are in line with the literature. As for the main independent variables, the study relies on traditional financial development indicators such as liquid liabilities, private credit to GDP ratios, financial institutions, and financial markets – proxies developed by Svirydzenka (2016). Institutional development is measured by two indices, one produced by the Heritage Foundation and the other by the World Governance Indicators (WGI) of the World Bank database (Kaufmann et al., 2010).

The most exciting finding was that finance decreases growth or is insignificant without evidence of non-linearity. Another important finding was that institutions play no role in direct or indirect growth via finance in all our samples. Hence, we find no support for our hypotheses H_1, H_2, and H_3. However, our findings further support the idea of several authors who found that the finance-growth nexus depends on the proxies used for financial development and the level of financial and institutional development within sample countries (H_4 and H_5).

The rest of the study is structured as follows: *Section 2* provides a literature review; *Section 3* describes the data and methodology used; *Section 4* analyses empirical results; and *Section 5* provides concluding observations.

2. Literature Review

The debate on the finance-growth nexus is still ongoing. Numerous papers provided theoretical foundations (Schumpeter, 1912; Robinson, 1952; Goldsmith, 1969; Shaw, 1973; Lucas, 1988), leading to extensive empirical literature confirming and challenging those theories. As a result of these studies, several relationships have been detected over the years, and four significant views have surfaced. The most prevailing view is the 'supply-leading hypothesis,' where finance leads to economic

growth (Beck et al., 2000; Levine et al., 2000; Christopoulos & Tsionas, 2004; Seetanah et al., 2009; Bittencourt, 2012; Beck et al., 2014). The second view is the 'demand-following hypothesis,' where growth precedes financial development (Favara, 2003; Naceur & Ghazouani, 2007; Hsueh et al., 2013; Bezemer et al., 2014; Samargandi et al., 2015; Carré & L'œillet, 2018). The 'feedback hypothesis' or a bi-directional relationship is the third view in the literature where finance and growth contribute positively to each other's development (P. O. Demetriades & Hussein, 1996; Greenwood & Smith, 1997; Cheng, 2012; Marques et al., 2013). Finally, the fourth view is the 'neutrality hypothesis' or no relationship between finance and growth (Lucas, 1988; Shan & Morris, 2002; Nyasha & Odhiambo, 2015).

Be it as it may, all these views are under scientific scrutiny as some studies concluded that these relationships depend on financial development proxies, methodologies, and sample countries and periods used for investigation (Fernandez & Galetovic, 1994; De Gregorio & Guidotti, 1995; Luintel & Khan, 1999; Ram, 1999; Naceur & Ghazouani, 2007; Favara, 2003; Hsueh et al., 2013; Carré & L'œillet, 2018; Nyasha & Odhiambo, 2018; Smolo, 2020b, 2021, 2022). Halkos and Trigoni (2010), Hassan et al. (2011), Hsueh et al. (2013), Marques et al. (2013), and Smolo (2020a) found more than one relationship in their studies to make things even more complicated.

Furthermore, investigating the finance-growth nexus in 24 advanced economies, Swamy and Dharani (2019) found a non-linear, inverted U-shaped relationship. In other words, a positive contribution of financial development to economic growth has its limit, and once that limit is reached, its contribution becomes negative. Law and Singh (2014), Prochniak and Wasiak (2017), and Smolo (2023) have reported similar findings.

Nevertheless, recent studies point out other factors directly and indirectly affecting this nexus. For instance, a tripartite relationship, institutions-finance-growth, attracts increasing attention from researchers. In particular, several studies highlighted the significance of institutional quality/development, such as political stability, property rights, rule of law, accounting standards, control of corruption, and government efficiency – among others – as essential ingredients in the finance-growth nexus (Anayiotos & Toroyan, 2009; P. Demetriades & Fielding, 2012; Gani & Ngassam, 2008; La Porta et al., 1998; Girma & Shortland, 2007; Law & Azman-Saini, 2008; Law & Habibullah, 2009; Hakimi & Hamdi, 2017; Slesman et al., 2019; Minović et al., 2021). For finance to affect growth positively, the institutional quality needs to reach a certain threshold. Otherwise, its impact on growth would be negative (Minea & Villieu, 2010; Djeri et al., 2020; Slesman et al., 2019).

In short, institutional quality affects economic growth directly and indirectly through its impact on financial development. Financial development may not contribute to the economic growth of Middle East and North African (MENA) countries unless institutional development is considered (Kutan et al., 2017). Efficient government and democracy contribute to efficient institutions that ultimately contribute to economic growth in Pakistan (Murtaza & Faridi, 2016). Furthermore, efficient institutions affect the economic growth of sub-Saharan African countries directly and indirectly through public debt (Sani et al., 2019). Similarly, Urbano et al. (2019) found that institutions lead to economic growth through entrepreneurship. However, besides improving the overall quality of institutions within a country, for economic growth to take place, it is equally important to reduce all sorts of inequality (Karla & Stiglitz, 2003; Nigar, 2015).

In brief, this ongoing debate on the finance-growth nexus offers inconclusive and sometimes conflicting results. This relationship is further complicated by several other factors that directly and indirectly affect economic growth through their impact on financial development. Institutional quality is the most significant factor that impacts this relationship, as represented by several indicators highlighted briefly above. While there has been much research on the finance growth nexus and developed economies, very few studies have investigated the relationship between institutions and

finance growth, especially in transition economies. Given these unresolved issues, this study sheds additional light on the institutions-finance-growth nexus, focusing on a few European samples with different financial, economic, and institutional foundations. The results are expected to offer valuable insights to policymakers and contribute to the existing literature on the topic.

3. Data, Model and Methodology

3.1. Data and Sample Selection

To investigate the relationship between financial and institutional development on one side and economic growth on the other, this study uses annual-level data for 38 countries from Europe as the primary sample. In addition, as the literature shows that impacts of finance and institutions may have different implications for economic growth due to various economic, financial, and institutional development, the primary sample is divided into two different country groups with the similar yet different financial, institutional, and economic environment: (i) EU member states (28 countries)[1] – the EU represents a trade union with a free flow of labor and capital with no tariffs or trade barriers; and (ii) European transition economies (10 countries)[2] – these economies are relatively small developing, and going through a transition from planned- to market-based economies.

In line with the existing literature, our dependent variable is the real per capita GDP growth rate (GDP) as a measure of economic growth (Kutan et al., 2017; Swamy & Dharani, 2019). For robustness tests, we are using GDP growth (GDPG) instead (Swamy & Dharani, 2019). Previous studies have used several proxies to analyze financial development variables. Some studies use a credit ratio to the private sector as a percentage of GDP (PR) to capture the efficiency of funds channeling to the private sector (Al-Malkawi & Abdullah, January 3; Levine, 1997; Smolo, 2020a). In contrast, others use a ratio of liquid liabilities to GDP (LL) to capture the financial sector size and depth (King & Levine, 1993; Levine, 1997; Compton & Giedeman, 2011; Law & Singh, 2014; Smolo, 2020a). However, Svirydzenka (2016) argues that these traditional variables do not reflect the multifaceted nature of financial development.

Consequently, apart from the two proxies for financial development mentioned above, this study employs two different indices suggested by Svirydzenka (2016), namely, the financial institutions index (FI) and the financial markets index (FM), with each one taking into consideration the depth, accessibility, and efficiency of financial institutions and markets. It is believed that these indices represent financial development in a more comprehensive form, providing a better picture and understanding of the role of financial development in economic growth. Furthermore, as several studies find a nonlinear relationship between finance and growth, this study uses squared terms of these financial variables (Rousseau & Wachtel, 2011; Breitenlechner et al., 2015; Haini, 2020).

Similarly, institutional development is also regarded as a complex, multidimensional concept as scholars used various indicators as its proxies. This study relies on two different measures. The first is the institutional development (overall score) the Heritage Foundation provides. The second one is the institutional quality index constructed based on six indicators from the World Governance Indicators (WGI) of the World Bank database. These indicators are control of corruption, political stability, rule of law, regulatory quality, voice and accountability, and government effectiveness developed by Kaufmann et al. (2010). However, instead of examining each indicator separately or

[1] EU member states 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, Sweden and the United Kingdom. We include the United Kingdom as it was part of EU during the study period.

[2] European transition economies are: Albania, Armenia, Belarus, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, North Macedonia, Serbia, and Ukraine.

jointly, we construct the institutional quality index using the principal component analysis (PCA). Using each indicator separately may not provide the overall quality of institutions as it is a complex phenomenon. At the same time, using all these indicators simultaneously may not be appropriate as they are highly correlated (Globerman & Shapiro, 2002; Buchanan et al., 2012). Hence, using factor analysis and following Globerman and Shapiro (2002) and Buchanan et al. (2012), we construct the institutional quality index by extracting the first principal component of those six institutional quality indicators. In addition, the study employs interaction terms of each financial development indicator with institutional development proxies to determine institutions' indirect impact on growth through financial development (Haini, 2020).

Table 1: Descriptive Statistics: all countries

Variable	Sign	Obs	Mean	Std. Dev.	Min	Max
GDP per capita growth (annual %)	GDP	684	2.84	0.33	-0.48	3.66
GDP growth (annual %)	GDPG	684	2.84	0.38	-1.82	3.69
Financial institutions	FI	648	-0.56	0.37	-1.93	-0.06
Financial markets	FM	648	-1.87	1.79	-7.79	-0.06
Liquid liabilities to GDP (%)	LL	683	4.17	0.69	2.38	6.84
Private credit to GDP (%)	PC	673	4.04	0.69	1.72	5.36
Institutional development (overall score)	ID	684	4.18	0.13	3.62	4.41
Institutional quality index	IQ	684	0.73	0.42	-0.57	1.36
Trade openness (% of GDP)	TO	684	4.63	0.42	3.82	6.01
Gross capital formation (% of GDP)	GCF	684	3.14	0.22	2.32	3.87
Government final consumption (% of GDP)	EXP	684	2.92	0.20	2.09	3.40
School enrollment, primary (% gross)	HC	662	4.62	0.05	4.44	4.87
Inflation - GDP deflator (annual %)	INF	684	2.57	0.32	-1.30	4.45

Note: All variables are in log form.

Table 2: Correlation matrix: all countries

Variables	GDP	GDPG	FI	FM	LL	PC	ID	IQ	TO	GCF	EXP	HC	INF
GDP	1.000												
GDPG	0.968	1.000											
FI	-0.258	-0.137	1.000										
FM	-0.214	-0.099	0.775	1.000									
LL	-0.211	-0.086	0.754	0.599	1.000								
PC	-0.358	-0.243	0.880	0.750	0.657	1.000							
ID	-0.078	-0.011	0.554	0.389	0.473	0.511	1.000						
IQ	-0.141	-0.032	0.780	0.761	0.599	0.736	0.722	1.000					
TO	0.083	0.107	0.064	-0.050	0.373	0.003	0.240	0.153	1.000				
GCF	0.310	0.272	-0.396	-0.401	-0.407	-0.462	-0.098	-0.254	0.056	1.000			
EXP	-0.259	-0.197	0.508	0.612	0.250	0.573	0.124	0.568	-0.029	-0.361	1.000		
HC	-0.077	-0.041	0.171	0.258	0.104	0.265	0.118	0.272	-0.091	-0.011	0.202	1.000	
INF	0.322	0.301	-0.490	-0.388	-0.399	-0.444	-0.482	-0.439	0.023	0.374	-0.203	-0.071	1.000

Note: GDP - GDP per capita growth, GDPG - GDP growth, FI - financial institutions, FM - financial markets, LL – liquid liabilities, PC – private credit, ID - institutional development, IQ – institutional quality index, GCF - gross capital formation, EXP - government consumption expenditure, TO - trade openness, HC - human capital, INF - inflation. All variables are in log form.

Furthermore, besides finance and institutions, other factors also influence economic growth. Thus, the study uses several control variables commonly used in the literature on the topic. These control variables are: GCF, the gross capital formation (% GDP) reflecting the overall economic

development of a country; TO, trade openness is measured by the sum of exports and imports of goods and services (% GDP) representing the significance of international trade on economic activities; EXP, government consumption expenditure (% GDP) as proxy for investment in physical capital; HC, measured by primary school enrolment (% Gross) and represent the human capital development; and INF, inflation rate measured by GDP deflator (annual %) indicating macroeconomic and business environment (in)stability (Beck et al., 2014; Bist, 2018; Ibrahim et al., 2017; Sabir et al., 2019; Swamy & Dharani, 2019). ***Table 1*** provides summary statistics of all variables used in model estimations, while ***Table 2*** provides the correlation matrix between these variables.

All data are sourced from World Development Indicators (World Bank), World Governance Indicators (World Bank), the Heritage Foundation, and the IMF Financial Development Index Database (Svirydzenka, 2016), covering the 2002-2019 period. The study focuses on this period for several reasons: (i) in 2002, the EURO was introduced[3] and 19 EU member states are also members of the European Monetary Union, offering additional layers of financial and institutional qualities; (ii) some TE, in particular the Western Balkan countries, went through turbulent times during the '90s and it took them some years to get their economies back on track. Both these reasons may affect relationships that are the focus of this study.

3.2. Models and Methods Used

The literature is overwhelmed with numerous techniques, diverse indicators, and various samples used to investigate the finance-growth nexus. Consequently, previous studies led to mixed results and different conclusions. Most studies that used panel data applied models such as fixed/random effect or least square dummy variable (LSDV), assuming homogeneity of impact across countries. Studies also used the generalized method of moments (GMM) estimation method for dynamic panel data, considering it superior to other methods.

However, Nickell (1981) argues that the FE and RE results are biased and inconsistent. At the same time, Kiviet (1995), Bruno (2005b, 2005a), Bun, and Carree (2006) indicate that the results produced using the LSDV and GMM estimators are also erratic and suffer from finite-sample biases.

Hence, we turn to the bias-corrected LSDV estimator (LSDVC) developed by Kiviet (1995) and use the '*xtlsdvc*' command in Stata developed by Bruno (Bruno, 2005b). Judson and Owen (1999) and Flannery & Hankins (2013) discuss the differences between these techniques. In short, when it comes to balanced panels, as is the case with our sample and all *T* lengths, the LSDVC estimation technique is superior to all other estimation techniques mentioned above. Using the LSDVC estimation technique, we get the bootstrapped standard errors that are computing via Monte Carlo simulations with 50 replications.

Thus, to assess the impact of financial development and institutional quality on economic growth, we use the following dynamic panel data model (Agbloyor et al., 2016; Compton & Giedeman, 2011):

$$GDP_{it} = \alpha GDP_{it-1} + \beta FD_{it} + \delta ID_{it} + \theta X_{it} + \mu_i + \eta_t + \varepsilon_{it} \qquad \textit{(Eq. 1)}$$

where for country *i* (the cross–sectional dimension) at time *t* (the time dimension), GDP_{it} is the log of annual real per capita GDP growth rate, GDP_{it-1} is the lagged value of the log of annual real per capita GDP growth rate, FD_{it} is a measure of financial development, ID_{it} is a measure of institutional development, X_{it} is a vector of all control variables; μ_i is a country-specific effect, η_t is a time-specific effect, and ε_{it} is a random error term that captures all other variables.

[3] Although the euro was officially launched on 1 January 1999, the physical notes and coins were introduced only on 1 January 2002.

As pointed out earlier, there is potential non-linearity in the finance-growth nexus. Hence, we will test this using square terms of financial development indicators as illustrated in the following model:

$$GDP_{it} = \alpha GDP_{it-1} + \beta FD_{it} + \gamma FD_{it}^2 + \delta ID_{it} + \theta X_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad \textit{(Eq. 2)}$$

where FD^2_{it} represents the square term of our financial development measures. Finally, to test whether the impact of financial development depends on the level of institutional development, we introduce an interaction term to ***Eq. (1)*** as presented in ***Eq. (3)*** below. These interaction terms allow us to distinguish the direct and indirect impacts of financial and institutional development on growth. As suggested by Brambor, Clark, & Golder (2006), we include all relevant terms in the interaction model specification as follows:

$$GDP_{it} = \alpha GDP_{it-1} + \beta FD_{it} + \delta ID_{it} + \vartheta\ (FD_{it} \times ID_{it}) + \theta X_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad \textit{(Eq. 3)}$$

where, $FD_{it} \times ID_{it}$ represents the interaction variable. Other terms are as defined earlier.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Results and Discussion

Table 3, ***Table 4***, and ***Table 5*** present the estimated results for linear, non-linear, and interaction models based on *Eq (1), Eq (2),* and *Eq (3)* respectively. In all these tables, we are using financial institutions (FI), financial markets (FM), liquid liabilities (LL), and private credit (PC) as proxies for financial development and the Heritage Institutional Development Index (ID) as a proxy for institutional development. In each table, we have twelve models, four for each sample: all (overall) countries, EU contries, and transition economies (TE) sample.

Now, we move to the discussion of linear relation results presented in ***Table 3***. This table tests our first hypothesis (H_1): that finance contributes to economic growth. In general, however, the results show that FI and PC significantly negatively impact economic growth in the overall and EU sample countries. At the same time, LL exhibits a similar impact only in the overall sample. These results align with Mihci (2006), and Swamy and Dharani (2019), but in contrast to the claims of Rousseau and Wachtel (2011), who point to the fact that the finance-growth relationship is fading.

In contrast, the impact of FM on economic growth is insignificant in all subsamples with different signs. Financial development, however, is negligible in the case of TE with a positive sign except when LL is used as a proxy for financial development, which shows a negative sign. We can attribute these results to the transitional nature of these countries that recently moved from control-based to market-based economies. During this process, they started financial liberalization without proper expertise, which made their markets open and vulnerable to international factors. All these contribute to the overall instabilities in those economies that could consequently make financial development ineffective. In brief, based on the results, we cannot confirm (H_1).

Surprisingly, however, institutional development (ID) sourced from the Heritage Foundation has an insignificant and predominantly negative impact on economic growth. This contrasts previous studies that showed a significant effect of ID on growth Singh et al. (2009), Nguyen et al. (2018), and Kutan et al. (2017). Thus, although financial and institutional development differs in the EU and TE samples, the results indicate that no institutions impact economic growth. Reasons for these somehow strange results could be that (i) the effect of institutional development has been amalgamated with financial development proxies in the case of EU countries, and (ii) institutions in TE countries are way too immature to make any significant contribution to growth either directly or indirectly

via financial development. These countries underwent rapid privatization and market liberalization while lacking proper legal and regulatory infrastructure. It may be due to these facts that both financial and institutional developments are insignificant in these countries. Rousseau and Wachtel (2011) report similar conclusions.

Table 3: The institutions-finance-growth nexus: linear models using GDP & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
GDP_{t-1}	0.144***	0.154***	0.153***	0.126***	0.111**	0.129***	0.127***	0.092**	0.106	0.064	0.131	0.132
	(0.048)	(0.049)	(0.040)	(0.048)	(0.045)	(0.045)	(0.045)	(0.045)	(0.127)	(0.125)	(0.091)	(0.091)
FI	-0.177*				-0.334**				0.126			
	(0.093)				(0.165)				(0.328)			
FM		0.034				-0.025				0.108		
		(0.036)				(0.046)				(0.083)		
LL			-0.130*				-0.080				-0.021	
			(0.074)				(0.113)				(0.154)	
PC				-0.150***				-0.184***				0.005
				(0.044)				(0.054)				(0.123)
ID	-0.076	-0.311	-0.178	-0.085	0.011	-0.358	-0.300	-0.164	0.001	0.370	-0.208	-0.225
	(0.298)	(0.239)	(0.274)	(0.228)	(0.357)	(0.290)	(0.316)	(0.238)	(0.653)	(0.641)	(0.567)	(0.535)
TO	0.420***	0.446***	0.411***	0.392***	0.755***	0.752***	0.737***	0.725***	0.034	0.025	0.253	0.231
	(0.119)	(0.117)	(0.111)	(0.111)	(0.173)	(0.173)	(0.173)	(0.201)	(0.287)	(0.304)	(0.314)	(0.334)
GCF	0.252***	0.239***	0.219***	0.209***	0.363***	0.335***	0.315***	0.313***	-0.174	-0.218	0.066	0.062
	(0.094)	(0.092)	(0.081)	(0.073)	(0.095)	(0.093)	(0.096)	(0.091)	(0.243)	(0.234)	(0.174)	(0.174)
EXP	-0.201	-0.261*	-0.208	-0.114	-0.139	-0.178	-0.156	-0.032	-0.425	-0.422	-0.325	-0.330
	(0.146)	(0.140)	(0.142)	(0.142)	(0.192)	(0.188)	(0.197)	(0.193)	(0.399)	(0.342)	(0.295)	(0.297)
HC	-0.364	-0.274	-0.384*	-0.340	-0.264	-0.170	-0.155	-0.106	-1.025	-1.337	-0.764	-0.760
	(0.350)	(0.349)	(0.232)	(0.318)	(0.298)	(0.297)	(0.296)	(0.200)	(0.986)	(0.969)	(0.650)	(0.644)
INF	0.209***	0.215***	0.207***	0.205***	0.357***	0.363***	0.366***	0.351***	-0.273*	-0.254*	-0.221	-0.220
	(0.057)	(0.057)	(0.053)	(0.051)	(0.041)	(0.040)	(0.040)	(0.048)	(0.144)	(0.141)	(0.138)	(0.138)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP per capita. GDP_{t-1} is the lagged dependent variable. FI - financial institutions, FM - financial markets, LL - liquid liabilities to GDP, PC - private credit to GDP, ID - institutional development, TO - trade openness, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.

When it comes to control variables, the results indicate that the lagged dependent variable (GDP_{t-1}), trade openness (TO), gross capital formations (GCF), and inflation (IFN) have a significantly positive impact on growth in all models but the TE sample. The overall effect of government expenditure (EXP) and human capital (HC) is insignificant, excluding models (2) and (3), where they are, respectively, found to have a significantly negative impact on growth. Again, all control variables are statistically insignificant for transition economies. Inflation is the only control variable that negatively and significantly impacts growth in models (10) and (11).

Testing for the possible non-linear relationships between finance and growth (H_2), we move to ***Table 4***, which reports results based on *Eq (2)* above. Integrating square terms into our baseline model made most financial development proxies insignificant, although with the same signs. The negative impact of financial development on growth is confirmed for LL and PC in the EU sample, and the results align with the results from ***Table 3***. However, our results do not support a non-linear relationship in our sample countries, as most financial development square terms are insignificant. A non-linear relationship is only detected in model (7), EU sample, where liquid liabilities are used as a proxy for financial development. Our results indicate a U-shaped relationship between finance

and growth, contrasting findings reported by Swamy and Dharani (2019), Law and Singh (2014), and Prochniak and Wasiak (2017), who found an inverted U-shaped relationship. As for control variables, the results conform to previously reported results from ***Table 3***.

Table 4: The institutions-finance-growth nexus: non-linear models using GDP & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
GDP_{t-1}	0.144***	0.154***	0.152***	0.122**	0.110**	0.130***	0.111**	0.092**	0.110	0.070	0.137	0.141
	(0.048)	(0.050)	(0.041)	(0.048)	(0.045)	(0.045)	(0.044)	(0.044)	(0.132)	(0.129)	(0.092)	(0.091)
FI	-0.324				-0.241				0.211			
	(0.261)				(0.286)				(1.515)			
FISQR	-0.074				0.073				0.037			
	(0.124)				(0.211)				(0.629)			
FM		-0.007				-0.029				0.183		
		(0.132)				(0.117)				(0.531)		
FMSQR		-0.006				-0.001				0.010		
		(0.018)				(0.026)				(0.070)		
LL			-0.513				-1.419**				-0.156	
			(0.327)				(0.631)				(1.269)	
LLSQR			0.052				0.147**				0.021	
			(0.041)				(0.070)				(0.196)	
PC				0.053				-0.750**				0.435
				(0.197)				(0.365)				(0.484)
PCSQR				-0.030				0.071				-0.073
				(0.028)				(0.045)				(0.077)
ID	-0.081	-0.311	-0.122	-0.111	0.019	-0.357	-0.137	-0.054	0.023	0.379	-0.209	-0.290
	(0.300)	(0.239)	(0.291)	(0.226)	(0.361)	(0.293)	(0.327)	(0.257)	(0.635)	(0.652)	(0.565)	(0.526)
TO	0.424***	0.449***	0.417***	0.388***	0.765***	0.750***	0.804***	0.756***	0.031	0.024	0.241	0.294
	(0.121)	(0.118)	(0.112)	(0.110)	(0.177)	(0.175)	(0.180)	(0.201)	(0.311)	(0.309)	(0.314)	(0.337)
GCF	0.253***	0.243***	0.227***	0.196***	0.369***	0.334***	0.336***	0.339***	-0.178	-0.222	0.059	0.079
	(0.094)	(0.091)	(0.082)	(0.075)	(0.099)	(0.094)	(0.096)	(0.090)	(0.252)	(0.242)	(0.172)	(0.171)
EXP	-0.204	-0.257*	-0.219	-0.112	-0.145	-0.179	-0.144	-0.134	-0.420	-0.431	-0.324	-0.370
	(0.147)	(0.139)	(0.142)	(0.143)	(0.194)	(0.189)	(0.196)	(0.199)	(0.413)	(0.367)	(0.300)	(0.300)
HC	-0.372	-0.279	-0.403*	-0.302	-0.287	-0.171	-0.151	-0.179	-1.002	-1.308	-0.757	-0.835
	(0.354)	(0.350)	(0.230)	(0.326)	(0.307)	(0.299)	(0.294)	(0.201)	(1.006)	(0.964)	(0.662)	(0.650)
INF	0.209***	0.214***	0.206***	0.200***	0.354***	0.363***	0.361***	0.350***	-0.272**	-0.252*	-0.219	-0.230*
	(0.057)	(0.057)	(0.053)	(0.051)	(0.040)	(0.040)	(0.040)	(0.047)	(0.138)	(0.143)	(0.140)	(0.137)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP per capita. GDP_{t-1} is the lagged dependent variable, FI - financial institutions, FISQR - square term of FI, FM - financial markets, FMSQR - square term of FM, LL - liquid liabilities to GDP, LLSQR - square term of LL, PC - private credit to GDP, PCSQR - square term of PC, ID - institutional development, TO - trade openess, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.

Table 5 below provides results based on *Eq (3)* and investigates whether finance's impact on growth depends on institutions (H_3). Having interaction terms in our models makes all our financial development proxies insignificant. While insignificant, the majority of financial development proxies change their signs. Institutional development is only significant, with a direct negative impact on growth in the model (2). However, our primary focus variables, interaction terms, are all insignificant with different signs. Hence, our results reject H_3. This aligns with studies by Minea & Villieu (2010), Djeri et al. (2020), and Slesman et al. (2019), who claim that institutional quality should reach a certain threshold for finance to affect growth positively. This may sound realistic for TE countries as their institutions could be more developed. However, this explanation may only apply to some EU sample countries with well-developed institutions. As pointed out briefly above, a possible

explanation could be that institutional development effects are already fused into other factors affecting economic growth, including but not limited to finance. All other control variables align with previous results reported in ***Table 3*** and ***Table 4***.

Table 5: The institutions-finance-growth nexus: interaction models using GDP & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
GDPt-1	0.145***	0.153***	0.154***	0.127***	0.110**	0.130***	0.128***	0.092**	0.095	0.069	0.119	0.128
	(0.048)	(0.049)	(0.040)	(0.047)	(0.045)	(0.045)	(0.046)	(0.044)	(0.122)	(0.129)	(0.093)	(0.095)
FI	0.964				3.409				-6.158			
	(1.947)				(2.563)				(6.557)			
FIxID	-0.277				-0.908				1.500			
	(0.471)				(0.613)				(1.585)			
FM		0.617				0.641				-0.061		
		(0.574)				(0.948)				(1.536)		
FMxID		-0.145				-0.160				0.043		
		(0.142)				(0.229)				(0.387)		
LL			-0.241				-0.190				-2.611	
			(0.915)				(1.722)				(2.639)	
LLxID			0.027				0.025				0.648	
			(0.220)				(0.406)				(0.658)	
PC				0.107				1.180				-2.236
				(0.912)				(1.130)				(1.992)
PCxID				-0.062				-0.326				0.540
				(0.220)				(0.266)				(0.482)
ID	-0.332	-0.664*	-0.278	0.134	-0.538	-0.615	-0.396	1.073	2.018	0.519	-2.279	-1.971
	(0.498)	(0.400)	(0.805)	(0.853)	(0.489)	(0.417)	(1.659)	(1.006)	(2.125)	(1.534)	(2.174)	(1.621)
TO	0.428***	0.448***	0.409***	0.391***	0.732***	0.741***	0.738***	0.706***	0.003	0.020	0.173	0.250
	(0.123)	(0.117)	(0.111)	(0.110)	(0.175)	(0.176)	(0.179)	(0.201)	(0.289)	(0.310)	(0.314)	(0.333)
GCF	0.252***	0.245***	0.218***	0.205***	0.342***	0.337***	0.316***	0.301***	-0.280	-0.219	0.029	0.033
	(0.094)	(0.092)	(0.082)	(0.074)	(0.099)	(0.093)	(0.097)	(0.089)	(0.291)	(0.238)	(0.175)	(0.177)
EXP	-0.173	-0.233	-0.215	-0.098	-0.114	-0.166	-0.156	0.034	-0.614	-0.426	-0.449	-0.499
	(0.148)	(0.144)	(0.154)	(0.173)	(0.197)	(0.192)	(0.201)	(0.188)	(0.507)	(0.342)	(0.306)	(0.326)
HC	-0.354	-0.263	-0.388*	-0.331	-0.174	-0.112	-0.157	-0.018	-1.124	-1.317	-0.689	-0.665
	(0.358)	(0.352)	(0.230)	(0.319)	(0.312)	(0.305)	(0.307)	(0.212)	(0.979)	(1.015)	(0.669)	(0.662)
INF	0.212***	0.219***	0.206***	0.206***	0.366***	0.365***	0.365***	0.358***	-0.310**	-0.255*	-0.227	-0.239*
	(0.057)	(0.057)	(0.054)	(0.050)	(0.040)	(0.040)	(0.040)	(0.046)	(0.156)	(0.142)	(0.139)	(0.140)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP per capita. GDP_{t-1} is the lagged dependent variable, FI - financial institutions, FIxID - interaction term between FI and ID, FM - financial markets, FMxID - interaction term between FM and ID, LL - liquid liabilities to GDP, LLxID - interaction term between LL and ID, PC - private credit to GDP, PCxID - interaction term between PC and ID, ID - institutional development, TO - trade openess, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.

4.2. Robustness Tests

As for robustness tests, we run the same estimations using GDP growth as our dependent variable, and the institutional development index constructed PCA method based on six WGI indicators. All tables for robustness tests are reported in Appendix 1. ***Table A1.1*** provides estimation results for our baseline model. Our results remain unchanged, and the results from ***Table 3*** are confirmed. As for the non-linear relationship, the robustness results in ***Table A1.2*** support our previous finding in ***Table 4***. However, besides model (7), these results show more evidence of non-linearity in model (3) for the

overall sample and model (8) for the EU sample. All these cases confirm the U-shaped relationship between finance and growth. Control variables are, nevertheless, in line with previous results.

Similarly, robustness tests for interaction models are presented in ***Table A1.3***. Although our main results in ***Table 5*** showed the insignificance of finance and institutions and their interaction terms, our robustness results are somehow different. While most results conform with the main results, three models confirm the negative and one positive significance of financial development on growth. At the same time, the interaction term in model (6), FMxIQ, is also found to have a significantly negative impact on economic growth. In other words, under this model, the effect of financial markets depends on institutional development. However, as most interaction terms are insignificant, we can conclude that institutions do not affect growth directly or via finance. At the same time, results for transition economies in ***Table A1.1***, ***Table A1.2***, and ***Table A1.3*** are consistent with the leading results reported earlier in ***Table 3***, ***Table 4***, and ***Table 5***.

The present findings seem consistent with other research that found the finance-growth nexus dependable on the financial development proxies used (Fernandez & Galetovic, 1994; De Gregorio & Guidotti, 1995; Luintel & Khan, 1999; Ram, 1999; Naceur & Ghazouani, 2007; Favara, 2003; Hsueh et al., 2013; Carré & L'œillet, 2018; Nyasha & Odhiambo, 2018). At the same time, these findings further support the idea that this relationship depends on financial and institutional development levels within sample countries. Hence, we found support for our H_4 and H_5 hypotheses.

Finally, it is essential to note that our results are robust to different combinations of two dependent and two institutional development proxies. These results are not reported but are available upon a reasonable request.

5. CONCLUSION

The study revisits the finance-growth relationship by focusing on EU and transition economies and considering institutional development. Our results reveal that the impact of financial development on economic growth is generally negative when overall and EU samples are considered. The effect is, however, insignificant when a transitional economies sample is used. Furthermore, even though financial and institutional development is at different levels in EU and TE sample countries, the results indicate no impact of institutions on economic growth at all. The effects of institutions are integrated within financial development proxies in the case of the EU, and these institutions are immature in transition economies to impact growth.

All in all, our primary and robustness results indicate that the impact of finance on growth is either significantly negative or insignificant altogether, and this relationship is primarily linear. In addition, institutions have no direct or indirect (via finance) impact on growth in all our samples. Hence, we find no support for our hypotheses H_1, H_2, and H_3. However, the evidence supports H_4 and H_5, showing that the finance-growth nexus depends on the proxies used for financial development and the level of financial and institutional development within sample countries.

Declarations

The author has no relevant financial or non-financial interests to disclose. The data are available upon a reasonable request from the author.

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APPENDIX 1

A1. ROBUSTNESS TESTS

Table A1.1: The institutions-finance-growth nexus: robustness test for linear models using GDPG & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
$GDPG_{t-1}$	0.095**	0.103**	0.108***	0.085*	0.110**	0.131***	0.126***	0.088**	0.076	0.049	0.088	0.086
	(0.048)	(0.048)	(0.039)	(0.048)	(0.046)	(0.045)	(0.046)	(0.044)	(0.127)	(0.128)	(0.095)	(0.093)
FI	-0.256**				-0.340**				0.019			
	(0.107)				(0.135)				(0.426)			
FM		0.050				-0.032				0.111		
		(0.045)				(0.046)				(0.095)		
LL			-0.156*				-0.126				-0.054	
			(0.087)				(0.108)				(0.195)	
PC				-0.188***				-0.199***				0.036
				(0.054)				(0.055)				(0.150)
IQ	0.245	0.062	0.160	0.278	0.123	0.090	0.112	0.190	0.416	0.434	0.356	0.325
	(0.197)	(0.172)	(0.184)	(0.179)	(0.183)	(0.183)	(0.189)	(0.172)	(0.375)	(0.325)	(0.417)	(0.385)
TO	0.476***	0.502***	0.453***	0.439***	0.735***	0.726***	0.701***	0.683***	0.080	0.097	0.265	0.179
	(0.146)	(0.145)	(0.139)	(0.137)	(0.173)	(0.174)	(0.175)	(0.204)	(0.330)	(0.355)	(0.383)	(0.401)
GCF	0.351***	0.328***	0.276***	0.246***	0.351***	0.302***	0.277***	0.278***	-0.197	-0.242	0.039	0.033
	(0.116)	(0.115)	(0.099)	(0.093)	(0.098)	(0.095)	(0.098)	(0.095)	(0.302)	(0.294)	(0.217)	(0.219)
EXP	-0.179	-0.227	-0.180	-0.098	-0.169	-0.228	-0.192	-0.080	-0.453	-0.533	-0.379	-0.393
	(0.174)	(0.173)	(0.174)	(0.186)	(0.198)	(0.196)	(0.204)	(0.193)	(0.493)	(0.457)	(0.392)	(0.377)
HC	-0.381	-0.255	-0.358	-0.276	-0.260	-0.108	-0.101	-0.068	-1.182	-1.351	-0.634	-0.626
	(0.438)	(0.437)	(0.294)	(0.402)	(0.301)	(0.303)	(0.303)	(0.202)	(1.149)	(1.151)	(0.788)	(0.783)
INF	0.357***	0.374***	0.361***	0.354***	0.359***	0.370***	0.374***	0.356***	-0.339**	-0.334**	-0.249	-0.242
	(0.069)	(0.070)	(0.066)	(0.064)	(0.041)	(0.040)	(0.041)	(0.048)	(0.172)	(0.163)	(0.177)	(0.177)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP growth. GDP_{t-1} is the lagged dependent variable, FI - financial institutions, FM - financial markets, LL - liquid liabilities to GDP, PC - private credit to GDP, IQ - institutional quality, TO - trade openess, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.

Table A1.2: The institutions-finance-growth nexus: robustness test for non-linear models using GDPG & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
$GDPG_{t-1}$	0.095**	0.103**	0.106***	0.083*	0.110**	0.132***	0.104**	0.089**	0.081	0.047	0.093	0.093
	(0.047)	(0.049)	(0.039)	(0.048)	(0.045)	(0.045)	(0.044)	(0.044)	(0.131)	(0.132)	(0.095)	(0.094)
FI	-0.300				-0.248				0.351			
	(0.310)				(0.280)				(1.827)			
FISQR	-0.023				0.071				0.141			
	(0.157)				(0.210)				(0.747)			
FM		0.036				-0.030				-0.041		
		(0.164)				(0.118)				(0.681)		
FMSQR		-0.002				0.000				-0.020		
		(0.022)				(0.027)				(0.092)		
LL			-0.877**				-1.793***				-0.418	
			(0.433)				(0.647)				(1.538)	
LLSQR			0.097*				0.184**				0.057	
			(0.054)				(0.072)				(0.237)	
PC				-0.049				-0.796**				0.595
				(0.249)				(0.332)				(0.587)
PCSQR				-0.021				0.076*				-0.095
				(0.036)				(0.042)				(0.093)
IQ	0.243	0.062	0.279	0.263	0.120	0.089	0.274	0.200	0.430	0.471	0.368	0.298
	(0.201)	(0.171)	(0.209)	(0.179)	(0.184)	(0.183)	(0.199)	(0.169)	(0.376)	(0.351)	(0.415)	(0.381)
TO	0.479***	0.503***	0.467***	0.436***	0.746***	0.724***	0.767***	0.719***	0.078	0.089	0.239	0.252
	(0.148)	(0.147)	(0.140)	(0.138)	(0.177)	(0.175)	(0.180)	(0.205)	(0.339)	(0.364)	(0.383)	(0.405)
GCF	0.350***	0.329***	0.288***	0.237**	0.357***	0.301***	0.302***	0.312***	-0.214	-0.242	0.023	0.053
	(0.116)	(0.114)	(0.100)	(0.096)	(0.102)	(0.096)	(0.098)	(0.096)	(0.311)	(0.296)	(0.216)	(0.215)
EXP	-0.181	-0.225	-0.227	-0.093	-0.173	-0.228	-0.204	-0.187	-0.452	-0.525	-0.376	-0.428
	(0.175)	(0.173)	(0.175)	(0.188)	(0.200)	(0.198)	(0.201)	(0.196)	(0.496)	(0.473)	(0.394)	(0.385)
HC	-0.384	-0.258	-0.376	-0.249	-0.282	-0.110	-0.115	-0.163	-1.084	-1.392	-0.602	-0.723
	(0.440)	(0.438)	(0.291)	(0.414)	(0.310)	(0.306)	(0.298)	(0.204)	(1.225)	(1.146)	(0.801)	(0.783)
INF	0.357***	0.374***	0.357***	0.350***	0.356***	0.370***	0.365***	0.354***	-0.340**	-0.338**	-0.245	-0.248
	(0.069)	(0.070)	(0.066)	(0.065)	(0.040)	(0.040)	(0.041)	(0.048)	(0.173)	(0.167)	(0.179)	(0.177)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP growth. GDP_{t-1} is the lagged dependent variable, FI - financial institutions, FISQR - square term of FI, FM - financial markets, FMSQR - square term of FM, LL - liquid liabilities to GDP, LLSQR - square term of LL, PC - private credit to GDP, PCSQR - square term of PC, IQ - institutional quality, TO - trade openess, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.

Table A1.3: The institutions-finance-growth nexus: robustness test for interaction models using GDPG & ID

VARIABLES	(1) ALL	(2) ALL	(3) ALL	(4) ALL	(5) EU	(6) EU	(7) EU	(8) EU	(9) TE	(10) TE	(11) TE	(12) TE
$GDPG_{t-1}$	0.095**	0.103**	0.109***	0.087*	0.111**	0.127***	0.125***	0.088**	0.080	0.055	0.092	0.063
	(0.047)	(0.048)	(0.039)	(0.048)	(0.046)	(0.044)	(0.046)	(0.044)	(0.133)	(0.130)	(0.094)	(0.096)
FI	-0.172				-0.155				-0.074			
	(0.159)				(0.269)				(0.655)			
FIxIQ	-0.209				-0.271				0.178			
	(0.265)				(0.310)				(1.105)			
FM		0.077				0.154				0.084		
		(0.055)				(0.101)				(0.129)		
FMxIQ		-0.064				-0.258**				0.105		
		(0.088)				(0.111)				(0.323)		
LL			-0.226*				-0.322*				-0.133	
			(0.116)				(0.189)				(0.224)	
LLxIQ			0.196				0.253				0.380	
			(0.164)				(0.230)				(0.632)	
PC				-0.214***				-0.277**				-0.131
				(0.069)				(0.128)				(0.188)
PCxIQ				0.076				0.099				0.637*
				(0.117)				(0.145)				(0.353)
IQ	0.074	-0.108	-0.565	-0.007	-0.014	-0.226	-0.994	-0.237	0.594	0.824	-1.000	-2.063
	(0.283)	(0.299)	(0.605)	(0.491)	(0.224)	(0.228)	(1.019)	(0.666)	(1.156)	(1.245)	(2.361)	(1.353)
TO	0.493***	0.507***	0.457***	0.437***	0.731***	0.672***	0.724***	0.699***	0.083	0.082	0.241	0.172
	(0.146)	(0.145)	(0.139)	(0.137)	(0.175)	(0.176)	(0.175)	(0.205)	(0.333)	(0.358)	(0.382)	(0.402)
GCF	0.357***	0.338***	0.270***	0.248***	0.340***	0.316***	0.267***	0.283***	-0.213	-0.253	-0.003	-0.083
	(0.113)	(0.113)	(0.099)	(0.094)	(0.102)	(0.096)	(0.098)	(0.093)	(0.326)	(0.304)	(0.215)	(0.220)
EXP	-0.179	-0.230	-0.223	-0.111	-0.161	-0.265	-0.268	-0.125	-0.436	-0.529	-0.355	-0.300
	(0.174)	(0.175)	(0.179)	(0.190)	(0.202)	(0.199)	(0.224)	(0.208)	(0.507)	(0.462)	(0.401)	(0.383)
HC	-0.359	-0.259	-0.434	-0.306	-0.219	-0.101	-0.204	-0.095	-1.228	-1.302	-0.595	-0.521
	(0.445)	(0.439)	(0.287)	(0.413)	(0.317)	(0.304)	(0.318)	(0.200)	(1.137)	(1.168)	(0.809)	(0.791)
INF	0.357***	0.373***	0.358***	0.357***	0.363***	0.371***	0.367***	0.351***	-0.343*	-0.338**	-0.239	-0.210
	(0.069)	(0.070)	(0.066)	(0.065)	(0.041)	(0.040)	(0.041)	(0.047)	(0.177)	(0.165)	(0.176)	(0.172)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	635	635	635	635	466	466	466	466	169	169	169	169
# of countries	38	38	38	38	28	28	28	28	10	10	10	10

Note: Bias correction initialized by Arellano and Bond estimator. Bias approximation is accurate up to 0(1/NT). Bootstrapped standard errors using 50 iterations. Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is GDP growth. GDP_{t-1} is the lagged dependent variable, FI - financial institutions, FIxIQ - interaction term between FI and IQ, FM - financial markets, FMxIQ - interaction term between FM and IQ, LL - liquid liabilities to GDP, LLxIQ - interaction term between LL and IQ, PC - private credit to GDP, PCxIQ - interaction term between PC and IQ, IQ - institutional quality, TO - trade openess, GCF - gross capital formation, EXP - government consumption expenditure, HC - human capital, INF - inflation. All variables are in log form.