Empirical Investigation of the Impact of Globalization on Economic Growth: Any Difference between the de Jure and de Facto Measures of Globalization?

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Abstract: *This paper empirically investigates how globalization impacted economic growth in a broad group of countries covered by the wiiw (the Vienna institute for international economic studies) database covering the period since the 1990s. Whilst theoretical arguments in favor of the positive effects of globalization are predominant, there also exist sound arguments pointing out that the effects might be negative too. Empirical evidence also provides a mixed picture. Given this ambiguity, it seems reasonable to further pursue the empirical effects of globalization on growth. The novelty in this paper is the application of different measures of globalization within the KOF index of globalization introduced by Dreher (2006) and later revisited by Gygli et al. (2019). In particular, this applies to distinguishing between the de jure and de facto measures of globalization and allows a comparison between the findings of these approaches. In its empirical investigation, this study uses the panel data analysis covering the ex-socialist European and Asian countries providing some interesting insights.*

1. INTRODUCTION

This paper empirically investigates the effects of globalization on economic growth in a broad group of countries covered by the wiiw (the Vienna institute for international economic studies) database covering the period since the 1990s. The ex-socialist countries investigated in this study had gone through a very complicated process of transition towards market economy. Following the advice from international institutions most of these countries opened rather quickly to international flows. So, in addition to other questions related to the effects of different reforms that were adopted, there also arises the question of the appropriateness of opening these economies so strongly and quickly. This paper sets to address the question what were the effects of globalization on growth in these economies. Whilst theoretical arguments in favor of the positive effects of globalization are predominant, there also exist sound arguments pointing out that the effects might be negative too. Empirical evidence also provides a mixed picture. Given this ambiguity it seems reasonable to further pursue the empirical effects of globalization on growth. The novelty in this paper is the application of different measures of globalization within the KOF index of globalization introduced by Dreher (2006) and later revisited by Gygli et al. (2019). In particular, this applies to distinguishing between the de jure and de facto measures of globalization and allows a comparison between the findings of these approaches. In its empirical investigation this study uses panel data analysis.

The paper has the following structure. Section 2 presents the paper background providing a short overview of the studies investigating the effects of globalization. Empirical methodology and the main findings are presented in Section 3. Section 4 concludes.

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2. PAPER BACKGROUND

2.1. Related literature

The economic literature is abundant with studies investigating globalization. This comes as no surprise given that almost all activities of humankind have been strongly impacted by the forces of globalization. If one were to picture the importance of globalization and its effects, it might be said that globalization is in general thought of as a benign force bringing prosperity and having mostly positive effects. However, even a slightly deeper investigation of the globalization phenomenon will lead to questioning this benign perspective. With globalization being such a complex phenomenon particular attention should be devoted to the different facets that globalization can have and investigate its consequences with great care. As the present paper is interested primarily in the effects of economic globalization on growth, the rest of this section provides the theoretical rationale and a brief overview of empirical studies focusing on economic globalization. On the theoretical front globalization is expected to affect economic growth positively. As a support to the theoretical case for globalization the following reasons may be listed: international knowledge spillovers, access to larger markets, increased competition, better opportunities to exploit comparative advantages and gains from specialization (see for example Grossman and Helpman, 2015 and Potrafke, 2015). In this sort of context, access to global markets and increased competition are expected to drive an economy's resources toward more productive uses and enhance allocative efficiency (McMillan and Rodrik, 2011). A strong body of empirical evidence seems to support this positive perspective. The bulk of the empirical literature thus points toward the positive effects of economic globalization on economic growth around the world (see for example Dreher, 2006; Potrafke, 2015; Ali and Malik, 2021). However, dissonant views are also present. Das (2004), for example, argues that the average world per capita income tripled in 25 years because of globalization. This author contends that a particularly strong positive impact was observed in emerging economies, but warns that globalization made the growth prospects of the Sub-Saharan countries poorer. McMillan and Rodrik (2011) also contend that, while developing countries have become more integrated with the world economy since the early 1990s, the very diverse outcomes observed among these countries suggest that the consequences of globalization depend on the manner in which countries integrate into the global economy. Thus, as argued by these authors, in several cases, like China and India and some other Asian economies the promise of globalization has been fulfilled, but in many other cases, Latin America and sub-Saharan Africa, globalization appears not to have fostered the desirable kind of structural change and the promise of globalization has not been fulfilled[2]. Ali and Malik (2021) suggest that countries with more productive capabilities get more benefits from economic globalization and find that rich countries managed to take more advantage of globalization as compared with poor countries. Gozgor and Can (2017) also observe that diversification of exports and economic globalization are positively related to economic growth merely in upper-middle economies. Focusing on the South Asian countries Hasan (2019) finds that overall globalization, economic globalization and political globalization accelerate economic growth in the long-run, but the dimensions of globalization have no significant effect in the short-run. In his study investigating the effects of globalization on economic growth in developing countries, Kilic (2015) finds that economic growth levels were positively affected by economic and political globalization, while social globalization affected growth negatively.

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[2]   While the above arguments usually refer to trade globalization as a particular form of economic globalization, it should be added that it is financial globalization that is usually more controversial. This disagreement in literature is nicely seen between for example Mishkhin (2009) and Rodrik and Subramanian (2009).

Using the recently revised KOF index of globalization Gygli et al. (2019) find that in a broad sample of 123 countries globalization has a positive effect on economic growth. It appears that the empirical literature provides a mixed picture of the effects of globalization on economic growth. This calls for further studies trying to disentangle these important consequences of globalization. In the present paper it is done focusing on the effects of globalization on economic growth in a sample of selected ex-socialist countries.

2.2. Measurement of globalization

Even the brief discussion of the related studies above calls for caution when it comes to measuring globalization and empirically estimating its effects. Different approaches to measuring globalization may be adopted. Thus, older empirical literature had traditionally used the indicator of openness defined as trade (exports plus imports) over GDP as a proxy for globalization. Given the complexities related to globalization new indices have been provided over time, for example, the A.T. Kearney/Foreign Policy Globalization Index (A.T. Kearney/Foreign Policy, 2001), the CSGR Globalization Index (Lookwood and Redoano, 2005), Cultural Globalization Index (Kluver and Fu, 2004), the Maastricht Globalization Index (Figge and Martens, 2014), KOF index of globalization just to name a few. Potrafke (2015) argues that the KOF index has found particularly widespread use in empirical studies on globalization. The present paper adopts the recently revised KOF index of globalization (Gygli et al., 2019) as it provides a comprehensive measure of globalization and has a number of advantages for the present study. In addition to the overall KOF index of globalization which is calculated based on the 43 underlying variables (before the revision it was 23), the particular subcomponents are also reported: economic globalization, social globalization and political globalization. For the purpose of this study which is interested in the effects of economic globalization on growth it becomes particularly handy that the index additionally distinguishes between trade and financial globalization. Another advantage arises from the fact that all the reported indices come additionally in the form of the de facto and de jure versions. All these allow new and interesting aspects of globalization to be investigated and that is what follows in the rest of this paper.

3. EMPIRICAL ANALYSIS

3.1. Modelling strategy and the data

The impact of globalization on economic growth is estimated econometrically by using panel data analysis. A fixed effect model is estimated as outlined below:

$$GDPGROWTH_{it} = \beta_1 KOF_{it} + \beta_2 \log GDP_{it-1} + \beta_3 HC_t + \beta_4 \log LEX_{it} +$$
$$\beta_5 \log FR_{it} + \beta_6 INV_{it} + \beta_7 GOV_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

$$i = 1..., 17, t = 1990..., 2018$$

(1)

where i refers to a country and t to a period. The dependent variable $GDPGROWTH_{it}$ represents the growth rate of GDP per capita in country i and period t. KOF_{it} is the main variable of interest measuring the overall globalization, but also accounting for its subcomponents: economic, social, political, trade and financial globalization. A number of additional variables are included as control variables. This is done to evade misspecification and to have the model corresponding to the standard literature on economic growth (see for example Barro, 1997). Thus, the following control variables are included: lagged logGDPpc, human capital (HC), logarithm of life expec-

tancy (log*LEX*), logarithm of fertility rate (log*FR*), share of investment in GDP (*INV*), share of government consumption in GDP (*GOV*), and inflation (*INF).* The used variables are defined in Table 1 below. All data are annual and cover the period from 1990 to 2018.

Table 1. Description of variables and sources

Variable	Definition	Source
GDPGROWTH	GDP per capita growth rate (%)	World Bank WDI
KOFGI	KOF index of globalization	
KOFecGI	KOF index of economic globalization	
KOFsoGI	KOF index of social globalization	Gygli et al. (2019)
KOFpoGI	KOF index of political globalization	
KOFtrGI	KOF index of trade globalization	
KOFfiGI	KOF index of financial globalization	
log*GDPL*	Logarithm of GDP per capita lagged	-
HC	Human capital	Penn World Table (Feenstra et al., 2015)
log*LEX*	Logarithm of life expectancy	World Bank WDI
logFR	Logarithm of fertility rate	World Bank WDI
INV	Gross fixed capital formation (% of GDP)	World Bank WDI
GOV	General government final consumption expenditure (% of GDP)	World Bank WDI
INF	Annual rate of inflation (%)	World Bank WDI

The sample includes 17 ex-socialist countries from Central and Eastern Europe and Asia (Albania, Bulgaria, Croatia, Czechia, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Serbia, Slovakia, Slovenia and Ukraine). As stated earlier, these countries had gone through very complicated transformation processes towards market economy, with fast and strong openings of their markets to international flows already at the early stages of transition. Not without critique, most of the countries might have opened too soon and too quickly, suggesting that they applied the recopies from international institutions (often hidden under the term "Washington consensus"[3]) and globalized quickly. An insight as to how quickly and how strongly this globalization evolved can be grasped from Figure 1. In what follows the paper investigates the effects of different aspects of globalization on economic growth in 17 ex-socialist countries from Central and Easter Europe and Asia.
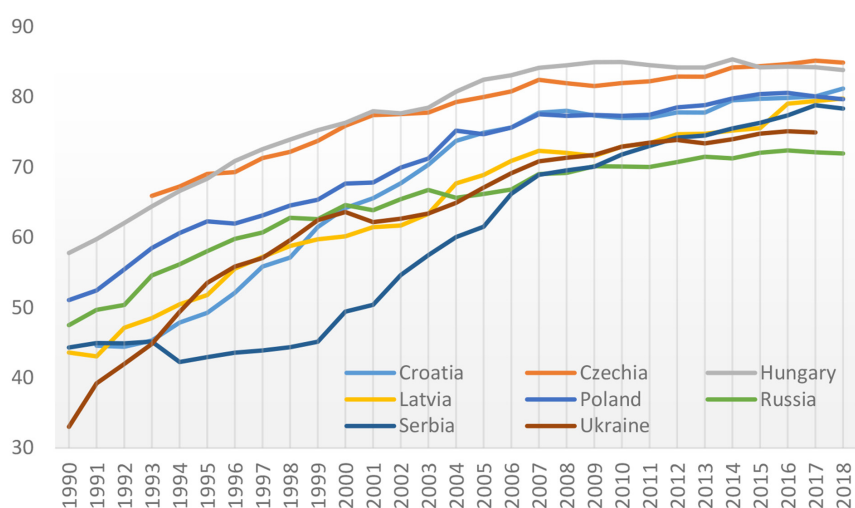
Figure 1. Level of globalization (KOF index of globalization) since 1990 – selected countries
Source: Gygli et al. (2019)

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[3] An interested reader may wish to take a deeper look into the Washington consensus and some of its critiques. See for example Williamson (2005) and Rodrik (2006).

3.2. Results of empirical investigation

The empirical investigation conducted in this section reports multiple models that were estimated and the main results are reported across three tables. In order to allow easier traction of the tables and the models being estimated econometrically in these tables, before reporting the results an introductory explanation is provided. As stated above the growth model is set quite broadly, with the determinants of growth included as reported in the standard growth literature and following similar studies investigating the effects of globalization on growth (see for example Barro, 1997; Dreher, 2006; Gygli et al., 2019). Thus, in addition to globalization, which is the main variable of interest, the model includes the following control variables: investment, government consumption, inflation, human capital, fertility rate, life expectancy. The many models (in total 18) that were estimated test econometrically the impact of these variables alongside with different versions of the globalization variable by using the KOF index of globalization and its subcomponents. These subcomponents correspond to economic (both trade and financial globalization), social and political globalization. In addition, econometric estimations were conducted investigating the effects of the de facto and de jure versions of these indices.

Table 2. The effects of globalization on economic growth: KOF globalization index (overall, de facto and de jure)

VARIABLES	(1) Globalization	(2) Globalization de facto	(3) Globalization de jure
KOFGI	0.105		
	(0.074)		
KOFGI de facto		0.160***	
		(0.062)	
KOFGI de jure			-0.008
			(0.065)
LogGDP$_{t-1}$	-7.855***	-8.189***	-6.828***
	(2.064)	(2.007)	(2.063)
Human capital	4.661	3.760	6.701**
	(3.218)	(3.113)	(3.171)
logLifeexpectancy	6.445	-1.587	26.175
	(44.397)	(43.499)	(44.211)
logFertility	-4.393	-5.635	-6.665
	(4.936)	(4.717)	(5.208)
Investment (% of GDP)	0.261***	0.251***	0.279***
	(0.056)	(0.055)	(0.055)
Government (% of GDP)	-0.488***	-0.457***	-0.504***
	(0.126)	(0.126)	(0.125)
Inflation	-0.007***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)
Observations	428	428	428
R-squared	0.298	0.306	0.294

*** significant at 1% level, ** significant at 5% level, * significant at 10% level.
  Standard errors in parentheses

Source: Author's calculations

Table 2 reports three different models with the main difference between them depending on the included KOF index of globalization. Model 1 (as presented in Column 1) uses the overall KOF index of globalization with the estimated effect of globalization on economic growth being positive but not statistically significant. The other variables included in the model are mainly of theoretically expected signs but not all of them being statistically significant. Human capital,

life expectancy and fertility are not statistically significant. Investment, as expected, has a positive and statistically significant effect on growth, while government consumption and inflation are also found to be statistically significant but having a negative effect on growth. Logarithm of GDP per capita from the previous period is estimated to have a negative impact and is statistically significant suggesting the presence of strong convergence effects (as expected given the relatively low levels of development in ex-socialist countries). Columns 2 and 3 report similar models with the KOF globalization index included in its de facto and de jure forms. As for the control variables the same general findings can be observed as in model 1 (column 1), with the exception that human capital becomes statistically significant at the 5 percent level of statistical significance in model 3. Of particular importance in columns 2 and 3 is the coefficient related to globalization which in its de facto version (KOF globalization index de facto, column 2) becomes statistically significant having a positive impact on economic growth. The de jure KOF index of globalization (Column 3) is estimated with a negative sign, but this effect appears not to be statistically significant. These are interesting findings, but one should not jump to conclusions too quickly and therefore the paper proceeds with estimating different subcomponents of globalization, particularly testing the difference between their de facto and de jure versions.

Table 3. The effects of globalization on economic growth: KOF index of economic globalization, social globalization and political globalization (overall, de facto and de jure)

VARIABLES	Economic globalization			Social globalization			Political globalization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
KOFecGI	0.139***								
	(0.042)								
KOFecGI de facto		0.167***							
		(0.031)							
KOFecGI de jure			-0.007						
			(0.036)						
KOFsoGI				0.184**					
				(0.075)					
KOFsoGI de facto					0.217***				
					(0.055)				
KOFsoGI de jure						-0.014			
						(0.067)			
KOFpoGI							-0.083**		
							(0.041)		
KOFpoGI de facto								-0.117***	
								(0.033)	
KOFpoGI de jure									0.006
									(0.038)
LogGDP$_{t-1}$	-7.878***	-8.336***	-6.873***	-10.437***	-12.133***	-6.712***	-6.827***	-7.896***	-6.977***
	(1.957)	(1.914)	(1.970)	(2.416)	(2.340)	(2.181)	(1.951)	(1.951)	(2.000)
Human capital	2.901	1.409	6.695**	4.882*	5.654**	6.745**	8.064***	8.605***	6.428**
	(3.108)	3.005	(3.042)	(2.998)	(2.896)	(3.088)	(3.021)	(2.956)	(3.030)
logLifeexpectancy	9.345	8.205	25.503	-1.383	1.045	27.117	46.653	58.073	23.096
	(42.329)	(41.335)	(42.860)	(43.620)	(42.273)	(44.226)	(43.785)	(43.054)	(43.646)
logFertility	-1.214	-3.118	-6.760	-5.224	-8.107*	-6.679	-7.480	-6.664	-6.236
	(4.941)	(4.630)	(5.141)	(4.734)	(4.679)	4.946)	(4.753)	(4.676)	(4.833)
Investment (% of GDP)	0.278***	0.299***	0.279***	0.245***	0.225***	0.280***	0.302***	0.323***	0.277***
	(0.053)	(0.053)	(0.055)	(0.056)	(0.055)	(0.055)	(0.056)	(0.055)	(0.055)
Government (% of GDP)	-0.538***	-0.470***	-0.500***	-0.501***	-0.489***	-0.504***	-0.560***	-0.577***	-0.500***
	(0.124)	(0.121)	(0.128)	(0.125)	(0.123)	(0.125)	(0.128)	(0.125)	(0.129)
Inflation	-0.007***	-0.006***	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	428	428	428	428	428	428	428	428	428
R-squared	0.313	0.340	0.294	0.304	0.320	0.294	0.301	0.315	0.294

*** significant at 1% level, ** significant at 5% level, * significant at 10% level.
Standard errors in parentheses

Source: Author's calculations

Table 4. The effects of globalization on economic growth: KOF index of economic globalization, trade globalization and financial globalization (overall, de facto and de jure)

VARIABLES	Economic globalization			Trade globalization			Financial globalization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
KOFecGI	0.139***								
	(0.042)								
KOFecGI de facto		0.167***							
		(0.031)							
KOFecGI de jure			-0.007						
			(0.036)						
KOFtrGI				0.052					
				(0.036)					
KOFtrGI de facto					0.163***				
					(0.032)				
KOFtrGI de jure						-0.051*			
						(0.027)			
KOFfiGI							0.149***		
							(0.035)		
KOFfiGI de facto								0.112***	
								(0.025)	
KOFfiGI de jure									0.061**
									(0.030)
LogGDP$_{t-1}$	-7.878***	-8.336***	-6.873***	-6.901***	-6.059***	-6.663***	-9.030***	-9.394***	-7.315***
	(1.957)	(1.914)	(1.970)	(1.956)	(1.908)	(1.956)	(1.985)	(1.997)	(1.961)
Human capital	2.901	1.409	6.695**	4.910	0.745	7.936***	3.447	3.682	5.652*
	(3.108)	3.005	(3.042)	(3.145)	(3.071)	(3.020)	(2.974)	(2.947)	(2.961)
logLifeexpectancy	9.345	8.205	25.503	15.738	6.416	36.398	17.518	15.254	24.022
	(42.329)	(41.335)	(42.860)	(42.969)	(41.483)	(42.901)	(41.774)	(41.705)	(42.420)
logFertility	-1.214	-3.118	-6.760	-3.523	-0.130	-10.023**	-3.497	-6.324	-4.057
	(4.941)	(4.630)	(5.141)	(5.132)	(4.763)	(5.104)	(4.698)	(4.637)	(4.862)
Investment (% of GDP)	0.278***	0.299***	0.279***	0.271***	0.285***	0.293***	0.299***	0.301***	0.282***
	(0.053)	(0.053)	(0.055)	(0.055)	(0.053)	(0.055)	(0.054)	0.054)	(0.054)
Government (% of GDP)	-0.538***	-0.470***	-0.500***	--0.532***	-0.532***	-0.459***	-0.499***	-0.440***	-0.536***
	(0.124)	(0.121)	(0.128)	(0.127)	(0.122)	0.127)	(0.123)	(0.123)	(0.126)
Inflation	-0.007***	-0.006***	-0.007***	-0.007***	-0.006***	-0.007***	-0.007***	-0.008***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	428	428	428	428	428	428	428	428	428
R-squared	0.313	0.340	0.294	0.298	0.337	0.300	0.323	0.326	0.301

*** significant at 1% level, ** significant at 5% level, * significant at 10% level.
    Standard errors in parentheses

Source: Author's calculations

Table 3 reports the effects of economic, social and political globalization on economic growth as measured by KOF indices of economic globalization, social globalization and political globalization (overall, de facto and de jure). In total, nine models were estimated (columns 1-9). As for the control variables, there seems to be consistency in comparison with the results reported earlier in Table 2 with the human capital, investment, government consumption, inflation and lagged GDP level being statistically significant and of the same expected signs as earlier. Again the primary interest is in the coefficients related to globalization, in particular the effects of economic globalization on growth, but as the indices of social and political globalization are readily available, the paper reports these results in passing as well. The first three models (Columns 1 − 3) are related to economic globalization. The estimated coefficients seem to suggest that the KOF index of economic globalization, the overall version (including both the de facto and the de jure measures) as well as the de facto version alone have positive and statistically significant effects on growth. The effect of the de jure KOF index of economic globalization is negative, but the effect lacks statistical significance. As stated earlier, in passing it can be also observed that

social and political globalization also have statistically significant effects, social globalization affecting growth positively and political globalization negatively. It is again interesting to note that the jure version of both indices is of the opposite sign and again not being statistically significant. As this paper is primarily focused on the effects of economic globalization on growth, in the remainder of the text the third set of estimations is devoted to the effects of subcomponents of economic globalization, namely trade and financial globalization.

Table 4 reports the last set of estimated models formally testing the effects of subcomponents of economic globalization, trade and financial globalization on growth. It should be noted that the first three models (Columns 1-3) are the same as those in Table 3 and are included here to enable easier traction and comparison between the effects of overall economic globalization and its subcomponents. Thus, in models 4 - 6 (Columns 4 – 6) the effects of trade globalization (as measured by the KOF index of trade globalization, overall, de facto and de jure) are estimated. It appears that the KOF index of trade globalization, the overall version including both the de facto and de jure indices (Column 4) is not statistically significant. The de facto KOF index of trade globalization (Column 5) is estimated to have a positive and statistically significant effect (at 5 percent level of statistical significance), whilst the de jure index is estimated to have a negative effect. However, this effect is only marginally significant at the ten percent level of statistical significance. It is interesting to note that again it appears that the de facto globalization exerts more important effects. As for the effects of financial globalization on growth (Columns 7 – 9) it appears that all three versions of the KOF index of financial globalization (overall, de facto and de jure) have a positive and statistically significant effect on growth.

4.   FUTURE RESEARCH DIRECTIONS

The investigation conducted in this paper provides a comprehensive approach towards estimating the effects of globalization on economic growth. This becomes particularly important with application of the revised KOF index of globalization, due to Gygli et al. (2019). With this index, many aspects of globalization that were not treated in previous studies, because of the obvious reason of not being available, now can be readily used and investigated formally. In this context, it will be interesting to see as to what extent application of this revised index across different country samples and periods will change the usual views on globalization and its effects. In addition, future research might be adding valuable insights on the other effects of globalization, for example on the consequences of globalization on inequality. With the global economy being recently exposed to many shocks and crises, the global financial crisis of 2008 and the most recent COVID-19 pandemics just to name the most important ones, it will be interesting to see how much deglobalization might be taking place, with the first signs increasingly emerging. Relations between deglobalization and economic growth might be particularly interesting avenues for future research.

5.   CONCLUSION

The effects of globalization on economic growth were explored in the group of 17 countries from Central and Eastern Europe and Asia. The investigated economies had gone through transformation towards functioning market economy during the 1990s, one important element of this process being the opening of these economies to trade and capital flows. Many elements of the transition to the market economy were investigated in the literature, including also the effects of opening of these countries to international flows. This paper contributes to the empirical lit-

erature by applying the revised KOF index of globalization in this specific group of countries. In addition to the standard effects related to globalization in general, application of the revised KOF index allowed additional aspects to be investigated: economic globalization (in particular trade and financial globalization), social globalization and political globalization.

In the empirical investigation panel data analysis was applied. The main findings of the paper can be summarized as follows. In general, the paper finds a positive impact of globalization on economic growth, with the positive effects also found for economic and social globalization. Political globalization is found to exert a negative influence. In addition, the estimations provide empirical evidence on the importance of both trade and financial globalization, affecting growth positively. The distinction between de facto and de jure measures and the accompanying empirical analysis seems to suggest that it is the de facto globalization that is generating the effects in the above reported results. This distinction between the de facto and de jure measures of globalization and its use in the empirical estimations makes a valuable contribution to the empirical literature calling for further application of the revised version of the KOF index in broader country samples and extending periods under investigation.

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