"International trade and foreign direct investment as growth stimulators in transition economies: does the impact of institutional factors matter?"

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BUSINESS PERSPECTIVES

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INTERNATIONAL TRADE AND FOREIGN DIRECT INVESTMENT AS GROWTH STIMULATORS IN TRANSITION ECONOMIES: DOES THE IMPACT OF INSTITUTIONAL FACTORS MATTER?

Abstract

The present paper develops a general production function framework, augmented with two institutional variables namely bureaucracy and corruption on 28 transition economies over the period 2000–2015. The authors use various econometric specifications and apply both the Fixed Effects, as well as the advanced system Generalized Method of Moments (GMM) panel data techniques. Empirical findings suggest that the impact of openness in terms of foreign direct investment and international trade is advantageous to all the economies of the panel. Furthermore, the findings indicate that classical growth determinants, such as labor and physical capital, have the expected positive contribution, while macroeconomic instability has a negative effect on real economic activity. Regarding the impact of the two institutional variables, corruption, and bureaucracy, the authors retrieve more influential results, as their impact appears to be diametrically opposite between the former Soviet Union states and the rest of European transition economics.

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INTRODUCTION

Diachronically the primary objective of government officials is to foster economic development so as to advance the economic prosperity of their inhabitants. It is equally common knowledge that economic growth may arise from various factors, economic and non-economic, synthesizing a composite system that should operate effectively to facilitate economic prosperity. After nearly two decades and a half since the collapse of the socialist system and the launch of the transition epoch in Central and Southern Eastern Europe and in the former Soviet Union, we can still uncover significant disparities in terms of economic performance and institutional progress across the different countries.

In fact, transition economies over the course of time mostly experienced a deep institutional change with two ultimate goals. First, the transition from communist states to free integrated market economies by means of macroeconomic stabilization, liberalization of their financial and foreign exchange markets, and extensive privatization of state companies. Second, the foundation of democratic governance. These two goals entailed mostly a drastic adjustment in the regulations overseeing equally political, economic, social and institutional operations of each country.

In the recent past, non-economic determinants of growth have been a topic to the very little empirical investigation. In fact, the role of institutional factors as growth determinants emerged in the last few years. In general, most of the recent empirical studies as in Economides and Egger (2009), Dahlström et al. (2012), and Freckleton et al. (2012) support the positive impact of institutional quality on economic performance.

In the case of transition economies, owing to the lack of comprehensive data and methodological issues, empirical studies investigating the institutional impact on economic performance appear to be suddenly rising only since the last decade. From a review of the relative empirical literature in the setting of transition economies, a few important issues can be underlined. First, most of the empirical studies apply the European Bank for Reconstruction and Development (EBRD) indicators as a variable to account for institutions quality and transition progress. In this cluster of studies, we can distinguish some of the earliest and prominent studies by de Melo et al. (1996), Sahay et al. (1999), and Sachs (2001) alongside with some recent empirical works of Nath (2009), Josifidis et al. (2012), Melnyk et al. (2014). However, it is widely accepted that EBRD proxies assess merely reforms in the area of infrastructure and financing, hence, they do not wholly meet the requirements to be indicators of institutional quality. Thus, in a later period of time, other scholars started to apply different institutional proxies. For instance, Beck, and Laeven (2006), and Raimbaev, (2011) applied the World Bank Governance Indicators, while the studies of Eicher and Schreiber (2010), Kottaridi and Filippaios (2015), and Trojette (2016) use the International Country Risk Guide (ICRG). Finally, more recently, the studies of Adigozalov and Rahimov (2015), Tamilina and Tamilina (2014) utilize the Economic Freedom indexes from Heritage Foundation; while Zeneli (2015), and Tsanana et al. (2016) employ the Transparency International Index.

Second, regarding the methodological approach, it is important to note that the majority of the early studies applied the OLS cross-sectional analysis (see among others, Lane & Rohner, 2004; Sahay et al., 1999) but in a later period of time, many scholars started considering merely static panel models of Fixed Effects and/or Random Effects, to address unobserved heterogeneity issues (see among others, Sachs, 2001; Chousa et al., 2005; Nath, 2009; Melnyk et al., 2014). However, the aforementioned group of studies encounters the problem of identifying appropriate instrumental variables for possible endogenous variables, in their applied growth models. Subsequently, in order to address the above issue, more recent studies conducted dynamic model specifications through the implementation of GMM (Generalized Method of Moments), and 2SLS or 3SLS (Two or Three Stage Least Squares) panel estimators (see, for example, Zeneli, 2015; Trojette, 2016; Tsanana et al., 2016).

Third, it is important to stress that there is a very limited number of papers from the aforementioned studies that have applied a growth model in the full set of transition economies. In fact, they give emphasis regularly in Central Eastern Europe and partially cover the South-Eastern Europe. The most unsatisfactory so far is that the empirical literature has covered limited states from the former Soviet Union in the dataset, usually Russia, and more rarely Ukraine.

Finally, the majority of the existing empirical studies which were linked to transition economies have studied the impact of institutional framework on growth by plainly accepting that the level of the institutional framework has matured at an analogous stride in all the countries during the period of each empirical analysis. Conceivably, the added information stemming from these studies is valuable, but these empirical works failed to deliver consistent policy directions and proposals for the reason that the impact of institutional constraints on economic performance can essentially vary consistently with the tangible level of institutional development.

Considering the above limitations from the existing empirical literature, this study contributes to the recent emerging literature on a number of margins. First, we use into our empirical analysis the full set of transition economics both in the area of Central Eastern and South-Eastern Europe, as

well as in the former Soviet Union. Second, we evaluate the performance of institutional indicators in various clusters of countries in order to retrieve more comparable and coherent results. Third, we apply both static panel approaches in terms of Fixed Effects/Random Effects, as well as the advanced Generalized Method of Moments (GMM) panel estimation technique, so as to retrieve more robust and contingent results regarding the issues of heterogeneity and endogeneity biases. Fourth, with the aim to clarify the complexity that surrounds economic growth, determinants of growth in our study are classified into several sets: initial conditions, physical and human capital, external openness and economic integration dynamics, macroeconomic stability factors and lastly institutional indicators. Fifth, with the intention of appraising the contribution of institutions on economic performance, we put into context two institutional indicators, that is, in the realms of bureaucracy and corruption that were rarely applied alongside in previous studies. Finally, we aim to investigate whether institutional indicators affect economic growth not only directly, but also indirectly by boosting the growth-enhancing effects of classical growth factors such as inward FDI, trade openness, and domestic investment.

The rest of the paper is structured as follows: section 1 provides a comprehensive review of theoretical literature on the growth determinants and the related empirical literature. Section 2 defines the methodology applied. Section 3 reports the data and the sample used. Section 4 presents the preliminary results. Section 5 displays and analyzes the empirical results. Final section concludes by providing important policy recommendations.

1. THEORETICAL AND EMPIRICAL LITERATURE REVIEW

1.1. Inward FDI and economic growth

The linkage between international capital movements and economic growth has been an issue of great interest and discussion among economists. Theoretical studies suggest that in developing economies with a shortage of domestic capital, FDI is considered as less volatile and more reliable source of capital injection (Adhikary, 2011). Similarly, it is argued that in the short term, FDI delivers a new capital injection, stimulating supplementary investment in both human and physical capital, which can be very advantageous for economies encountering relentless liquidity restraints and can facilitate even an immediate resumption of economic growth after a prolonged period of recession (Tsitouras, 2016). Then again, in the long run, the influence of FDI on economies is much greater and exceeds by providing investments in new-fangled or established production bases; engendering employment; distributing skills and technology; and enhancing the domestic export capacity (Tuman & Emmert, 2004).

Besides the abovementioned direct influences of FDI on financial resources, indigenous investment, and employment, host economies can also reward from the indirect influence of FDI known as "spillovers", that is, in the realms such as management and marketing skills, contracts for marketing and trading products internationally, technology know-how (Vahter, 2004).

In this context, it is also inferred that different absorptive capacity of host economies which is related to a number of factors such as the level of income per capita, quality human capital, technological know-how, trade openness, local infrastructure, financial sector and established institutions determines the level of any possible positive influence of FDI on economic growth (Borensztein et al., 1998; Alfaro et al., 2004).

The vast majority of empirical studies which were focused on the set of European transition economies underline a positive impact of FDI on economic performance. Briefly we can refer to the studies of Deger and Emsen (2006) in 27 transition economies, Apergis et al. (2008) in 27 transition economies, Nath (2009) in 13 transition economies of Central and Eastern Europe, and the Baltic region, Feeny et al. (2014) for a sample of 209 economies that include also the most of

the European transition economies, Hudea and Stancu (2012) in seven Eastern European economies, Melnyk et al. (2014) for 26 post-communist economies, Josifidis et al. (2012), and more recently Tsitouras and Nikas (2016) in 15 Central-Eastern and South-Eastern European economies.

1.2. International trade and economic growth

As advocated in the literature, trade openness can be a catalyst for long-run sustainable economic expansion, because trade can transfer foreign R&D knowledge and cutting-edge technology from developed to developing economies (Coe & Helpman, 1995). In particular, it is argued that exports can play a major role in the growth process through the increasing returns to scale and better resource allocation (Venables, 2009). Furthermore, imports can also have an impact on productivity growth via their influence on local innovation as a result of import competition. A boost in import volumes exposes the indigenous companies to foreign competition, thus they have to respond by producing competitive goods (Lawrence & Weinstein, 1999). In many modest open developing economies, imports deliver much-required elements of production placed in the export industry (Awokuse, 2008).

Some empirical scholars, however, cast doubt about the positive influence of trade openness on growth. It is claimed that a high degree of trade openness may bring macroeconomic instability by means of increased inflation, depressed exchange rates, deteriorated balance of payments leading to anemic and fragile domestic investments (Rodrik, 2000).

As compared to FDI, empirical literature that examined the association between trade openness and growth validated a more robust positive connection. For instance, studies such as Sachs and Warner (2001), Das and Paul (2011) stress the role of trade openness as an engine of growth in the case of developing economies. In the set of European transition economies, similar findings were also confirmed by recent studies as in Awokuse (2008), Josifidis et al. (2012), Cetintas and Barisik (2009), Tsitouras and Nikas (2016).

1.3. Institutions and economic growth

It is generally accepted that "institutions" are a highly composite concept, as they include notions, for instance, "institutional quality" and "economic freedom" (Fukuyama, 2006). As emphasized in North (1990) and Rodrik (2000), specific important institutional arrangements related to the rule of law; the enforceability of contracts; judicial efficiency; and the security of property rights are vital factors for economic development.

Considering the concept of economic freedom it is linked with the Adam Smiths' proposals about the economically free society. In this context, every individual has the right to control his resources and, hence, to work, produce, consume and invest without any restraint (see Heritage Foundation's report, 2015). However, it is urged that we should not disdain the role of governments alongside the free market institutions determining prosperity and growth. Government presence and interventions are critical by providing public goods and services and revising market failures leading to the upsurge of the investment and profitability of the private sector (La Porta et al., 1999).

In this context, it seems that while in the 1970s and 1980s (see Krueger, 1974; Brennan & Buchanan, 1980) the heavy importance of governments, academia and policy makers was towards the reduction of the size of the state and its involvements in the economy, the evolution of "endogenous growth theory" in the early 1990s (see Romer, 1990) changed the landscape. Accordingly, it was advocated that institutional quality and a qualified state bureaucracy are essential prerequisites for a state to stand as "developmental" (Evans & Rauch, 1999). Above all, it was the earlier path-breaking study of (Weber, 1968), which only recently has gained the appropriate importance, who constructed the theoretical foundations on how bureaucracy could eventually foster economic development. The key fundamental features of an effective state "Weberian" bureaucracy are: 1) a definite set of decision-making processes; 2) meritocratic recruitment, that is, by means of formal writing exams for holders of degrees and diploma, instead of political assignations and depositions; 3) rewarding long-term vacations; 4) internal promotions grounded

on assessments for the repletion of the higher hierarchy and 5) high socioeconomic status for state employees (see Rauch & Evans, 2000).

Along the same lines, it is underlined that the effectual bureaucracy will promote economic growth by exerting constant, autonomy, strength and expertise on state affairs regardless of shifts and reversals in political and government scene (Kottaridi & Filippaios, 2015). Other studies such as Raunch (1995) and Libman (2012) support that bureaucratic coherence promotes long-term investments in public infrastructure, as well as augment the provision and efficiency of collective goods and services such as education and health raising, in turn, the overall productivity and the economic performance of economies. However, it can be argued that the professionalization of bureaucracy is an economically and technically demanding structure that needs a significant period of time to be flourished (Rodrik, 2007).

Empirical studies such as Evans and Rauch (1999), Henderson et al. (2007), Portes and Smith, (2008) and more recently Cottaridi and Fillipaios (2015) for the case of the new member of E.U. find a strong confirmation of the positive link between bureaucracy and growth. In contrast, a significant number of studies (see Colclough & Manor, 1991; Ayal & Karras, 1996; Chowdhury, 2006; Papaconstantinou et al., 2013) refute the constructive link of bureaucracy on economic expansion due to the increased taxation over private returns in addition to the rent-seeking activities of bureaucrats, thereby reducing domestic investment and depressing economic activity.

With regard to the influence of corruption on economic development, this topic has gained great attention during the last few years. Arguably, it is very challenging to outline precisely the notion of corruption, as it is a multidimensional phenomenon coupled with various structures and functions in different frameworks. According to the Transparency International Organization "corruption always encompasses the misuse of assigned authority for individual benefit" (Transparency International, 2016).

In reality, there are two different schools of thought about whether corruption is propitious or detrimental on economic growth. The first is a rather provocative school of thought by supporting that corruption actually "grease the wheels" of economic performance via multiple mechanisms. According to Huntington (1968), corruption in the form of bribes could help entities circumvent prevailing cumbersome government regulations at a relatively low cost and thus increase efficiency and economic performance.

However, recent studies report that corruption can be a catalyst for economic growth only in countries with weak institutions and flawed governance (Meon & Weill, 2010). Additionally, Bologna (2016) declares that the link between corruption and growth is susceptible to the level of uncertainty, concerning the provision of the service in return for bribes, where at low levels of uncertainty corruption can provoke growth, whereas this positive effect can promptly offset by upsurges in uncertainty.

The second school of thought supports that corruption "sand the wheels" of economic growth through various channels. In particular, Mauro (1995) supports that corruption exerts a negative impact on private investment as a result of increased cost of state administration. Moreover, it is inferred that corruption can spawn a resource misallocation both in the form of state revenues and expenditures. In the first case, bribes can result to plummeted earning of taxes. On the other hand, corruption will redirect public spending from productive projects such as the provision of health and education to non-productive operations like military expenses in which chances for bribes are ample (Mauro, 1997). Many scholars also argue that corruption has harmful effects on income quality and human capital accumulation, as corruption facilitates preferential treatment for rent-seeking bureaucrats and, at the same time, depress business opportunities for young talented people, which, in turn, causes social and political uncertainty (Assiotis & Sylwester, 2010).

In view of the contradictory theoretical arguments, many empirical studies have examined the influence of corruption on economic development. Recent findings in the empirical literature such as Levy (2007), Houston (2007), Meon and Weill (2010), Swaleheen and Stansel (2007) postulate that corruption exerts a positive effect on

economic growth in economies with weak institutional quality. Similarly, Mehrara et al. (2011) for the case of OPEC countries, and Vial and Hanoteau (2010) for Asian economies find a positive correlation.

In contrast, the seminal study of Mauro (1995), alongside with Barreto (2000), Sachs and Warner (2001), Freckleton et al. (2012) establish a negative link between corruption and economic development. Among others, Campos et al. (2010) in a metanalysis of 460 empirical studies point out that the 32 percent of their sample support a statistical robust detrimental effect of corruption on growth, 62 percent of their sample confirm a weak statistical relationship, while only a 6 percent of their sample confirm a robust positive influence of corruption on economic growth.

2. MODEL SPECIFICATION

We employ a panel growth specification as proposed in this area of empirical research by many prominent scholars (see Borenszstein et al., 1998; Barro & Sala-i-Martin, 2004; Alfaro et al., 2004; Feeny et al., 2014). The estimated equation, before the inclusion of various interaction terms, is formulated as follows:

$$\ln Y_{it} = \delta_0 + \delta_1 \cdot \ln Y_{i,t-1} + \delta_2 \cdot FDI_{it} +$$
$$+\delta_3 \cdot TradeOpen_{it} + \delta_4 \cdot Bur_{it} + \qquad (1)$$
$$+\delta_5 \cdot Cor_{it} + \delta_6 \cdot X'_{it} + \mu_i + \varepsilon_{it}.$$

Equation 1 can be alternatively specified with the economic growth rate as a dependent variable as follows:

$$Growth_{it} = \ln Y_{it} - \ln Y_{it-1} = \delta_0 + (\delta_1 - 1)\ln Y_{i,t-1} +$$
$$+\delta_2 \cdot FDI_{it} + \delta_3 \cdot TradeOpen_{it} + \delta_4 \cdot Bur_{it} + \qquad (2)$$
$$+\delta_5 \cdot Cor_{it} + \delta_6 \cdot X'_{it} + \mu_i + \varepsilon_{it},$$

where subscript $i = \{1, 2, ..., N\}$ signifies countries, while $t = \{1, 2, ..., T\}$ signifies time. The dependent variable is the annual growth rate of GDP per capita (in constant prices of 2010). The variable $\ln Y_{it}$ is identified as the GDP per capita, while $(\delta_1 - 1)$ is the convergence coefficient, FDI_{it} connotes the inward FDI, $TradeOpen_{it}$

symbolizes the trade openness, Bur_{it} implies the level of bureaucracy, Cor_{it} indicates the level of corruption, X'_{it} is a vector of explanatory variables that determine economic growth, μ_i is the country specific fixed (time-invariant) effect, and ε_{it} is the specification error.

The choice of the explanatory variables is motivated by the existing empirical growth literature along with the availability of the data for the full set of transition economies. In order to capture the growth convergence effect (see Barro & Sala-i-Martin, 2004), the logarithm of GDP per capita, lagged by one year, $(Y_{i,t-1})$, is calculated in constant 2010 US\$. This coefficient is expected to have a negative sign in accordance with the literature that postulates that an economy will register higher growth rates, the more distant is from its steady state.

In our empirical study, we employ the FDI variable (FDI_{it}) to the growth equation, since it is considered as a catalyst for economic growth (see Alfaro et al., 2004; Borensztein et al., 1998). We also consider another significant policy variable that promotes economic development and it is trade-openness $(TradeOpen_{it})$. As a rule, in the empirical literature, trade openness is calculated as the sum of exports and imports as a share of total GDP and indicates greater international integration and competitiveness of an economy (see Barro & Sala-i-Martin, 2004).

To assess the role of institutions' quality on the economic performance, we have decided to adopt two measures that reflect the level of bureaucracy and corruption for each economy. Regarding the measure of bureaucracy, we have decided to apply an indicator that assesses the economic freedom which is intrinsically connected with the bureaucratic structure, as it encompasses more measures of the quality of the governance. In this study, the Heritage Foundation index is selected due to comprehensive coverage that provides for the set of transition economies. To ensure an easier interpretation of the empirical findings and with the aim of an increase in the scale will indicate more bureaucracy, the overall index has been rescaled using the following formula: $Bur_{it} = 100$ – Economic Freedom Score.

Regarding the measure of corruption, the Corruption Perception Index (CPI) is selected

in this empirical analysis on the grounds of data availability which permits to implement the relative econometric techniques. Correspondingly, for the purpose of an increase in the scale which will indicate more corruption, we use the rescaled Corruption Perception Index (CPI) by applying the following formula: $Cor_{it} = 100$ – CPI Score.

The baseline equation also covers a proxy of control variables X'_{it}, which are regarded as major factors of economic growth process as identified in the relative empirical growth literature. In particular, we include the secondary school enrolment rate (as a proxy for the quality of human capital) and the Gross Fixed Capital Formation as a share of GDP, as a proxy for domestic investment, which can as well be considered either supplement or alternative to inward FDI (Enderwick, 2005).

To account for the regional macroeconomic policy and stability, we include two indicators: The government expenditure as a share of GDP (a proxy for the size of the government); and the annual inflation growth rate. We assume the impact of these two macroeconomic fundamentals to be detrimental on growth rates.

The set of explanatory variables also includes interactions of the two institutional variables with region dummy variables so as to account the influence of institutional indicators across different regions in the set of transition economies. Finally, we have considered a dummy variable to capture any possible structural economic shift that may have arisen in the transition economies in the aftermath of the global financial crisis in late 2008.

3. SAMPLE AND DATA

This empirical research covers the full set of "transition economies" (see Table A in Appendix for more details on the full list and grouping of countries). In particular, our sample consists of 28 transition countries: the twelve[1] Commonwealth of Independent States (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and

Uzbekistan), the eight Central Eastern European Countries and Baltic States (Czech Republic, Hungary, Poland, Slovakia, Slovenia, Estonia, Latvia and Lithuania), and the eight countries from South Eastern Europe (Albania, Bosnia, Bulgaria, Croatia, FYROM, Montenegro, Romania and Serbia). We have excluded from the state of Kosovo due to severe data constraints. In our sample, we apply annual data over the period 2000–2015, being retrieved from various well-established sources such as the World Bank Indicators, and the UNCTAD database. Correspondingly, the data on the institutional indicators are retrieved from the Transparency International and the Heritage Foundation databases. The time frame of our study is primarily dictated by the data availability, considering that comprehensive data prior to 2000 was not available in the Transparency International and the Heritage Foundation databases for the majority of the post-communist economies. Finally, considering that there are inherently missing observations for some countries from 2000 to 2003, our sample is regarded as slightly unbalanced (see Table A in Appendix for more evidence on variable definitions and data sources).

4. EMPIRICAL METHODOLOGY

Considering that the sample of this study is comprised of 28 transition economies and covers the period 2000–2015, a panel data technique is considered as the most appropriate procedure. Two of the most prominent panel econometric procedures in the literature are the Fixed Effects (FE) and Random Effects (RE) estimators that can account for unobserved heterogeneity among the countries of a sample. In this essence, the Hausman-test (1978) is applied in order to select between the Random Effects (RE) or Fixed Effects (FE) estimator. This test basically estimates whether the error term is correlated with the explanatory variables of the model under the null hypothesis being that they are not.

In recent years, the GMM dynamic panel estimators have become increasingly popular among the empirical growth scholars, as they address a num-

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[1] As of December 31, 2016 Commonwealth of Independent States comprise the following nine full member States: Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, and Uzbekistan; two associated members: Turkmenistan, Ukraine; and one former member Georgia. For the sake of clarity, we consider all these countries as Commonwealth of Independent States.

ber of weaknesses in the "oversimplified" static estimates. In fact, while static panel data approaches may produce biased results, as they do not evaluate potential endogeneity of explanatory variables, the dynamic panel data approaches can easily address the issue of possible endogeneity of all explanatory variables by the employment of internally generating instruments (Greene, 2008).

In reality, there are two alternates of GMM estimators in the dynamic panel approach. The first is acknowledged as First-Difference GMM estimator and introduced by Arellano and Bond (1991) and the subsequent which has been extended is the System GMM developed by Arellano and Bover (1995) and Blundell and Bond (1997).

Arellano and Bond (1991) suggest transforming equation (1) to remove country-specific effects by getting the first-differences as follows:

$$
\begin{aligned}
\Delta \ln Y_{it} = Growth = {} & \delta_1 \cdot \Delta \ln Y_{i,t-1} + \\
& + \delta_2 \cdot \Delta FDI_{it} + \delta_3 \cdot \Delta TradeOpen_{it} + \\
& + \delta_4 \cdot \Delta BUR_{it} + \delta_5 \cdot \Delta COR_{it} + \\
& + \delta_6 \cdot \Delta X'_{it} + \Delta \varepsilon_{it}.
\end{aligned}
\tag{3}
$$

In contrast, the System GMM estimator applies a system of two equations one in levels (Equation 2) and one in differences (Equation 3) leading to increased efficiency. In particular, in the levels of equation estimation, lagged differences are used as instruments, whereas in differenced equation's estimation, lag-levels are used as instruments.

More importantly, a set of arguments suggest that the System GMM is more efficient than the First-Difference GMM in the following cases. First, in small samples (that is when the number of cross-sections is relatively small) as it employs both the time-dimension as well the cross-section aspect of the dataset leading to greater precision and lesser finite sample bias (Baltagi, 2008, p. 2). Second, in models such as our specification, which include many macroeconomic variables and possibly evolve according to random walk, lagged levels of variables perform as poor instruments for first differences, suggesting that the System GMM estima-

tor is favoured over the First-Difference GMM estimator (Baum, 2006). Third, by applying in level equation first differenced instruments, which are deterministically stationary, provides the warranting that all regressors are eventually stationary (Baltagi et al., 2009).

To confirm the consistency of the GMM estimator, it is crucial to consider the following two diagnostic tests: The first test is the Hansen (1982) J-test of over-identifying restrictions. The null hypothesis that should not be rejected is that the instrument set is valid and that the model is not over-identified. The second test examines the conjecture of no correlation in the residuals. In fact, it is expected a rejection of the null hypothesis of first order serial correlation in first differences (AR1). In contrast, a failure to reject the null hypothesis of no second order autocorrelation (AR2) in residuals must be confirmed as it will disclose autocorrelation in levels (Arellano & Bond, 1991).

5. PRELIMINARY RESULTS

Table 1 summarizes the descriptive statistics for the full sample of transition economies for all the variables applied in our empirical study. These statistics indicate that the cross-country variation is fairly significant, including the institutional indexes of bureaucracy and corruption, rationalizing the employ of Fixed Effects or Random Effects and GMM panel method techniques.

Table 2 presents the correlation matrix for the variables that aim to support the modeling of this empirical study and validate the choice of instruments in the case of GMM method. The correlation coefficients suggest in general no high multicollinearity among the variables.

However, the variable attached to the corruption index has a relatively high correlation (above 50%) with the measures attached to the initial GDP per capita and the bureaucracy index. To deal with these issues and especially with the relative volatility that exhibits the Corruption Index in the set of transition economies, we decide to apply the growth rates of this variable so as not to affect the reliability of the results.

Table 1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP per capita growth	448	4.56	4.80	−14.56	33.03
Log of Initial GDP per capita	420	8.54	0.94	6.03	10.14
Inward FDI	447	39.70	23.11	0.36	132.27
Trade Openness	448	102.48	31.07	24.17	199.68
Human Capital	431	93.69	8.93	69.60	111.35
Domestic Investment	448	23.91	6.49	7.42	57.71
Government Spending	448	17.16	4.16	7.32	29.94
Inflation	448	9.39	14.86	−18.93	185.29
Bureaucracy Index	437	41.16	9.05	22.00	63.40
Corruption Index	432	64.36	13.02	30.00	87.00

Note: Std. Dev. = Standard Deviation; Min = Minimum; Max = maximum; Obs = Observation. For variable definitions and sources see Table A in Appendix.

Figure 1 plots the average Bureaucracy Index compared to the average Corruption Index, for the 28 transition economics over the period 2000–2015. The positive relationship between corruption and bureaucracy is showed with a fitted line in the scatter plot in Figure 1. In particular, we reveal that countries characterized by higher levels of bureaucracy lean towards to be related with higher levels of corruption. As exemplified in Figure 1, the Commonwealth of Independent States suffer from the highest levels of both bureaucracy and corruption, while the economies of South Eastern Europe register rather moderate indexes of these two institutional measures. Conversely, in the economies of Central Eastern Europe and Baltic States, we observe a better performance in terms of combating bureaucracy and corruption.

6. THE ANALYSIS OF EMPIRICAL RESULTS

The results that we received from Hausman test[2] confirmed the rejection of null hypothesis hence we move towards the Fixed Effects estimator to deal with the cross-sectional heterogeneity.

On the other hand, considering the characteristics of our dataset, we employ the System GMM estimator, as it outperforms the Difference GMM estimator in our paradigm. A critical point prior to the implementation of GMM methodology is to confirm the endogeneity of some of the variables of our model. For this purpose, we considered the relative empirical literature running the Durbin-Wu-Hausman test[3] (Durbin, 1954;

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2   The results that we received from Hausman test are available upon request.

3   The results that we received from Durbin-Wu-Hausman test are available upon request.

Table 2. Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
1. GDP per capita growth	1.00	–	–	–	–	–	–	–	–	–	–
2. Log of Initial GDP per capita	−0.23	1.00	–	–	–	–	–	–	–	–	–
3. Inward FDI	−0.16	0.29	1.00	–	–	–	–	–	–	–	–
4. Trade Openness	−0.02	0.31	0.38	1.00	–	–	–	–	–	–	–
5. Human Capital	−0.11	0.46	0.09	0.22	1.00	–	–	–	–	–	–
6. Domestic Investment	0.24	0.11	0.22	0.17	0.07	1.00	–	–	–	–	–
7. Government Spending	−0.28	0.27	0.10	0.32	0.14	−0.21	1.00	–	–	–	–
8. Inflation	0.12	−0.33	−0.31	−0.05	−0.02	0.06	−0.09	1.00	–	–	–
9. Bureaucracy Index	0.11	−0.47	−0.45	−0.36	−0.24	−0.10	−0.01	0.53	1.00	–	–
10. Corruption Index	0.23	−0.73	−0.35	−0.52	−0.42	0.01	−0.38	0.37	0.66	1.00	–
11. Corruption Index growth	−0.02	−0.03	−0.08	−0.01	−0.03	−0.01	0.03	0.21	0.10	0.13	1.00

Note: For variables definitions and sources see Table A in Appendix.

Note: EST = Estonia; LVA = Latvia; LTU = Lithuania; CZE = Czech Republic; HUN = Hungary; POL = Poland; SVK = Slovakia; SVN = Slovenia; BGR = Bulgaria; ROM = Romania; HRV = Croatia; ALB = Albania; BIH = Bosnia and Herzegovina; MKD = FYROM; MNE = Montenegro; SRB = Serbia; ARM = Armenia; AZE = Azerbaijan; BLR = Belarus; GEO = Georgia; KAZ = Kazakhstan; KGZ = Kyrgyzstan; MDA = Republic of Moldova; RUS = Russian Federation; TJK = Tajikistan; TKM = Turkmenistan; UKR = Ukraine; UZB = Uzbekistan.

Figure 1. Relationship between bureaucracy and corruption

Wu, 1974; Hausman, 1978) as well. Through this test, we found confirmation for the endogeneity of the FDI, domestic investment and trade openness variables. Consequently, the valid instruments for the three endogenous variables include lags of two and deeper. The explanatory variables of GDP per capita, bureaucracy, and corruption were treated as predetermined, while the rest of independent variables are treated as exogenous. In the case of predetermined variables, valid instruments include lags of one period and deeper, whereas exogenous variables are instrumented by their contemporaneous values (Arrelano & Bover, 1995).

Table 3 presents the results of the static and dynamic panel data methods. For the sake of consistency and comparability of these two methodological approaches, Fixed Effect estimates are reported in the odd number of columns of Table 3,

while System GMM estimates are reported in the even number of columns of the same table.

The lower segment of Table 3 provides also satisfactory diagnostics for the system GMM estimator. The Hansen J test confirms the validity of our instruments by not rejecting the null hypothesis of over identified restrictions. Furthermore, the results that we derive from Arellano-Bond AR (1) and AR (2) tests are that the first order of autocorrelation is in force, however, more outstandingly, the absence of the second order of serial correlation according to AR (2) test is not rejected.

In fact, Table 3 provides satisfactory diagnostics as the results are solid across model specifications, as it confirmed by the statistical significance at 1 percent of F-test and by the constant increased explanatory power of R-squared, from 0.47 in model (1) to 0.58 in model (13). Hence, we can confirm that

Table 3. Empirical results

Independent variables	Dependent. variable: GDP per capita growth													
	Fixed Effects	**System GMM**	**Fixed Effects**	**System GMM**	**Fixed Effects**	**System GMM**	**Fixed Effects**	**System GMM**	**Fixed Effects**	**System GMM**	**Fixed Effects**	**System GMM**	**Fixed Effects**	**System GMM**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**	**Model 11**	**Model 12**	**Model 13**	**Model 14**
Log of Initial GDP p.c.	−0.052**	−0.107***	−0.067***	−0.057**	−0.065***	−0.063**	−0.077***	−0.109**	−0.068***	−0.070***	−0.070***	−0.068***	−0.082***	−0.101***
	(0.020)	(0.003)	(0.000)	(0.015)	(0.002)	(0.012)	(0.001)	(0.016)	(0.004)	(0.001)	(0.000)	(0.001)	(0.000)	(0.003)
Inward FDI$_{t-1}$	0.035*	0.075	0.143***	0.348***	0.145***	0.373***	0.161***	0.367***	0.151***	0.393***	0.156***	0.400***	0.176***	0.359***
	(0.100)	(0.151)	(0.004)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trade Openness	0.073***	0.183***	0.137***	0.250***	0.141***	0.264***	0.142***	0.305***	0.160***	0.301***	0.161***	0.299***	0.162***	0.303***
	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Human Capital	0.197***	0.417**	0.176***	0.232*	0.161**	0.217*	0.153**	0.438*	0.146**	0.248**	0.144**	0.236*	0.136**	0.370*
	(0.006)	(0.013)	(0.009)	(0.076)	(0.014)	(0.097)	(0.012)	(0.073)	(0.019)	(0.050)	(0.020)	(0.058)	(0.019)	(0.078)
Domestic Investment	0.013	0.043	0.119**	0.242**	0.121**	0.266**	0.109**	0.365***	0.115**	0.197**	0.121**	0.200**	0.107**	0.291***
	(0.894)	(0.863)	(0.023)	(0.044)	(0.024)	(0.083)	(0.047)	(0.002)	(0.026)	(0.024)	(0.020)	(0.014)	(0.050)	(0.001)
Government Spending	−0.189*	−0.077	−0.187*	−0.033	−0.165	−0.024	−0.224**	−0.202	−0.191*	−0.101	−0.196*	−0.114	−0.268*	−0.260
	(0.058)	(0.759)	(0.100)	(0.802)	(0.114)	(0.879)	(0.047)	(0.438)	(0.100)	(0.518)	(0.100)	(0.452)	(0.020)	(0.264)
Inflation	−0.041*	−0.125**	−0.064**	−0.102*	−0.091***	−0.138***	−0.089**	−0.093*	−0.092***	−0.151***	−0.095***	−0.030**	−0.096***	−0.092**
	(0.088)	(0.035)	(0.023)	(0.084)	(0.000)	(0.004)	(0.010)	(0.073)	(0.000)	(0.005)	(0.000)	(0.027)	(0.000)	(0.014)
D. Crisis	−5.671***	−6.163***	−4.371***	−5.337***	−4.492***	−5.585***	−4.153***	−3.437***	−4.409***	−5.470***	−4.271***	−5.345***	−3.834***	−3.894***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inward FDI *Trade Openness	−	−	−0.001***	−0.004***	−0.001***	−0.004***	−0.002***	−0.005***	−0.002***	−0.004***	−0.002***	−0.004***	−0.002***	−0.004***
			(0.002)	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Bureaucracy	−	−	−	−	−0.018	−0.176	−0.221**	−0.202	−	−	−	−	−0.210**	−0.127
	−	−	−	−	(0.822)	(0.306)	(0.036)	(0.284)	−	−	−	−	(0.047)	(0.513)
Bureaucracy* CEEBSEE16[a]	−	−	−	−	−	−	0.303***	0.275*	−	−	−	−	0.341***	0.213
	−	−	−	−	−	−	(0.009)	(0.064)	−	−	−	−	(0.001)	(0.085)*
Corruption	−	−	−	−	−	−	−	−	−0.027	−0.053**	−0.092**	−0.221***	−0.092**	−0.171***
	−	−	−	−	−	−	−	−	(0.299)	(0.037)	(0.050)	(0.001)	(0.050)	(0.002)
Corruption* CIS12[b]	−	−	−	−	−	−	−	−	−	−	0.093*	0.245***	0.096*	0.186***
	−	−	−	−	−	−	−	−	−	−	(0.095)	(0.002)	(0.087)	(0.006)

Table 3 (cont.). Empirical results

Independent variables	Fixed Effects	System GMM	Fixed Effects	System GMM	Fixed Effects	System GMM	Fixed Effects	System GMM	Fixed Effects	System GMM	Fixed Effects	System GMM	Fixed Effects	System GMM
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
							Dependent. variable: GDP per capita growth							
Lagged GDP p.c. growth	–	0.100	–	0.051	–	0.043	–	0.075	–	0.018	–	0.014	–	0.037
	–	(0.516)	–	(0.416)	–	(0.535)	–	(0.297)	–	(0.786)	–	(0.823)	–	(0.586)
Constant	27.511	39.521	34.885**	6.185	35.377*	18.462	48.225**	29.943	37.545**	14.851	38.737**	14.514	51.900**	30.998
	(0.130)	(0.133)	(0.019)	(0.452)	(0.074)	(0.372)	(0.026)	(0.237)	(0.018)	(0.342)	(0.015)	(0.334)	(0.020)	(0.129)
							Diagnostic tests							
R-squared	0.466	–	0.543	–	0.545	–	0.557	–	0.565	–	0.568	–	0.578	–
F. Statics	37.230	17.210	48.350	22.090	32.640	24.810	31.740	19.890	29.520	17.580	31.830	19.170	33.360	22.100
P. value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen J-test (p-value)	–	22.34(0.380)	–	21.92(0.525)	–	18.82(0.534)	–	19.85(0.282)	–	23.59(0.212)	–	22.18(0.218)	–	18.20(0.636)
AR (1) test (p-value)	–	–3.25(0.000)	–	–2.87(0.004)	–	–2.82(0.005)	–	–2.65(0.008)	–	–2.57(0.010)	–	–2.65(0.008)	–	–2.53(0.012)
AR (2) test (p-value)	–	–2.34(0.380)	–	–0.89(0.376)	–	–0.98(0.325)	–	–1.54(0.125)	–	–1.24(0.214)	–	–1.23(0.218)	–	–1.64(0.111)
Number of groups	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Number of obs.	404	404	404	404	397	397	397	397	391	391	391	391	386	386

Notes: 1) p-values are reported in paratheses. ***, **, * indicate significance at 1%, 5% and 10%, respectively. 2) a dummy variable CIS12 comprises the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. 3) b The dummy variable CEEBSEE16 comprises the following countries: Estonia, Latvia and Lithuania, Czech Republic, Hungary, Poland, Slovakia, Slovenia, Albania, Bosnia, Bulgaria, Croatia, FYROM, Montenegro, Romania and Serbia. 4) Hansen J test controls for over identifying restrictions. 5) AR (1) and AR (2) stats indicate the tests for the null of no first-order and second-order serial correlation. 6) In the model specifications with the Fixed Effects estimator, we considered violations of linear regressions related to the error terms by implying robust standard errors to prevent autocorrelation, and heteroscedasticity. 7) In the model specifications with System GMM estimator, we applied the statistical software Stata 14 and "xtabond2" branded command originated by Roodman (2005) with the one-step robust estimator. 8) Finally, the following subcommands were applied: 1) "collapse" to present results with decreasing instruments; 2) "small" that will request small sample corrections to the covariance matrix estimation; and 3) "robust" so that standard errors to be robust to heteroscedasticity and autocorrelation (see Roodman 2009).

the growth determinants that were chosen in this paradigm have the adequate explanatory power to interpret the growth of GDP per capita in the set of 28 transition economies.

The results from the baseline specification are presented in the first two columns (Models 1 and 2) obtained using the Fixed Effects and GMM methods, respectively. In particular, the impact of inward FDI on per capita growth is positive, but it is rather statistically insignificant in both Fixed Effects and GMM methods at 10 percent and 15 percent, respectively. Similarly, we observe that domestic investment, though positive, is statistically insignificant in both two econometric approaches. Next, we find that trade openness and human quality estimates are positive and statistically significant at 1 percent in both two econometric estimators. On the contrary, the inflation rate and government spending have a negative sign on economic growth, as indications of economic instability and uncertainty. However, in the case of government spending, we observe that this coefficient is solely statistically significant at the Fixed Effects estimations. This finding highlights the great heterogeneity that surrounds the incapacity of transition government authorities to use effectively the public money.

The coefficient of lagged growth rate of GDP per capita has the expected positive sign. In contrast, the coefficient attached to the initial GDP per capita has the expected negative sign. Taking into consideration also the statistical significance of other structural growth factors across different model specifications we validate the presence of "beta" convergence. In regard to the speed[4] of convergence that we retrieve from the results, equals about 3 percent with both static and dynamic panel methods which have been taken into consideration.

To verify and enhance the robustness of the results of the baseline equation, in Models (3) and (4), we add an interaction term (FDI * Trade Open). This interaction variable is expected to address the issue of possible collinearity between the two key variables FDI and trade openness, and regulate the proliferation of instruments in the GMM method. More importantly,

we note that after the inclusion of the interaction term we solve the issue of collinearity between the two measures of external openness and subsequently we retrieve more sizeable and robust estimates for the core explanatory variables such as FDI, trade openness and domestic investment for both Fixed Effects and GMM estimators. Apparently, these three variables appearing as robust driving forces of growth in the set of transition economies. In particular, applying a Fixed Effect method in Model (3), for every 1 percent increase in FDI, there is 0.14 percent rise in economic growth compared to 0.035 percent of the same method in Model (1). Similarly, in Model (4), when we controlled for endogeneity bias applying GMM, the positive effect of FDI rises from 0.075 percent in Model (2) to 0.35 percent in Model (4). Regarding the impact of trade openness, as one can identify by applying Fixed Effects, raises from 0.07 percent in model (1) to 0.14 percent in model (3). Similarly, using a GMM estimation, the positive impact of trade openness also upsurges from 0.18 percent in Model (2) to 0.25 percent in Model (4).

Somewhat surprisingly, in Models (3) and (4), evaluating the magnitude of coefficients of FDI, trade openness and domestic capital, we reveal that the impact of FDI as a growth stimulator is constantly greater than the other two growth determinants. A possible explanation for this finding is that the post-Communist economies have registered plethoric growth rates of FDI inflows with regards to the corresponding growth rates of domestic investment and trade volumes.

In Models (5) and (6) (see Table 3), we control for institutional constraints, namely the effect that has the prevalence of bureaucracy on the economic performance of transition economies. Interestingly, though, the coefficient of the bureaucracy is negative but statistically insignificant in both Fixed Effects and GMM estimations. With regard to this finding, a closer observation of Figure 1 shows great discrepancies in the level of bureaucracy across transition economies. Hence, we proceed with the classification of the targeted economies into distinctive groups of transition

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4 The level of convergence is calculated in Models 13 and 14 as follows: $\lambda = \left[1 - \exp\left(\beta \cdot T\right)\right] / T$, where β is the coefficient of initial GDP per capita, and T is the timeframe of the study.
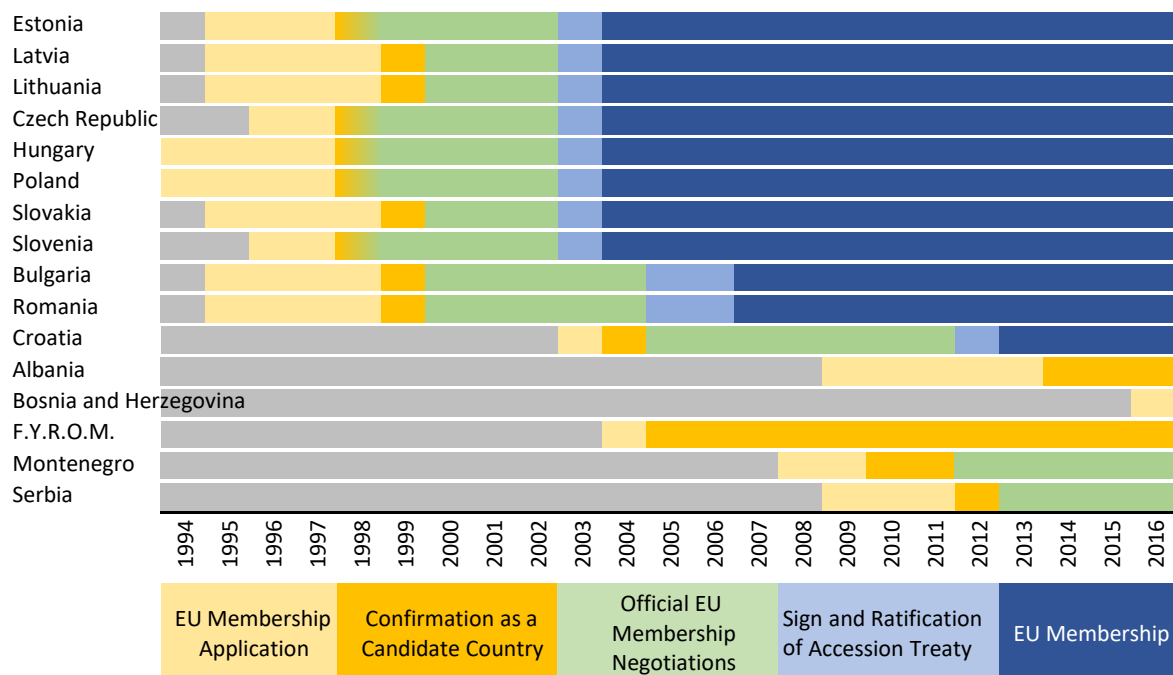
Figure 2. Timeline of the process of EU accession for European transition economies

economies, those of Central Eastern and South Eastern Europe and Baltic States (which in our study henceforth are linked to CEEBSEE16) in the first taxonomy and those of Commonwealth of Independent States (which in our study henceforth are linked to CIS-12) in the second taxonomy.

Thus, we decide to introduce in Models' specifications (7) and (8) (see Table 3), an interaction variable (BUR*CEEBSEE16) that can consider the regional impact of bureaucracy on GDP per capita growth. In particular, CEEBSEE16 is a dummy variable that takes the value of one if the country belongs to the CEEBSEE16 region, zero otherwise.

Somewhat surprisingly, the coefficient of the interaction term between the institutional constraint of bureaucracy and CEEBSEE16 is positive and statistically significant in both Fixed Effects and GMM estimations (see Models 7 and 8). More importantly, the entry of interaction term (BUR*CEEBSEE16) increases in two panel estimations the negative elasticity of the variable of bureaucracy (BUR) and turns into a statistically significant variable (at 5% of statistical significance) in the case of Fixed Effects method. Hence, it is evident that country specific effects are assessed

to be more significant than endogeneity concerns between bureaucracy and GDP per capita. For certain, the most captivating result is that the positive coefficient on the BUR*CEEBSEE16 is in absolute terms greater than the negative coefficient on the BUR variable. Thus, the results (in Models 7 and 8) confirm that in the case of Central-Eastern and South-Eastern Europe, a higher level of state intervention exerts a beneficial impact on GDP as opposed to the detrimental effect in the case of Commonwealth of Independent States.

There are a number of other plausible explanations as to why the impact of bureaucracy on the GDP is beneficial solely in the case of the CEEBSEE16 region. First, it appears that the prolonged process of the adoption of European Union policy in European transition economies (see Figure 2) has boosted significant advances in comprehensive reforms in their institutional frameworks so as to conform rigid prerequisites as an element of their EU accession preparations.

Second, the fairly successful performance of these group of economies in attracting foreign direct investments and promoting exports, as it verified by the relative indicators that assesses the inward FDI

and exports as a share of GDP (see for more details Tsitouras & Nikas, 2016) have inevitably affected the quality of their state bureaucracy. According to the modern trade and FDI theory (see Venables, 2009), FDI and exports can affect the total output and subsequently the quality of the organizational structure of a state, as a result of the increased demand by energetic indigenous and foreign private companies over policy governance. More significantly, in the long run, it is valued that a mutual association could be formed between private energetic and extrovert local businesses and political governance, which could operate as a basis of maintainable increasing returns as the greater private business sector results in optimal provision of complementary public goods and services, the outcome being a virtuous cycle.

Third, the growth model of these transition economies was formulated on three specific pillars: the European Union integration process, the Washington Consensus, and the IMF-supported programs[5]. Consequently, this group of economies was accustomed to the primary guiding principles of these institutions, precisely commutating initially the majority of state enterprises into separate legal entities and at a later stage privatizing them, hence, improving the business environment and creating consistent conditions for both domestic and foreign investments. In fact, these economies have focused more on spending based fiscal adjustments than tax-based fiscal adjustments (see IMF, 2016) that triggered less recessions and greater FDIs, but more importantly enabled, in the long run, a boost on investments and total output growth rates. It is important to note that among the directives provided by IMF, the most critical that unanimously suggested to all the government authorities that implement an arrangement with IMF, is the reform of indigenous government employment and compensation system (see Clements et al., 2010). For instance, among the directives that are commonly proposed from IMF[6] to partner countries, a rather provocative encompasses even the substitution of old public employees with young more qualified and talented employees. Overall, these arrangements are expected: to reduce the government labor costs; to boost the productivity

in the public sector; and to limit the brain drain from the local economy.

Finally, it is believed that national entities and policy makers in these group of economies have been facilitated to improve their public-sector efficiency, as the staffing and assessment policies of their public sector were implemented with limited social and political reactions and constraints, taking advantage of the trend for the emigration of the local citizens to North America, Australia in the early 1990s and to more advanced economies of European Union particularly after 2004 when intra-EU migration rose substantially (Robila, 2007; Castro-Martín & Cortina, 2015). These surges were also noteworthy, paradoxically prior to the provisional limitations on labor movements for citizens of the new EU member states were applied (Eurostat, 2011). During the same period, many of the new EU members from Central-Eastern Europe registered significant flows of labor migration from non-EU neighbors (Strarfor, 2012). It is evident that the majority of emigrants from Eastern European countries to old members of European Union had a relative medium level of education with an inclination to work in low-skilled jobs (Castro-Martín & Cortina, 2015). The only exception to that trend was the emigrants that were coming from the former Republic of Yugoslavia during or after the war as refugees had a better education level (Robila, 2007). Overall, these factors reflect the fact that most qualified labor force remained in their home countries and staffed both the public and private sector of their economies.

Altogether, in the case of CEEBSEE economies, the above mentioned factors resulted in dynamic interconnections between ex-state and private labor market; increased funds in public infrastructure; improved quality of public spending; and enhancement of the provision and efficiency of collective goods and services, that is, in terms of public education and health, raising, in turn, the overall productivity of the state sector in this group of transition economies.

In the next two Models (9) and (10), we substitute the institutional constraint variable of bureaucra-

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5   See for more details about the involvement of the IMF in post-communist economies the study of Roaf, Atoyan, Joshi, & Krogulski (2014).

6   Consider the views of the Director of the IMF's European Department IMF'S Poul Thomsen (Retrieved from http://www.ekathimerini.com/155749/article/ekathimerini/news/greece-needs-new-targeted-measures-says-imfs-poul-thomsen).

cy with this of corruption. The results indicate that the coefficient of the corruption is negative in both Fixed Effects and GMM estimations, but it is statistically robust only in the latter estimation. This result bears the competence of the GMM method to control for the endogeneity between the model of growth and corruption. After a thorough examination of possible regional dummies, we introduce in Models (11) and (12) the interaction dummy variable $(COR \cdot CIS12)$ that can assess the regional impact of corruption on economic growth in the set of Commonwealth of Independent States.

Going straight to the purpose of interest, we observe in Models (11) and (12) that the interaction dummy variable (COR*CIS12) enters the model with a positive sign and statistically significant coefficient both in Fixed Effects and GMM estimations. More importantly, the inclusion of this regional interaction dummy variable also raises the statistical significance of the negative impact of corruption in both two panel estimates. Overall, the results that we retrieve in Models (11) and (12) are of particular interest. Apparently, the impact of corruption on GDP per capita is detrimental for the majority of transition economies, as indicated by the negative and statistically significant variable of corruption. However, the most interesting finding is that the positive coefficient of $COR \cdot CIS12$ is in absolute terms larger than the negative coefficient attached to the corruption variable. This result indicates that the occurrence of corruption affects rather in a positive way the economic performance of Commonwealth of Independent States, thus supporting the "grease of the wheels" hypothesis for this group of states, as we discussed earlier in the literature review section.

There are a number of explanations as to why the impact of corruption is positive in the set of Commonwealth of Independent States (CIS12). First, it is interesting to note that corruption exerts a positive role on growth in economies with worst institutional performance both in terms of the extent of corruption and bureaucracy. The members of Commonwealth of Independent States have registered the worst performance, as indicated by the findings of Figure 1, both in terms of bureaucracy and corruption over the period 2000–2015. This implies that in economies with a rigid bu-

reaucracy the more possible for these economies to benefit from corruption is the greases of the wheels of governments. In particular, in these economies, state employees that accept bribes are possible to be urged to fasten the pace of their work resulting in a more systematic provision of state services. Above all, bribes in such a deficient institutional environment can be regarded as one powerful tool to promote economic growth by means of facilitating economic transactions that may not have materialized otherwise.

Second, we tie our results to the fact that the vast majority of Commonwealth of Independent States are characterized as rather autocratic regimes (see Figure 3). In these political regimes, corruption can be characterized as more centralized. Hence, it is commonly accepted that in these autocratic regimes, bribes most commonly are collected by one single centralized agent who possibly may facilitate avoiding dominant awkward government regulations at a relatively low cost and thus can increase efficiency and economic performance. On the other hand, in the case of more democratic regimes of Central-Eastern and South-Eastern Europe, the existence of various decentralized government agents resulting in a greater uncertainty in the whole domestic economic environment which can have a harmful effect on the total economic performance.

Finally, in Models (13) and (14), we include all four institutional variables (alongside with the full list of control variables). Interestingly enough, the inclusion of the whole set of institutional variables does not alter the sign and the statistical significance of the other control variables of the basic model specifications. More importantly, it is worth emphasizing that in the final two model specifications, the positive coefficients attached to core growth determinants are further increased. In particular, applying the Fixed Effect estimation, the coefficient attached to the FDI variables increases from 0.143 percent (Model 3) to 0.176 percent (Model 13). Similarly, in the case of the GMM estimation, the *FDI* coefficient increases from 0.348 percent (Model 4) to 0.359 percent (Model 14). The trade openness coefficient, applying the Fixed Effects method increases from 0.137 percent (Model 3) to 0.162 percent (Model 13) and by applying the GMM estimation the same coefficient increases from 0.250 per-
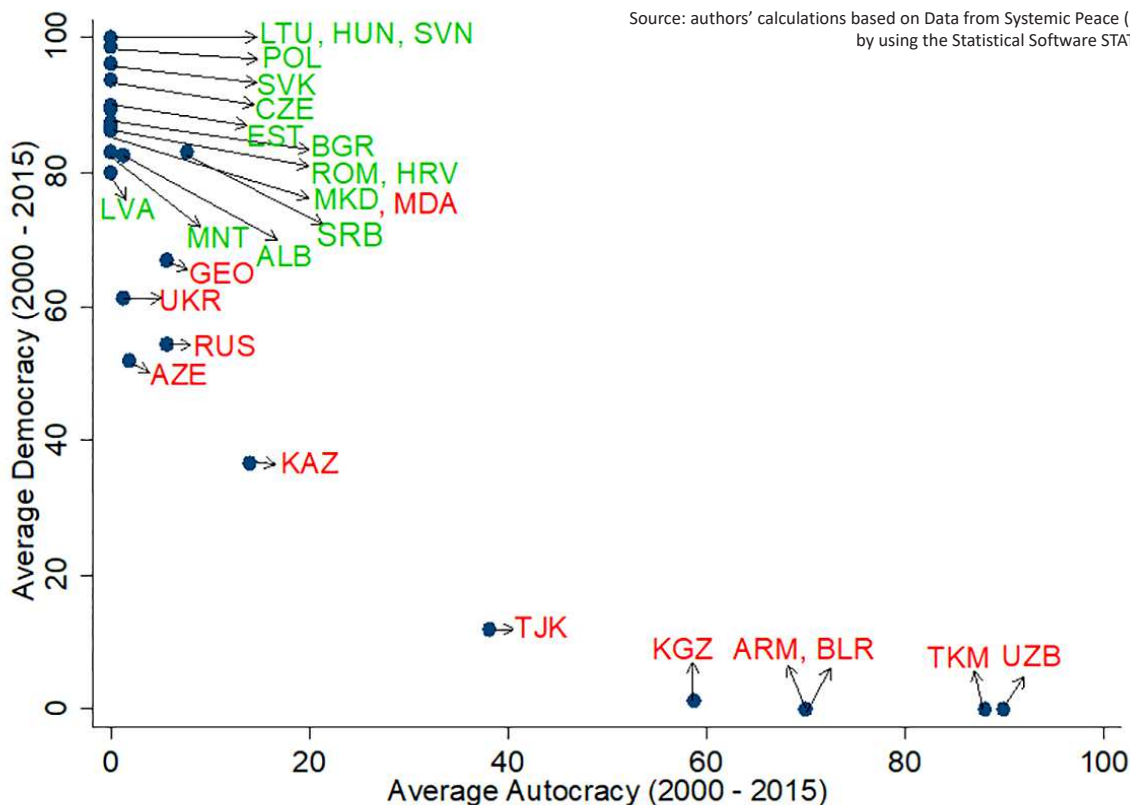
Note: EST = Estonia; LVA = Latvia; LTU = Lithuania; CZE = Czech Republic; HUN = Hungary; POL = Poland; SVK = Slovakia; SVN = Slovenia; BGR = Bulgaria; ROM = Romania; HRV = Croatia; ALB = Albania; BIH = Bosnia and Herzegovina; MKD = FYROM; MNE = Montenegro; SRB = Serbia; ARM = Armenia; AZE = Azerbaijan; BLR = Belarus; GEO = Georgia; KAZ = Kazakhstan; KGZ = Kyrgyzstan; MDA = Republic of Moldova; RUS = Russian Federation; TJK = Tajikistan; TKM = Turkmenistan; UKR = Ukraine; UZB = Uzbekistan.

Figure 3. Scatter plot of indexes of political regimes (democracy vs autocracy)

cent (Model 4) to 0.303 percent (Model 14). These important results suggest that institutions affect economic growth also indirectly by boosting the growth-enhancing effects of classical growth factors such as inward FDI, trade openness, and domestic investment.

Another evidence of the influence that the two institutional factors (bureaucracy and corrup-

tion) have on the growth dynamics of transition economies is that the coefficient attached to the speed of economic convergence is further increased in Models (13) and (14) as compared to Models (3) and (4). Finally, the results that we retrieve in the final two model specifications further confirm and strengthen the previous relationships between bureaucracy and corruption with economic growth.

CONCLUSION AND POLICY RECOMMENDATIONS

The present paper applies a growth model, augmented by two institutional variables, bureaucracy and corruption, on 28 transition economies over the period 2000–2015. Regarding the impact of economic determinants of growth, we find strong evidence of a positive effect of external openness of an economy, by means of inward FDI and trade, on economic growth. Additionally, other growth determinants such as the domestic investment and the quality of the labor force, matter as well for economic growth in the panel countries. Interestingly though, assessing the magnitude of the coefficients of the above-mentioned growth determinants, we reveal that the impact of FDI as a growth stimulator in all model specifications is always greater than the rest of growth determinants. On the basis of these findings, it

is crucial for these economies to formulate the appropriate policies so as to further enhance for their economies, the international trade transactions and the accessibility to FDI in order to fasten the pace of further economic acceleration.

Regarding the influence of non-economic growth determinants, we retrieve more thought-provoking results. First, the results suggest that the significance of institutional factors is equally important as compared to the classical growth factors. More importantly, we confirm that institutions affect economic growth not only directly, but also indirectly by boosting the growth-enhancing effects of classical growth factors such as inward FDI, trade openness, and domestic investment. Second, there is substantial evidence that the great disparity that characterizes the institutional progress across transition economies cannot be ignored in econometric estimations so as to provide coherent and robust empirical results. Third, this study finds fairly extensive evidence for a high degree of complementarity between institutional indicators, as a greater existence of bureaucracy affects significantly the size of the impact of corruption on economic performance. This is indicative in our study, in the case of Commonwealth of Independent States, where corruption greases the wheels of governments in a severe deficient institutional framework. Fourth, the results confirm the notion that the exact level of an institutional indicator, matters for economic growth. In particular, the results validate that in most corrupted countries, corruption promotes growth (this is the case of Commonwealth of Independent States), but in countries with low and intermediate levels, corruption considerably hampers economic growth (this is the case of Central-Eastern and South-Eastern European countries).

Finally, the findings suggest that the quality of institutions in the set of post-communist states appear to be contingent on the quality of government officials to a higher degree than their developmental alternatives. In fact, in the case of Central-Eastern and South-Eastern countries, this evolutionary process can be attributed primarily to government officials that must have committed themselves to the merits of institutional transformation of their countries, and subsequently to the citizens that have shown a more open mentality to grasp the merits of an effective "Weberian" bureaucracy in terms of institutional enhancement. In contrast, in the set of more autocratic regimes of former Soviet Union, government authorities have promoted institutional improvement to a level corresponding to their goals that a powerful authority can control its physical and legal entities to what extent could participate in economic actions. This makes unequivocal why even the most economically prosperous autocratic regimes register the higher degree of both bureaucracy and corruption, why they usually shift to rigid anticorruption strategies and/or why corruption frequently escalates only when the government authority drops the control of power.

Considering that the influence of institutional factors on national income is different between the two groups of transition economies that have been analyzed in our study, special focus should be paid by policymakers while forming regulatory advances. In the case of Central-Eastern and South-Eastern European transition economies, government authorities have the legitimate duty in guaranteeing two specific genuine attributes: distinct separations of the pursuits between state employees and political figures, and solidification of the meritocratic recruitment procedures in the state sector that altogether can play a definite role in the eradication of corruption.

In the context of the Commonwealth of Independent States, though the results suggest that in countries infested with a quite incompetent institutional environment, corruption could be a helping hand to the economy, this does not warrant complacency by government authorities. In fact, a bundle of policies should be directed towards supporting the institutional framework by creating sound legal systems, securing property rights and eradicating the corruption and bureaucratic inefficiencies.

Above all, evaluating the results of our analysis, it is more than telling that international trade and FDI appear to assert a beneficial impact on the quality of the institutions and the quality of public governance. Thus, efforts by policymakers should be directed towards bringing in more and higher quality

FDI; and expand the size of their extrovert private sector of their economies. This, in turn, could operate as a basis of maintainable increasing returns as the greater private business sector results in optimal provision of complementary public goods and services, the outcome being a virtuous cycle.

Overall, it is essential for all the government authorities in post-communist countries, the regulatory reform to be constantly on their policy agenda, so as to instil to their citizens the advantages of building effective institutions in delivering long-run economic growth. This condition is associated with the proper functioning of institutions, the effective separation of powers, the restriction of the arbitrariness of the governments, and the subordination of "political will" in the rules, which are the keys to the prosperity of a nation.

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APPENDIX

Table A. Variables definitions and sources

Variable	Description	Unit of measurement	Source
GDP p.c. growth	GDP per capita growth	Annual % growth rate of GDP per capita	World Bank, WDI (2015)
Log of Initial GDP p.c.	GDP per capita (constant 2010 US$)	Log of GDP per capita (constant 2010 international $)	World Bank, WDI (2015)
Inward FDI	Foreign Direct Investment (FDI) stocks calculate the total level of direct investment at the end of a calendar year	% of GDP	UNCTAD Investment Reports (2015), Asian Development Bank Database (2015)
Trade Openness	Trade is the sum of exports and imports of goods and services measured as a share of Gross Domestic Product	% of GDP	World Bank, WDI (2015)
Human Capital	Labor force with secondary education is the share of the total labor force that attained or completed secondary education as the highest level of education	% of GDP	World Bank, WDI (2015), Asian Development Statistical Database (2015)
Domestic Investment	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements)	% of GDP	World Bank, WDI (2015)
Government Spending	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees)	% of GDP	World Bank, WDI (2015), Asian Development Statistical Database (2015)
Inflation	Inflation, Consumer Price Index	Inflation rate, (annual %)	World Bank, WDI (2015), Asian Development Statistical Database (2015)
Bureaucracy Index	The measurement of Economic Freedom is based on 10 quantitative and qualitative factors: 1) Property Right; 2) Freedom from Corruption; 3) Fiscal Freedom; 4) Government Spending; 5) Business Freedom; 6) Labor Freedom; 7) Monetary Freedom; 8) Trade Freedom; 9) Investment Freedom; and 10) Financial Freedom. The Economic Freedom Index ranges between 0 and 100. The initial index has been rescaled with the aim of an increase in the scale will indicate more bureaucracy	100 – average score of economic freedom	Heritage Foundation (2015)
Corruption Index	The Corruption Perceptions Index ranks countries based on how corrupt a country's public sector is perceived to be. The Corruption Perceptions Index ranges between 0 and 10 for the years 1995–2011 and between 0-100 afterwards. Initially, we have converted all the values to vary in the scale 0 to 100. The adjusted index has been rescaled with the aim of that an increase in the scale will indicate more corruption	100 – average score of corruption perceptions	Transparency International (2015)
D.Crisis	Dummy variable that takes the value of 1 for the period 2009–2015, 0 otherwise		Authors' own calculation
CIS12	Dummy variable that take the value of 1 if the country belongs to the Commonwealth of Impendent States, 0 otherwise		Authors' own calculation
CEEBSEE16	Dummy variable that take the value of 1 if the country belongs to the CEEBSEE16 region, 0 otherwise		Authors' own calculation