

DOI: 10.7251/EMC1502211B

Datum prijema rada: 2. oktobar 2015.

Datum prihvatanja rada: 10. decembar 2015.

UDK: 343.352(4-672 EU)

Časopis za ekonomiju i tržišne komunikacije

Godina V • broj II

str. 211-228

PREGLEDNI NAUČNI RAD

CORRUPTION, CAPITAL ABUNDANCE AND ECONOMIC DEVELOPMENT: EVIDENCE FROM THE EUROPEAN UNION COUNTRIES

Vlatka Bilas	Associate professor, Department of International Economics, Faculty of Economics and Business, University of Zagreb, J. F. Kennedy sq. 6, 10000 Zagreb, Croatia, vbilas@efzg.hr
Mile Bošnjak	Risk management and control Department, SKDD – CCP Smart Clear Ltd, Heinzl street 62 a, 10000 Zagreb, Croatia. mile.bosnjak76@gmail.com
Sanja Franc	Senior assistant, Department of International Economics, Faculty of Economics and Business, University of Zagreb, J. F. Kennedy sq. 6, 10000 Zagreb, Croatia. sfranc@efzg.hr

Abstract: *The aim of this paper is to establish and clarify the relationship between corruption level and development among European Union countries. Out of the estimated model in this paper one can conclude that the level of corruption can explain capital abundance differences among European Union countries. Also, explanatory power of corruption is higher in explaining economic development than in explaining capital abundance, meaning stronger relationship between corruption level and economic development than between corruption level and capital abundance. There is no doubt that reducing corruption would be beneficial for all countries. Since corruption is a wrongdoing, the rule of law enforcement is of utmost importance. However, root causes of corruption, namely the institutional and social environment: recruiting civil servants on a merit basis, salaries in public sector competitive to the ones in private sector, the role of international institutions in the fight against corruption, and some other corruption characteristics are very important to analyze in order to find effective ways to fight corruption. Further research should go into this direction.*

Keywords: *corruption, economic development, capital abundance, European Union*

JEL classification: *Z13, F43, C13*

INTRODUCTION

Corruption is a significant discussion subject among economists, international and national institutions due to its potential negative effects on economic development, either directly or indirectly. It is defined as an abuse of public power for private benefit (Boris Podobnik et al., 2008), or abusing public power to extract/

accept bribes from the private sector for personal benefit (Shang-Jin Wei, 1999). There is a consensus that corruption refers to acts in which the power of public office is used for personal gain against the rule of law (Arvind K. Jain, 2001). In other words, it is the misuse of public office for private gain (Jakob Svensson, 2005).

Corruption is a reflection of a country's legal, economic, cultural and political institutions (Svensson, 2005). Corruption undermines the state's legitimacy (World Bank, 1998). It is present in all societies to a greater or lesser extent. It is a persistent feature of human societies over time and space (Toke S. Aidt, 2003). Most macro-economic variables are determined simultaneously with corruption and there is a causal effect between the two (Jain, 2001).

The existence of corruption affects economic growth, the level of gross domestic product (GDP) per capita, investment activity, international trade and price stability negatively and it changes the composition of government expenditures (Axel Dreher and Thomas Herzfeld, 2005).

Corruption also affects the pattern of resource allocation, as well as the distribution of income within society (Jain, 2001).

Existence of corruption requires three elements to co-exist (Jain, 2001). First, someone must have discretionary power. Second, there must be economic rents associated with this power and third, the legal system must offer sufficiently low probability of detection and penalty for the misconduct. In other words, at least three conditions are necessary for corruption to arise and persist: discretionary power, economic rents and weak institutional frame (Aidt, 2003). There are two predominant models of corruption: the agency model and the resource allocation model (Jain, 2001). Agency model is applied to situations where there is information asymmetry, the principal lacks full information about the actions of its agent and in resource allocation models, and corruption changes the relative costs of inputs and outputs as well as the penalties faced by decision-makers. The most obvious application of the resource allocation model is for rent-seeking behavior.

Some countries can tolerate relatively high levels of corruption and continue to maintain economic growth, whereas others cannot. According to Asian Development Bank (1997) a state's natural resource base and the sources of its comparative advantage play a critical role in its ability to attract investment. Countries

abundant with natural resources often attract more investment than those relying on low wages and labor intensive manufacturing to attract foreign investment. Therefore, it is interesting to see what the role of corruption in investment intensity and capital abundance is in chosen sample countries. The Asian Development Bank (1997) suggests if corruption is highly predictable, the impact on development may be reduced. If corruption is “containable” in this way, its’ impact on development is reduced.

Despite all mentioned above, analysis of the cause-effect of relationship between corruption and economic growth is still ambiguous. Low level of corruption, of course, is not the only reason explaining economic development. It’s not clear to what extent corruption influences development through lower investment and therefore lower capital abundance, and how powerful is the influence on development through other channels.

The aim of this paper is to establish and clarify the relationship between corruption and development among European Union countries. Previous research on this topic (Paulo Mauro 1995, Vito Tanzi and Hamid R. Davoodi, 1997) examined the relation between corruption level and investment.

Following Peter Debeare (2003) who examined the relationship between production factor abundance and GDP per capita based on the Heckscher - Ohlin international trade theory, we wanted to test whether factor abundance gives better performance in explaining the relation with corruption level than just investments.

In order to establish and clarify the relationship between corruption and development among European Union countries, research hypothesis are defined as follows:

- (1) Higher level of corruption among European Union countries causes lower economic development.
- (2) Higher level of corruption among European Union countries causes lower capital abundance. Explanatory power of corruption is higher in explaining economic development than in explaining capital abundance.

Paper is divided into six parts. Besides the introduction and conclusion, the paper contains the literature review, methodology explanation, the results of the research and related discussion.

LITERATURE REVIEW

Corruption acts as a major deterrent to growth and development (Jain, 2001). Government officials may abuse their arbitrary power to restrict the supply of certain demanded services and in order to surpass that barrier an extra-price of the service is required (Nadia Florino, Emma Galli, and Ilaria Petrarca, 2012: 127). Bribery can also remove incentives to investments and define a sub-optimal rent-seeking equilibrium of human capital. Both effects threaten economic growth.

Studies mainly argue a negative association between corruption level and country's wealth (Podobnik et al., 2008). It means that poorer countries are more corrupt. Of course, low level of corruption is not the only explanation for poor economic growth. It is widely accepted that large public sectors and pervasive government intervention may be associated with greater corruption (Mauro, 2004). As countries go through the economic transition to become richer, corruption drops dramatically (Martin Paldam, 2001).

Still, the effect of corruption on growth remains an empirical question (Florino et al., 2012).

Keith Blackburn, Niloy Bose, and Emranul M. Haque (2011) found that the relationship between corruption and development is two-way causal: bureaucratic malfeasance both influences and is influenced by economic activity. A consensus seems to have emerged that corruption and other aspects of poor governance and weak institutions have substantial, adverse effects on economic growth (Mauro, 2004:1). It raises the question why countries do not fight corruption harder when there is a clear argument that everybody would be better off without it. Mauro (2004) explains that when corruption is widespread, individuals do not have incentives to fight it. Also, according to his opinion, gradual reforms are less likely to work than more ambitious and comprehensive reforms.

Besides that, Florino et al. (2012) analyzed the interaction between corruption and government expenditure and showed that corruption undermines the positive impact that public expenditures have on economic growth. Emanuel Anoruo and Habtu Braha (2005) showed that corruption directly negates economic growth by lowering productivity and indirectly by hampering investment. Blackburn et al. (2011) argue that corruption distorts the quantity and quality of public expenditures. It means that these expenditures are not only inflated, but also misdirected towards the provision of low-quality public goods.

Also, corruption distorts government expenditure towards less productive activities and resources are wasted through rent seeking (Florino et al., 2012).

Cooper A. Drury, Jonathan Kriekhaus, and Michael Lustztig (2006) suggest a complex causal relationship between democracy, corruption and economic growth. They argue that the negative effect of corruption is mediated by the political process in which corruption occurs, and that democracy will mitigate or reduce the negative effect.

Lorenzo Pellegrini (2003) found that institutions are relevant determinants of the income levels of countries and through their effect on income, institutions are important factors in shaping environmental policies. If sound institutions foster economic development and the demand for environmental protection increases, institutional quality will produce stricter environmental policies. Institutional quality Pellegrini (2003) approximated with the corruption index published by Transparency International.

Gabriela R. Montinola and Robert W. Jackman (2002) analyzed the effects of democracy and free markets on corruption. They found that corruption is typically a little higher in countries with intermediate levels of political competition than in dictatorships. But, once past the threshold, higher levels of competition are associated with considerably less corruption. In other words, democratic practices inhibit corruption.

On the sample of estimated bribe payments of Ugandan firms, Raymond Fisman and Jakob Svensson (2007) found that rate of taxation and bribery are negatively correlated with firm growth. A one-percentage point increase in the bribery rate is associated with a reduction in firm growth of three percentage points. Fisman and Svensson (2007) also found that the effect of corruption is much larger than the retarding effect of taxation.

Paldam (2001) argues that religion can have significant effect on the level of corruption. The purpose of the analysis he conducted was to show if cultural factors as formed by religious differences can explain the corruption index. He showed that two groups of religions decrease corruption: Reform Christianity and Tribal religion. Other religions increase corruption in a similar way.

Eric M. Uslaner (2008) argues that countries cannot escape the corruption easily or at all. According to him, the roots of corruption lie in economic and legal

inequality, low level of generalized trust and poor policy choices. He argues the existence of inequality trap, which in fact means that high inequality leads to low trust and high corruption and consequently to more inequality.

Low levels of corruption incidence can be beneficial to economic growth (Fabio Méndez and Facundo Sepúlveda, 2006). Also, model of bargaining between politicians and firms shows that corruption can facilitate an efficient allocation of resources and bribes can represent a way to distribute resources between politicians and private sector.

Beata K. Smarzynska, and Javorick S. Wei (2000) empirically showed that corruption reduces inward FDI and shifts ownership structure towards joint ventures. Corruption makes local bureaucracy less transparent and therefore, increases the value of a local joint partner compared to a foreign investor (Smarzynska and Wei, 2000). However, more technologically-developed foreign investors may be less inclined to form a joint venture because of the possibility of leakage of their technological know-how. Also, Johann G. Lambsdorff (2004) states that corruption will deter net annual capital inflows due to its association with a lacking tradition of law and order.

Fahim A. Al-Mahrubi (2000) claims that besides negative consequences of corruption on macroeconomic outcomes such as low investment and slow growth, corruption is partly responsible for high inflation. Lowering tariffs and other barriers to international trade, unifying market-determined exchange rates and interest rates, eliminating enterprise subsidies, minimizing regulations, licensing requirements and other barriers to entry for new firms and investors, demonopolizing regulations and privatizing government assets and transparently enforcing prudential banking regulations and auditing and accounting standards are some of the major policy changes that will unambiguously reduce opportunities for corruption (World Bank, 1998).

There are some researchers who argue that corruption can in short-run solve some government inefficiencies (Florino et al., 2012). The „greasing the wheels hypothesis“ implies that corruption has growth-enhancing effects in situations where governance is lacking or economic policy is inefficient or both. Francis T. Lui (1985) states that firms value the time wasted by waiting in queues and are willing to buy with priority by paying a bribe. The proponents of this view argue that corruption acts like oil that greases and facilitates the engine of economic growth as it helps government officials to make the process of project approval more efficient (Anoruo and Braha, 2005).

Corrupt countries can still grow as long as corruption has not gone so far as to undermine economic fundamentals totally (Susan Ackerman-Rose, 1996). Anticorruption strategies should seek to improve the efficiency and fairness of government and to enhance the efficiency of the private sector, not to create a rigid, unresponsive and autocratic government (Ackerman-Rose 1996).

METHODOLOGY

Initially, as a sample we took all European Union member countries (EU28). Due to the fact that we found no available data on gross fixed capital formation for Greece, Czech Republic and Romania, they were excluded from the analysis. Diagnostics checking of the estimated model showed heteroskedasticity problem as usually being the case in cross-section model estimation. Bulgaria and Luxembourg were removed out of the sample countries due to their outlying properties. In regards to abovementioned, final sample includes 23 countries: Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Croatia, Ireland, Italy, Latvia, Lithuania, Hungary, Malta, Netherlands, Germany, Poland, Portugal, Slovenia, Slovakia, Spain, Sweden, United Kingdom.

Variables' description and data sources are shown in Table 1. Corruption Perceptions Index (CPI) was first introduced by Transparency International. The Corruption Perceptions Index ranks countries and territories based on how corrupt their public sector is perceived to be. A country or territory's score indicates the perceived level of public sector corruption on a scale of 0 - 100, where 0 means that a country is perceived as highly corrupt and 100 means it is perceived as very clean (uncorrupt).

Table 1. Variable's description and data sources

Variable	Description	Unit	Source
GDPPC	GDP per capita in PPS in 2011	EU28 =100	Eurostat
I	Gross fixed capital formation [1995 - 2011]	-000- EUR	Eurostat
Labour abundance (LA)	Working-age population	000	World Bank
CPI	Corruption Perceptions Index in 2011	index	Transparency International
Capital abundance - country c	$K^c = \sum_{t=1995}^{2011} (1 - 0,1333)^{(2011-t)} \cdot I_t^c$	000 EUR	
Capital Abundance - country c	K^c/LA	EUR	

Source: Authors.

In general, there was a dilemma in economic research of whether to measure economic growth by growth rate or by GDP per capita (Damir Piplica and Petar Čovo, 2011). As it is known, growth rate affects level of GDP per capita. In a same way the gross fixed capital formation affects the capital abundance. In that manner, we assumed that if we took GDP per capita as variable representing economic development level, it would be appropriate to take capital abundance for representing capital abundance level. Following Edward E. Leamer (1984) and Daniel Treffer (1995), we calculate countries' capital abundance applying the 15-year double declining balance method as follows:

$$K^c = \sum_{t=1995}^{2011} (1 - 0,1333)^{(2011-t)} \cdot I_t^c$$

I_t^c - gross fixed capital formation in country c and year t

K^c - capital abundance in country c .

Since relative capital abundance makes the difference for each country, we consider labour abundance and calculate capital abundance as follows:

$$RCA^c = K^c / LA^c$$

RCA^c - capital abundance in country c

LA^c - labour abundance in country c .

We assume the relationship between GDP per capita, capital abundance and Corruption Perceptions Index (CPI) and therefore we employ linear regression models.

Firstly we tested stationarity assumption validity for each of the observed variables as prerequisites for parameters estimation in regression models. In order to test stationarity characteristics we employed the Phillips-Perron Unit Root Test.

Afterwards, we employed the ordinary least squares (OLS) method as a parameter estimator in defined models.

Estimated linear regression models are defined in regression equations (1), (2), (3) and (4).

In order to determine how well the difference in capital abundance and Corruption Perceptions Index, together, can explain the difference in GDP per capita we defined a linear regression model which has GDP per capita as dependent variable and capital abundance (RCA) and Corruption Perceptions Index (CPI) as independent variables.

$$GDPPC = \alpha + \beta_1 \cdot RCA + \beta_2 \cdot CPI + \varepsilon \quad (1)$$

Furthermore, we wanted to check for how well the difference in CPI can explain the difference in RCA. If corruption discourages investment then country with higher CPI should have lower capital abundance. In order to determine explanatory power of CPI in explaining capital abundance we defined auxiliary regression model as follows.

$$RCA = \alpha + \beta_1 \cdot CPI + \varepsilon \quad (2)$$

Afterwards, we wanted to check for how well the difference in CPI only can explain the difference in GDP per capita. In order to determine explanatory power of CPI only in explaining GDP per capita among sample countries we defined auxiliary regression model as follows.

$$GDPPC = \alpha + \beta_1 \cdot CPI + \varepsilon \quad (3)$$

Also, we wanted to test to what extent only the variable RCA can explain GDP per capita. In order to test how well the difference in RCA can explain the difference in GDP per capita we defined linear regression model as follows.

$$GDPPC = \alpha + \beta_1 \cdot RCA + \varepsilon \quad (4)$$

After parameters estimation, testing the assumptions of linear regression has been performed for each of the estimated models as follows:

- In order to test homoscedasticity (constant variance) of the errors versus the predictions we employed White test.
 - In order to test normality of the errors we employed Jarque–Bera test. Jarque–Bera test is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution.
 - In order to test autocorrelations among errors we employed correlogram.
- Coefficient of determination, denoted R squared, indicates how well data fit the

statistical model. In other words, how much of variability observed in a dependent variable can be explained by variability of independent variables. Comparing the Coefficient of determination in model (2) and model (3) it can be seen how much CPI level influences GDP per capita and how CPI level influences capital abundance (RCA). Comparing the Coefficient of determination in model (3) and model (4) it can be seen how much CPI level influences GDP per capita and how much capital abundance (RCA) influences GDP per capita.

Based on the abovementioned comparison it can be seen how much CPI level influences GDP per capita through capital abundance and how much through other channels, as well as role of corruption level and production factor abundance in economic development.

RESULTS

By performing the Phillips-Perron Unit Root Test we found all of the observed variables stationary around constant (Table 2).

Table 2. Phillips-Perron Unit Root Test

Variable		p - value
CPI	around zero	0.4833
	around constant	0.0083
GDPPC	around zero	0.3022
	around constant	0.001
RCA	around zero	0.1064
	around constant	0.0013

Source: Authors.

Afterwards we estimated linear regression model (1) that assumes the relationship between GDP per capita as dependent variable and relative capital abundance and Corruption Perceptions Index (CPI) as independent variables. Results for the estimated model are shown in the Table 3.

Table 3. Dependent variable GDPPC, independent variables RCA and CPI

Independent variable	Coefficient	Prob.
C	23.17654	0.0009
RCA	0.639822	0.0000
CPI	5.335362	0.0034
R-squared	0.941173	
Adjusted R-squared	0.935571	
Prob (F-statistic)	0.000000	

Source: Authors.

Table 3 shows that if RCA increases for 1 EUR, CPI being constant, GDP per capita will increase for 0.63 % in regards to GDP per capita of EU28. If CPI increases for 1, RCA being constant, GDP per capita will increase for 5.33 % in regards to GDP per capita of EU28. Difference in factor abundance and CPI together can explain 94.11% of differences in GDP per capita among sample countries (Table 3).

In accordance to the abovementioned we can accept the hypothesis that states higher level of corruption among European Union countries causes lower economic development.

If corruption discourages investment then countries with lower CPI should have lower capital abundance. In order to determine explanatory power of CPI in explaining capital abundance we defined auxiliary regression model (2) and estimated results are shown in the Table 4. Out of the estimated results it can be seen that if CPI increases for 1, meaning lower corruption level, RCA will increase for 12.88 EUR.

Table 4. Dependent variable RCA, independent variable CPI

Independent variable	Coefficient	Prob.
C	-27.80235	0.0116
CPI	12.88165	0.0000
R-squared	0.765537	
Adjusted R-squared	0.754879	
Prob (F-statistic)	0.000000	

Source: Authors.

In accordance to abovementioned, we can accept the hypothesis that states that higher level of corruption among European Union countries causes lower capital abundance.

In accordance with the White test results we found no heteroskedasticity in any of the estimated models. Jarque–Bera test confirms normal distribution of residuals in all models and correlogram shows no autocorrelation in any estimated model. Therefore, all of the required model assumptions are satisfied.

According to the estimated regression model (2), difference in CPI can explain 76.55% of differences in capital abundance among sample countries (table 4). Out of the estimated regression model (3) we found that difference in CPI can explain 84.57% of differences in GDP per capita among sample countries (Table 5). Therefore, we can accept the hypothesis that states explanatory power of corruption is higher in explaining economic development than in explaining capital abundance.

Table 5. Dependent variable GDPPC, independent variable CPI

Independent variable	Coefficient	Prob.
C	5.387993	0.5188
CPI	13.57732	0.0000
R-squared	0.845725	
Adjusted R-squared	0.838712	
Prob (F-statistic)	0.000000	

Source: Authors.

Table 6. Dependent variable GDPPC, independent variable RCA

Variable	Coefficient	Prob.
C	39.97189	0.0000
RCA	0.956894	0.0000
R-squared	0.910553	
Adjusted R-squared	0.906488	
Prob (F-statistic)	0.000000	

Source: Authors.

Furthermore, comparing Coefficients of determination in model (3) (table 5) and model (4) (Table 6) it can be seen that CPI level correlates with GDP per capita at 84.57 %, and capital abundance (RCA) correlates with GDP per capita at 91.05 %.

The results also show that 94.11 % of differences in GDP per capita among sample countries can be explained by either differences in Corruption Perceptions Index or differences in capital abundance.

Furthermore, 91.05 % of differences in GDP per capita among sample countries can be explained only by capital abundance. So, the capital abundance comes out as the main determinant of GDP per capita among sample countries.

At the same time, 76.55 % of differences in capital abundance among sample countries can be explained by Corruption Perceptions Index. Furthermore, only Corruption Perceptions Index differences explain 84.57 % of differences in GDP per capita among sample countries. It can be seen that CPI holds higher explanatory power in explaining GDP per capita than in explaining capital abundance.

DISCUSSION

The results have shown that capital abundance is the main determinant of GDP per capita among sample countries. It is possible to attract some (however, limited) investment in a country despite the high level of corruption due to natural resources abundance or low wage and labor intensive manufacturing.

High corruption level is strongly correlated with low capital abundance among sample countries. Furthermore, the effect of high corruption level influences GDP per capita through other channels, besides capital abundance. Corruption can slow down accumulation of human capital (Pak H. Mo, 2001). As a consequence, negative effects on GDP per capita can come through that channel. Other possible explanation could be that available capital is not used efficiently in a country with high corruption level. Even though the used sample of European Union countries is a heterogeneous sample in regards to GDP per capita, factor abundance and corruption level as chosen variables have high statistical significance and explanation power. Contrary to the GDP growth and investment, it takes some time to achieve certain level GDP per capita, as well as factor abundance. Therefore, chosen variables show long-run effects of development and capital accumulation.

Mo (2001) found that 1% increase in the corruption level reduces the growth rate by about 0.72%. Also, he argues that the most important channel through which corruption affects economic growth is political instability, which accounts for about 53 % of the total effect.

Tanzi and Davoodi (1997) estimated correlation between Corruption index and public investment on the world sample and found correlation of 20.07 %. Mauro (1995) estimated cross-section model on a sample of 50 countries using the World Bank data from 1960 to 1985 and found correlation up to 44 %. The model estimated in this paper taking the sample of 23 EU countries, involving factor abundance instead of investment, shows even higher correlation (76.55%). It may be the case that taking in account capital abundance instead of investment model achieves higher explanatory power.

Our finding that corruption has negative influence on economic growth is consistent with numerous researches.

Podobnik et al. (2008) analyzed the dependence of the gross domestic product (GDP) per capita growth rates on changes in the Corruption Perceptions Index (CPI) for the period 1999 - 2004. On the sample of all countries in the world they found that, on average, an increase of CPI by one unit leads to an increase of the annual GDP per capita growth rate by 1.7%. By performing regression analysis only on the European Union countries with transition economies, they found that an increase of CPI by one unit leads to an increase of the annual GDP per capita growth rate by 2.4%. Podobnik et al. (2008) also found a statistically significant power-law functional dependence between foreign direct investment (FDI) received by different countries per capita and the country corruption level measured by the CPI.

Florino et al. (2012) estimated the effect of corruption on economic growth in a panel dataset for the 20 Italian regions during the period 1980 - 2004 in order to verify whether corruption played a role in the growth path of southern Italy. Their results show negative correlation between corruption and economic growth. They also found that the presence of corruption undermines the positive impact that public expenditure has on economic growth, if productive.

Claire Wallace and Christian W. Haerpfer (2000) found a high correlation between economic growth on the one hand, and level of corruption on the other. Lambsdorff (2004) showed that an increase in corruption by one point on a scale

from 10 (highly clean) to 0 (highly corrupt) lowers productivity by 4% of GDP and decreases net annual capital inflows by 0.5% of GDP.

Results of the research conducted by Anoruo and Braha (2005) who investigated the effect of corruption on economic growth for 18 African countries indicate that a one-unit increase in corruption retards economic growth by roughly 0.87 % percent. Also, one-unit increase in corruption translates to about 4.69% decrease in investment share of GDP.

Dreher and Herzfeld (2005) calculated that an increase of corruption by about one index point reduces GDP growth by 0.13 percentage points and GDP per capita by 425 USD.

CONCLUSION

The research conducted in this paper showed high explanatory power of corruption level in explaining the differences in economic development represented by GDP per capita among 23 European Union member countries. Therefore, the level of corruption can explain the difference in economic development among European Union countries. At the same time, we found high coefficient of determination in estimated models, corruption level being independent variable, and capital abundance a dependent one. Furthermore, we found capital abundance to be better explaining variable than investments in models taking in account corruption level and explaining economic development. Out of the estimated models one can conclude that higher level of corruption among European Union countries is related with capital abundance. Eventually, explanatory power of corruption is higher in explaining economic development than in explaining capital abundance. If the corruption level influences economic development and capital abundance then the adverse influence will be not only through lower capital abundance but through capital efficient usage as well. Further research could be directed towards analyzing correlation between other factors abundance (like skilled labor), efficient capital usage and corruption level as well as endogeneity of the corruption level in the estimated models.

Based on the findings of this paper, the efforts should be made to curtail corruption especially in the new EU members, which are post-communist economies. There is no doubt that reducing corruption would be beneficial for all countries. Since corruption is a wrongdoing, the rule of law enforcement is of utmost importance. However, root-causes of corruption, namely the institutional and soci-

al environment: recruiting civil servants on a merit basis, salaries in public sector competitive to the ones in private sector, the role of international institutions in the fight against corruption, and some other corruption characteristics are very important to analyze in order to find effective ways to fight corruption. Further research should go into this direction. We view our analysis as a step forward towards better understanding of an important issue such as corruption.

LITERATURE

- Ackerman-Rose, S. (1996). *The Political Economy of Corruption – Causes and Consequences* [online]. Viewpoint Note No. 74. Washington: World Bank. <https://openknowledge.worldbank.org/handle/10986/11629> [accessed 15 Jul 2013]
- Aidt Toke, S. (2003). "Economic analysis of corruption: a survey". *The Economic Journal*, 113 (491): 632-652.
- Al Marhubi, F. (2000). "Corruption and inflation". *Economic Letters*, 66 (2000): 199-202.
- Anoruo, E., Habtu, B. (2005). "Corruption and Economic Growth: the African Experience". *Journal of Sustainable Development in Africa*. 7 (1): 43-55. http://www.jsdafrica.com/Jsda/Spring2005/ArticlePDF/Arc_Corruption%20and%20Economic%20Growth.pdf [accessed 15 Jul 2013]
- Asian Development, B. (1997). *Anticorruption: Our Framework, Policies and Strategies*. <http://www.adb.org/publications/search/1319?page=25>.
- Blackburn, K., Niloy, B., Emranul, M.H. (2011). "Public expenditures, bureaucratic corruption and economic development". *The Manchester School*, 79 (3): 405-428.
- Debaere, P. (2003). "Relative Factor Abundance and Trade". *Journal of Political Economy*, 111 (3): 589-610.
- Dreher, A., Thomas, H. (2005). *The Economic Costs of Corruption: A Survey and New Evidence* [online]. <http://ssrn.com/abstract=734184> or <http://dx.doi.org/10.2139/ssrn.734184> [accessed 15 Jul 2013]
- Drury, C.A., Jonathan, K., Michael, L. (2006). "Corruption, democracy, and Economic Growth". *International Political Science Review*, 27 (2): 121-136.
- Fisman, R., Jakob, S. (2007). "Are corruption and taxation really harmful to growth? Firm level evidence". *Journal of Development Economics*, 83 (2007): 63-75.
- Florino, N.E.G., Ilaria, P. (2012). "Corruption and Growth: Evidence from the Italian Regions" [online]. *European Journal of Government and Economics*, 1 (2): 126-144. <http://www.ejge.org/index.php/ejge/article/view/23/24> [accessed 12 Nov 2013].
- Hall, R.E., Jones, C.I. (1999). "Why Do Some Countries Produce So Much More Output per Worker than Others?." *Quarterly Journal of Economics*, 114 (1): 83-116.
- Jain, Arvind K. 2001. "Corruption: A review". *Journal of Economic Surveys*, 15 (1): 71-121. [http://darp.lse.ac.uk/PapersDB/Jain_\(JES01\).pdf](http://darp.lse.ac.uk/PapersDB/Jain_(JES01).pdf) [accessed 15 Jun 2013]

- Lambsdorff, J.G. (2004). How corruption affects economic development [online]. http://www.wiwi.unipassau.de/fileadmin/dokumente/lehrstuehle/lambsdorff/Papers/C_Development.pdf [accessed 15 Jul 2013].
- Leamer, E.E. (1984). *Sources of International Comparative Advantage: Theory and Evidence*. Cambridge: MIT Press.
- Lui, F.T. (1985). "An Equilibrium Queuing Model of Bribery" [online]. *Journal of Political Economy*, 93 (4): 760-781. <http://www.jstor.org/discover/10.2307/1832136?uid=3738200&cuid=2&cuid=4&sid=21103956532501> [accessed 19 Jul 2014].
- Lui, F.T. (1996). "Three aspects of corruption". *Contemporary Economic Policy*, 14 (3): 26-29.
- Mauro, P. (1995). "Corruption and Growth". *Quarterly Journal of Economics*, 110 (3): 681-712.
- Mauro, P. (2004). "The Persistence of Corruption and Slow Economic Growth" [online]. International monetary Fund Staff Papers, 51 (1): 1-18. <https://www.imf.org/external/pubs/ft/staffp/2004/01/mauro.htm> [accessed 19 Jul 2014].
- Méndez, F., Facundo, S. (2006). "Corruption, growth and political regimes: Cross country evidence". *European Journal of Political Economy*, 22 (1): 82-98.
- Mo, P.H. (2001). "Corruption and Economic Growth". *Journal of Comparative Economics*, 29: 66-79.
- Montinola, G.R., Robert, W.J. (2002). "Sources of Corruption: A Cross-Country Study". *British Journal of Political Science*, 32 (1): 147-170.
- Paldam, M. (2001). "Corruption and Religion Adding to the Economic Model". *Kyklos*, 54 (2/3): 383-414.
- Pellegrini, L. (2003). Corruption, economic development and environmental policy [online]. European Summer School, 1-6th 2003. <http://www.feem-web.it/ess/ess03/students/pellegr.pdf> [accessed 19 Jul 2014].
- Piplica, D., Petar, Č. (2011). "Corruption and economic growth in Croatia" [online]. *Oeconomica Jadertina*, 2: 85-99. hrcaak.srce.hr/file/111606 [accessed 19 July 2014].
- Podobnik, B., Jia, S., Đuro, N., Plamen, C.I., Helen, E.S. (2008). "Influence of corruption on economic growth rate and foreign investment". *The European Physical Journal B*, 63: 547 – 550.
- Smarzynska, B.K., Javorick, S.W. (2000). "Corruption and Composition of Foreign Direct Investment: Firm-level Evidence" [online]. National Bureau of Economic Research, Working Paper 7969. <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-2360> [accessed 20 Jul 2014].
- Svensson, J. (2005). "Eight Questions about Corruption" [online]. *Journal of Economic Perspectives*, 19 (3): 19-42. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=892967 [accessed 20 Jul 2014].
- Tanzi, V., Hamid, R.D. (1997). Corruption, Public investment, and Growth [online]. International monetary Fund Working Paper No. 97/139. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=882701 [accessed 19 Jul 2014]
- Trefler, D. (1995). "The Case of the Missing Trade and Other Mysteries" [online]. *The American Economic Review*, 85 (5): 1029-1046. <http://www.econ.ku.dk/nguyen/teaching/>

- Trefler%201995.pdf [accessed 19 Jul 2014].
- Uslaner, E.M. (2008). *Corruption, Inequality, and the Rule of Law*. New York: Cambridge University Press.
- Wallace, C., Christian, W.H. (2000). "Democratisation, Economic Development and Corruption in East-Central Europe. Sociological Series". Vienna: Institute for Advanced Studies. www.ihs.ac.at/publications/soc/rs44.pdf [accessed 19 Jul 2014].
- Wei, S.J. (1999). "Corruption in Economic Development: Beneficial Grease, Minor Annoyance, or Major Obstacle?" [online]. Policy research working paper 2048. Washington, DC: World Bank. <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-2048> [accessed 19 Aug 2013].
- World, B. (1998). "Corruption and development". Prenotes, No 4. Washington: World Bank.

KORUPCIJA, OBILNOST KAPITALA I EKONOMSKI RAZVOJ: ISKUSTVA ZEMALJA ČLANICA EUROPSKE UNIJE

Vlatka Bilas, Mile Bošnjak, Sanja Franc

Sažetak: *Cilj ovog rada je utvrditi i razjasniti povezanost između razine korupcije i razine razvoja među zemljama članicama Europske unije. Temeljem procijenjenog modela u ovom radu može se zaključiti kako razina korupcije može objasniti razlike u kapitalnoj opskrbljenosti među zemljama Europske unije. Također, objašnjavajuća moć korupcije je veća u objašnjavanju ekonomskog razvoja nego opskrbljenosti kapitalom, a što znači da je jača veza između razine korupcije i ekonomskog razvoja nego razine korupcije i opskrbljenosti kapitalom. Temeljeno na rezultatima istraživanja provedenog u ovom radu, potrebno je uložiti napore u smanjivanje korupcije, posebno u novim zemljama članicama Europske unije, a koje su post-komunističke zemlje. Nema sumnje da bi smanjivanje korupcije donijelo koristi ovim zemljama. S obzirom da je korupcija protuzakonita, provedba vladavine prava je od velike važnosti. Ipak, korijeni nastanka korupcije, posebno institucionalno i društveno okruženje: odabir državnih službenika po zaslugama, plaće u javnom sektoru konkurentne onima u privatnom sektoru, utjecaj međunarodnih institucija u borbi protiv korupcije te neke druge karakteristike korupcije od važnosti su za analizu i pronalazak učinkovitih načina za borbu protiv korupcije. Daljnje istraživanje treba ići u tom smjeru.*

Ključne riječi: *korupcija, ekonomski razvoj, obilnost kapitalom, Europska unija*

JEL klasifikacija: *Z13, F43, C13*