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The Determinants of Corruption in Transition Economies^{*}

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Abstract: This paper examines the determinants of corruption in transition economies. We found that the progress of structural reform, comprising marketization, rule of law, and democratization had a crucial impact on the extent of corruption control in former socialist countries.

Key words: transition economies, corruption, marketization, rule of law, democratization

JEL classification: K42, O17, O57, P26, P52

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1. Introduction

The drastic reform of the economic system has provided great benefits for former socialist states. Despite remarkable economic growth in recent years, however, these countries are facing some grave social issues. Above all, the spread of corruption throughout all aspects of civil life is regarded as one of the most serious problems. The significance of corruption in the former communist bloc is clearly shown in objective assessments by third parties. In fact, according to the World Bank (2007), only eight of 34 transitional countries exceed the world average of the Control of Corruption Index, and most of the remaining 26 countries fall much below it.

In **Table 1**, using panel data for the period 1996-2006 covering 202 countries throughout the world, we regressed the Control of Corruption Index to a dummy variable(s), which assigns a value of 1 to transitional countries or to a specific group of them, controlling GDP per capita and its quadratic value.¹ As shown in the table, the extent of corruption control in former socialist states deviates downward when compared to the trend of the whole world, even after considering the economic development level of these countries. Moreover, the table clearly indicates that a noticeable difference in the degree of corruption has arisen among transitional countries themselves.

The above findings are closely related to the fact that these countries are still in the transition from a planned system to a market economy. However, the determinants of corruption in transition economies have been investigated on the macro level in only a few studies. In addition, as reported later, the preceding studies have some shortcomings that need to be overcome. In this paper, we examine this issue through the estimation of a new empirical model using the Control of Corruption Index for 32 transitional countries as the dependent variable.

The next section considers various factors that can affect the corruption level in transition economies and discuss the remaining issues of previous research. Section 3 describes the data and empirical methodology. Section 4 reports the estimation results. Section 5 summarizes the major findings and concludes the paper.

¹ In general, the corruption level tends to decline along with the development of a national economy and increasing income levels. It is argued, however, that the marginal effect in which economic development controls corruption gradually diminishes. Accordingly, we predict that the estimates of GDP per capita and its quadratic value have a positive and a negative sign, respectively.

2. Literature review and remaining issues

The determinants of corruption, confirmed by preceding studies with high statistical significance, are divided broadly into three categories, namely, economic, political, and cultural, in accordance with the classification of La Porta et al. (1999). Among them, the variables that can be applied to the empirical analysis of transition economies in each category are discussed below.

The economic factors include the economic development level measured by GDP per capita and the degree of marketization expressed by the extent of economic freedom and the openness of trade (e.g., Ades and Di Tella, 1999; Gurger and Shah, 2005). In addition, official development aid (ODA) and public works are regarded as factors that trigger corruption because these policies tend to foster a cozy relationship between political and business circles (e.g., Ali and Isse, 2003; Dreher et al., 2004).

The political factors cover the rule of law, political democratization, and the degree of administrative centralization (e.g., Alt and Lassen, 2003; Herzfeld and Weiss, 2003). With regard to the impact of administrative centralization on corruption, it is noteworthy that decentralization may work as a corruption control factor because it depresses the cost-benefit performance of corruption for bribe payers. Meanwhile, there is an argument according to which the streamlining of administrative organizations that accompanies decentralization tends to promote personal connections between bureaucrats and businesspersons and the decentralization of police organizations weakens enforceability and increases corruption (e.g., Rose-Ackerman, 1994; Damania et al., 2004). Indeed, the empirical results on this point are mixed. In any case, the administrative centralization is one of the critical issues in this research field, and, hence, it is worth examining its impact on the corruption level in the context of a transition economy.

The third category is the cultural factor. Treisman (2000) argues that the share of the Protestant population in a country is negatively associated with the country's corruption level. This is because criticism of public authorities by citizens is not as easily made in a hierarchical religious society where the Catholic church or the Islamic religious authority is dominant as in an egalitarian religious society where the Protestant church has historically played a role as a countervailing power exercising surveillance over a state. Basing on this notion, we examine the corruption control effect arising from a difference in the dominant religion.

Next, from the viewpoint of the study on transition economies, we specify the issues

examined in this paper: The number of studies that have examined the determinants of corruption focusing on macro-level factors in transition economies is limited, namely, to those by Broadman and Recanatini (2000, 2002) and Abed and Davoodi (2000). In addition, however, these studies contain four problems enumerated here. First, they use a small dataset. Secondly, the specification of the regression model is insufficient. Thirdly, the statistical robustness of the estimation results has not been thoroughly examined. Finally, as the subjects of empirical analysis are limited to the former Soviet Union and Central and Eastern Europe, there may be some regional bias in the empirical results. We attempt to overcome these remaining issues by introducing all of the above discussed potential factors of corruption into the right-hand side of the regression equation and by estimating the model using long-term panel data covering almost all transition economies worldwide.

3. Data and empirical methodology

Following the empirical strategy discussed in the previous section, we use panel data for 32 transition economies in the regions of Central and Eastern Europe, the former Soviet Union, and Asia.² The observation period covers nine years from 1998 through 2006. The data consist of 224 country-year observations.

We use the World Bank's Control of Corruption Index as the dependent variable of the regression model. As independent variables, we adopt nine variables representing either political, economic, or cultural factors that may affect the corruption level in a transitional country. They include three policy indices reflecting the degree of (a) marketization, (b) rule of law, and (c) democratization, all of which are essential reform measures to achieve the transition to a market economy; (d) a comprehensive index of the transformation policy that assesses overall progress of the above three reform measures; (e) GDP per capita; (f) the quadratic value of GDP per capita; (g) the net inflow of ODA; (h) the construction industry's share of GDP, as a proxy for the scale of domestic public works; (i) a dummy variable that assigns a value of 1 to countries with the federal government system; and (j) the Protestant population share. In addition to these variables, we also employ (k) the duration of socialism³ and (l) transitional country group variables, as shown in Table 1, as control variables. To avoid a simultaneous bias problem, we lag all four policy variables,

² Only Kosovo and Montenegro are excluded due to a lack of data.

³ This variable is divided by the number of years elapsed from the start of transition in considering the possibility that the institutional inertia effect of the old regime decays with the passage of time.

GDP per capita, its quadratic value, net inflow of ODA, and construction industry's share of GDP for one year, to utilize them as predetermined variables.

Basically, we use the random-effects estimator and pooling OLS estimator to perform panel regression because the estimation equation contains time-invariant variables on its right-hand side. For a robustness check, however, we report the best estimation result according to the model specification test of three panel estimators, including the fixed-effects estimator.⁴ To avoid the impact of the Protestant population share, which is also a time-invariant variable that becomes unestimatable due to the selection of a fixed-effects model, the interaction terms between policy indices and Protestant share are introduced to the estimate equation.

In accordance with the discussions and empirical evidence of the preceding studies, we expect that the policy variables, the Protestant population share, its interaction terms with a policy variable, and GDP per capita positively correlate to the extent of corruption control and, in contrast, the net inflow of ODA, the construction industry share, the adoption of a federal government system, and the quadratic value of GDP per capita relate negatively to the extent of corruption control. The duration of socialism is expected to be negatively associated with the extent of corruption control because the longer the planned economy is implemented, the more the collusive relationship between the state and enterprises is strengthened, and, consequently, the more difficult it is to sweep away the cozy relationships among political and business establishments in the transition period. If the corruption difference among former socialist states is sufficiently explained by these independent variables, the transitional country group variables cannot be estimated with statistical significance.

4. Estimation results

The estimation results are reported in **Table 2**. The models from [1] to [5] are those including the transitional country group variables, and the models from [6] to [11] are those

⁴ Assuming the one-way model, which controls only country-level individual effects, and the two-way model, which pays attention to the existence of time fixed-effects as options to perform panel regression as well, we first specify the form of individual effects according to the results of F test, Hausman test, and the Breush-Pagan test. The model to be estimated is then determined by the result of the F test concerning the selection of the one-way fixed-effects model and the two-way fixed-effects model. If the model cannot be specified to one even after this procedure, we report the estimation results of both one-way and two-way models.

not including them on the right-hand side of the estimation equation. The former five models are designed to examine how much the difference among transitional country groups at a corruption level can be explained by independent variables. The latter six models that are estimated by the best method, including the fixed-effects estimator according to the model specification test, aim to check the statistical robustness of independent variables. Each model shows a very high value of the determination coefficient adjusted for the degrees of freedom ($\text{Adj.}R^2$). It can be ascertained that each model sufficiently explains the dispersion of the extent of corruption control of transitional countries.

As **Table 2** shows, under all model specifications, every policy variable is positive and statistically significant at the 1% or lower level. This strongly suggests that the promotion of marketization, rule of law, and democratization as well as the comprehensive progress of these three policy measures produce a very strong control effect on corruption activities in transition economies. In three models, the interaction terms between policy indices and the Protestant population share are estimated with a positive sign at the 10% or less significant level, indicating that a national policy for establishing a market-oriented economy and an egalitarian religious society are in a mutually institutional complementary relationship for the prevention of corruption.

Among other independent variables, GDP per capita and its quadratic value are significantly estimated to be positive and negative, respectively, in line with our expectations in many models. The federal government system dummy variable is estimated to be negative and significant at the 5% or lower level, except for Models [4] and [5]. We conjecture that the concentration of administrative functions into the central government under systemic transformation has secondary effects to raise the corruption level of the whole nation. Although the construction industry's share of GDP is significantly estimated in four models, its coefficient shows a positive sign contrary to our expectation. Among control variables, the duration of socialism is negatively estimated at the 10% or lower level in five models. This result demonstrates that the stronger the institutional inertia of the communist regime is, the more difficult it will be to mitigate corruption in the transition period.

In contrast to Model [1], which contains only GDP per capita and its quadratic value on the right-hand side of the estimate equation, the statistical significance of the transitional country group variables notably declines in regression models to which policy indices and other independent variables are introduced. In particular, in Models [4] and [5], which capture the policy progress of each country by using the democratization policy variable or the comprehensive index of the transformation policy, all the transitional country group

variables are estimated insignificant. In addition, the statistical significance of policy indices largely surpasses that of other independent variables. We interpret these results as evidence that the remarkable differences in corruption control arising among transitional countries can be explained by disparities in the democratization impetus and comprehensive policy capacity of the government. We also believe that this factor is the central reason for the upward deviation of the corruption level of transitional countries from the world trend, which is reported in the Introduction.

5. Conclusion

In this paper, we empirically examined the determinants of corruption in former socialist states by using panel data covering almost all transition economies in the world. As a result, we obtained the following evidence. First, there is a strong positive relationship between corruption control and the progress of systemic transformation policy. Secondly, the coupling of an egalitarian religious society and policy measures aimed at systemic transformation to a market economy exerts a mutually complementing prevention effect on corruption. Thirdly, a centralized administrative system can become a hotbed of corruption. Finally, the stronger the institutional inertia (or historical path-dependency) of the communist regime is, the more serious the corruption problems are in a country. These empirical results lead to the political implication that fundamental structural reforms are very effective in preventing corruption in transitional countries.

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Table 1

Panel regression analysis of the divergence in the level of corruption of transitional countries from the world trend

Independent variable: Control of Corruption Index ^a	[1]	[2]	[3]
Degree of economic development			
GDP per capita	0.581 *** (16.62)	0.583 *** (16.85)	0.584 *** (16.87)
GDP per capita (quadratic value)	-0.050 *** (-11.91)	-0.050 *** (-11.97)	-0.050 *** (-11.97)
Transitional country groups ^b			
All transitional countries	-0.282 *** (-2.90)		
Countries newly joining the EU in 2004		0.390 ** (2.18)	
Non-EU member countries in Southern and Eastern Europe as of 2004		-0.284 * (-1.67)	
Central and Eastern Europe countries newly joining the EU in 2004			0.405 * (1.81)
Baltic countries			0.364 (1.26)
Countries newly joining the EU in 2007			-0.050 (-0.14)
Non-EU member countries in Southern and Eastern Europe			-0.351 * (-1.83)
CIS member countries		-0.680 *** (-4.56)	
European CIS member countries			-0.592 ** (-2.36)
Central Asian and Caucasian CIS member countries			-0.723 *** (-4.02)
Asian transitional countries ^c		-0.384 * (-1.70)	-0.384 * (-1.70)
<i>N</i>	1528	1528	1528
Adj. <i>R</i> ²	0.504	0.518	0.519

Notes: All models are estimated using the two-way random-effects estimator. The estimation period is from 1996 through 2006. Constant terms are not reported for brevity. The figures in parentheses are the *t* value. ***, **, and * indicate the significance level at 1%, 5%, and 10%, respectively.

a The Control of Corruption Index covers more than 200 countries in the world. The index measures the degree to which public power is exercised to obtain personal gain and is processed so that 99% of data falls within the range from -2.5 (worst) to 2.5 (best).

b Default category is non former socialist transitional countries.

c Including China.

Source: Authors' estimation. Original sources of the Control of Corruption Index and GDP per capita (unit: 10,000 US dollars) are from the World Bank (2007) and the United Nations' public data, respectively.

Table 2

Panel regression analysis on the determinants of corruption in transition economies

Independent variable: Control of Corruption Index	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Estimation method	Two-way random-effects	Two-way random-effects	Two-way random-effects	Two-way random-effects	Two-way random-effects	One-way fixed-effects	One-way fixed-effects	One-way fixed-effects	Two-way random-effects	One-way fixed-effects	Two-way random-effects
Policy variables ^a											
Marketization (Expected sign: +)		0.139 *** (3.62)				0.124 *** (2.73)					
Rule of law (+)			0.381 *** (8.18)				0.281 *** (4.89)				
Democratization (+)				0.295 *** (7.03)				0.249 *** (4.38)	0.331 *** (9.48)		
Comprehensive index of transformation policy (+)					0.189 *** (7.89)					0.197 *** (6.01)	0.217 *** (10.57)
Policy index × Protestant population share (+)		-0.0002 (-0.03)	0.002 (0.32)	0.016 * (1.73)	0.005 (1.32)	0.005 (0.56)	0.008 (1.34)	0.023 ** (2.19)	0.013 (1.47)	0.010 ** (2.18)	0.002 (0.67)
Other economic, political, and cultural factor variables											
GDP per capita (+)	1.004 *** (4.13)	1.058 *** (3.95)	0.772 *** (3.32)	0.835 *** (3.41)	0.688 *** (2.81)	0.454 * (1.74)	0.243 (0.99)	0.269 (1.10)	0.986 *** (4.64)	0.070 (0.28)	0.905 *** (-4.43)
GDP per capita (quadratic value) (-)	-0.355 *** (-2.82)	-0.313 ** (-2.13)	-0.199 (-1.51)	-0.234 * (-1.72)	-0.185 (-1.39)	-0.159 (-1.05)	-0.075 (-0.53)	-0.118 (-0.83)	-0.289 ** (-2.30)	-0.037 (-0.26)	-0.269 ** (-2.22)
Net inflow of ODA (-)		0.064 (1.36)	0.062 (1.64)	0.066 (1.58)	0.054 (1.33)	0.020 (0.33)	0.026 (0.46)	-0.014 (-0.25)	0.057 (1.39)	-0.001 (-0.02)	0.049 (1.25)
Construction industry's share of GDP (-)		0.009 * (1.74)	0.007 (1.61)	0.007 (1.44)	0.007 (1.43)	0.012 ** (2.12)	0.012 ** (2.38)	0.011 ** (2.14)	0.007 (1.45)	0.011 ** (2.25)	0.006 (1.42)
Federal government system (-)		-0.253 *** (-3.12)	-0.148 ** (-2.23)	-0.110 (-1.46)	-0.130 * (-1.82)	-0.386 *** (-3.54)	-0.361 *** (-3.49)	-0.228 ** (-2.04)	-0.148 ** (-2.03)	-0.249 ** (-2.41)	-0.141 ** (-2.06)
Control variables											
Protestant population share (+)		0.006 (0.53)	0.004 (0.91)	-0.011 (-1.11)	-0.009 (-0.84)	—	—	—	-0.005 (-0.54)	—	-0.001 (-0.06)
Duration of socialism (-)		-0.008 (-0.53)	-0.023 * (-1.91)	-0.040 *** (-3.13)	-0.020 * (-1.65)	0.008 (0.92)	-0.008 (-1.03)	-0.001 (-0.07)	-0.048 *** (-4.95)	0.001 (0.09)	-0.027 *** (-2.88)
Transitional country group variables ^b											
Central and Eastern Europe countries newly joining the EU in 2004	0.337 ** (2.21)	0.217 (1.43)	0.059 (0.53)	0.125 (0.95)	0.111 (0.89)						
Non-EU member countries in Southern and Eastern Europe	-0.305 ** (-1.98)	-0.170 (-1.23)	-0.101 (-1.06)	-0.126 (-1.08)	-0.082 (-0.73)						
Baltic countries	0.406 ** (2.37)	0.158 (0.93)	0.124 (1.05)	0.201 (1.40)	0.106 (0.77)						
European CIS member countries	-0.562 *** (-3.55)	-0.317 ** (-2.08)	-0.217 ** (-2.00)	-0.144 (-1.07)	-0.164 (-1.28)						
Central Asian and Caucasian CIS member countries	-0.641 *** (-4.35)	-0.429 *** (-2.95)	-0.271 ** (-2.53)	-0.116 (-0.84)	-0.184 (-1.45)						
Asian transitional countries ^c	-0.333 ** (-2.12)	-0.239 (-1.56)	-0.236 ** (-2.31)	-0.061 (-0.46)	-0.128 (-1.03)						
N	224	213	213	213	213	213	213	213	213	213	213
Adj. R ²	0.788	0.812	0.876	0.859	0.867	0.952	0.957	0.957	0.847	0.960	0.864

Notes: Constant terms are not reported here for brevity. The estimation period is from 1998 through 2006. The figures in parentheses are the *t* value. ***, **, and * indicate the significance level at 1%, 5%, and 10%, respectively.

a The policy indices of marketization, rule of law, and democratization are processed so that 99% of data falls within the range from -2.5 (no progress at all) to 2.5 (sufficient progress). The comprehensive index of transformation policy is the first principal component of these 3 policy indices (the accounted for variance is 91.91%), whose value falls within the range from -3.28 to 2.92.

b Default category is countries newly joining the EU in 2007.

c Including China.

Source: Authors' estimation. The original sources of variables used for the estimation are as follows: the Control of Corruption index, policy indices of marketization, rule of law, and democratization are from the World Bank (2007); the GDP per capita (unit: 10,000 US dollars) and construction industry's share of the GDP are calculated by the authors based on public data of the United Nations; the net inflow of ODA (unit: 1 billion dollars) is from the World Bank (2008); and the Protestant population share is from the CIA (2008) and La Porta et al. (1999). Other variables are set by the authors.