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February 2010

Online at <http://mpa.ub.uni-muenchen.de/21519/>

MPRA Paper No. 21519, posted 22. March 2010 00:29 UTC

# A panel study on the relationship between corruption and government size

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## **Abstract**

Using panel data from 1996 to 2005, this paper shows that the effect of government size on corruption is positive at a low level of democracy, but it is negative at a high level. This finding could fill the gaps in previous studies whose findings on the relationship between corruption and government size are controversial.

**Keywords:** Corruption; Government size; Democracy; Panel data

**JEL Classification:** C23; D73; H11

## **1 Introduction**

Corruption is a main factor that hinders economic growth, reduces government's legitimacy, and affects political stability across time and countries (e.g., Mauro, 1995 and La Porta et al., 1999). For this reason, searching for a mechanism to determine corruption has been conducted by many studies, including Treisman (2000), Serra (2006), Billger and Goel (2009) and Saha et al. (2009). Some examine corruption by considering government size. La Porta et al. (1999) conclude that a large government has lower corruption level due to stronger checks and balances. On the other hand, Rose-Ackerman (1999) argues that large government

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affects bureaucracy efficiency and increases corruption. More recently, Billger and Goel (2009) examine the sensitivity of determinants to the conditional distribution of corruption across countries. Although they show that larger government generally decreases corruption, but in the most corrupt countries, the effect is insignificant.

As seen from the above studies, the results on the effect of government size on corruption are mixed. Based on the analysis of 140 countries' panel data from 1996 to 2005, this paper contributes to the literature about corruption by providing a new empirical analysis on the relationship between government size and corruption. We consider the effect of the interaction between government size and democracy, which has not been considered in previous studies to the best of our knowledge. This approach is interesting because democracy is deemed a factor that reflects government transparency or a kind of yardstick to explain the effect of government size on corruption. Since corruption is a severe problem especially faced by developing countries, this study focuses on them. However, we also provide the results of full countries sample for comparison.

## 2 Estimation Methodology and Data

To measure the effect of government size on corruption based on the level of democracy, the estimation equation is specified as below:

$$\begin{aligned} corruption_{i,t} = & \alpha_0 + \alpha_1 govsize_{i,t} + \alpha_2 democracy_{i,t} \\ & + \alpha_3 govsize_{i,t} \times democracy_{i,t} + X'_{i,t} \Lambda + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where  $i$  and  $t$  are the country identity and the time series;  $govsize$  stands for government size;  $X$  is a vector of the variables that may also influence the corruption;  $\Lambda$  is a coefficient vector;  $\varepsilon$  is an error term.  $X$  includes the logarithms of per capita GDP, the political stability, the economic freedom, the urbanization, the regulatory quality and regional dummies.

From Eq. (1), the net effect of government size on corruption can be calculated as follows:

$$\frac{\Delta corruption_{i,t}}{\Delta govsize_{i,t}} = \alpha_1 + \alpha_3 democracy_{i,t}. \quad (2)$$

From Eq. (2), the impact of government size on corruption is a function of the level of democracy. As previously mentioned, this paper focuses on developing or non-OECD countries. However, we also conduct the estimation for the case of full countries for comparison.

As for the data, this study utilizes annual data spanning from 1996 to 2005

in 140 countries, 110 of which are non-OECD and defined as developing countries. The sample period and the numbers of countries are selected based on data availability. The data definitions and sources are summarized in Table 1.

### 3 Empirical Results

Table 2 reports the estimation results in the developing countries. Columns (1), (2) and (3) are the results of pooled ordinary least squares (OLS) estimation. In column (1), the independent variables contain only government size, democracy and their interaction term. The coefficient of government size is insignificant. This may be due to the problem of omitted variables. To avoid this problem, to column (2) we add variables that may influence corruption, as indicated by many previous studies. The negative effects of income, political stability, economic freedom and regulatory quality on corruption are consistent with such previous studies as La Porta et al. (1999) and Treisman (2000). Column (3) shows the results when four regional dummies are added simultaneously to control the time invariant regional specific effect.

Columns (4) and (5) report the results of fixed effects (FE) and random effects (RE) estimations. Based on the Hausman test, FE estimation is preferable to RE estimation. Note that FE estimation can solve the endogeneity problems at some level if they arise from the correlation between country specific and error terms. Since FE estimation considers the country specific effects, we can obtain the unbiased coefficients even if the unobserved country specific term is correlated with the error term. Hence, this paper concentrates on FE estimation. Since income, economic freedom and regulatory quality have negative effects on corruption, it is reasonable to judge that our FE estimation results are plausible.

Fig. 1 captures the effect of government size on corruption with the level of democracy based on the FE estimation results for developing countries. Although the pooled OLS results indicate that this effect is negative regardless of the level of democracy, the FE estimation result suggests that it is positive at a low level of democracy. One possible explanation is that, in less democratic countries, the increase in government size may lead to more opportunities for rent seeking, worsening the corruption level.

Additionally, for comparison, we also conduct estimation for the sample of full countries. The results are presented in Table 3. Column (4) shows that the coefficients of income and economic freedom are not significant in this case, but they are significant for developing countries. This result may reflect that income and economic freedom are not the determinants of corruption in developed countries where income is already high and economic freedom is secured to some

extent. Fig. 2 provides the result of the partial effects of government size on corruption for full countries. Given Figs. 1 and 2, there is a possibility that these effects are undervalued, particularly for countries with a medium level of democracy.

Our above results provide evidence that the impact of government size on corruption can be positive or negative depending on the country's level of democracy. This finding might help fill the gap in the previous studies that find controversial results on the relationship between corruption and government size.

## **4 Conclusion**

This paper empirically examines the relationship between government size and corruption. Our estimation results suggest that the effect of government size on corruption is positive at a low level of democracy and negative at a high level of democracy. This finding sheds light on how to explain the controversial findings of previous studies on the relationship of corruption and government size. Although panel estimation with instrumental variables is not considered in our estimation methodology, the endogeneity problems are slightly improved by using fixed effects (FE) estimation. Future work includes a more profound study using instrumental variables.

## **Acknowledgements**

The third author wishes to acknowledge the financial support from the Japan Society for the Promotion of Science (JSPS).

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Table 1: Data definitions and sources

Variables	Definitions	Sources
Corruption	Transparency International's corruption perception index (CPI) ranges from 0 to 10. Our corruption index equals 10 minus CPI. Range: 0 (least corrupt) to 10 (most corrupt).	Transparency International
Government size	Government size index equals 100 minus government size score reported by Heritage Foundation. It considers not only expenditures by central but also local governments. Range: 0 (smallest) to 100 (largest).	Heritage Foundation
Democracy	Political rights and civil liberties range from 1 (best) to 7 (worst). Democracy index equals 14 minus sum of political rights and civil liberties. Range: 0 (least democratic) to 12 (most democratic).	Freedom House
GDP per capita	GDP per capita (constant 2000 US\$)	World Development Indicators 2007
Political stability	Perceptions on likelihood that unconstitutional or violent means will destabilize or remove government from power. Range: -2.5 (instable) to 2.5 (stable)	Worldwide Governance Indicators
Economic freedom	Average of seven indicators (i.e., business freedom, trade freedom, fiscal freedom, monetary freedom, investment freedom, financial freedom and property rights). Range: 0 (least free) to 100 (freest).	Heritage Foundation
Urbanization	Urban population (% of total)	World Development Indicators 2007
Regulatory quality	Perceptions of government's ability to formulate/implement policies and regulations to permit/promote private sector development. Range: -2.5 (worst) to 2.5 (best)	Worldwide Governance Indicators
Regional dummies	Africa, Asia, Europe, Latin America, North America and Oceania are categorized following the United Nations' world region categorization.	<a href="http://www.un.org/depts/dhl/maplib/worldregions.htm">http://www.un.org/depts/dhl/maplib/worldregions.htm</a>

Table 2: Estimation results in developing countries

Dependent variable: Corruption					
	(1)	(2)	(3)	(4)	(5)
Government size	-0.004 (0.006)	-0.011** (0.004)	-0.012*** (0.004)	0.010** (0.004)	0.008** (0.004)
Democracy	-0.080*** (0.028)	0.081*** (0.021)	0.056** (0.022)	-0.012 (0.028)	0.034 (0.023)
Government size democracy	-0.002*** (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.001** (0.000)	-0.001*** (0.000)
GDP per capita (ln)		-0.252*** (0.058)	-0.265*** (0.060)	-0.374* (0.217)	-0.460*** (0.090)
Political stability		-0.403*** (0.060)	-0.442*** (0.059)	0.063 (0.084)	-0.136* (0.070)
Economic freedom		-0.012* (0.007)	-0.006 (0.006)	-0.012* (0.006)	-0.012** (0.005)
Urbanization		-0.002 (0.002)	-0.005** (0.002)	0.028 (0.017)	-0.000 (0.004)
Regulatory quality		-1.030*** (0.123)	-1.003*** (0.122)	-0.280*** (0.108)	-0.460*** (0.095)
Africa			0.158 (0.771)		
Asia			0.239 (0.772)		
Europe			1.028 (0.774)		
Latin America			0.540 (0.772)		
Constant	7.526*** (0.201)	8.760*** (0.562)	8.496*** (0.979)	8.544*** (1.354)	10.425*** (0.593)
Number of observations	686	500	500	500	500
R-squared	0.175	0.711	0.740	0.201	0.654

Notes:

1. The asterisks \*\*\*, \*\* and \* are 1%, 5% and 10% of significant levels.
2. The numbers in parentheses are standard errors.



Table 3: Estimation results in full countries

Dependent variable: Corruption					
	(1)	(2)	(3)	(4)	(5)
Government size	0.010 (0.006)	0.000 (0.005)	0.003 (0.005)	0.009** (0.004)	0.012*** (0.004)
Democracy	-0.119*** (0.027)	0.136*** (0.021)	0.128*** (0.021)	-0.032 (0.026)	0.021 (0.022)
Government size democracy	-0.004*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.000* (0.000)	-0.001*** (0.000)
GDP per capita (ln)		-0.424*** (0.058)	-0.484*** (0.057)	-0.039 (0.206)	-0.673*** (0.091)
Political stability		-0.541*** (0.068)	-0.515*** (0.065)	0.032 (0.075)	-0.165** (0.068)
Economic freedom		-0.019** (0.007)	-0.010 (0.007)	-0.009 (0.005)	-0.010* (0.005)
Urbanization		0.000 (0.002)	-0.001 (0.002)	0.021 (0.016)	0.001 (0.005)
Regulatory quality		-1.028*** (0.133)	-0.994*** (0.127)	-0.310*** (0.094)	-0.473*** (0.088)
Africa			1.099*** (0.267)		
Asia			1.479*** (0.263)		
Europe			1.953*** (0.250)		
Latin America			1.725*** (0.263)		
North America			0.713** (0.340)		
Constant	7.673*** (0.221)	9.775*** (0.607)	8.421*** (0.644)	5.453*** (1.378)	11.626*** (0.585)
Number of observations	998	707	707	707	707
R-squared	0.521	0.521	0.854	0.166	0.800

Notes:

1. The asterisks \*\*\*, \*\* and \* are 1%, 5% and 10% of significant levels.
2. The numbers in parentheses are standard errors.

Figure 1: Partial effects of government size on corruption in developing countries

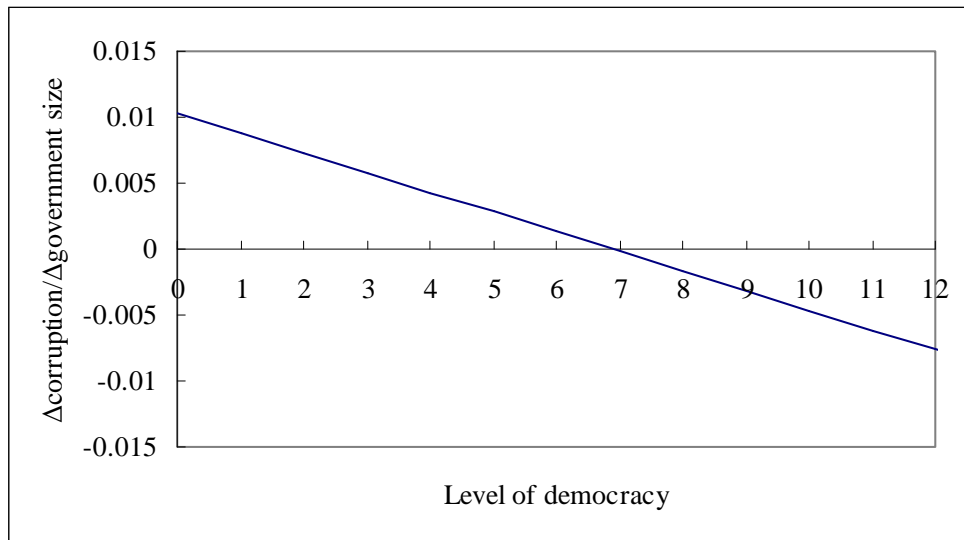


Figure 2: Partial effects of government size on corruption in full countries

