THE CORRUPTION AND INCOME DISTRIBUTION IN OPEC AND OECD COUNTRIES: A COMPARATIVE STUDY

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Abstract
Anecdotal evidence relates corruption with growing levels of income inequality. This paper investigates the effects of corruption on income distribution empirically using panel data and a dynamic panel estimator from OECD and OPEC countries during 2000–2007. The results show that for OPEC members due to the dependency of these countries on oil revenues as a rent source, corruption freedom (decrement in corruption) does not have expected positive impact on income distribution. However, for OECD countries, freedom of corruption improves income distribution, supporting the traditional theory.
Key words: Corruption, Income distribution, Gini coefficient, Panel data
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1. Introduction

In recent years, increasing attention has been devoted to understanding the reasons for corruption. The literature defines corruption as an illegal payment to public organizations or agents to get interest that they are not deserved or abusing from public official for private benefit [Rose-Ackerman (1978, 1996), Klitgaard (1988), Shleifer and Vishny (1993)]. The World Bank, IMF, United Nations and other international organizations consider corruption as the main barrier of progress, economic growth and social and political stability. Many empirical and theoretical studies insist on negative effect of corruption on income and its distribution from different channels. These researches are concentrated on causes of corruption and focused on some factors such as economic growth, democracy, federalism, and religion, and colonial history, legal origin, size of the government, wages of government employee, natural resources and openness. It should be noted that corruption has important consequences on economic growth, democracy and composition of government spending [Sanjeev Khagram and You, Jong-Song (2003)].

From long time historians, politicians and economists discuss the effects of corruption on income and income distribution. Most of recent literature considers corruption as a price mechanism. Corruption mainly imposes an extra tax on transactions [Murphy, Shleifer, and Vishny (1991); Mauro (1995)].

Furthermore, investment projects are transferred to those who pay more bribes than others [Shleifer and Vishny (1993)]. In addition since bribery contracts are not enforceable in court, officials and administration mainly delay the waiting process (the queue) in order to get more bribes [Myrdal, (1968)].

Since corrupt rent seekers tend to extract more benefits, it leads to misallocation of the resources and talents. Indeed talents transfer from innovation sector to rent seeking sector. Since the speed of

technology progress is determined by talents concentrated in innovation sector, growth rate decreases in countries in which corruption is widespread [Murphy, Shleifer, and Vishny (1991)].

Finally because innovators and talents need certificate and government permission to start their activity, corruption has many harmful effects on them although established producers do not need this permission [Murphy,Shleifer, and Vishny (1993)].

Corruption can affect resource allocation in two ways. First, corruption can change the assessment of private investment with different characteristics induced changes in the relative price of goods and services, resources and production factors as well as entrepreneurial talent.

Second, corruption causes inefficient resource allocation. Since the decision maker about public and private investment is a corrupt organization of government, it uses bribes as a decision criterion. It should be noted that ordering of project determination based on social interests is different from ranking based on received bribe by public organization. According to above discussion, corruption distorts the efficient allocation of resources and disrupts economic activity.

It may seem strange, but some researchers and scientists have positive view about corruption and are not concerned about it. Leff 1964 for example regards corruption as grease for the wheels of rigid official construction. Francis T.Lui (1985) shows how payment of bribes reduces the waiting costs in public organizations and administrations, leading to increased efficiency.

This paper investigates the effects of corruption on income distribution empirically using panel data and a dynamic panel estimator from OECD and OPEC countries during 2000–2007. In the second section of this paper, we briefly investigate the theoretical literature regarding to corruption and income distribution. The study also proceeds by reviewing the existing past empirical literature on corruption and income inequality in Section three. The econometric methodology and empirical results are discussed in the forth section of this paper. Section five concludes the paper.

2. Theoretical Literature

Income inequality generally leads to corruption through different mechanisms. One of the main and basic theoretical discussions in corruption literature considers corruption as a function of motivation and opportunity. The simplest analysis believes when inequality increases, the rich people have more motivation and high opportunity to take participate in corrupt activity [Rose-Ackerman,(1978); klitgaard, 1988].

In a society with higher income inequality, rich people use their economic resources as a political instrument to maintain their opportunity and increase their interests. This can be done through corrupt activities to change public policy satisfying their benefits. [Weber 1948; Marx, 1975; Bourdieu, 1990; Coleman 1990].

Given other factors the high level of inequality impedes poor people to become organized, so their abilities are reduced to control rich people corruption activity [Weber, 1948; Marx, 1975]. In societies with high inequality, the poor people are likely deprived of their basic rights and have many problems to obtain public services like education and medical care in comparison with those with low inequality. So, in such countries bribe is a common way to remove bureaucracy in order to get basic services which are legal rights to people.

Furthermore, High level of inequality means large share for small number of rich people and a small share for great number of

poor ones. So in such societies poor people are highly motivated to sell their votes to receive money, gift and other favors in return and rich ones become more interested to buy votes of poor people to protect their status and maintaining the level of inequality for obtaining more benefits. Thus we expect more bureaucracy corruption in countries with high level of inequality.

From a different view, based on median voter theory, the high level of inequality leads to more corruption because it increases government size and in consequence increases the level of corruption. Median voter theory notes that the policy and income are determined by Median voter preference [Hotelling, 1929; Downs, 1957; Black, 1958]. Based on this theory Alesina and Rodrik (1994) and Persson and Tabellini(1994) discuss that countries with higher level of inequality have higher tax rates and redistribution because median voter prefers higher tax rates and redistribution when inequality increases. Corruption level increases with greater government intervention because firms and rich people try to evade taxes and regulations [Krueger, 1974; La Palombara, 1994; Shleifer and Vishny, 1998].

High levels of inequality also lead to larger gap between median voter preferences for redistribution and rich people that inherently have great motivation to take participate in corruption. Rich people are strongly opposed with radical redistribution demanded by median voter because potential tax base is very thin and great pressure would be imposed to small number of rich people. Income policy in countries with high inequality is closer to rich people rather than median voter. This is due to the fact that rich ones use different instruments such as corruption to increase their own gain. In summary, higher income inequality leads to greater demand for higher tax rate and higher motivation of rich people to take participate in corrupt activity. Thus it affects tax management.

In societies with higher income equality, rich people have less motivation to participate in corrupt activity because their interests are somehow aligned or at least are not opposed with median voter. Policy preferences of median voter are the mix of social programs, insurance, security programs and a moderate redistribution program with a flat tax system. Rich people do not strongly oppose with these policies of median voter because they do not harm from redistribution very much. Therefore the effects of inequality on taxation system and redistribution are not clear and need empirical studies because it has different effects on rich people and median voter.

In electoral democracy, median voter preferences have noticeable political effects because in this kind of democracy, voting plays an important role in political system and poor people have more opportunity to organize and influence on policy. Since political competitions exist, corruption should be lower theoretically. Some empirical studies have found an inverted U-shaped relationship between corruption and democracy [Montinola and Jackman, 2002; Mohtadi and Roe, 2003]. It means that corruption increases in initial transient period of authoritarian rules and decreases when democracy becomes more widespread. But in democratic regimes with high inequality, rich people have more motivation and opportunity to engage in corruption in order to influence policy. Therefore, poor people have less ability to control rich ones in societies with high level of inequality and corruption relatively increases in comparison with legal activities.

The fundamental and important foundations of empirical models about the influences of corruption on inequality and economic growth are given bellow.

- ✓ Corruption and inequality have inverted U-shaped relationship. Thus countries with intermediate level of corruption have higher inequality than countries with low level of corruption.
- ✓ Corruption should have negative correlation with income level and economic growth.
- ✓ Based on Murphy, Shleifer, and Vishny (1991) view, corruption is considered as tax on production sector. According to this view corruption would increase tax and push talents toward rent-seeking sector therefore growth rate decreases. Furthermore, bureaucracy prepares a better opportunity for corruption activities.

  There are other foundations increasing tendency toward rent-seeking activity that are not modeled clearly. Some of them are listed below:
- ✓ Population growth will be higher in countries with higher level of corruption because corruption pushes labor force toward traditional sector which needs labor force with low talent.
- ✓ Since modern sectors are concentrated in cities so they have lower motivation for engaging in corruption. It can be said that distortion in the structure of modern sectors increases tendency toward rent-seeking sector. Thus countries with higher level of corruption are less urbanized.
- ✓ Corruption affects business through banking system and other financial interventions. Therefore economies with higher level of corruption experience lower level of financial deepening.

  Since government expenditure is financed through the tax of modern sector the share of government expenditure is considered as an important factor to corruption so it decreases investment and entrepreneurship. On the other hand the difference between income in traditional and modern sectors decreases when government expenditure increases. Thus it can be said that influences of corruption are lower in countries with higher government expenses.

High Gini coefficient implies credit constraints for entry into the modern sector or becoming an entrepreneur [Li, Squire, and Zou, 1998]. So a high Gini coefficient is associated with a larger traditional sector. Since corruption imposes greater tax on modern sectors, in countries with larger traditional sector the smaller percentage of population will be influenced by corruption and thus corruption has less impact on inequality. We thus expect in countries with higher Gini coefficient, corruption increases inequality to a lower extent. But it should be noted that in such countries because of wider traditional sector and lower talent entering to modern sectors, growth rate is lower.

3. Empirical Literature

Gupta (1998) studied the ways that corruption has negative effect on income distribution and poverty by regression analysis among 56 countries. He pointed out to relationship between economic growth, deviation in tax system, poor targeting of social program and income inequality. According to his study income inequality which originates from corruption decreases economic growth and tax evasion increases income inequality. He also noted that, poor social programs increases income inequality because they have great benefits for rich people and also gets away from poverty alleviation policies. He also used Gini coefficient for estimation of income inequality distribution. He concluded that benefits from corruption leads to poverty and inequality.

Davoodi (1998) found that influence of corruption on income distribution acts as a function of government participation in allocating and financing scarce goods and services. In addition, Gini coefficient shows that corruption increases income inequality.

He used 37 countries cross section data and found a significant positive impact of corruption on income inequality

Léonce Ndikumana and Mina Baliamoune-Lutz (2007) studied the effect of corruption on private and public investment and economic growth in 33 African countries during 1982-2001 by using GMM estimation technique. The main variables of this model are logarithm of per capita GDP, domestic investment as percent of GDP, openness, payment to privet sector (percent of GDP) and the education rate of adult as a measure of social capital. The selected measure of corruption is in range of 0-6. They found that corruption affects income growth directly through influence on investment. Corruption has a negative effect on domestic investment and this leads to difference between private and public investment and also discourages private sector investment.

Muhammad Aman Ullah and Dr. Eatzaz Ahmad (2007) used panel data of 71 developed and developing countries in the period of 1984-2002 to study relationship between corruption and income inequality. They used panel GMM estimation technique and controlling variables which include trade, education, capital per capita for each worker, government expenditure and population growth. Their results show that corruption not only affects income growth but also influences income distribution. As discussed before, income inequality has harmful effect on economic growth. Since corruption increases income inequality, it causes decrement in economic growth too. Finally, noted that corruption have significant distribution effects and since these effects leads to decrement in efficiency therefore, have considerable effect on equality and growth.

Kwabena Gyimah-Brempong and Samaria Munoz de Camacho (2006) used panel data and dynamic panel estimation to study regional differences related to corruption effects on growth and income distribution. The Gini equation estimated is shown below:

$$Gini = \gamma_0 + \gamma_1 \dot{y} + \gamma_2 edu + \gamma_3 y + \gamma_4 corrupt + \gamma_5 Govcon + \gamma_j \sum_j dum_j \times Corrupt + \varepsilon$$

In above model $\dot{y}$ is growth rate of income per capita, y is income per capita, edu is human capital stock or accessibility of adult population to education, $Corrupt$ is a factor to measure quality of institutions in economy, $Govcon$ is government consumption and dum_j is dummy variable for Africa, Asia and Latin America. Their conclusion shows that regional differences which originate from corruption have significant effects on growth and income distribution. On the other hand corruption has greater effect on income distribution inequality in countries of Latin America.

Sanjeev Khagram and You, Jong-Song (2003) studied corruption and its effect on economic growth and income distribution by using Murphy definition in their paper. By estimation of growth equation and Gini coefficient they concluded that corruption has an inverted U-shape relationship with income distribution so Gini coefficient difference in under developed and industrialized countries can be attributed to corruption. Finally, corruption retards economic growth.

4. Methodology and Empirical Results

In this study, we use panel data for two groups of countries categorized into oil-rich countries and OECD countries during 2000-2007. Oil countries include: Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates and Venezuela. OECD countries include: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland ,Ireland, Italy,

Japan, Korea, South, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

The econometric model for these two groups of countries is shown in equation bellow:

$$I_{it} = \beta_0 + \beta_1 cor_{it} + \beta_2 c_{it} + \epsilon_{it}$$
$$i = 1, \dots N;\ t = 1, \dots \dots T$$

Where I_{it} is measure of income inequality (Gini coefficient), cor_{it} is corruption indicator, c_{it} is control variables vector and ϵ_{it} is disturbance term for country i at time t.

Dependent variable is Gini coefficient and its data are gathered from WIID (World Income Inequality Database). The proxy used for corruption indicator is corruption freedom being in the range of 0-10 and is obtained from Gottingen University. The zero value shows maximum value of corruption and 10 show the minimum corruption. Control variables for oil rich countries are: growth of GDP (GGDP), the ratio of government expenditure to GDP (G), import value index (IDXIMP), population growth (pop), and the ratio domestic credit to private sector to GDP (DCP). For OECD countries control variables consist of the above variables as well as the ratio of private investment to GDP (I/Y), age dependency (AGE), the ratio of Subsidies to government expenditure (SUB), the ratio of consumption to GDP (C/Y), inflation (INF) and the enrollment ration in secondary school (SCOL). The data of these variables are obtained from WDI.

The model of income Inequality is estimated using panel and dynamic panel data of OPEC and OECD countries during 2000-2007 separately. The estimation results reported in tables 1 and 2 respectively in Appendix.

The basic different panel data estimators are considered: pooled OLS, Fixed effects, random effects and generalized method of moments (GMM). The results of OLS, Fixed, Random effects and GMM are presented in columns 1, 2, 3 and 4 respectively in Tables 1 and 2 for two groups of countries.

For OPEC countries, the Gini coefficient is regressed on corruption (COR), growth of GDP (GGDP), the ratio of government expenditure to GDP (G), import value index (IDXIMP), population growth (pop) and the ratio of domestic credit paid to private sector to GDP (DCP). The results are indicated in Table 1 for the four specifications. The corruption variable has not the expected sign, being statistically significant at the 5% level in most specifications. The societies that are perceived as being more corrupt, surprisingly enjoying a lower Gini coefficient or better income distribution. The point estimate suggests that a 1% increase in the corruption index is associated with an increase in Gini coefficient by 0.46%. The results are not consistent with the previous findings. It can be argued that oil revenues of OPEC member countries enhances tendency towards corrupt and rent-seeking activities, while improving income distribution.

The coefficients of the control variables suggest that a larger share of government spending in GDP is associated with lower Gini coefficient while higher growth of GDP, higher import value index, higher population growth and higher ratio of domestic credit paid to private sector increase Gini coefficient.

The results for OECD countries are reported in Table 2. For these countries, Gini coefficient is regressed on corruption (COR), growth of GDP (GGDP), the ratio of domestic credit paid to private sector to GDP (DCP), the ratio of private investment to GDP (I/Y), age dependency (AGE), the ratio of subsidies to government expenditure (SUB), the ratio of consumption to GDP

(C/Y), inflation (INF) and the enrolment ration in secondary school (SCOL).

Results indicate that corruption variable has the expected sign and is statistically significant at the 5% level. The coefficients of the control variables show that growth of GDP, ratio of domestic credit to private sector, share of private investment and consumption in GDP have negative impact on Gini coefficient. Moreover, a larger share of government spending in GDP, higher inflation, higher ratio of schooling, higher age dependency ratio and a larger share of subsidies to government expenditure is associated with higher Gini coefficient.

In Table 1 the F-test is significant at conventional confidence levels for all models. Evidence of serial correlation in the residuals was found for most models. Serial correlation is expected because income distribution in one given year affects income distribution in subsequent years. To address this issue the models were also estimated by GMM.

The coefficient of corruption variable from Panel GMM estimation (table 1 column 4) is positive and significant (0.022) which support previous results: in OPEC countries, decreasing corruption has no positive effect on income distribution.

As it can be seen from Table 2 for OECD countries, coefficient of corruption variable estimated by OLS, Fixed effect, Random effect and GMM panel are -1.051, -1.071, -2.6 and -0.837 respectively. So all estimated coefficients of corruption variable are negative and significant, indicating that corruption has negative impact on income distribution in OECD countries that supports the previous studies.

5. Conclusion

We studied the effects of corruption on income distribution using panel data approach for OECD and OPEC member countries. According to the traditional economic thought, corruption decrement improves income distribution through different ways. This paper has shown that corruption is associated with higher income inequality in OECD countries and lower one in OPEC countries. It seems that high oil revenues and excessive government intervention in OPEC member countries have improved income distribution, although leading to corrupt and rent seeking activities. The results also show that increase in government expenditure has positive impact on income distribution for OPEC member countries, verifying the theory that countries with high government expenditure have lower inequality and lower rate of economic growth. For OECD countries, corruption has negative impact on income distribution, supporting traditional theory.

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Appendix:

Table 1: Corruption and Income Distribution: Panel Regression Analysis for OPEC Countries, 2000–2007. (Dependent Variable is Gini Coefficient)

	Pooled	Fixed Effects	Random Effects	GMM
Gini(-1)				0.073* (0.0010)
Cor	0. 27 (0.1740)	0. 55* (0.0010)	0. 46** (0.06)	0. 22* (0.0000)
Idximp	0.028* (0.0000)	0.015* (0.0000)	0.015* (0.0021)	3.01* (0.0000)
Pop	1.024* (0.0005)	2.44* (0.0000)	3.42* (0.0077)	0.143* (0.0119)
Ggdp	0.159* (0.0255)	0.158* (0.0119)	0.233* (0.0000)	0.044* (0.0077)
Dcp	-0.129* (0.0000)	0.052* (0.0077)	0.183 (0.23)	-0.134* (0.0530)
G	0.656* (0.0000)	-0.111* (0.0530)	-0.214 (0.17)	4.31* (0.046)
constant	33.19 (0.0000)	37.07 (0.0000)	32.04 (0.0000)	
No.of observation	96	96	96	72
Adjusted R-squared	0.48	0.97	0.51	
F static (p-value)	68.22 (0.0000)	208.68 (0.0000)	17.16 (0.0000)	
LM test		226.81		
Hausman Test			7.42 (0.28)	
P-test over (identification of instruments)				0.432

Notes: (*), (**) denote, respectively, significance at the 5 percent and 10 percent levels. The numbers inside the parenthesis represent P-value. The Lagrange Multiplier (LM) test reject the pooled regression model (OLS). The Hausman test does not reject the random effects model. In all models, a high score on the corruption index indicates a low level of corruption.

Table 2: Corruption and Income Distribution: Panel Regression Analysis for OECD Countries, 2000 -2007.(Dependent Variable is Gini Coefficient)

	Pooled	Fixed Effects	Random Effects	GMM
GINI(-1)				-0.099*
				(0.0000)
COR	-1.051*	-0.071**	-0.574*	-0.837*
	(0.0000)	(0.0875)	(0.0095)	(0.0000)
I/Y	-0.110*	-0.026*	-0.1091*	-0.0274
	(0.0054)	(0.0024)	(0.0460)	(0.18)
AGE	58.99*	5.446*	21.70*	64.16*
	(0.0000)	(0.0000)	(0.0039)	(0.0000)
SUB	-0.048*	0.013*	0.0616*	-0.056
	(0.0000)	(0.0177)	(0.0222)	(0.1301)
GDPP	-0.000216*	-3.75E-05*	-5.18E-05	-0.000264*
	(0.0000)	(0.0000)	(0.3845)	(0.0000)
C/Y	-0.136*	-0.0701*	-0.201*	-0.1904*
	(0.0000)	(0.0000)	(0.0021)	(0.0000)
DCP	0.043*	-0.002517*	-0.003075	0.050783*
	(0.0000)	(0.0000)	(0.5678)	(0.0000)
INF	0.033788*	0.021454*	0.041817*	0.038445*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SCOL	0.171674*	0.029509*	0.079998*	0.269215*
	(0.0000)	(0.0000)	(0.0135)	(0.0000)
CONSTANT	6.123713	32.76580*	30.11436*	
	(0.1488)	(0.0000)	(0.0001)	
OBSERVATION	476	476	476	408
Adjusted R-squared	0.71	0.99	0.17	
F-statistic	133.5091	72.18	12.17809	
(p-value)	(0.0000)	(0.0000)	(0.0000)	
LM test	891.08			
Hausman Test			2.23	
			(0.0013)	
P-test over (identification of instruments)				0.381

Notes: (*), (**) denote, respectively, significance at the 5 percent and 10 percent levels. The numbers inside the parenthesis represent P-value. The Lagrange Multiplier (LM) test rejects the pooled regression model (OLS). The Hausman test rejects the random effects model. In all models, a high score on the corruption index indicates a low level of corruption.