

# Studying the Factors Affect Economic Corruption in Oil-Rich Countries

Masooome Fouladi<sup>1</sup>

Lecturer at Faculty of  
Economics University of  
Tehran

Yazdan Goodarzi Farahani<sup>2</sup>

PhD Student at Faculty of  
Economics  
University of Tehran

Hedieh Setayesh<sup>3</sup>

PhD Student at Faculty of  
Economics and Management,  
Tehran Science and Research  
Branch of Islamic Azad  
University

## Abstract

Recent studies indicate that countries that are rich in natural resources have a potential tendency to be corrupt. This paper focuses on studying the factors affect economic corruption in oil-rich countries. We consider a set of variables including: the size of oil sector, tax income, the size of government, human development, democracy, inflation, liquidity, private sector debt to bank system, value added of agriculture and industry sectors, oil resources utilization, and corruption perception index. Using these variables we estimate 4 econometric models in a GMM framework. The results show that the size of oil sector, the size of government, inflation, private sector debt, liquidity, and democracy in oil-rich countries are positively related to corruption while value added of agriculture and industry sectors, and human development affect corruption adversely so that increasing these variables reduces corruption in these countries.

**Keywords:** corruption, oil countries, liquidity, democracy, economic sectors, human development.

**JEL. Classification:** N50, D70, D73, I00, E40, H30.

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<sup>1</sup> E-mail: mafooladi@ut.ac.ir

<sup>2</sup> E-mail: yazdan.farahani@gmail.com

<sup>3</sup> E-mail: hedi\_setayesh@yahoo.com

## **Introduction**

Corruption as an unfavourable fact has grown dramatically in administrative, political and socio-economic systems. Corruption is one of the economic deficiencies which can weaken economic growth and development; thus it is considered as an important impediment to economic growth and political stability, particularly in developing countries. Hence, numerous studies have examined corruption levels in natural resource-based economies including oil-based countries. On the other hand, Corruption is a widespread phenomenon affecting all societies to different degrees, at different times (see Gerlagh and Pellegrini (2007)).

Oil can bring both opportunity and risk. “The revenues that will flow from oil have the potential to drive domestic development and transform the country into a significant economic actor, both regionally and globally; But there also is a danger that oil instead undermines progress, as the symptoms of the ‘resource curse’ take hold” (Shepherd,2013). As Kolstad and Wiig (2007) have mentioned, resource curse explains why resource rich countries have inappropriate performance in social and economic development. Various studies have been focused on this area considering factors such as transparency mechanisms, good management, good governance, human development levels, and governments’ dependency on oil revenues.

Using GMM estimation method, this paper examines the factors affect corruption in 30 oil-rich countries<sup>1</sup> during 2000 to 2010.

## **Statistical Evidence**

In general, two indices are used to study corruption in countries: the Corruption Perception Index (CPI) and the Control of Corruption Index (CCI). These two measures are introduced below.

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<sup>1</sup> Our sample of oil countries contains Algeria, Angola, Argentina, Australia, Azerbaijan, Brazil, Canada, China, Ecuador, Egypt, India, Indonesia, Iran, Iraq, Kazakhstan, Kuwait, Libya, Malaysia, Mexico, Norway, Oman, Qatar, Russia, Saudi Arabia, Soudan, United Arab Emirates, United Kingdom, United States, Venezuela and Vietnam.

1. Corruption perception index (CPI) focuses on corruption in public sector and defines corruption as the misuse of public power for private benefit of society. Surveys used to compile the index include questions relating to (for example) bribery of public officials. Validity of the index (CPI) is different in different countries and depends on the number of information sources which are used to assess the level of corruption.

Measuring Corruption Perception Index for each year is based on the information associated to both that specific year and the year before that. The Index scores countries and territories on a scale from 0 (highly corrupt) to 100 (very clean).<sup>1</sup> It is important to note that in order to evaluate corruption in each country, the related “score” should be considered; the reason is that a country’s CPI-based “rank” can change simply because new countries enter the index or others may drop out.

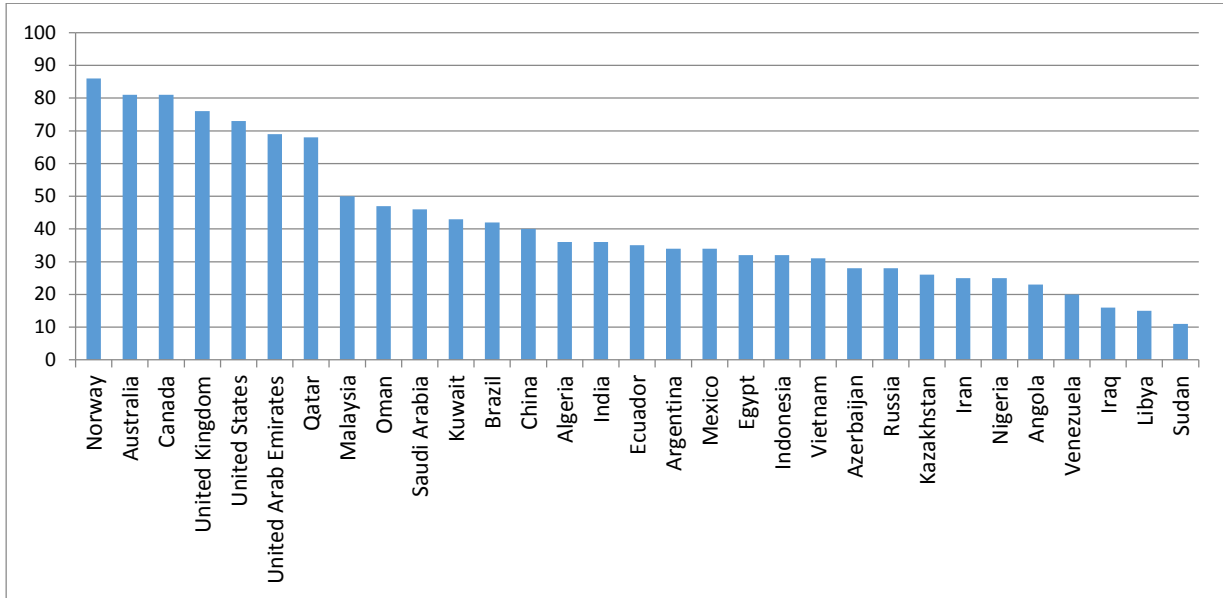
2. The Control of Corruption Index (CCI) is an aggregation of different indicators that measure the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of state by elites and private interests. This index ranges from -2.5 (for very poor performance) to +2.5 (for excellent performance).

As the Corruption Perception Index (CPI) is used for our analysis, we first present an overview of the corruption levels in sample of countries (as shown in figure 1).

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<sup>1</sup> Transparency International  
Online at: <http://cpi.transparency.org/cpi2013/results/>

**Figure 1- Corruption Perception Index, 2013**

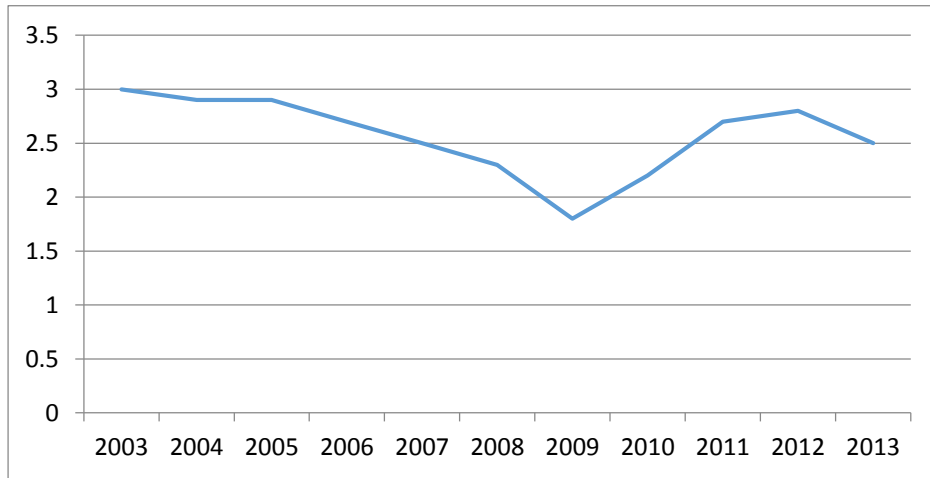


Source: Transparency International

Figure 1 illustrates that the Corruption Perception Index varies largely among oil-rich countries. Scoring 86, Norway has been ranked 1<sup>st</sup> among oil-rich countries and it has been ranked 5<sup>th</sup> out of 175 countries in Transparency International’s 2013 Corruption Perception Index. Moreover, Australia, Canada, United Kingdom, United States, Emirates and Qatar with the Corruption Perception Index scores of more than 60 are slightly in a good situation. In contrast, Soudan, Libya and Iraq have placed at 3 lowest positions in Transparency International’s 2013 Corruption Perception Index. On the basis of this index Iran has been ranked 144<sup>th</sup> (out of 175) with score of 25. As can be seen in figure 2 Iran’s Corruption Perception Index, with the average of 2.5, has always been below 3 for the last 10 years.<sup>1</sup> The least score of this index for Iran has been 1.8 in 2009.

<sup>1</sup> Since the range of Corruption Perception Index has changed from 0 – 10 to 0 - 100 in recent years, we have used the former for some years.

**Figure 2- Iran's Corruption Perception Index**



Thus it can be clearly perceived that while the entire studying sample are similar in being oil-rich countries, there are significant differences in these countries' economic corruption levels. Hence, these differences suggest that studying factors affect corruption would be helpful to identify the channels through which corruption can be extended. Furthermore, it provides the ability to conduct effective solutions for reducing corruption in the whole world.

### **Empirical Studies**

Kolstad and Wiig (2007) examine the relationship between transparency and corruption, focusing on oil-rich countries. Their findings suggest that “political transparency index” and “control of corruption index” are positively and significantly related. Studying 139 countries during 1984-2006, Anthonsen et.al (2009) conclude that oil and gas rent dependency has negative effects on quality of governments. They consider three dimensions of good quality of government including low level of corruption, bureaucratic quality and strong and impartial legal systems. Moreover, taxation identified as one of the main determinants of that negative relationship. Aslaksen takes into account the effect of natural resource abundance on corruption using panel data estimations in a sample of 132 countries during 1982-2006. The results indicate that both oil extraction and mineral income is associated with more corruption. Furthermore, the adverse impact of oil on corruption is present both in democratic and nondemocratic

countries among OPEC member countries and non OPEC member countries. In a recent study by Bhattacharyya and Holder (2010) they used panel data method to test how natural resources can feed corruption, covering the period 1980–2004. According to their findings resource rents increase corruption if and only if the quality of the democratic institutions is below a certain threshold level. These results imply that resource-rich countries indeed have a tendency to be corrupt because resource windfalls encourage their governments to engage in rent-seeking. But as in the resource-rich democracies Australia and Norway, this tendency can be checked by sound democratic institutions that keep governments accountable to the people.

Using GMM estimations, Baliamoune-Lutz and Ndikumana (2008) study the impact of corruption on private and public investments in a sample of 33 African countries during 1982-2000. They find that corruption has a positive effect on public investment while it has a negative effect on private investment.

In a study by Kotera et al. (2010) the impact of government expenditures on corruption has been examined in a panel data framework, using pooled ordinary least square method. This survey covers developing countries or non OECD member countries. The set of variables includes Corruption Perception Index, the size of government, democracy index, logarithm of GDP per capita, degree of economic openness, and political stability. The results show that the size of government has a positive effect on corruption at low levels of democracy, while it affects corruption negatively at high levels of democracy. Estimating various models also indicates that democracy index has positive and negative impacts on corruption; as well as political stability has a negative effect on corruption meaning that increased political stability in a country reduces corruption level in that country.

## **Analysis of the Data and Empirical Model**

In this section, we introduce the variables and estimated model. To examine the relationship between corruption and the factors that influence it, according to previous studies and model's hypotheses, the following variables are considered:

*-The size of Government:*

Some studies believe that larger governments lead to more corruption because a large government associates with more administrative organizations and also more staff and decision makers. As a result, probability of creating different ways of corruption will rise. (See Ackerman, 1999). The size of government is calculated by the share of government expenditure in GDP in selected countries.

*-Value added of agricultural and industry sectors*

Growth in agricultural and industry sectors can lead to independency from oil revenue in developing countries. Therefore it makes a decrease in corruption and rent resulted from oil earnings.

*-The size of oil sector:*

Government dependence on oil revenues leads to less reliance on tax revenues. So the government does not respond to the society. Also, an increase in oil revenues usually leads to a decline in the productivity of other economic sectors. Consequently, this may raise corruption in the country. Ratio of oil revenues to GDP has been calculated for measuring this variable.

*- Democracy*

Democracy as a political system based on well-organized forces of competitive political parties that are well-established, has the potential to decrease the corruption opportunities in the economic system. Regulatory Institutions monitor government policies and government components to establish rationality in the political system and also to prevent corruption. Thus, according to this view it is expected that the relationship between democracy and corruption is negative and therefore corruption will fall in a society with higher democracy. However, some facts has gone against this claim especially in transitional economies. In fact, despite the improvement in democratic elements of these countries, they usually demonstrate higher degree of corruption. More political and economic decisions are made outside the democratic institutions and are not responsive to the public. Thus it can be stated that according to the countries considered in this study, the relationship between democracy and corruption may be positive and higher democracy raises the corruption. This variable is measured as the percentage of women's participation in political process.

### *-Corruption Perceptions Index (CPI)*

Corruption Perceptions Index has a much stronger correlation with real GDP per capita than other existing indicators for measuring corruption (see Wilhelm 2002). Also the various aspects of corruption has been considered, CPI index will be used for measuring corruption in this paper.

### *-Inflation*

Inflation may translate resource flows from productive activities to unproductive activities due to the negative impact on the productivity of manufacturing activity. This translation is a hidden corruption in economy. Not only inflation rise hidden corruption but also it may expand poverty and inequality. In inflationary economy, people are looking for unusual income from economic imbalances that arise from reduction in efficiency of productive activities. This variable is based on the Consumer Price Index.

### *- Tax revenues*

Eliminating government dependence on oil revenues, financing government spending through taxes and enhancing the quality of regulation are the main levers for reducing corruption. So If an increase in the size of government is associated with better supervision and better regulation and also more reliance on tax revenues, it will result in reduction of corruption. Studies show that successful countries in reducing dependence on oil revenues have lower corruption levels. Thus it is expected that relationship between tax revenues and corruption will be negative.

### *- Human Development Index*

High rates of poverty, poor health, infant mortality, and poor performance of the education sector can be named as important social consequences of abundant natural resources in oil-exporting countries. In these countries, despite substantial increases in per capita income due to oil revenues, the standard of living is low (see Karl 2004). HDI is a comparative measure of life expectancy, literacy, education and standards of living and can be used as an indicator to measure the pressure and necessity of economic policies to quality of life. Thus, an increase in the level of human development can reduce the level of corruption in the country. In this study, the data for HDI was taken from the World Development Report.



- *Liquidity*

Using this variable, ratio of liquidity growth to GDP growth is considered. Depending on channels of increase in liquidity, this variable may form a basis for corruption.

- *Private sector debt to banks:*

In order to study the impact of monetary sector on the corruption index, the private sector debt to banks system is used. Inefficiency, lack of proportionality of the organization and structure of banks with their objectives, the complexity of rules and regulations, and incorrect management in bank lending are the most important factors leading to incorrect conductivity in the banks resources. As a result, non-repayment or delaying in repayments to the bank can also be associated with the conduit for formation or increasing corruption.

Total data for the variables listed in this paper has been collected from the World Bank Reports, World Development Report and Transparency International website.

## **Model Specification**

In this paper we pool cross-section and time series data to study the impact of oil revenue on corruption. The empirical model form for this specification is given by:

$$CPI_{it} = \alpha_{1i} + \alpha_2 LOILR_{it} + \alpha_3 LVADA_{it} + \alpha_4 LVADI_{it} + \alpha_5 LHDI_{it} + \alpha_6 DEMO_{it} + \alpha_7 LG_{it} + \varepsilon_{it}$$

(1)

Where in this equation:

CPI is corruption perception index.

LOILR is the logarithm of oil revenue.

LVADA is the logarithm of agriculture value added.

LVADI is the logarithm of industry and service value added.

LHDI is the logarithm of human capital index.

DEMO is democracy index.

LG is logarithm of the size of government

The  $\alpha_{1i}$  is a constant term and  $i$  is a cross-section data for countries referred to, and  $t$  is a time series data and  $\varepsilon_{it}$  is an error term.

To analysis whether money variables effect on corruption we will determine the following equation:

$$\begin{aligned} \text{CPI}_{it} = & \alpha_{1i} + \alpha_2 \text{LOILR}_{it} + \alpha_3 \text{LPDB}_{it} + \alpha_4 \text{LG}_{it} + \alpha_5 \text{LM2}_{it} + \alpha_6 \text{INF}_{it} + \\ & \alpha_7 \text{LTAX}_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

In this equation:

LPDB is the logarithm of private sector debt to bank systems.

LM2 is the logarithm of liquidity.

INF is the rate of inflation.

LTAX is the logarithm of tax revenue.

Finally we consider the effects of oil revenue and oil extraction on corruption with monetary and fiscal variables from annual data covering the period of 2000 to 2010 in following equations:

$$\begin{aligned} \text{CPI}_{it} = & \alpha_{1i} + \alpha_2 \text{LOILR}_{it} + \alpha_3 \text{LVADA}_{it} + \alpha_4 \text{LM2}_{it} + \alpha_5 \text{LHDI}_{it} + \alpha_6 \text{DEMO}_{it} + \\ & \alpha_7 \text{LG}_{it} + \alpha_8 \text{INF}_{it} + \alpha_9 \text{LTAX}_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{CPI}_{it} = & \alpha_{1i} + \alpha_2 \text{LEXOIL}_{it} + \alpha_3 \text{LVADA}_{it} + \alpha_4 \text{LM2}_{it} + \alpha_5 \text{LHDI}_{it} + \alpha_6 \text{DEMO}_{it} + \\ & \alpha_7 \text{LG}_{it} + \alpha_8 \text{INF}_{it} + \alpha_9 \text{LTAX}_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

In order to investigate the possibility of panel cointegration, first, it is necessary to determine the existence of unit roots in the data series. For this study we have chosen the Im, Pesaran and Shin (IPS, hereafter), which is based on the well-known Dickey-Fuller procedure.

Im, Pesaran and Shin denoted IPS proposed a test for the presence of unit roots in panels that combines information from the time series dimension with that from the cross section dimension, such that fewer time observations are required

for the test to have power. Since researchers have found the IPS test to have superior test power for analyzing long-run relationships in panel data, we will also employ this procedure in this study.

Table 1 presents the results of the IPS panel unit root test at level indicating that all series except for inflation, corruption and democracy indexes are I(1) in the constant of the panel unit root regression. These results clearly show that the null hypothesis of a panel unit root in the level of the series cannot be rejected at various lag lengths. We assume that there is no time trend. Therefore, we test for stationarity allowing for a constant plus time trend. In the absence of a constant plus time trend, again we found that the null hypothesis of having panel unit root is generally rejected in all series at level form and various lag lengths. We can conclude that most of the variables are non-stationary in with and without time trend specifications at level by applying the IPS test which is also applied for heterogeneous panel to test the series for the presence of a unit root. The results of the panel unit root tests confirm that the variables are non-stationary at level.

Table 1: Panel Unit Root Test – Im, Pesaran and Shin (IPS)

Variable	Level	
	Constant	Constant + Trend
<b>CPI</b>	-3.67	-3.68
<b>LOILR</b>	-1.57	-1.81
<b>LEXOIL</b>	-1.79	-1.69
<b>LVADA</b>	-2.20	-2.83
<b>LVADI</b>	-1.25	-1.57
<b>LHDI</b>	-4.12	-3.89
<b>DEMO</b>	-3.25	-3.56
<b>LG</b>	-1.17	-1.27
<b>LPDB</b>	-1.58	-1.87
<b>LM2</b>	-2.38	-2.89
<b>INF</b>	-3.43	-3.47

<b>LTAX</b>	-1.19	-1.27
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Note: Levels and first order differences denote the IPS t-test for a unit root in levels and first differences respectively. Number of lags was selected using the AIC criterion. We use the Eviews software to estimate this value.

Table 1 also presents the results of the tests at first difference for IPS test in constant and constant plus time trend. We can see that for all series the null hypothesis of unit root test is rejected at 95 percent critical value. Hence, based on IPS test, there is strong evidence that all the series are in fact integrated of orders one.

We can conclude that the results of panel unit root tests reported in Table1 support the hypothesis of a unit root in all variables across countries, as well as the hypothesis of zero order integration in first differences. At most of the 5 percent significance level, we found that all tests statistics in both with and without trends significantly confirm that all series strongly reject the unit root null. Given the results of IPS test, it is possible to apply panel cointegration method in order to test for the existence of the stable long-run relation among the variables.

Table 2: The Pedroni Panel Cointegration Test (P-Value)

<b>Test</b>	<b>Constant</b>	<b>Constant + Trend</b>
Panel $v$ -Statistic	0.02	0.39
Panel $\rho$ -Statistic	0.40	0.58
Panel t-Statistic: (non-parametric)	0.00	0.02
Panel t-Statistic (adf): (parametric)	0.00	0.00
Group $\rho$ -Statistic	0.08	0.05
Group t-Statistic: (non-parametric)	0.00	0.09
Group t-Statistic (adf): (parametric)	0.07	0.00

The next step is to test whether the variables are cointegrated using Pedroni's (1999, 2001, and 2004). This is to investigate whether long-run steady state or cointegration exist among the variables. Since the variables are found to be non-stationary in level for examining the relationship between oil revenue and corruption in the countries that have highest level in corruption index has been selected.

The most common methods for investigating the impact of oil revenue on corruption are cross-country regressions and panel data techniques. Note that the estimates of coefficient can be biased for a variety of reasons, among them measurement error, reverse causation and omitted variable bias. Therefore, a suitable estimation method should be used in order to obtain unbiased, consistent and efficient estimates of this coefficient. To deal with these biases, researchers have utilized dynamic panel regressions with lagged values of the explanatory endogenous variables as instruments. Such methods have several advantages over cross-sectional instrumental variable regressions. In particular, they control for endogeneity and measurement error not only of the monetary and fiscal variables, but also of other explanatory variables. Note also that, in the case of cross-section regressions, the lagged dependent variable is correlated with the error term if it is not instrumented.

In our analysis, we employ the system GMM estimator developed by Arellano and Bover (1995), which combines a regression in differences with one in levels. Blundell and Bond (1998) present Monte Carlo evidence that the inclusion of the level regression in the estimation reduces the potential bias in finite samples and the asymptotic inaccuracy associated with the difference estimator.

The consistency of the GMM estimator depends on the validity of the instruments used in the model as well as the assumption that the error term does not exhibit serial correlation. In our case, the instruments are chosen from the lagged endogenous and explanatory variables. In order to test the validity of the selected instruments, we perform the Sargan test of over identifying restrictions proposed by Arellano and Bond (1991). In addition, we also check for the presence of any residual autocorrelation. Finally, we perform stationarity tests belonging to the first- (Levin-Lin-Chu, 2002) and second-generation unit root test (Pesaran, 2007). The results suggest that all series are stationary, and consequently no co-integration analysis is necessary. Therefore we proceed directly to the GMM estimation.

The dynamic panel regressions were run both for the four specification model as mentioned before. The estimation results are presented in Tables 3.

Table 5: Consideration the relationship between oil revenue and corruption in selected countries by using GMM method (Dependent variable: Corruption index)

Variables	Model (1)	Model (2)	Model (3)	Model (4)
	Coefficient	Coefficient	Coefficient	Coefficient
<i>LCPI(-1)</i>	1.70 (3.29)	1.83 (3.98)	2.04 (4.36)	1.98 (2.91)
<i>LOILR</i>	-1.38 (-2.38)	-1.45 (-3.29)	-2.18 (-2.67)	-
<i>LEXOIL</i>	-	-	-	-1.65 (-3.67)
<i>LVADA</i>	0.95 (2.20)	-	1.01 (2.58)	1.19 (5.33)
<i>LVADI</i>	0.78 (2.48)	-	-	-
<i>LHDI</i>	1.02 (3.14)	-	1.22 (3.87)	1.29 (2.18)
<i>DEMO</i>	-0.12 (-1.95)	-	-0.25 (-1.88)	-0.49 (-1.90)
<i>LG</i>	-0.88 (-3.27)	-1.02 (-4.29)	-1.28 (-3.56)	-1.87 (-4.21)
<i>LPDB</i>	-	-0.58 (-1.97)	-	-
<i>LM2</i>	-	-0.20 (-3.55)	-0.42 (-1.97)	-0.61 (-2.72)
<i>INF</i>	-	-1.20 (-3.28)	-1.34 (-4.27)	-1.29 (-3.09)
<i>LTAX</i>	-	0.94 (2.87)	1.02 (2.16)	1.38 (3.93)
J- STATISTIC	14.45	13.24	15.84	14,64
WALD TEST	122.36	119.20	115.28	120,43

Note: The null hypothesis for the t-ratio is  $H_0 = \beta_1 = 0$ ; Figures in parentheses are t-statistics. We use the Eviews software to estimate this value.

The regression result for corruption index is presented in table 3. Before going to the detail of the result, it is essential to establish the overall credibility of the results. The value of j-statistic and Wald statistic are highly significant in all the four equations, confirming that the overall fitting of the equations is quite satisfactory.

Reduction in "Corruption Perception Index" means an increase in the level of corruption. So the negative sign of the coefficient indicates the positive effect on the amount of corruption. The results in all models show that inflation has a negative impact on the Corruption Perceptions Index. Therefore in countries with higher inflation, there is higher level of corruption.

As we expected, the increase in liquidity is correlated directly with the level of corruption. The liquidity is one of the causes of inflation and therefore it can also affect corruption. The results show that an increase in private sector debt to the banking system has a direct impact on increasing the level of corruption in these countries, which confirms the existence of channels for corruption in lending system in these countries.

Tax revenue has a positive correlation with CPI index. In other words as we expected, countries that rely on tax revenue have to respond to the people and therefore corruption in these countries is better controlled.

Based on the results shown in table 3, increase in the size of oil sector is negatively related to corruption. This means that when the oil sector is larger in the economy, corruption index reduces which shows high levels of corruption in the country. The results from the fourth model in which the extraction of oil was used instead of the size of oil sector, shows a negative impact of oil extraction on CPI Index. This can be interpreted such that government reliance on oil revenues will increase with arising in utilization of oil recourses. Also the level of wealth in community rises and may provide various channels of corruption formation for using this wealth. This variable is one of the most important variables which shows significant difference in the corruption in countries like Norway, Canada, Australia and Britain with OPEC countries.

Coefficients obtained for the effect of value-added in agricultural and industrial sectors on the corruption index, confirm that the larger agricultural and industrial

sectors, the better the corruption index. The agricultural sector has a greater impact than the industry sector. This may be because of tendency of oil economies to inject resources to industry sector. Therefore share of this sector in economy can be related to the interests of the ruling class. This leads to the spread of corruption.

The result indicates a negative correlation between CPI index and democracy which means that corruption in the oil-rich countries has been raised with increases in democracy. In other words, the results in this section show that the second group theory about the relation between democracy and corruption in the oil countries is correct. Hence despite the improvement in the democratic process, political and economic decisions made outside the democratic institutions and acts only on the interests of powerful groups.

In all estimated models results show that countries with better human development indicators have less corruption. These results confirm that countries in which labor force is a main concern, are more responsive to the community and also have efficient means of monitoring government operations.

### **Summary and conclusions**

One of the most important factors affecting the socio-economic development of each country is the level of corruption. There can be a mutual relationship between corruption and other variables that are important in development.

On the other hand, in countries that rely on natural resource revenues, potentially there is a possibility of corruption formation. If these revenues that are at the disposal of the government, are not supervised by an efficient system of monitoring-control, corruption will be widespread.

Moreover, corruption can waste resources and thus withdraws them from the path of production and progress. So it will be a barrier for development.

In this paper we study the factors affecting the level of corruption in the oil-rich countries. Variables are the size of oil sector, tax income, the size of government, human development index, democracy, inflation, liquidity, debt of private sector to banking system, value-added of agriculture and industry sectors, the rate of oil resources exploitation and the Corruption Perception Index. Four models were estimated and the results show that the size of oil sector, the size of government, inflation, debt of private sector, liquidity and democracy in these countries are



directly related to the level of corruption. Value-added of agriculture and industry sectors and human development levels have inverse effects such that when these indicators rise the index of corruption declines.

Therefore although the oil-rich countries access to a massive wealth for their growth and development, they can use it efficiently and provide an appropriate social-economic-political system.

Attention to agriculture and industry sectors, investment in human development, controlling the size of government, effective regulation of money, the banking system respecting to the law, and trying to prevent the economy's dependence on oil revenues are effective strategies in this field.

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