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CORRUPTION, RELIGION AND ECONOMIC PERFORMANCE IN OPEC COUNTRIES: AN ANALYSIS*

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ABSTRACT

The analysis of corruption in international business is a relatively new but an important phenomenon and for the last two decades many research works have attempted to capture the economic impact of the corruption in a country. None of such works has addressed the issue of corruption and religion together in the context of developing but resource rich economies. To fill this gap, this study examines the incidence of corruption and religion for economic performance for several OPEC countries. Statistical methodology relies on panel estimation and simultaneous panel estimation in addition to traditional ordinary leas squares errors regression models. Results show that economic performance (measured by Real Gross Domestic Product) responds positively to less corruption and the dominant religion, especially Islam, in our study. Needless to say, this study also suffers from limitations, regarding the measurement of corruption, limitation of data and possible exclusion of other explanatory variables in the model.

JEL Classification: F2; F21; F23; H2; O16.

Key words: Corruption, Religion, Economic Performance, International Business, OPEC

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1. INTRODUCTION

Corruption in international business has recently emerged as a major public policy issue across the globe. Corrupt practices such as bribing public officials to obtain business contracts and/or favors are not new in human civilization. References to bribery have been noted as early as 300 B.C. In the ancient Indian book *Arthasastra*, written by Chanakya, he mentions the concept of *utkoch*, or bribery. In China, the Qin Dynasty (220 B.C.) understood the concept of corruption and placed heavy penalties for those who were involved in such practices. However, the formal treatment of corrupt practices in the literature is a relatively new phenomenon as it applies to modern industrial organizations. Corruption is conceived as a distorting factor in the function of the economy. It is known to disrupt free and open market economic practices and consequently can lead to a significant reduction in the social and economic well being for the country as a whole. One of the most unfortunate outcomes of corruption is the negative impact on the public's respect for the rule of law, which will impact the structure and stability of society (Mauro, 1995).

In the last half century, the world has experienced a tremendous growth in the area of international trade and investment. However, this growth has also ushered in an era of corruption within international business. The World Bank estimates that five percent of exports to developing countries go to corrupt officials (Moss, 1997). The chairman of the U.S. branch of Transparency International, a non-governmental organization dedicated to combating corruption, has noted that many analysts feel "there has been a gradual escalation in bribery to influence the decision making of public officials. At one point, five percent of a contract price was standard. It has increased gradually until now it's in the twenty to thirty percent range" (Andelman, 1998). If bribery is a burden to international firms, it may be even more costly to the countries where they operate. It has been further estimated that the income lost as a result of corruption is the largest potential source of funding available to many developing countries aside from foreign direct investment (Hamra, 2000).

Incidences of corruption are likely to vary from county to country. Given the legal prohibition against bribery in the U.S. and other OECD countries, and their experience in both implementing

and enforcing such laws, firms in these countries are less likely to engage in corrupt practices to gain an advantage when deciding to invest in a foreign country. On the other hand, developing countries are in many cases just beginning the economic transition or development processes with respect to corruption. Many of these developing countries were under different economic or political structures until the middle of the last century. As a result, most of these countries have weak fiscal rules, weak financial institutions with low credibility, and fewer governmental regulations. Moreover, regulations in many of these countries addressing corruption are also generally regarded as inadequate in their scope and implementation. Therefore, after the introduction to process of economic development, it is likely that corrupt practices are going to continue in those same countries.

Economic agents and governmental organizations around the world are aware of the existences of such corrupt practices in these countries (for example, the Bofor scandal in India, as well as several recent corruption scandals in Bangladesh[1]). In Kenya, "questionable" public expenditures noted by the Controller and Auditor General in 1997 amounted to 7.6 percent of the GDP (Shah and Schacter, 2004). The World Bank has developed a simple formula to describe corruption: C = M + D – A – S where C stands for corruption, M for monopoly, D for discretion, A for accountability and S for salary. Therefore, it would seem that corruption tends to flourish where poorly paid public officials have a lot of discretion to perform monopoly functions with very little accountability. It is no surprise that most of the corrupt countries are perceived to be among the least developed as well as impoverished. The existence of corruption in many developing countries has led multilateral financial agencies such as the World Bank, International Monetary Fund and others to become more cautious about granting aid or approving foreign direct investments in those countries. Similarly, multinational corporations as well as other private firms and organizations have become more concerned about the unexpected outcome of corruption. Non-governmental organizations, such as Transparency International and others have also attempted to address the subject through its annual rankings of perceived corruption among countries.[2]

Understanding the impact of corruption is important because it helps us decide why and how we need to fight corruption. Equally important is to understand what factors contribute most to corruption.

Alternatively, what characteristics and economic indicators can best predict the extent of corruption in a country?[3] How may indicators vary between different sets of countries?[4] Religion may also play a significant role in corruption in addition to the traditional factors such as GDP growth, inflation, per capita income, media freedom etc.[5] By looking at such different attributes of a country, one may be able to make a prediction about to what extent corruption may affect it economically.[6]

Our study focuses on a specific, closely related group of countries with an intention to isolate and measure the impact of corruption. For this purpose we examine the experiences of several OPEC countries (Algeria, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela) for a relative comparison. The OPEC countries are unique because oil constitutes a large part of the economy for all of these countries. The dominance of oil creates a situation where large multinational corporations and large public sector exist side by side. This large public sector has a great deal of control over the economy and this unique dual nature of the OPEC countries suggests that a corruption may play a different role in these economies. Our study also adds to the analysis by looking at the role of religion in this context. A dominant religion in most of these countries is Islam, which typically requires or fosters religious beliefs (such as honesty, thriftiness, work ethics, relatively lower tolerance for corrupt activities etc.), which are inductive to economic growth. Therefore, it is plausible to argue that a higher percentage of Muslims in these countries would be more beneficial to economic growth and higher level of economic wellbeing for the residents than other countries.

The organization of this paper is as follows: the next section presents the hypotheses to be investigated. In Section 3, the statistical methodology and the data used for testing the theoretical propositions are presented. In Section 4, a discussion of the implications of our statistical results is presented. In the final section, the conclusion of the findings and the limitations of the study are presented.

2. PROPOSITION

There has been a significant growth in the volume of trade and investment by multinational corporations and other firms in foreign

countries in the last few decades. For example, the FDI of $60 billion in 1968 increased to more than $6.5 trillion by 2007 (International Financial Statistics, 2009). Thus, the FDI has grown dramatically over the last few decades in many countries, including developing countries. In addition, the FDI has recently become an important factor for the development strategy for many of these developing nations. It is important in terms of job creation as well as changes in the technological infrastructure of the FDI recipient countries. OPEC countries have experienced significant increase in the amount of the FDI in their economy to help them in various economic activities including the petroleum industries (exploration, refinement, sales etc.). Many previous studies have examined the reasons behind the FDI and the choice of host countries with a vast array of results, too numerous to be extrapolated at this point.

The investment decision of firms and the overall activities of the manufacturing sector are likely to be affected by corruption as this sector typically requires permits and/or licenses and is subject to a host of various other rules and regulations to operate. The incidence of corruption (or bribery, in our case) can be considered as an input into the production process. In addition, this sector is subject to an uncertainty (the possibility of getting caught and prosecuted for corruption), and thus, corruption invariably increases the cost of operation for this sector. As a result, output in the manufacturing sector will be lower with the increase in corruption. This theoretical discussion postulates that when an economy contains elements of corruption, it will affect the economy negatively. Improved transparency level will drastically reduce corruption cost and it will lead to a positive effect on the economy. The relationship between economic growth and bribery has been examined extensively in the literature, beginning with Mauro (1995). In general, the studies find a negative correlation between bribery and economic growth (Bardhan, 1997). Fisman and Svensson (2000) use evidence from Uganda to confirm that bribery retards development at the micro level. They studied the relationship between bribe payments, taxes, and firm growth in Uganda for the period 1995-97 and found that a one percentage point increase in the bribery rate was associated with a three percentage point reduction in firm growth. A study by Habib and Zurawicki (2002) looked at aggregate investment flows from seven countries among themselves and eighty two other countries over a three year period (1996-98) and related those flows to the

individual country's CPI. They concluded that "corruption is a serious obstacle to investment." Smarzynska and Wei (n.d.) studied the impact of bribery in a host country on the preference of foreign investors for a joint venture or a wholly-owned subsidiary. They conclude, based on firm-level data, that bribery reduces FDI and shifts the ownership structure towards joint ventures. Sanyal and Samanta (forthcoming), in a study of U.S. outward FDI found that while high levels of bribery in recipient countries discouraged U.S. investment, there were important exceptions. Swaleheen (2007) in a panel study exhibited that investment allocation decisions are affected in a significant way by corruption. More recently, P. Mahagaonkar (2008) provided a firm level empirical analysis in which corruption affects innovative activities negatively.

Religion also plays an important role in the economy.[7] Religious people are often perceived as less concerned about economic well-being and egalitarian in their outlook. Islam for example, also forbids some capitalistic ideas, such as interest on loans, which may dissuade investment by reducing the credit pool in the economy. On the other hand, (as discussed earlier) Islam also recommends people to be more honest, ethical and harder working, which should have positive effect on the economy. Moreover, it is plausible to assume that a country with a large majority of the population following one religion would have less corruption. This is because a lack of religious diversity creates a more homogeneous and often tight-knit community. Close ties within a community can lead to less corruption and more economic growth as citizens attempt to help each other and look out for one another.

Thus, from this simple analysis the following propositions are suggested:

- **Proposition I**: Real Gross Domestic Product of the OPEC countries are likely to be affected adversely by that country's level of corruption.
- **Proposition II**: Real Gross Domestic Product of the OPEC countries is likely to be affected positively by that country's dominant religion.

3. EMPIRICAL METHODOLOGY

In this section, we examine the statistical evidences regarding the relationship between corruption, religion and the economic

performance of the OPEC countries as hypothesized in the previous two propositions. The empirical work is described in several steps: the econometric specification, selection of key independent variables and the estimation results. Based on the previous empirical works, the functional relationship can be formulated as

(1) $Y_{it} = g(X_{it}) + \varepsilon_{it}$

where Y_{it} is a measure of economic performance, and X_{it} is the vector of the corresponding explanatory variables and ε_{it} is the random white noise error term, and i is for i-th country and t is for t-th time period . We develop the following linearized version of (1):

(2) $Y_{it} = \beta_0 + \sum \beta_{it} X_{jit} + \varepsilon_{it}$

where $j = 1, 2, \ldots, K$ are the key explanatory variables.

To estimate this equation (2) statistically, we have collected data for twelve OPEC countries (Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela). While the data is complete for the most part, there is missing data for Ecuador and Angola. Both of these countries joined OPEC in 2007, so the data for value of petroleum exports divided by the GDP was not computed due to insufficient information.

The principal variable of interest in this study is the measurement of corruption. Following traditions (and data availability) we have used the CPI (corruption perception index) as the measurement of corruption. The CPI scores or the Index, based on a survey of surveys, is devised from data collected over the previous three years from a wide variety of sources (www.transparency.org). By being a single composite score, the CPI has increased the reliability of the data of each individual source and best captures the perception of the level of corruption in a country as it affects the international businessperson. The CPI has gained acceptance amongst economists, academics, businesspersons, and the media as a credible measure of extant bribery and corruption. Widely reported in the media when it is announced annually, it should be noted that CPI scores report perceptions of bribery and corruption within countries and not actual levels of bribery and corruption.

The perception is about the extent of bribe-taking among public officials and politicians in individual countries with respect to conducting business. The CPI does not account for bribery in the private sector or other forms of corruption (e.g., electoral fraud). The CPI is computed on a scale of 10.0 to 0.0. A country rated 10.0 means the country is perceived to be virtually bribe- or corruption-free; a score of 0.0 means bribery is rampant. The limitations on data for the corruption perceptions index for these countries forced us to limit the analysis to the years 2003-2007. The other explanatory variables selected in the study are rate of inflation, value of petroleum exports divided by GDP, and percentage of population of the dominant religion.

GDP data was obtained through the World Bank's statistical database. This is relevant as it could theoretically have a positive or negative relation with corruption; and as noted earlier, the primary research proposition is that Economic growth will be higher in countries with a higher CPI score and lower in countries with a lower CPI score. Many developing countries tend to grow at very high rates while they are in the first stages of development. These countries are also prone to corruption, as the structure of the government and other institutions are not sophisticated, and thus are prone to manipulation.

The counter argument would say that countries with Higher Real GDP are more developed and stable. The stable high real income discourages corruption as the institutions are protected by the prosperity of the population as High Real GDP indicates a higher standard of living and this would promote a society where corruption would be less beneficial as the people are well off anyway. It will also be interesting to see how the Higher Real GDP is affected in these particular countries as it is heavily dependent on oil prices. Inflation was calculated as the percentage increase in the GDP deflator from one year to another. Again, the inflation numbers came from the World Bank data source. Inflation numbers are relevant because high inflation creates less purchasing power and makes the people feel poorer and affects their economic activities, which in turn affects the GDP. On the other hand, mild inflation may be conducive to economic growth as it enhances profitability of the firms and encouraging more investment decisions.

As mentioned before, many of the OPEC countries have Islam as the dominant religion. Therefore it is beneficial to take a look at the impact of this religion on the Real GDP of these countries. This

religion variable was originally intended to be measured as a binary variable (following others, such as Barro and McCleary (2003)) for comparing the predominantly Islamic countries (Algeria, Iran, Kuwait, Libya, Saudi Arabia, and the United Arab Emirates) with the countries with no significant Muslim population (Ecuador and Venezuela). However, the inclusion of Nigeria (50% Muslim), Qatar (78% Muslim), and even to a certain extent Kuwait (85% Muslim) have made it valuable to have the variable measured numerically as the percentage of the population that follow the religion of Islam. The religion data was obtained from the CIA World Fact Book 2008, and the percentage has remained more or less constant throughout the relevant time-period; none of the countries have experienced any drastic religious demographic changes over the past five years.

Finally, the study[8] uses the importance of petroleum for the overall economic activities of these countries. For this purpose, it has used the percentage (calculated as the value of petroleum exports divided by the GDP) as the instrumental variable. Previous studies would suggest that a higher degree of the importance of petroleum would lead to more bureaucratic control and regulations over the economy, which in turn may lead to abuse of power and hindering economic activities.

Multiple regression analyses were employed on the sample observations collected from ten of these twelve OPEC countries (Algeria, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela) over the last five years (2003-2007). Angola and Ecuador were excluded, because as mentioned before, these nations only joined OPEC recently, and insufficient data was available for these countries. Thus in our regression model (2) $i = 10$ and $t = 5$. We expect that estimated coefficient of CPI and Religion will be positive, the sign of inflation to be indeterminate and the sign of "importance of petroleum is likely to be negative. SAS software was used for statistical computation

4. ANALYSIS OF EMPIRICAL RESULTS

Basic descriptive statistics for these variables are presented in Table 1. As noted earlier, we do not have complete balanced data, as sample observations for one or more countries are missing (not available). In Table 2, we have reported the cross correlations of corruption perception indices (or CPI) across countries. Some cross

correlations are surprisingly high and significant, implying a possible spillover of corruption across a few countries.

At first, we have estimated the relation (2) by pooling all the data together (for constant coefficient). We used logarithmic transformation of the real GDP and exclude the rate of GDP growth as one of the dependent variables to have more degrees of freedom for our analysis. Logarithmic transformation makes the dependent variable less volatile and to make the estimation more robust, estimation was done following robust errors estimation techniques using Newey-West (HAC) error structure. This simple regression result is shown on Table 3.

TABLE 1
Summary Statistics

Variable	CPI	LRGDP	REL	INF	PETR	VEXP
Mean	3.544	6.743576	0.80	164.6037	42.486	37.96
Variance	1.749	10.102189	0.043	9077.68	241.466	1277.65
Kurtosis	–0.652	–0.7568	2.293	6.8718	–0.5068	9.33
Skewness	0.7853	0.5705	–1.8489	2.348	0.50	2.832
Missing Obs	1	1	0	1	0	0
Sample* size	49	49	50	49	50	50

Notes: * Because of unavailability of a few observations, actual sample observations used in the analysis.
CPI = Corruption Perception Index,
LRGDP = Log (Real Gross Domestic Product),
REL = Dominant Religion,
INF = Consumer Price Index,
PETR = Export of Petroleum product,
VEXP = Export of Petroleum as a percentage of GDP.

TABLE 2
Cross Correlations of the CPI among Countries
(Pearson Correlation Coefficients: Prob > |r| under H_0: $\rho = 0$)

	Algeria	Iran	Iraq	Kuwait	Libya	Nigeria	Qatar	Saudi Arabia	Venezuela
Algeria	1.00000	–0.71938 (0.1707)	–0.48002 (0.4132)	0.81442 (0.0933)	0.9704* (0.0061)	0.86804 (0.1320)	0.69236 (0.1951)	0.48510 (0.4075)	–0.57237 (0.3133)
Iran	–0.71938 (0.1707)	1.00000	0.68228 (0.2044)	–0.40234 (0.5019)	–0.74388 (0.1495)	–0.55460 (0.4454)	0.41961 (0.4819)	0.01568 (0.9800)	0.9277* (0.0231)
Iraq	–0.48002 (0.4132)	0.68228 (0.2044)	1.00000	–0.59508 (0.2898)	–0.61390 (0.2707)	0.00000 (1.0000)	0.78472 (0.1160)	–0.46975 (0.4247)	0.85253 (0.0665)
Kuwait	0.81442 (0.0933)	–0.40234 (0.5019)	–0.59508 (0.2898)	1.00000	0.80374 (0.1012)	0.44023 (0.5598)	–0.9490* (0.0137)	0.8866* (0.0450)	–0.36116 (0.5504)
Libya	0.9704* (0.0061)	–0.74388 (0.1495)	–0.61390 (0.2707)	0.80374 (0.1012)	1.00000	0.96558* (0.0344)	–0.74724 (0.1466)	0.51062 (0.3793)	–0.68192 (0.2048)
Nigeria	0.86804 (0.1320)	–0.55460 (0.4454)	0.00000 (1.0000)	0.44023 (0.5598)	0.96558* (0.0344)	1.00000	–0.44023 (0.5598)	–0.25890 (0.7411)	–0.44023 (0.5598)
Qatar	0.69236 (0.1951)	0.41961 (0.4819)	0.78472 (0.1160)	–0.9490* (0.0137)	–0.74724 (0.1466)	–0.44023 (0.5598)	1.00000	–0.89298 (0.0413)	0.48966 (0.4024)
Saudi Arabia	0.48510 (0.4075)	0.01568 (0.9800)	–0.46975 (0.4247)	0.8866* (0.0450)	0.51062 (0.3793)	–0.25890 (0.7411)	–0.89298 (0.0413)	1.00000	–0.05337 (0.9321)
Venezuela	–0.57237 (0.3133)	0.9277* (0.0231)	0.85253 (0.0665)	–0.36116 (0.5504)	–0.68192 (0.2048)	–0.44023 (0.5598)	0.48966 (0.4024)	–0.05337 (0.9321)	1.00000

Notes: * Implies significant correlation at the 5% level.

TABLE 3
Ordinary Least Squares Estimation

Variable	Coefficient	*t*-stat	Significance	Standardized beta
Constant	2.612785819	1.30642	0.19140864	0
CPI	–0.8133	–3.656	0.0025**	–0.378
REL	5.4766	5.2943	0.0000	0.536
INF	0.0139	2.239	0.0251**	0.418
VEXP	0.0073	1.153	0.248	0.083
R-square	0.473			
F-stat	9.66			

Notes: * Significant at the 10% level and ** significant at the 5% level.

TABLE 4
Panel Estimation (LSDV Model)

Variable	Estimate	*t*-statistics	*p*-value
CPI	0.0832	2.11	0.042**
REL	5.64	22.78	0.000**
INF	0.0007	3.19	0.0029**
VEXP	–0.003	–5.34	0.0000**
CS1	2.713566717	20.10514	0.0000
CS2	7.170287800	54.10450	0.0000
CS3	4.510536403	27.57014	0.0000
CS4	–2.37384	–49.86851	0.0000
CS5	–2.016817120	–13.84041	0.0000
CS6	5.955454935	89.38785	0.0000
CS7	–0.372135910	–5.60964	0.0000
CS8	0.980719590	7.76559	0.0000
CS9	0.000000000	0.00000	0.0000
CS10	3.540964864	28.78987	0.0000

Notes: Test for Fixed Effect Model: F-value: 7501.62 with p-value <.0001.
* Significant at the 10% level and ** significant at the 5% level.
CS1 = Algeria, CS2 = Iran, CS3 = Iraq, CS4 = Kuwait, CS5 = Libya, CS6 = Nigeria, CS7 = Qatar, CS8 = Saudi Arabia, CS9 = UAE, CS10 = Venezuela.

The results in Table 3 exhibit both the CPI and religion. These were important indicators of economic performance as both were significant at one percent. We have found that both Religion and

Inflation have positive signs for coefficients. It indicates that the higher the value of the dominant religion, the higher the level of income in the economy. Since it is measured as a percentage of Islamic population, it implies that as the percentage of Islamic population goes up, the country becomes more prosperous. However, we found that the sign of the CPI is negative, implying higher income associated with more corruption. In addition to the CPI and religion, the rate of inflation was also important for explaining the Real GDP. Although petroleum export as a percentage of GDP (measured as VEXP or Value of Export as a percentage of GDP) has a positive coefficient implying positive correlation with the real GDP, it is not statistically significant. The standardized beta coefficients for each independent variable in the regression models are also reported. Comparing the magnitudes of the beta coefficients, it is clear that religion and inflation are the main determinants of the economic performance; and religion is the most important among the included variables. From the empirical results of Table 3, it is clear that Propositions I and II can be substantiated adequately.

Next we have attempted to run a panel estimation for this set of data. Since the percentage of population of Muslims does not change over the time period; traditional fixed effect estimation cannot be done, as the first difference eliminates the religion factor from the model. So, we have tried to estimate a least square dummy variable model (or LSDV) and random effect model. The result is reported in Tables 4 and 5. F-test for fixed effect model (or LSDV model) is highly significant. Estimated F-value is 7501.62 with a p-value of <.0001. This implies that LSDV model is a more appropriate model when compared to pooled regression model of Table 3. In Table 4, we notice that coefficients of CPI, Religion, and Inflation are positive while that of VEXP is negative; all of them are significant. The most important variable again is religion. The CPI has a positive sign indicating higher Real GDP and less corruption are positively related. VEXP has a negative sign, implying as petroleum export gains more importance in the GDP, Real GDP stagnates. This result clearly supports our two propositions without any doubt. Most of the country-specific effects are positives and significant. For the UAE, the country-specific effect cannot be estimated as it has missing observations.

TABLE 5
Panel Estimation: Random Effect Model

Variable	Estimate	*t*-statistics	*p*-value
CPI	0.0818	2.172	0.029**
REL	7.525	6.018	0.000**
INF	0.00077	3.379	0.0007**
VEXP	–0.003	–5.426	0.0000**

Notes: Hausman test *M*-statistic: 5.87, p-value 0.1117
* Significant at the 10% level and ** significant at the 5% level.

In Table 5, result from random effect panel model is reported. Hausman's *M*-statistic is 5.87 with a significance level 0.1117, implying that the Random Effect Model does seem to be the appropriate model. Thus after conducting the standard multiple tests (Hausman test for Fixed Effect model versus the pooled OLS model, and Random Effect model versus Fixed Effect model), the Random Effect model for panel estimation seems to be the most appropriate model. The estimation results does corroborate the findings of the LSDV model estimation as all four variables are significant and has the same sign as we find in Table 4. In this specified model as well, religion is the most important variable. Thus for both the Fixed Effect model and Random Effect model, statistical results corroborate our initial hypotheses regarding the relationships between corruption, religions and economic performance of these countries.

TABLE 6
Panel Estimation: Fixed Effect Model (First Difference)

Variable	Estimate	*t*-statistics	*p*-value
CPI	0.0832	12.114	0.041**
REL	00.000	0.00	
INF	0.00076	–3.192	0.0029**
VEXP	–0.003	–5.345	0.0000**

Notes: *F*-Test for No Fixed Effects: $F(9, 34) = 4953.76$, p-value <.0001.
* Significant at the 10% level and ** significant at the 5% level.

TABLE 7
Panel Estimation: (SUR Model)

Variable	Estimate	*t*-statistics	*p*-value
CPI	0.532955062	5.55240	0.0000**
REL	6.347412109	13.40051	0.0000**
INF	0.017730797	14.89029	0.0007**
VEXP	0.013140069	2.52506	0.01156785**

Notes: * Significant at the 10% level and ** significant at the 5% level

Next, we analyze the data using the First Difference Regression (FD) model for fixed effect panel and the Seemingly Unrelated Regression (SUR) model. Because of first differencing, the religion variable is eliminated and its coefficient is estimated as zero in the FD model. The results are presented in Tables 6 and 7. In both cases the coefficient of the CPI is positive and significant. The sign of religion is highly significant and positive in the SUR model which clearly supports the contention that Islam as a dominant religion has a positive effect on the economic performance of these countries.

TABLE 8
Ordinary Least Squares Estimation

Variable	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007
Constant	–20.27	–8.05	–3.46	1.79	3.02
	(3.693)	(5.96)	(5.93)	(5.79)	(5.49)
CPI	–0.941*	–.43	–0.47	–0.666	–0.68
	(0.0127)	(0.57)	(.66)	(.78)	(.85)
REL	14.853**	9.27*	7.51*	5.45	4.98
	(0.683)	(2.91)	(3.20)	(3.32)	(3.51)
INF	0.143**	0.06*	0.034*	0.0147	0.009
	0.009	(0.02)	(0.016)	(0.01)	(0.009)
VEXP	0.0094*	0.0073	0.013	0.0145	0.012
	(0.004)	(0.01)	(0.03)	(0.05)	(0.06)
R-square	.984		.64	.53	.47
F-stat	45.61	3.79	2.29	1.43	1.11
	(.005)*	(.08)**			

Notes: * Significant at the 10% level and ** significant at the 5% level.
Standard errors in parentheses.

Next, we have estimated a cross section regression model for each year for these countries separately. The limited data (only ten observations) forced the study to be selective with variables, as there needed to be enough degrees of freedom to make statistical inferences. These empirical results are presented in Table 8. Glancing over the results in this table, it seems that religion is a significant factor for the year 2003, 2004 and 2005, but thereafter it is not highly significant for determining the level of economic performance in those countries. However, the estimated t-statistic value is greater than one, implying it has some explanatory power even in the years 2006 and 2007. However, the CPI and VEXP do not have significant impact on the economic performance of these countries.

TABLE 9
Simultaneous Panel Estimation (LSDV Model)

Variable	Estimate	*t*-statistics	*p*-value
CPI	0.469390905	1.43057	0.16142164
REL	3.262615767	1.61233	0.11587339
INF	0.001169039	2.04498	0.04843293**
VEXP	–0.004012231	–2.95638	0.00554174**
CS1	3.948081423	3.74888	0.0000
CS2	8.375978887	8.14080	0.0000
CS3	5.936480685	4.86505	0.0000
CS4	–2.203843493	–13.11482	0.0000
CS5	–0.673861688	–0.58847	0.55999791
CS6	6.377845317	17.13801	0.0000
CS7	–0.827821115	–2.08054	0.04486079
CS8	2.042856285	2.24201	0.04486079
CS9	0.000000000	0.00000	0.0000
CS10	2.596139312	3.18030	0.00307657

Notes: *J*-specification (1) = 0.017893.
Significance level of *J* = 0.89358831.
Durbin-Watson statistic = 2.016093.
* Significant at the 10% level and ** significant at the 5% level.
CS1 = Algeria, CS2 = Iran, CS3 = Iraq, CS4 = Kuwait, CS5 = Libya, CS6 = Nigeria, CS7 = Qatar, CS8 =S audi Arabia, CS9 = UAE, CS10 = Venezuela.

In our last statistical analysis, we have considered a simultaneous panel model for estimation. It is often suspected that there exists simultaneity among the corruption index and real GDP in an economy. It means there is a possibility of two way causality between the CPI and the real GDP.[9] In that case, the estimates and statistical results become unreliable. In order to alleviate that problem, we have used instrumental variable estimation in the context of panel data. We have used media freedom, constant, value of the exportable petroleum product as the additional instruments in our analysis. We have used RATS Version 7.0 to estimate the simultaneous panel model and the results are reported in Table 9.

The traditional test statistics is Hansen's *J*-statistic for over identifying restrictions; to test whether the model is correctly specified and the instruments are valid. Following Roodman's assertion, the *J*-statistic is used as a specification test and models with Hansen's *p*-value higher than 0.25 are considered well-specified. Our *J*-specification test statistic is 0.017893 with a significance level of *J* as 0.89358831. It indicates that the model is properly specified with appropriate instruments. Examining the results from this table we notice that neither the CPI nor Religion is statistically significant at 10% level. For Religion, the *t*-statistic is 1.612 with a *p*-value of .115 (very close to being significant) and for the CPI, the *t*-statistic is 1.43 with a *p*-value 0.16. But for both *t*-statistics, absolute values are well above one, and signs of the coefficients are positive. This, in a sense, is corroborating our hypothesized propositions. Inflation has positive sign and VEXP has negative sign which are quite similar to what resulted from our other estimation techniques.

Thus, our overall evaluation of the empirical results reported in Tables 3–8, indicate that the CPI has a significant positive effect on the real gross domestic product in these OPEC countries. Similarly, religion has a significant impact on the real gross domestic product, indicating Islam as a dominant religion with a significant positive effect on the economy. For these countries, the Islamic religion is a positive factor, not a negative factor as often portrayed in the general media and communications.

It can also be inferred from this empirical evidence that there are many other factors affecting or influencing economic performance in these petroleum exporting countries, which are not included in our model. However, among the variables included in this research, the

level of corruption and dominant religion as a percentage of population in those countries were our main interest. Considering all the empirical results, it appears that both the level of corruption and Islam as the dominant religion are very important determinants of the economic performance and economic growth in these countries. For the country specific effects, the results are somewhat mixed. For most of the countries, within these countries, individual attributes have a positive effect on the domestic economy. For Algeria, Iran, Iraq, Nigeria, Saudi Arabia and Venezuela effects on these countries are positive and statistically significant. For Kuwait, Libya and Qatar, country specific effects are negative and significant. Overall, the results of our study are quite in line with few other studies in the context of FDI and economic growth in developing countries.[10]

5. CONCLUSION AND POLICY IMPLICATIONS

The major findings of this paper conclude that bribery (or corruption) and economic growth impact each other both in a unidirectional and simultaneous manner. It was also found that there exists a strong positive effect of the dominant religion of Islam on the economic performance of these countries. The empirical findings are quite consistent with our hypothesized propositions. The findings suggest that the OPEC countries should make the utmost effort to root out or reduce corruption in their economic and administrative infrastructure if they wish to enhance the rate of economic growth and improve their economic well being.[11] One of the major implications of this finding is that national governments need to pay attention to the prevalence of corruption in conducting business in its territories and how the country is perceived by the rest of world on this metric. Reducing the corruption goes a long way to increase the competitive edge of these countries.

A second implication is that for businesspersons and foreign investors, Islam as a dominant religion is not an impediment for economic activities (as is often implied in the mainstream media), but rather it can be considered a conducive factor for economic growth. It sends out a very meaningful signal about the OPEC countries that Islam is not against economic development. These two signals influence decisions on where to invest or where not to invest and thus provides for a more informed assessment of country risk and the cost of doing business.

This study also suffers from limitations, as the measurement of corruption is the one based on perception of corruption and not the actual level of corruption. There exists also the possibility that other important relevant economic variables may have been omitted in our regression equation.[12] Limitations of data create other problems. It is difficult to obtain consistent data for these OPEC countries with the relevant independent variables. However, this can be rectified in the future work, when newer and larger sets of data are available.

ENDNOTES

1. "People pay TK 6796Cr in bribes a year," The Daily Star, April 21, 2005. 38% global firms asked to pay bribes in India: study, Times of India, October 16, 2007.

2. Pricewaterhouse Coopers launched a new "Opacity Index" in 2000, to examine aspects of Business practices other than corruption in countries. "To Fight corruption, One African Offers Presidents Cash", Editorial Observer, New York Times, Nov 24, 2006.

3. Sanyal and Samanta (2002) confirmed Husted's (1999) findings and found that in addition to per capita income, income distribution was another significant economic factor to impact corruption. Similarly, Getz and Volkema (2001) found that bribery in a country was related to wealth and so was power distance and uncertainty avoidance. Uncertainty avoidance moderated the relationship between economic adversity and bribery. Thus, there is an empirical basis to suggest that certain economic and cultural factors determine perceived levels of bribery. Sanyal and Samanta (2004) have also found that economic freedom and level of human development are associated with levels of perceived bribery in a country with open economies and high level of human development inversely related to bribery.

4. Marko Danon (2010) has presented a nice summary about the contemporary Research of Corruption

5. Pleskov and Samanta(2010) found that dominant religion has positive impact on corruption index.

6. Although it has been established that corruption is costly, its impact on the economy is not uniform. According to Asian Development Bank, "some countries can tolerate relatively high levels of bribery and graft and continue to maintain respectable rates of economic growth, whereas others cannot"

7. See Barro and McCleary (2003).

8. The study also considered another independent variable, Media Freedom; that may be used as an instrument for corruption. Media freedom is measured by "Reporters without Borders" and is an index designed to measure the amount of freedom the press has in a country. The index "reflects the degree of freedom that journalists and news organizations enjoy in each country, and the efforts made by the authorities to respect and ensure respect for this freedom." It is calculated through a detailed questionnaire completed by various correspondents and partnering organizations throughout the world. A high degree of press freedom would likely decrease the degree of corruption in a country. A free press is more likely to expose corruption and thus make it more difficult for the culprits to get away with their offenses. Therefore, it is surmised that CPI may capture the essence of media freedom indirectly.

9. C. Delavallade (2006) examined empirically the impact of corruption on the government spending which affects GDP and concluded that corruption distorts government spending

10. For example, Lemi and Asefa (2001) conducted an investigation regarding FDI flow and uncertainty in the context of African countries and they have concluded that impact of uncertainty on FDI flow is insignificant. They have pointed out that many other factors such as labor, trade connection, External debt etc. may also affect the FDI flow capital formation in these countries. This is also true for our study.

11. The World Bank's report Doing Business 2007: How to Reform ranked 175 countries on the case of doing business, most of these countries rank pretty low.

12. It seems that omitted independent variables are not likely to be correlated with CPI, so the coefficient estimate of the index of corruption is likely to be unbiased.

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