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Article

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The Correlates of Terms of Trade in Oil Exporting Countries of Gulf Cooperation Council Region

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ABSTRACT

Terms of trade is associated with the gains from trade and subsequent economic welfare for a nation. Previous studies on terms of trade for oil exporting countries particularly investigating for a favorable terms of trade are missing. The study applies the Fixed Effect model on a panel of six oil producing countries of Gulf Cooperation Council for the period 2008 to 2016 and find that oil price is negatively associated with terms of trade, albeit weakly. Terms of trade is positively associated with economic growth; hence this study refutes the Prebisch-Singer hypothesis for these countries. Moreover, terms of trade is positively associated with trade opens and are not significantly associated with institutions, exchange rate and inflation. The results imply that these oil exporting countries have to reduce their dependence on oil price to attain favorable terms of trade through diversification of the export basket. Also further integration with the world economy through higher trade openness will help these countries to improve their terms of trade. This examination of factors impacting the terms of trade of oil exporting countries of GCC happens to fill a gap in the existing literature.

Keywords: Terms of Trade, Oil Price, Economic Growth, Trade Openness, Institution, Oil Exporters
JEL Classifications: F14, Q43

1. INTRODUCTION

A favorable terms of trade represent that an equal and proportionate increase in the export price over the imports, while the deterioration in the terms of trade represents the fall in the export price over the imports. Deterioration of the terms of trade reduces the economic welfare of the nation. The worsening terms of trade is considered as the reason for non-proportionate gains from trade, biased against the developing countries. The contemplation of this problem is significant to shape up the "inward" or "outward" trade strategies of various developing countries. It has even led to the demand for a new international economic order, ensuring equality in terms of sharing the benefits of trade.

This debate originated after the seminal works of Prebisch (1950) and Singer (1950) based on a United Nations study on United Kingdom (UK) which opined that the terms of trade of the third world countries continued to deteriorate over the long run since they are specialized in the production and export of the primary products. This formed the Prebisch-Singer hypothesis which highlighted that the demand is less elastic of primary products in general and agricultural products in particular demand than manufactured goods exported by developed countries. This make the terms of trade of primary product exporting countries to deteriorate, overtime.

But, the Prebisch- Singer hypothesis has been criticized it on the various grounds, like, an improvement in the quality of the manufactured products over the primary products. Also, this is based on the assumption that developing countries focuses their exports on the primary products, while the developed countries on the manufactured products, which may not be completely

true. It also observed that the demand for the primary products in the manufacturing sector has reduced because of increase of the synthetic raw materials and efficient use of the technologies in the processing of the raw materials (Salvatore, 1990).

Regarding terms of trade, past studies have estimated positive, negative and no secular trends when using different time periods, definitions, and estimation methods (Hadass and Williamsons, 2001). Such studies exclusively on oil exporting countries are meager. Also, there is a research gap in terms of studies which identifies the determinants of movements in terms of trade in countries, particularly for oil exporting countries of Gulf Cooperation Council (GCC) countries. In this paper we attempt to study the correlates of terms of trade for six oil exporting countries GCC countries.

The six countries of GCC countries primarily export oil. Crude oil's long-term trend of real price of crude oil is different than primary commodities (UNDP, 2015). As countries react differently to oil price shocks as compared to other shocks (Backus and Crucini, 1998) and also it has great many macroeconomic implications (Dibooglu and Aleisa, 2004). Terms of trade of oil exporting and non-oil exporting countries behave differently (Grilli and Young, 1988). These six countries are Rent seeking in resource rich countries classified as developing economies by United Nations in its World Economic Situation and Prospects (WESP) reports.

2. LITERATURE REVIEW

The main objective of this study is to study the correlates of term of trade of oil exporting countries. The price of oil is an important factor to determine the terms of trade of the oil exporting countries. Oil prices have an important effect on the trade related aspects of oil exporting country. An increase in oil prices creates the surpluses at the current account balances for the oil exporting countries where as the deficit in the current account balances for the oil importing countries (Golub, 1983). The benefit of the increase in the oil prices is summarized as an increase in the export revenue and import demand for the oil exporting countries leading to current account surplus of these countries. This also leads to an increase in the import of oil exporting countries which contributes to make an adjustment over the global trade. As the elasticity of import with the domestic activity is greater than one therefore, an increase in oil price is offset by an increase in the export to the oil exporting countries (Kamps and Beck, 2009). In oil-exporting countries namely Iran, Jordan, Algeria, Ecuador, Nigeria and Venezuela, the terms of trade, is strongly based on oil prices (Naziri et al., 2015).

Trade openness is export plus import of a country divided by its gross domestic product (GDP). It reflects upon the volume of trade in a country. Trade openness leads to an increase in investments and economic growth (Razin et al., 2002). The exports and imports of oil exporting country like Saudi Arabia was found to be cointegrated (Haque, 2015). Trade openness facilitates the movement of the goods, services, technologies and foreign direct investment among the various countries. The positive relationship of the trade openness and terms of trade is also supported by Shahbaz (2012) and Mputu (2016). It not only reduces the cost of the production by the use of the advanced technology but also it makes the availability of the goods at the cheaper rate for the consumers. Trade openness is one of the important factors to accelerate the economic growth (Vespignani et al., 2019,) However, it is also advocated that the trade openness is an instrumental to improve the terms of trade, which make its multiplier effect to promote the domestic investment in human and physical investment to economic growth (Dabús and Delbianco, 2019).

The role of institutions in terms of trade as the engine of the growth cannot be underestimated. The quality of the institutions is treated as the source of the determinants of the pattern of trade and making comparative advantages among the various trading partners (Levchenko, 2004). Though previous studies on institutions and its relationship with terms of trade for oil exporting GCC countries is missing, but the countries whose bureaucracies and legal systems are strong are less affected by the oil price shocks (Mehlum et al., 2005; Rickne, 2009). Due to the poor quality of the institutions low income countries export volumes are <74% than the high-income countries. Quality of institution impact gains from trade (Francois and Manchin, 2013). Rent seeking in resource-rich countries lead to weak institutions (Frankel, 2010). Poor institutional quality in countries involved in natural resource extraction leads to conflict and corruption (Álvarez et al., 2018). Further, abundance of natural resource positively impacts economic growth only after the institutions have received a particular level of quality (Shadrokh and Zamanzadeh, 2018).

The fluctuation in the terms of trade is considered as an important source of the volatile inflation. The terms of trade have no impact on the inflation (Gruen and Dwyer, 1995). The literature does not support the unanimity of the relationship between inflation and terms of trade (Murshed, 2018). The study with respect to Bangladesh, found that in the beginning an improvement in the terms of trade increases the inflation but it does not sustain with the time and in the last it becomes the negative. However, the study failed to establish the long run relationship between inflation and terms of trade. Other studies also opined that an improvement in the terms of trade may increase or decrease the domestic inflation (Gruen and Shuetrim, 1994). Another study by Tagliabue (2005) opined that an increase in the expected rate of the inflation lead to an expansionary monetary policy. It reduces the demand for money and increases the demand for the capital goods and finally deteriorates the terms of trade. An improvement in the terms of trade results in the appreciation of the exchange rate and has a favorable impact on inflation (Ijaz et al., 2014). The volatile terms of trade provided uncertainty in the economy and forced to lower down the inflation through decline in investment and aggregate demand (Desormeaux et al., 2010).

Exchange rate is another important variable associated with terms of trade. The changes in the real exchange rate are less than half of terms of trade as estimated by Gruen and Wilkinson (1991). The volatility in the terms of trade is an important determinant of the changes in the real exchange rate and changes in the price of the non-tradable. The real exchange rate is affected by the terms

of trade, mainly through the income effect (Gregorio and Wolf, 1994). The volatility in the terms of trade accounted for the half of the variations of the GDP and real exchange rate (Mendoza, 1995). The flexible exchange rate has small effects on the deterioration of the terms of trade because fluctuations in the exchange rate absorb the shocks of the terms of trade. However, these absorptions are missing under the fixed exchange rate system. Therefore, the deterioration in the terms of trade ends with the contraction of the output under the fixed exchange rate system (Broda, 2004). There is a long run stable relationship between real oil prices and real exchange rate of the oil exporting countries (Jahan-Parvar and Mohammadi, 2011).

Unfortunately, studies on the terms of trade of oil exporting countries of Gulf Cooperation council (GCC) are meager. In one of the related studies Dibooglu and Aleisa (2004) investigated the effect of the oil price shocks on the oil exporting countries. They find out that there is a sizeable impact of the oil price shocks and the terms of trade shocks of Saudi Arabian economy for the period during 1980-2000. The fluctuations in the oil prices not only made vulnerable to the terms of trade but also, they are responsible for the short run shocks in the trade balance, and the aggregate demand and supply. The long run movement in the prices of oil is explained by monetary shocks in the short run and real prices in the long run. The volatility of the terms of trade of these countries is stabilized by nominal price of oil in the short run.

In some of the recent empirical studies, terms of trade is positively associated with economic growth and terms of trade in Pakistan for the period 1990-2008 (Fatima, 2010); in Columbia for the period 1994-2011 (Hernandez, 2011); and in Sub-Saharna African countries for the period 1985-2010 (Awel, 2010). While Naziri et al., 2015 in their study for the period 1980-2010 refuted the Prebisch-Singer hypothesis for certain developing countries exporting agricultural products namely: Bangladesh, Pakistan, Argentina, Brazil, Colombia and Indonesia. But for oil-exporting countries namely Algeria, Iran, Jordan, Nigeria, Venezuela and Ecuador, the terms of trade, depend strongly on oil prices. However, there is a literature gap in terms of studies, which identifies the determinants of movements in terms of trade in countries, particularly for oil exporting countries.

3. DATA AND METHODS

The study uses a panel of six countries of the Gulf Cooperation Council (GCC) countries namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. These are primarily oil exporting countries. The study plans to study the impact of oil prices and GDP on terms of trade for the period 2008-2016. The data is analyzed using Stata12. Further, the study considers trade openness and institutions, exchange rate, and inflation as the control variables and attempts to check their impact on terms of trade. All the data is taken in long term.

Oil price data is of Arabian light variety taken Saudi Arabian Monetary Agency (SAMA). The data on institutional quality is taken from International Country Risk Guide (ICRG). The components on ICRG are "Government Stability, Socioeconomic Conditions; Investment Profile; Internal Conflict; External Conflict; Corruption; Military in Politics; Religious Tensions; Law and Order; Ethnic Tensions; Democratic Accountability; and Bureaucracy Quality" It basically measures political, financial and economic risks. Unfortunately, the data post 2016 is not available for the GCC countries.

All the data on the remaining variables is taken from World Development indicators (WDI). It defines net barter terms of trade index as the "percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000." Trade openness is the "sum of exports and imports of goods and services measured as a share of gross domestic product." The study uses inflation measured through consumer price index; and exchange rate measured by real effective exchange rate. The study uses gross domestic product (GDP) at constant prices as a proxy for economic growth.

Regarding the methods, this study plans to use, Pooled OLS, fixed effect and random effect model. Pooled OLS model assumes that there is no cross section or time series effect and hence OLS gives efficient and consistent parameters. The general equation is:

$$Y_{it}=\beta_0+\beta_1 X_1+e_{it}\ (ui=0)$$

u_i stands for cross-sectional or time specific effect.

Fixed Effect model helps in analyzing the impact of variables over item. It studies the association between the independent variables and the dependent variable within the country. Every individual country has its own features which may or may not be impacting the dependent variable. Like an increase in oil price are leading to an increase in terms of trade in one country, while it may be leading to a decrease in terms of trade in another country. The model assumes that the factors within a country which can influence the outcome variable and this is what the fixed effect model strives to control. The model attempts to remove the impact of these time-invariant characteristics so that only the net impact of the independent variable on the dependent variable is assessed. This model also assumes that the time-invariant characteristics are unique to each country and are not to be associated with other features. Each country is different because of which the error terms are not correlated with other country's error terms. If the error terms are correlated for different the fixed effect is not suitable.

The fixed effect model is of the form

$$Y_{it}=\beta_1 X_1+(\beta_0+u_i)$$

Here the null hypothesis is that
H_0: $u_1=0$;
H_A: $u_1\neq 0$;

The F-test checks that all $u_i=0$. As the null hypothesis is rejected, then it iimplies that there are some fixed effect.

Next, the study estimates the Random Effect model. In this model the variation across countries is assumed to be random and not-correlated with the independent variables. This model is suitable when there are chances that the difference across countries may impact the dependent variables. This model includes time invariant

properties which were included in the intercept term in the Fixed Effect model. This model further assumes that the error terms are not correlated with the independent variables hence it allows time-invariant variables as explanatory variables.

When it can be strongly assumed that there are no omitted variables or at least that the omitted variables are not related with the independent variables then Random Effect model is aptly suited. But if there are omitted variables which are correlated with the variables of the model, then Fixed Effect model is suited for omitted variables as it is assumed that the impact of omitted variables will be fixed or constant. Towards this it is necessary that the omitted variables have time-invariant values with time invariant effects. Fixed Effect model does not work properly when the variables do not change over time as it does not estimate the effect of variable whose values do not change overtime whereas Random Effect model estimates the effect of time invariant variables.

As both the fixed effect and random effect model is significant hence Hausman test is applied to choose the preferred model. Here the null hypothesis is that the random Effect model is appropriate and the alternate hypothesis is that the Fixed Effect model is appropriate. Finally, Pesaran's test of cross sectional independence is done to check for the problem of serial correlation.

4. EMPIRICAL RESULTS

Figure 1 below portrays the net barter terms of trade data for the six GCC countries. Barring Bahrain, all the countries exhibited strong fluctuations in their net barter terms of trade. In fact, after 2012, there is sharp decline in the terms of trade. The oil prices in USD per barrel were 95.16 in 2008, 61.38 in 2009, 77.82 in 2010, 107.82 in 2011, 106.53 in 2012, 97.18 in 2014, 49.85 in 2014, and 40.96 in 2016. Though the oil prices are fluctuating but the significant decline happened only after 2014, while the terms of trade deteriorated significantly after 2012 itself. Also, during this period the GDP of all the six countries has increased though there is a deterioration of terms of trade. It is expected that econometric analysis would give further insights into the relationship of terms of trade with the oil price, GDP and other variable under study.

The results of panel data models are summarized in Table 1. The variable oil price, trade openness, and GDP is significant across all the three models. The variables, exchange rate and inflation are not significant across the three models. And the variable institution, is significant in Pooled and Random Effect model but not significant in Fixed Effect model. The F-ratio for Pooler OLS model, Wald's statistics for Random effect model and F test (that all u_i=0) for Fixed Effect model, all are significant indicating that the entire model are correctly specified. Pooled OLS model not preferred as it assumes no cross section or time series effect.

Out of the three models, the study needs to identify the best model to estimate the relationships. Pooled estimate is ignored as it does not consider cross section and time series effects. The study needs to choose between random effect and fixed effect models. Both these models are suited for panel data. As the Hausman's test has a $P < 5\%$, hence this study accepts the fixed effect model over the random effect model. Lastly, the results of Pesaran's test of cross sectional independence indicate that the model is free from the issues of serial correlation.

The results of Fixed Effect model indicates that GDP is positively relate with terms of trade. A 1% increase in GDP leads 3.7% increase in terms of trade. This implies that overtime, with the increase in economic growth, the terms of trade do not deteriorate as hypothesized by the Prebisch-Singer hypothesis. This result is similar to the findings of (Fatima, 2010); (Hernandez, 2011); (Awel, 2010) and Naziri et al. 2015 for other developing countries.

The results also indicate that oil price is negatively related with terms of trade. As oil price increase there is deterioration in terms of trade and vice versa. The result of this study contradicts the findings of Naziri et al., 2015 and Dibooglu and Aleisa (2004) that the terms of trade for oil exporting countries are strongly dependent on oil prices. In the current study the coefficient of oil price is very small (−0.0001).

Trade openness is positively related with terms of trade and this relationship is significant. As the level of trade openness increase, the terms of trade also improve. The result of this study is similar

Figure 1: Terms of trade of individual countries

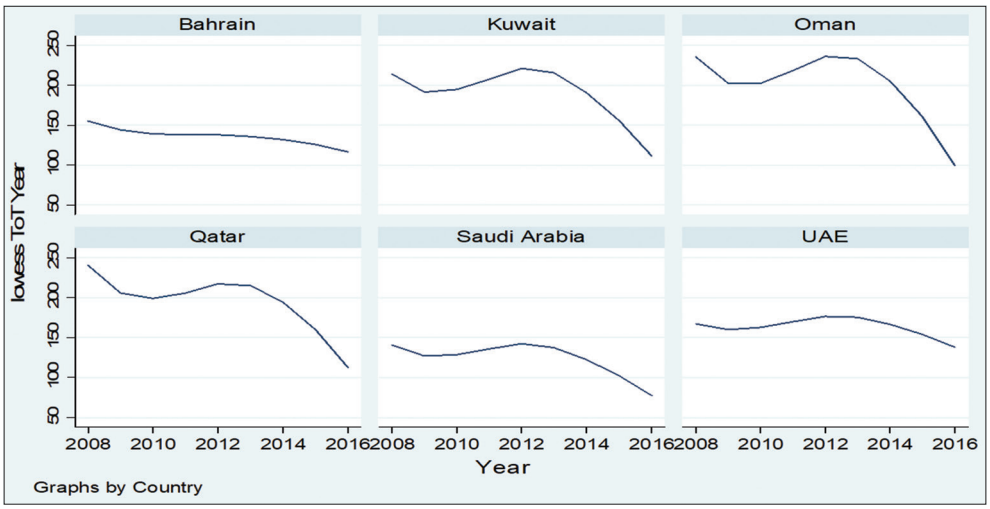

Table 1: Results of panel data analysis

	Pooled	Random	Fixed
Ln (oil price)	0.000134 (0.702)	0.000134 (0.700)	−0.0001915 (0.027)
Ln (trade openness)	−0.000162 (0.742)	−0.000162 (0.740)	0.0009553 (0.001)
Ln (Institutions)	−0.0060724 (0.020)	−0.0060724 (0.016)	0.0006954 (0.360)
Ln (exchange rate)	−0.0001936 (0.235)	−0.0001936 (0.229)	−0.001429 (0.368)
Ln (Inflation)	−0.0000826 (0.512)	−0.0000826 (0.509)	0.0000045 (0.843)
Ln (GDP)	0.038314 (0.000)	0.038314 (0.000)	0.0378303 (0.000)
Constant	2.287495 (0.000)	2.287495 (0.000)	2.267404 (0.000)
Number of observation	54	54	54
R-sq	0.99	0.99	0.99
F-ratio of pooled OLS		18472.72 (0.000)	
Wald's test, in RE model		110836.35 (0.000)	
F test that all u_i=0, in FE model		13.93 (0.0305)	
Hausman's test		308.02 (0.000)	
Pesaran's test of cross sectional independence		−0.640 (0.5221)	

Source: Author's calculation

to Shahbaz, 2012; Mputu, 2016; Dabús and Delbianco, 2019. This indicates that more integrated is the country with the other countries, more advantageous is the terms of trade of the country.

Institutional quality is not significantly associated with terms of trade of these GCC countries. This indicates that institutions are not yet effective in facilitating improvements in terms of trade for these oil exporting countries. This result is similar to the finding of Mehlum et al., 2005; Rickne, 2009 which finds no relationship between terms of trade and institutions. Exchange rate is also not related with terms of trade. Past studies have found terms of trade and exchange rate to be related Gregorio and Wolf (1994) and Mendoza (1995). The plausible reason could be the pegging of exchange rates of these countries to the US dollar and also US being the major trade partner for these GCC countries. Inflation also happens to be insignificant variable. Past literature does not support a unanimous agreement on the relationship between inflation and terms of trade as improvements in the terms is associated with both of increase or decrease the domestic inflation (Gruen and Dwyer, 1995; Murshed, 2018).

5. CONCLUSION AND POLICY RECOMMENDATIONS

The study concludes that for the sample period under study, the Prebisch-Singer hypothesis does not hold true for the six oil producing countries of GCC, as terms of trade is positively associated with economic growth. Oil price being negatively related with terms of trade has important implications for oil producing countries. The more a country depends on the price from oil; the unfavorable will be the terms of trade. These countries need to further integrate with the world economy through increased trade openness. Another implication is that these oil exporting countries have to go for export diversification. They have to diversify their export basket as the current dependence on oil price is having a negative association with their terms of trade.

Though institutions are not significantly associated with terms of trade in this study but institutions do have a role in the economic growth and development of a country. This is where these oil exporting countries have to strive to improve the quality of their institutions so that it significantly contributes to economic growth. Also, inflation is not related with oil exporting countries, these oil exporting countries can strive to improve their terms of trade without fearing an increase in inflation. The results indicate that oil exporting countries are a different from both developing and developed countries with respect to terms of trade. The study opines that a broader analysis needs to be done incorporating a bigger sample of oil exporting, countries in the Middle East and North African region including Nigeria, Iraq and Iran.

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