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Impact of Fluctuations in Oil Prices on Libyan Economic Growth

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Abstract

This paper examines the impact of fluctuations in Libyan oil exports on Libyan economic growth. The paper uses "export as an engine of growth model". Such a model is applied to total output as well as sectoral outputs. However, this study uses a Koyck distributed lag scheme. The paper also uses cointegration analysis to examine the long-term trade relationship between Libyan GDP and its oil exports. The results suggest that are spread effects from oil exports to the rest of the economy. However, when both the component and inflationary effects are excluded (but not the real gain from the rise in export prices) the results suggest no evidence of spread effects. This conclusion is supported by sectoral output analysis. Results of cointegration analysis suggest that there is no long-term relationship between Libyan oil exports and non-oil GDP. In other words, the two variables do drift too far apart from each other over time.

JEL Classification: F1

I
Introduction

Over 50 percent of world supply of crude oil is produced by developing economies. The bulk of this production is supplied by developing countries who are members of the OPEC organization. These members are: Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, Unit Arab Emirates and Venezuela.

Libya has been exporting oil for quite a time. The share of Libya is approximately 6 percent. Hence it would be useful to investigate the role of oil exports in the process of Libyan development.

Table 1 reveals the significance of oil exports in Libya over the past four decades. In 1963 oil exports amounted to about 99.7 percent of total community exports and 97.9 percent of total exports of goods and services. These percentages were reduced slightly over the following 42 years. They amounted to 95.8 percent and 94.4 percent in 1981 and to 92.3 percent and 90.6 percent in 2004.

Table 1 also shows that in 1963 oil exports were responsible for over 47 percent of GDP. This percentage changed significantly over the

following four decades due to changes in oil prices. Thus, in 1974, following the oil embargo, the percentage of oil exports to GDP increased to approximately 63 percent. At the end of the oil boom in 1981, the percentage of oil exports to GDP was reduced to the same level as before the boom. The share of oil exports to GDP went to its lowest level (20.6 percent) in 1998, when oil prices were very low (less than US$10 per barrel).The sharp rise in oil prices in 2004 pushed this percentage to its highest level (65 percent). Finally, Table 1 shows that oil exports per capita was the highest in 1974 and the lowest in 1998.

Table 1: Significance of Oil Exports in the Libyan Economy

	1963	1974	1981	1998	2004
Value of oil export (in US dollars)	370	8257	14930	5612	18653
Oil exports as % of total commodity exports	99.7	99.6	95.8	93.0	92.3
Oil exports as % of total exports of goods and services	97.9	95.9	94.4	91.6	90.6
Oil exports as % of GDP	0.47	62.9	47.0	20.6	65.0
Oil exports per capita (US dollars)	2238	3523	4684	1100	3249

Actually, if per capita income was to be used as the yardstick of economic development, then Libya, in 1974, would have been considered as a developed country. Its per capita GDP in that year was greater than that of the United Kingdom and was more than twice the average for all developing market economies. However, the situation in 1998 was completely the opposite of that in 1974.

This paper tries to examine the impact of fluctuations in Libyan oil exports on Libyan economic growth. It is divided into six sections. Section two compares the rates of growth of Libyan oil growth and Libyan non-oil sectors over the last four decades. Section three examines the relationship between exports and Economic Growth in the Libyan economy. The response of sectoral output to expansion in oil exports is examined in section four. Section five tests if there is a long-term relationship between Libyan oil exports and non-oil GDP. *Section six* summarizes the main findings of the study.

II
Rates of Growth of Libyan Oil Exports and Non-oil Sectors

The impressive increase in Libyan GDP has taken place after the oil embargo in 1973 and the consequent export price rises, It is therefore, attributable to the performance of the export sector and especially to the increasing oil prices.

Table 2 represents estimates of the (constant proportional) rates of growth over the four periods that experienced fluctuations in oil prices since 1963. Four periods were distinguished:

1963 – 1973
1974 – 1981
1982- 1998
1999 - 2004

The first and third periods represent the years of relative stagnation in oil prices while the second and forth periods represent substantial increases in oil prices. The growth rates were calculated using the regression model:

$$\text{Log}_e Y_{it} = b_0 + b_1 t + \mu_t \qquad (1)$$

Where $Y_{i,t}$ represents the output of the ith sector country in period t and t represents time. .The coefficient b_1 represents the proportional (constant) rate of growth i.e.

$$b_1 = [(d M / d t) / M] \qquad (2).$$

The data in Table 2 suggest that the rates of growth of output of Libyan oil exports and output of non-oil sectors (*assessed in current values and measured in US dollars.*) were greater (in most cases during the period 1963-1973 when oil prices were very low (less than US$3 per barrel)) than during other periods. This may be due to the fact that the initial values were too small. The data in Table 2 also suggest that growth rates of all Libyan sectors were much higher during the period of oil boom (1974-1981) than during the period of oil recession (1982-1998). Because the Libyan Dinar was highly devaluated against the US dollar since 1999, the values of sectoral output , measured in US dollars, had declined significantly over the period 1999- 2004. As a result, the growth rates of all sectors were negative during that period, despite the fact that oil exports (measured in US dollars) during the same period, enjoyed a very high rate of growth. When measured in local prices, all Libyan non-oil sectors, with the exception of agriculture and trade, had a zero rate of growth. This suggests that the Libyan economy did not benefit from the growth in its oil exports during the last few years

Table 2
Rates of Growth of Libyan Sectoral Output
(Percentages)

Sector	1963-73	1974-81	1982-98	*1999-2004**	1963-2004
Oil Exports	20.6	13.6	- 2.65	13.4	5.44
Total Non-Oil Output	18.5	17.4	1.85	-20.0	7.99
Agriculture, hunting & fishing	11.7	16.1	9.07	-13.0	10.5
Manufacturing	13.6	20.6	4.66	-13.8	10.5
Construction	28.1	14.1	-4.96	-9.78	6.47
Wholesale & Retail Trade	21.1	17.5	5.36	-13.4	9.38
Transport & Communication	32.1	14.6	4.75	-13.2	9.79
Other activities	18.4	15.3	0.00	-13.8	7.81

* The rates of growth of Libyan non-oil sectors during the period 1999 – 2004, where output values are measured in local currency rather than in US currency; are: 0.00, 3.84; 0.00; 0.00, 2.76, 0.00, 0.00

III
Relationship between Exports and Economic Growth

The mechanism by which exports could act as an 'engine of growth' (or leading sector) and the determinants of the overall impact of an export stimulation on the economy have been well discussed in the literature (Baldwin, 1965; Bhagwati et al., 1971; Chambers and Gordon, 1966, Esfahani, 1991; Erazy, 1967; Frankel, and Romer, 1996; Lee , 1989, Metwally, and Tamaschke, 1980, Metwally and Abdel-Rahman, 1985; Metwally, 2004; Ram, 1987; Riedel,1984; Severn, 1968; Srinivasan, 2001, Syron. and Wassu, 1968, Tamachke, 1979 and.Watkins, 1977).

Exports contribute to economic growth directly (through direct contributions to Gross Domestic Product) and indirectly through contributions to GDP per medium of spread (or carry-over) effects. The indirect contribution to growth embraces Hirschman-type linkages and can broadly be considered as a sequence of multiplier-accelerator mechanisms (Hirschman, 1958).

Theoretically indirect contributions (or spread effects) can continue to accrue long after some export stimulus has occurred. The overall impact of an export stimulus on the economy has many determinants including technology, the propensity to import, the extent to which investment

opportunities generated are accepted domestically, the ability, to attract foreign factors and so on. Obviously the timing pattern exhibited by exports' direct and indirect contributions to growth need to be fixed and could conceivable vary between sub-periods, especially over longer periods of economic development.

It is also claimed that the instability of commodity prices has an important impact on economic growth (Cashin, and Mc Dermott, 2002; Ghosh, and Ostry, 1994; Love, 1986, Massel,, 1990 and Salvatore, 1998).

Export growth models suggest that the postulated relationship between export growth and GDP over time is central to the 'exports as an engine of growth' model; theoretically exports can contribute to the growth of GDP directly and indirectly per medium of spread (or carryover) effects, which taken time.

Table 3 provides the econometric results of the investigations into the relationship between export growth and GDP (in current prices) for the four periods that exhibit variations in oil prices. The following regression model was used:

$$\ln (Y_t / Y_{t-1}) = b_0 + b_1 \ln (X_t / X_{t-1}) + b_2 \ln (Y_{t-1} / Y_{t-2}) + u_t \qquad (3)$$

Where:
Y = GDP
X = Oil exports

The regression results suggest that the current period export coefficient is highly significant in all periods. By way of contrast however the lagged GDP variable (representing all lagged exports via the Koyck geometrically declining weight assumption) is significant at least at the 5% level only in the periods that enjoyed high oil prices (1974-1981 and 1999-2004). As this part of the results may be interpreted as representing the spread effects 'proper', the results clearly suggest that the Libyan GDP has benefited from opportunities generated by increase in oil exports However, the lagged effects are outweighed by the current period contributions which could suggest that the investment opportunities generated are not fully exploited.

Table 3
Libyan Oil Exports and Gross Domestic Product (Current Price)

The Model: $\ln (Y_t / Y_{t-1}) = \hat{b}_0 + \hat{b}_1 \ln (X_t / X_{t-1}) + \hat{b}_2 \ln (Y_{t-1} / Y_{t-2}) + u_t$

Period	n	$\hat{b}_0$	$\hat{b}_1$	$\hat{b}_2$	R^{-2}	F	"h"
1963-1973	11	0.014 (0.307)	0.622 (5.706)	0.311 (1.681)	0.755	16.4	
1974-1981	8	0.039 (2.084)	0.641 (21.0)	0.149 (2.589)	0.987	260.3	
1982-1998	17	0.005 (0.630)	0.136 (3.811)	0.111 (1.427)	0.536	8.079	1.029
1999-2004	6	-.174 (-1.811)	0.721 (3.903)	0. 102 (2.897)	0.914	15.7	
1963-2004	42	0.137 (o.787)	0.544 (9.641)	0.261 (3.129)	0.718	53.3	1.164

Two objections may be raised against the results in Table 3: (a) The results in Table 3 were obtained from data valued at current prices and hence may exhibit strong inflationary effects; (b) The significance of the coefficients of the variable $\ln (X_t/X_{t-1})$, may be a reflection of the simple fact that exports are a high component of GDP. To suppress the inflationary effect the relationship between exports and GDP was investigated in constant prices, but allowing for improvements in the terms of trade. Thus both GDP and exports were deflated by an index of import prices. Deflating exports by an index of import prices and not by an index of export prices should be more acceptable since a rise in the price of exports relative to that of imports (i.e. an improvement in the terms of trade) reflects a true gain to the economy.

The following model was tested:

$$\ln (Y^-_t / Y^-_{t-1}) = b_0 + b_1 \ln (X^-_t / X^-_{t-1}) + b_2 \ln (Y^-_{t-1} / Y^-_{t-2}) + u_t \qquad (4)$$

Where:
Y^- = GDP valued at constant import prices
X^- = Oil exports valued at constant import prices

The econometric results obtained using this method of deflation are given in Table 4

Table 4
Libyan Oil Exports and Gross Domestic Product (Deflated by import Price)

The Model: $\ln (Y^-_t / Y^-_{t-1}) = \hat{b}_0 + \hat{b}_1 \ln (X^-_t / X^-_{t-1}) + \hat{b}_2 \ln (Y^-_{t-1} / Y^-_{t-2}) + u_t$

Period	n	$\hat{b}_0$	$\hat{b}_1$	$\hat{b}_2$	R^{-2}	F	"h"
1963-1973	11	0.283 (1.264)	0.706 (6.227)	0.012 (0.071)	0.800	21.1	
1974-1981	8	0.188 (0.662)	0.560 (4.994)	0.256 (1.358)	0.821	17.0	
1982-1998	17	0.361 (1.901)	0.393 (4.124)	0.429 (1.445)	0.531	10.0	1.044
1999-2004	6	0.291 (0.727)	0.820 (4.658)	0.031 (0.377)	0.706	9.603	
1963-2004	42	0.363	0.549 (9.018)	0.089 (0.984)	0.660	40.8	0.974

The results in Table 4 conform partially with those in Table 3 (where variables are valued at current prices). The regression results suggest that the export coefficient is highly significant in all periods. By way of contrast however the lagged GDP variable (representing all lagged exports via the Koyck geometrically declining weight assumption) was not significant at least at any period. Therefore, the improvement in terms of trade, show that the oil sector in Libya is smaller when valued at constant export prices and that spread effects in this country depend more on export prices rather than on export quantities. It would, of course, be absurd to disregard the price effect of oil exports when the rest of the world is expressing great concern about the continuous rise in these prices and when a real export price rise (i.e. relative to the price of imports) represents a rise in real income and theoretically could generate its own sequence of spread effects (i.e. indirect contributions of export growth to GDP)

To suppress the component effect the contribution of the oil (i.e. mining) sector from GDP has been excluded and the changes in the output of the remaining sectors (i.e. GDP minus oil) were regressed on changes in exports. To suppress both the component and the inflationary effects (i.e. the rise in prices which does not represent a rise in real incomes) the deflated value of total non-oil output (i.e. the domestic product of industries other than mining) was regressed on the deflated value of exports (using an import **price** index with 1963 =100).

The following model was tested:

$$\ln (Y^-_{non-oil,t} / Y^-_{non-oil, t-1}) = b_0 + b_1 \ln (X^-_t / X^-_{t-1}) +$$
$$b_2 \ln (Y^-_{non-oil, t-1} / Y^-_{non-oil, t-2}) + u_t \qquad (5)$$

Where:

$Y^-_{non-oil}$ = (GDP – Oil) valued at constant import prices

X^- = Oil exports valued at constant import prices

The results are given in Table 5. These results suggest that when both the component and the inflationary effects are excluded there is no evidence of spread effects of oil exports to the rest of the economy.

Table 5
Libyan Oil Exports and Non-0il GDP (Deflated by import Price)

The Model: $\ln (Y^-_{non-oil,t} / Y^-_{non-oil, t-1}) = \hat{b}_0 + \hat{b}_1 \, n (X^-_t / X^-_{t-1}) + \hat{b}_2 \, \ln (Y^-_{non-oil, t-1} / Y^-_{non-oil, t-2}) + u_t$

Period	N	$\hat{b}_0$	$\hat{b}_1$	$\hat{b}_2$	R^{-2}	F	"h"
1963-1973	11	0.542 (1.245)	0.542 (1.804)	0.059 (0.210)	0.214	2.515	
1974-1981	8	1.540 (2.832)	0.249 (0.969)	0.264 (0.362)	-0.159	0.521	
1982-1998	17	0.530 (1.919)	0.194 (1.354)	0.279 (1.193)	0.69	1.594	1.002
1999-2004	6	0.147 (0.282)	0.306 (2.090)	0.227 (0.619)	0.322	2.187	
1963-2004	42	0.566 (2.938)	0.317 (2.071)	0.119 (0.815)	0.229	3.146	1.652

IV
Response of Sectors' output to expansion in oil exports

It is suggested that various sectors in any economy respond to changes in the income of a major source of income, such as oil exports in the oil producing economies (Lucas, 1988, Barro, 1991, Mankiw, Romer and Weil 1992; Salvatore, 1996 and United Nations 2002). Available data were disaggregated to investigate the relationship between sectoral output and exports. The responsiveness of the output of six main sectors to changes in exports was examined. *A priori* it is expected that the growth in exports would stimulate the output of these sectors.

The following regression model for the period 1963-2004:

$$\ln (Y_{it} / Y_{it-1}) = b_0 + b_1 \ln (X_{it} / X_{it-1}) + b_2 \ln (Y_{it-1} / Y_{it-2}) + b_3 \, D_t + u_t \qquad (6)$$

where

Y_i =   Real output of the ith sector

X   =   Oil exports valued at constant import prices

D_t =   A dummy variable where: D=0: 1963-1973; 1982-1998

D=1:1974-1981; 1999 - 2004

A dummy variable is used to assess the impact of fluctuations in oil prices during the period 1963-2004.

The econometric results of this analysis are given in Table 6. When the inflationary effect is excluded and real output is regressed against real exports (again deflated by an import price index (1963=100) to follow real gains), the econometric results of the sectoral analysis support, to a great extent, the results of Table 5.

The "t" values of the coefficient b_1 in Table 6 suggest that, real output of all sectors in Libya, with the exception of the trade sector (wholesale and retail trade) and other economic activities (finance, insurance and other services) has not responded to growth in exports. Also, dummy variables in all cases are not statistically significant, which suggests that the intercept of real output did not increase during periods of rise in export prices.

Table 6
Oil Exports and Output of Various Libyan Sectors
(1963-1984)

Sector	b_0	b_1	b_2	b_3	R^{-2}	F	"h"
Agriculture, hunting & fishing	0.786 (4.126)	0.0035 (0.029)	0.3224 (1.427)	-0.024 (0.253)	- 0.022	0.708	1.783
Manufacturing	0.424 (2.510)	0.616 (1..677)	0.236 (0.157)	-0.016 (0.992)	0.140	3.009	1.752
Construction	0.371 (1.745)	0.382 (1.798)	0.259 (1.961)	-0.0067 (0.468)	0.134	3.110	1.665
Wholesale & Retail Trade	0.511 (2.099)	0.407 (2.910)	0.918 (0.639)	-0.020 (1.478)	0.312	6.535	1.651
Transport & Communication	1.162 (1.013)	0.219 (0.191)	0.309 (1.910)	-0.076 (0.841)	0.032	1.452	1.643
Other Economic Activities	0,456 (2.438)	0.369 (3.440)	0.181 (1.292)	-0.0140 (1.647)	0.325	6.859	1.322

The results in Table 6 suggest that manufacturing output in the Libyan economy does not seem to have responded to changes in oil exports. This indicates weak linkages. The statistically significant intercept term for this sector (revealed by the t value of the coefficient b_0) clearly suggests

that manufacturing output in the Libyan economy in growing independently of the expansion in exports. This may indicate that this sector engages primarily in the production of import substitutes for which there is a ready demand. It may also indicate that the expansion in oil exports is not fully exploited in stimulating manufacturing output. In other words, the Libyan economy may be finding problems in trying to maximize the rate of growth of the manufacturing sector. Perhaps one basic problem is that of market limitations (Metwally, 1979).

It is not surprising therefore, that most of the increase in oil revenue finds its way to investment overseas, imports of goods and services and to the pile up of reserves and that only a small fraction of oil export proceeds are ploughed back into the economy to build its productive capacity.

V
Long-Term Relationship between Libyan GDP and its Oil Exports

The aim of this section is to test if there is a long-term relationship between Libyan oil exports and its GDP. If such a relationship exists, this would suggest that the two variables do not drift too far apart from each other over time. In other words there is evidence of cointegration between the two variables. This would imply that growth in GDP in Libya is simply a reflection of growth in its oil exports. However if there is no evidence of cointegration, the relative magnitude of Libyan GDP may be increasing or decreasing over-time, compared with its oil exports (Romer, 1986 and Grossman, and Helpman ,1999;).

Figure 1 gives a preliminary idea about the relationship between Libyan GDP and its oil exports over 42 years (from 1963 to 2004). This graph suggests that the two variables drift too far apart from each other over time. However, fluctuations in GDP seem to be highly related with fluctuations in Libyan oil exports.
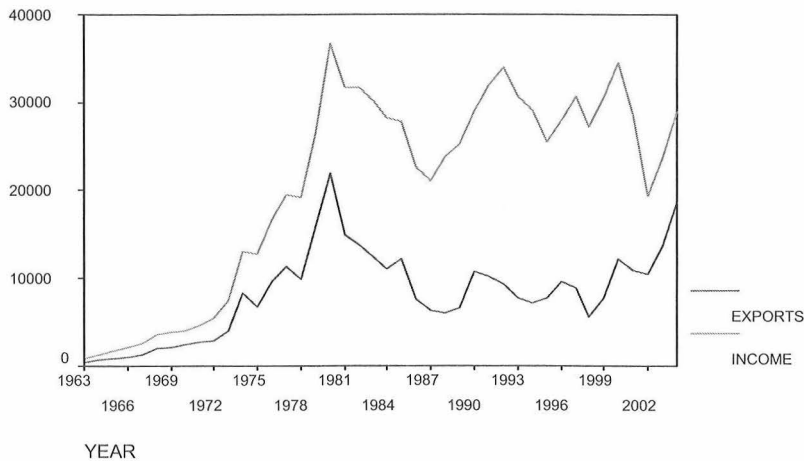
Figure 1: Trade Relationship between Libyan GDP and its Oil Exports

This paper uses the cointegration technique to examine the long-term relationship between Libyan GDP and oil exports. If a long-run relationship exists the two variables must form a unique cointegrating vector. In order to test for cointegration, and in particular to investigate whether a unique cointegrating vector can be identified, we have employed the maximum likelihood estimation technique developed by Johansen (1988) and Johansen and Juselius (1990). This approach does not have the now well-documented drawbacks of the Engle and Granger (1987) approach to cointegration and can be used in a multivariate setting to establish the numbers of distinct cointerating vectors (Ng and Perron, 1997).

The first step in implementing this approach is to test for the order of integration of each variable included in the model. It is a common practice to apply the Augmented Dickey – Fuller Test (ADF) given by the following equation for variable Z.

$$Z_t = \alpha + \beta Z_{t-1} + \Sigma^k_{i=1} \quad \tau i \, \Delta Z_{t-1} + \omega_{t,} \tag{7}$$

Where, ω is an error term (Dickey and Fuller 1979, Dickey and Rossana, 1994).

The cumulative distribution of the ADF test statistic is provided by Mackinnon (1991). If the calculated (absolute) statistics is greater than its critical value, then Z is said to be stationary or I(0). Table 7 represents the results of the Augmented Dickey – Fuller test. The estimation is based on a total of 42 observations for the period 1963 to 2004. The Augmented Dickey-Fuller regressions include an intercept and a linear trend.

It is clear that the calculated (absolute) statistics in Table 7 are greater than the critical value for the variables representing Libyan GDP and Libyan oil exports only for the differenced variables. This indicates non-stationarity of these variables at the level and that the variables have achieved

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stationarity after being differenced once. Thus, the variables are integrated of order one, I(1). This fact enables us to conduct the cointegration analysis. (Johansen,1988). This technique suggests a maximum likelihood estimation procedure that provides two test statistics for determining the number of cointegrating vectors that could exist among a set of variables.

Table 7
Unit Root Tests of Libyan GDP and Libyan Oil Exports

Variables	ADF stat for log	ADF stat for Δlog
Libyan GDP	-2.0112	-5.3661
Libyan Oil Exports	-1.9933	-5.2264

Notes: 95% critical value for the augmented Dickey-Fuller statistic = -3.5236 for the log values and = --3.5247 for Δlog values

The trended case, with a trend in DGP (Wickens, 1996 and Wooldridge, 2006), which has higher critical values, was considered in this analysis. The first step is to specify a lag length for the VAR, which, on the basis of the likelihood ratio test, was set at four periods. Table 8 give the cointegration results for the long-term relationship between Libyan GDP and Libyan total exports.

The results in Table 8 show that the LR tests based on maximal eigenvalue of the stochastic matrix and the trace of the stochastic matrix suggest that the null hypothesis of no cointegration cannot be rejected for Libyan GDP with its oil exports. Thus, there is no evidence of long-term relationship between Libyan Gross Domestic Product and its oil exports.

Table 8
Results of Cointegration Analysis for Libyan GDP and Oil Exports
Cointegration with unrestricted intercepts and unrestricted trends in the VAR

1.   Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix
■ ■

38 observations from: 5 to 42. Order of VAR = 4.
List of variables included in the cointegrating vector:
Log Exports   Log GDP
List of eigenvalues in descending order:
.25293   .041384
****

Null	Alternative	Statistic	95% Critical Value	90%Critical Value
r = 0	r = 1	11.0808	18.3300	16.2800
r<= 1	r = 2	1.6061	11.5400	9.7500

****

2.   Cointegration LR Test Based on Trace of the Stochastic Matrix
****

38 observations: from 5 to 42. Order of VAR = 4.
List of variables included in the cointegrating vector:
Log Exports   Log GDP
List of eigenvalues in descending order:
.25293   .041384
****

Null	Alternative	Statistic	95% Critical Value	90%Critical Value
r = 0	r>= 1	12.6869	23.8300	21.2300
r<= 1	r = 2	1.6061	11.5400	9.7500

****

Choice of the Number of Cointegrating Relations Using Model Selection Criteria
****
38 observations from   5 to   42. Order of VAR = 4.
List of variables included in the cointegrating vector:
Log Exports   Log GDP
List of eigenvalues in descending order:
.25293   .041384
****

Rank	Maximized LL	AIC	SBC	HQC
r = 0	32.8753	16.8753	3.7746	12.2141
r = 1	38.4157	19.4157	3.8586	13.8806
r = 2	39.2187	19.2187	2.8429	13.3923

****
AIC = Akaike Information Criterion   SBC = Schwarz Bayesian Criterion
HQC = Hannan-Quinn Criterion

Conclusions

1. The growth rates of all Libyan sectors were much higher during the periods of rise in oil prices than during the period of oil recession. However, economic growth of all Libyan sectors (with the exception of agriculture and wholesale retail trade) did not benefit from the growth in its oil exports during the last few years which may suggest lack of investment opportunities in the recent years.

2. The Libyan GDP has benefited from opportunities generated by increase in oil exports However; the lagged effects are outweighed by the current period contributions which could suggest that the investment opportunities generated are not fully exploited.

3. The relationship between exports and GDP in constant prices, but allowing for improvements in the terms of trade, suggest that the export coefficient is highly significant in all periods. However; the lagged GDP variable (representing all lagged exports via the Koyck geometrically declining weight assumption) was not significant at any period years which may suggest lack of investment opportunities in all periods.

4. When both the component and the inflationary effects are excluded there is no evidence of spread effects of oil exports to the rest of the economy.

5. Real output of all Libyan sectors, with the exception of trade sector (wholesale and retail trade) and other economic activities (including finance, insurance and other services) has not responded to growth in exports. if anything the growth in the manufacturing sector has been in the opposite direction to that of oil exports over the last four decades.

6. The null hypothesis of no cointegration cannot be rejected for Libyan GDP with its oil exports. Thus, there is no evidence of long-term relationship between Libyan Gross Domestic Product and Libyan oil exports.

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