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Exports and Economic Growth: The Arab Experience

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This paper aims at analysing the relationship between exports and economic growth in the Arab countries using annual data for the period 1970–1999. Section two of this study presents a theoretical background of the relationship between exports and economic growth. Literature review is found in Section 3. In Section 4, the methodological issues of studying this relationship are discussed. Results of stationarity tests using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) as well as Bivariate Johansen-Juseluis tests for cointegration are presented in Section 5. Stationarity tests suggest that time series are non-stationary in their levels and seem to be stationary in their first differences. Testing for long-run cointegration relationship using Johansen-Juseluis approach, it is found that in general there is no cointegration relationship between exports and GDP. For this reason, we abandoned the error correction model and tested for causality using different versions of Granger's causality test. We found mixed results about the causal relationship between exports and GDP in Arab countries.

1. INTRODUCTION

The successful growth record of outward-oriented economies in South-East Asia in the last three decades has revived the debate on optimal growth strategies of LDCs on two major fronts. One is the emergence of 'new growth theory' of Lucas and Romer, which emphasises the role of increasing returns to scale and the dynamic spillover effects of the export sector's growth. The second is the externality impact of exports as a leading sector in the diffusion of modern technology across other sectors and industries. It appears that the rapid growth in these successful newly industrialised countries in Asia lends support to the basic premises of the new growth theory.

It has been mentioned that there is a strong empirical association between periods of rapid growth of trade and the rate of growth of GDP. The interpretation of the direction of causality, however, is problematic. Results of recent empirical studies on the causal relationship between exports and GDP growth cast a doubt on the universality as well as the efficacy of export promotion policies.

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In principle, economic theory suggests that economic growth from a source quite unconnected with the economy's trade, manifested in an outward shift of the production possibilities curve, may lead to a change in the volume of exports, and that the sign of that change depends on the particular form of growth enjoyed. This suggests that causality may run from economic growth to exports growth. On the other hand, we have theories suggesting that higher exports may finance greater inflow of capital goods, which may in turn lead to economic growth.

This study aims at investigating the causal relationship between exports and economic growth in the Arab countries. In particular, we use stationarity tests and cointegration techniques to decide which tests of causality we shall apply to discover the relationship between exports and GDP growth in Arab countries. If tests indicate that there is cointegration between these two variables, a vector error correction model will be developed to test for the existence and direction of Granger-causality between export growth and economic growth. If there is no cointegration, we shall use the classical Granger causality tests.

2. THEORETICAL BACKGROUND AND EMPIRICAL EVIDENCE

An important part of the development literature emphasises a strong causal connection running from the growth of trade to the growth of income, suggesting that trade is the engine of growth. Trade is, thus, the connecting link between the rate of growth of industrial production in developed countries and the rate of growth of output in developing countries.

In another view, trade is regarded as the facilitating rather than the driving force in the development process. In this case, if the supply-side factors are sufficiently favourable in developing countries, there can be a very rapid rate of growth of exports from such countries against unfavourable world trade trends.

Several interpretations have been provided in the literature to explain the link between trade and growth. These interpretations can be summarised as follows.

First: an initial competitive advantage may be discovered. Sources of the competitive advantage vary among cases. For instance, this may be due to lower labour costs, rapid growth in world demand for natural resource-intensive commodities, undervalued exchange rate, etc.

Second: attempts to utilise the competitive advantage will lead to a rapid growth of exports. This will stimulate investments in the export sector. Devoting more resources to this sector will encourage specialisation, which will result in concentration of investments in sectors of comparative advantage which are likely to augment productivity; not only in these sectors, but also productivity of the overall economy will be enhanced. For example, rapid growth in world demand for natural resource-intensive commodities raises domestic growth via direct effects on investments and indirect effects through factor inflows, externalities, and linkages with other sectors.

Third: scale economies will be realised as a result of an enlargement of the effective market size. This will make it feasible for firms in the trade sector to adopt plants of the minimum efficient size, especially in cases where that size is larger relative to the domestic market.

Fourth: increased export earnings, the major source of foreign exchange for many LDCs, will ease foreign exchange constraints on growth by enhancing the capacity to import the materials essential for domestic production process, especially physical inputs and capital goods.

Fifth: increased competition encountered in international markets will provide greater incentives for improved resource allocation, technological improvements, better management, and greater entrepreneurial confidence, and also generate externalities, the effects of which will spillover into the non-export sector and thereby help raise the overall productivity in the economy, particularly via skill formation and efficient price mechanisms.

On the other hand, one might expect that causality runs from economic growth to exports. For instance, higher productivity leads to lower unit costs which facilitate exports. If domestic production increases faster than domestic demand, then producers are likely to expand their exports.

The empirical evidence also seems to suggest that structural change provided a major link between exports and economic growth in the outward-oriented LDCs. The export sector is the initiator of the economy-wide structural changes in the form of technical innovations and diffusion of skill-intensive externality of human capital, and thus it contributes to a higher level of aggregate productivity. The dynamic expansion of the export sector, largely based on the increased specialisation in manufacturing exports, has been the driving force behind the modernisation of the economy. The expansion of the exports sector itself has been promoted by continuously changing the export base in response to changing world demand.

Substantial amount of research has been conducted to assess the role of exports in economic growth. The majority of studies seem to have concluded that exports are probably good for economic growth, which is a support for the export growth hypothesis. In these studies a real output growth variable is regressed on export levels, export/GDP shares or export growth, by using a single equation model. The statistical significance of the coefficient of the export variables has then been interpreted as evidence supporting the export-led growth hypothesis. The validity of these findings was questioned because the single equation studies using OLS regression (sometimes called impact studies) are, from an econometric perspective, mostly inadequate in addressing the issue of causality. If a bi-directional causality between these two variables (exports and output) exists, the estimation and tests used in the impact studies are inconsistent.

The impact studies (OLS) presume that the export variable is exogenous. This is a rather restrictive assumption as a feedback from output to exports is very likely.

These concerns have subsequently generated a series of empirical work aimed at resolving the issue of causality between exports and output growth. Causality tests carried out in these studies have revealed that the causal direction, in general, depends on the country and commodity group under consideration.

Early attempts used rank correlation methods alone to examine the strength of the association between growth in per capita GNP and growth in exports.[1] The main argument is that since exports are part of the national product, a positive correlation of the two variables is almost inevitable. The general conclusion from all the rank correlation studies is that high levels of economic growth are significantly associated with high levels of export growth.

Subsequent studies used a production function methodology. Growth rate of either GNP or GDP is regressed upon the growth rate of exports and a set of additional explanatory variables, usually the labour force and investment. Tyler (1981), e.g., using the production function approach concluded that a basic level of development is necessary for a country to benefit most from growth.[2]

In a study of cross-section of 88 countries Ram (1985) found that the role of exports in growth is predominantly positive. Greenaway and Nam (1988) used information on 41 LDCs and suggest that outward orientation has been more conducive to growth and exporting than inward orientation. Khan and Saqib (1993) considered exports as a production input. The influence of exports on growth was examined in a simultaneous equation framework. They found strong association between export performance and GDP growth. Bahmani-Oskooee and Alse (1993) found that there is a long-run relationship between real exports and real output in LDCs, and that the relationship is a positive one. Paul and Chowdhury (1995), using tests of stationarity and cointegration, and running Granger causality tests, found evidence that causality ran from exports to GDP growth, suggesting that export promotion was a viable policy for Australia. Kwan and Kwok (1995) used exogeneity tests to study the relationship between exports growth and output growth for China. Results suggest that current real export growth has a positive impact on output growth.

Mixed results, however, were found by Ghartey (1993), who found a unidirectional relationship between exports and economic growth in the U.S. and Taiwan. Sharma and Dhakal (1994), using a sample of 30 countries, found a bi-directional relationship between exports and growth among 5 countries. Exports cause growth in six countries, while growth causes exports in eight countries, and no relationship between exports and growth in the remaining 11 countries. Kwan, Cotsomitis, and Kwok (1996), using tests of exogeneity, reached mixed results for

[1]See Balassa (1978) and Kavoussi (1984).

[2]Kavoussi (1984) states that while export expansion tends to be associated with better economic performance in low-income countries too, the contribution of exports is greater among the more advanced countries.

Taiwan. On the other hand, Boltho (1996) investigated whether growth in Japan was export-led. Results suggest that domestic forces rather than foreign demand propelled longer-run growth. A similar study, carried out by Henriques and Sadorsky (1996), investigated the export-led growth hypothesis for Canada and found evidence that a one-way Granger causal relationship existed in Canada whereby changes in GDP preceded changes in exports. Moreover, Ahmed and Harnhirun (1996), using data for five ASEAN countries, found that there was no statistical evidence of a long-term relationship from exports to economic growth in the ASEAN region.

3. METHODOLOGICAL ISSUES

Early attempts to quantitatively test for the existing relationship between exports expansion and economic growth employed a nonparametric approach, most commonly using rank correlation coefficients—Spearman's and Pearson's rank correlation—to measure the strength of association between economic growth and some potentially related variable such as export growth. These initial correlation studies did not achieve much in terms of actual policy prescription. A high degree of positive correlation between the two variables was accepted as supportive evidence of the export-led growth hypothesis, but realistically, without knowledge of the causality structure it did not mean much. This has the advantage of not presuming a specific functional form for the relationship. Among its weaknesses, however, are the difficulties of handling multivariate relationships and their relative lack of statistical power.

Other attempts regressed real output growth on export levels, export shares, or export growth using a single-equation model. The statistical significance of the coefficient of the export variables has then been interpreted as the evidence supporting the export-led growth hypothesis. There are several shortcomings of this approach as mentioned above.

These concerns have subsequently generated a series of empirical work aimed directly at testing the causal relationship between exports and economic growth either in a bivariate or a multivariate framework. Tests of causality are, however, suspected on the grounds that the Granger or Sims tests are valid only if the original time series are not cointegrated. A second problem with these studies is their arbitrary choice of the lag length. Some of the questions of causality are complicated by the observation that its direction may change as a country develops, with the present rate of growth determined by a liberal strategy that may have been made politically feasible by the attainment of a given level of development, while that level of development may have been occasioned by pursuing a protectionist policy in the past.

The Granger Causality test procedure involves two separate hypothesis tests. Specifically, the first hypothesis test consists of the null hypothesis that export

growth (X) does not cause GDP growth (Y), as opposed to the alternative hypothesis that export growth does cause GDP growth. The restricted model regresses Y against lagged values of it, whereas the unrestricted model regresses Y against lagged values of Y and X. The second hypothesis test consists of the null hypothesis that Y does not cause X as opposed to the alternative hypothesis that Y growth does cause X. The restricted model consists of a regression of X against the lagged values of Y. The unrestricted model regresses exports against lagged X and also lagged Y.

In general, the results of the hypothesis tests can result in four possible outcomes that are as follows.

- Accept both null hypotheses, meaning that causality runs neither from X to Y nor from Y to X though the variables appear to be correlated.
- Accept the null hypothesis that X does not cause Y but reject the null hypothesis that Y does not cause X, meaning that unidirectional causality runs from Y to X.
- Reject the hypothesis that X does not cause Y but accept the hypothesis that Y does not cause X, meaning that causality runs unidirectionally from X to Y.
- Reject both null hypotheses, meaning that there exists a feedback causal relation between X and Y.

There are obvious shortcomings associated with causality studies. Standard Granger or Sims tests are only valid if the original time series from which growth rates are generated are not cointegrated. If the time series are cointegrated, then, as Granger argues, causal inferences will be invalid. Therefore, it is necessary to check for cointegration properties of the original exports and output series before using the simple Granger test. If a country's export and output data are found to be cointegrated, then the conclusions reached by previous studies using the simple Granger test are all nullified.

It is also known that most economic time series such as exports and output exhibit non-stationary tendencies that result in spurious regression results. To remedy this problem, rates of change of output and exports are used. This is close to the concept of first differencing. First differencing, however, filters out low-frequency (long-run) information. To remedy this problem, the cointegration technique and error-correction modelling are recommended. Error-correction models try to establish causality between two variables after reintroducing the low-frequency information (through the error-correction term) into the analysis.

4. STATIONARITY AND COINTEGRATION TESTS

In light of our previous discussion about the appropriate methodology for testing the causality between exports growth and output growth, it is necessary now to check for the cointegrating properties of the original exports and output series.

Cointegration is a concept developed to deal with the analysis of the relationship between non-stationary time series. It allows the time series to be individually non-stationary but a linear combination of these series has to be stationary. Thus, the main idea behind the cointegration is to look for a linear combination of individually non-stationary time series that is itself stationary.

The research on cointegration tests has developed into two main paths: tests that rely on the residuals obtained from the cointegrating regression,[3] and the system-based tests using the vector auto-regression (VAR).[4] In this respect, the most often used test for the order of integration or a unit root is the so-called Augmented Dickey-Fuller (ADF) test.

An alternative and more robust test to ADF is the test that was developed by Phillips and Perron (1988). The Phillips and Perron (PP) test proposes a semi-parametric correction for a wide variety of serial correlation and time-dependent hetroskedasticity. It accommodates models with a drift and a time trend so that it can be used to distinguish between stationarity and non-stationarity about a deterministic trend.[5]

The variables GDP and exports for all countries included in the study are subjected to stationarity testing, using both the ADF and the PP. These tests are performed on the level of the variables. The results presented in Table 1 indicate that all GDP and exports in all countries are integrated of order one (I(1)), i.e., non-stationary in levels, despite the fact that the PP test suggests that these variables are stationary in some countries. The Augmented Dickey-Fuller (ADF) and the PP tests are reapplied after differencing all series. The test results indicate that the first difference of GDP and exports in all countries are integrated of order zero, I(0), i.e., stationary.[6]

Given the common integrational properties of the variables under consideration, we also test for cointegration between these variables using the Johansen-Juseluis maximum likelihood procedure. This procedure has two advantages over the Engle-Granger two-step approach. Unlike the Engle-Granger approach, the Johansen-Juseluis procedure tests several cointegrating relationships rather than assuming a single cointegrating vector. Furthermore, the Johansen-Juseluis approach is insensitive to the choice of the dependent variable in the cointegrating regression, as is the case in Engle-Granger approach.

We now proceed to test for a long-run cointegrating relationship between GDP and exports. The bivariate test for cointegration based on the Johansen-Juseluis approach is provided in Table 2. Starting with the null hypothesis on no cointegration (r=0) among the variables, the trace statistics is well below the critical

[3]E.g., Engle and Granger (1987).
[4]E.g., Johansen (1988), and Johansen and Juseluis (1990).
[5]The PP tests are asymptotically equivalent to the corresponding ADF.
[6]These results are not reported here but are available from the authors upon request.

Table 1

Tests for Stationarity in the Levels of the Series

			PP Tests		
Country	Variables	ADF Test	No Constant No Trend	Constant No Trend	Constant Trend
Algeria	GDP	–1.63	–1.23	–6.35*	7.53*
	Exports	–2.24	–1.71	–8.62*	–6.59*
Bahrain	GDP	–1.17	0.79	–3.34	–4.73
	Exports	–1.66	0.59	–2.47	–8.05
Egypt	GDP	–2.38	1.38	0.826	–6.16*
	Exports	–3.50*	0.43	–2.47	–7.88*
Iraq	GDP	0.94	11.81	18.17	27.85
	Exports	–1.67	–2.16	–8.49*	–7.35*
Jordan	GDP	–2.29	5.46	–3.46*	–17.25*
	Exports	–3.01*	1.06	–0.89	–14.81*
Kuwait	GDP	–2.49	–0.22	–9.34*	–24.56*
	Exports	–1.89	–0.82	–8.40*	–25.80*
Libya	GDP	–1.68	–0.51	–3.13*	–3.68*
	Exports	–1.72	–0.37	–5.54*	–4.60*
Mauritania	GDP	1.43	2.37**	0.99	1.92
	Exports	–0.85	2.93*	0.99	–0.31
Morocco	GDP	–2.37	0.774	–0.50	–13.98*
	Exports	–1.57	1.265	0.24	–8.26*
Oman	GDP	–2.18	1.61	0.74	–7.08*
	Exports	–2.79	1.24	0.25	–25.43*
Qatar	GDP	–2.71	–0.03	–6.15*	–3.33**
	Exports	–2.51	–0.80	–4.48*	–4.96**
Saudi Arabia	GDP	–1.82	0.57	–5.94*	–7.73*
	Exports	–1.86	–0.37	–9.96*	–8.63*
Sudan	GDP	–3.71*	–0.01	–10.13*	–7.82*
	Exports	–2.46	–1.51	–8.49*	–12.55*
Syria	GDP	–2.98**	0.58	–3.94*	–5.04*
	Exports	–1.00	1.64	0.62	–3.13
Tunis	GDP	–1.61	1.19	0.37	–5.07*
	Exports	–1.76	1.38	0.01	–8.58*
UAE	GDP	–2.26	–0.81	–1.97	–6.91*
	Exports	–1.44	–0.91	–2.31	–6.82*

Note: *(**) indicates statistical significance at the 99 percent (95 percent) level.

The critical values for both the ADF and the PP tests can be found in Fuller (1979). The ADF critical value at the 1 percent and 5 percent significance levels are –3.50 and –2.937 respectively. The PP critical values are –2.65 and –1.95 (model 3), –3.50 and –2.937 (model 4), and –4.18 and –3.61 (model 5) at the 1 percent and 5 percent significance levels respectively. The optimum lag length (k) in the ADF equation was chosen based on Akaike's final prediction criterion.

Table 2

Bivariate Johansen-Juselius Tests for Cointegrating Relationships between GDP and Exports

Country	Null Hypothesis	Alternative Hypothesis	Test Statistic
Algeria	$r = 0$	$r \geq 1$	11.12
	$r \leq 1$	$r \geq 2$	4.52
Bahrain	$r = 0$	$r \geq 1$	19.26
	$r \leq 1$	$r \geq 2$	2.66
Egypt	$r = 0$	$r \geq 1$	17.56
	$r \leq 1$	$r \geq 2$	5.99
Iraq	$r = 0$	$r \geq 1$	17.43
	$r \leq 1$	$r \geq 2$	5.95
Jordan	$r = 0$	$r \geq 1$	23.41
	$r \leq 1$	$r \geq 2$	6.71
Kuwait	$r = 0$	$r \geq 1$	11.95
	$r \leq 1$	$r \geq 2$	0.002
Libya	$r = 0$	$r \geq 1$	7.62
	$r \leq 1$	$r \geq 2$	0.60
Mauritania	$r = 0$	$r \geq 1$	7.38
	$r \leq 1$	$r \geq 2$	2.81
Morocco	$r = 0$	$r \geq 1$	11.13
	$r \leq 1$	$r \geq 2$	0.87
Oman	$r = 0$	$r \geq 1$	13.86
	$r \leq 1$	$r \geq 2$	1.46
Qatar	$r = 0$	$r \geq 1$	9.90
	$r \leq 1$	$r \geq 2$	1.89
Saudi Arabia	$r = 0$	$r \geq 1$	22.50
	$r \leq 1$	$r \geq 2$	2.46
Sudan	$r = 0$	$r \geq 1$	12.01
	$r \leq 1$	$r \geq 2$	3.15
Syria	$r = 0$	$r \geq 1$	21.14
	$r \leq 1$	$r \geq 2$	6.46
Tunis	$r = 0$	$r \geq 1$	20.85
	$r \leq 1$	$r \geq 2$	2.08
UAE	$r = 0$	$r \geq 1$	12.32
	$r \leq 1$	$r \geq 2$	1.34

Notes: r stands for the number of cointegrating vectors. Critical values for the 5 percent significance level are 69.8 ($r = 0$) and 48.4($r \leq 1$). These values are taken from Johansen and Juselius (1990).

values, thus it fails to reject the null hypothesis r=0 in favour of the general alternative $r \geq 1$. Consequently, we conclude that there is no single cointegrating relationship involving GDP and exports for all countries considered in the study.

5. CAUSALITY TEST RESULTS

According to Granger, X is said to Granger cause Y if Y can be forecast better by using past values of Y and X than just lagged values of Y. There are some conflicting views about whether Granger's concept is a proper definition of causality.

Causality tests between two economic variables were proposed by Granger (1969) and developed by Sims (1972) and by Geweke, Meese, and Dent (1982). The aim of causality tests is to determine whether a variable X can help to forecast another variable Y. If it cannot, then we say that X does not Granger cause and vice versa. There are three common tests for causality between two variables. These tests are:

1. The Granger causality test:

$$y_t = a_1 + \sum_{i=1}^{p} \beta_{1i} x_{t-1} + \sum_{j=1}^{q} c_{1j} y_{t-j} + \varepsilon_{1t}\,; \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

2. The Sims exogeneity test:

$$y_t = a_2 + \sum_{i=1}^{m} \beta_{2i} x_{t-i} + \sum_{j=1}^{n} c_{2j} x_{t+j} + \varepsilon_{2t}\,; \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

3. The Geweke, Meese, and Dent test:

$$y_t = a_3 + \sum_{i=1}^{u} \beta_{3i} x_{t-i} + \sum_{j=1}^{v} c_{3j} y_{t-j} + \sum_{k=1}^{z} d_{1k} y_{t+k} + \varepsilon_{3t} \quad \ldots \quad \ldots \quad (3)$$

The procedure for testing causality is the following. A regression of Y on lagged X and Y is estimated using the OLS, and an F-test is calculated to test for the null hypothesis that $\alpha_i = 0$ for lags 1,2,...p is conducted. The F-statistic is calculated using the following formulae:

$$F = \frac{(RSS_R - RSS_u)/q}{RSS_u/(T-2q-1)}\,; \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where RSS_u is the sum of squared residuals for unrestricted Equations (1-2), RSS_R is the sum of squared residuals when the restrictions that $\alpha_i = 0$ for n = 1,2,...n are imposed. T is the sample size and q is the lag length.

If the calculated F-statistic is greater than critical values, then the null hypothesis that X does not cause Y is rejected. Another regression of X on lagged Y and X is estimated. If the calculated F-statistic is again led to the rejection of the null hypothesis, then a feedback causal relationship exists between Y and X. Sims (1972) developed Granger's causality test. He used a two-sided distributed lag of X on Y and tests the leads of X. Empirical research suggests that the error term of the test is likely to be autocorrelated, and thus may lead to incorrect inference. Geweke, Meese, and Dent (1983) presented an alternative test (Equation 14) known as the modified Sims test, which is designed to avoid the problem of serial correlation in the Sims model by including lagged values of the independent variable. Geweke, Meese, and Dent compute a two-sided distributed lag of X on Y and test the leads of Y.

Geweke, Meese, and Dent (1982) examined several forms of causality tests and found that the Sims test was sensitive to the failure to correct for serially correlated residuals. They proposed an alternative test using a two-sided distributed lag augmented with lagged dependent variables instead of one-sided distributed lag as Granger did. If the examination of data shows no sign of serial correlation, the Geweke, Meese, and Dent model may not be appropriate in this case. The inclusion of lagged dependent variables leads to a fall in degrees of freedom and possible misspecification. This may explain why only weak causality from X to Y is obtained for this model.

Pierce and Haugh (1977) proposed a mechanism to test for instantaneous causality test. However, given that the mechanisms by which exports affect growth are not likely to operate instantaneously, no tests for contemporaneous causality are performed.

An important issue that is generally missed in previous literature is the choice of the appropriate lag length. Arbitrary lag specification is common. This, however, may imply misspecification of the order of the autoregressive process. In order to specify the lag length for each country, the Schwarz's (1978) and Akaike (1973) information criterion are used. The lag length is chosen to minimise the final prediction error.

Table 3 shows the results for the appropriate lag length of each country with a maximum lag length of 10 lags. Given the appropriate lag length results presented above, we continue to test for causality relations using the three models of causality. Table 4 represents the results of the causal relationships between exports and growth in the Arab countries. Table 5 summarises these results.

The causality tests of the Granger, the Sims, and the Geweke, Meese, and Dent models provide mixed results for the causal relationship between economic growth and exports. Different tests provide different results for different countries. However, if we combine the results from the three models of causation, we can conclude the following results.

1. We find that there is a bidirectional causal relationship between exports and growth in the case of Algeria, Bahrain, Egypt, Jordan, Mauritania, and Oman. For these countries, exports cause growth and, at the same time, growth affects exports.
2. We find that there is a unidirectional causal relationship from exports to growth in the case of Iraq, Morocco, Saudi Arabia, and Syria. The strongest evidence is found in the case of Syria. All the three models suggest that exports causes growth.
3. We find that there is a unidirectional causal relationship from growth to exports in the case of the United Arab Emirates.
4. Finally, we find that there is no causal relationship between exports and growth in the case of Kuwait, Libya, Qatar, Sudan, and Tunis.

These results are in line with the conclusions of previous work about the causal relationship between exports and growth in less developed countries.[7]

The results show that for the majority of Arab countries exports do not seem to work as an engine of growth. This may be partially explained by the fact that abundance of oil revenues in 9 of the 16 countries has, directly or indirectly,

Table 3

Appropriate Lag Length

Country	Y on X	X on Y
Algeria	3	4
Bahrain	4	4
Egypt	2	3
Iraq	2	4
Jordan	1	4
Kuwait	3	3
Libya	2	2
Mauritania	3	2
Morocco	3	2
Oman	4	2
Qatar	4	3
Saudi Arabia	4	2
Sudan	4	2
Syria	2	3
Tunis	4	2
United Arab Emirates	1	4

[7]For example, Chow (1987); Bahmani-Oskooee and Alse (1993); Ghartey (1993); Sharma and Dhakal (1994); Kwan and Kwok (1995); Kwan, Cotsomitis, and Kwok (1996); Ahmed and Harnhirun (1996).

Table 4

Causality Tests

Country	Model	Granger	Sims	Geweke, *et al*.
Algeria	Y on X	3.955(0.028)**	0.552(0.651)	1.423(0.299)
	X on Y	2.696(0.078)*	1.546(0.278)	2.415(0.207)
Bahrain	Y on X	1.097(0.409)	4. 428(0.067)*	3.559(0.375)
	X on Y	40.096(0.032)**	1.163(0.425)	1.466(0.455)
Egypt	Y on X	3.903(0.035)**	5.905(0.010)***	2.167(0.100)*
	X on Y	0.939(0.441)	5.956(0.007)***	2.146(0.147)
Iraq	Y on X	10.001(0.001)***	1.824(0.197)	0.048(0.952)
	X on Y	0.475(0.753)	0.995(0.477)	0.398(0.803)
Jordan	Y on X	8.506(0.008)***	0.033(0.857)	0.043(0.837)
	X on Y	0.606(0.663)	3. 741(0. 041)**	3. 940(0.066)*
Kuwait	Y on X	0.420(0.740)	1.585(0.237)	0.237(0.868)
	X on Y	1.277(0.312)	1.139(0.367)	0.119(0.946)
Libya	Y on X	0.028(0.971)	0.195(0.824)	1.061(0.378)
	X on Y	0.019(0.981)	0.282(0.758)	0.723(0.506)
Mauritania	Y on X	1.429(0.271)	4.210(0.029)**	2.229(0.154)
	X on Y	1.211(0.319)	5.477(0.015)**	2.478(0.119)
Morocco	Y on X	0.691(0.568)	4.945(0.015)**	0.990(0.433)
	X on Y	1.418(0.246)	0.470(0.632)	0.877(0.434)
Oman	Y on X	2.369(0.099)*	0.506(0.732)	0.486(0.746)
	X on Y	0.140(0.869)	4.516(0.023)**	3.556(0.053)**
Qatar	Y on X	0.570(0.642)	0.592(0.632)	1.088(0.402)
	X on Y	0.787(0.518)	1.051(0.405)	0.965(0.450)
Saudi Arabia	Y on X	0.811(0.538)	0.916(0.491)	3.402(0.088)*
	X on Y	0.164(0.849)	0.438(0.652)	0.585(0.568)
Sudan	Y on X	1.344(0.299)	1.525(0.267)	1.327(0.360)
	X on Y	1.017(0.378)	2.292(0.102)	0.568(0.577)
Syria	Y on X	3.008(0.070)*	6.687(0.007)***	4.631(0.025)**
	X on Y	2.393(0.102)	1.613(0.231)	0.757(0.540)
Tunis	Y on X	0.393(0.810)	0.348(0.840)	0.953(0.487)
	X on Y	1.648(0.215)	1.469(0.254)	0.683(0.518)
UAE	Y on X	0.399(0.534)	0.014(0.903)	0.653(0.429)
	X on Y	0.716(0.597)	0.241(0.906)	6.238(0.083)*

Note: *, **, *** indicates statistical significance at 99 percent, 95 percent, and 90 percent levels respectively.

Table 5

Summary of Causality Tests

Country	Model		Inference
Algeria	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Bahrain	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Egypt	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Iraq	Y on X	X → Y	Exports cause growth.
	X on Y	Y → X	
Jordan	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Kuwait	Y on X	X ↛ Y	No causal relationship between exports and growth.
	X on Y	Y ↛ X	
Libya	Y on X	X ↛ Y	No causal relationship between exports and growth.
	X on Y	Y ↛ X	
Mauritania	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Morocco	Y on X	X → Y	Exports cause growth.
	X on Y	Y ↛ X	
Oman	Y on X	X → Y	Bidirectional causal relationship between exports and growth.
	X on Y	Y → X	
Qatar	Y on X	X ↛ Y	No causal relationship between exports and growth.
	X on Y	Y ↛ X	
Saudi Arabia	Y on X	X → Y	Exports cause growth.
	X on Y	Y ↛ X	
Sudan	Y on X	X ↛ Y	No causal relationship between exports and growth.
	X on Y	Y ↛ X	
Syria	Y on X	X → Y	Exports cause growth.
	X on Y	Y ↛ X	
Tunis	Y on X	X ↛ Y	No causal relationship between exports and growth.
	X on Y	Y ↛ X	
UAE	Y on X	X ↛ Y	Growth causes exports.
	X on Y	Y → X	

→ means that the first variable causes the second.

↛ means that the first variable does not cause the second.

negatively affected the development of the export sector in the Arab region. Arab oil-exporting countries got direct benefits out of the high oil prices and foreign exchange inflows. Other countries in the region got indirect benefits through high levels of migrants remittances and, in many cases, through aid from the oil-rich countries. This helped to ease foreign exchange bottlenecks and encouraged these countries to pursue inward-oriented strategies, mainly protecting their industrial sectors at the expense of efficiency.

High structures of protection created incentives for investments in non-tradable goods. However, since profit rates are often higher in sheltered domestic markets, high levels of protection reduce firms' incentives to enter world markets and they instead concentrate on domestic markets. Capabilities to export industrial products remain relatively low, probably also due to the type of industrialisation pursued. At times when oil prices dropped and terms of trade deteriorated, production structures could not shift towards tradable goods [Sideri (1999)].

There have been numerous attempts to encourage regional integration among Arab states, but these agreements have not been successful in creating a solid regional trading bloc. The impact of such agreements on regional trade liberalisation has been extremely limited. Inter-Arab trade makes up only ten percent of total Arab trade against almost 65 percent with industrial countries. Recently, the area has witnessed a renewed interest in forming a regional trading bloc by the member states of the Arab League. Eighteen Arab states agreed to establish the Arab Free Trade Area (AFTA), which came into effect on January 1998. The AFTA aims at eliminating import duties and other barriers to trade on goods of Arab origin over a ten-year period. Given the current intra-trade ties and production structures, the project may prove to be optimistic.

To enhance their export sector, Arab countries need to carry out economic reform policies on different fronts; mainly by liberalising exchange rates, interests rates, pricing policies, opening up domestic markets, cutting down subsidies, rationalising government expenditure, reforming monetary and taxation systems, and adopting investment programmes designed to promote the export sector.

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Data Sources

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Algeria 1970-1996, Bahrain 1975-1997, Egypt 1970-1998, Iraq 1970-1993, Jordan 1970-1997, Kuwait 1970-1997, Libya 1970-1992, Mauritania 1970-1995, Morocco 1970-1997, Oman 1970-1997, Qatar 1970-1995, Saudi Arabia 1970-1997, Sudan 1970-1997, Syria 1970-1997, Tunis 1970-1998, and UAE 1972-1996.