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ECONOMIC INTEGRATION AMONG THE MEMBERS OF THE LEAGUE OF ARAB STATES: AN EMPIRICAL EVIDENCE

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This article investigates the extent of economic integration among five members of the League of Arab States namely Egypt, Jordan, Saudi Arabia, Sudan and Syria, by empirically testing the nature of intra-trade activities in the grouping. Five of their major trading partners are included in the study, i.e. France, Germany, Italy, the UK and the US. The gravity model is used in the scaled and unscaled forms. Both panel and yearly estimations for the period 1991 to 2002 are performed. The results indicate that the LAS economic grouping has not been effective in trade creation, indicating the failure of integration measures undertaken. The article recommends tariff reductions and the provision of better infrastructure to increase intra-trade activities among LAS members.

1. INTRODUCTION

Efforts to attain economic integration represent a partial movement towards free trade through differential treatment for member as opposed to non-member countries. As is well discussed in international trade theory, economic integration may lead to two static effects, which Viner (1950) calls trade creation and trade diversion. Trade creation is said to take place when integration leads to a shift in the product origin from a domestic producer who faces higher costs to a member producer with lower resource costs, leading to a more efficient

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allocation of resources. Trade diversion, on the other hand, takes place when the product origin shifts from a non-member producer who faces lower costs to a member producer whose resource costs are higher, thus representing a fall in efficiency and welfare. In addition to the static effects, economic integration can also have dynamic effects in the form of a more competitive trade environment as a result of the removal of trade barriers and the possibility of realising economies of scale.

Over the last decade, efforts at economic integration have increasingly become the central focus of various groups of countries. Apart from the obvious objectives of trade creation and reaping other benefits of economic integration as stated above, it is also hoped that forming economic groupings can also stimulate investment in the member countries from both internal and foreign sources. It has been argued that integration does stimulate investment by reducing risk and uncertainty due to the larger market that producers become open to. Furthermore, foreign investors may wish to invest in productive capacity in a member country to avoid being excluded by trade restrictions and a high common external tariff (Appleyard, 1995).

This article seeks to investigate the extent of economic integration among five members of the League of Arab States (LAS), namely Egypt, Jordan, Saudi Arabia, Sudan and Syria, by empirically testing the nature of intra-trade activities in the grouping. Five of their major trading partners are included in the study, i.e. France, Germany, Italy, the UK and the US. Both panel and yearly estimations for the period 1991 to 2002 are performed by using the gravity models in both the scaled and unscaled forms. Whether or not integration efforts have been successful can be seen from the presence of significant intra-trade activities and whether there has been trade creation or trade diversion among LAS members. The findings of the study can hopefully be used by member states to align their policies further so as to fully benefit from regional economic integration towards the possibility of establishing closer economic ties among themselves.

The article is organised as follows. The next section gives an account of efforts to attain economic integration by the LAS since its year of establishment. Section 3 provides a survey of the use of gravity models in analysing the effects of economic integration. Section 4 describes the

model and data used in this study and Section 5 presents an analysis and discussion of the results. The last section concludes.

2. THE LEAGUE OF ARAB STATES AND EFFORTS TOWARDS ECONOMIC INTEGRATION

The League of Arab States (LAS) was formed in 1945 with a vision to be an institution that would strengthen the political, cultural and economic ties among the Arab states.[1] The atmosphere of war and resistance against aggression, the need for unity against the dangers of the Zionist movement, and the awareness of a considerable volume of commercial exchange and transfer of individuals taking place between the Arab states formed the cornerstone for the formation of the LAS ("The Arab League," 2004).

Based on the third foundation which relates to the economic arena, the Economic and Financial Committee of the League was established which recommended modest forms of economic cooperation among member states. Although no material results were achieved, the LAS still places great importance on the economic aspect of cooperation as one of the Joint Arab Action items as stated in the Economic and Social Council resolution. This can be seen by the several subsequent attempts to establish economic cooperation among members of the League over the following 55 years. The Treaty of Joint Defence and Economic Cooperation between the States of the Arab League[2] was signed on 13 April 1950 and established the Economic Council to realise the aims set forth in Article VII of the Treaty, i.e. to raise the standard of living in the Arab states, cooperate in the exploitation of their natural resources, facilitate the exchange of their respective agricultural and industrial products and generally organise and coordinate their economic activities, and conclude the necessary inter-Arab agreements to realise their aims (Muhammad Diab, 1966, p. 238).

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[1] From 7 member states originally, the LAS has now 22 members, namely Jordan, UAE, Bahrain, Tunisia, Algeria, Djibouti, Saudi Arabia, Sudan, Syria, Somalia, Iraq, Oman, Palestine, Qatar, Comoros, Kuwait, Lebanon, Libya, Egypt, Morocco, Mauritania and Yemen.

[2] The signatories of this Treaty were Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, Syria and Yemen.

Three years later, in 1953, the Conference of Arab Ministers of Finance and National Economy recognised the need to create a "common market" where there could be free movement of resources and products. The creation of such a "unified" Arab market was conceived to enable, among others, the lowering and ultimate abolition of tariffs among the Arab states; the widening of markets available to Arab industries which would make possible the use of large-scale methods of production; the increase in the productive efficiencies of existing industries due to greater competition; the harmonisation of economic development plans among Arab states which can prevent duplication of projects; and the speeding up of the possibility of a unified policy vis-à-vis the exploitation of their natural resources, especially oil.

The Arab Trade Convention that resulted from the aforementioned Conference provided for the exemption of farm, mineral and animal products of Arab origin from all import duties and accorded selected industrial products of domestic origin preferential reduction in import duties. The Arab Trade Convention was later modified at various intervals by the Economic Council to extend its scope in terms of product coverage as well as the degree of preferential tariff treatment accorded. However, the trend towards increasing the coverage of the Convention came to a standstill mainly due to the unwillingness on the part of the signatories to accord each other, on a multilateral basis, preferences that would further free their trade from quantitative and qualitative restrictions (Muhammad Diab, 1966, p. 240).

This dismal situation led to a belief that Arab economic cooperation would have to be worked out within a wider and more comprehensive framework. In 1957, the Arab Economic Unity Agreement was ratified and the Arab Economic Convention was adopted by the Arab Economic Council. The Convention envisages the creation of an economic area that would ensure the participants, on a basis of equality, free movement of persons and capital funds; free exchange of domestic and foreign products; freedom of residence and employment; freedom of transportation and transit; freedom of the use of transport vehicles, sea ports and civil airports; and freedom of ownership, trusteeship and inheritance.

The Arab Economic Union Council was formed to suggest ways and means to unify the policies of the Arab states to achieve these objectives. The Convention targeted a maximum period of 10 years after

ratification to bring about unification of the signatories. On 13 August 1964, a resolution for the establishment of an Arab Common Market was issued as a first step towards bringing about an economic union among the signatories. The Arab Common Market Convention stipulates a gradual abolition of all quantitative and qualitative restrictions, as of 1 January 1965, on commodities produced by the signatories (Muhammad Diab, 1965, p. 242). A schedule of tariff reductions was drafted towards this end which covered agricultural, mineral and manufactured products. This predetermined chronology for the complete liberalisation of intra-Arab trade and the long duration (between 10 to 15 years) given before withdrawal from the Agreement is allowed are important to provide assurance to entrepreneurs, thus providing a conducive environment for attracting larger investments from both domestic and foreign sources.

There was no significant development in economic cooperation since then until the adoption of the Principle of National Planning in directing and developing the Joint Arab Action as a result of the Amman Summit in 1980. The Summit also approved the documents relating to the Strategy of the Joint Arab Economic Venture, the National Economic Action Charter, the Draft of the Common Development Contract and the Unified Investment Agreement ("The Arab League," 2004). On 19 February 1997, the Economic and Social Council of the League adopted its resolution No. 1317 declaring the establishment of a Pan-Arab Free Trade Area over a period of 10 years beginning 1 January 1998 and approving its Executive Programme.

The aims of establishing the free trade area are to keep pace with the conditions and needs of all Arab States consistent with the provisions of the World Trade Organisation (WTO), preserve Arab States' economic interests, develop economic and trade relations among Arab States and between them and the outside world, and constitute the first practical step towards the creation of an Arab economic bloc that will have a standing on the world economic arena. As before in the Arab Common Market Convention of 1965, another schedule of gradual trade liberalisation procedures was agreed upon involving customs duties and other charges and taxes of a similar effect by equal annual percentages. A full liberalisation of all Arab goods, hence the creation of the Pan-Arab Free Trade Area was envisaged by 21 July 2007.[3] In line with this

[3] For further details, see "The Agreement of the Arab Free Trade Area" (2004).

objective, the First Arab Economic Conference was held in November 2001 as a result of an Egyptian initiative under the theme of "Promoting the Arab Economic Performance". The Amman Summit of 2001 was named "The Economic Summit", since it was the First Periodical Summit held in accordance with the Cairo Summit resolution adopted in 2000 to hold such a conference ("The Arab League," 2004).

Apart from the need to re-align integration procedures to the provision of the WTO, the latest effort to establish a free trade area is obviously a result of the general view that the numerous efforts of integration in earlier periods have been unsuccessful. The validity of such a perception, however, has yet to be empirically analysed. Since no such effort has been undertaken thus far, this article seeks to investigate the intra-trade activities among the LAS member states.

3. APPLICATIONS OF THE GRAVITY MODEL

The gravity model has been extensively used for empirical studies in international economics. The model has also been successfully applied to flows of varying types such as migration and foreign direct investment. Early applications of the gravity model were viewed with skepticism. However, the work of scholars, among others for example Anderson (1979) and Oguledo and Macphee (1994), provided a sound theoretical foundation for a gravity model analysis of trade flows. Anderson (1979), for example, made the first formal attempt to derive the gravity equation from a model that assumed product differentiation. Oguledo and Macphee (1994) derived the gravity equation from a linear expenditure system in an attempt to answer criticism that the theoretical foundation of the gravity model is weak. As a result of these works, there has been a wider acceptance and more frequent application of the gravity model to explain international trade flows among nations.

When specifically applied to the flow of international trade, the gravity model states that the volume of trade flows between two nations is determined by the supply and demand conditions of the exporting and importing states or restraining forces relating to the specific flows between the two states. According to Oguledo and Macphee (1994), the first justification of the gravity model is based on physics. The model appeals to the physical law of gravitation and electrical forces to conclude that the flow of goods from one country to another equals the

product of the potential trade capacities of the two states divided by a resistance or distance factor. According to the basic gravity model, the volume of exports between two states is a function of their incomes (GDPs), populations, geographical distance and a set of dummies.

There is a large number of empirical works in the literature of international trade which have in some ways contributed to the improvement of the performance of the gravity equation. In a recent paper, Martinez-Zarzoso and Nowak-Lehmann (2003) used the augmented gravity model which was introduced by Bougheas et al. (1999) to analyse trade flows between Mercosur and the European Union. Martinez-Zarzoso and Nowak-Lehmann improved the model by introducing a new infrastructure index to improve measurement of transport costs which is not only a function of distance but also public infrastructure. Greenway and Milner (2002) discussed and addressed econometric issues confronted when applying the gravity model to analyse trade between regional or economic blocs. Loungani, Mody and Razin (2002) and Hutchinson (2002), among others, contributed to the refinement of the explanatory variables considered in the analysis and to the addition of new variables.

Gravity models have been extensively used to evaluate the trade effects between regional blocs. Martinez-Zarzoso (2003) used the gravity model to evaluate the effects of preferential agreements between several regional blocs: the European Union (EU), the North American Free Trade Area (NAFTA), the Caribbean Community (CARICOM), the Centro-American Common Market (CACM) and other Mediterranean states (MEDIT). Martinez-Zarzoso found that the dummy variables for the membership of trade blocs show mixed results. However, he found that as a result of trade preference schemes among member states of a particular trade bloc, there is an increase in intra-trade among the member states. In his study, Martinez-Zarzoso found that there is an increase in intra-trade among EU members and the NAFTA members.

In two separate studies, Tang (2003) applied the gravity model to examine the effect of European Union integration on trade with the APEC states, and Hassan (2003) examined intra-trade among the South Asian Association for Regional Cooperation (SAARC) member states. In contrast to other studies, Tang did not include distance as an independent variable to analyse trade between the EU and APEC states.

It would be interesting to know whether distance has a role to play in the flow of trade between these two economic blocs. On the other hand, Hassan included distance as an independent variable in his gravity equation. However, he did not convert the distance variable into log form as done in other studies such as Aitken (1973), Pelzman (1974), Loungani, Mody, and Razin (2002). This shortcoming raises questions on the validity of the findings of Hassan's study.

4. METHODOLOGY AND DATA

The gravity model specifies that exports from country *i* to country *j* are explained by their economic sizes (GDP or GNP), their populations, direct geographical distances and a set of dummies incorporating some kind of institutional arrangements (Martinez-Zarzoso and Nowak-Lehmann, 2003). As in earlier works, this study uses the gravity model to evaluate the effects of preferential trading arrangements within the LAS on trade.

As presented in Anderson (1979) and Oguledo and Macphee (1994), the gravity equation is derived from a linear expenditure system. The case of many commodity classes of goods flowing between each country *i* and *j* is considered in this study, integrating transport costs proxied by distance. In deriving the gravity equation, the overall preference function is assumed to be weakly separable with respect to the partition between traded and non-traded goods, while preferences for traded goods are assumed to be identical across countries and homothetic. Accordingly, for the purpose of simplicity, the utility function is assumed to take the Cobb-Douglas form with identical preferences and expenditure shares. Given the level of expenditure on traded goods, demands for individual traded goods are determined as if a homothetic utility function in traded goods alone was maximised subject to a budget constraint involving expenditure on traded goods. The traded goods share varies across regions and countries and has been found to be explained well by income and population (see Kuznets, 1966; Maizels, 1968). In addition, the linear or log-linear regression lines of traded goods' shares on income and population tend to be stable over time.

In deriving the gravity equations used in this study, we first take the simple case of assuming no transport costs. Country *j*'s import demand

(i.e. country *i*'s exports to *j*) of commodity class *k* goods produced by country *i* (M_{ijk}) can be written as follows:

$$M_{ijk} = \theta_{ik} \phi_j Y_j \tag{1}$$

where θ_{ik} = share of country *j*'s expenditure on country *i*'s tradeable goods to country *j*'s total expenditure on tradeables;
ϕ_j = share of country *j*'s expenditure on all traded goods to country *j*'s total expenditure, $\phi_j = F(Y_j, N_j)$, and N_j = population in country *j*;
Y_j = income in country *j*.

With the introduction of transport costs as proxied by distance, the landed value in importing country *j* becomes $M_{ijk}\tau_{ijk}$, where τ_{ijk} represents transport costs. Traded goods expenditure shares are identical functions $\theta_{ik}(\tau_j)$ where τ_j is the vector of the τ_{ijk}'s for country *j*. Demand for import becomes:

$M_{ijk}\tau_{ijk} = \theta_{ik}(\tau_j)\phi_j Y_j$ or

$$M_{ijk} = \frac{1}{\tau_{ijk}} \theta_{ik}(\tau_j)\phi_j Y_j \tag{2}$$

Aggregate trade flows between *i* and *j* can, therefore, be written as:

$$M_{ij} = \sum_k M_{ijk} = \phi_j Y_j \sum_k \frac{1}{\tau_{ijk}} \theta_{ik}(\tau_j) \tag{3}$$

The trade balance relation for country *i* (which shows the value of imports of country *i* equaling its value of exports) implies:

$$\begin{aligned} m_i \phi_i Y_i &= \sum_j M_{ij} \\ &= \sum_j \phi_j Y_j \sum_k \frac{1}{\tau_{ijk}} \theta_{ik}(\tau_j) \end{aligned} \tag{4}$$

where m_i is the capital account scale factor that corrects for any trade imbalance, $m_i = m(Y_i, N_i)$.

If transport costs are an increasing function of distance (*d*) and the same across commodities, i.e., $\tau_{ijk} = f(d_{ij})$ with $f(0) = 1$ and $f' > 0$, then the import demand equation in stochastic form can be written as:

$$M_{ij} = \phi_j Y_j \sum_k \frac{1}{f(d_{ij})} \theta_{ik} U_{ij} \quad \text{or}$$

$$M_{ij} = \left(\sum_k \theta_{ik} \right) \phi_j Y_j \frac{1}{f(d_{ij})} U_{ij} \tag{3'}$$

where U_{ij} is a log-normal disturbance with $E(\ln U_{ij}) = 0$. The trade balance equation becomes

$$m_i \phi_i Y_i = \sum_j \phi_j Y_j \sum_k \frac{1}{f(d_{ij})} \theta_{ik} \quad \text{or}$$

$$m_i \phi_i Y_i = \left(\sum_k \theta_{ik} \right) \sum_j \phi_j Y_j \frac{1}{f(d_{ij})} \tag{4'}$$

Equation (3') states that the foreign port value of country *j*'s demand for all of *i*'s goods equals country *j*'s total expenditure on traded goods (in home prices), $\phi_j Y_j$, times the common aggregate traded goods expenditure share for *i*'s goods $\sum_k \theta_{ik}$ deflated by the transport cost factor. Equation (4') states that country *i*'s expenditure on all traded goods at *i*'s prices, $\phi_i Y_i$, times the capital account scale factor m_i must equal the value at country *i* of *i*'s exports to all countries.

Solving (4') for $\sum_k \theta_{ik}$ and substituting into (3') gives us the gravity equation as follows:

$$M_{ij} = \frac{m_i \phi_i Y_i \phi_j Y_j}{\sum_j \phi_j Y_j \frac{1}{f(d_{ij})}} \cdot \frac{1}{f(d_{ij})} \cdot U_{ij} \tag{5}$$

Linearisation of *m*(.), *F*(.) and *f*(.) gives

$$m_i = m(Y_i, N_i) = k_m Y_i^{m_Y} N_i^{m_N}$$

$$\phi_i = F(Y_i, N_i) = k_\phi Y_i^{\phi_Y} N_i^{\phi_N}$$

$$\phi_j = F(Y_j, N_j) = k_\phi Y_j^{\phi_Y} N_j^{\phi_N} \quad \text{and}$$

$$\tau_{ijk} = f(d_{ij}) = k_d d_{ij}^{\mu}$$

Hence, equation (5) can be written as:

$$M_{ij} = \frac{(k_m Y_i^{m_Y} N_i^{m_N})(k_\phi Y_i^{\phi_Y} N_i^{\phi_N}) Y_i (k_\phi Y_j^{\phi_Y} N_j^{\phi_N}) Y_j}{\left[\dfrac{\sum_j (k_\phi Y_j^{\phi_Y} N_j^{\phi_N}) Y_j}{k_d d_{ij}^{\mu}}\right]} \cdot \frac{1}{k_d d_{ij}^{\mu}} \cdot U_{ij} \qquad (6)$$

Setting $\left[\dfrac{\sum_j (k_\phi Y_j^{\phi_Y} N_j^{\phi_N}) Y_j}{k_d d_{ij}^{\mu}}\right] = k'$ which is a constant term, the gravity equation becomes

$$M_{ij} = \frac{1}{k'} \cdot \left[(k_m k_\phi^2) Y_i^{m_Y+\phi_Y+1} N_i^{m_N+\phi_N} Y_j^{\phi_Y+1} N_j^{\phi_N}\right] \cdot \frac{1}{k_d d_{ij}^{\mu}} \cdot U_{ij} \text{ or}$$

$$M_{ij} = \frac{k_m k_\phi^2}{k_d k'} \cdot \left[Y_i^{m_Y+\phi_Y+1} Y_j^{\phi_Y+1} N_i^{m_N+\phi_N} N_j^{\phi_N}\right] \cdot d_{ij}^{-\mu} \cdot U_{ij} \qquad (7)$$

The gravity model can be transformed into its multiplicative form through mathematical manipulation to become

$$M_{ij} = \frac{k_m k_\phi^2}{k_d k' Y_j^{m_Y} N_j^{m_N}} \cdot \left[Y_i Y_j^{m_Y+\phi_Y+1} N_i N_j^{m_N+\phi_N}\right] \cdot d_{ij}^{-\mu} \cdot U_{ij} \qquad (8)$$

Writing equations (7) and (8) in log-linear form, we have

$$\ln M_{ij} = \alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln N_i + \alpha_4 \ln N_j + \alpha_5 \ln d_{ij} + \ln U_{ij} \quad (7')$$

where $\alpha_0 = \dfrac{k_m k_\phi^2}{k_d k'}$, $\alpha_1 = m_Y + \phi_Y + 1$, $\alpha_2 = \phi_Y + 1$, $\alpha_3 = m_N + \phi_N$, $\alpha_4 = \phi_N$,

and $\alpha_5 = -\mu$

$$\ln M_{ij} = \alpha_0 + \alpha_1 \ln Y_i Y_j + \alpha_2 \ln N_i N_j + \alpha_3 \ln d_{ij} + \ln U_{ij} \qquad (8')$$

where $\alpha_0 = \frac{k_m k_\phi^2}{k_d k' Y_j^{m_Y} N_j^{m_N}}$, $\alpha_1 = m_Y + \phi_Y + 1$, $\alpha_2 = m_N + \phi_N$, and $\alpha_3 = -\mu$.

The gravity model used in this study describes the usual relationship between bilateral trade to GDP, population and distance between countries. In addition, membership in the LAS and the adjacency of one country to another are also included. Four gravity models are formulated and estimated by using the ordinary least squares (OLS) method for a total of ten countries from 1991 until 1996. Due to the unavailability of data for most members of the LAS and incomplete data for most of the years in the last two decades, this study is only confined to a six-year period with five LAS members. They include Egypt, Jordan, Saudi Arabia, Sudan and Syria. The remaining five countries included in the estimation are the major trading partners of the selected LAS members, namely France, Germany, Italy, the United Kingdom and the United States.

Following Tang (2003) and Hassan (2003), the gravity model using the multiplicative approach is first estimated in our study. Equation (8') becomes as follows:

$$ln X_{ij} = \alpha_0 + \alpha_1 ln Y_i Y_j + \alpha_2 ln N_i N_j + \alpha_3 ln Distance + \alpha_4 LAS + \alpha_5 Border + \varepsilon_{ij} \quad (9)$$

In order to include bilateral trade data with zero data values[4], this study also re-estimates equation (9) by scaling the trade values from export values under the OLS to one plus export values under the scaled OLS. Thus, the scaled OLS model is written as:

$$ln(1 + X_{ij}) = \alpha_0 + \alpha_1 ln Y_i Y_j + \alpha_2 ln N_i N_j + \alpha_3 ln Distance + \alpha_4 LAS + \alpha_5 Border + \varepsilon_{ij} \quad (10)$$

For comparison purposes, equations (9) and (10) are later re-estimated using the "individual variable" approach of the gravity model, as in equation (7') (see Brada and Mendez, 1983; Bikker, 1987; and

[4] Zero data values may reflect small trade values (i.e., less than USD 0.5 million) that still need to be captured in the estimation.

Oguledo and Macphee, 1994). The gravity equation then takes the following form:

$$\ln X_{ij} = \alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln N_i + \alpha_4 \ln N_j + \alpha_5 \ln Distance + \alpha_6 LAS + \alpha_7 Border + \varepsilon_{ij} \quad (11)$$

while the scaled form is written as follows:

$$\ln(1 + X_{ij}) = \alpha_0 + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln N_i + \alpha_4 \ln N_j + \alpha_5 \ln Dis\tan ce + \alpha_6 LAS + \alpha_7 Border + \varepsilon_{ij} \quad (12)$$

Equations (9) – (12) are first estimated using the annual data of ten countries in a panel regression analysis. In order to see the effects of the LAS preferential trading agreement from one year to the other, yearly cross-section estimations of equations (11) and (12) are also undertaken. All variable definitions and sources are given in Table 1.

The effects of income variables (Y_i, Y_j) on trade flows are expected to be positive. This is due to the fact that an increase in income will result in greater production available for exports. In addition, a rise in income usually leads to an increase in imports.

The sign of the coefficients of the population variables (N_i, N_j) is, however, indeterminate since population size can be trade enhancing as well as trade inhibiting. According to Oguledo and Macphee (1994), a large population may, on the one hand, indicate large resource endowment, self-sufficiency and less reliance on international trade. On the other hand, it is possible that a large domestic market (or population) would promote division of labour, and thus, create an opportunity for trade in a wide variety of goods. According to the latter argument, the expected sign of the population coefficient is positive.

Distance is a proxy variable for natural trade resistance which is a composite of transportation costs and transport time (Aitken, 1973). Long distance between trading countries, *ceteris paribus*, leads to higher costs and a lower profit margin to the importer. Consequently, *Distance* is hypothesised to have a negative effect on exports.

Table 1:
List of Variables and Data Sources

Variable	Definition, Source
$ln\ X_{ij}$	Export values between countries *i* and *j* in logarithmic form (measured in real US million dollars). Source: *Direction of Trade Statistics* (various years).
$ln Y_i$	Gross domestic product of exporter country *i* in logarithmic form (measured in real US million dollars). Source: *International Financial Statistics, CD-ROM* (2003), *IMF World Economic Outlook Database* (2004).
$ln Y_j$	Gross domestic product of importer country *j* in logarithmic form (measured in real US million dollars). Source: *International Financial Statistics, CD-ROM* (2003), *IMF World Economic Outlook Database* (2004).
$ln N_i$	Population of exporter country *i* in logarithmic form (measured in millions). Source: *International Financial Statistics, CD-ROM* (2003).
$ln N_j$	Population of importer country *j* in logarithmic form (measured in millions). Source: *International Financial Statistics, CD-ROM* (2003).
In Distance	Distance between two countries from capital cities in logarithmic form (measured in kilometers). Source: http://www.wcrl.ars.usda.gov/cec/java/lat-long.htm.
LAS	A dummy variable which takes the value of one if the country is a member of the LAS and zero otherwise.
Border	A dummy variable which takes the value of one if two countries have a common border and zero otherwise.
$ln(1+X_{ij})$	Scaled export values (i.e., 1+ export values) between countries *i* and *j* in logarithmic form (measured in real US million dollars). Source: *Direction of Trade Statistics* (various years).
$ln Y_i Y_j$	Gross domestic product of countries i *and j* in multiplicative and logarithmic form (measured in real US million dollars). Source: *International Financial Statistics, CD-ROM* (2003).
$ln N_i N_j$	Population in countries i *and j* in multiplicative and logarithmic form (measured in millions). Source: *International Financial Statistics, CD-ROM* (2003).

LAS is a dummy variable representing preferential trading agreements among the League of Arab States. A positive coefficient indicates trade creation among the LAS members while a negative coefficient indicates trade diversion (Jobe, 2002). In order to examine the effects of the adjacency of countries, the *Border* dummy variable is included in the model. Since neighbourliness generally stimulates trade

due to similarity of tastes and an awareness of common interests (Balassa, 1961), the coefficient of the variable is expected to be positive.

5. ANALYSIS OF RESULTS AND DISCUSSION

The results of the estimation of the gravity equation using the multiplicative approach are shown in Table 2. The diagnostics of an initial estimation indicate that a first-order autocorrelation problem exists in both models.[5] With the presence of autocorrelation, the coefficient estimates are inefficient despite the fact that they are still unbiased, consistent and asymptotically normally distributed (Gujarati, 2003). Although this is not considered to be a major problem in this context since the estimation results are not meant for forecasting purposes where the efficiency of estimates would be crucial (Ramanathan, 2002), Generalised Least Squares (GLS) was applied to correct for autocorrelation. The Durbin-Watson (DW) statistics are now 2.1113 for the unscaled model and 2.1190 for the scaled model, both indicating the elimination of the autocorrelation problem. The joint significance of the explanatory variables as indicated by the *F*-statistics (F = 81.6878 and F = 84.8631 for the unscaled and scaled models, respectively) show significance at the 1% level. R^2 and adjusted-R^2 values are found to be low but this is expected in a panel regression analysis such as this one, due to the heterogeneity of the countries under study.

The findings show the significance of GDP, *Distance* and *Border* variables in both the scaled and unscaled forms. Neighbourliness stimulates trade as shown by the positive sign of the *Border* variable. The signs for GDP and *Distance* are as expected *a priori*, showing a positive relationship between income and trade and a negative relationship between distance and trade. In this study, the insignificance of population variable implies that population size is neither trade enhancing nor trade inhibiting. The preferential dummy, *LAS*, is also insignificant which reflects that the regional grouping does not have any

[5] Computed values of the Durbin-Watson (DW) statistics are 1.3134 and 1.3015 for the unscaled and scaled models, respectively, which do not fall in the "no-autocorrelation problem" region. The 1% critical values of d_L and d_U are 1.623 and 1.725, respectively, with n = number of observations = 539 and k = number of explanatory variables excluding the constant term = 5.

impact on trade. This is consistent with the general awareness within the Arab League that despite efforts at reducing tariffs, it does not manage to promote trade among members of the LAS.

Table 2:
Estimation Results of Selected LAS States Using the Multiplicative Approach of the Gravity Model for 1991-2002

	Unscaled Model **Dependent variable:** $\ln X_{ij}$	**Scaled Model** **Dependent variable:** $ln(1+X_{ij})$
Constant	-4.7646*** (-3.9503)	-4.4893*** (-3.8784)
$ln Y_i Y_j$	0.5595*** (14.1216)	0.5493*** (14.4869)
$ln N_i N_j$	-0.0781 (-0.8569)	-0.1024 (-1.1738)
In Distance	-0.4205*** (-3.3408)	-0.3967*** (-3.2927)
LAS	0.2324 (0.9405)	0.2160 (0.9078)
Border	0.4142** (2.2474)	0.3486** (1.9911)
R^2	0.4814	0.4900
Adjusted-R^2	0.4755	0.4842
Durbin-Watson	2.1113	2.1190
F-statistics	81.6879***	84.8631***

Notes: X_{ij} = Export of country *i* to country *j*; Y_i = GDP of exporter country *i*; Y_j = GDP of importer country *j*; N_i = Population of exporter country *i*; N_j = Population of importer country *j*;
***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Figures in parentheses represent *t*-values.

The estimation results as shown in Table 2 are consistent with most empirical findings done in earlier studies. For comparison purposes, the general gravity equation with individual GDP and population variables for each of the exporting and importing countries is also estimated. In addition, the use of this individual variable approach provides more information in explaining the trade flows among the states under study.

Table 3:
Estimation Results of Selected LAS States Using the Individual Variable Approach of the Gravity Model for 1991-2002

	Unscaled Model **Dependent variable:** $ln\,X_{ij}$	**Scaled Model** **Dependent variable:** $ln(1+X_{ij})$
Constant	-6.7054*** (-5.6957)	-6.3569*** (-5.6129)
$ln\,Y_i$	0.7587*** (12.6664)	0.7372*** (12.6886)
$ln\,Y_j$	0.4652*** (9.7923)	0.4654*** (10.3289)
$ln\,N_i$	0.1625 (1.3551)	0.1355 (1.1684)
$ln\,N_j$	-0.2468** (-2.3218)	-0.2718*** (-2.6780)
$ln\,Distance$	-0.2668** (-2.1615)	-0.2547** (-2.1528)
LAS	-0.1887 (-0.7636)	-0.1794 (-0.7532)
Border	0.4812*** (2.7260)	0.4025** (2.4015)
R^2	0.5256	0.5324
Adjusted-R^2	0.5184	0.5253
Durbin-Watson	2.1404	2.1492
F-statistics	72.8432***	75.1318***

Notes: X_{ij} = Export of country *i* to country *j*; Y_i = GDP of exporter country *i*; Y_j = GDP of importer country *j*; N_i = Population of exporter country *i*; N_j = Population of importer country *j*;
***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Figures in parentheses represent *t*-values.

The results (corrected for autocorrelation) are shown in Table 3. The diagnostics for DW, *F*, R^2 and adjusted-R^2 values are similar to the earlier results. The preferential dummy variable, *LAS*, is still found to be insignificant as in the earlier estimation, confirming the ineffectiveness of the League of Arab States in promoting trade among member countries. Similar results as before are also found for *Distance* and *Border*, both being significant with the former having a negative while the latter a positive relationship with exports. The incomes of both the exporter and importer countries are found to be significantly affecting

trade, as expected *a priori*. In this model, the population of importer states is found to be significant and negatively related to exports. These results are consistent with earlier studies (Aitken, 1973; Oguledo and Macphee, 1994; Martinez-Zarzoso, 2003) analysing trade flows in other regional groupings which found the conventional trade flow variables to be generally significant.

The insignificance of the population variable of exporter states may reflect the possibility that a large resource endowment may neither lead to self-sufficiency that lowers reliance on international trade nor promote the division of labour that creates opportunities for trade, due to the high unemployment that exists in these states. The unemployment rate in Egypt, for example, was 11.3% in 1995 (*IFS CD-ROM*, 2003), and the rates ranged from 12% in 2002 in Egypt to 25% in Saudi Arabia in the same year (CIA *World Factbook*, 2004a-e).

Results from yearly estimations of the model (corrected for autocorrelation) in both the unscaled and scaled forms are presented in Tables 4 and 5, respectively. With the exception of the years 1991 and 1998, the R^2 values that measure the overall goodness of fit of the regression model in both tables are all above 0.5. The *F*-statistics are significant at the 1% level for the year 1992 onwards indicating that the coefficients are jointly non-zero.

Both the unscaled and scaled models show similar results. None of the explanatory variables are found to influence trade for the year 1991 except for LAS, and this is most likely due to the Gulf War that took place from 1990 to 1991. Both GDP variables are found to be significant and positively related to trade from 1992 to 2002. However, the population of exporter countries is negatively significant only for the year 1994 in the unscaled model and for the years 1992 and 1994 in the scaled model. On the other hand, the population of importer countries is also found to be negatively significant but for a longer duration from 1992 to 1996 for both models. The *Border* variable is generally insignificant for all the years, except 1992-1994. Again, the LAS economic grouping is found to be insignificant which implies neither trade diversion nor trade creation, indicating the failure of integration measures undertaken.

Table 4:
Results from Yearly Estimations of Selected LAS States Using the Unscaled, Individual Variable Approach of the Gravity Model

	1991	**1992**	**1993**	**1994**	**1995**	**1996**
Constant	3.6807 (0.6566)	-16.4244* (-3.7198)	-14.9916*** (-3.7018)	-13.5934*** (-3.7107)	-10.5492*** (-3.1663)	-7.2344** (-2.0910)
$ln\,Y_i$	0.3176 (0.7526)	1.5025*** (6.0855)	1.3543*** (5.7825)	1.2522*** (7.8824)	1.1072*** (6.6821)	0.9005*** (6.2231)
$ln\,Y_j$	0.4116 (1.1100)	0.9584*** (3.6691)	0.9214*** (3.8712)	0.8152*** (3.8519)	0.6870*** (4.2179)	0.5004*** (3.5825)
$ln\,N_i$	0.2619 (0.2985)	-0.6369 (-1.6240)	-0.3884 (-1.0503)	-0.5204* (-1.9493)	-0.2738 (-0.9527)	-0.0964 (-0.3247)
$ln\,N_j$	-0.1719 (-0.2447)	-0.8454* (-1.8319)	-0.9550** (-2.3074)	-0.9056** (-2.3712)	-0.8199** (-2.5554)	-0.7948** (-2.5100)
In Distance	-0.9800 (-1.1657)	-0.3358 (-0.7892)	-0.2436 (-0.6306)	-0.0679 (-0.1939)	-0.1344 (-0.4139)	-0.0205 (-0.0571)
LAS	-2.3100* (-1.9074)	0.3941 (0.4437)	0.1700 (0.2061)	0.1775 (0.2343)	-0.2076 (-0.2943)	-0.3326 (-0.4391)
Border	-0.4778 (-0.5143)	1.3249* (1.9262)	1.2167** (2.0267)	1.0071* (1.7270)	0.5220 (1.0389)	0.3402 (0.6278)
R^2	0.3207	0.6690	0.6942	0.7246	0.7468	0.6979
Adjusted-R^2	0.1655	0.5954	0.6263	0.6634	0.6905	0.6307
Durbin-Watson	2.0868	1.9207	2.0211	1.9341	1.9110	1.8688
F-statistics	2.0656*	9.0953***	10.2171***	11.8415***	13.2731***	10.3940***

	1997	**1998**	**1999**	**2000**	**2001**	**2002**
Constant	-8.9514* (-2.0026)	-9.3844** (-2.1183)	-11.1930** (-2.4519)	-8.3483** (-2.0957)	-7.7091** (-2.2399)	-6.9741** (-2.0764)
$ln\,Y_i$	0.6762*** (3.4966)	0.6480*** (3.4285)	0.6110*** (3.2349)	0.6870*** (3.4842)	0.8142*** (5.1676)	0.8343*** (5.1522)
$ln\,Y_j$	0.4923*** (2.8361)	0.4147** (2.2417)	0.4675*** (2.8378)	0.3665*** (2.9460)	0.4066*** (3.4599)	0.3633*** (3.2395)
$ln\,N_i$	0.2871 (0.6960)	0.4480 (1.0905)	0.3624 (0.8674)	0.5495 (1.2487)	-0.2431 (-0.7028)	-0.1501 (-0.4398)
$ln\,N_j$	-0.1394 (-0.3378)	-0.1887 (-0.4589)	0.0827 (0.1949)	0.3320 (1.0231)	-0.0904 (-0.3072)	-0.1451 (-0.5117)
In Distance	-0.0514 (-0.1068)	0.1007 (0.2003)	0.1762 (0.3392)	-0.2526 (-0.6121)	-0.0118 (-0.0325)	-0.0267 (-0.0756)
LAS	0.7405 (0.7988)	1.0941 (1.2112)	1.5500 (1.6663)	0.6549 (0.7983)	0.2378 (0.3306)	-0.1833 (-0.2566)
Border	1.0861 (1.5864)	0.9509 (1.2227)	1.0566 (1.4988)	0.8313 (1.4962)	0.4667 (0.9259)	0.3456 (0.7145)
R^2	0.5021	0.5151	0.5286	0.6732	0.6753	0.7001
Adjusted-R^2	0.3914	0.4011	0.4177	0.6006	0.6031	0.6335
Durbin-Watson	2.0842	2.1731	2.2055	1.9440	2.2083	1.8548
F-statistics	4.5376***	4.5155***	4.7664***	9.2700***	9.3574***	10.5055***

Notes: X_{ij} = Export of country *i* to country *j*; Y_i = GDP of exporter country *i*; Y_j = GDP of importer country *j*; N_i = Population of exporter country *i*; N_j = Population of importer country *j*;
***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Figures in parentheses represent *t*-values.

Table 5:
Results from Yearly Estimations of Selected LAS States Using the Scaled, Individual Variable Approach of the Gravity Model

	1991	1992	1993	1994	1995	1996
Constant	3.5755 (0.6792)	-15.0450*** (-3.6346)	-14.0880*** (-3.5895)	-12.9067*** (-3.6885)	-10.0997*** (-3.1474)	-6.9066** (-2.0522)
$ln Y_i$	0.3326 (0.8116)	1.4387*** (6.0600)	1.3098*** (5.7021)	1.2063*** (7.8978)	1.0802*** (6.6094)	0.8859*** (6.1057)
$ln Y_j$	0.3878 (1.1191)	0.8924*** (3.6798)	0.8769*** (3.8201)	0.7729*** (3.8383)	0.6604*** (4.2681)	0.4836*** (3.6240)
$ln N_i$	0.2116 (0.2475)	-0.6589* (-1.7505)	-0.4010 (-1.1070)	-0.5138* (-2.0044)	-0.2665 (-0.9434)	-0.0884 (-0.2983)
$ln N_j$	-0.2083 (-0.3149)	-0.8197* (-1.9047)	-0.9271** (-2.3182)	-0.8814** (-2.4249)	-0.7828** (-2.5582)	-0.7596** (-2.4920)
In Distance	-0.9092 (-1.4471)	-0.3043 (-0.7608)	-0.2244 (-0.5991)	-0.0331 (-0.0990)	-0.1279 (-0.4093)	-0.0308 (-0.0880)
LAS	-2.1832* (-1.9121)	0.2862 (0.3426)	0.0979 (0.1226)	0.1380 (0.1906)	-0.2296 (-0.3382)	-0.3620 (-0.4901)
Border	-0.5654 (-0.6528)	1.1317* (1.7693)	1.1169* (1.9265)	0.9741* (1.7505)	0.5140 (1.0721)	0.3275 (0.6284)
R^2	0.3275	0.6735	0.6919	0.7273	0.7515	0.7012
Adjusted-R^2	0.1738	0.6010	0.6234	0.6667	0.6963	0.6348
Durbin-Watson	2.0918	1.9223	2.0302	1.9321	1.9071	1.8739
F-statistics	2.1306*	9.2834***	10.1062***	12.0034***	13.6119***	10.5605***

	1997	1998	1999	2000	2001	2002
Constant	-8.6507* (-1.9803)	-6.4285 (-1.4040)	-10.8605** (-2.4465)	-8.1926** (-2.1383)	-7.4719** (-2.2568)	-6.9662** (-2.1825)
$ln Y_i$	0.6624*** (3.4814)	0.5823** (2.6821)	0.5960*** (3.2467)	0.6576*** (3.4697)	0.7984*** (5.2161)	0.8078*** (5.2721)
$ln Y_j$	0.4758*** (2.8180)	0.5929*** (3.7290)	0.4545*** (2.8327)	0.3584*** (3.4054)	0.3973*** (3.5426)	0.3594*** (3.3862)
$ln N_i$	0.2769 (0.6826)	0.3093 (0.6696)	0.3336 (0.8216)	0.5674 (1.3367)	-0.2424 (-0.7223)	-0.1196 (-0.3679)
$ln N_j$	-0.1250 (-0.3108)	-0.4629 (-1.1794)	0.0709 (0.1714)	0.3343 (1.0736)	-0.0868 (-0.3082)	-0.1325 (-0.4932)
In Distance	-0.0422 (-0.0897)	-0.2783 (-0.5648)	0.2001 (0.3953)	-0.2226 (-0.5615)	-0.0023 (-0.0065)	-0.0021 (-0.0063)
LAS	0.7215 (0.7965)	0.9588 (0.9892)	1.4959 (1.6542)	0.6372 (0.8079)	0.2016 (0.2911)	-0.1720 (-0.2528)
Border	1.0528 (1.5780)	-0.0240 (-0.0364)	1.0300 (1.5010)	0.8280 (1.5528)	0.4512 (0.9351)	0.3612 (0.7881)
R^2	0.5032	0.4770	0.5287	0.6807	0.6856	0.7144
Adjusted-R^2	0.3928	0.3608	0.4179	0.6097	0.6158	0.6509
Durbin-Watson	2.0902	2.1132	2.2144	1.9439	2.0226	1.8381
F-statistics	4.5587***	4.1049***	4.7685***	9.5912***	9.8139***	11.2566***

Notes: X_{ij} = Export of country *i* to country *j*; Y_i = GDP of exporter country *i*; Y_j = GDP of importer country *j*; N_i = Population of exporter country *i*; N_j = Population of importer country *j*;
***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Figures in parentheses represent *t*-values.

There exist a few factors that hinder stronger intra-regional trade flows within the LAS and within the Middle-East region in general. Poor transport and communications within the region has been cited as one deterring factor that hampers regional trade and integration ("With whom?", October 1998). Another factor relates to the region's economic and geographical structure where many of the states offer competing products, particularly petrol and petroleum products (Egypt, Saudi Arabia, Sudan and Syria) and agricultural goods and textiles (all five selected LAS states). Even the manufactured goods produced by these countries tend to be low skill intensive, undiversified and therefore, largely competing.

Table 6:
Comparative Measure of Trade Policy Regimes
IMF Trade Restrictiveness Index, 2000

Region	Overall rating	Non-tariff barriers rating	Tariff rating	Average tariff (%)
Middle-East & North Africa	5.6	2.0	3.0	18.1
Sub-Saharan Africa	4.7	1.6	3.0	19.2
Fast-growing countries of East Asia[a]	3.4	1.7	1.3	7.2
Rest of Asia	5.0	1.9	2.4	13.8
Eastern Europe (early transition) & Baltics[b]	1.9	1.1	1.4	8.0
Eastern Europe (late transition)	2.9	1.4	1.8	11.5
Former Soviet Union	4.2	1.8	1.8	10.2
Western Hemisphere	4.1	1.8	1.8	11.7
Industrial countries	3.9	2.0	1.0	5.4

Notes: [a]Comprises Hong Kong, Indonesia, South Korea, Malaysia, Philippines, Singapore and Thailand.
[b]Comprises Czech Republic, Hungary, Poland, Slovak Republic, Estonia, Latvia and Lithuania.

Source: IMF, *World Economic Outlook* (2001), in "Slow road to globalization" (2002), Table 1, p. 6.

Certainly the most crucial barrier to higher intra-trade is the widespread imposition of prohibitively high tariff and non-tariff barriers to imports. In 2000, the International Monetary Fund (IMF) rated the Middle-East & North Africa as the second most trade-restrictive in the world behind Sub-Saharan Africa, with an average tariff rate of 18.1% (see Table 6). This compares to only 7.2% for the fast-growing countries of Asia and

5.4% for the industrial countries as a whole. Non-tariff barriers are also prevalent, which include import quotas, lengthy and costly customs clearance procedures and overly demanding technical requirements and quality controls ("Slow road to globalisation", 2002, p. 7).

As mentioned earlier in this article, after several failed attempts by the LAS to create a Pan-Arab Free Trade Area or Greater Arab Free Trade Area (GAFTA) among its members, 14 Arab states signed up to the most recent attempt, i.e. the "Executive Programme" in 1998. However, despite pledges by the signatories to reduce tariffs by 10% per year on raw materials and manufactured goods, in reality not much has been achieved. This is due to the fact that grace periods and exclusions have been sought and granted for a long list of products, and agricultural goods are subject to long seasonal exclusions. At the bilateral level, progress has also been slow with numerous bilateral 'free trade agreements' being signed over the previous years with very few concrete results ("Slow road to globalisation", 2002).

Several measures can be undertaken to increase intra-trade activities. Tariff reduction efforts obviously need to be more seriously undertaken and implemented. However, in this regard, the LAS would need to reassess the feasibility of the tariff reduction schedule in the Executive Programme of 1998 that requires 10% tariff reductions annually for raw materials and manufactured goods. A new schedule that is more workable for individual member states needs to be developed in order to prevent too many applications for exclusions of too many goods which would definitely lead to the utter failure of the arrangements.

On the domestic front, better infrastructure needs to be provided by member states as this is important not only for intra-trade, but also for multinational companies to set up their operations. The current management of transport and communications infrastructure by public monopolies in many member states needs to be replaced by the private sector in order to have a better and more efficient road and communication system. This has actually taken place in a few states where foreign companies are already investing in telecoms and transport ("With whom?", 1998). In addition, cross-border transportation systems can be better planned by the various governments concerned to further promote trade flows among neighbouring states.

6. CONCLUSION

The LAS is a regional organisation that has the potential to exert its influence in both political and economic matters. However, although it has been able to articulate its interests, it lacks the international respect necessary to make its voice heard. International observers have suggested that the LAS undergo not only a political but also an economic reform. Some have even suggested that the future of the LAS must be laid on economic cooperation. It is argued that a reform based on economic integration will enable the LAS to regain influence in international and Middle Eastern politics (Anderson, 2004).

This article investigates the extent of economic integration among five LAS members, namely Egypt, Jordan, Saudi Arabia, Sudan and Syria, by empirically testing the nature of intra-trade activities in the grouping. Five of their major trading partners are included in the study, namely France, Germany, Italy, the UK and the US. The gravity models are used in the scaled and unscaled forms as well as in the multiplicative and individual variable approaches. Both panel and yearly estimations for the period 1991 to 2002 are performed in order to obtain more information on the intra-trade activities over the years. The results indicate that the LAS economic grouping has not been effective in trade creation, indicating the failure of the integration measures undertaken. More serious tariff reduction efforts with a more workable tariff reduction schedule need to be undertaken and a better infrastructure needs to be provided to encourage trade activities among LAS members.

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