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February 15, 2000

WP/00/10
Correction 1

Subject: Intra-Arab Trade: Is It Too Little?

CORRIGENDUM

The following corrections were made in WP/00/10 (January 2000):

Page 2, Contents, Section V: for "Specification of the Gravity Mode"
read "Specification of the Gravity Model"

Page 14, third full para., line 2: for "consisting with the observation"
read "consistent with the observation"

Page 15, Table 4: table revised.

Page 17, Table 5: table revised.

Corrected pages are attached.

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Correction 1

INTERNATIONAL MONETARY FUND

Middle Eastern Department

Intra-Arab Trade: Is It Too Little?

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Authorized for distribution by Pierre Dhonte

January 2000

Abstract

This paper estimates a gravity model to address the issue of whether intra-Arab trade is too little. Although gravity models have been extensively used to measure bilateral trade among countries, they have—to the best of our knowledge—never been used to measure intra-Arab trade. Our results suggest that intra-Arab trade and Arab trade with the rest of the world are lower than what would be predicted by the gravity equation, suggesting considerable scope for regional—as well as multilateral—integration. The results also suggest that intra-GCC and intra-Maghreb trade are relatively low while the Mashreq countries exhibit a higher level of intragroup trade.

JEL Classification Numbers: C1,F1,O4

Keywords: Arab countries, gravity model, trade

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¹ The authors thank Pierre Dhonte for suggesting the topic and for his encouragement. They wish to also thank David Coe, Howard Handy, Oleh Havrylyshyn, Karim Nashashibi, Antonio Spilimbergo, Jianping Zhou, and participants at a Middle Eastern departmental seminar for helpful comments, and Ilse-Marie Fayad for assistance in collecting and organizing the large data set.

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for which we calculate the average level for each variable. Distance is measured as the direct distance between two capitals.⁹

The model is estimated with the Arab countries in the sample. Following Foroutan and Pritchett (1993), we use dummy variables to statistically test our main hypothesis on intra-Arab trade. Subsequently, we use the model to test trade within the subregions. Thus, we introduce three dummy variables in equation (3):

Arab₁ = 1 if the reporting country is an Arab country;
 Arab₂ = 1 if the reporting country is an oil-exporting Arab country; and
 Arab₃ = 1 if the reporting and partner countries are in the Arab group.

The first variable captures any patterns that are applicable to the trade of Arab countries with the entire sample and the second captures patterns specific to the oil-exporting Arab countries—both variables measure the extent of trade integration between Arab countries and the rest of the world compared to the predictions of the gravity model. The third variable is the one most relevant to the question posed in this paper since it focuses on bilateral Arab trade and compares the observed pattern with what the gravity model suggests based on the whole sample. Thus, our model takes the following form:

$$t_{ij} = \alpha_0 + \alpha_1 y_i + \alpha_2 y_j + \alpha_3 n_i + \alpha_4 n_j + \alpha_5 dis_{ij} + \sum_1^n \beta_i Region_{ij} + \sum_i^n \chi_i Language_{ij} + \delta_1 Border_{ij} + \delta_2 Open_i + \sum_i^3 \phi_i Arab_{ij} \quad (4)$$

Two problems remain to be addressed; one data related and the other econometric. First, our data on bilateral trade includes trade in oil, and many of the Arab countries in our sample are oil-producing countries. Oil may bias the results both by exaggerating the level of the region's trade with the rest of the world and also by underestimating the potential for intra-Arab trade given the similar economic structure of the oil economies. Ideally, trade in oil should not be included or, at least, the results when oil data are included should be contrasted with those obtained when it is not.¹⁰ However, due to data shortcomings and

⁹ We have not experimented with other measures of distance. The measure used would tend to exaggerate the distance between countries the larger their size as in the case of a number of Arab countries. We expect the use of the border variable to lessen the bias against large countries that is created by the distance variable.

¹⁰ A priori, most trade theories do not distinguish between trade in raw materials and finished goods, supporting the case for including trade in oil. However, most oil sectors in oil-exporting countries, especially those in the Arab countries, represent enclave economies that do not capture the overall comparative advantage in these economies. On a more technical note, the reporting of trade in oil is often incomplete as it does not take into account re-exports or the final destination of crude that is sold in world markets.

inconsistencies, it was not possible to exclude the data of oil trade from all the countries in the sample. Accordingly, while the gravity model below is estimated using exports, imports, and total trade as the dependent variables, only the imports equation is likely to provide insight on intra-Arab trade given the bias resulting from oil exports.¹¹

The econometric problem derives from the fact that since the value of the imports, exports, and trade is censored at zero, ordinary least squares (OLS) produces inconsistent estimates. With a few exceptions, the problem of zero observations has generally been ignored in the empirical literature. Since the value of almost 15 percent of the observations in our data set, including 20 percent in the sample of Arab countries, is at zero, the estimates produced by OLS would be biased towards zero by roughly 25 percent.¹² In fact, for our data set, the maximum likelihood (Tobit) estimates tended to be higher than those produced by OLS. As such, we shall report the estimates of the gravity coefficients generated by the Tobit procedure to correct for the censoring.

I. EMPIRICAL RESULTS

Table 4 presents the empirical results of estimating of equation (4) for imports, exports and total trade. The model's overall performance is quite good and compares favorably with other studies.¹³ As expected, trade (as well as imports and exports separately) increases with both domestic and foreign GDP and with per capita income, and falls with distance; all variables are statistically significant at the 5 percent level.¹⁴

Moreover, countries with a common border tend to trade more with each other, consistent with the observation that intra-trade within the Arab subgroups is higher than overall intra-Arab trade. Cultural attributes, as proxied by language, yield mixed results: on the one hand, English-speaking countries tend to trade more with each other than would be expected; on the other hand, the results for French-speaking countries are not statistically significant, probably reflecting the composition of the sample used in the model. The ASEAN preference arrangement shows large positive effects but the results for the EU arrangement suggest that it decreased trade. We do not have a good explanation to the counter-intuitive results for the EU arrangement. Perhaps, the role of factor mobility or the

¹¹ Kleiman (1992) also used imports as the dependent variable in his study of trade in the Middle East.

¹² This assumes, as has been shown by Greene (1981), that OLS bias is linear in the proportion of observations not at zero.

¹³ See, for example, Foroutan and Pritchett (1992) and Frankel and Wei (1996).

¹⁴ The main exception is GDP per capita of the trading partner in the export equation which gives insignificant results.

time period chosen (1995–97) impacts the results. The trade restrictiveness index exhibits the expected effect although its statistical significance varies across the three equations.

Table 4. Maximum Likelihood Estimates of the Gravity Model
Using the Tobit Procedure
(Arab countries as one group)

Dependent Variable	Imports		Exports		Trade	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Arab Dummy Variables						
Arab1	0.35	1.41	-0.82	-3.17 ***	0.19	0.83
Arab2	-1.17	-5.62 ***	-1.12	-4.83 ***	-0.88	-4.62 ***
Arab3	-0.65	-2.34 ***	-0.26	-0.84	-0.42	-1.78 **
Proximity						
Distance	-1.01	-12.0 ***	-1.34	-13.9 ***	-1.01	-13.1 ***
Border	1.29	3.52 ***	0.61	2.56 ***	0.97	2.87 ***
Reporter						
GDP ⁱ	0.98	18.4 ***	1.08	20.14 ***	0.95	19.5 ***
GDPPC ⁱ	0.16	2.69 ***	0.32	5.12 ***	0.21	3.77 ***
Partner						
GDP ^j	1.25	25.4 ***	1.29	23.1 ***	1.14	25.3 ***
GDPPC ^j	0.16	3.27 ***	-0.02	-0.4	0.11	2.39 ***
Preferential						
ASEAN	1.56	1.94 **	2.02	2.16 ***	1.84	2.47 ***
EU	-0.83	-2.53 ***	-0.89	-2.4 ***	-0.61	-2.05 **
GCC	-1.76	-2.36 **	-2.01	-0.25	-0.57	-0.84
AMU	-0.14	-2.15 **	-0.95	-3.25 ***	-1.15	2.42 **
Language						
English	1.46	5.53 ***	1.63	5.43 ***	1.49	6.1 ***
French	0.42	0.88	0.34	0.63	0.24	0.54
Openness						
Reporting Country	0.24	1.53 *	...	...	0.28	1.91 **
Partner Country	...	...	-0.16	-0.96	-0.18	-1.37 *
Number of countries	61		61		61	
Uncensored observations	3718		3718		3718	
S.E.	2.53		2.53		2.53	
Log-likelihood	-2.35		-2.45		-2.29	
R ²	61.4%		62.3%		62.7%	

Note: ***, ** and * denote significance at the 5 percent, 10 percent, and 15 percent level, respectively.

With regards to Arab trade, the empirical estimates in Table 4 yield the following results when the entire group of Arab countries are considered:

- Arab exports to the rest of the world are lower than what is predicted by the gravity model.
- In the case of the oil-exporting Arab countries, their exports and imports are noticeably lower than what is predicted by the model.
- Intra-Arab trade is lower than what the model predicts based on both the imports and total trade equation.
- The GCC and AMU trading arrangements have not promoted greater integration among member countries: for each arrangement, members countries trade less amongst themselves than what the model predicts.

In all, these results suggest that considerable scope for trade exist both for Arab trade with the rest of the world and within the region itself. To the extent that regional trading arrangements promote trade between member countries, the existence of the GCC and AMU is justified by the low level of trade within each subgroup.

We pursued these findings on Arab trade patterns further by reestimating the model after disaggregating the Arab countries into three subgroups: GCC (Bahrain, Kuwait, Qatar, Oman, Saudi Arabia, and United Arab Emirates), Maghreb (Algeria, Libya, Mauritania, Morocco, and Tunisia), and Mashreq (Egypt, Jordan, Lebanon, Sudan and Syria). In doing so, we are in essence treating each subgroup as a separate region for which we examine the extent of trade integration.¹⁵ The empirical results are summarized in Table 5. Again, the standard coefficients of the gravity model have the expected sign and are statistically significant. The empirical results support the following findings:

- With the exception of the Mashreq, other subgroups trade less with the outside world than what the model predicts. For the Mashreq, whether we use exports or imports, countries trade considerably more with the outside world; and
- With the exception of the Mashreq, other subgroups exhibit lower levels of intragroup trade; for the Mashreq, the opposite is true with member countries having more intragroup trade.

Thus, the empirical results based on a more disaggregated examination of the Arab countries would seem to suggest that the lower level of intra-Arab trade observed above is being driven by the GCC and Maghreb countries.¹⁶ Notwithstanding the absence of a regional trading arrangement linking the group, the Mashreq countries appear to have achieved considerably

¹⁵ Technically speaking, we replace the dummy variables for the entire group of Arab countries with ones for each subgroup and introduce intragroup dummy variables.

¹⁶ Although not reported, the results for the Djibouti and Yemen when treated as a subgroup are similar to those for the GCC and AMU.

higher levels of regional integration in addition to being more integrated with the global economy than the other two subgroups.¹⁷

Table 5. Maximum Likelihood Estimates of the Gravity Model
Using the Tobit Procedure
(Arab countries disaggregated into three groups)

	Imports		Exports		Trade	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Arab Dummy Variables 1/						
AMU	-1.79	-4.66 ***	-1.6	-10.14 ***	-1.48	-4.39 ***
GCC	-0.84	-2.41 ***	-0.26	-0.66	-0.17	-1.55 *
Mash	0.79	2.04 **	1.1	2.83 ***	0.54	1.86 **
Proximity						
Distance	-1.18	-8.19 ***	-1.61	-10.13 ***	-1.14	-9.1 ***
Border	1.34	2.16 ***	0.51	1.98 **	0.97	2.87 ***
Reporter						
GDP ⁱ	1.12	14.33 ***	1.52	18.4 ***	1.57	17.86 ***
GDPPC ⁱ	0.129	1.23	0.31	2.78 ***	-0.05	-0.61 **
Partner						
GDP ^j	1.55	19.5 ***	1.57	17.86 ***	1.14	25.3 ***
GDPPC ^j	0.2	2.47 ***	-0.05	-0.61	0.11	2.39 ***
Preferential						
ASEAN	1.46	1.99 **	2.37	1.58 **	1.84	2.47 ***
EU	-1.34	-2.42 ***	-0.97	-1.61 **	-0.61	-2.05 **
GCC	-4.3	-3.5 ***	-0.25	-0.66	-0.57	-0.84
AMU	-0.27	-3.11 ***	-1.43	-3.62 ***	2.05	2.42 ***
Mash	1.63	2.34 ***	1.18	2.24 **	1.48	2.19 **
Language						
English	1.76	3.91 ***	2.43	4.98 ***	1.49	6.1 ***
French	0.76	1.64 *	0.54	1.12	0.24	0.54
Openness						
Reporting Country	0.03	0.12	...	...	-0.04	-0.02
Partner Country	...	...	-0.33	-1.24 *	-0.39	-1.8 **
Number of countries	61		61		61	
Uncensored observations	3718		3718		3718	
S.E.	4.2		4.6		3.79	
Log-likelihood	-2.86		-2.9		-2.7	
R ²	63.8%		64.1%		65.1%	

Note: ***, ** and * denote significance at the 5 percent, 10 percent, and 15 percent level, respectively.

1/ The regressions presented in this table do not impose any common dummy variables on the Arab countries as a whole.

¹⁷ Statistically, we are able to reject the hypothesis that the coefficients pertaining to the Mashreq countries are equal to those for the AMU and GCC countries. Thus, Mashreq trade with the rest of the world and within the Mashreq group appears to exhibit a different pattern from that of the rest of the Arab world.

VII. CONCLUDING THOUGHTS AND POLICY IMPLICATIONS

The analysis presented in this paper supports the hypothesis that intra-Arab imports are too low. It also suggests that the Arab countries as a whole trade less with the outside world than what would be expected. In quantitative terms, the model suggests that overall intra-Arab trade should be about 10–15 percent higher than what is observed.¹⁸ This raises a question as to why intra-Arab trade is too small and why the Arab world is less integrated with the global economy—is it due to policy induced impediments to trade or to more fundamental structural reasons that are not easily reversed? We have not examined in any detail the relative importance of these explanations. In particular, while our model includes a dummy variable that measures trade restrictiveness (and that is statistically significant), the variable is not region-specific—it does not tell us whether the trade impediments faced by Arab countries in their dealings with other Arab countries are greater than those faced with the rest of the world. This is an area that is ripe for future research.

Nevertheless, our results strengthen the case for further trade liberalization in the Arab world, possibly in the context of greater regional integration. Greater regional integration, in a way that is compatible with multilateral liberalization, could contribute to growth not only by increasing trade and allowing regional producers to benefit from economies of scale, but also by encouraging foreign direct investment and the deepening of capital markets. In this regard, the recent initiatives in regional integration are to be welcomed: in 1998, 14 Arab countries established the Pan-Arab Free Trade Agreement (PAFTA) under which tariffs will be reduced for participating members by 10 percent annually (establishing free trade from 2007).¹⁹ However, our results also suggest that considerable room exists for the growth of Arab trade with the rest of the world. As such, the recently launched cooperation initiatives in the Southern Mediterranean basin have the potential of achieving greater trade integration between the Arab countries and Europe.

¹⁸ Based on the estimated equation for the level of trade in Table 5.

¹⁹ Moreover, various bilateral free trade agreements have recently been concluded among countries in the region.