The Trade Performance of the Middle East and North Africa

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Abstract: The share of global exports from the Middle East and North Africa (MENA) fell from 2.2 percent in 1995 to 1.8 percent in 2008. This paper characterizes MENA's trade over the period. Cross-section results show that, controlling for the standard determinants of trade, MENA exports to the outside world were at only a third of their potential in recent years. Interestingly, while MENA also under-trades within the region, the extent of undertrading is less acute than with the outside world. There is, however, no indication of more rapid regional integration over time, suggesting that intra-regional trade agreements have been ineffective. Our results also show that exports have been expanding more rapidly over time in the MENA region than elsewhere. At historical growth rates, it would take another 20 years to reach potential. When we exclude petroleum or natural resources, exports are also at only a third of the benchmark, but the improved export performance over time is much slower and implies it could take twice as long to reach potential. Finally, we examine intra-industry trade, which has characterized world trade growth over the period. East Asia and Europe show large and rising intra-industry trade, both globally and regionally, reflecting increased trade in differentiated goods and the expansion of supply chains. Despite neighbouring these regions, the MENA countries have been left out of this transformation.

1 Introduction and summary

The MENA region's economic growth has been by and large slow or volatile since 1980. While there are a number of potential contributing factors, a number of papers indicate a strong link between international trade flows and income per capita.[1] At the same time, a number of commentators have noted that the region has largely missed out on global trade integration, due in large part to the restrictiveness of their trade regimes. Trade policy, including high and complex tariffs, have often been cited as the main policy-induced barrier to intra-Arab trade, but other factors including high logistics costs and insufficient skills have been cited.[2] As a result, many ascribe at least part of the MENA region's poor economic performance to inadequate trade flows.[3]

This paper presents the results of an investigation of the trade performance of countries in the Middle East and North Africa (MENA) region. Using the most recent data available, it compares trade volumes for MENA as a whole and for individual countries with other regions and global benchmarks. It also describes how trade volumes have evolved since 1994, again using appropriate benchmarks. Finally, it examines the extent of intra-industry trade in the region, and how MENA compares with other regions.

It analyses aggregate trade volumes measured a number of ways as well as constructed measures of non-petroleum trade and trade excluding natural resources. We do this to prevent our results being skewed by the rise in commodity

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prices over the sample period. We employ descriptive analysis but also use econometric estimates of gravity models, which enable us to condition on a number of trade determinants in order to benchmark MENA's trade volumes. While a number of controls are used in the econometrics, the emphasis in this work is on benchmarking trade volumes and not the causal determinants of trade.

To preview the results, MENA's trade-GDP or export-GDP ratio is above the world average and has been since at least the mid 1990s, but this is in large part due to petroleum exports. Notably, MENA trade (imports+exports) excluding oil is at about the world average but exports alone are below the world average. Conditioning on GDP, distance and a number of other factors, a typical MENA country under-trades with other countries. In particular, exports to the outside world are at only a third of their potential. However, intra-MENA trade is conditionally higher than extra-MENA trade. These results hold for aggregate exports, non-natural exports and non-petroleum exports. The finding that MENA under-trades is broadly consistent with earlier work.

The share of global exports from the Middle East and North Africa (MENA) fell from 2.2 percent in 1995 to 1.8 percent in 2008 notwithstanding a rise in its share of world trade and its trade-GDP ratio since 2000. Importantly, this applies for most MENA countries and even for non-petroleum or non-natural exports. This pattern is confirmed when conditioning on observed and unobserved characteristics in a panel gravity model: MENA's propensity to trade with the outside world, especially exports, rose over and above the world trend. Together with our cross-section results, this suggests MENA under-exports less than it used to. Given estimated growth trajectories, it would take 20 years for MENA to reach the benchmark for overall exports and about twice that if we exclude oil or all natural resources. The share of intra-MENA trade in total trade has remained constant since 1994 and gravity model estimates imply no change in the relative propensity to trade within MENA as opposed to with the rest of the world. In other words, MENA's trade has not become more regionalised.

While the volume of trade is important for growth, the nature of trade also matters. We explore how intra-industry trade has evolved in MENA because this indicates whether there has been a rise in fragmentation and/or trade in differentiated products. The index used measures the proportion of total exports and imports that are within the same industries, as opposed to between industries. Intra-industry trade is an indicator of trade in differentiated goods or vertical specialization across borders, within industries. While intra-industry trade in East Asia and Emerging Europe has surged, the other regions have lagged. Despite neighbouring these regions, the MENA countries have been left out of this transformation. As a region, MENA displays the lowest levels of aggregate intra-industry trade and has displayed only modest rises.

The next section discusses previous findings on MENA's trade. Section 3 presents a short discussion of the trade data sources, including what appears to be systematic underreporting of oil exports in the aggregate COMTRADE data but reliable measures when oil is excluded. Section 4 presents a snapshot of the MENA trade picture in the late 00s while Section 5 presents the analysis over 1994-2009. Section 6 reports indexes of intra-industry trade. Section 7 offers some concluding comments.

2 Previous Literature: Does MENA Trade Too Little?

Existing descriptive data and econometric evidence implies that MENA's trade volumes are below potential. For example, Miniesy & Nugent (2005) use IMF data for a panel of 3-5 year periods between 1970 and 2000, a broad set of countries and many different candidate explanatory variables. Their focus is on MENA, which they define as Arab League countries plus Iran and Turkey. They have a dummy for MENA trade with the world (import or export) and for intra-MENA trade, as well as interactions with period dummies. They find that intra-MENA trade is far below what it should be. Their results also appear to suggest this underperformance was less severe is the late 1990s than in the 70s and 80s. Extra-MENA trade is also lower than expected, with the extent of under-trading possibly being greater in 2000 than 1970.

Bhattacharya & Wolde (2010) show the non-oil export-GDP ratio for MENA is below the world average over the 1999-2008 period. With a cross-section gravity model, they find a large negative coefficient for eight MENA countries in an export equation, which falls slightly and becomes insignificant with the addition of (country-level) variables from the *Enterprise Surveys*. In a separate imports regression, the MENA dummy coefficient is not significant. Al-Atrash & Yousef (2000) use a 1995-1997 cross-section to estimate that intra-Arab trade is too low, as is Arab trade with the rest of the world. This paper uses a relatively limited set of countries, namely exports from 18 Arab countries and 43 others. Bobol & Fatheldin (2005) get similar results with 1997-2003 data, finding that Maghreb-Mashreq and Maghreb-GCC trade is especially low. Boughanmi (2008) studies GCC countries. With pooled import data from 1990-2004, they find that, although intra-GCC trade is a low proportion of total GCC trade, it is higher than one would expect given trade determinants.

A related and sometimes overlapping literature examines specific trade agreements within MENA or between MENA and elsewhere. For example, Cieslik & Hagemejer (2009) find MENA-EU deals increased MENA imports from Europe but not MENA exports to the continent. Nugent (2002) asks why MENA trades so little by investigating a number of trade agreements within the region. In most cases, the agreements did not appear to increase trade over the 1970-1997period.

Most of the recent literature on intra-industry trade (IIT) does not focus on the Middle East. The most comprehensive recent study is Brulhart (2009), which details patterns across countries from 1962 to 2006 using data at the 3-digit and 5-digit SITC level. His main conclusion is that there is an upward trend in the share of trade that is intra-industry. However, this trend is largely in the high and middle income countries, with some low-income, mainly Asian countries, also enjoying the phenomenon.   While he highlights the absence of this phenomenon in sub-Saharan Africa, he does not isolate MENA. A World Bank (2002) study centered on Latin America, using 4-digit SITC data from 1980 to 1998, finds that MENA was the only region to experience a decline in IIT, but it does not discuss possible causes or consequences of this decline.

The results in this paper complement existing work in a number of ways. In terms of MENA's relative trade, most of the papers employ a single cross-section. While we also use a single cross section with slightly newer data for some important questions, we also use a full panel since 1994 for others. In terms of IIT, this work updates recent data, and also is the first to focus on MENA.

Miniesy & Nugent (2005) also use a full panel but the data ends before 2000. Our results suggest patterns since then may have changed somewhat. Further, following recent developments in the gravity modelling literature, this paper is more careful with its use of fixed effects in the panel, which can be important for estimating and interpreting results. Also, like that paper, we have a dummy representing intra-MENA trade, but we have two dummies for extra-MENA trade that separate MENA imports from MENA exports, while they have only one dummy.

3 Data

Our analysis will make use of descriptive statistics and regression analysis. We have a wide range of countries including almost all (World Bank defined) MENA countries. When constructing MENA aggregates, we exclude Israel and Malta from the analysis. As we will clarify when necessary, some other countries may need to be dropped due to data availability.

We use aggregate trade flows of all products both within the MENA region and between MENA and the rest of the world. We make comparisons using trade in all goods (not services). However, many MENA countries are rich in petroleum. Because there has been a large rise in commodity prices and trade data are commonly measured in current values, this could give a flattering picture of trade performance over time and also across countries. However, many other countries are abundant in natural resources other than oil and many of these resources have also seen a big rise in prices. Therefore, it could also be misleading to exclude the MENA region's dominant export yet not do so for the regions we are comparing MENA against. For this reason, we also make use of aggregate trade flows excluding natural resources. We note however that exporting a lot of a set of products in which your comparative advantage lies can go hand in hand with "under" exporting the other products. Therefore, while no individual measure is unequivocally the best, each provides particular insights.

Furthermore, using aggregate trade flows can mask important features of the data. Productivity and consumer welfare gains come not only from the quantity of trade, but also from the nature of trade. Two examples are the availability of differentiated products and participation in fragmented cross-border production process. Furthermore, this form of trade can be less vulnerable to trade adjustment costs. These examples can manifest themselves as intra-industry trade. Therefore, in addition to the aggregate trade flows, we present information on the evolution of intra-industry trade.

Both the descriptive analysis and regressions use various data sources. We use the IMF DOT data for aggregate trade flows. We also refer to COMTRADE data for aggregate trade flows and disaggregated data for studies of IIT. The IMF data have the potential advantage of using mirrored import data on a number of occasions when data are missing from COMTRADE exporters. COMTRADE allows us to generate disaggregated trade data too. Therefore, we use the COMTRADE data to produce non-petroleum trade, which we proxy as the total minus products under SITC code 33. We also produce a measure of non-natural exports, which excludes various categories following the example of the WTO (2010) report on trade in natural resources (which include petroleum of course). We consider exports and imports where appropriate and sometimes total trade.

We found that there are at times large discrepancies between the IMF and COMTRADE export data, with the latter having lower export-GDP shares and more zeroes. However, the COMTRADE mirrored import data is much closer to the IMF data, partially due to better reporting by importers but also by construction: the IMF uses mirrored imports. This is well known. Perhaps less well known is our finding that, while COMTRADE imports and COMTRADE exports differ a lot at the aggregate level – for the world and for MENA countries – the discrepancy all but disappears once we exclude petroleum exports. This suggests that much of the discrepancy appears to be due to systematic underreporting of oil

exports by the exporters (and not the importers). This may be of interest in of itself. However, this suggests that the COMTRADE data are actually quite reliable as long as we exclude oil.

In principle, it is generally more appropriate to use information on net exports (exports which exclude re-exports). While the COMTRADE data has separate flows for gross and net exports, they are many instances when gross and net flows are the same. Unless one assumes that there were no re-exports, one must accept that re-exports are not being reported. There is a table indicating the availability of either trade flow, which shows this varies by country and also by time period for the same country. However, the table is not prepared at the bilateral level. In all likelihood, some bilateral flows are recorded gross and others are recorded net. Therefore, to avoid misleading inference from inconsistent reporting of re-exports and aid comparability across countries and over time, we use gross measures.

The descriptive analysis draws on the World Development Indicators, which is based on IMF data, but also from our own calculations based on bilateral IMF or COMTRADE data. Because some countries are necessarily excluded from the bilateral dataset, the aggregate of country-level or region-level trade is a (very slight) underestimate.

For regional comparisons of IIT, data are at the HS 2-digit (96 industries) level, from COMTRADE via the World Trade Indicators for 1995 and 2007.[4] For MENA, we also calculate the indices at the HS 4-digit (1241 industries) and find similar results. Most Previous studies use SITC 3-digit data (about 100 industries) because data going back are only available in SITC.

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[4] We also calculate for 2005 to ensure that results for 2007 are not driven by the crisis, but results are almost identical.

4   A snapshot of trade performance in the late 00s

A standard measure of trade openness is trade (exports plus imports) relative to GDP. By this measure, which is reported in Table 1, MENA is more open than the world on average. The world ratio is pulled down substantially by Latin America & Caribbean and by South Asia. This allows MENA to be less open than Asia and Sub-Saharan Africa yet still above the world average.

Table 1: Measures of Openness

Region	Trade	Exports	Imports
	% GDP		
East Asia & Pacific	74.1	46.4	27.7
Europe & Central Asia	50.2	32	18.2
Latin America & Caribbean	35.2	21	14.2
Middle East & North Africa	49.7	29.1	20.6
South Asia	26.5	15.7	10.8
Sub-Saharan Africa	52.2	31	21.2
World	41.5	24.1	17.4

Source: WDI based on IMF DOT. 2005-7.

In Table 2, the Total column based on UN data reveals a larger gap between world and MENA trade ratios than in Table 1. More importantly, the MENA average trade percentage is below the world average once one excludes trade in petroleum or all natural resources.

Table 2: Trade Openness Excluding petroleum or natural resource

Trade:	Total	Non-petroleum	Non-natural
MENA	59%	36%	32%
WORLD	44%	38%	35%

Source: Own calculations based on bilateral COMTRADE data.

Table 3 focuses on exports. It compares MENA with the world but also breaks down export information by country. It also permits a comparison of data sources, which was discussed in the previous section.[5] For all goods, most MENA countries are above the world average, so it is not just a few nations driving the MENA total. However, once we exclude petroleum or all natural resources, most countries fall below the world average. Similarly, while MENA non-petroleum trade (exports+imports) is at about the world average, MENA non-petroleum exports are below.

Table 3: Exports of all goods, non-petroleum and non-natural goods

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[5] Comparing the COMTRADE total exports with IMF total exports, we can see that the export numbers are lower for the former. Some countries, like Libya and Bahrain, exhibit stark differences. However, mirrored imports from COMTRADE yield similar numbers to the IMF statistics (in part because the IMF uses mirrored import data in some cases). This suggests systematic underreporting by exporters. Further, a comparison between the COMTRADE export and import data suggests the overall discrepancy for MENA is by and large eliminated after excluding petroleum. This implies that the underreporting is concentrated in oil. However, the discrepancy is not eliminated for Libya and Bahrain.

EXPORTS:	IMF	COMTRADE			COMTRADE MIRROR		
	All	TOTAL	NONPET	NONNAT	TOTAL	NONPET	NONNAT
Algeria	41%	42%	16%	0%	39%	13%	2%
Bahrain	38%	14%	10%	6%	41%	22%	11%
Egypt	12%	11%	8%	5%	18%	14%	9%
Iran	27%	16%	4%	3%	29%	5%	3%
Jordan	30%	32%	20%	29%	28%	23%	24%
Kuwait	42%	3%	3%	3%	47%	5%	3%
Lebanon	12%	11%	10%	9%	10%	7%	8%
Libya	63%	0%	0%	0%	66%	5%	3%
Morocco	19%	19%	16%	14%	22%	18%	17%
Oman	64%	57%	18%	12%	62%	18%	6%
Qatar	63%	61%	26%	5%	72%	30%	7%
Saudi Arabia	51%	46%	8%	6%	54%	9%	7%
Syria	31%	26%	13%	13%	18%	6%	6%
Tunisia	38%	40%	33%	32%	40%	31%	32%
UAE	65%	42%	25%	23%	69%	25%	19%
West Bank/ Gaza	0%	11%	10%	10%	2%	1%	1%
Yemen	29%	29%	2%	2%	31%	2%	2%
MENA	44%	31%	11%	8%	47%	12%	8%
WORLD	22%	21%	19%	17%	22%	19%	18%

Source: Own calculations using bilateral data from IMF and COMTRADE. Note data missing for Iraq and Djibouti and most likely not reported by Libya.

While we have so far controlled for the GDP of the exporting country, we have not yet accounted for the size of the trading partners. One way to do this is to use a concept called economic distance (Behar & Manners, 2010), which calculates a measure of each region's distance to the big markets (big GDP countries). This is done by constructing a GDP-weighted aggregate of distance to all bilateral trading partners in the world. Figure 1 – see Behar & Manners for details of construction – shows that MENA is relatively well positioned. Driven to a large extent by many MENA countries' proximity to the large European market, economic distance is lower for a typical person in MENA than for the typical person in most regions. Recall from Table 1 that MENA trades/exports less of its output than Sub-Saharan Africa yet we can see it does this despite being closer to attractive export markets or convenient sources of imported inputs.[6]

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[6] Redding & Venables (2003) refer to this in terms of "market access" and "supplier access".

Figure 1: Economic Distance by Region
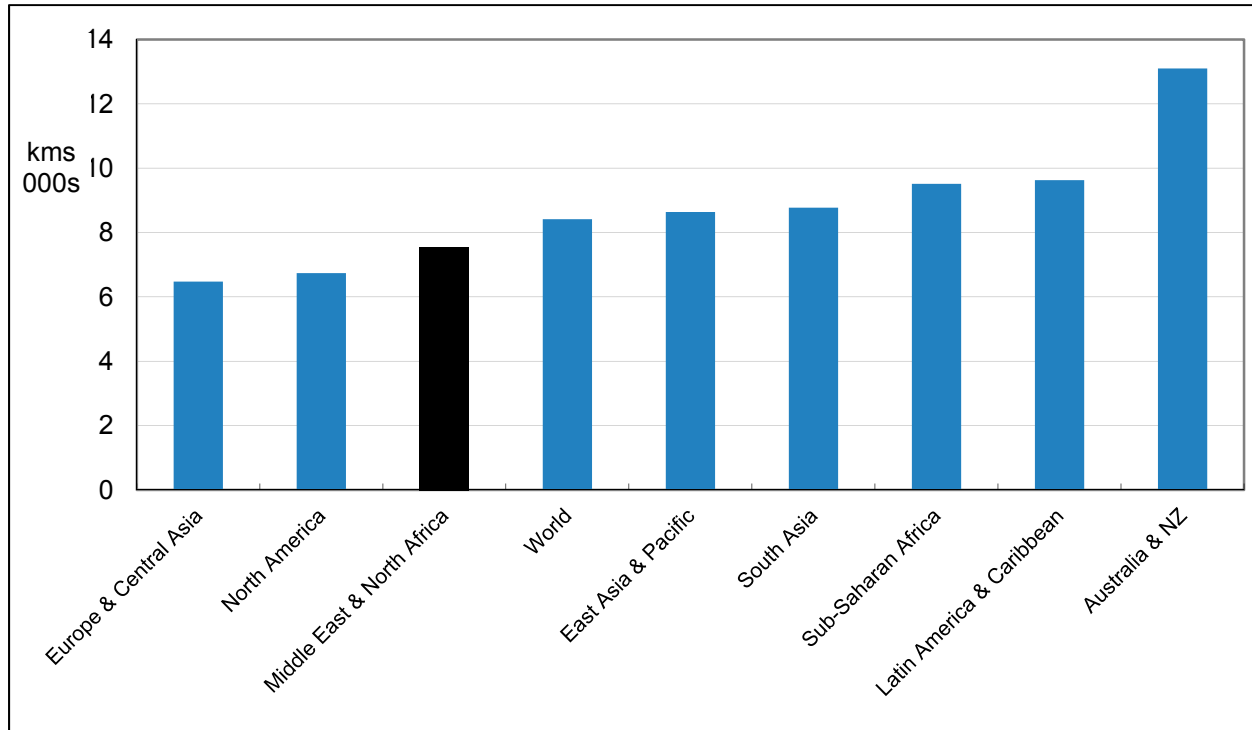
One way to account for country size and distance systematically is to estimate a gravity model. This approach also allows one to account for a whole range of observable geographical, institutional and other covariates. Tables 4 and 5 do so for aggregate exports while Table 6 and 7 do so for non-petroleum and non-natural exports. In all cases, we use a single cross section of data averaged over the years 2005-9.[7]

In Table 4, of particular interest are the coefficients on the three MENA dummies, which indicate whether the exporter is a MENA country (MENAexp), whether the importer is a MENA country (MENAimp) and whether both countries are in MENA (MENApair). The first is an indicator of how much MENA exports to the rest of the world, controlling for GDP, distance and other characteristics. The second is similarly an indicator of how much MENA imports from the rest of the world. These two dummies provide information on extra-MENA trade. The third is an indicator of intra-MENA trade relative to extra-MENA trade. The combined effect for a pair of MENA countries - intra-MENA trade - is taken by adding the three coefficients. The bottom of the table gives the "treatment effect" for intra-MENA trade ie $e^{MENAexp+MENAimp+MENApair}$-1 in percentage terms.

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[7] Many observations for 2009 are missing and there was a sharp drop in trade coinciding with the great recession. For this reason, we also ran the model with an average of 2005-7 data. The results were very similar.

Table 4: Cross-section gravity model estimates for overall exports and mirrored imports: 2005-9

	IMF Exports	UN Exports	UN Imports	IMF Exports	UN Exports
ln(GDPexp)	1.432***	1.346***	1.014***	1.124***	0.992***
ln(GDPimp)	0.985***	0.861***	1.318***	0.506***	0.439***
Distance	-1.573***	-1.462***	-1.338***	-1.388***	-1.388***
MENAexp	-1.032***	-0.945***	-0.307***	-0.783***	-0.901***
MENAimp	-0.657***	-0.571***	-1.083***	-0.187	-0.037
MENApair	0.941***	0.774***	0.566***	0.835***	0.910***
Contiguous countries	0.685***	0.974***	0.838***	0.499**	0.840***
Common Language	0.747***	0.597***	0.653***	0.717***	0.580***
Common Colonizer	1.030***	0.780***	0.807***	1.161***	0.825***
Same Colonizer 1945	1.239***	1.264***	1.129***	1.070***	1.103***
Same country	0.498**	0.670***	0.918***	1.091***	1.107***
ln(Populationexp)	-0.0984***	-0.0718***	0.141***	0.0668	0.168***
ln(Populationimp)	0.141***	0.0804***	-0.125***	0.449***	0.424***
ln(Areaexp)	-0.0780***	-0.0324**	-0.0675***	0.00998	0.0884***
ln(Areaimp)	-0.110***	-0.0378**	-0.0101	-0.0452**	0.0390**
Landlockedexp	-0.349***	-0.203***	-0.314***	0.0155	0.247***
Landlockedimp	-0.707***	-0.810***	-0.500***	-0.961***	-0.754***
ln(Costtoexpcontainer)				-0.836***	-1.111***
ln(Documentstoexport)				0.770***	0.706***
ln(Leadtimeexport)				0.14	0.129
ln(Costtoimportcontainer)				0.223**	0.0455
ln(Documentstoimport)				0.239*	0.203*
ln(Leadtimetoimport)				-0.291***	-0.286***
Portqualityindexexp				0.104**	0.179***
Portqualityindeximp				0.149***	0.165***
Tradeinfrastructureindexexp				0.700***	0.614***
Tradeinfrastructureindeximp				0.823***	0.667***
Tariffmostfavouredexp				-0.0485***	-0.0524***
Tariffmostfavouredimp				-0.0362***	-0.0469***
_cons	-28.39***	-25.05***	-29.14***	-22.30***	-16.90***
N	16984	16793	18102	10752	10989
MENA pair overall (% relative to benchmark)	-53%***	-52%***	-56%***	-13%	-3%

*** .1% ** 1% * 5% significance levels. Controlling for other factors, MENA under-exports to the rest of the world and under-imports. IMF data suggests intraregional trade is higher than the benchmark. Overall, MENA under-trades substantially.

Columns 1-3 are standard gravity regressions for IMF exports, COMTRADE exports and COMTRADE imports. As indicated by the large negative MENAexp dummy, they consistently estimate that MENA exports to the rest of the world are lower than what one would expect, conditioning on distance GDP and other trade determinants. For example, column 2 implies a typical MENA country exports $e^{-0.945}$-1=61% below potential to the outside world. Across the five specifications, the average is 66%, which means MENA exports to the outside world are at only a third of their potential. This holds to a smaller extent for MENA imports from the rest of the world. The MENApair dummy is positive, which means that, relative to external trade, a pair of MENA countries trade with each other more than would be expected, conditioning on importer and exporter fixed effects, size, distance and other covariates. As indicated at the bottom of the table, the

first three columns yield large and statistically significant estimates that on average. These imply a typical MENA pair under trades by 54%. In other words, intra-MENA trade is at less thanhalf its potential level.

For reference, the extra-MENA and period interaction dummy for the late 1990s in Miniesy & Nugent (2005) – their most recent period – imply a negative coefficient for extra-MENA trade – roughly equivalent to our MENAexp and MENAimp dummies – of -1 to -1.2, which is bigger in absolute value. The analogous intra-MENA dummies have a coefficient of -1.2 to -2. This is equivalent to the sum of our three MENA dummies and implies MENA under-trades with itself to a greater extent than found here. The recent Bhattacharya & Wolde (2010) paper does not distinguish between intra- and extra-MENA pairings, but their coefficient for MENA exporters varies from -1.2 to -2. While their lower number (obtained with a number of controls) is insignificant, it is still more negative than our MENAexp coefficient or the sum of the MENAexp and MENApair coefficients. In a separate equation for MENA imports, they have small negative or positive insignificant values.

Columns 4 and 5 investigate whether the coefficients change if we add further controls or policy variables. Comparisons of columns 1 and 4 and of columns 2 and 5 show the export dummy remains significant while the import dummy does not. This suggests such controls do not meaningfully account for export performance but do go some way to explaining import performance. As a result of the smaller import coefficients, the calculated effect for intra-MENA trade becomes small and insignificant. This suggests that trade performance on the import side can be partially accounted for by the observable control variables. However, in further regressions (available on request), we found that much of the difference between the results is due to the exclusion of many MENA countries because of missing data for the control variables. In Bhattacharya & Wolde (2010), further controls render all the dummies insignificant but do not reduce the coefficients. In contrast, Miniesy & Nugent (2005) find that adding controls seems to amplify the extent of MENA's under-trading rather than account for it.

While we have included many control variables, it is possible that unobservable country-specific features bias the results. Furthermore, recent developments in theoretical and empirical gravity modelling highlight the importance of multilateral resistance (Feenstra, 2004).[8] To address these issues, we present results where we use exporter- and importer- fixed effects in Table 5. This does not allow for the separate identification of a MENAexp or MENAimp dummy. However, the positive MENApair coefficient again show that trade within the region is high relative to that between MENA countries and the rest of the world. As a further indicator of the propensity of MENA countries to trade, we report the standardised coefficients on the dummy variables, which have been divided by the mean value across all exporters or importers respectively. A value of less than 1, which is found for most MENA exporters or importers, indicates systematic under-trading. However, note that this does not allow one to distinguish which characteristics might be driving this.[9]

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[8] Trade between two countries depends not only on the absolute cost of trading, which is known as bilateral resistance and is proxied by distance and other variables in gravity models, but on the cost of trading relative to the costs of trading with other countries, which is known as multilateral resistance. Failure to account for these so-called "third country" effects can lead to biased estimates and comparative statics (Behar and Nelson, 2009).

[9] One example is GDP. Small ratios could merely reflect that countries are small. We address this issue for exporter dummies by replacing exports with exports:GDP so that the exporter dummy is purged of the exporter's GDP, but the MENA importer dummies are not purged of importer GDP.

Table 5: Cross-section gravity model estimates including exporter and importer dummies: 2005-9

		IMF Exports:GDP	UN Exports:GDP
	Distance	-1.846***	-1.720***
	MENApair	0.822***	0.664***
	Contiguous	0.365**	0.641***
	Common Language	0.646***	0.661***
	Common Colonizer	0.896***	0.659***
	Same Colonizer 1945	1.685***	1.560***
	Same country	0.554**	0.807***
Exporter dummies~	Algeria	0.8	0.9
	Bahrain	0.9	0.7
	Egypt, Arab Rep.	1.2	1.2
	Iran, Islamic Rep.	1.3	1.2
	Iraq	0.5	0.2
	Jordan	0.8	0.8
	Kuwait	1.0	0.7
	Lebanon	0.9	0.9
	Libya	0.8	.
	Oman	1.0	1.1
	Qatar	0.9	0.9
	Saudi Arabia	1.4	1.5
	Syrian Arab Republic	0.9	1.0
	Tunisia	1.0	0.9
	United Arab Emirates	1.5	1.7
	Yemen, Rep.	0.6	0.5
Importer dummies~	Algeria	1.1	1.2
	Bahrain	0.8	0.5
	Egypt, Arab Rep.	1.5	1.7
	Iran, Islamic Rep.	1.4	1.6
	Iraq	0.8	0.8
	Jordan	0.9	0.9
	Kuwait	0.9	0.9
	Lebanon	1.0	0.9
	Libya	1.0	0.9
	Oman	0.8	1.0
	Qatar	0.8	0.6
	Saudi Arabia	1.6	2.0
	Syrian Arab Republic	1.0	1.0
	Tunisia	0.8	0.9
	United Arab Emirates	1.9	2.6
	Yemen, Rep.	0.8	0.6
	_cons	20.25	22.76
	N	16984	16793

*** .1% ** 1% * 5% significance. ~ gives ratio of MENA country dummy to the average dummy for all countries such that a value of less than 1 indicates under-exporting or under-importing. Most MENA countries under-trade with the world while intra-MENA trade is relatively high.

Tables 6 and 7 present results for exports that exclude either petroleum or all natural resources. Because one might expect countries rich in natural resources to have lower non-natural exports, we have controlled for this with dummies representing oil-rich or resource-rich countries.

In Table 6, column 1 has no controls for oil-abundance, column 2 includes a dummy for countries where oil comprises more than 10% of exports (71% of countries) and column 3 includes a dummy for countries where oil comprises more than half of exports (43%). Column 4 draws on US Energy Information Administration data to identify about 20 countries where oil production exceeds 1 million barrels per day.[10] Column 5 includes exporter and importer fixed effects.

For non-petroleum exports, the results are robust across columns. Exports to the rest of the world are low. For example, estimates from column 1 imply exports are $e^{-1.165}-1=-69\%$ relative to the benchmark. Averaging across the specifications, MENA exports are at about a third of their potential, as was the case for all goods in Table 4. In contrast, imports are statistically significantly above the benchmark and intra-MENA trade relative to trade elsewhere is high. Overall a typical pair of MENA countries still under-trades – for example column 1 shows the extent of under-trading is $|e^{-1.165+0.193+0.629}-1|=29\%$ – but the extent is smaller than for all products and the estimates are not always significant.

Table 7 presents various specifications where the dependent variable is exports excluding natural resources. Column 2 defines a resource-rich exporter as one whose country-level natural resource exports are more than 10% of total exports; this comprises 80% of countries. Column 3 has a stricter definition, where the approximately 40% of countries whose natural resource exports exceed half of exports are defined as resource-rich.[11] Column 4 uses a definition based on endowments rather than trade flows, drawn from the top 30 resource-rich countries taken from Michaels (2010). The endowment-based measure offers potential advantages over trade-based measures in a gravity equation, but this measure is based on mining and fuel products as opposed to broader endowments like fish or forests.

Column 1 in Table 7 again indicates that MENA countries export too little to the rest of the world. The coefficient of -1.389 implies that, controlling for GDP, distance and a large number of other factors, a MENA country exports about a quarter to the rest of the world relative to what it "should" export. MENA imports are slightly above what one would expect but not statistically significantly. The MENApair dummies are high and statistically significant, which indicates that intra-MENA trade is high relative to trade with the outside world. Overall, intra-MENA trade is 13% below potential, which is statistically insignificant.

Columns 2-4 in Table 7 establish whether accounting for resource endowments affects the results. Column 2 does not differ from column 1, possibly because too many countries are classified as resource-rich. Column 3 does; primarily by reducing the MENAexp coefficient (in absolute value), the overall intra-MENA estimate becomes positive (30%) and statistically significant. Column 4 produces similar results to column 3. Overall, intra-MENA trade in non-natural goods is higher than one would expect given GDP, distance and other characteristics and this can be statistically significant once one controls for endowments.

However, columns 3 and 4 still indicate that exports of non-natural goods to the rest of the world are below the benchmark. Averaging across columns 1-4, we again find that MENA exports to the rest of the world are at only a third of their potential. Column 5 includes importer and exporter fixed effects, which controls for resource endowments and a range of observed and unobserved country characteristics. The MENApair dummy is similar to the rest of the table and re-enforces the result that intra-MENA trade is high relative to extra-MENA trade.

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[10] This information was obtained from http://tonto.eia.doe.gov/country/index.cfm?view=production. This list nests a list of countries with high proven oil reserves.
[11] The numerator is based on COMTRADE data while the denominator is based on IMF data.

Table 6: Cross-section gravity model estimates for non-petroleum exports: 2005-9 data

	Non-petroleum Exports				
	1	2	3	4	5
ln(GDPexp)	0.684***	0.695***	0.708***	0.714***	
ln(GDPimp)	0.530***	0.529***	0.531***	0.533***	
Distance	-1.151***	-1.154***	-1.144***	-1.141***	-1.526***
MENAexp	-1.165***	-1.204***	-1.037***	-1.018***	
MENAimp	0.193*	0.193*	0.191*	0.194*	
MENApair	0.629***	0.631***	0.604***	0.623***	0.686***
Contiguous countries	0.882***	0.876***	0.904***	0.899***	0.543***
Common Language	0.412***	0.412***	0.434***	0.419***	0.356***
Common Colonizer	1.011***	0.998***	1.024***	1.050***	0.930***
Same Colonizer 1945	0.965***	0.970***	0.971***	1.034***	1.466***
Same country	0.680***	0.678***	0.679***	0.690***	0.569***
ln(Populationexp)	0.252***	0.247***	0.230***	0.230***	
ln(Populationimp)	0.273***	0.274***	0.273***	0.271***	
ln(Areaexp)	0.0467**	0.0522**	0.0419**	0.0800***	
ln(Areaimp)	0.00912	0.00906	0.0089	0.00964	
Landlockedexp	0.195**	0.237**	0.192*	0.185*	
Landlockedimp	-0.298***	-0.298***	-0.302***	-0.300***	
ln(Costtoexpcontainer)	-1.135***	-1.178***	-1.110***	-1.125***	
ln(Documentstoexport)	0.356**	0.270*	0.430***	0.366***	
ln(Leadtimeexport)	0.0977	0.105	0.164	0.111	
ln(Costtoimportcontainer)	0.0201	0.0219	0.0193	0.0178	
ln(Documentstoimport)	0.282**	0.283**	0.283**	0.279**	
ln(Leadtimetoimport)	-0.167*	-0.166*	-0.165*	-0.170*	
Portqualityindexexp	-0.0225	-0.0451	-0.00254	-0.0322	
Portqualityindeximp	0.0734*	0.0741*	0.0723*	0.0718*	
Tradeinfrastructureindexexp	0.880***	0.878***	0.849***	0.879***	
Tradeinfrastructureindeximp	0.389***	0.393***	0.393***	0.385***	
Tariffmostfavouredexp	-0.0318***	-0.0364***	-0.0341***	-0.0369***	
Tariffmostfavouredimp	-0.0499***	-0.0496***	-0.0498***	-0.0505***	
Oil exports>10%		0.131*			
Oil exports>50%			-0.259**		
Oil-rich country				-0.331***	
_cons	-9.409***	-9.168***	-10.10***	-10.30***	21.36***
N	5439	5439	5439	5439	7312
MENA pair overall (% relative to benchmark)	-29%*	-32%**	-22%	-18%	.
Exporter,importer FE?	N	N	N	N	Y

MENA under-exports to the rest of the world but does not statistically significantly under-import from it. Within-MENA trade is high but often not significantly. Overall, MENA trades less than the benchmark. *, ** and *** denote significance at 5%, 1% and 0.1%.

Table 7: Cross-section gravity model estimates for non-natural exports: 2005-9 data

	Non-natural Exports				
	1	2	3	4	5
ln(GDPexp)	1.023***	1.023***	1.101***	1.016***	
ln(GDPimp)	0.433***	0.433***	0.438***	0.433***	
Distance	-1.351***	-1.352***	-1.318***	-1.328***	-1.723***
MENAexp	-1.389***	-1.391***	-0.941***	-0.921***	
MENAimp	0.0894	0.089	0.0975	0.094	
MENApair	1.156***	1.156***	1.108***	1.163***	1.097***
Contiguous countries	0.905***	0.905***	0.989***	0.897***	0.650***
Common Language	0.580***	0.581***	0.634***	0.616***	0.668***
Common Colonizer	0.823***	0.823***	0.845***	0.870***	0.830***
Same Colonizer 1945	1.110***	1.109***	1.102***	1.204***	1.580***
Same country	1.103***	1.102***	1.123***	1.136***	0.896***
ln(Populationexp)	0.211***	0.213***	0.0824*	0.161***	
ln(Populationimp)	0.348***	0.348***	0.350***	0.348***	
ln(Areaexp)	-0.00108	-0.00238	0.0360*	0.0556***	
ln(Areaimp)	0.0608***	0.0608***	0.0595***	0.0617***	
Landlockedexp	0.349***	0.358***	0.270***	0.208**	
Landlockedimp	-0.609***	-0.609***	-0.616***	-0.605***	
ln(Costtoexpcontainer)	-1.486***	-1.489***	-1.426***	-1.405***	
ln(Documentstoexport)	0.520***	0.518***	0.648***	0.617***	
ln(Leadtimeexport)	0.178*	0.181*	0.469***	0.239**	
ln(Costtoimportcontainer)	0.186**	0.186**	0.182**	0.185**	
ln(Documentstoimport)	0.0848	0.0849	0.0683	0.0793	
ln(Leadtimetoimport)	-0.218**	-0.218**	-0.212**	-0.221**	
Portqualityindexexp	0.0723*	0.0719*	0.151***	0.111***	
Portqualityindeximp	0.176***	0.176***	0.176***	0.172***	
Tradeinfrastructureindexexp	0.714***	0.716***	0.618***	0.948***	
Tradeinfrastructureindeximp	0.494***	0.494***	0.495***	0.502***	
Tariffmostfavouredexp	-0.0518***	-0.0516***	-0.0596***	-0.0608***	
Tariffmostfavouredimp	-0.0515***	-0.0515***	-0.0522***	-0.0520***	
Naturalexports>10%		0.0221			
Naturalexports>50%			-0.938***		
Resource-rich country				-0.931***	
_cons	-14.29***	-14.31***	-16.25***	-15.75***	21.69***
N	9246	9246	9246	9246	12983
MENA pair overall					
(% relative to benchmark)	-13%	-13%	30%*	40%*	.
Exporter,importer FE?	N	N	N	N	Y

MENA under-exports to the rest of the world but does not under-import from it. Within-MENA trade is high. Overall, MENA trades less than the benchmark, but not necessarily to a statistically significant extent. *, ** and *** denote significance at 5%, 1% and 0.1%.

To summarise this section, the descriptive analysis has indicated that overall MENA exports as a proportion of GDP are higher than the world average, but this world average is pulled down by two closed regions, so MENA countries do worse than most other countries. When we exclude petroleum or all natural resources, the descriptive analysis suggests MENA's trade or export-GDP ratio is below the world ratio. Further, MENA is relatively well located in the sense that its distance from attractive markets is low. Accounting for GDP, distance to trading partners and other factors, MENA's

aggregate exports are at only a third of potential regardless of whether we consider all goods or exclude oil or natural resources. , There is no systematic evidence that the region under-imports, especially once one excludes the oil or natural resources it would not need to import anyway. MENA is more prone to trade within the region even after accounting for proximity. However, our estimates for all goods indicate that a pair of MENA countries trade less than a comparable pair of non-MENA countries. The extent is weaker when we exclude petroleum and the results are mixedfor non-natural exports.

5 Trade performance over time: 1994-2009

Figure 2 demonstrates a fall in MENA's share of world trade in the 1990s such that it accounted for about 1.7% of world exports and 1.5% of world imports in 2000. In the new century, the trend was arrested for exports and reversed for imports such that imports accounted for about 1.9% of world GDP by 2008.

Figure 2: MENA trade (exports or imports of goods and services) as a share of world trade
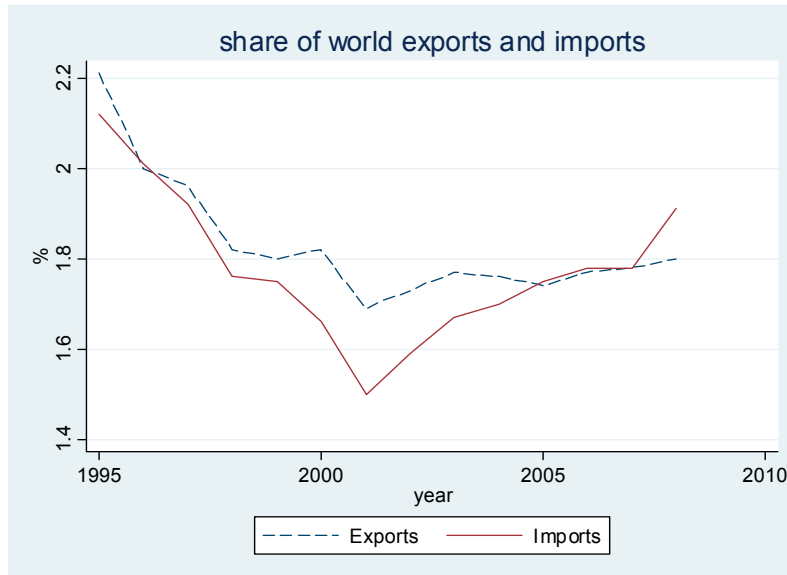
Annual observations from 1994-2008. Source: own calculations with WDI data, based on IMF DOT data.

MENA's real GDP grew 85% between 1994 and 2008, while the world's GDP growth rate was 52%. Thus, to measure whether openness rose in MENA, it is better to consider trade-GDP ratios. Figure 3 shows how trade-GDP ratios evolved over time. MENA's trade openness fell to about 40% in the late 1990s but rose to almost 70% by 2008.[12] World openness rose in the 1990s and continued rising. This is consistent with the picture in Figure 2. MENA's openness was never below the world ratio. By construction, high-income ratios closely track the world aggregates. MENA's ratio dropped to that for other developing countries in the late 90s but accelerated away in the mid 00s.

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[12] This is consistent with the World Bank MENA Trade Competitiveness study (Lopez-Calix, Walkenhorst & Diop, 2010).

Figure 3: Merchandise trade (exports+imports) as a % of GDP for MENA and other global aggregates
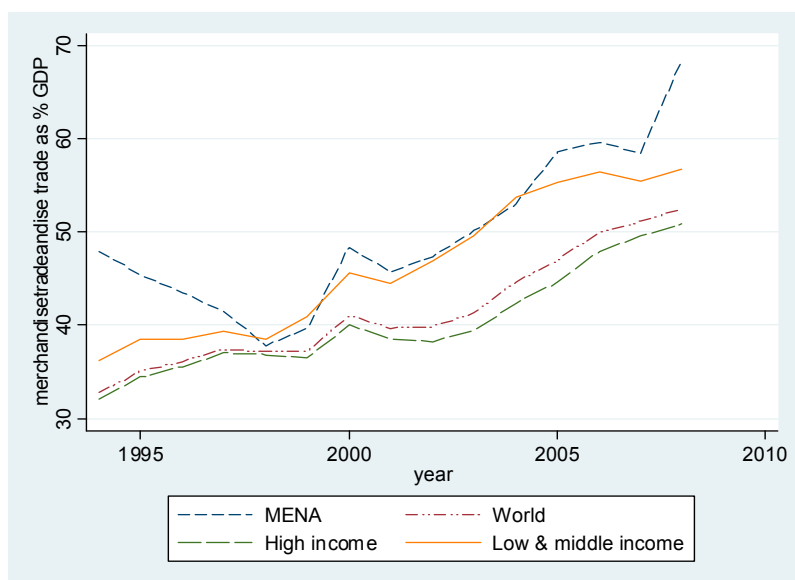
Figure 4 compares trade-GDP ratios in the mid 90s and late 00s for individual MENA countries. The overall rise seen in aggregate is representative of most countries in the region. Although there is variation, most countries saw a rise in their trade openness. We also place the countries in the context of global aggregates. The lighter bars are towards the left of the graph, which roughly indicates that most MENA countries have higher trade-GDP ratios than developed and developing countries alike. However, it is clear that rises in trade-GDP ratios took place in the rest of the world as well, which we will describe in further detail shortly.

Figure 5 compares non-petroleum exports-GDP ratios. For many MENA countries, non-petroleum export intensity rose over the sample period, which indicates that the pattern in Figure 4 is not due exclusively to rising petroleum exports. Given that the oil windfall might have led to expectations of a decline in non-petroleum exports as a consequence[13], this is an important finding. Unlike Figure 4, the lighter bars representing global aggregates lie towards the right of the display, which means most MENA countries have lower non-petroleum export-GDP ratios than global aggregates. As will be shown shortly, the rest of the world also managed to increase its export intensity for non-petroleum exports.

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[13] This is a phenomenon known as the "Dutch Disease". A natural resource discovery or rise in the price of the resource leads to an appreciation of the currency and/or diversion of scarce resource (like human capital) to that natural resource sector, which leads to shrinking production and exports from other sectors.

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Figure 4: Merchandise trade-GDP ratios for MENA countries and global aggregates in 1994-97 and 2006-9
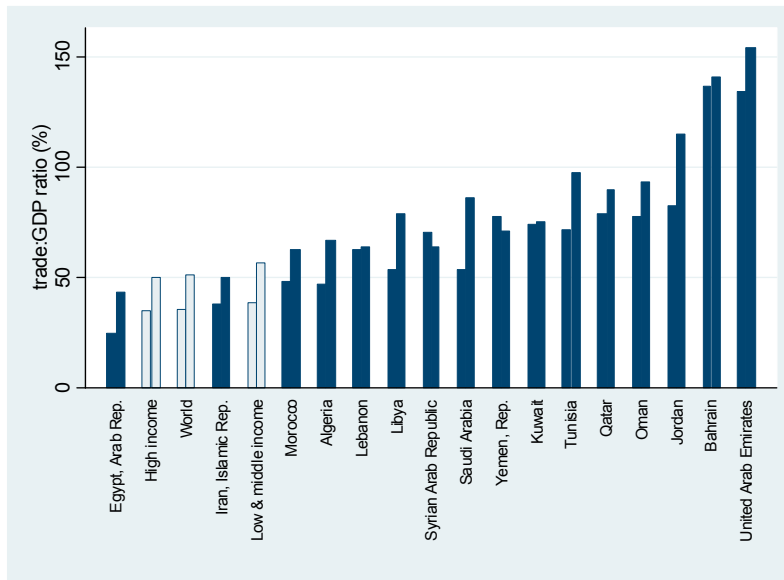
Figure 5: Non-petroleum export-GDP ratios for MENA countries and global aggregates in 1994-1997 and 2006-9
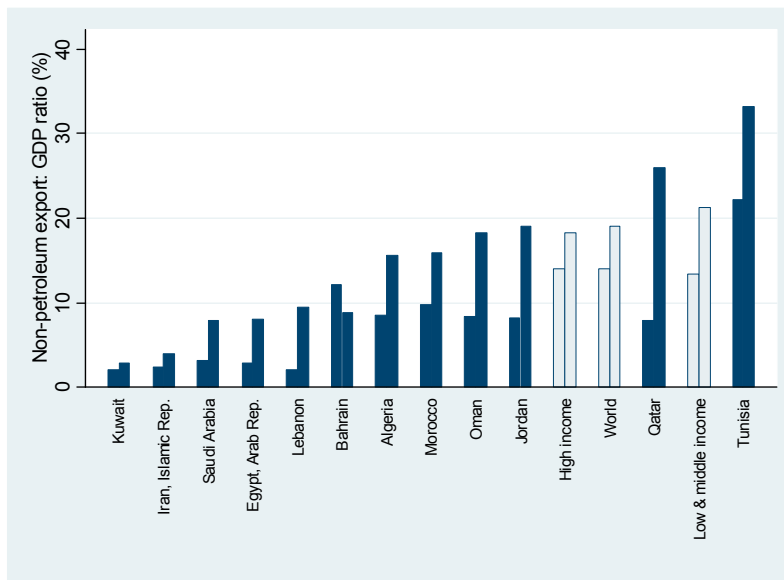
Zooming out again to analyze the MENA region as a whole, Figure 6 depicts rising export intensities for all goods and if one excludes petroleum or all natural resources. In absolute terms, the 17 percentage point rise in overall (IMF) exports exceeds the 6-7 point rise for non-petroleum exports. However, the doubling of non-petroleum exports as a share of GDP is a larger relative rise than the aggregate rise.

Figure 6: Ratios of exports to GDP in the aggregate MENA region
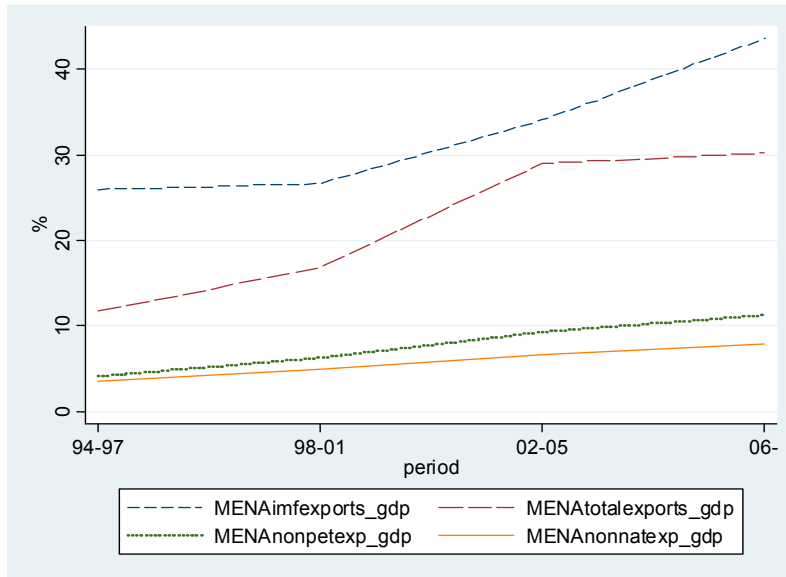
Looking at the data in another way, Figure 7 shows that MENA's non-natural exports as a share of overall exports rose and fell over the period such that the share was below 14% in the mid 90s and 18% in the late 00s. Figure 7 also shows the analogue for the world share, which fell from 85% to below 79%. Hence, relative to world patterns, MENA's share of natural resources in exports has fallen. Thus, MENAs reliance on petroleum (or other natural resource) exports can be said to have risen or fallen depending on how one looks at the data.

Figure 7: Non-natural exports as a share of total exports for MENA (left axis) and for the world (right axis).
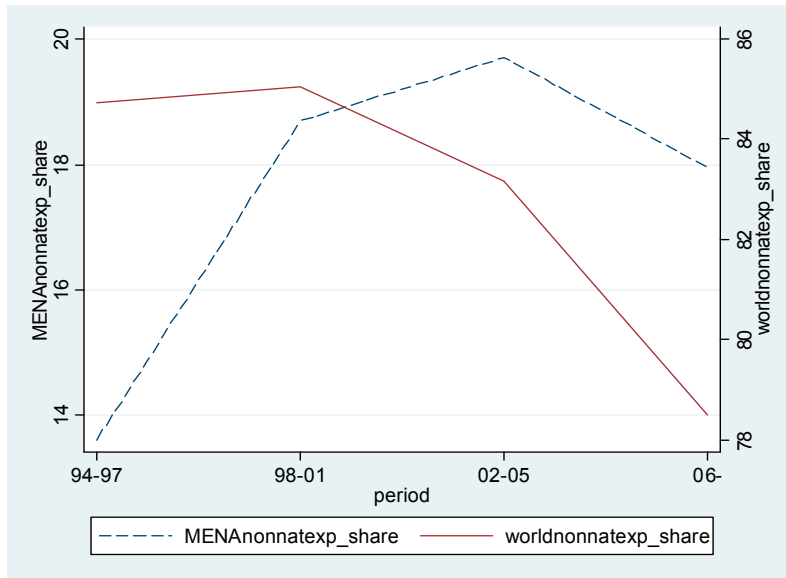
Figure 8 compares MENA's export-GDP ratio with the world as a whole. For all goods, MENA's ratio (top line) is higher than the world's (second line) and the gap has widened since the turn of the century. For non-natural exports, the world's ratio (third line) is higher than that for MENA and the gap has remained constant over the period.

Figure 8: Overall and non-natural export: GDP ratios for MENA and the world.
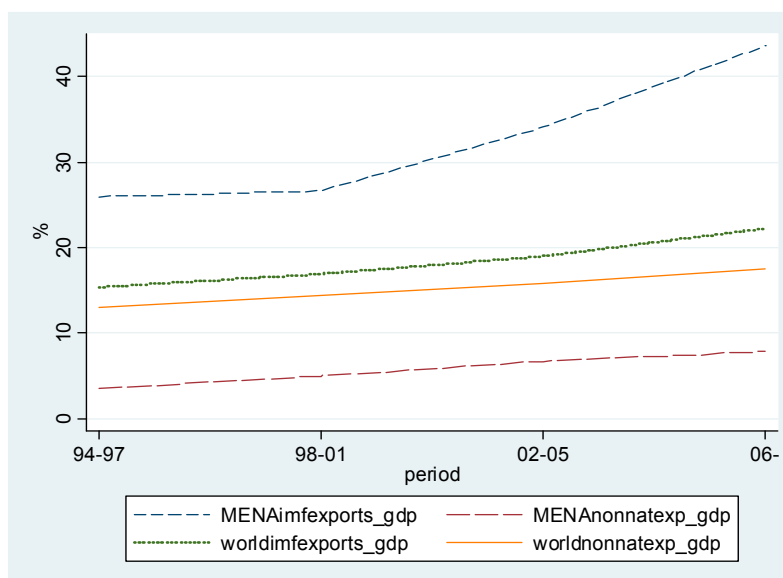
Do MENA countries trade with themselves more than they used to? Table 8 shows that the share of MENA's total exports staying in MENA remained constant at about 10%. Given the dominance of oil, which you would not expect to be traded between MENA's oil producers, it is not surprising to see that the share of non-oil exports staying in MENA is higher. This too has remained constant at about a quarter. The share of non-natural exports staying in MENA was about a third and the table suggests the ratio rose slightly since the mid 1990s.

We note that, for the UN data in Table 8, we restricted our sample to the countries that consistently reported data over the period.[14] Using data from all reporting countries in 2006-9, the intra-MENA shares were 32% and 43% for non-petroleum and non-natural exports respectively.

Table 8: Intra-MENA exports as a percentage of total exports

period	Overall	Nonpet	Nonnat
1994-97	10%	26%	31%
1998-01	9%	23%	30%
2002-5	11%	24%	35%
2006-9	11%	25%	38%

Source: Own calculations using bilateral IMF data (overall) and UN COMTRADE data (non-petroleum and non-natural exports).

We now complement the descriptive analysis with regression analysis using a panel of data from 1994 onwards, divided into 4-year periods. We can control for time-invariant characteristics of the countries and the country pairs using country-pair fixed effects (*ij* fixed effects).[15] We can also control for time varying country-specific characteristics either directly by including GDP or indirectly by including country-time (*it, jt*) fixed effects. The former specification allows us to

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[14] Algeria, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia and Tunisia

[15] Distance is on such time invariant characteristic, which is not separately identified. We ran alternative specifications where distance is interacted with time, but these did not affect the results.

identify more MENA dummies while the latter allows us to control for multilateral resistance and other time-varying potentially unobservable country-specific effects while still addressing the question of intra-MENA regionalization.[16]

Our use of dummies differs from Miniesy & Nugent (2005). With this specification, we do not intend to answer questions like "Do MENA countries overtrade relative to the benchmark?", which we already addressed with the cross-section data. Instead, analogous to the descriptive analysis in this section, we ask how this propensity has evolved since the mid 1990s. For example, "Controlling for various time-varying and time-invariant characteristics, as well as world trends in trade openness, have MENA's exports to the world gone up or down? Does MENA trade with itself more than it used to?"

Table 9: Gravity model estimates from 1994-2009 panel.

	IMF	Nonnat	Nonpet	IMF	Nonnat	Nonpet
1 ln(GDPexp)	0.869***	1.293***	1.227***			
2 ln(GDPimp)	0.865***	1.060***	0.920***			
3 ln(Populationexp)	-1.162***	-0.503**	-0.353			
4 ln(Populationimp)	0.346**	-0.127	-0.369*			
5 Period 2 (98-01)	-0.0165	-0.101***	-0.116***	-0.0163	-0.529	-0.762
6 Period 3 (02-05)	0.172***	-0.0267	0.0379	0.445	0.119	0.497
7 Period 4 (06-)	0.564***	0.204***	0.276***	2.225***	1.546**	2.084***
8 Period2*MENAexp	0.198***	-0.0643	0.07			
9 Period3*MENAexp	0.494***	0.217**	0.165			
10 Period4*MENAexp	0.637***	0.394***	0.296**			
11 Period2*MENAimp	0.0381	0.0187	0.004			
12 Period3*MENAimp	0.0786	0.140*	0.0542			
13 Period4*MENAimp	0.124*	0.221***	0.153*			
14 Period2*MENApair	0.121	0.0931	0.052	0.122	0.106	-0.0727
15 Period3*MENApair	0.154	-0.0766	0.0984	0.14	-0.0631	0.0805
16 Period4*MENApair	-0.032	-0.26	0.0824	-0.0765	-0.286*	0.0144
N	64887	44598	24212	66052	45147	24426
Intra-MENA change %	107%***	43%***	70%***			
Bilateral FE?	Y	Y	Y	Y	Y	Y
Time- country FE?	N	N	N	Y	Y	Y

Relative to world trends, MENA has increased its exports to the world and to a lesser extent increased its imports. Within-MENA exports stayed constant or fell. Overall, MENA trade rose relative to world trends even for non-natural exports. *** .1% ** 1% * 5% significance levels.

In the first three columns, the period dummies (variables 5-7) reflect what has happened to overall export trends for the world as a whole, controlling for changes in GDP and population over the period (and time invariant characteristics). The Period 4 dummy indicates that the world is more open than it used to be, with trade in all goods being $e^{0.564}-1=76\%$ higher in the late 00s than in the mid 90s. This also holds once one excludes natural resources or just petroleum, although the extent of the change is much smaller over the period and the 1998-2001 years in fact exhibited less non-natural trade and petroleum openness.

How has MENA performed, controlling for all these determinants and *relative to global trends?* Variables 8-10 indicate how MENA exports to the rest of the world have evolved relative to the mid 90s by interacting MENA export dummies

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with period dummies. Variables 11-13 provide information on MENA's imports and 14-16 depict MENA's intraregional trade relative to trade outside the region.

The results indicate that MENA exports more than it used to, even accounting for the fact that it grew faster than the rest of the world over the period. Recall that variables 8-16 describe MENA's trade openness over and above world trends. For example, the period 4 coefficient for overall IMF exports is 0.637, which means that MENA's export openness grew by $e^{0.637}-1=$ 89% more than the rest of the world. Given that cross-section results show that MENA still under-trades by 66% this suggests that trade would have to continue growing at the same pace for 20 years to reach potential. If we exclude oil or natural resources, it would take about twice as long. Given smaller coefficients in columns 2 and 3, MENA's exports would take 35 years in the case of non-natural goods or 46 years in the case of non-petroleum exports.

The results indicate that MENA's imports grew faster than for the world as a whole, but not to the same extent as exports. Table 8 hinted that the share of within-MENA trade was broadly constant, with the possible exception of non-natural goods. Consistent with this, Table 9 shows that there has been no statistically significant change in the propensity for MENA countries to trade with each other relative to the rest of the world over time. A possible exception is the negative coefficients for non-natural trade within the region.

Because exports openness and import openness rose in general and because there was at most a small fall in intra-MENA trade relative to extra-MENA trade, trade between a typical pair of MENA countries rose over the period. For example, combining the period 4 exporter, importer and pair dummies for MENA in column 1, the results indicate that a MENA pair traded 107% more in the late 00s than in the mid 90s. This holds to a lesser extent once one excludes oil or natural resources.

In columns 4-6, we use time-country fixed effects. While we cannot identify overall export or import trends with this specification, we can check for the robustness of the findings for world trade over time and for within-MENA trade relative to trade with the rest of the world. The period 4 dummies (variables 3 to 5) are even higher than in columns 1-3, which re-enforces the finding that the world became more open to trade as a whole, controlling for a fuller range of characteristics. Similarly, the propensity for MENA countries to trade with each other relative to elsewhere either fell or remained unchanged, depending on the specification. This is consistent with columns 1-3 and indicates that MENA has not become more integrated in terms of trade.

While our data is from 1994 onwards, Miniesy & Nugent (2005) have data from 1970-2000. Their results suggest extra-MENA trade performance was still deteriorating in the late 90s; ours suggest an improvement relative to the mid 90s, for exports at least, and a continued improvement subsequently. For intra-MENA trade, their results suggest intra-MENA trade rose over the period. Ours suggest that intra-MENA trade *relative* to extra-MENA trade has stopped rising, but the results for intra-MENA trade as a whole are broadly consistent with theirs.

To summarize, we have seen that MENA's exports to the rest of the world – and to a lesser extent its imports – have risen over time, even after accounting for its relatively fast GDP growth. Combined with the cross-section analysis, this implies that it under-trades with the world less than it used to. This applies to non-petroleum and non-natural exports as well. Within-MENA trade has as a proportion of overall trade has remained broadly constant. Overall, the typical MENA pair under-trades but by less than it used to.

6   Intra-Industry Trade

Intra-industry trade is when a country both exports to and imports from another country in the same industry. This could be because products are differentiated or because sectors involve international supply chains. When measured at the product level, it is more likely because of differentiation, while when measured at the industry level it can be a result of both effects. One advantage of this type of trade is that traditional adjustment effects of trade liberalization are less likely to be felt when trade is intra-industry. The reason is that resources do not have to move across industries where retraining and retooling is necessary. Instead, they need only move across firms within a given sector.

To measure this type of trade, we use the intra-industry trade (IIT) index. The IIT index measures the share of total trade that a country has with its partners that is intra-industry. For example, if exports from country A to country B in a sector are 100 and imports are 50, then intra-industry trade in the sector between country A and B is 100 in that sector (50 of exports and 50 of imports). If all trade is completely balanced across sectors and countries, i.e. imports are equal to exports in every sector in every country the index takes the value of one. In contrast, if a country's exports to all trade partners are in different sectors from its imports, then the index will take a value of zero. Specifically, the index for a country is calculated as

$$(1) \qquad IIT_c = \frac{\sum_{p=1}^{j}\sum_{i=1}^{k} 2*\min(x_{pi}, m_{pi})}{\sum_{p=1}^{j}\sum_{i=1}^{k}(x_{pi} + m_{pi})}.$$

Where p is partner, and there are j partners; i is industry and there are k industries; x_{pi} is export to partner p in industry i and m_{pi} is import from partner p in industry i. The numerator is the total trade between a country and its partners that qualifies as intra-industry. The denominator is a country's total trade.

The index can be aggregated up for a region as

$$(2) \qquad IIT_R = \frac{\sum_{c=1}^{n}\sum_{p=1}^{j}\sum_{i=1}^{k} 2*\min(x_{pi}, m_{pi})}{\sum_{c=1}^{n}\sum_{p=1}^{j}\sum_{i=1}^{k}(x_{pi} + m_{pi})},$$

where c are the n countries in region R. The numerator is the total trade between the countries in a region with the world that qualifies as intra-industry. Note that intra-industry trade is still at the bilateral level. It is the sum of trade among all country pairs that is intra-industry, where one partner is in a given region. The denominator is the region's total trade.

We also calculate the average of the countries' IITs in region R:

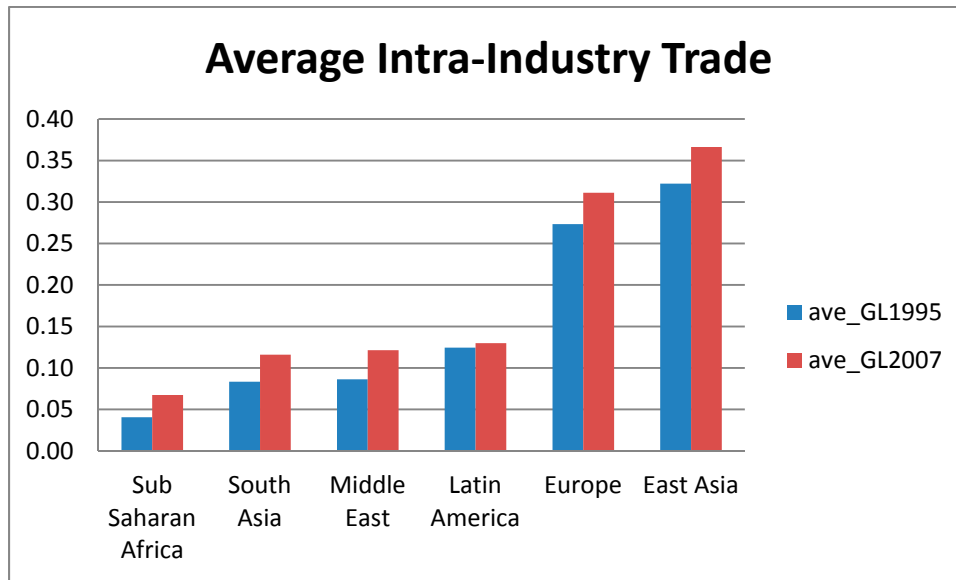$$(3) \quad AVEIIT_R = \frac{\sum_{c=1}^{j} IIT_c}{n}$$

Figures 11 and 12 show the regional aggregate and average IIT indices as defined in equations 2 and 3 respectively. Figure 11 highlights that MENA has much less intra-industry trade than other regions notwithstanding the modest increase between 1995 and 2007. Figure 12, however, reveals that this obscures significant variation among countries. The typical country in the Middle East, sub Saharan Africa, South Asia and Latin America all have little intra-industry trade. The difference between figure 11 and Figure 12 comes from the large amount of intra-industry trade in large traders like Brazil, Mexico, India, and South Africa in those regions.

Figure 11: Aggregate Intra-Industry Trade by Region

Aggregate Intra-Industry Trade
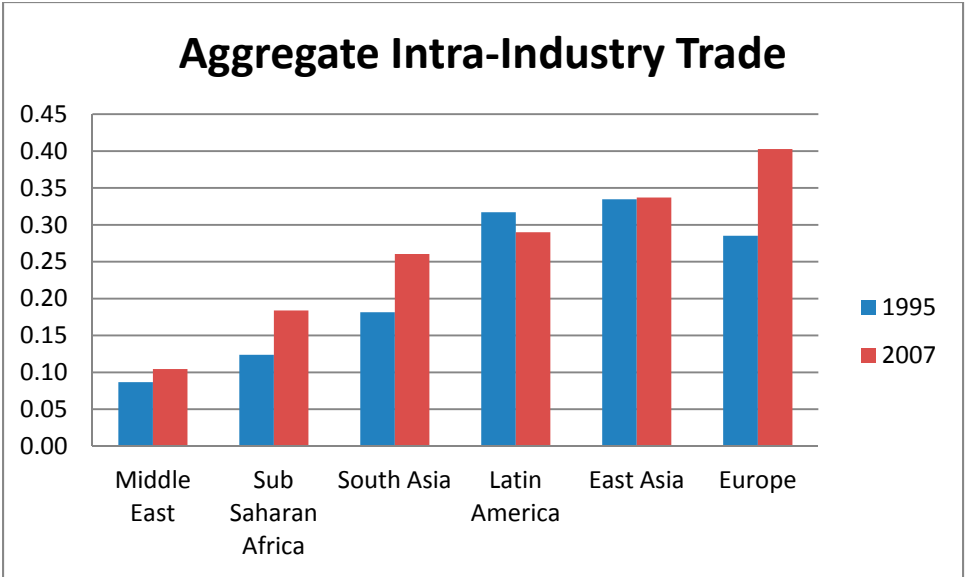
Source: Own calculations using data from the World trade Indicators

Figure 12: Average Intra-Industry Trade by Region

Average Intra-Industry Trade

Figures 13 and 14 show the same regional aggregate and average IIT indices for intra-industry trade within the region. The purpose is to see whether intra-industry trade within the region leads or lags overall intra industry trade for the region. In this case we consider only pairs of countries that are in the same region. While overall intra-industry trade in East Asia remained constant at about one-third of total trade from 1995 to 2007, intraregional intra-industry trade surged. This reflects the shift of supply chains to Asia over this period. In the Middle East and North Africa, growth in intra-industry trade has also been sharper within the region than globally.

Figure 13: Aggregate Intra-Industry Trade as a Share of Regional Trade

Intraregional Aggregate Intra-Industry Trade

Figure 14: Intra-industry Trade as a Share of Regional Trade, Country Average

**Intraregional Average
Intra-Industry Trade**
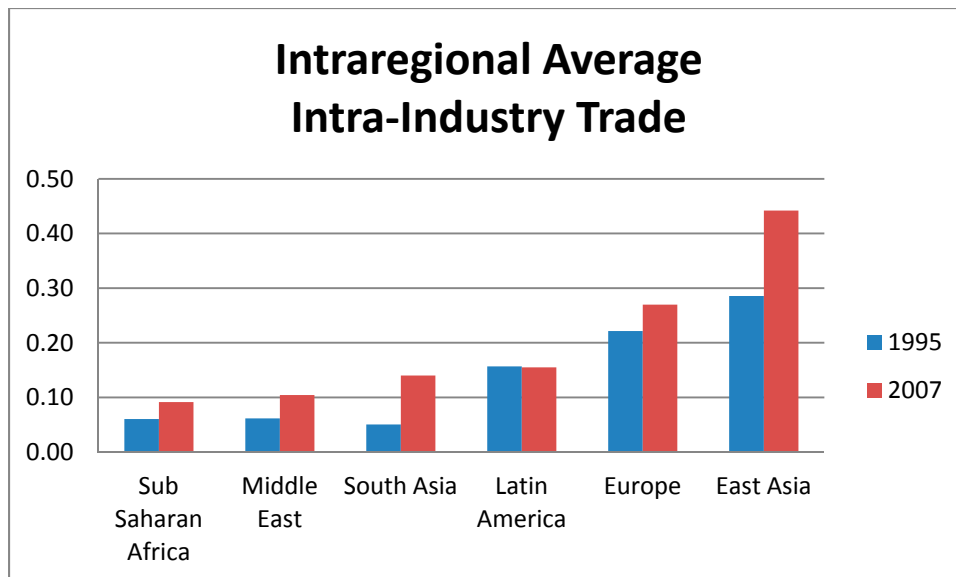
7   Concluding comments

This paper has shown that MENA's export-GDP ratio is above the world average but that, once one controls for its size, proximity to overseas markets and other factors, exports are low. Estimates consistently indicate that exports to the outside world are at only a third of potential. More encouragingly, MENA's exports to the rest of the world have risen since the mid 1990s, even after accounting for its relatively fast GDP growth and world trends. At current rates, it would take about 20 years for MENA's exports of all goods to the outside world to reach potential. Non-oil and non-natural resource export performance also improved but to a lesser extent than for all goods, implying it would take over 40 years to reach potential. The slower growth is to be expected given rising commodity prices over the period, but that there is any growth at all is notable because booming exports of commodities might have been expected to crowd out exports of other goods.

The econometric results do not explicitly benchmark MENA against other developing regions. As reported in Ianchovichina (2011), many developing countries have expanded their exports fast. As a result, MENA has not done as well as other developing countries in terms of increasing its share of world exports of non-oil goods. While resource-rich developing countries have benefited from surging demand for oil and other commodities, some resource-poor developing countries have succeeded despite rising commodity prices. Therefore, there are grounds for a systematic econometric comparison between MENA and other less developed regions that uses a number of trade measures, including total exports, non-oil exports and non-natural exports.

In contrast to exports, imports are at levels that are slightly below the benchmark and non-petroleum imports are relatively high. Over time, import-propensities have risen at rates that exceed global trends but that are not as high as for exports.

There are indications of increased regionalization of trade in many parts of the world. This has in part been attributed to fragmentation of production across different countries that may be close to each other (World Bank, 2009). Although further research is needed, indications are that this pattern does not apply to MENA as much as for East Asia or Europe.

The region has low levels of aggregate intra-industry trade. Despite this, the share of intra-MENA trade is high relative to benchmarks, which means the MENA region is quite regionalized. Furthermore, MENA's trade has not become more regionalized over time, even though there is evidence of an increase in intra-industry trade with all trade partners and within the region. This suggests that the trade agreements signed by members during the sample period did not promote trade within the region. More research is required to understand the nature and determinants of trade within MENA, including the potential role of regional trade agreements.

Finally, this paper has almost exclusively documented patterns related to trade in goods. There are indications that MENA's exports of services have grown faster than its exports of goods – both in percentage terms and relative to middle-income countries (Ianchovichina, 2011). Further work is needed to benchmark the volume of trade in services within MENA and between MENA and the rest of the world, possibly in a manner analogous to that performed for goods here.

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