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Abstract

This study investigates the past trade patterns of the MENA region and analyzes the sectoral growth impacts of them. We employ a sample of two agriculture, one mining, ten manufacturing, and twelve service sectors of 19 MENA countries and 186 trading partners from 1990 to 2015. Our graphical illustration indicates that while the shares of the EU (the major trading partner with a share higher than 30%) and other developed countries in all types of trade decrease, the share of the other developing countries in all kinds of trade and the share of China in intermediate trade increase. Our growth results suggest that while expanding forward global value chain participation with all groups or countries promotes the manufacturing sector, expanding forward global value chain participation with China and other developing countries enhances the service sector. All industries gain from an increase in the backward global value chain participation with the EU and the US. Our findings also propose a strong heterogeneity within the MENA region in terms of types of trade flows and trade partners. Given these results, we argue that global value chain participation of the MENA region promotes the growth of all sectors depending on the types of flows and trading partners. These results reveal the importance of systematic and dynamic trade policies to effectively integrate the MENA region into both regional and global value chains and to reap the benefits of them.

Keywords: Trade patterns, Sectoral growth, MENA region

JEL Classifications: F10, F43, D57.

ملخص

تبحث هذه الدراسة في الأنماط التجارية السابقة لمنطقة الشرق الأوسط وشمال إفريقيا وتحلل آثار النمو القطاعي لها. نستخدم عينة من اثنين من الزراعة، وواحد للتعدين، وعشرة قطاعات تصنيع، واثني عشرــ قطاعًا خدميًا في 19 دولة في الشرق الأوسط وشمال إفريقيا و 186 شريكًا تجاريًا من 1990 إلى 2015. تشير الرسوم البيانية إلى أنه في حين أن حصص الاتحاد الأوروبي (الشريك التجاري الرئيسيـ بحصــة أعلى من 30٪) والبلدان المتقدمة الأخرى في جميع أنواع التجارة تنخفض، فإن حصــة البلدان النامية الأخرى في جميع أنواع التجارة وحصة الصين في التجارة الوسيطة تزداد. تشير نتائج النمو لدينا إلى أنه في حين أن توسيع المشاركة المستقبلية في سلسلة القيمة العالمية مع جميع المجموعات أو البلدان يعزز قطاع التصنيع، فإن توسيع المشاركة المستقبلية في سلسلة القيمة العالمية مع الصين والبلدان النامية الأخرى يعزز قطاع الخدمات. تستفيد جميع الصناعات من زيادة المشاركة المتخلفة في سلسلة القيمة العالمية مع الاتحاد الأوروبي والولايات المتحدة. تقترح النتائج التي توصلنا إليها أيضًا عدم تجانس قوي داخل منطقة الشرق الأوسط وشمال إفريقيا من حيث أنواع التدفقات التجارية والشركاء التجاريين. وبالنظر إلى هذه النتائج، نرى أن المشاركة العالمية في سلسلة القيمة لمنطقة الشرق الأوسط وشمال أفريقيا تعزز نمو جميع القطاعات حسب أنواع التدفقات والشركاء التجاريين. وتكشف هذه النتائج عن أهمية السياسات التجارية المنهجية والدينامية لإدماج منطقة الشرق الأوسط وشمال أفريقيا بفعالية في سلاسل القيمة الإقليمية والعالمية على السواء وجنيّ فوائدها.

1. Introduction

Increasingly changing trade structures have continued to shape the development paths of countries. The future of the Middle East and North African (MENA) region also highly depends on the current trend in international trade. According to the latest World Bank (WB) statistics, the share of exports of the MENA countries in their gross domestic product (GDP) is 36% and the share of imports in GDP is 35% in 2020. Given these high shares and the geographical position of the region, the trade structure of the MENA region deserves special attention.

Over the past three decades, liberalization efforts have increased with decreasing transportation costs and enhancement in information and telecommunication technologies. The MENA region has also participated in these actions through different bilateral and regional trade agreements with the countries within the region as well as with the countries outside the region. These are the Gulf Cooperation Council (GCC) (1981), the Arab Maghreb Union (AMU) (1989), and the Greater Arab Free Trade Area (GAFTA) or the Pan Arab Free Trade Agreement (PAFTA) (1997), as well as there, are some collaborations with the African states, the European Union (EU) (Euro-Mediterranean Association Agreements) (1995), the United States (US) (MEFTA initiative) (2003), Turkey, and Canada (Miniesy et al., 2004). Furthermore, the majority of the MENA countries (Qatar, Kuwait, Bahrain, the United Arab Emirates, Oman, Saudi Arabia, Djibouti, Egypt, Jordan, Mauritania, Morocco, and Tunisia) are members of the World Trade Organization (WTO). However, the integration of the MENA region into the global production system is rather weak because the implementation of these agreements and collaborations can be insufficient (Saidi and Prasad, 2018). Therefore, it can be argued that benefits from trade cannot be efficiently realized.

Our research questions are related to the trade-growth nexus of literature. Even though the trade-growth nexus is highly discussed for many regions and countries (Frankel et al. (1996) for East Asian countries; Dijkstra (2000) for Latin America; Wooster et al. (2008) for the EU; Zhao and Wang (2009) for China), the topic is discussed in a limited number of studies for the MENA region. Karam and Zaki (2015) indicate a positive association between the trade of all types of products and the real GDP for the MENA region. Del Prete et al. (2018) further calculate the GVC participation of North African countries and suggest that increasing the GVC participation of these countries can benefit their industries. Unfortunately, the empirical literature is quite limited. Therefore, we contribute to the literature by using newly defined trade in value-added statistics and providing a detailed empirical analysis of the growth impact of the trade flows in the MENA region.

Given these findings in the literature and to fulfill the gap in policy discussion, our research is mainly guided by the following questions:
- Is there any specific trade pattern of the MENA region within the region (intra-MENA) and with the rest of the world?
- Does this specific pattern stimulate growth?

In light of these questions, we first investigate the trade patterns, that is the backward (import) and forward (export) integration of the MENA region by dividing the region into three major parts (the North African part, the Gulf Cooperation Council (GCC), and the other Middle East part), as well as considering different trading partners such as the MENA, North Africa, the Gulf Cooperation Council (GCC), the other Middle East, the EU, the United States, China, other developed, and other developing via the EORA database for two agriculture, one mining, ten manufacturing, and twelve service sectors from 1990 to 2015.[3] Having observed the specific trade patterns, we analyze the growth impacts of trade with these country groups or countries.

Our graphical illustrations indicate that while the shares of the EU (the major trading partner with a share over 30%) and other developed countries in all types of trade decrease, the share of the other developing countries in all kinds of trade and the share of China in intermediate trade increase. Our estimation results suggest that while the growth of the manufacturing sectors can be promoted by increasing forward GVC participation with all groups or countries, the growth of the service sectors can be boosted by an increase in forward GVC participation with only China and other developing countries. An increase in backward GVC participation with the EU and the US benefits all industries. Within the MENA region, we observe a strong heterogeneity in terms of trade partners and flow. We argue that all these findings help policymakers to shape future trade policies to enhance the prosperity of the MENA countries.

The study is organized as follows. The next part introduces the data, and the third part explains the methodology. The fourth part presents the results of the analyses, and the final section concludes the paper.

2. Data

We employ a variety of different databases. Our main database EORA provides global multi-regional input-output tables including two agriculture, one mining, ten manufacturing sectors (food & beverages; textiles and wearing apparel; wood and paper; petroleum, chemical and non-metallic mineral products; metal products; electrical and machinery; transport equipment; other manufacturing; recycling; and construction), and twelve service sectors (education, health and other services; hotels and restaurants; retail trade; wholesale trade; transport; others; maintenance and repair; post and telecommunications; public administration; financial intermediation and business activities; private households; and electricity, gas and water) of 186 countries including 19 MENA countries (see Table A1 in appendix) from 1990 to 2015 (Lenzen et al., 2012, 2013). We group them into three main sectors: (i) manufacturing, (ii) service, and (iii) agriculture and mining. Based on the definitions of the United Nations agencies and programs, the MENA region consists of Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Saudi Arabia, Syria, Tunisia, Turkey, the United Arab Emirates (UAE), and Yemen.

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[3] The latest year is 2016 in the EORA dataset. We choose not to include the last year because we observe a very high jump in the data for aggregate trade values.

Following the value-added decomposition method indicated in Wang et al. (2017), we calculate domestic value-added embedded in export and foreign value-added embedded in imports to avoid double counting problems and to detect the true domestic value created by the sectors. In other words, our trade measures, intermediate export, final export, and intermediate export, are in domestic or foreign value-added terms, not conventional gross trade statistics including both domestic and foreign value-added. We also take value-added, gross fixed capital formation, and labor compensation from this database. We calculate capital stock by utilizing the perpetual inventory method. The initial capital stock values are taken from the International Monetary Fund (IMF, 2020). The country-level initial capital stock is split across industries according to the value-added shares of sectors in the total economy. Industry-specific depreciation ratios are taken from the methodology notes of the World Input-Output Database (WIOD) (Erumban et al., 2012). Investment values are given as gross fixed capital formation in the EORA26 database. We then calculate the sectoral capital stock for each country sector. Capital intensity is calculated as a ratio of capital stock to labor compensation.

We use the average years of schooling of the adult population in countries from the Our World in Data (Barro and Lee, 2013; Lee and Lee, 2016; and the Human Development Report of the United Nations Development Program (UNDP, 2021)). We use population in the Centre d'Études Prospectives et d'Informations Internationales (CEPII) database. We employ the polity index in the Polity V database to consider the institutional quality of the countries (Marshall and Gurr, 2020). The polity index ranges from -10 meaning strongly autocratic to +10 meaning strongly democratic. We take foreign direct investment (FDI) stock as a share of GDP from the United Nations Conference on Trade and Development (UNCTAD, 2021). We also use the GDP deflator in the World Bank to convert nominal values to real ones.

Figure 1 below illustrates the shares of each country group or countries in the intermediate export of the MENA region. Trends show that while the shares of intermediate exports to China and other developing countries increase through the period, the shares of intermediate exports to the EU and other developed countries decrease. The shares of the United States and the MENA region are stable. Figure 2 demonstrates the shares of each country group or country in the final export of the MENA region. Trends show that while the shares of final exports to GCC, other Middle East, and other developing expand through the period, the shares of final exports to the EU, the United States, and other developed countries diminish. The shares of the North African part and China are stable.

Figure 1. Share of intermediate export (%) of the MENA by country groups
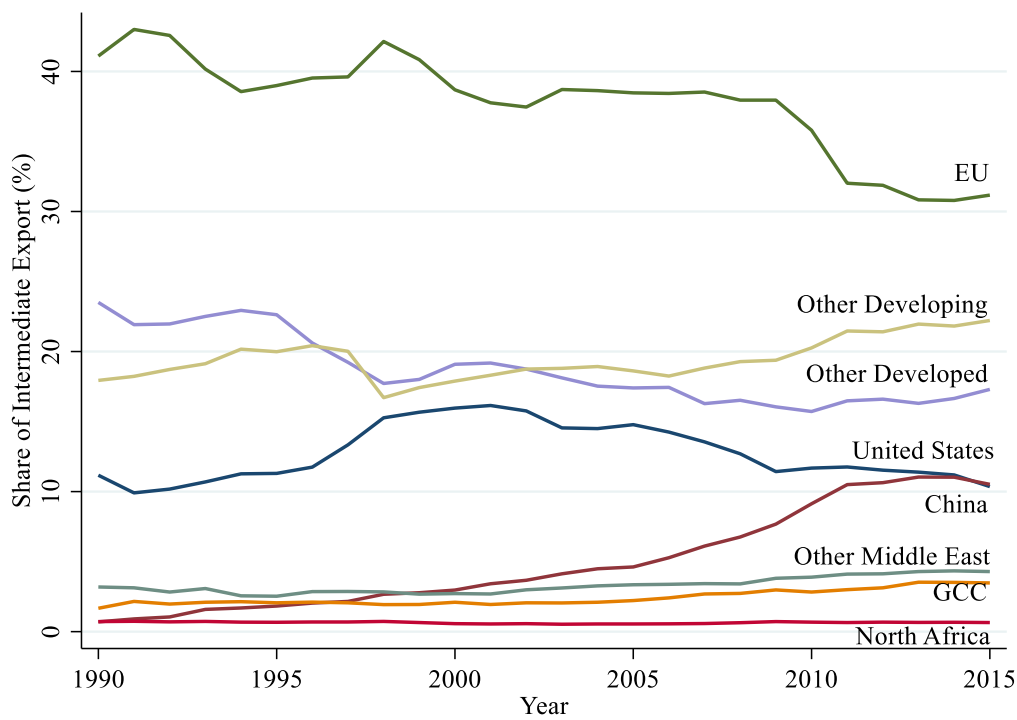
Figure 2. Share of final export (%) of the MENA by country groups
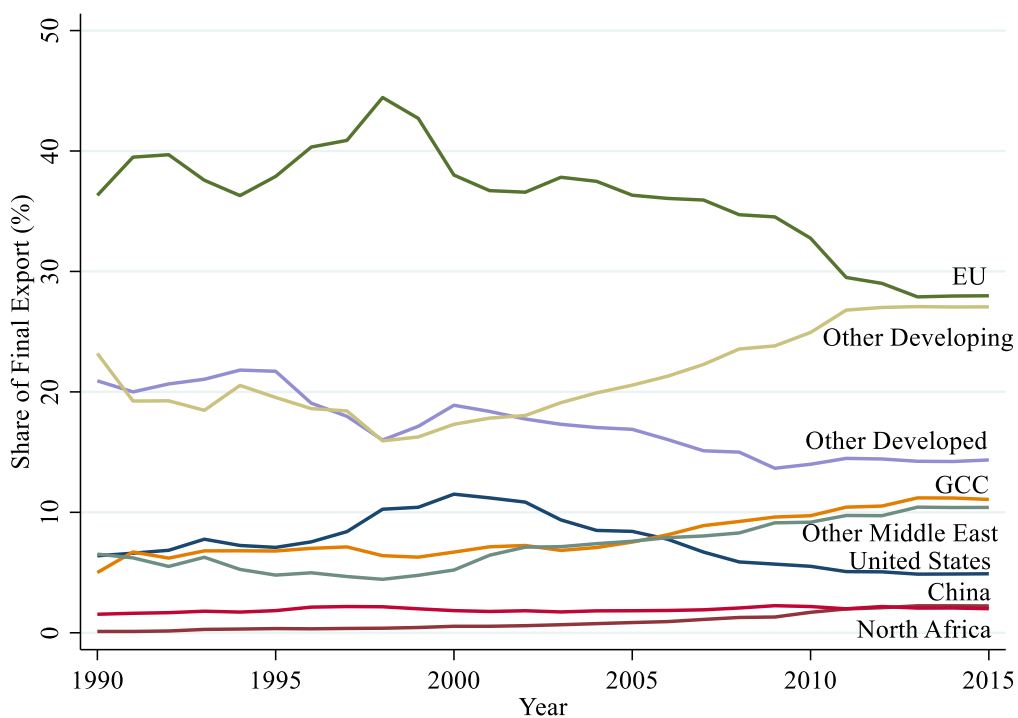
Figure 3 presents the shares of each country group or countries in intermediate imports of the MENA region. Trends show that while the shares of intermediate imports from China and other developing countries grow through the period, the shares of intermediate imports from the EU,

the United States, and other developed countries decrease. The shares of North Africa, GCC, and other Middle East are stable.

Figure 3. Share of intermediate import (%) of the MENA by country groups
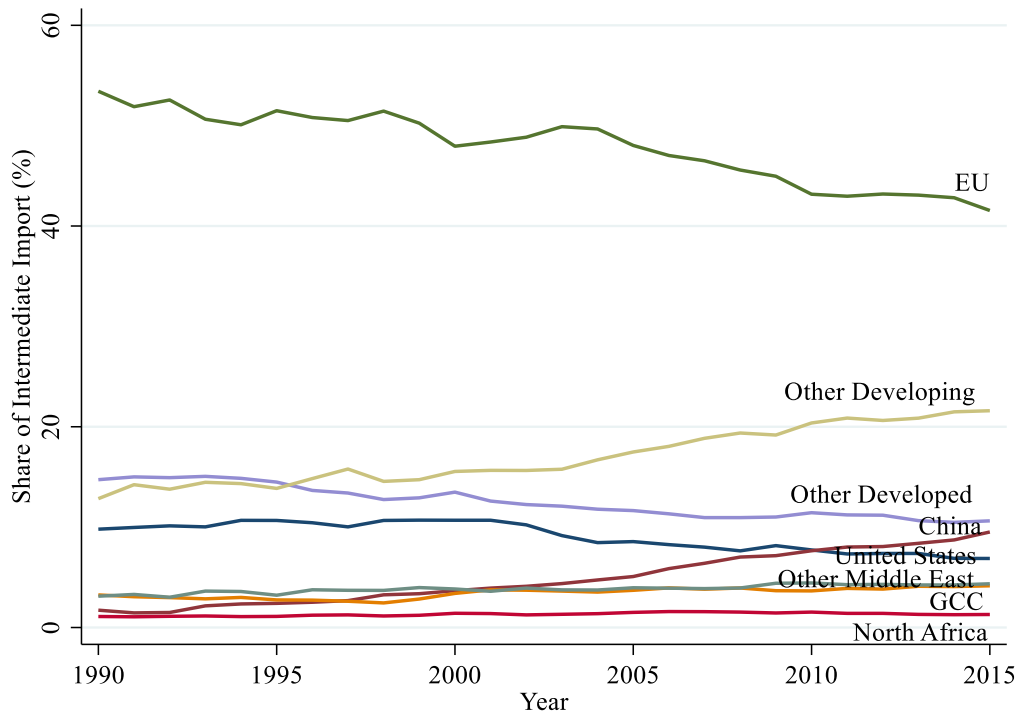
All in all, the EU appears to be the main trade partner of the MENA region regardless of the types of trade flows (over 30%). For intermediate exports, final exports, and intermediate imports, trade with other developing and developed countries reaches substantial shares. For final exports, intra-regional trade has a crucial share in the MENA region. When we consider the composition of trade according to trade partners over the years, we notice that while the shares of the EU and other developed countries in all types of trade tend to decrease, the shares of the other developing countries in all kinds of trade and the share of China in intermediate trade tend to increase. Table 1 presents the summary statistics of variables utilized in econometric analysis. Among the three groups in the MENA region, the GCC has the highest sectoral growth rate on average compared to North Africa and other Middle East parts. While on average the GCC trades within the MENA region at most, North African trades with other countries at most. Among these trade flows, the intermediate imports from and exports to the EU capture the highest ratios.

Table 1. Summary statistics

Variables	MENA Obs.	MENA Mean	North Africa Obs.	North Africa Mean	GCC Obs.	GCC Mean	Other Middle East Obs.	Other Middle East Mean
Value-added growth	10,855	7.53	3,753	6.78	2,845	8.39	4,257	7.63
Intermediate export/Value-added (MENA)	10,669	1.66	3,736	1.02	2,776	2.16	4,157	1.90
Final export/Value-added (MENA)	10,758	2.93	3,747	1.19	2,822	4.43	4,189	3.49
Intermediate import/Value-added (MENA)	10,825	2.18	3,753	1.40	2,845	2.32	4,227	2.78
Intermediate export/Value-added (North Africa)	10,699	0.19	3,698	0.26	2,788	0.08	4,213	0.21
Final export/Value-added (North Africa)	10,781	0.32	3,727	0.42	2,835	0.10	4,219	0.37
Intermediate import/Value-added (North Africa)	10,800	0.34	3,727	0.41	2,845	0.18	4,228	0.39
Intermediate export/Value-added (GCC)	10,690	0.80	3,732	0.22	2,762	1.43	4,196	0.90
Final export/Value-added (GCC)	10,749	1.83	3,740	0.44	2,818	3.25	4,191	2.12
Intermediate import/Value-added (GCC)	10,803	0.70	3,746	0.27	2,817	1.03	4,240	0.85
Intermediate export/Value-added (Other Middle East)	10,697	0.61	3,740	0.48	2,817	0.59	4,140	0.76
Final export/Value-added (Other Middle East)	10,767	0.67	3,748	0.26	2,828	0.87	4,191	0.91
Intermediate import/Value-added (Other Middle East)	10,808	1.06	3,753	0.64	2,843	0.91	4,212	1.53
Intermediate export/Value-added (EU)	10,703	5.33	3,656	9.92	2,817	2.65	4,230	3.15
Final export/Value-added (EU)	10,736	2.77	3,642	4.24	2,838	1.42	4,256	2.41
Intermediate import/Value-added (EU)	10,823	10.71	3,727	11.37	2,845	8.32	4,251	11.72
Intermediate export/Value-added (United States)	10,776	1.22	3,731	1.51	2,821	1.55	4,224	0.74
Final export/Value-added (United States)	10,741	0.51	3,727	0.45	2,789	0.56	4,225	0.53
Intermediate import/Value-added (United States)	10,822	1.87	3,745	1.36	2,840	2.51	4,237	1.88
Intermediate export/Value-added (China)	10,734	0.58	3,728	0.41	2,802	0.07	4,207	0.47
Final export/Value-added (China)	10,764	0.05	3,723	0.03	2,845	1.08	4,239	0.06
Intermediate import/Value-added (China)	10,795	1.18	3,743	0.80	3,743	0.80	4,207	1.60
Intermediate export/Value-added (Other Developed)	10,855	1.84	3,753	1.38	2,845	3.47	4,257	1.15
Final export/Value-added (Other Developed)	10,855	1.06	3,753	0.95	2,845	1.71	4,257	0.72
Intermediate import/Value-added (Other Developed)	10,855	3.06	3,753	2.01	2,845	3.53	4,257	3.67

Table 1. Summary statistics (contd.)

Intermediate export/Value-added (Other Developing)	10,734	2.94	3,713	2.14	2,845	4.34	4,176	2.71
Final export/Value-added (Other Developing)	10,795	2.39	3,729	1.32	2,841	3.20	4,225	2.80
Intermediate import/Value-added (Other Developing)	10,821	5.02	3,741	3.25	2,839	5.22	4,241	6.43
Capital intensity	10,855	9.39	3,753	10.12	2,845	5.71	4,257	11.21
Schooling years	10,855	5.88	3,753	4.88	2,845	7.48	4,257	5.68
Population growth	10,855	2.70	3,753	1.81	2,845	4.38	4,257	2.36
Polity index	10,855	-3.91	3,753	-3.99	2,845	-8.37	4,257	-0.85
FDI/GDP	10,855	25.62	3,753	27.62	2,845	22.40	4,257	26.02

Notes: Value-added growth, all trade shares, population growth, and FDI shares are in percentages.

3. Methodology

To examine the second query that we raised in the Introduction part, we employ the following empirical model to decide whether trade with specific countries or groups matters for sectoral growth.

$$VA\_g_{c,s,t} = \gamma_0 + \gamma_1 VA\_g_{c,s,t-1} + \gamma_2 Trade_{c,s,t} + \gamma_3 S_{c,s,t} + \gamma_4 C_{c,t} + \gamma_5 T_t + \varepsilon_{c,s,t} \qquad (1)$$

where c, s, and t stand for the country, sector, and year, respectively. $VA\_g_{c,s,t}$ and $VA\_g_{c,s,t-1}$ stands for level value and one-year lag value of value-added growth of country-sector pair, respectively. $Trade_{c,s,t}$ represents a vector of specific trade shares of the country sector in the MENA region with a specific country or country groups such as the MENA, North Africa, the Gulf Cooperation Council (GCC), the other Middle East, the European Union (EU), the United States, China, other developed, and other developing. We differentiate trade as intermediates, that is global value chain (GVC) related part, and finals, that is non-GVC part. $S_{c,s,t}$ signifies the capital intensity calculated as a division of capital stock by labor compensation. We also control some country characteristics, $C_{c,t}$, such as the average years of schooling, population growth, polity index, and foreign direct investment stock as shares of GDP. T_t stands for year dummies.

To take the business cycles into account and to smooth the variables, we employ 5-year moving averages of all variables in our model. The dynamic panel data model is estimated by utilizing the System Generalized Methods of Moments (SGMM) procedure to get consistent and efficient estimates and to solve possible autocorrelation, endogeneity, and unobservable heterogeneity problems (Arellano and Bover, 1995; Blundell and Bond, 1998; Roodman, 2009). The lagged differences are used as instruments in level equations whereas the lagged levels of variables are utilized as instruments in the difference equations.[4] In all specifications, we obtain valid probabilities of Hansen test statistics and AR (2) values.[5]

4. Results

This part represents the SGMM estimation results of the growth model for all, manufacturing, service as well as agriculture and mining sectors, separately (Tables 2-5). Table 2 presents the results of the total sample by considering nine main trading groups or countries (MENA, GCC, North Africa, other Middle East, EU, United States, China, other developed, other developing) through columns 1 to 9. The estimation results suggest that an increase in intermediate export to the MENA, the GCC, the United States, China, other developed, and other developing (as a

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[4] We employ one lag for the total sample without the "collapse" command. We employ the first 19, 24, and 3 lags of variables as instrumental variables for manufacturing, service, and agriculture and mining sectors with "collapse" command, respectively.

[5] We conduct several robustness checks. First, we use the level of variables instead of the 5-year moving averages of them. Second, we exclude Yemen, Syria, and Iraq, where there have been intense conflicts. Third, we subset manufacturing sectors without construction and subset service sectors without electricity, gas and water. Fourth, we include China's trade shares in total world trade to consider the Chinese shock, that is Chinese accession to the WTO. In all these four different sensitivity analyses, we reach nearly the same findings. The results are available upon request.

share of value-added) significantly promote value-added growth of the MENA sectors. The same positive impact is valid only for the final export to other developed countries. On the contrary, final exports to the EU and US do not seem to benefit the MENA region. Similar to the intermediate export, importing intermediates from the EU, the United States, and other developed countries enhances the growth of sectors. These results provide substantial evidence for the technology transfer argument from developed countries. These results can also be explained by the differences in comparative advantages of the MENA region and other countries in each specific trade flow. The other important thing is the higher growth effects of the trade of intermediates rather than the trade of final products, which reveals the potential benefits of global value chain participation.

When we consider the control variables, we notice that sectoral value-added growth is very persistent over time. While we do not observe significant effects of capital intensity and foreign direct investment on the value-added growth of sectors, the polity measure significantly raises the growth of sectors. Since the countries in the MENA region generally suffer from political instability and economic turbulences resulting from internal or external wars and the Arab Spring, this result again emphasizes the importance of an institutional framework to foster growth. The other interesting result is the negative impact of schooling years. Pritchett (2001) explains this relationship by a perverse institutional government environment, the decreasing marginal returns to education, and low-quality education such that more schooling neither creates an efficient human capital accumulation nor transmits knowledge and skills.

Table 2. Value-added growth - All sectors

	(1) MENA	(2) North Africa	(3) GCC	(4) Other Middle East	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Lag of value-added growth	0.852***	0.846***	0.845***	0.851***	0.845***	0.842***	0.834***	0.849***	0.843***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)	(0.010)
Intermediate export/Value-added	0.075**	-0.579**	0.132***	0.127	0.009	0.059***	0.078***	0.124***	0.120***
	(0.031)	(0.237)	(0.041)	(0.099)	(0.007)	(0.015)	(0.025)	(0.031)	(0.027)
Final Export/Value-added	-0.017	-0.017	-0.000	0.002	-0.015**	-0.022*	0.143	0.075**	-0.022
	(0.012)	(0.099)	(0.011)	(0.038)	(0.007)	(0.013)	(0.293)	(0.031)	(0.020)
Intermediate Import/Value-added	-0.019	-0.049	-0.056*	-0.051	0.008***	0.112***	-0.058***	0.030***	0.003
	(0.020)	(0.189)	(0.034)	(0.036)	(0.003)	(0.022)	(0.019)	(0.010)	(0.006)
Capital intensity	-0.006	-0.006	-0.001	-0.006	-0.005	-0.005	-0.007	-0.006	-0.005
	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)
Schooling years	-0.065**	-0.052*	-0.087***	-0.075**	-0.065**	-0.077***	-0.038	-0.056**	-0.024
	(0.026)	(0.027)	(0.029)	(0.029)	(0.026)	(0.027)	(0.029)	(0.028)	(0.027)
Population growth	0.004	0.003	-0.009	0.011	0.016	0.001	-0.006	-0.024	-0.023
	(0.016)	(0.018)	(0.015)	(0.017)	(0.017)	(0.016)	(0.015)	(0.016)	(0.016)
Polity	0.045***	0.044***	0.044***	0.034***	0.032***	0.023**	0.037***	0.046***	0.035***
	(0.012)	(0.013)	(0.012)	(0.013)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
FDI/GDP	0.001	0.004*	0.000	0.003	0.002	0.002	0.003	0.001	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	10,414	10,431	10,432	10,424	10,425	10,475	10,460	10,523	10,467
Number of countries-sectors	465	464	465	466	461	465	471	467	467
Number of instruments	465	465	465	465	465	465	465	465	465
AR (2)	0.191	0.189	0.147	0.118	0.121	0.101	0.133	0.128	0.162
Hansen (p)	0.132	0.138	0.132	0.125	0.162	0.132	0.095	0.118	0.119

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** p<0.01, ** p<0.05, * p<0.1.

Table 3 presents the results of manufacturing industries. The results are quite similar to what we have found for all sectors. Exporting intermediate products to the GCC, the EU, the United States, China, other developed, and other developing countries is growth enhancing. Intra-MENA trade of final products in manufacturing seems to benefit the growth of the manufacturing sectors. The manufacturing industries in the MENA region certainly benefit from participating in the forward global value chains enabling them to engage in a finer operational organization and supply chain management as in De Marchi et al. (2018). Similar to estimates for all sectors, the EU and the United States are the only group or countries from where the growth of the MENA region benefits by importing intermediates. The positive impact of the intermediate goods in manufacturing from the EU and the United States reveals the importance of the origin of the imported product and the productivity-enhancing effects of the intermediates coming from high-technology countries. However, intra-region intermediate imports and intermediate imports from China seem to harm the MENA region. Given the strong positive impact of importing from the EU and the United States and under the budget constraints of the country-sector pairs, importing from other countries means fewer imports of intermediates from the EU and the United States and failure to realize the potential benefits of importing from them.

The regressions provided in Table 4 are conducted for only service sectors. While exporting intermediate services to the GCC, China, and other developing countries increase the value-added growth of service sectors, exporting final services to China and other developed countries rises the growth. Utilizing intermediates from the EU, the United States, and other developed countries also enhances growth. The other important thing is that schooling years turn out to be positive in all columns. This suggests that the growth of service sectors significantly and highly depends on human capital even if we cannot control its quality. Compared to the manufacturing sectors, the service sectors successfully engage in forward GVC participation with developing countries rather than all countries. Similar to the manufacturing industries, these sectors also benefit from participating in backward linkages with developed countries including the EU and the United States. Table 5 represents the results of the agriculture and mining sectors. While the growth of the agriculture and mining sectors do not seem to be significantly associated with trade; similar to the manufacturing and service sectors, importing from the Unites States significantly enhances the growth of the agriculture and mining sectors. This again may be explained by the high technology and knowledge embedded in imported products and the learning process through the global value chains (Tajoli and Felice, 2018).

Table 3. Value-added growth - Manufacturing sectors

	(1) MENA	(2) North Africa	(3) GCC	(4) Other Middle East	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Lag of value-added growth	0.852***	0.832***	0.816***	0.817***	0.789***	0.781***	0.767***	0.820***	0.805***
	(0.017)	(0.017)	(0.017)	(0.019)	(0.018)	(0.021)	(0.014)	(0.018)	(0.018)
Intermediate export/Value-added	0.166	0.994	0.261**	0.145	0.152***	0.776***	0.181*	0.174*	0.280***
	(0.106)	(0.779)	(0.118)	(0.406)	(0.038)	(0.280)	(0.092)	(0.100)	(0.082)
Final Export/Value-added	0.079**	0.113	0.029	0.194	-0.136***	0.024	-1.010	0.116	-0.154**
	(0.032)	(0.232)	(0.028)	(0.163)	(0.047)	(0.099)	(0.648)	(0.243)	(0.066)
Intermediate Import/Value-added	-0.291***	-1.315***	-0.173	-0.720***	0.045***	0.359***	-0.211***	0.069	0.044
	(0.110)	(0.397)	(0.161)	(0.216)	(0.014)	(0.107)	(0.060)	(0.046)	(0.033)
Capital intensity	0.089***	0.067**	0.065*	0.040	-0.016	0.010	0.036	0.017	0.034
	(0.033)	(0.029)	(0.035)	(0.032)	(0.024)	(0.027)	(0.029)	(0.026)	(0.025)
Schooling years	-0.387*	-0.333**	-0.148	-0.473*	0.093	0.079	0.131	-0.014	0.076
	(0.201)	(0.143)	(0.174)	(0.258)	(0.124)	(0.154)	(0.155)	(0.125)	(0.135)
Population growth	-0.076	-0.051	-0.146***	-0.133**	-0.070	-0.049	-0.192***	-0.106**	-0.140***
	(0.051)	(0.054)	(0.047)	(0.063)	(0.047)	(0.054)	(0.045)	(0.053)	(0.045)
Polity	0.027	-0.027	0.061	0.012	-0.009	0.006	0.096*	0.003	0.017
	(0.055)	(0.054)	(0.050)	(0.079)	(0.045)	(0.064)	(0.049)	(0.043)	(0.050)
FDI/GDP	0.012	0.034***	0.014*	0.020*	0.008	0.024**	0.030***	0.015*	0.017**
	(0.009)	(0.009)	(0.007)	(0.011)	(0.009)	(0.011)	(0.009)	(0.008)	(0.007)
Observations	4,192	4,212	4,214	4,178	4,202	4,153	4,225	4,258	4,268
Number of countries-sectors	185	186	185	185	184	186	188	187	187
Number of instruments	205	205	205	205	205	205	205	205	205
AR (2)	0.156	0.167	0.170	0.124	0.159	0.153	0.224	0.203	0.222
Hansen (p)	0.238	0.222	0.237	0.238	0.254	0.222	0.192	0.207	0.206

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Value-added growth - Service sectors

	(1) MENA	(2) Other Middle East	(3) North Africa	(4) GCC	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Lag of value-added growth	0.793***	0.785***	0.792***	0.775***	0.774***	0.780***	0.776***	0.765***	0.774***
	(0.018)	(0.015)	(0.017)	(0.016)	(0.018)	(0.020)	(0.016)	(0.023)	(0.018)
Intermediate export/Value-added	0.137	0.001	-1.358	0.472*	-0.088	0.040	0.301***	-0.188	0.327***
	(0.318)	(0.282)	(1.458)	(0.244)	(0.055)	(0.121)	(0.072)	(0.212)	(0.101)
Final Export/Value-added	-0.038	0.121	1.601	-0.195	-0.486	-0.288	0.853**	0.616*	0.037
	(0.264)	(0.287)	(1.089)	(0.238)	(0.298)	(0.393)	(0.419)	(0.363)	(0.098)
Intermediate Import/Value-added	0.303	0.314	-0.309	0.480	0.303***	0.666**	0.040	0.313**	-0.035
	(0.487)	(0.495)	(1.375)	(0.304)	(0.085)	(0.264)	(0.178)	(0.154)	(0.067)
Capital intensity	0.023	0.026*	0.025*	0.025*	0.049**	0.044***	0.027**	0.050***	0.016
	(0.017)	(0.014)	(0.013)	(0.014)	(0.019)	(0.012)	(0.014)	(0.018)	(0.015)
Schooling years	0.136*	0.139**	0.229***	0.174*	0.064	0.134	0.285***	0.243*	0.495***
	(0.077)	(0.063)	(0.075)	(0.092)	(0.137)	(0.082)	(0.066)	(0.137)	(0.083)
Population growth	-0.215***	-0.210***	-0.225***	-0.253***	-0.254***	-0.225***	-0.261***	-0.306***	-0.252***
	(0.038)	(0.031)	(0.032)	(0.033)	(0.039)	(0.054)	(0.032)	(0.052)	(0.033)
Polity	0.011	-0.021	0.051	0.087**	0.040	0.039	0.039	0.074*	0.120***
	(0.032)	(0.034)	(0.034)	(0.034)	(0.042)	(0.031)	(0.031)	(0.041)	(0.035)
FDI/GDP	0.002	0.005	0.009	0.013	-0.013	-0.004	0.013	-0.008	0.004
	(0.020)	(0.010)	(0.012)	(0.008)	(0.011)	(0.013)	(0.009)	(0.011)	(0.009)
Observations	5,092	5,090	5,070	5,081	5,120	5,142	5,023	5,054	5,042
Number of countries-sectors	227	227	226	226	227	227	228	226	227
Number of instruments	250	250	250	250	250	250	250	250	250
AR (2)	0.551	0.583	0.541	0.460	0.647	0.522	0.518	0.519	0.447
Hansen (p)	0.313	0.310	0.327	0.326	0.313	0.309	0.293	0.326	0.315

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Value-added growth – Agriculture and Mining sectors

	(1) MENA	(2) Other Middle East	(3) North Africa	(4) GCC	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Lag of value-added growth	0.913***	0.927***	0.934***	0.897***	0.906***	0.899***	0.912***	0.880***	0.959***
	(0.050)	(0.037)	(0.058)	(0.069)	(0.140)	(0.068)	(0.045)	(0.117)	(0.108)
Intermediate export/Value-added	0.350	-0.698	-3.730	0.298	-0.038	-0.010	0.194	0.319	-0.186
	(0.253)	(0.769)	(4.536)	(0.451)	(0.143)	(0.276)	(0.317)	(0.336)	(0.306)
Final Export/Value-added	-0.227	0.208	6.037	-0.003	-0.062	-12.131	-14.659	0.382	-0.044
	(0.158)	(0.390)	(4.457)	(0.144)	(0.134)	(12.040)	(20.101)	(0.339)	(0.562)
Intermediate Import/Value-added	1.627	2.251	-2.780	-7.084	0.591	1.813**	0.206	0.722	0.260
	(1.060)	(2.195)	(14.021)	(12.791)	(0.358)	(0.853)	(1.139)	(0.683)	(0.283)
Capital intensity	0.067**	0.064**	0.057	0.052*	0.076**	0.037	0.057*	0.050*	0.072***
	(0.028)	(0.027)	(0.036)	(0.026)	(0.035)	(0.026)	(0.033)	(0.025)	(0.027)
Schooling years	-0.109	-0.557	-0.245	0.141	-0.849	-0.639	-0.406	-0.191	-0.920*
	(0.747)	(0.510)	(0.288)	(0.533)	(0.588)	(0.384)	(0.390)	(0.542)	(0.461)
Population growth	-0.182	-0.188	-0.331	-0.415**	-0.286	-0.390*	-0.211	-0.257	-0.177
	(0.149)	(0.211)	(0.257)	(0.202)	(0.247)	(0.218)	(0.177)	(0.231)	(0.233)
Polity	0.258	-0.031	0.024	0.129	-0.118	0.026	-0.018	0.127	-0.143
	(0.213)	(0.144)	(0.139)	(0.173)	(0.251)	(0.183)	(0.191)	(0.183)	(0.140)
FDI/GDP	-0.009	0.010	0.010	-0.010	-0.025	-0.004	-0.003	-0.013	0.000
	(0.024)	(0.028)	(0.029)	(0.014)	(0.030)	(0.017)	(0.020)	(0.022)	(0.022)
Observations	1,130	1,156	1,149	1,137	1,103	1,180	1,212	1,211	1,157
Number of countries-sectors	53	54	52	54	50	52	55	54	53
Number of instruments	61	61	61	61	61	61	61	61	61
AR (2)	0.664	0.642	0.629	0.760	0.800	0.389	0.425	0.525	0.872
Hansen (p)	0.239	0.274	0.572	0.516	0.173	0.398	0.119	0.113	0.510

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** p<0.01, ** p<0.05, * p<0.1.

Heterogeneity in the MENA Region

Tables 6 and 7 present the results for two main sector groups manufacturing and non-manufacturing as well as the MENA disaggregation (North Africa, the GCC, and other Middle East).[6] Table 6 reveals that the results given in Table 3 are mainly driven by the North African part of the MENA region. The manufacturing industries of North Africa enhance their sectoral growth with higher forward GVC participation with the EU, the United States, and other developing countries as well as with higher backward GVC participation with the EU and other developing countries. While the growth of manufacturing sectors of the other Middle East part can also be enhanced via trade within the MENA region, the growth of the manufacturing sector of GCC countries depends only on intermediates coming from other developed and other developing countries.

Table 7 provides the results for non-manufacturing sectors. Similar to the manufacturing industries, the findings of overall non-manufacturing sectors are quite parallel to the results of the North African part. An increase in intermediate export to the other Middle East, the EU, the United States, and other developed, final export to other developing countries, and intermediate imports from the United States increase the growth of non-manufacturing sectors in the North African part. The growth of non-manufacturing sectors in the other Middle East part is positively affected by final export to other developing countries and the United States, and intermediate imports from GCC and the United States. Similar to the manufacturing industries, the group GCC benefit only from backward GVC participation with the other Middle East, the EU, and the United States.

Given the strong heterogeneities in the impacts of trade on sectoral growth varying with the types of flows, trade partners, the sectors as well as the differences in the MENA regions itself, it is quite crucial to track the trade-growth linkages in much more disaggregated samples to reach precise policy recommendations for each special unit.

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[6] Because of the low number of country-sector groups compared to the number of instruments, we cannot run the SGMM for the agriculture and mining sectors. Instead, we use manufacturing and non-manufacturing disaggregation.

Table 6. Value-added growth – Manufacturing sectors – MENA disaggregation

North Africa	(1) MENA	(2) North Africa	(3) GCC	(4) Other Middle East	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Intermediate export/Value-added	1.176**	0.065	1.372	2.456*	0.196***	0.900**	0.411	0.527	0.614*
	(0.537)	(1.164)	(1.505)	(1.369)	(0.068)	(0.357)	(0.362)	(0.517)	(0.327)
Final Export/Value-added	-0.279**	-0.842*	-0.186	-0.955***	-0.202***	0.152	-0.057	0.294	-0.297
	(0.121)	(0.448)	(0.159)	(0.356)	(0.067)	(0.150)	(0.741)	(0.426)	(0.327)
Intermediate Import/Value-added	0.394	-0.721	2.290	0.110	0.071*	0.155	-0.083	0.027	0.303**
	(0.396)	(0.483)	(1.650)	(0.329)	(0.035)	(0.139)	(0.120)	(0.056)	(0.125)
Observations	1,485	1,438	1,488	1,492	1,380	1,441	1,464	1,466	1,455
Number of countries-sectors	60	59	60	60	56	59	60	59	59
Number of instruments	79	79	79	79	79	79	79	79	79
AR (2)	0.211	0.214	0.215	0.222	0.173	0.183	0.233	0.199	0.198
Hansen (p)	0.100	0.106	0.087	0.087	0.197	0.125	0.092	0.104	0.105
GCC	MENA	North Africa	GCC	Other Middle East	EU	United States	China	Other Developed	Other Developing
Intermediate export/Value-added	0.154	0.657	0.295	-1.528	-0.023	-0.665	-0.004	0.087	-0.028
	(0.186)	(2.923)	(0.240)	(1.350)	(0.199)	(0.479)	(0.103)	(0.090)	(0.237)
Final Export/Value-added	0.014	1.056	0.019	0.254	0.063	0.207	0.375	-0.116	-0.026
	(0.043)	(1.036)	(0.046)	(0.244)	(0.083)	(0.200)	(1.589)	(0.099)	(0.152)
Intermediate Import/Value-added	-0.102	1.056	-0.195	0.334	0.034	0.095	0.110	0.193**	0.187*
	(0.139)	(1.010)	(0.178)	(0.428)	(0.034)	(0.143)	(0.211)	(0.084)	(0.104)
Observations	1,161	1,179	1,139	1,167	1,179	1,124	1,163	1,168	1,179
Number of countries-sectors	49	50	49	50	50	49	50	50	50
Number of instruments	70	70	70	70	70	70	70	70	70
AR (2)	0.015	0.320	0.219	0.021	0.023	0.338	0.305	0.252	0.204
Hansen (p)	0.527	0.189	0.353	0.526	0.621	0.231	0.155	0.143	0.214

Table 6. Value-added growth – Manufacturing sectors – MENA disaggregation (contd.)

Other Middle East	MENA	North Africa	GCC	Other Middle East	EU	United States	China	Other Developed	Other Developing
Intermediate export/Value-added	0.608*	10.276**	0.706	0.032	0.399	0.223	0.623*	0.198	0.430***
	(0.361)	(4.886)	(0.482)	(0.636)	(0.309)	(0.416)	(0.323)	(0.282)	(0.145)
Final Export/Value-added	0.053	0.586	-0.089	-0.051	-0.177**	-0.168	-2.829*	-0.101	-0.229**
	(0.067)	(0.541)	(0.082)	(0.190)	(0.076)	(0.302)	(1.663)	(0.272)	(0.097)
Intermediate Import/Value-added	-0.018	-0.207	1.028*	-0.403**	0.013	0.156	-0.245*	-0.017	0.055
	(0.117)	(0.644)	(0.565)	(0.190)	(0.018)	(0.124)	(0.128)	(0.057)	(0.047)
Observations	1,546	1,595	1,587	1,519	1,643	1,588	1,598	1,624	1,634
Number of countries-sectors	76	77	76	75	78	78	78	78	78
Number of instruments	97	97	97	97	97	97	97	97	97
AR (2)	0.401	0.472	0.380	0.325	0.509	0.465	0.604	0.540	0.668
Hansen (p)	0.173	0.144	0.182	0.215	0.143	0.141	0.121	0.132	0.132

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 7. Value-added growth – Non-Manufacturing sectors – MENA disaggregation

North Africa	(1) MENA	(2) North Africa	(3) GCC	(4) Other Middle East	(5) EU	(6) United States	(7) China	(8) Other Developed	(9) Other Developing
Intermediate export/Value-added	0.937**	-2.364**	0.110	1.640**	0.094***	0.346***	0.111	0.846**	0.174
	(0.463)	(1.139)	(0.802)	(0.763)	(0.031)	(0.121)	(0.196)	(0.372)	(0.117)
Final Export/Value-added	-0.746	1.403	-0.008	-0.786	-0.193**	-1.285	0.973	-0.528	0.113**
	(0.568)	(1.898)	(1.583)	(0.903)	(0.091)	(1.015)	(3.734)	(0.483)	(0.044)
Intermediate Import/Value-added	0.391	-3.606***	1.162	1.444	0.118	1.096***	0.169	0.628	-0.037
	(0.351)	(1.231)	(0.976)	(0.876)	(0.081)	(0.382)	(0.669)	(0.465)	(0.077)
Observations	2,158	2,120	2,148	2,164	2,050	2,169	2,130	2,143	2,103
Number of countries-sectors	90	90	90	90	86	90	90	89	90
Number of instruments	115	115	115	115	115	115	115	115	115
AR (2)	0.318	0.366	0.249	0.324	0.342	0.274	0.296	0.340	0.214
Hansen (p)	0.281	0.270	0.267	0.260	0.369	0.260	0.264	0.307	0.308
GCC	MENA	North Africa	GCC	Other Middle East	EU	United States	China	Other Developed	Other Developing
Intermediate export/Value-added	-0.103	2.305	0.094	-1.267	-0.100	0.098	-0.061	-0.043	0.078
	(0.523)	(3.264)	(0.209)	(0.829)	(0.117)	(0.170)	(0.084)	(0.111)	(0.079)
Final Export/Value-added	0.053	-3.786*	-0.059	0.171	-1.598*	-2.154	0.148	0.111	-0.016
	(0.746)	(2.179)	(0.666)	(0.267)	(0.881)	(2.345)	(0.731)	(0.144)	(0.032)
Intermediate Import/Value-added	-0.200	0.845	-0.036	1.519*	0.387***	0.899**	0.129	0.365	0.171
	(0.199)	(3.043)	(0.223)	(0.832)	(0.097)	(0.357)	(0.366)	(0.251)	(0.162)
Observations	1,614	1,615	1,614	1,646	1,647	1,656	1,616	1,611	1,654
Number of countries-sectors	72	71	71	73	72	72	73	71	73
Number of instruments	97	97	97	97	97	97	97	97	97
AR (2)	0.790	0.499	0.846	0.340	0.448	0.167	0.298	0.429	0.264
Hansen (p)	0.288	0.308	0.319	0.254	0.341	0.281	0.248	0.352	0.255

Table 7. Value-added growth – Non-Manufacturing sectors – MENA disaggregation (contd.)

Other Middle East	MENA	North Africa	GCC	Other Middle East	EU	United States	China	Other Developed	Other Developing
Intermediate export/Value-added	0.314**	1.448	0.765	-0.589	-0.181	-0.643***	0.236	-0.498	-0.170
	(0.130)	(3,142.080)	(0.497)	(0.545)	(0.349)	(0.228)	(30.505)	(0.461)	(0.255)
Final Export/Value-added	-0.201*	0.032	-0.253	0.490	0.113	1.959***	0.088	0.087	0.436*
	(0.109)	(3,131.370)	(0.190)	(0.548)	(1.230)	(0.706)	(273.765)	(0.150)	(0.239)
Intermediate Import/Value-added	0.786**	0.955	3.983***	0.026	0.396	1.060***	-0.018	0.438**	-0.096
	(0.359)	(1,070.171)	(0.924)	(0.525)	(0.282)	(0.366)	(43.417)	(0.183)	(0.094)
Observations	2,450	2,484	2,456	2,436	2,526	2,497	2,489	2,511	2,442
Number of countries-sectors	118	117	119	118	119	117	120	120	117
Number of instruments	142	142	142	142	142	142	142	142	142
AR (2)	0.975	0.999	0.735	0.726	0.585	0.583	0.814	0.531	0.958
Hansen (p)	0.277	0.115	0.248	0.272	0.256	0.291	0.182	0.227	0.292

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

5. Conclusion

International trade is one of the crucial mechanisms for the growth of economies. Understanding the dynamics in the trade-growth nexus such as the types of integration (backward or forward linkages) and the identity of trading partners (the MENA or non-MENA countries) are two important initial steps to constitute solid trade policies in the overwhelmingly integrated global trade and production systems. Since the MENA region has distinct features needed to be investigated in a detailed way, analyzing the impacts of MENA's trade integration within the region and with the rest of the world on the growth of the MENA has great potential to provide evidence for the important policy-related research area.

Our SGMM estimations provide substantial evidence to effectively integrate into both regional and global chains as well as to stimulate the growth of the MENA region. Given the high heterogeneities in the region, we are also able to discuss the subject for the different countries, sectors, and product groups (intermediate and final) in the MENA region by the unique dataset with large coverage. Our empirical analysis suggests that the sectoral growth of the MENA region depends mainly on its integration into global value chain activities. Higher forward GVC participation with all groups or countries promotes the growth of manufacturing sectors whereas increases in forward GVC participation with China and other developing countries enhance the growth of the service sectors. All sectors benefit from higher backward GVC participation with the EU and the United States. Moreover, for North Africa, GCC, and other Middle East, we obtain different results depending on trading partners and trade flows, suggesting strong heterogeneity within the MENA region.

Empirical findings reveal the importance of the growth impact of global value chain participation. Overall, the growth of the MENA region for both manufacturing and non-manufacturing sectors is highly dependent on trade with non-MENA countries. Still, North Africa, GCC, and other Middle East are important trade partners for the MENA region depending on the types of trade flows and the region of the home country. Overall, these findings highlight the significance of country-sector-trading partner level and specific integration scenarios into both regional and global value chains for the growth of the MENA region.

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Appendix

Table A1. Countries

MENA	Other Developed		Other Developing					
North Africa	Andorra	Israel	Afghanistan	Cameroon	Gambia	Macao SAR	Pakistan	Sri Lanka
Algeria	Aruba	Italy	Albania	Cape Verde	Gaza Strip	Madagascar	Panama	Sudan
Egypt	Australia	Japan	Angola	Central African Republic	Georgia	Malawi	Papua New Guinea	Suriname
Libya	Austria	Liechtenstein	Antigua	Chad	Ghana	Malaysia	Paraguay	Swaziland
Mauritania	Bahamas	Luxembourg	Argentina	Chile	Greece	Maldives	Peru	TFYR Macedonia
Morocco	Belgium	Monaco	Armenia	China	Guatemala	Mali	Philippines	Tajikistan
Tunisia	Bermuda	Netherlands	Azerbaijan	Colombia	Guinea	Malta	Poland	Tanzania
GCC	British Virgin Islands	New Zealand	Bangladesh	Congo	Guyana	Mauritius	Portugal	Thailand
Bahrain	Brunei	Norway	Barbados	Costa Rica	Haiti	Mexico	Romania	Togo
Kuwait	Canada	San Marino	Belarus	Cote dIvoire	Honduras	Moldova	Russia	Trinidad and Tobago
Oman	Cayman Islands	Singapore	Belize	Croatia	Hungary	Mongolia	Rwanda	Turkmenistan
Saudi Arabia	Cyprus	Spain	Benin	Cuba	India	Montenegro	Samoa	Uganda
UAE	Denmark	Sweden	Bhutan	Czech Republic	Indonesia	Mozambique	Sao Tome and Principe	Ukraine
Other Middle East	Finland	Switzerland	Bolivia	DR Congo	Jamaica	Myanmar	Senegal	Uruguay
Djibouti	France	Taiwan	Bosnia and Herzegovina	Dominican Republic	Kazakhstan	Namibia	Serbia	Uzbekistan
Iran	French Polynesia	UK	Botswana	Ecuador	Kenya	Nepal	Seychelles	Vanuatu
Iraq	Germany	USA	Brazil	El Salvador	Kyrgyzstan	Netherlands Antilles	Sierra Leone	Venezuela
Jordan	Greenland		Bulgaria	Eritrea	Laos	New Caledonia	Slovakia	Viet Nam
Lebanon	Hong Kong		Burkina Faso	Estonia	Latvia	Nicaragua	Slovenia	Zambia
Syria	Iceland		Burundi	Ethiopia	Lesotho	Niger	South Africa	Zimbabwe
Turkey	Ireland		Cambodia	Fiji	Liberia	Nigeria	South Korea	
Yemen				Gabon	Lithuania	North Korea	South Sudan	

Notes: We use the MENA definitions of United Nations agencies and programs. Income classification is based on the country's 1990 income level, which is the initial year of our dataset (World Development Indicators (WDI) - World Bank, 2020).