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The Past and the Future Trade Patterns of the MENA Region: The Pursuit of Growth

Pınar Tat¹, Abdullah Altun², Halit Yanıkkaya³

Abstract

This study investigates the past trade patterns of the MENA region and analyzes the sectoral growth impacts of them. In light of the results of econometric analysis, the study further predicts the growth impact of any future trade agreements supporting a prominent specific trade pattern in the framework of input-output modeling. 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 simulation findings also propose that the growth of the MENA region is highly dependent on trade with the rest of the world, it is important to notice that the growth of both manufacturing and non-manufacturing sectors of other Middle East is enhanced at most with higher imported intermediates from the GCC. Given these results and depending on the input-output modeling, 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.

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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, Bahrein, 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 two strands of the literature: trade-growth and liberalization-trade nexuses. 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, especially regarding the potential impacts of any future integration in the framework of input-output models.

Some studies analyze the effects of liberalization efforts on the MENA region. Cieřlik and Hagemeyer (2009) find out that the new EU Association Agreements with the MENA region rises the imports of the MENA region from the EU, but this effort does not impact the export of the MENA region to the EU countries. Parra et al. (2016) find that North-South agreements, that is trade between developed and developing countries, can enhance the exports of the MENA region. Other studies analyze the impact of further integration in the MENA region on intra-trade. Al-Atrash and Yousef (2000) estimate the gravity model and suggest that intra-Arab trade can be 10-15 percent higher than the observed values. Miniesy et al. (2004) also employ a gravity model and predict that the intra-MENA can be increased by 147 percent if the full integration among countries will be sustained. Peridy and Abedini (2014) claim that the predicted intra-GAFTA trade values are higher than the actual ones suggesting further room to facilitate intraregional trade better.

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?
- If a trade agreement is established to support a prominent specific trade pattern in the future, what will be the growth impacts of this establishment on the MENA region?

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, the 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 2015⁴. We then have a two-tier estimation strategy. Having observed the specific trade patterns, in the first part, we analyze the growth impacts of trade with these country groups or countries. In the second part, we investigate the potential change in the output level of each sector group as a result of an increase in trade of the MENA region with prominent trade partners in the framework of the input-output

⁴ 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.

model. Investigating the subject in the context of production networks with the inter-country input-output tables enables researchers and policymakers to understand the production dynamics of any trade agreement in the future.

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. Depending on the empirical results, our input-output simulation findings also reveal the growth impact of global value chain participation. Even though the growth of the MENA region is highly dependent on trade with the rest of the world, it is important to notice that the growth of both manufacturing and non-manufacturing sectors of other Middle East can be enhanced at most with higher imported intermediates from the GCC. While the intermediate imports of manufacturing sectors in the GCC from other developing countries generate higher impacts compared to the other possible trade flows, final exports of the non-manufacturing sectors of other Middle East to the United States generate higher effects compared to the other possible trade flows. 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. 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. 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-Lee, 2013; Lee-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.

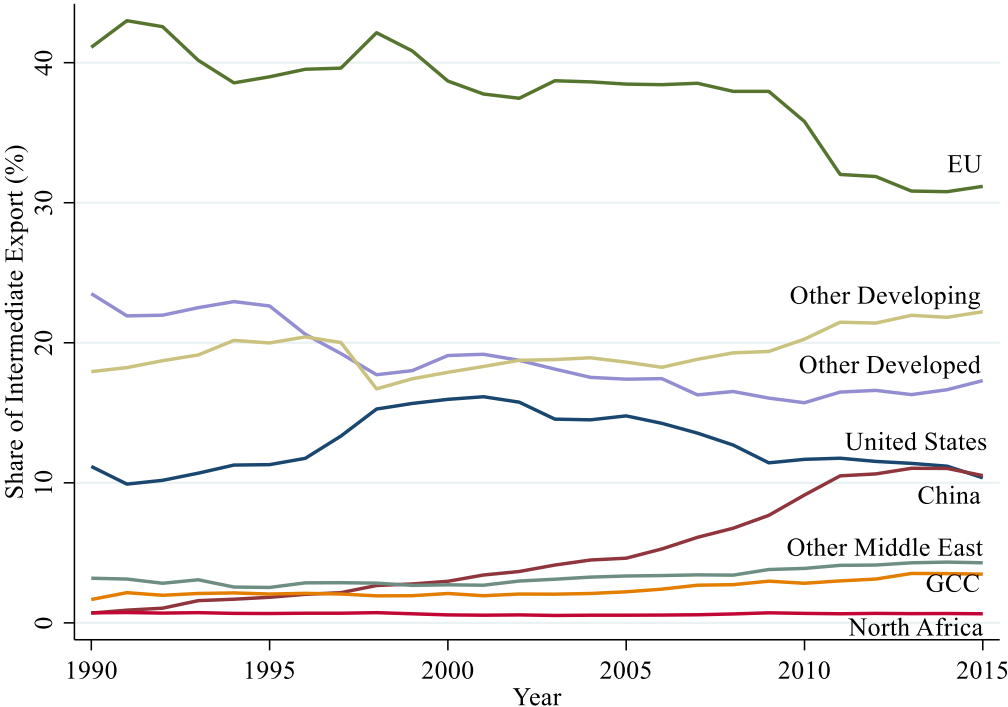


Figure 1: Share of intermediate export (%) of the MENA by country groups

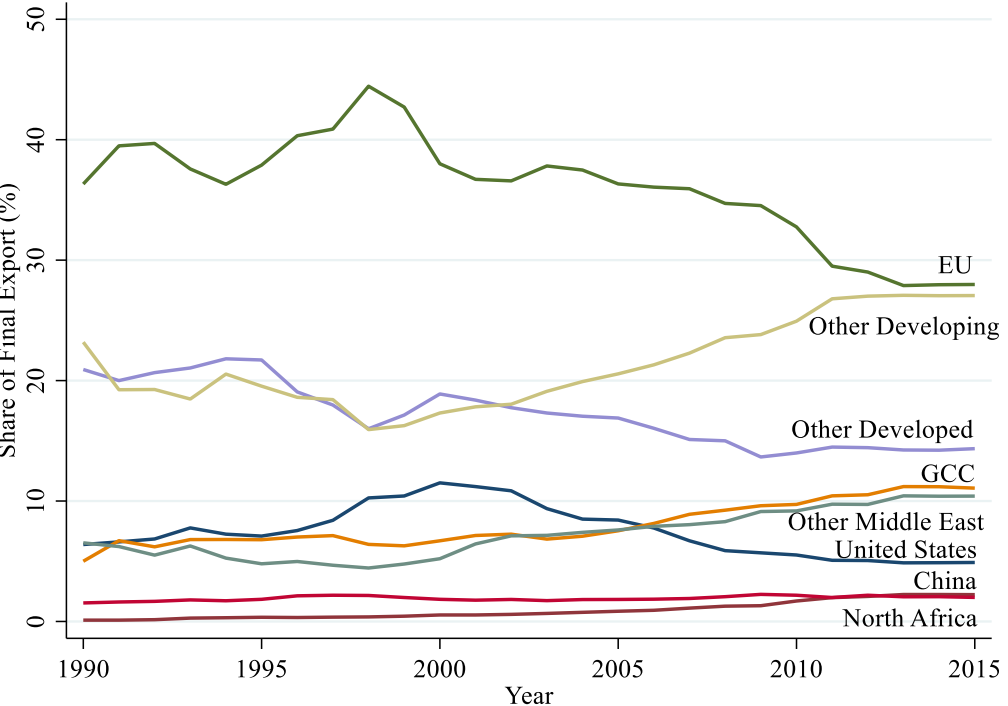


Figure 2: Share of final export (%) of the MENA by country groups

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.

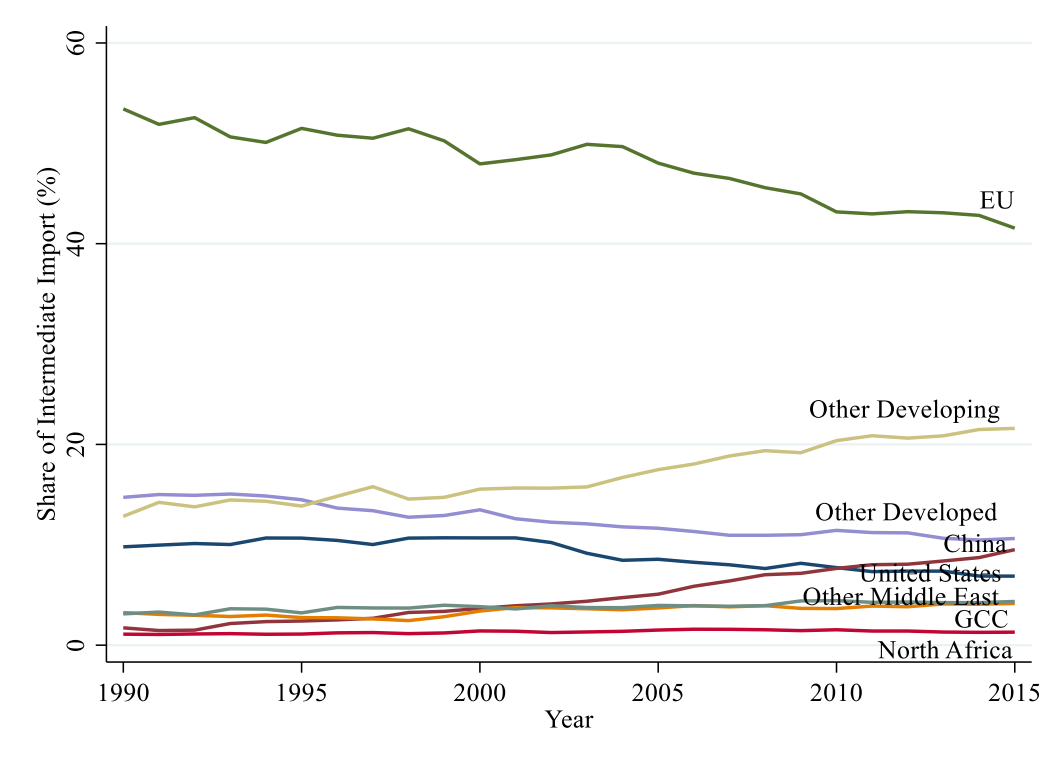


Figure 3: Share of intermediate import (%) of the MENA by country groups

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 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 the 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 export to the EU captures the highest ratios.

Table 1: Summary statistics

| Variables | MENA | | North Africa | | GCC | | Other Middle East | |
|---|-------------|-------------|---------------------|-------------|-------------|-------------|--------------------------|-------------|
| | Obs. | Mean | Obs. | Mean | Obs. | Mean | Obs. | 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 (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 |
| 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

The First Stage

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

$$VA_g_{c,s,t} = \gamma_0 + \gamma_1 Trade_{c,s,t} + \gamma_2 S_{c,s,t} + \gamma_3 C_{c,t} + \gamma_4 T_t + \varepsilon_{c,s,t} \quad (1)$$

where c , s , and t stand for the country, sector, and year, respectively. $VA_g_{c,s,t}$ stands for value-added growth of country-sector pair. $Trade_{c,s,t}$ 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 number of average schooling years, 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.⁵ In all specifications, we obtain valid probabilities of Hansen test statistics and AR (2) values.⁶

⁵ 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.

⁶ 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.

The Second Stage

In the second stage, given the econometrical findings, we evaluate the possible effects of an increase in trade with specific countries or groups in the future on the growth of the MENA region by employing an input-output model. We reconstruct the 2015 EORA input-output table so that we can grasp the demand and supply-side effects of any change in trade patterns on output. In this reduced form of the IO tables, we have 26 sub-sectors for three MENA groups, and the other countries are aggregated by considering hypothetical trade agreements or patterns. Utilizing matrices in the 2015 IO table and reinterpreting the basic equation of Acemoglu et al. (2016), which expresses output as a column or row sum of the input-output matrix, we can analyze the impacts of trade agreements or patterns on the output of the MENA region as follows. For each MENA and other country group (c), we write the following equations.

Demand-side

$$X = (I - A)^{-1}(\text{Intermediate export}^{\text{Favored partner}} + \text{Final export}^{\text{Favored partner}}) \quad (2)$$

where $(I - A)^{-1}$ is the inverse of the Leontief matrix. A is the intermediate consumption matrix and X is the gross output matrix. The Leontief inverse matrix expresses the effect of a unit change in exported intermediates/final demand on the change in output.

Supply-side

$$X = (I - AX/X)^{-1}\text{Intermediate import}^{\text{Favored partner}} \quad (3)$$

where $(I - AX/X)^{-1}$ is the inverse of the Ghosh matrix. The Ghosh inverse matrix expresses the effect of a unit change in foreign intermediate goods and services on the change in output.

Regarding shock values, we follow the past trends of the trade volumes. The Greater Arab Free Trade Area or Pan Arab Free Trade Agreement was taken into action in 1998 to enhance intra-regional trade. It was aimed to decrease tariff rates until 2008. To boost inter-regional trade, the Euro-Mediterranean Agreements (EMA) was signed with the majority of the MENA countries from 1995 to 2004. The Middle East Free Trade Area Initiative (MEFTA) was introduced in 2003. We assume that any further trade integration would create the same effect in trade. Therefore, we apply the 3-year moving average for the periods 2002-2008 (liberalization period). We estimate the predicted trade values and subtract them from the actual values for each trading partner and type of flow to reach the hypothetical shock values.

4. Results

The First Stage

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 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. This result should be carefully considered before an interpretation and needs to be further elaborated because the measure considers only the number of schooling years and does not tell anything about the quality of schooling.

Table 2: Value-added growth - All sectors

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|---------------------|---------------------|----------------------|---------------------|---------------------|----------------------|----------------------|---------------------|---------------------|
| | MENA | North Africa | GCC | Other Middle East | EU | United States | China | Other Developed | Other Developing |
| Lag of value-added growth | 0.852*** (0.010) | 0.846*** (0.010) | 0.845*** (0.010) | 0.851*** (0.010) | 0.845*** (0.010) | 0.842*** (0.011) | 0.834*** (0.010) | 0.849*** (0.011) | 0.843*** (0.010) |
| Intermediate export/Value-added | 0.075** (0.031) | -0.579** (0.237) | 0.132*** (0.041) | 0.127 (0.099) | 0.009 (0.007) | 0.059*** (0.015) | 0.078*** (0.025) | 0.124*** (0.031) | 0.120*** (0.027) |
| Final Export/Value-added | -0.017 (0.012) | -0.017 (0.099) | -0.000 (0.011) | 0.002 (0.038) | -0.015** (0.007) | -0.022* (0.013) | 0.143 (0.293) | 0.075** (0.031) | -0.022 (0.020) |
| Intermediate Import/Value-added | -0.019 (0.020) | -0.049 (0.189) | -0.056* (0.034) | -0.051 (0.036) | 0.008*** (0.003) | 0.112*** (0.022) | -0.058*** (0.019) | 0.030*** (0.010) | 0.003 (0.006) |
| Capital intensity | -0.006 (0.006) | -0.006 (0.008) | -0.001 (0.006) | -0.006 (0.006) | -0.005 (0.006) | -0.005 (0.006) | -0.007 (0.005) | -0.006 (0.006) | -0.005 (0.006) |
| Schooling years | -0.065** (0.026) | -0.052* (0.027) | -0.087*** (0.029) | -0.075** (0.029) | -0.065** (0.026) | -0.077*** (0.027) | -0.038 (0.029) | -0.056** (0.028) | -0.024 (0.027) |
| Population growth | 0.004 (0.016) | 0.003 (0.018) | -0.009 (0.015) | 0.011 (0.017) | 0.016 (0.017) | 0.001 (0.016) | -0.006 (0.015) | -0.024 (0.016) | -0.023 (0.016) |
| Polity | 0.045*** (0.012) | 0.044*** (0.013) | 0.044*** (0.012) | 0.034*** (0.013) | 0.032*** (0.011) | 0.023** (0.011) | 0.037*** (0.012) | 0.046*** (0.012) | 0.035*** (0.012) |
| FDI/GDP | 0.001 (0.002) | 0.004* (0.002) | 0.000 (0.002) | 0.003 (0.002) | 0.002 (0.002) | 0.002 (0.002) | 0.003 (0.002) | 0.001 (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. 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. 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. In other words, 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). 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.

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 associated with trade; similar to the manufacturing and service sectors, importing from the United 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) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
| | MENA | North Africa | GCC | Other Middle East | EU | United States | China | Other Developed | Other Developing |
| Lag of value-added growth | 0.852*** (0.017) | 0.832*** (0.017) | 0.816*** (0.017) | 0.817*** (0.019) | 0.789*** (0.018) | 0.781*** (0.021) | 0.767*** (0.014) | 0.820*** (0.018) | 0.805*** (0.018) |
| Intermediate export/Value-added | 0.166 (0.106) | 0.994 (0.779) | 0.261** (0.118) | 0.145 (0.406) | 0.152*** (0.038) | 0.776*** (0.280) | 0.181* (0.092) | 0.174* (0.100) | 0.280*** (0.082) |
| Final Export/Value-added | 0.079** (0.032) | 0.113 (0.232) | 0.029 (0.028) | 0.194 (0.163) | -0.136*** (0.047) | 0.024 (0.099) | -1.010 (0.648) | 0.116 (0.243) | -0.154** (0.066) |
| Intermediate Import/Value-added | -0.291*** (0.110) | -1.315*** (0.397) | -0.173 (0.161) | -0.720*** (0.216) | 0.045*** (0.014) | 0.359*** (0.107) | -0.211*** (0.060) | 0.069 (0.046) | 0.044 (0.033) |
| Capital intensity | 0.089*** (0.033) | 0.067** (0.029) | 0.065* (0.035) | 0.040 (0.032) | -0.016 (0.024) | 0.010 (0.027) | 0.036 (0.029) | 0.017 (0.026) | 0.034 (0.025) |
| Schooling years | -0.387* (0.201) | -0.333** (0.143) | -0.148 (0.174) | -0.473* (0.258) | 0.093 (0.124) | 0.079 (0.154) | 0.131 (0.155) | -0.014 (0.125) | 0.076 (0.135) |
| Population growth | -0.076 (0.051) | -0.051 (0.054) | -0.146*** (0.047) | -0.133** (0.063) | -0.070 (0.047) | -0.049 (0.054) | -0.192*** (0.045) | -0.106** (0.053) | -0.140*** (0.045) |
| Polity | 0.027 (0.055) | -0.027 (0.054) | 0.061 (0.050) | 0.012 (0.079) | -0.009 (0.045) | 0.006 (0.064) | 0.096* (0.049) | 0.003 (0.043) | 0.017 (0.050) |
| FDI/GDP | 0.012 (0.009) | 0.034*** (0.009) | 0.014* (0.007) | 0.020* (0.011) | 0.008 (0.009) | 0.024** (0.011) | 0.030*** (0.009) | 0.015* (0.008) | 0.017** (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) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | MENA | Other Middle East | North Africa | GCC | EU | United States | China | Other Developed | Other Developing |
| Lag of value-added growth | 0.793*** (0.018) | 0.785*** (0.015) | 0.792*** (0.017) | 0.775*** (0.016) | 0.774*** (0.018) | 0.780*** (0.020) | 0.776*** (0.016) | 0.765*** (0.023) | 0.774*** (0.018) |
| Intermediate export/Value-added | 0.137 (0.318) | 0.001 (0.282) | -1.358 (1.458) | 0.472* (0.244) | -0.088 (0.055) | 0.040 (0.121) | 0.301*** (0.072) | -0.188 (0.212) | 0.327*** (0.101) |
| Final Export/Value-added | -0.038 (0.264) | 0.121 (0.287) | 1.601 (1.089) | -0.195 (0.238) | -0.486 (0.298) | -0.288 (0.393) | 0.853** (0.419) | 0.616* (0.363) | 0.037 (0.098) |
| Intermediate Import/Value-added | 0.303 (0.487) | 0.314 (0.495) | -0.309 (1.375) | 0.480 (0.304) | 0.303*** (0.085) | 0.666** (0.264) | 0.040 (0.178) | 0.313** (0.154) | -0.035 (0.067) |
| Capital intensity | 0.023 (0.017) | 0.026* (0.014) | 0.025* (0.013) | 0.025* (0.014) | 0.049** (0.019) | 0.044*** (0.012) | 0.027** (0.014) | 0.050*** (0.018) | 0.016 (0.015) |
| Schooling years | 0.136* (0.077) | 0.139** (0.063) | 0.229*** (0.075) | 0.174* (0.092) | 0.064 (0.137) | 0.134 (0.082) | 0.285*** (0.066) | 0.243* (0.137) | 0.495*** (0.083) |
| Population growth | -0.215*** (0.038) | -0.210*** (0.031) | -0.225*** (0.032) | -0.253*** (0.033) | -0.254*** (0.039) | -0.225*** (0.054) | -0.261*** (0.032) | -0.306*** (0.052) | -0.252*** (0.033) |
| Polity | 0.011 (0.032) | -0.021 (0.034) | 0.051 (0.034) | 0.087** (0.034) | 0.040 (0.042) | 0.039 (0.031) | 0.039 (0.031) | 0.074* (0.041) | 0.120*** (0.035) |
| FDI/GDP | 0.002 (0.020) | 0.005 (0.010) | 0.009 (0.012) | 0.013 (0.008) | -0.013 (0.011) | -0.004 (0.013) | 0.013 (0.009) | -0.008 (0.011) | 0.004 (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) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|---------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | MENA | Other Middle East | North Africa | GCC | EU | United States | China | Other Developed | Other Developing |
| Lag of value-added growth | 0.913*** (0.050) | 0.927*** (0.037) | 0.934*** (0.058) | 0.897*** (0.069) | 0.906*** (0.140) | 0.899*** (0.068) | 0.912*** (0.045) | 0.880*** (0.117) | 0.959*** (0.108) |
| Intermediate export/Value-added | 0.350 (0.253) | -0.698 (0.769) | -3.730 (4.536) | 0.298 (0.451) | -0.038 (0.143) | -0.010 (0.276) | 0.194 (0.317) | 0.319 (0.336) | -0.186 (0.306) |
| Final Export/Value-added | -0.227 (0.158) | 0.208 (0.390) | 6.037 (4.457) | -0.003 (0.144) | -0.062 (0.134) | -12.131 (12.040) | -14.659 (20.101) | 0.382 (0.339) | -0.044 (0.562) |
| Intermediate Import/Value-added | 1.627 (1.060) | 2.251 (2.195) | -2.780 (14.021) | -7.084 (12.791) | 0.591 (0.358) | 1.813** (0.853) | 0.206 (1.139) | 0.722 (0.683) | 0.260 (0.283) |
| Capital intensity | 0.067** (0.028) | 0.064** (0.027) | 0.057 (0.036) | 0.052* (0.026) | 0.076** (0.035) | 0.037 (0.026) | 0.057* (0.033) | 0.050* (0.025) | 0.072*** (0.027) |
| Schooling years | -0.109 (0.747) | -0.557 (0.510) | -0.245 (0.288) | 0.141 (0.533) | -0.849 (0.588) | -0.639 (0.384) | -0.406 (0.390) | -0.191 (0.542) | -0.920* (0.461) |
| Population growth | -0.182 (0.149) | -0.188 (0.211) | -0.331 (0.257) | -0.415** (0.202) | -0.286 (0.247) | -0.390* (0.218) | -0.211 (0.177) | -0.257 (0.231) | -0.177 (0.233) |
| Polity | 0.258 (0.213) | -0.031 (0.144) | 0.024 (0.139) | 0.129 (0.173) | -0.118 (0.251) | 0.026 (0.183) | -0.018 (0.191) | 0.127 (0.183) | -0.143 (0.140) |
| FDI/GDP | -0.009 (0.024) | 0.010 (0.028) | 0.010 (0.029) | -0.010 (0.014) | -0.025 (0.030) | -0.004 (0.017) | -0.003 (0.020) | -0.013 (0.022) | 0.000 (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.

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).⁷ 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.

⁷ 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

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|---------------------|---------------------|-------------------|--------------------------|----------------------|----------------------|-------------------|------------------------|-------------------------|
| North Africa | MENA | North Africa | GCC | Other Middle East | EU | United States | China | Other Developed | Other Developing |
| Intermediate export/Value-added | 1.176** (0.537) | 0.065 (1.164) | 1.372 (1.505) | 2.456* (1.369) | 0.196*** (0.068) | 0.900** (0.357) | 0.411 (0.362) | 0.527 (0.517) | 0.614* (0.327) |
| Final Export/Value-added | -0.279** (0.121) | -0.842* (0.448) | -0.186 (0.159) | -0.955*** (0.356) | -0.202*** (0.067) | 0.152 (0.150) | -0.057 (0.741) | 0.294 (0.426) | -0.297 (0.327) |
| Intermediate Import/Value-added | 0.394 (0.396) | -0.721 (0.483) | 2.290 (1.650) | 0.110 (0.329) | 0.071* (0.035) | 0.155 (0.139) | -0.083 (0.120) | 0.027 (0.056) | 0.303** (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 (0.186) | 0.657 (2.923) | 0.295 (0.240) | -1.528 (1.350) | -0.023 (0.199) | -0.665 (0.479) | -0.004 (0.103) | 0.087 (0.090) | -0.028 (0.237) |
| Final Export/Value-added | 0.014 (0.043) | 1.056 (1.036) | 0.019 (0.046) | 0.254 (0.244) | 0.063 (0.083) | 0.207 (0.200) | 0.375 (1.589) | -0.116 (0.099) | -0.026 (0.152) |
| Intermediate Import/Value-added | -0.102 (0.139) | 1.056 (1.010) | -0.195 (0.178) | 0.334 (0.428) | 0.034 (0.034) | 0.095 (0.143) | 0.110 (0.211) | 0.193** (0.084) | 0.187* (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 |
| 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

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------|--------------------|----------------------|-------------------|--------------------------|---------------------|----------------------|-------------------|------------------------|-------------------------|
| North Africa | MENA | North Africa | GCC | Other Middle East | EU | United States | China | Other Developed | Other Developing |
| Intermediate export/Value-added | 0.937** (0.463) | -2.364** (1.139) | 0.110 (0.802) | 1.640** (0.763) | 0.094*** (0.031) | 0.346*** (0.121) | 0.111 (0.196) | 0.846** (0.372) | 0.174 (0.117) |
| Final Export/Value-added | -0.746 (0.568) | 1.403 (1.898) | -0.008 (1.583) | -0.786 (0.903) | -0.193** (0.091) | -1.285 (1.015) | 0.973 (3.734) | -0.528 (0.483) | 0.113** (0.044) |
| Intermediate Import/Value-added | 0.391 (0.351) | -3.606*** (1.231) | 1.162 (0.976) | 1.444 (0.876) | 0.118 (0.081) | 1.096*** (0.382) | 0.169 (0.669) | 0.628 (0.465) | -0.037 (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 (0.523) | 2.305 (3.264) | 0.094 (0.209) | -1.267 (0.829) | -0.100 (0.117) | 0.098 (0.170) | -0.061 (0.084) | -0.043 (0.111) | 0.078 (0.079) |
| Final Export/Value-added | 0.053 (0.746) | -3.786* (2.179) | -0.059 (0.666) | 0.171 (0.267) | -1.598* (0.881) | -2.154 (2.345) | 0.148 (0.731) | 0.111 (0.144) | -0.016 (0.032) |
| Intermediate Import/Value-added | -0.200 (0.199) | 0.845 (3.043) | -0.036 (0.223) | 1.519* (0.832) | 0.387*** (0.097) | 0.899** (0.357) | 0.129 (0.366) | 0.365 (0.251) | 0.171 (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 |
| 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.

The Second Stage

Having evaluated the most prominent trading partners according to the relative significances and coefficients in Tables 6 and 7 for each MENA and sector sub-samples, we first calculate the predicted trade volumes for these specific sub-samples by applying the 3-year moving average for the period 2002-2008. We then obtain the possible trade shocks by subtracting the predicted volumes from the actual ones and expressing them as percentages. To reach the impacts of these shocks on output, we apply input-output calculations.

Table 8 presents the results provided by the input-output simulations. For manufacturing industries, given the most significant results for each trade variable, North Africa benefits from exporting intermediates to the EU and importing intermediates from other developing countries. If the exported intermediates to the EU increase by 9%, which is the calculated potential trade shock as explained above, and the imported intermediates from the other developing countries rise by 18%, the sectoral output also rises by 13% and 26%, which is obtained from the input-output calculation, respectively. If GCC imports more intermediates from other developed countries, a 19% rise in the trade flow enhance output by 29%. The other Middle East gains from exporting intermediates to other developing countries and importing intermediates from the GCC. If the exported intermediates to other developing countries increase by 23% and the imported intermediates from the GCC rise by 4%, the output also rises by 35% and 6%, respectively. It is important to note that similar to our estimates in Table 6, the manufacturing industries of the MENA region regardless of the three sub-samples benefit from only global value chain participation. While international trade with these specific trading partners enhances output, only the output of other Middle East can be risen via trade with a group in the MENA region. For non-manufacturing industries and North Africa, if the exported intermediates to the US, exported finals to other developing countries, and the imported intermediates from the US increase by 6%, 16%, and 11%, the output also rises by 8%, 21%, and 14%, respectively. The GCC benefits from importing more intermediates from the EU. A 20% rise in this flow enhances output by 26%. The other Middle East gains from exporting finals to the US and importing intermediates from the GCC. If the exported finals to the US increase by 13% and the imported intermediates from the GCC rise by 7%, the output also increases by 19% and 9%, respectively. Similar to the manufacturing industry, non-manufacturing sectors of other Middle East part also gain from importing intermediates from a group in the MENA region. In contrast to the manufacturing industries, non-manufacturing sectors of North Africa and other Middle East also benefits from exporting finals.

Table 8: Simulation results

| | Manufacturing | | | | Non-Manufacturing | | | |
|--------------------------|----------------------|-------------------|--------------------|------------------------|--------------------------|-------------------|--------------------|------------------------|
| | Partner | Δ in trade | Δ in output | Relative impact | Partner | Δ in trade | Δ in output | Relative impact |
| North Africa | | | | | | | | |
| Intermediate export | EU | 9% | 13% | 1.44 | United States | 6% | 8% | 1.33 |
| Final export | - | - | - | - | Other Developing | 16% | 21% | 1.31 |
| Intermediate import | Other Developing | 18% | 26% | 1.44 | United States | 11% | 14% | 1.27 |
| GCC | | | | | | | | |
| Intermediate export | - | - | - | - | - | - | - | - |
| Final export | - | - | - | - | - | - | - | - |
| Intermediate import | Other Developed | 19% | 29% | 1.53 | EU | 20% | 26% | 1.30 |
| Other Middle East | | | | | | | | |
| Intermediate export | Other Developing | 23% | 35% | 1.52 | - | - | - | - |
| Final export | - | - | - | - | United States | 13% | 19% | 1.46 |
| Intermediate import | GCC | 4% | 6% | 1.50 | GCC | 7% | 9% | 1.29 |

Notes: The most prominent trading partners are decided according to the significance and size of the coefficients in Tables 6 and 7. The trade shocks in percentages are calculated by subtracting the predicted values from the actual values. The possible changes in output are calculated with the input-output simulations as described in the methodology section. The relative impacts are the ratios of change in output to change in trade.

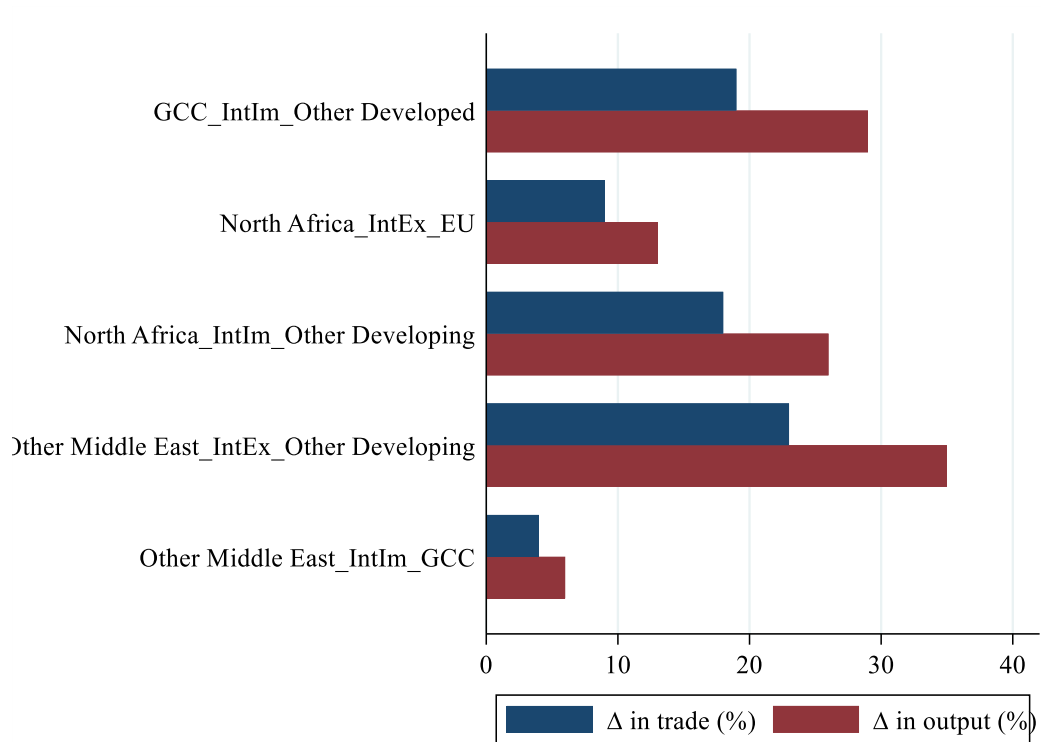


Figure 4: Simulation results, manufacturing sectors

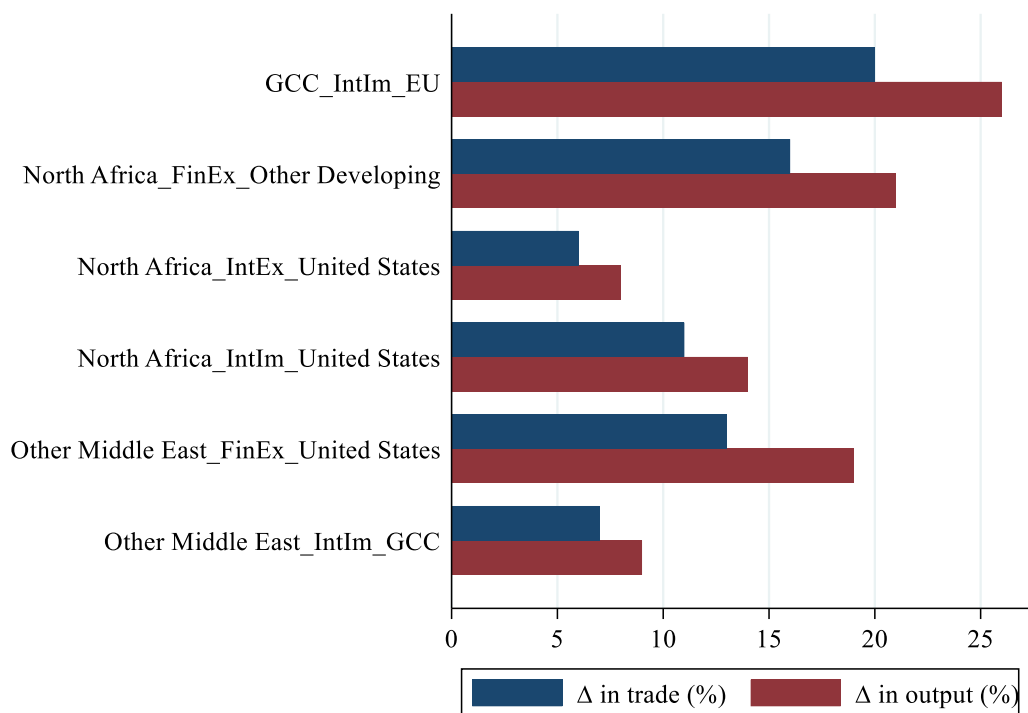


Figure 5: Simulation results, non-manufacturing sectors

Figures 4 and 5 depict the simulation results to observe the relative importance and impacts of trade flows on output for manufacturing and non-manufacturing sectors, respectively. As can be seen from the relative impact columns of Table 8, while the intermediate imports of manufacturing sectors in GCC from other developing countries produce slightly higher impacts compared to the other possible trade flows (Figure 4), the final exports of the non-manufacturing sector in other Middle East to the United States generate higher effects compared to the other possible trade flows (Figure 5).

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 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. Our SGMM estimations enable us to gauge trade integration scenarios 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. For manufacturing industries, the intermediate exports of North Africa to the EU, the intermediate imports of North Africa from other developing countries, the intermediate imports of GCC from other developed countries, the intermediate exports of other Middle East to other developing countries, and the intermediate imports of other Middle East from GCC are observed as the most prominent trade flows. For non-manufacturing industries, the intermediate exports of North Africa to the US, the final exports of North Africa to other developing countries, the intermediate imports of North Africa from the US, the intermediate imports of GCC from the EU, the final exports of other Middle

East to the US, and the intermediate imports of other Middle East from GCC are observed as the most prominent trade flows.

Both empirical and simulation 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. Note that compared to the other two MENA regions, other Middle East part benefits the most from higher imported intermediates from GCC countries. While the intermediate imports of manufacturing sectors in GCC from other developing countries lead to higher impacts compared to the other possible trade flows, the non-manufacturing final exports of other Middle East to the United States cause higher effects compared to the other possible trade flows. Overall, these findings highlight the significance of trade negotiations for the MENA successfully integrating into regional and global value chains and enhancing the growth of the region. Having calculated the potential trade shocks and their impacts on sectoral growth, future research will focus on the predicted future trade volumes and output levels to provide certain targets for potential trade negotiations.

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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 d'Ivoire | 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).