ISSN: 1576-0162
DOI: https://doi.org/10.33776/EUHU/rem.v73i.9123

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

Los patrones de comercio pasados y futuros de la región MENA: en busca del crecimiento

Pınar Tat
pinartat@gtu.edu.tr
Department of Economics, Gebze Technical University

Abdullah Altun
aaltun@gtu.edu.tr
Department of Economics, Gebze Technical University

Halit Yanıkkaya
halityanikkaya@gtu.edu.tr
Department of Economics, Gebze Technical University

Recibido: julio 2025; aceptado: mayo 2026

Abstract

This study investigates the trade patterns of the MENA region and their impacts on sectoral growth. We employ a sample of 25 sectors across 21 MENA countries and 186 trading partners over the period 1990–2018. Descriptive evidence shows that the shares of the EU and other developed countries in all types of trade have declined, while the shares of the MENA region, China, and other developing countries have increased. Our results reveal substantial heterogeneity within the MENA region regarding trade flows and trading partners. We find that expanding forward participation in global value chains (GVCs) with the United States, other developed countries, and developing countries promotes growth in the manufacturing sector. In contrast, greater backward GVC participation with EU countries supports growth in the service sector. Furthermore, increased backward GVC participation with non-MENA countries and higher final exports to China benefit the agricultural and mining sectors. Overall, the findings suggest that GVC participation fosters growth across all sectors, although the effects depend on the type of trade flow and trading partner involved. The results highlight the importance of systematic and dynamic trade policies to strengthen the integration of MENA economies into regional and global value chains and maximize the associated economic benefits.

Keywords: Trade patterns; MENA region; economic growth.

Resumen

Este artículo analiza la evolución de los patrones comerciales de la región de Oriente Medio y Norte de África (MENA) y sus efectos sobre el crecimiento sectorial. Utilizando información de 25 sectores, 21 países de la región MENA y 186 socios comerciales durante el período 1990-2018, examinamos los cambios en la integración comercial y en la participación en las cadenas globales de valor (CGV). Los resultados descriptivos muestran una disminución de la participación de la Unión Europea y de otras economías desarrolladas en los flujos comerciales de la región, acompañada por un aumento de la importancia relativa de la propia región MENA, China y otras economías en desarrollo. Asimismo, se observa una notable heterogeneidad entre países y sectores en cuanto a flujos y socios comerciales. El análisis econométrico revela que la expansión de la participación hacia adelante en las CGV con Estados Unidos, otras economías desarrolladas y países en desarrollo impulsa el crecimiento del sector manufacturero. Por su parte, una mayor participación hacia atrás en las CGV con la Unión Europea favorece el crecimiento de los servicios, mientras que una mayor integración hacia atrás con países externos a la región MENA y el aumento de las exportaciones finales a China benefician a los sectores agrícola y minero. Estos hallazgos sugieren que la participación en las CGV promueve el crecimiento sectorial, aunque sus efectos dependen del tipo de integración y del socio comercial.

Palabras clave: Patrones comerciales; región MENA; crecimiento económico.

JEL Classification / Clasificación JEL: F10, F43, D57.

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 current trends 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 46%, and the share of imports in GDP is 39% in 2023. 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 intensified alongside declining transportation costs and improvements 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 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). Although trade volumes are high and substantial liberalization efforts have been implemented, the integration of the MENA region into the global production system is rather weak because trade activities are still concentrated in low value-added and resource-based activities, and the effective implementation of liberalization measures has been limited (Saidi and Prasad, 2018). Therefore, it can be argued that the benefits of trade cannot be efficiently realized.

The main purpose of this study is to investigate the trade-growth nexus within the MENA region, with a particular focus on understanding the specific trade patterns that is the backward (import) and forward (export) integration of the MENA region by considering different trading partners such as the MENA region, the EU, the United States, China, other developed, and other developing countries, as well as their impact on economic growth. The study also divides the sample into three main sector groups, manufacturing, services,

and agriculture & mining, to account for sectoral heterogeneity in trade-growth linkages. The paper aims to fill a significant gap in the empirical literature by providing a detailed examination of the MENA region's trade structures and their implications for growth. Given these findings in the literature and to address 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?
- Does this impact vary across sectors?

In light of these questions, we first investigate the trade patterns via the EORA database for two agricultural, one mining, ten manufacturing, and twelve service sectors from 1990 to 2018. Having observed the specific trade patterns, we analyze the growth impact of trade with these country groups or countries.

This paper contributes to the literature in several important ways. *First,* we calculate and utilize newly defined trade in value-added statistics, which offer a more accurate representation of trade flows by accounting for the domestic and foreign value-added content of trade. By relying on a multi-regional input-output framework, this approach distinguishes between domestic value-added embedded in exports and foreign value-added embedded in imports and avoids the double-counting problem inherent in conventional gross trade measures. This approach moves beyond traditional gross trade statistics and allows us to better capture the growth implications of international production fragmentation. *Second,* we adopt a bilateral framework that considers trade linkages between individual country pairs, rather than relying solely on aggregate measures. This allows for a more comprehensive analysis of how trade in value-added flows between MENA countries and their partners affects growth. *Third,* we explore heterogeneity in the effects of trade across different sectors such as manufacturing, services, and agriculture & mining, which provides new and deeper insights into sector-specific dynamics within the region.

Our graphical illustrations indicate that while the shares of the EU (the major trading partner with a nearly 40% share) and other developed countries in all types of trade have decreased, the shares of the MENA region, China, and other developing countries in all kinds of trade have increased. Our estimation results suggest that while the growth of the manufacturing sectors can be promoted by increasing forward GVC participation with the United States, other developed, and other developing countries, the growth of the service sectors can be boosted by an increase in backward GVC participation with only the EU countries. An increase in backward GVC participation with the non-MENA countries and final exports to China benefits the agricultural and mining sectors. Within the MENA region, we observe a strong heterogeneity

in terms of trade partners and 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 reviews the related literature. The third part introduces the data, and the fourth part explains the methodology. The fifth part presents the results of the analyses, and the final section concludes the paper.

2. Literature review

Over the last three decades, rapid advances in information, communication, and transportation technologies, declining transportation costs, and lower trade barriers have led the world to have highly integrated and interdependent production systems and economies. The structure in which a product is produced entirely by one country has been replaced by a system in which different parts of a product are produced by different countries. This transformation fundamentally reshapes the nature of global production and international trade. To describe the changing structure of production and trade, the literature uses the concept of Global Value Chains (GVCs). GVCs refer to the entire process through which a product gains value, from idea development and design to production, marketing, and delivery (Porter, 1985; Gereffi, 1994; Koopman et al., 2010, 2014). GVC activities have expanded steadily, especially after the 1990s, and this expansion has resulted in greater knowledge and technology diffusion, a high level of division of labor, the adoption of best practices, and specialization in specific segments (Antràs et al., 2017). Through specialization in specific stages of production, access to global markets, and diversification in exports, GVCs promote economic growth. However, sustainable growth depends on deepening participation and moving up the value chain rather than only increasing gross trade volumes (Dollar et al., 2017). As a result, participation in GVCs has become a key mechanism enabling countries to integrate into the global economy and enhance their growth potential.

Building on this perspective, the literature identifies the main channels through which participation in GVCs affects economic growth. In the literature, it is argued that trading through the channels mentioned above leads to two types of learning. First, the "learning by importing" hypothesis predicts that research and development (R&D) spillovers through foreign technologies derived from high-quality and diverse inputs will increase productivity and growth (Grossman and Helpman, 1991; Amiti and Konings, 2007; Tajoli and Felice, 2018). Theoretical models focusing on GVC participation also suggest that the international division of labor can boost productivity and growth (Baldwin and Yan, 2016; Pahl and Timmer, 2020; Pahl et al., 2020). Second, the "learning by exporting" hypothesis assumes that countries improve their performance through economies of scale, learning in value chain management, and more sophisticated processes in organizations (Feder, 1982; Young, 1991;

De Marchi et al., 2018). Moreover, high levels of specialization in different segments of production and the competitive effects of the international market also lead to productivity and growth gains (Criscuolo and Timmis, 2017). Taken together, these mechanisms highlight that both backward and forward linkages in GVCs are crucial for understanding the trade-growth relationship.

In line with these theoretical mechanisms, a large empirical literature examines the trade-growth nexus across different regions and countries. The trade-growth nexus is highly discussed for many regions and countries (Frankel et al., 1996; Frankel and Romer, 1999; Yanikkaya, 2003; Wooster et al., 2008; Zhao and Wang, 2009; Kim and Lin, 2009; Kummritz, 2016; Jangam and Rath, 2021; Mao, 2022). Frankel et al. (1996) find a significant causal role of trade openness in the growth of the East Asian countries. Frankel and Romer (1999) show that trade has a quantitatively large and statistically significant positive effect on income by using the geographical characteristics of countries as instrumental variables. Wooster et al. (2008) assert that trade within the EU increases output more than trade with non-member countries. Zhao and Wang (2009) emphasize the positive role of liberalization on economic growth throughlearning -by-doing for 13 EU countries. Kim and Lin (2009) assert that trade openness contributes to the long-term growth of 61 countries through investment and productivity growth channels. Kummritz (2016) suggests that increases in both forward and backward GVC participation result in higher domestic value-added for 54 countries. Landesmann and Stöllinger (2019) claim that policies supporting trade-related sectors are critical for growth and resilience, particularly in low- and middle-income economies in Europe. Jangam and Rath (2021) suggest that participation in both forward and backward GVCs promotes economic growth of manufacturing and service sectors, especially for high-tech sectors. Mao (2022) finds a U-shaped relationship between GVC and economic growth, indicating that at low levels of GVC, the growth effects are limited or even negative, while beyond a certain threshold, deeper participation leads to positive economic growth. Taken together, these studies provide a coherent picture in which trade and GVC participation are key drivers of economic performance, although their effects may vary depending on the level and structure of integration. However, most of this evidence is concentrated on developed or emerging regions, leaving other regions relatively underexplored.

Against this background, the MENA region remains relatively understudied in this context. Existing contributions are scarce and often limited in scope. For instance, Karam and Zaki (2015) indicate a positive association between the trade of all types of products and the real GDP for the MENA region, without distinguishing between types of trade or value-added content. Del Prete et al. (2018) further calculate the GVC participation of North African countries and investigate the determinants rather than looking at the growth impacts. Nana et al. (2025) find a positive relationship between GVC and economic growth for African countries, especially for tech-intensive services and labor-intensive goods, without distinguishing trading partners. Therefore, a clear gap remains

in the literature regarding the role of value-added trade, bilateral linkages, and sectoral heterogeneity in shaping the trade-growth nexus in the MENA region.

3. Data

We employ a variety of databases. Our main database EORA provides global multi-regional input-output tables including two agricultural, 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 21 MENA countries (see Table A1 in appendix) from 1990 to 2018 (Lenzen et al., 2012, 2013). We group the sectors into three main sectors: (i) manufacturing, (ii) service, and (iii) agriculture and mining.[1] 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, Qatar, Oman, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, the United Arab Emirates (UAE), and Yemen. Even if the sample period corresponds to the data availability of the EORA, the period has also witnessed significant economic changes in the MENA region. Many MENA countries implemented economic liberalization policies through various trade agreements in the 1990s and 2000s.

The multi-regional input-output (MRIO) framework provides a comprehensive structure to analyze production linkages across countries and sectors by tracing how output from one country-sector is used as an input in another. Using the Leontief inverse matrix, this framework allows the identification of both direct and indirect production linkages and the measurement of value-added embedded in international trade flows (Leontief, 1936; Miller and Blair, 2009). This feature makes the input-output approach particularly suitable for analyzing global value chain participation.

The global input-output framework is based on the following equilibrium equation:

$$\mathbf{X = Ax + Y} \tag{1}$$

1 Sectors in each category have different trade linkages. For service sectors; the intermediate export of transport, final export of hotels and restaurants, and intermediate import of public administration sector are higher than the trade flows of any other service sectors. For manufacturing sectors; the intermediate export of petroleum, chemical and non-metallic mineral products, final export of textiles and wearing apparel, and intermediate import of transport equipment sector are higher than the trade flows of any other manufacturing sectors.

where x is the vector of gross output, A is the global input coefficient matrix, and Y is the vector of final demand. Rearranging Equation (1) yields:

$$\mathbf{X = (I-A)^{-1}\ Y = BY} \tag{2}$$

where $A = Zx^{-1}$ and $B = (I-A)^{-1}$ is the global Leontief inverse matrix. Z denotes the intermediate input matrix and x denotes the diagonalized gross output vector.

This equilibrium relationship constitutes the analytical foundation for value-added decomposition, as it links production, intermediate inputs, and final demand across countries and sectors. Building on this framework, Wang et al. (2017) propose a decomposition method that traces how value-added generated in each country-sector is distributed across domestic use, exports, and global production networks.

Following the latest value-added decomposition method indicated in Wang et al. (2017), UIBE GVC Index Team (2017), UIBE (2017a, 2017b), we calculate domestic value-added embedded in exports 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 import, are in domestic or foreign value-added terms, not conventional gross trade statistics, including both domestic and foreign value-added.

Based on this framework, the basic decomposition can be written as:

$$\mathbf{x = Ax + Y = A^D\ x + Y^D + A^F\ x + Y^F = A^D\ x + Y^D + E} \tag{3}$$

where $A^F = A\text{-}A^D$ and $Y^F = Y\text{-}Y^D$. $E = A^F x + Y^F$ denotes gross exports. A^D and A^F represent domestic and foreign input coefficient matrices, respectively. YD and Y^F denote domestic and foreign final demand, respectively.

Rearranging Equation (3) yields:

$$\mathbf{x = (I-A^D)^{-1}\ Y^D + (I-A^D)^{-1}\ E = LY^D + LE = LY^D + LY^F + LA^F\ x} \tag{4}$$

where $L = (I\text{-}AD)^{-1}$ is the local Leontief inverse matrix.

The value-added coefficient matrix is defined as $v = Vax^{-1}$. Using this definition, the distribution of domestic value-added across production activities can be expressed as:

$$\begin{aligned} \mathbf{Va'} &= \hat{\mathbf{v}}\mathbf{B}\hat{\mathbf{Y}} = \hat{\mathbf{v}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{D}} + \hat{\mathbf{v}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{F}} + \hat{\mathbf{v}}\mathbf{L}\mathbf{A}^{\mathbf{F}}\mathbf{B}\hat{\mathbf{Y}} = \\ &= \hat{\mathbf{v}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{D}} + \hat{\mathbf{v}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{F}} + \hat{\mathbf{v}}\mathbf{L}\mathbf{A}^{\mathbf{F}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{D}} + \hat{\mathbf{v}}\mathbf{L}\mathbf{A}^{\mathbf{F}}(\mathbf{B}\hat{\mathbf{Y}} - \mathbf{L}\hat{\mathbf{Y}}^{\mathbf{D}}) \end{aligned} \tag{5}$$

Equation (5) shows where each country-sector value-added (Va') goes. The first part (vLY^D) is the value-added produced and consumed domestically. The second part (vLYF) shows the value-added embodied in exports of final products. This measure is the final export in value-added terms. The third part

($vLA^F LY^D$) simple production sharing activities. In other words, the value-added produced by the country-industry crosses the border once and is transformed into a final product and used in the trading partner country. The fourth term ($\widehat{vLA}^F(B\widehat{Y}-L\widehat{Y}^D)$) demonstrates complex production activities. In other words, the value-added produced by the country-sector crosses the border many times and is transformed into a final product and used in a country other than the trading partner country. The third and fourth parts constitute intermediate exports in value-added terms. When we find the bilateral export flow of country-sector A to country-sector B, we automatically find the bilateral import flows of that country-sector B from country-sector A. This measure is intermediate import in value-added terms. Since sectors do not consume final products, we do not have final imports in value-added terms.

Building on this decomposition, we can define forward and backward GVC participation. Forward participation measures the share of domestic value-added embedded in exported intermediates. Backward participation captures foreign value-added embedded in imported intermediates. When we divide these values by value-added, we end up with forward and backward GVC participation ratios, respectively.

Domestic value-added embedded in intermediate exports that are directly absorbed by the importer (simple forward participation) is computed as:

$$Simple\ Forward = \hat{\mathbf{v}}\mathbf{L}\mathbf{A}^{\mathbf{F}}\mathbf{L}\hat{\mathbf{Y}}^{\mathbf{D}} \tag{6}$$

To identify complex forward participation, we first define $Z = A^F B\widehat{Y}$. Z denotes the matrix of foreign intermediate input use embedded in gross output production. Next, the foreign-use matrix Z^F is constructed by excluding domestic transactions from Z. Domestic blocks are removed by setting diagonal country blocks equal to zero. Then, $Z^D = Z - Z^F$.

Complex forward participation is computed as:

$$Complex\ Forward = \hat{\mathbf{v}}\mathbf{L}\mathbf{Z}^{\mathbf{F}} - Simple\ Forward \tag{7}$$

The sum of simple and complex forward participation constitutes total forward GVC participation in value-added terms. Since we operate with the bilateral dataset, these volumes are also backward.

We also take country-sector-year-level varying variables such as value-added, gross fixed capital formation, and labor compensation from this database. The capital-labor ratio is calculated as a ratio of gross fixed capital formation to labor compensation.

We employ some country-year-level varying variables. We take the average years of schooling of the adult population in countries from 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

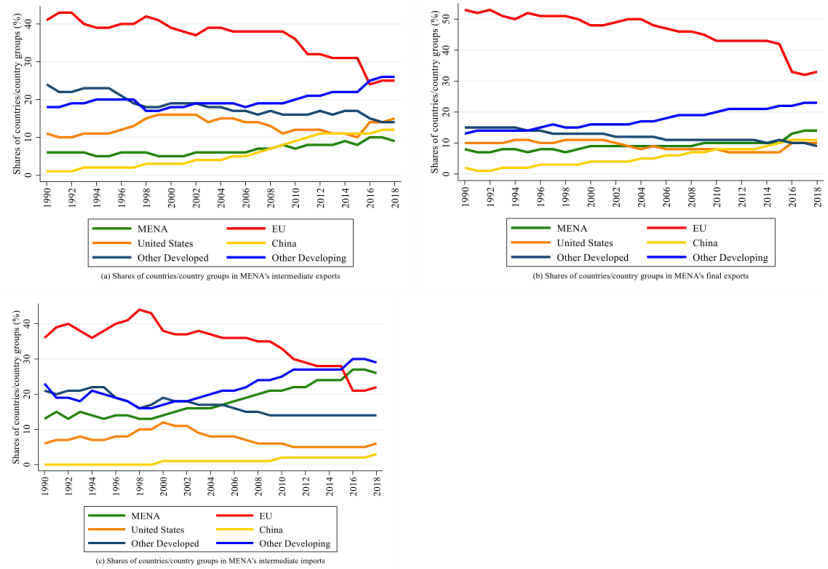
the institutional quality of the countries (Marshall and Gurr, 2020). The polity index ranges from -10, meaning strongly autocratic, to +10, meaning strongly democratic. We take foreign direct investment (FDI) stock as a share of GDP from the United Nations Conference on Trade and Development (UNCTAD, 2021). We also use the GDP deflator in the World Bank to convert nominal values to real ones.

Figure 1 illustrates the distribution of the MENA region's trade across partner country groups or countries. Panel (a) of Figure 1 below illustrates the shares of each partner country group or countries in the MENA region's total intermediate exports. Trends show that while the shares of intermediate exports to the MENA region, China, and other developing countries increase through the period, the shares of intermediate exports to the EU and other developed countries decrease. The share of the United States is stable. Panel (b) of Figure 1 demonstrates the shares of each partner country group or country in the MENA region's total final exports. Trends show that while the shares of final exports to the MENA region, China, and other developing countries expand through the period, the shares of final exports to the EU, the United States, and other developed countries diminish. Panel (c) of Figure 1 presents the shares of each partner country group or countries in the MENA region's total intermediate imports. Trends show that while the shares of intermediate imports from the MENA region, China, and other developing countries grow through the period, the shares of intermediate imports from the EU and other developed countries decrease. The share of the United States is stable.

The EU appears to be the main trade partner of the MENA region, regardless of the types of trade flow (on average, 40%). 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 MENA, China, and other developing countries in all kinds of trade tend to increase, the shares of the EU and other developed countries in all types of trade tend to decrease.

In summary, while the EU remains a significant partner, the emerging economies increasingly shape the direction and depth of MENA's trade relations. These shifts reflect several economic and policy-related changes. First, intra-regional trade gains momentum due to MENA regional agreements and geopolitical realignments (South-South integration). Second, China's dominance corresponds with its Belt and Road Initiative and energy/security investments across the MENA (Sharma, 2019). Third, the EU's declining share might reflect higher regulatory standards in EU markets.

Figure 1. Shares of countries/country groups in MENA's trade



Source: Own elaboration.

Table 1 presents the summary statistics of the variables utilized in the econometric analysis. The MENA region appears to be relatively more engaged as an exporter of final goods, yet it remains only partially integrated in intermediate trade. The MENA region's relative strength as an exporter of final goods can be explained by its natural resource and energy advantage, while its limited integration in trade in intermediate goods might be linked to the lack of industrialization and political instability. The EU and other developed countries play a central role in intermediate goods trade. Value-added growth averages 6.83% but shows high variability and fluctuations. Capital intensity and FDI/GDP values show low averages but quite wide variance. This indicates significant investment and capital structure differences among countries in the region. The average polity index is -4.22, indicating a generally low level of democracy across the region. The correlation table is provided in Table A2 in the Appendix.[2]

2 We further examine the Variance Inflation Factor (VIF) values to assess the concern of multicollinearity between variables in all our regression models. We find that VIF values are below 3 in all specifications. These results show that the problem of multicollinearity is not serious in our models.

Table 1. Summary statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Value-added growth	12,769	6.83	7.57	-40.36	48.17
Intermediate export/Value-added (MENA)	12,607	1.84	2.81	0.00	19.90
Final export/Value-added (MENA)	12,674	3.27	8.72	0.00	80.23
Intermediate import/Value-added (MENA)	12,731	2.60	4.72	0.01	46.66
Intermediate export/Value-added (EU)	12,600	4.95	7.06	0.02	47.67
Final export/Value-added (EU)	12,646	2.71	8.91	0.00	87.78
Intermediate import/Value-added (EU)	12,731	11.00	18.37	0.02	164.74
Intermediate export/Value-added (United States)	12,689	1.23	2.01	0.00	17.30
Final export/Value-added (United States)	12,640	0.54	2.44	0.00	32.31
Intermediate import/Value-added (United States)	12,742	2.02	3.25	0.00	28.90
Intermediate export/Value-added (China)	12,647	0.65	1.24	0.00	10.09
Final export/Value-added (China)	12,681	0.07	0.23	0.00	2.68
Intermediate import/Value-added (China)	12,736	1.53	3.00	0.00	28.44
Intermediate export/Value-added (Other Developed)	12,769	1.98	2.81	0.01	20.23
Final export/Value-added (Other Developed)	12,769	1.01	2.73	0.00	25.31
Intermediate import/Value-added (Other Developed)	12,769	3.16	5.49	0.01	52.31
Intermediate export/Value-added (Other Developing)	12,676	3.11	4.09	0.03	29.59
Final export/Value-added (Other Developing)	12,727	2.58	6.11	0.00	57.39
Intermediate import/Value-added (Other Developing)	12,743	5.50	10.63	0.02	105.96
Capital intensity	12,769	0.58	1.22	0.00	14.91
Schooling years	12,769	6.24	2.39	0.40	11.79
Population growth	12,769	2.83	2.20	-1.65	15.63
Polity index	12,769	-4.22	4.87	-10.00	9.00
FDI/GDP	12,769	26.54	27.21	0.32	123.79

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

4. 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.

$$VA\_g_{c,s,t} = \gamma_0 + \gamma_1 VA\_g_{c,s,t-1} + \gamma_2 Int\_export_{c,s,t} + \gamma_3 Final\_export_{c,s,t} + \gamma_4 Int\_import_{c,s,t} + \gamma_5 S_{c,s,t} + \gamma_6 C_{c,t} + \gamma_7 T_t + \varepsilon_{c,s,t} \quad (8)$$

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. $Int\_export^{c,s,t}$ represents a share of intermediate exports in value-added. $Final\_export^{c,s,t}$ represents a share of final exports in value-added. $Int\_import^{c,s,t}$ represents a share of intermediate

imports in value-added. We also differentiate these trade measures depending on partner countries such as the MENA, the European Union (EU), the United States, China, other developed, and other developing. In other words, a separate regression is estimated for each partner country to allow the trade-growth relationship to vary across heterogeneous trade linkages.

$S^{c,s,t}$ signifies the capital-labor ratio calculated as a division of gross fixed capital formation 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. We include year dummies to control time-specific effects that might similarly influence all cross-sectional units. These effects might be driven by global or regional economic shocks such as changes in oil prices (the price drop in 2014), financial crises (2008/9 Global Financial Crisis), and political events (Arab Spring, conflicts in Yemen, Syria, and Iraq)[3].

To take the business cycles into account and to reduce the noise arising from short-term fluctuations/shocks, we employ 5-year moving averages of all variables in our model. This approach helps to better reflect the medium-term structural relationships and provide a clearer interpretation of the model (Lee and Shin, 2021).

The dynamic panel data model is estimated by utilizing the System Generalized Methods of Moments (SGMM) procedure to get unbiased, consistent, and efficient parameter estimates and to solve possible autocorrelation, endogeneity, and unobservable heterogeneity problems (Arellano and Bond, 1991; 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. Unlike Difference GMM, which uses only lagged levels as instruments for the difference equation, System GMM exploits both difference and level equations. Therefore, SGMM strengthens the instrument set, improves efficiency, and yields more reliable estimates, particularly in panels with a short time dimension.[4]

3 All variables are normalized by trimming the top and bottom 1 percent of their distributions in order to mitigate the influence of extreme values. This same normalization procedure is applied to all variables (dependent, main interest, and control). Therefore, the differences in the number of observations across columns (1)-(6) of the estimation tables reflect differences in the distributions of trade flows across different trading partners and trade types.

4 Before the System GMM estimation, panel unit root tests are conducted to examine the time-series properties of the variables. While value-added growth rate, intermediate import share, schooling years, population growth, polity index, and FDI share are stationary in levels (I(0)), intermediate export, final export shares, and capital intensity are nonstationary. However, they become stationary after first differencing. The System GMM estimator jointly exploits equations in levels and first differences, using lagged differences as instruments for the level equation and lagged levels as instruments for the difference equation. Therefore, the SGMM appropriately handles persistent and potentially non-stationary variables. Since no variable is second-order (I(2)) integrated, the estimation strategy remains valid.

We use a different number of lags for each subgroup to balance the number of instruments and the number of cross-units. The SGMM uses these valid instruments to create moment conditions that eliminate the correlation between explanatory variables and the error term. Minimizing a certain norm of the sample averages of the moment conditions provides GMM parameters. The validity of instruments is tested by the Hansen test statistic distributed as chi-squared with degrees of freedom equal to the number of over-identifying restrictions. The serial correlation in the residuals of the differenced equation is tested by the AR (2) test statistics (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998). In all specifications, we obtain valid probabilities of Hansen test statistics and AR (2) values.[5]

To further explore potential variations in the effects, we conduct heterogeneity analysis by dividing the sample into three main aggregate sectors - manufacturing, services, and agriculture & mining. This sectoral classification reflects both the structural characteristics of MENA economies and the need to maintain econometric validity of the SGMM. Focusing on these core sectors enables a deeper and more nuanced understanding of the trade-growth linkages.

5. Results

This part presents the SGMM estimation results of the growth model for all, manufacturing, service, agricultural and mining sectors, separately (Tables 2-5). Table 2 presents the results of the total sample by considering six main trading groups or countries (the MENA, the EU, the United States, China, other developed, and other developing) through columns 1 to 6. The estimation results suggest that an increase in intermediate exports to the MENA, the EU, the United States, other developed, and other developing countries (as a share of value-added) significantly promotes value-added growth of the MENA sectors. This finding provides substantial evidence for the "learning by exporting" hypothesis through economies of scale, exposure to international competition, and learning in value chain management (Criscuolo and Timmis, 2017; De Marchi et al., 2018).

On the contrary, final exports to MENA, the EU, the United States, and other developing countries do not seem to benefit the MENA region. This result suggests that exporting final goods, without deeper integration into global value chains, may limit opportunities for learning, upgrading, and knowledge spillovers. Unlike studies relying on gross exports, our value-added-based and bilateral framework allows us to identify that these growth-enhancing effects

5 We conduct several robustness checks. First, we use the Ordinary Least Squares with time fixed effects. Second, we subset manufacturing sectors without construction and subset service sectors without electricity, gas and water. In all these different sensitivity analyses, we reach qualitatively similar results. The results are given in the Appendix (Table A3-A5).

are primarily driven by intermediate rather than final exports (Baldwin and Yan, 2016; Antràs et al., 2017).

Regarding backward linkages, importing intermediates from only the EU enhances sectoral growth. This result provides strong support for the "learning by importing" hypothesis through access to high-quality inputs and technology transfer (Tajoli and Felice, 2018; Pahl and Timmer, 2020). The absence of similar effects for imports from other regions may reflect differences in input quality, technological content, and compatibility with local production structures. These results can also be explained by the differences in comparative advantages of the MENA region and other countries in each specific trade flow.

Overall, the positive growth effects of the trade of intermediates rather than the trade of final products reveal the potential benefits of global value chain participation. While our approach and data differ significantly, the overall direction of our findings is broadly consistent with Karam and Zaki (2015), despite their use of gross trade variables and lack of distinction between intermediate and final goods. Our results are also in line with Nana et al. (2025), which examines the growth effects of GVC participation. However, unlike these studies, our analysis goes beyond aggregate measures by distinguishing between intermediate and final trade flows and by accounting for heterogeneity across trading partners. Neither Karam and Zaki (2015) nor Nana et al. (2025) differentiate between intermediate and final goods, nor do they examine the role of specific trade partners in shaping sectoral growth. By jointly incorporating value-added-based measures, flow-type disaggregation, and partner-level heterogeneity, our study provides a more detailed and policy-relevant understanding of how different forms of GVC participation affect sectoral growth.

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-labor ratio on the value-added growth of sectors, schooling years, the polity measure, and foreign direct investment significantly raise the growth of sectors. The positive impact of average schooling years highlights the critical role of human capital in improving sectoral growth. Since the countries in the MENA region generally suffer from political instability and economic turbulence resulting from internal or external wars and the Arab Spring, this result again emphasizes the importance of an institutional framework to foster growth. Foreign direct investment supports sectoral growth by bringing new technologies, better management practices, and access to global markets.

Table 3 presents the results for the manufacturing industries. Exporting intermediate products to the United States, other developed, and other developing countries is growth-enhancing. 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 United States and other developed countries are the only group or country from which the growth of the MENA region deteriorates due to importing intermediates. This may indicate

that local capacity to adopt imported advanced technologies is limited. The presence of an assembly-oriented structure instead of technology-based production in manufacturing sectors reduces the contribution of imports to growth. This points to structural weaknesses in backward linkages and external dependence.

Table 2. Value-added growth: all sectors

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.962***	0.953***	0.959***	0.955***	0.959***	0.959***
	(0.015)	(0.014)	(0.015)	(0.021)	(0.015)	(0.016)
Intermediate export/Value-added	0.079***	0.034***	0.119***	0.067	0.133***	0.081***
	(0.030)	(0.007)	(0.019)	(0.069)	(0.028)	(0.030)
Final Export/Value-added	-0.043***	-0.042***	-0.045**	-0.223	-0.075	-0.057**
	(0.013)	(0.013)	(0.018)	(0.212)	(0.056)	(0.024)
Intermediate Import/Value-added	0.025	0.014**	-0.012	-0.057	0.014	0.006
	(0.024)	(0.006)	(0.025)	(0.041)	(0.016)	(0.010)
Capital-labor ratio	0.067	-0.025	0.100	0.103	0.040	0.082
	(0.087)	(0.088)	(0.107)	(0.098)	(0.089)	(0.088)
Schooling years	0.124***	0.105***	0.095***	0.083**	0.077***	0.107***
	(0.027)	(0.026)	(0.024)	(0.038)	(0.026)	(0.024)
Population growth	-0.117***	-0.115***	-0.124***	-0.122***	-0.139***	-0.128***
	(0.016)	(0.015)	(0.015)	(0.033)	(0.016)	(0.017)
Polity	0.049**	0.047**	0.034*	0.039*	0.055***	0.046**
	(0.019)	(0.021)	(0.018)	(0.024)	(0.019)	(0.019)
FDI/GDP	0.008***	0.005**	0.011***	0.010***	0.007***	0.008***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Observations	12,354	12,319	12,403	12,421	12,412	12,438
Number of countries-sectors	512	505	511	520	516	518
Number of instruments	522	522	522	522	522	522
Arellano-Bond test statistics for AR(2)	1.13	0.88	1.18	1.16	1.16	1.12
Arellano-Bond p-value for AR(2)	0.259	0.376	0.239	0.247	0.248	0.262
Hansen test statistics	510.64	503.59	509.03	519.02	514.64	516.93
Hansen p-value	0.203	0.271	0.218	0.138	0.170	0.153

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. ***p<0.01, **p<0.05, *p<0.1. We employ the first lags of all variables without the "collapse" command.

The regressions provided in Table 4 are conducted only for the service sectors. Exporting intermediate services to the MENA region and China decreases the value-added growth of service sectors. This negative effect may reflect the relatively low technological content in regional and South-South service trade, which may constrain growth gains. In contrast, utilizing

intermediates from the EU enhances growth. The positive impact of the intermediate imports in service sectors from the EU reveals the importance of the origin of the imported product and the productivity-enhancing effects of the intermediates coming from high-technology countries. This result is consistent with the "learning by importing" hypothesis and supports the view that services trade with technologically advanced economies can foster upgrading.

Table 5 presents the results of the agricultural and mining sectors. The growth of the agricultural and mining sectors does not seem to be significantly associated with forward GVC participation. This finding suggests that the agricultural and mining sectors in the MENA region remain weakly integrated into downstream value chains with limited opportunity for learning through exporting intermediates. On the other hand, importing from the EU, the United States, China, other developed, and other developing countries significantly enhances the growth of the agricultural 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). It is noteworthy that exports of final products to China are significant and growth-enhancing for the MENA's agricultural and mining sectors. This can be explained by the region's comparative advantage in natural resource-based products and China's strong and growing demand for raw materials and agricultural commodities. In this sense, unlike manufacturing and services, final goods exports may still be an effective growth channel for resource-intensive sectors.

Overall, these heterogeneous results indicate that the growth effects of trade are highly partner- and sector-specific. Country- and sub-region-specific characteristics such as trade agreements, geographical proximity, natural resource endowments, institutional quality, and political stability are likely to shape these outcomes. Given the strong heterogeneity in the impacts of trade across flow types, trading partners, and sectors, our findings highlight the importance of employing disaggregated and value-added-based approaches to accurately capture trade-growth linkages and to design targeted, sector-specific policy recommendations rather than one-size-fits-all trade strategies.

Table 3. Value-added growth. manufacturing sectors

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.859***	0.872***	0.875***	0.877***	0.883***	0.859***
	(0.028)	(0.023)	(0.030)	(0.031)	(0.028)	(0.031)
Intermediate export/Value-added	-0.056	-0.074	0.265*	0.136	0.473**	0.151**
	(0.093)	(0.071)	(0.144)	(0.130)	(0.202)	(0.075)
Final Export/Value-added	-0.069**	-0.133***	-0.256**	-0.505	-0.522**	-0.060
	(0.027)	(0.048)	(0.121)	(0.590)	(0.245)	(0.052)

(Continue)

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Intermediate Import/Value-added	-0.001	0.030	-0.254**	-0.094	-0.114**	-0.048
	(0.061)	(0.023)	(0.109)	(0.061)	(0.050)	(0.029)
Capital-labor ratio	0.661**	0.296	0.919**	0.899***	0.943***	0.971***
	(0.313)	(0.320)	(0.356)	(0.324)	(0.353)	(0.319)
Schooling years	0.215	-0.030	-0.064	-0.077	-0.257*	-0.115
	(0.134)	(0.140)	(0.145)	(0.119)	(0.155)	(0.137)
Population growth	-0.021	-0.072	-0.008	-0.014	-0.019	-0.031
	(0.041)	(0.050)	(0.045)	(0.046)	(0.046)	(0.040)
Polity	-0.123**	0.002	-0.128**	-0.060	-0.116**	-0.070
	(0.053)	(0.073)	(0.062)	(0.055)	(0.057)	(0.059)
FDI/GDP	0.040***	0.037***	0.057***	0.047***	0.052***	0.045***
	(0.011)	(0.011)	(0.013)	(0.011)	(0.012)	(0.011)
Observations	4,987	4,999	4,950	5,067	5,058	5,083
Number of countries-sectors	206	204	206	210	209	208
Number of instruments	226	226	226	226	226	226
Arellano-Bond test statistics for AR(2)	0.61	0.44	0.56	0.53	0.49	0.56
Arellano-Bond p-value for AR(2)	0.542	0.657	0.575	0.598	0.622	0.579
Hansen test statistics	203.33	201.56	203.70	207.31	205.85	206.27
Hansen p-value	0.226	0.253	0.220	0.172	0.190	0.185

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. We employ the first 21 lags of variables as instrumental variables for manufacturing sectors with the "collapse" command.

Table 4. Value-added growth. service sectors

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.993***	0.982***	0.974***	0.978***	0.983***	0.991***
	(0.029)	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)
Intermediate export/Value-added	-0.264*	0.123	0.143	-0.433**	0.100	-0.054
	(0.157)	(0.082)	(0.171)	(0.180)	(0.225)	(0.064)
Final Export/Value-added	-0.130	-0.441	-0.279	-0.331	-0.005	-0.066
	(0.093)	(0.382)	(1.146)	(0.488)	(0.193)	(0.046)
Intermediate Import/Value-added	0.050	0.058*	-0.129	-0.111	0.081	-0.005
	(0.089)	(0.035)	(0.122)	(0.103)	(0.104)	(0.041)
Capital-labor ratio	-5.116***	-4.261***	-5.707***	-5.923***	-4.842***	-5.266***
	(1.165)	(1.110)	(1.238)	(1.109)	(1.091)	(1.143)
Schooling years	0.070	0.195	0.041	0.103	-0.004	0.039
	(0.176)	(0.146)	(0.162)	(0.201)	(0.187)	(0.152)
Population growth	-0.218***	-0.187***	-0.143**	-0.201**	-0.127	-0.211***

(Continue)

	(0.070)	(0.068)	(0.072)	(0.082)	(0.081)	(0.070)
Polity	0.034	0.079	0.048	0.037	0.009	0.080
	(0.048)	(0.055)	(0.050)	(0.050)	(0.053)	(0.050)
FDI/GDP	0.033**	0.023*	0.032**	0.030**	0.022	0.030**
	(0.014)	(0.012)	(0.014)	(0.015)	(0.015)	(0.014)
Observations	5,980	5,994	6,052	5,923	5,917	5,965
Number of countries-sectors	246	245	247	250	248	250
Number of instruments	262	262	262	262	262	262
Arellano-Bond test statistics for AR(2)	0.08	0.12	0.21	0.24	0.16	0.10
Arellano-Bond p-value for AR(2)	0.937	0.904	0.831	0.813	0.870	0.922
Hansen test statistics	243.96	242.79	244.56	247.23	245.94	248.20
Hansen p-value	0.184	0.198	0.177	0.148	0.161	0.138

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. We employ the first 25 lags of variables as instrumental variables for service sectors with the "collapse" command.

Table 5. Value-added growth: agricultural and mining sectors

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	1.092***	0.984***	1.097***	1.071***	1.086***	1.144***
	(0.079)	(0.140)	(0.079)	(0.058)	(0.079)	(0.100)
Intermediate export/Value-added	0.199	0.377	0.220	0.167	0.417	0.172
	(0.185)	(0.365)	(0.212)	(0.306)	(0.330)	(0.392)
Final Export/Value-added	-0.137	-0.421	0.803	15.196*	0.111	0.061
	(0.102)	(0.405)	(3.324)	(8.254)	(0.228)	(0.357)
Intermediate Import/Value-added	0.586	0.830*	1.602**	1.003*	1.120*	0.411**
	(0.544)	(0.442)	(0.719)	(0.531)	(0.616)	(0.199)
Capital-labor ratio	-3.360	-3.151	-9.253	-5.103	-16.717*	-5.239
	(11.710)	(21.562)	(14.401)	(7.554)	(9.538)	(10.381)
Schooling years	-0.318	-0.431	0.063	-0.116	-0.361	-0.233
	(0.666)	(0.852)	(0.519)	(0.367)	(0.538)	(0.492)
Population growth	-0.152	-0.106	-0.230	-0.198	-0.158	-0.017
	(0.170)	(0.429)	(0.192)	(0.160)	(0.227)	(0.224)
Polity	-0.023	0.269	0.280*	0.255	-0.008	0.272
	(0.101)	(0.186)	(0.162)	(0.204)	(0.164)	(0.207)
FDI/GDP	0.023	0.097*	0.028	0.031	0.029	0.047
	(0.022)	(0.058)	(0.037)	(0.023)	(0.026)	(0.035)
Observations	1,387	1,326	1,401	1,431	1,437	1,390
Number of countries-sectors	60	56	58	60	59	60
Number of instruments	73	73	73	73	73	73
Arellano-Bond test statistics for AR(2)	1.59	0.48	1.23	1.69	1.69	1.74

(Continue)

Arellano-Bond p-value for AR(2)	0.112	0.631	0.218	0.091	0.090	0.082
Hansen test statistics	33.70	32.75	35.39	45.40	29.16	41.52
Hansen p-value	0.579	0.624	0.498	0.135	0.783	0.243

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. We employ the first 4 lags of variables as instrumental variables for the agricultural and mining sectors with the "collapse" command.

6. Conclusions

International trade is one of the crucial mechanisms for economic growth. 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), is an important first step in designing sound trade policies in an increasingly integrated global trade and production system. Since the MENA region has distinct characteristics that warrant detailed investigation, analyzing the impacts of MENA's trade integration within the region and with the rest of the world on MENA's economic growth has strong potential to provide evidence for an important policy-relevant research agenda.

Our SGMM estimations provide substantial evidence that integration into both regional and global value chains can effectively foster 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 using the unique dataset with extensive coverage. Our empirical analysis suggests that the sectoral growth of the MENA region depends mainly on its integration into global value chain activities. Moreover, we obtain different results depending on trading partners and trade flows, suggesting strong heterogeneity within the MENA region. For manufacturing sectors, higher forward GVC participation with the United States, developed and developing countries, promotes sectoral growth. For the service sectors, backward GVC participation with the EU countries enhances sectoral growth. For agriculture and mining, backward GVC participation with all countries and groups except for the MENA region, as well as exporting final products to China, increases sectoral growth.

Given the heterogeneous effects of trade on economic growth in the MENA region, the importance of evidence-based policy design becomes more apparent. Through targeted trade policies and incentives, promoting higher forward GVC participation in manufacturing sectors with the USA, other developed countries, and other developing countries, as well as facilitating backward GVC participation in service sectors, particularly with the EU, appears essential for enhancing economic growth in the MENA region. Similarly, strengthening backward GVC participation in agriculture and mining sectors with non-MENA countries also improves regional economic growth. These findings imply that a one-size-fits-all trade policy is unlikely to be effective for the MENA region. Instead, sector-specific and partner-specific trade strategies, combined

with complementary domestic policies such as human capital accumulation, institutional strengthening, and improvements in absorptive capacity, are crucial for fully benefiting from GVC integration. As suggested by our results, selectively enhancing MENA's integration into global and regional value chains stimulates economic growth across different sectors.

All in all, the empirical findings highlight the importance of global value chain participation for economic growth. The growth of the MENA region across all sectors is highly dependent on trade with non-MENA countries. These findings emphasize the significance of country–sector–trading partner-level analysis and specific integration patterns within both regional and global value chains for MENA's economic growth.

Nevertheless, this study is subject to several limitations. First, although our dataset provides extensive coverage across sectors and trading partners, data constraints prevent a deeper disaggregation at the firm or product level. Second, while the SGMM framework addresses endogeneity concerns using internal instruments, potential endogeneity may persist. Future research could extend this analysis by incorporating firm or product-level data. In addition, the use of truly exogenous external instrumental variables could provide a more robust identification strategy and further strengthen causal inference. All these extensions would further enrich the understanding of the trade-growth nexus in the MENA region.

Acknowledgments

This work was sponsored by the Economic Research Forum (ERF) and has benefited from both financial and intellectual support. The views expressed in this work are entirely those of the authors and should not be attributed to ERF, its Board of Trustees or donors. The third author acknowledges support from the Turkish Academy of Sciences.

References

Amiti, Mary & Konings, Jozef (2007). Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia. *American Economic Review*, *97*(5), 1611-1638.

Antràs, Pol; De Gortari, Alonso & Itskhoki, Oleg (2017). Globalization, Inequality and Welfare. *Journal of International Economics*, *108*, 387-412.

Arellano, Manuel & Bond, Stephen (1991). Some Tests of Specification for Panel Data. *Review of Economic Studies*, *58*(2), 277–297.

Arellano, Manuel & Bover, Olympia (1995). Another Look at the Instrumental Variable Estimation of Error-Components Models. *Journal of Econometrics*, *68*(1), 29-51.

Baldwin, John Richard & Yan, Beiling (2016). *Global Value Chain Participation and the Productivity of Canadian Manufacturing Firms*. Montreal, Canada: Institute for Research on Public Policy.

Barro, Robert Joseph & Lee, Jong Wha (2013). A New Data Set of Educational Attainment in the World, 1950-2010. *Journal of Development Economics*, *104*, 184-198.

Blundell, Richard & Bond, Stephen (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, *87*(1), 115-143.

Criscuolo, Chiara & Timmis, Jonathan (2017). The Relationship between Global Value Chains and Productivity. *International Productivity Monitor*, *32*(2017), 61-83.

De Marchi, Valentina; Giuliani, Elisa & Rabellotti, Roberta (2018). Do Global Value Chains Offer Developing Countries Learning and Innovation Opportunities? *The European Journal of Development Research*, *30*(3), 389-407.

Del Prete, Davide; Giovannetti, Giorgia & Marvasi, Enrico (2018). Global Value Chains: New Evidence for North Africa. *International Economics*, *153*, 42-54.

Dijkstra, A. Geske (2000). Trade Liberalization and Industrial Development in Latin America. *World Development*, *28*(9), 1567-1582.

Dollar, David; Inomata, Satoshi; Degain, Christophe; Meng, Bo; Wang, Zhi; Ahmad, Nadim & Kidder, Matthew (2017). *Global Value Chain Development Report 2017: Measuring and Analyzing the Impact of GVCs on Economic Development*. World Bank Group.

Feder, Gershon (1982). On Exports and Economic Growth. *Journal of Development Economics*, *12*(1-2), 59-73.

Frankel, Jeffrey A. & Romer, David H. (1999). Does Trade Cause Growth? *American Economic Review*, *89*(3), 379-399.

Frankel, Jeffrey A.; Romer, David H. & Cyrus, Teresa (1996). Trade and Growth in East Asian Countries: Cause and Effect? *NBER Working Paper Series*, No. 5732.

Gereffi, Gary (1994). The Organization of Buyer-Driven Commodity Chains: How US Retailers Shape Overseas Production Networks. In *Commodity Chains and Global Capitalism*, ed. M. Korzeniewicz and G. Gereffi, 95-122. New York: Praeger.

Grossman, Gene M. & Helpman, Elhanan (1991). Trade, Knowledge Spillovers, and Growth. *European Economic Review*, *35*(2-3), 517-526.

Hummels, David; Ishii, Jun & Yi, Kei-Mu (2001). The Nature and Growth of Vertical Specialization in World Trade. *Journal of International Economics*, *54*(1), 75-96.

Jangam, Bhushan Praveen & Rath, Badri Narayan (2021). Do Global Value Chains Enhance or Slog Economic Growth? *Applied Economics*, *53*(36), 4148-4165.

Karam, Fida & Zaki, Chahir (2015). Trade Volume and Economic Growth in the MENA Region: Goods or Services? *Economic Modelling*, *45*, 22-37.

Kim, Dong-Hyeon & Lin, Shu-Chin (2009). Trade and Growth at Different Stages of Economic Development. *Journal of Development Studies*, *45*(8), 1211-1224.

Koopman, Robert; Powers, William; Wang, Zhi & Wei, Shang-Jin (2010). *Give Credit Where Credit is Due: Tracing Value-added in Global Production Chains* (No. w16426). National Bureau of Economic Research.

Koopman, Robert; Wang, Zhi & Wei, Shang-Jin (2014). Tracing Value-Added and Double Counting in Gross Exports. *American Economic Review*, *104*(2), 459-494.

Kummritz, Victor (2016). *Do Global Value Chains Cause Industrial Development?* Graduate Institute of International and Development Studies, Center for Trade and Economic Integration, Working Paper Series. CTEI Working Paper No. 2016-01.

Landesmann, Michael A. & Stöllinger, Roman (2019). Structural Change, Trade and Global Production Networks: An 'Appropriate Industrial Policy' for Peripheral and Catching-up Economies. *Structural Change and Economic Dynamics*, *48*, 7-23.

Lee, Jong-Wha & Lee, Hanol (2016). Human Capital in the Long Run. *Journal of Development Economics*, *122*, 147-169.

Lee, Keun & Shin, Hochul (2021). Varieties of Capitalism and East Asia: Long-Term Evolution, Structural Change, and the End of East Asian Capitalism. *Structural Change and Economic Dynamics*, *56*, 431-437.

Lenzen, Manfred; Kanemoto, Keiichiro; Moran, Daniel & Geschke, Arne (2012). Mapping the Structure of the World Economy. *Environmental Science & Technology*, *46*(15), 8374-8381.

Lenzen, Manfred; Moran, Daniel; Kanemoto, Keiichiro & Geschke, Arne (2013). Building Eora: A Global Multi-Region Input–Output Database at High Country and Sector Resolution. *Economic Systems Research*, *25*(1), 20-49.

Leontief, Wassily W. (1936). Quantitative Input and Output Relations in the Economic Systems of the United States. *The Review of Economic Statistics*, 105-125.

Mao, Zhuqing (2022). Global Value Chains (GVCs) and Economic Growth: A Nonlinear Analysis. *The Singapore Economic Review*, *67*(03), 985-1004.

Marshall, Monty G. & Gurr, Ted Robert (2020). *Political Regime Characteristics and Transitions, 1800-2018 Dataset Users' Manual*. Center for Systemic Peace.

Miller, Ronald E. & Blair, Peter D. (2009). *Input-Output Analysis: Foundations and Extensions*. Cambridge University Press.

Miniesy, Rania S.; Nugent, Jeffrey B. & Yousef, Tarik M. (2004). Intra-Regional Trade Integration in the Middle East: Past Performance and Future Potential. *Trade Policy and Economic Integration in the Middle East and North Africa: Economic Boundaries in Flux*, 329-345.

Nana, Ibrahim & Tabe-Ojong, Martin Paul Jr. (2025). Global Value Chain Participation and Economic Growth in Africa. *Applied Economics*, 1-20.

Pahl, Stefan & Timmer, Marcel P. (2020). Do Global Value Chains Enhance Economic Upgrading? A Long View. *The Journal of Development Studies*, *56*(9), 1683-1705.

Pahl, Stefan; Timmer, Marcel P.; Gouma, Reitze & Woltjer, Pieter J. (2022). Jobs and Productivity Growth in Global Value Chains: New Evidence for Twenty-Five Low-and Middle-Income Countries. *The World Bank Economic Review*, *36*(3), 670-686.

Porter, Michael (1985). *Value Chain. The Value Chain and Competitive Advantage: Creating and Sustaining Superior Performance*.

Roodman, David (2009). How to Do xtabond2: An Introduction to Difference and System GMM in Stata. *Stata Journal*, *9*(1), 86-136.

Saidi, Nasser & Prasad, Aathira (2018). *Trends in Trade and Investment Policies in the MENA Region*. MENA-OECD Working Group on Investment and Trade.

Sharma, Anu (2019). An Analysis of 'Belt and Road' Initiative and the Middle East. *Asian Journal of Middle Eastern and Islamic Studies*, *13*(1), 35-49.

Tajoli, Lucia & Felice, Giulia (2018). Global Value Chains Participation and Knowledge Spillovers in Developed and Developing Countries: An Empirical Investigation. *The European Journal of Development Research*, *30*(3), 505-532.

United Nations Conference on Trade and Development (UNCTAD) (2021). *Foreign Direct Investment: Inward and Outward Flows and Stock, Annual*. Retrieved from: https://unctad.org/topic/investment/investment-statistics-and-trends.

United Nations Development Programme (UNDP) (2021). *Human Development Report (2018 Statistical Update)*. Retrieved from: https://hdr.undp.org/sites/default/files/2018_human_development_statistical_update.pdf.

University of International Business and Economics (UIBE) GVC Index Team (2017). *Data Files Structure of the UIBE GVC Index System*. http://139.129.209.66:8000/d/daedafb854/.

University of International Business and Economics (UIBE) (2017a). *Data Files Structure of the UIBE GVC Index System*. https://v2.fangcloud.com/share/a26979974d538c7e5aeb24b55a?folder_id=63000172546&lang=en.

University of International Business and Economics (UIBE) (2017b). *UIBE Global Value Chain Indexes System – Concept Note*. https://v2.fangcloud.com/share/a26979974d538c7e5aeb24b55a?folder_id=63000172546&lang=en.

Wang, Zhi; Wei, Shang-Jin; Yu, Xinding & Zhu, Kunfu (2017). *Characterizing Global Value Chains: Production Length and Upstreamness* (No. w23261). National Bureau of Economic Research.

Wooster, Rossitza B.; Banda, Tepa M. & Dube, Smile (2008). The Contribution of Intra-Regional and Extra-Regional Trade to Growth: Evidence from the European Union. *Journal of Economic Integration*, 161-182.

Yanikkaya, Halit (2003). Trade Openness and Economic Growth: A Cross-Country Empirical Investigation. *Journal of Development Economics*, *72*, 57-89.

Young, Alwyn (1991). Learning by Doing and the Dynamic Effects of International Trade. *The Quarterly Journal of Economics*, *106*(2), 369-405.

Zhao, Longyue & Wang, Yan (2009). China's Pattern of Trade and Growth after WTO Accession: Lessons for Other Developing Countries. *Journal of Chinese Economic and Foreign Trade Studies*, *2*(3), 178-210.

Table A1. Countries

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

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). The United States and China are also included in the country sample.

Table A2. Correlations of variables

	Value-added growth	Intermediate export/Value-added	Final export/ Value-added	Intermediate import/Value-added	Capital-labor ratio	Schooling years	Population growth	Polity index	FDI/GDP
Value-added growth	1.000								
Intermediate export/Value-added	0.011	1.000							
Final export/Value-added	-0.016	0.283	1.000						
Intermediate import/Value-added	-0.046	-0.070	0.448	1.000					
Capital-labor ratio	-0.001	-0.194	0.015	0.285	1.000				
Schooling years	0.054	0.019	0.089	0.006	0.056	1.000			
Population growth	0.245	-0.018	0.050	-0.004	-0.057	0.267	1.000		
Polity index	-0.058	-0.070	0.042	0.081	0.055	-0.163	-0.285	1.000	
FDI/GDP	-0.010	0.034	0.179	0.160	-0.043	0.299	-0.041	0.258	1.000

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

Appendix

Table A3. Value-added growth: all sectors, OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.895***	0.893***	0.892***	0.894***	0.893***	0.896***
	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)	(0.010)
Intermediate export/Value-added	0.019	0.012***	0.063***	0.066**	0.044***	0.038***
	(0.012)	(0.004)	(0.013)	(0.027)	(0.009)	(0.008)
Final Export/Value-added	-0.015***	-0.013***	-0.023***	-0.080	-0.016*	-0.017**
	(0.005)	(0.004)	(0.006)	(0.141)	(0.008)	(0.007)
Intermediate Import/Value-added	0.015	0.004	-0.009	-0.015	0.001	0.001
	(0.015)	(0.003)	(0.011)	(0.016)	(0.008)	(0.005)
Capital intensity	0.002	-0.004	0.019	0.016	0.009	0.015
	(0.030)	(0.029)	(0.032)	(0.033)	(0.031)	(0.031)
Schooling years	0.095***	0.088***	0.087***	0.089***	0.079***	0.090***
	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)
Population growth	-0.047***	-0.043***	-0.045***	-0.053***	-0.053***	-0.053***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Polity	0.005	0.001	0.004	0.004	0.007	0.007
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)
FDI/GDP	0.002	0.002*	0.003**	0.003**	0.002*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	12,354	12,319	12,403	12,421	12,412	12,438
R-square	0.835	0.835	0.835	0.834	0.835	0.835

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

Table A4. Value-added growth: manufacturing sectors without construction

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.864***	0.888***	0.893***	0.896***	0.893***	0.881***
	(0.028)	(0.027)	(0.028)	(0.029)	(0.029)	(0.030)
Intermediate export/Value-added	-0.171**	0.020	0.431***	0.011	0.425**	0.075
	(0.073)	(0.057)	(0.148)	(0.102)	(0.187)	(0.064)
Final Export/Value-added	-0.051**	-0.095***	-0.281**	-0.439	-0.534**	-0.036
	(0.025)	(0.033)	(0.109)	(0.726)	(0.253)	(0.042)
Intermediate Import/Value-added	-0.050	-0.007	0.012	-0.076	-0.176***	-0.033
	(0.059)	(0.018)	(0.090)	(0.055)	(0.061)	(0.028)
Capital-labor ratio	0.343	0.330	0.310	0.450**	0.716***	0.514**
	(0.214)	(0.218)	(0.232)	(0.215)	(0.270)	(0.205)
Schooling years	0.339**	-0.047	-0.084	-0.094	-0.282	-0.113
	(0.134)	(0.120)	(0.129)	(0.097)	(0.174)	(0.114)
Population growth	-0.035	-0.055	0.025	0.009	-0.017	-0.021
	(0.035)	(0.048)	(0.042)	(0.046)	(0.049)	(0.041)
Polity	-0.078	0.028	-0.115*	-0.052	-0.092	-0.041
	(0.057)	(0.069)	(0.063)	(0.058)	(0.072)	(0.060)
FDI/GDP	0.037***	0.033***	0.047***	0.039***	0.049***	0.033***
	(0.010)	(0.010)	(0.011)	(0.010)	(0.013)	(0.009)
Observations	4,499	4,509	4,450	4,565	4,549	4,583
Number of countries-sectors	185	185	188	189	188	187
Number of instruments	208	208	208	208	208	208
Arellano-Bond test statistics for AR(2)	1.09	1.00	1.06	1.04	1.02	1.03
Arellano-Bond p-value for AR(2)	0.276	0.320	0.289	0.298	0.306	0.302
Hansen test statistics	182.56	182.64	185.27	186.61	185.65	185.31
Hansen p-value	0.259	0.257	0.216	0.196	0.210	0.215

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. We employ the first 19 lags of variables as instrumental variables for manufacturing sectors with the "collapse" command.

Table A5. Value-added growth: service sectors without electricity, gas and water

	(1)	(2)	(3)	(4)	(5)	(6)
	MENA	EU	United States	China	Other Developed	Other Developing
Lag of value-added growth	0.993***	0.982***	0.974***	0.978***	0.983***	0.991***
	(0.029)	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)
Intermediate export/Value-added	-0.264*	0.123	0.143	-0.433**	0.100	-0.054
	(0.157)	(0.082)	(0.171)	(0.180)	(0.225)	(0.064)
Final Export/Value-added	-0.130	-0.441	-0.279	-0.331	-0.005	-0.066
	(0.093)	(0.382)	(1.146)	(0.488)	(0.193)	(0.046)
Intermediate Import/Value-added	0.050	0.058*	-0.129	-0.111	0.081	-0.005
	(0.089)	(0.035)	(0.122)	(0.103)	(0.104)	(0.041)
Capital-labor ratio	-5.116***	-4.261***	-5.707***	-5.923***	-4.842***	-5.266***
	(1.165)	(1.110)	(1.238)	(1.109)	(1.091)	(1.143)
Schooling years	0.070	0.195	0.041	0.103	-0.004	0.039
	(0.176)	(0.146)	(0.162)	(0.201)	(0.187)	(0.152)
Population growth	-0.218***	-0.187***	-0.143**	-0.201**	-0.127	-0.211***
	(0.070)	(0.068)	(0.072)	(0.082)	(0.081)	(0.070)
Polity	0.034	0.079	0.048	0.037	0.009	0.080
	(0.048)	(0.055)	(0.050)	(0.050)	(0.053)	(0.050)
FDI/GDP	0.033**	0.023*	0.032**	0.030**	0.022	0.030**
	(0.014)	(0.012)	(0.014)	(0.015)	(0.015)	(0.014)
Observations	5,485	5,508	5,549	5,435	5,442	5,483
Number of countries-sectors	228	227	227	230	228	230
Number of instruments	253	253	253	253	253	253
Arellano-Bond test statistics for AR(2)	0.40	0.30	0.38	0.40	0.37	0.41
Arellano-Bond p-value for AR(2)	0.687	0.767	0.700	0.692	0.710	0.680
Hansen test statistics	226.19	224.59	224.36	228.02	226.32	228.17
Hansen p-value	0.303	0.330	0.334	0.274	0.301	0.272

Notes: Clustered robust standard errors by countries-sectors in parentheses. Year dummies are included. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. We employ the first 24 lags of variables as instrumental variables for service sectors with the "collapse" command.