Global Value Chain Participation, Institutional Quality and Current Account Imbalances in the MENA Region

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Abstract

This paper examines the relationship between the current account balance and participation in global value chains (GVCs) while considering institutional quality in the Middle East and North Africa (MENA) region over the period 2006-2018. We identify the key fundamentals of current account balances by estimating Bayesian Model Averaging (BMA) supplemented by the General-to-Specific (GETS) method. We find that integration into GVCs has a significant positive effect on the current account, conditional on institutional quality. These findings suggest that for MENA countries to better integrate into and benefit from GVCs, policies should target improvements in the institutional framework.

Keywords: Global value chains, current account imbalance, Bayesian model averaging, institutional quality.
JEL Classifications: F32, F51, F41, F62.

ملخص

تبحث هذه الدراسة العلاقة بين ميزان الحساب الجاري والمشاركة في سلاسل القيمة العالمية (GVCs)، مع مراعاة الجودة المؤسسية في منطقة الشرق الأوسط وشمال إفريقيا (MENA) أثناء فترة 2006-2018. في هذا الصدد، تضع الدراسة تقديرًا لنموذج بايزي المتوسط (BMA) يكمله منهجية الانتقال من العام إلى خاص (GETS) بهدف تحديد الأساسيات الرئيسية لميزان الحساب الجاري. ومن خلال تطبيق مختلف تدابير جودة المؤسسات ومؤشر المشاركة في سلاسل القيمة العالمية، اكتشفت الدراسة أن الإدماج في سلاسل القيمة العالمية له تأثير إيجابي ملحوظ على الحساب الجاري، تبحث هذه الدراسة العلاقة بين ميزان الحساب الجاري والمشاركة في سلاسل القيمة العالمية (GVCs)، مع مراعاة الجودة المؤسسية في منطقة الشرق الأوسط وشمال إفريقيا (MENA) أثناء فترة 2006-2018. في هذا الصدد، تضع الدراسة تقديرًا لنموذج بايزي المتوسط (BMA) يكمله منهجية الانتقال من العام إلى خاص (GETS) بهدف تحديد الأساسيات الرئيسية لميزان الحساب الجاري. ومن خلال تطبيق مختلف تدابير جودة المؤسسات ومؤشر المشاركة في سلاسل القيمة العالمية، اكتشفت الدراسة أن الإدماج في سلاسل القيمة العالمية له تأثير إيجابي ملحوظ على الحساب الجاري، في حين أن معاملات فترة-مصطلح-مؤشر التفاعل شديدة السلبية. يدل هذا بوضوح على أن الجودة المؤسسية تخفف من التأثير الإيجابي للإدماج التجاري على الحساب الجاري. وتشير هذه النتائج إلى أن بلدان الشرق الأوسط وشمال إفريقيا ينبغي أن تدخل في نقاشات واسعة النطاق حول وضع إطار مؤسسي قوي، هذا حتى تستطيع تحسن من الإدماج في سلاسل القيمة العالمية.

1. Introduction

The question of unexplained current account balances has become a major concern in international macroeconomics, as they play an important role in the transmission of shocks in an increasingly integrated world. In the Middle East and North Africa (MENA) region, research has focused on the sources of current account fluctuations in light of the high potential of oil production (Bousnina et al., 2020). Persistent imbalances can induce demand for protectionist policies, which could harm global growth. Economic globalization is driving profound changes in international trade. The increasing fragmentation of production stages between countries in recent years is particularly striking, as firms are taking advantage of lower transport costs, more open trade policies, and technological innovations. This international trend toward the decentralization of production has given rise to various new concepts and definitions, including global value chains (GVCs). This amounts to what Baldwin (2016) named the "second unbundling of globalization."

The share of intermediates in total trade relative to the segment of finished goods has steadily increased as a consequence of dividing up the production chain internationally (Antràs, 2005). The regional dispersion of basic development, component manufacturing, assembly, and local market sales is an example of the cross-border dispersion of GVC activity (Dedrick et al., 2010). Many studies have improved our understanding of GVCs by documenting the increasing dispersion of cross-border production through the development of a framework for measuring value-added trade and the integration of economies into GVCs (Koopman et al., 2014). Based on this research, other studies have examined the economic impact of GVCs. For example, participation in GVCs appears to boost growth (IMF, 2013), make the distribution of economic income more unequal (Timmer et al., 2015), amplify macroeconomic spillover effects across countries (Georgiadis, 2016), improve our understanding of competitiveness and transformation (Tinta, 2017), and potentially worsen the current account (López-Villavicencio and Mignon, 2021).

On an international level, the MENA region has the lowest participation rates in GVCs (World Bank, 2020). Unlike other regions, most of the trade in MENA's supply chain products is non-regional. De Melo and Twum (2020) argue that these patterns may reflect poor governance and a weak regulatory environment that hinders the development of regional supply chains. In this paper, we study the current account balance implications of participation in GVCs in the MENA region. We investigate the relationship between current account imbalances and GVC participation, looking at whether the latter plays an important role in constraining the former. The literature on this issue is very sparse and the main mechanisms by which GVCs affect a country's current account are not well established.

The existing empirical literature focuses largely on simple current deficits or surpluses (Bussière et al., 2004). When the current account deviates from the equilibrium level determined by the fundamentals suggested by Lane and Milesi-Ferretti (2012), it is more appropriate to refer to external imbalances. To this end, identifying the main determinants of the current account of the countries studied is the first challenge we face. This is impeded by

the lack of clear theoretical guidance and the presence of model uncertainties emerging from empirical studies. To determine the fundamentals of current account balance positions while addressing model uncertainty, we employ the Bayesian Model Averaging (BMA) technique. The advantage of this method is that it avoids an arbitrary selection of current account models and provides accurate estimates of current account balances in the medium term. To test the robustness of this method in the selection process, we also use the General-to-Specific (GETS) method as an alternative to the BMA approach.

Our paper contributes to the literature in several ways. First, we address a topical policy issue of great importance in MENA countries, namely the potential impact of participation in GVCs on the current account balance. We measure GVCs by constructing an index corresponding to each country's backward and forward participation, i.e., the extent to which they use imported intermediates in their export products and the extent to which they export products used in production downstream in the supply chain. Second, we utilize two alternative methods (BMA and GETS) to study model uncertainty and investigate the determinants of the current account without neglecting the structural characteristics of the countries under study. Third, we specifically consider the fundamentals of the current account by estimating the relationship between the current account and its determinants using the system generalized method of moments (GMM) to consider the dynamics of the current account. Finally, we incorporate a variety of institutional indicators into the analysis to capture different aspects of the general concept of institutional quality, with a particular focus on political institutions.

The rest of the paper proceeds as follows. Section 2 describes the theoretical literature review. The sample and data are defined in section 3. Section 4 presents the empirical methodology, while section 5 discusses our main results on the effect of GVC participation on the current account. Section 6 attempts to explain the relationship between GVCs and the current account while considering institutional quality. Section 7 concludes the paper.

2. Theoretical background and literature review

Current global account imbalances have grown persistently over the past two decades and have tightened sharply with the 2007-2008 financial crisis. It is important to understand the extent to which macroeconomic factors have driven these trends in order to assess the likely evolution of current account imbalances in the future. Although countries in the MENA region have faced turbulent current account dynamics over the past three decades, they have not been the focus of many empirical studies.

Several studies have recently examined the determinants of the current account. Some studies analyze the fundamentals of the current account in order to estimate the level of the current account that can be considered sustainable for a state based on a set of macroeconomic attributes. These macroeconomic determinants typically include the rate of gross domestic product (GDP) growth, the rate of population growth, and the fiscal balance. Interestingly, the main studies on short-term current account imbalances are based on the assumption that the

current account acts as a buffer against temporary income shocks, smoothing intertemporal consumption (Glick and Rogoff, 1995). Another strand of the literature has attempted to provide a comprehensive characterization of medium-term determinants by examining cross-sectional and panel data sets (Chinn and Prasad, 2003; Gruber and Kamin, 2007; and Chinn and Ito, 2008). In contrast, the determinants of long-run changes and short-run dynamics in current account balances for a wide range of developed and emerging countries have not been the subject of much research. For example, Debelle and Faruqee (1996) analyzed the structural determinants of current account balances for developed countries from the perspective of savings-investment. Lee et al. (2006) have extended their analysis to developing countries. This literature goes back to Faruqee et al. (1996), who estimate an error correction model to assess the role of macroeconomic and demographic factors in explaining short- and medium-term variations in current account balances.

Loayza et al. (1999) use a dynamic approach for a set of 44 developing countries to estimate the role of macroeconomic factors in determining the current account balance. Moreover, the study by Calderon et al. (2002) focuses on developing economies and, more specifically, low-income states. Among other things, they approve that real exchange rate appreciation and deterioration in the total terms of trade worsen the current account deficit according to the prediction of the Mundell-Fleming model. In addition, Medina et al. (2010) study the macroeconomic basis of the current account of developing countries. The results found suggest that the budget balance has a significant impact on the current account; they also assert that the increase in net foreign assets improves the current account balance. By analyzing developed, emerging, and developing countries, Das (2016) finds that the current account balance is positively correlated with net foreign assets, trade openness, and the real effective exchange rate, but it is negatively associated with commodity prices. Therefore, in contrast to emerging countries, commodity prices, GDP growth, and trade openness are positively correlated with the current account. These results suggest that the fundamentals of the current account explain different structural characteristics according to the different groups of countries selected.

2.1 Current account balance and GVCs
In the wake of current globalization, it is important to understand the sources of these imbalances and the likely adjustment mechanisms. In particular, the relationship between the current account and participation in GVCs is the central question of this paper. However, the existing literature on the link between GVCs and current account balances is too limited and focuses on individual countries or European countries. In contrast, this article extends the analysis to a wide range of countries in the MENA region. Brumm et al. (2019) study this transmission channel by developing a model of the real international business cycle between two countries, which includes trade in final consumption goods and intermediate inputs into domestic production, and imported intermediates are imperfect substitutes for output. Assuming that the efficiency of imported intermediates in domestic production is temporarily impacted, the authors show that the positive impact increases the share of foreign value added in domestic exports and stimulates exports by increasing the competitiveness of domestic products. In fact, the shock is temporary; in a state of equilibrium, the domestic economy saves

part of its income to smooth consumption over time, leading to current account surpluses. Interestingly, this interpretation is limited to a particular form of participation in GVCs, namely backward participation, which consists of importing intermediate goods or services that are then used to assemble the final product that is exported.

Two other points that were ignored in the hypothetical mechanism cited above should be mentioned. First, increased participation in GVCs should have a positive impact on the current account position, especially in the case of forward participation, since developed participation means that more imports are used as inputs for exports. In fact, when domestic firms participate more in GVCs, they will become more competitive as they substitute cheaper imported intermediates for domestically produced ones. Nevertheless, the relationship between participation in GVCs and the current account is therefore ambiguous. Based on a study of 26 countries and using the IMF's External Balance Assessment (EBA) model, López-Villavicencio and Mignon (2021) show that backward participation makes a negative contribution to the current account. Second, in addition to the decomposition between forward and backward participation, current account balances also depend on the quality of the institutional environment (Bousnina and Gabsi, 2021). We therefore hypothesize:

Hypothesis 1: GVCs promote the stability of the current account in MENA countries.

2.2 Current account balance, GVCs, and institutional quality

The emergence of evidence on the proliferation of GVCs has also revived age-old discussions on the role that the quality of the institutional environment can play – whether through trade policy or even industrial policy – in ensuring current account sustainability and stimulating economic growth. Indeed, foreign direct investment, which tends to be highly sensitive to policy obstacles, is a key driver of current account sustainability and, at the same time, participation in GVCs (Kowalski et al., 2015).

Substantial strands of literature support the idea that institutional quality can be a fundamental key to value chain development, as it can determine firms' ability to enforce contracts. Indeed, this paper is part of the rapidly growing theoretical and empirical literature on the interaction of international trade and institutional quality. The incomplete contracts framework was first investigated in the analysis of international trade by Grossman and Helpman (2002a, b) and Antràs (2003, 2005) in order to study the international organization of production and the boundaries of multinational firms.

Although Antràs and Helpman (2004) do not model the quality of the country's contractual environment, it is reasonable to assume that dispersion within industries and countries may be affected by the quality of national institutions. Subsequent papers by Levchenko (2007) propose a model of international trade in which the quality of the institutional environment is modeled under incomplete contracts. Similarly, Nunn and Trefler (2013) tested the implication developed by Antràs and Helpman (2008). They agreed that good contract enforcement is an

important source of comparative advantage. Political stability, credibility of reforms, and absence of corruption are often revealed as prerequisites for international trade, reducing the risk incurred by investors and exporters.

As already mentioned, our study attempts to explain the origins of the relationship between GVCs and current account by suggesting that the effect of GVC participation on current account balance may operate indirectly through its impact on the environment of institutions. In our opinion, a strong legal system is one of the most important mechanisms that can influence the relationship between GVC participation and the current account for several reasons.

Our paper builds on studies by Brumm et al. (2019) and López-Villavicencio and Mignon (2021). Firstly, we collect data covering 16 countries, providing a larger dataset than previous studies linking the current account and GVC participation. Secondly, we rely on several empirical techniques to ensure the robustness of our results. Specifically, while Brumm et al. (2019) address static representations, we additionally consider a dynamic specification to account for the persistence of imbalances. Allowing this inertia in our framework is highly important, as persistent imbalances between countries have become a major issue. Third, we disaggregate our backward and forward linkage indicator to explore sectoral differences. Finally, we use a variety of institutional indicators, each of which captures different aspects of a broad concept of institutional quality with a particular emphasis on economic institutions.

Consequently, our research is inspired by these works while leading a reflection on the role of institutions in the MENA region and their effect on the relationship between current account and GVC participation. Therefore, our second hypothesis is as follows:

Hypothesis 2: The current account and GVC participation relationship varies depending on the institutional quality in MENA countries.

3. Data sources

We employ a panel data[3] regression with 16 MENA countries (Table 7 in the appendix) for the period 2006-18. The dataset comes from different sources. The explained variable of interest in this study is the current account balance of real per capita GDP (CA) taken from the World Development Indicators (WDI) database of the World Bank. However, the data are not available for a uniform period of time for each country. Therefore, the number of observations is expected to vary across countries, leading to estimations over unbalanced panel data.

3.1 Indicators of GVC participation

The task of measuring GVCs is far from straightforward due to the fragmentation of production in several countries. Although trade data has been widely used to measure GVCs, this raises

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[3] All data are employed at the annual frequency. For more details on definitions and data sources, see Table 8 in the appendix.

significant concerns. The most obvious disadvantage is that trade data are expressed in gross terms, which means that the value of intermediate inputs traded along the supply chain is taken into account multiple times, which skews the measurement.

As noted by De Backer et al. (2018), the main advances in terms of measuring GVCs came from the construction of multi-country input-output tables linking national input-output tables using bilateral trade flows. In this article, we rely on the UNCTAD-Eora[4] database (2019), which offers global coverage (189 countries and a "rest of the world" region) that contains data for all the countries in our sample over the period 1990-2018 and is based on the OECD Trade in Value Added (TiVA) database reflecting the role of countries in GVCs over time. In fact, the main finding of the UNCTAD-Eora database is a set of principal GVC indicators, including foreign value added, domestic value added, and domestic value added embedded in other countries' exports. The most important cross-regional value-added trade databases include the UNCTAD-Eora GVC database, the World Input-Output Database (WIOD), and the TiVA database. Major regional initiatives include the Asian Multi-Regional Input-Output Database (ADB MRIO) from the Asian Development Bank, the South American Global Trade Analysis Project (GTAP) for Purdue University, and the Input-Output Table from the Economic Commission for Latin America and the Caribbean (ECLAC) (Casella, 2019).

Other important indicators of GVCs, such as participation in GVCs, can be obtained from the three core indicators (Koopman et al., 2010). To track changes in GVC participation, we provide a simple average statistic to reflect a country's backward and forward participation. Denote by $Z_{i,c}$ gross output of country i used in production in country c and denote by a_i gross output of country i. We define backward participation in GVC as the ratio of gross imported intermediates to gross output.

In this respect, the backward participation index is formulated as follows:
$$\text{Backward}_{i,t} = \sum_{i \neq c} Z_{i,c}/a_i \tag{1}$$

Analogously, we define country i's forward GVCs participation as the ratio of gross exported intermediates to gross output, that is:
$$\text{Forward}_{i,t} = \sum_{i \neq c} Z_{i,c}/a_i \tag{2}$$

Gross output is given by the sum of domestic output used as intermediate input in the domestic economy and abroad, and domestic output that is worn for final consumption in the domestic economy and abroad. While both steps are expressed as shares of the reference country's exports, they measure very different forms of engagement. For example, a country that is predominantly assembling products into final goods and subsequently exporting them will have a strong backward participation index but a small forward participation measure. Conversely,

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[4] The UNCTAD-Eora GVC database was initially released as part of an analysis initiated for the World Investment Report 2013 under the theme "Global value chains: Investment and trade for development" (UNCTAD, 2013).

a country which predominantly supplies intermediates to an assembler will have a highly developed forward participation indicator but a small backward participation. Therefore, these participation measures give us a metric of engagement in the form of buying from (backward participation) and selling to (forward participation) GVCs, or the demand and supply sides of the value chain activity. Our key variable is then defined as an unweighted average of the backward and forward participation of a country:

$$GVC_{i,t} = \frac{Forward_{i,t} + Backward_{i,t}}{2} \tag{3}$$

This measure aims to capture a country's overall degree of integration into GVCs through both backward and forward participation.

3.2 Data on institutional quality

For institutional variables, we use a set of institutional quality indicators taken from the International Country Risk Guide (ICRG). Five indicators were selected: (1) democratic accountability (ranges 0-6,) which measures how responsive a government is to its people; (2) quality of bureaucracy (ranges 0-4), which measures institutional strength, quality of bureaucracy and the autonomy from political pressure; (3) investment profile (ranges 0-12), which is an assessment of factors affecting the risks to investment which are not covered by other political, economic, and financial risk components; (4) corruption (ranges 0-6), which refers to corruption in the political system (countries with low levels of corruption have high index values, and vice versa; and (5) law and order (ranges 0-6), which reflects the strength and impartiality of the legal system and popular observance of the law.

3.3 Other data

To assess the strength of the independent link between GVC participation and current account balance, we control for other potential determinants of current account in our regression. Specifically, we consider the most used variables in the empirical theory defined as follows: fiscal balance; oil price; growth rate as a percentage of GDP; terms of trade; trade openness; old-age dependency ratio; young dependency ratio; population growth rate; OECD economic growth; foreign direct investment; net foreign assets as a percentage of GDP; and real effective exchange rate.

Table 8 in the appendix reports the data sources of the variables employed in the study. As a preliminary analysis, we present the main descriptive statistics of the retained variables in Table 1. The average current account balance of the total sample over the period studied is 3.7 percent. The country with the highest recorded current account deficit is Lebanon (-26.20 percent) while Kuwait has the highest surplus (45.45 percent) during the period 2006-2018. Regarding democracy indicators, the minimum value is recorded in Saudi Arabia and Iraq. Countries with the highest democracy indicators include Tunisia and Jordan.

Table 1. Summary statistics

Variables	Mean	Std.dev	Minimum	Maximum	Kurtosis	Jarque-Bera
CA	0.037	0.122	-2.620	4.545	7.116	0.000
FDI	1.118	0.436	-0.223	0.389	1.780	0.001
FIS	-0.051	0.172	-1.633	0.428	1.132	0.005
GVC	0.047	0.388	0.023	0.046	1.311	0.029
NFA	0.513	0.257	-0.944	5.099	1.725	0.035
YPOP	0.073	0.289	0.226	2.331	1.159	0.003
REER	0.788	0.113	2.331	3.835	1.288	0.018
OIL	0.873	0.188	0.341	1.161	1.720	0.001
POP	0,448	0,235	0,012	1.051	1.003	0.033
TOT	1.199	0.322	0.745	2.166	1.360	0.001
OPOP	0.530	1.648	-1.916	2.346	0.223	0.001
OPEN	0.722	0.254	0.000	1.911	0.891	0.003
GDP-OECD	0.078	0.223	0.000	2.308	1.338	0.019
GROWTH	0.047	0.088	-0.015	0.166	1.332	0.004
DEMOC	2.158	1.375	1.000	5.000	0.114	0.005
CORR	2.623	0.952	0.000	4.000	0.798	0.002
BUREAU	1.956	0,739	0.000	3.000	0.996	0.007
INVP	3.572	0.112	1.080	11.50	1.223	0.002
LAW	4.055	1.112	1.000	5.000	2.336	0.000

As already mentioned, these variables are platykurtic with a Kurtosis less than three; however, the current account is anti-platykurtic with a Kurtosis of 7.116. In addition, the series normality hypothesis was rejected by the Jarque-Bera test. In total, this distribution rejected the normality assumption (p-value = 0.00).

4. Empirical methodology

Several empirical works that deal with the relationship between the current account and its fundamentals can be fully analyzed by a single theoretical model (Chinn and Prasad, 2003). Empirical methodology is typically used to test the predictions of different theoretical models, and due to the lack of clear theoretical guidance, most arbitrarily choose model specifications. Given the large number of specifications that can be neglected, this a priori choice will be affected by potential biases.

This study has two major objectives. The first is to identify the determinants of the current account balance (Bousnina and Gabsi, 2021) through an econometric approach based on the uncertainty of the model by applying the BMA model. Next, we use the GMM to identify the key fundamentals of the current account and demonstrate the extent to which GVC participation could affect the stability of the current account in the countries studied. Finally, we use various institutional indicators, each of which covers different aspects of the broad concept of institutional quality, with an emphasis on economic institutions. It is interesting to note that

while a stable political environment may provide better legal protection for referendum rights, freedom of expression, the rule of law, and better protection for the banking system against corruption and interventionist policies will improve the financing of the system's operations (Krieckhaus, 2006).

4.1 BMA methodology

We use BMA to clarify the main determinants of the current account while considering the uncertainty associated with the model specifications, as the number of potential fundamentals is relatively large. The importance of this method is that it solves two main problems commonly encountered in empirical research. There are many explanatory variables and limited data. Traditional regression models cannot provide effective answers to which variables should be included in the model and their respective positions. Consider the following empirical current account model:

$$Y = \alpha + Z\beta + \varepsilon \tag{4}$$
$$\varepsilon \sim N(0, \sigma^2\, I) \tag{5}$$

Where y is the current account as a percentage of GDP, α is a constant, Z is a vector of explanatory variables, β is the vector of regression coefficients, and ε is an error term that follows a normal distribution with zero mean and variance σ^2.

In order to solve the problem of uncertainty in relation to the specification of the model, the methodology adopted makes it possible to estimate different models for all the possible combinations of {Z} and by constructing a weighted average. Assuming that Z contains k potential explanatory variables, this means estimating 2^k variable combinations, each with a certain probability of being the "true" model. If $\emptyset$ is the quantity of interest, such as coefficients β, the associated posterior probability – i.e., the distribution of the estimated coefficient vector conditional on one specific model j and the underlying data D – can be presented as follows:

$$p\big(M_j\big|D\big) = \sum_{j=1}^{2^K} p\big(\emptyset\big|M_j, D\big)p\big(M_j\big|D\big) \tag{6}$$

Therefore, the posterior distribution of $\emptyset$ is an average of the posterior distribution under each of the models considered, weighted by their posterior model probability. For a model M_j, the latter are obtained using Bayes' rule and specified as follows:

$$p\big(M_j\big|D\big) = \frac{p\big(M_j\big|D\big)p(M_j)}{\sum_{s=1}^{2k} p\big(D\big|M_s\big)p(M_s)} \tag{7}$$

Where $p\big(M_j\big|D\big) = \int \big(D\big|\theta_j, M_j\big)p\big(\theta_j\big|M_j\big)d\theta_j$ is the assimilated likelihood of model $p\big(y\big|M_j\big)$, while is the probability of the data given model M_j, is multiplied with the marginal probability

p (M$_j$) divided by the integrated likelihood p(y). The latter has to be stimulated by the researcher and would reflect prior beliefs. Moreover, in line with Fernandez et al. (2001), we select a uniform prior probability that means a common prior model probability, i.e., $p(M_j) = 2^{-K}$. This is a popular choice to represent the lack of prior knowledge. Following Hoeting et al. (1999), the posterior mean and variance of $\emptyset$ are respectively formulated as follows:

$$E(\emptyset/D) = \sum_{y=0}^{2^K} \hat{\Delta}_j \, p(M_j/D) \tag{8}$$

$$V(\emptyset/D) = \sum_{j=0}^{2^K} \big(V(\emptyset|D, M_j) + \hat{\Delta}_j^2\big) p(M_j|D) - E(\theta/D)^2 \tag{9}$$

Where $\hat{\Delta}_j = (\emptyset|D, M_j)$.

To verify the validity of this study, we carry out several robustness tests. We will adapt two sets of data: annual data and average data over five years covering all the countries studied. The two types of data are used for various purposes, which may be complementary. On the one hand, five-year average data can eliminate cyclical fluctuations, thus deepening the underlying determinants of the current account (Lane and Milesi-Ferretti, 2012). This is especially important for developing countries, where – apart from short term fluctuations due to variations in commodity prices – there are also measurement errors. On the other hand, the use of annual time series allows more variation both between and within countries, which should help identify the most robust fundamentals of the current account (Dufrenot et al., 2010).

4.2 The determinants of current account balance and GVC participation

To identify the determinants of current account balances, we regress a set of macroeconomic variables. Following previous theoretical and empirical studies by López-Villavicencio and Mignon (2021), we estimate the following equation:

$$CA_{i,t} = \alpha_0 + \alpha_1 CA_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 GVCP_{i,t} + \varepsilon_{i,t} \tag{10}$$

$$CA_{i,t} = \alpha_0 + \alpha_1 CA_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 Backward_{i,t} + \varepsilon_{i,t} \tag{11}$$

$$CA_{i,t} = \alpha_0 + \alpha_1 CA_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 Forward_{i,t} + \varepsilon_{i,t} \tag{12}$$

Where $CA_{i,t}$ is the current account as a percentage of GDP, i and t represent a country and time, respectively. In addition, $X_{i,t}$ is a vector of explanatory variables , $Backward_{i,t}$ is the measure of backward integration into GVCs, $Forward_{i,t}$ is the measure of forward integration into GVCs, $GVC_{i,t}$ is participation in GVCs, U_i is a country-specific effect, ϑ_t is a time-specific effect, and $\varepsilon_{i,t}$ is an error term. To improve the credibility of the estimates of the determinants of the current account, several econometric problems must be overcome. The use of a dynamic panel model requires particular attention to the choice of the appropriate estimation technique. The presence of the lagged dependent variable among the explanatory variables implies a problem of correlation between the lagged endogenous variable and the error term. Moreover, some explanatory variables are endogenous. This endogeneity bias is essentially due to the

reverse causality problem. In fact, many studies have found that the fiscal balance can affect the current account balance, which implies the existence of a causal relationship (Vamvoukas and Spilloti, 2015; Benayed and al., 2015; Manamba, 2017; and Ghafur, 2020).

The presence of such a problem may lead to biased results when applying classical estimation methods such as the Ordinary Least Squares (OLS) estimator or the Fixed Effects estimator. In order to correct the endogeneity problem, we adopt the GMM proposed by Arellano and Bond (1991). This estimation method allows us to instrument the lagged dependent variable as well as the endogenous explanatory variables with their past values, which distinguishes it from instrumental variable techniques that use external instruments with a difficult appropriate choice. Thus, it is interesting to note that the GMM allows us to correct not only the endogeneity of the lagged dependent variable, but also that of all the explanatory variables. The validity of the GMM estimator and, consequently, the use of lagged variables as instruments, is verified using the Hansen over-indexing and second-order autocorrelation tests. The null hypothesis of the Hansen test states that the instrumental variables are uncorrelated with the error term, while the null hypothesis of the AR (2) test assumes the absence of second-order autocorrelation of the residuals (Arellano and Bond, 1991).

5. Empirical results
5.1 The BMA approach
The results of the BMA approach are presented in Table 2 for the 16 countries studied and cover the period 2006-18. The importance of the variables in explaining the position of the current account (p ($\beta_i \neq 0$| D)) is presented in the column "BMA PIP," which represents the posterior inclusion probabilities (PIP). A variable is considered relevant when its PIP is greater than or equal to 50 percent and there is no uncertainty about its sign (Dufrenot et al., 2010). Additionally, the results for the five-year average data and the annual data are very similar. In both estimates, eight current account fundamentals were identified, seven of which are common: budget balance, GVCs, oil balance, GDP growth rate, terms of trade, real effective exchange rate, and OECD economic growth. The similarity between these results reflects the fact that medium-term current account fundamentals (five-year average data) and short-term fundamentals (annual data) are not significantly different.

Table 2. BMA estimates

	Annual data				5-year average data			
	BMA PIP	**Post Mean**	**Post SD**	**Cond.PoS. Sign**	**BMA PIP**	**Post Mean**	**Post SD**	**Cond.Pos. Sign**
FDI	0.030	-0.250	0.052	0.000	0.050	-0.330	0.235	0.000
FIS	0.999	0.293	0.043	0.898	0.696	0.336	0.292	1.000
GVC	0.950	0.004	0.009	1.000	0.923	0.003	0.009	0.999
NFA	0.079	0.030	0.003	0.066	0.978	0.039	0.018	0.900
RY	0.043	0.005	0.043	0.993	0.094	0.043	0.323	1.000
REER	0.942	-0.095	0.053	0.899	0.992	-0.039	0.094	0.871
OIL	1.000	0.332	0.033	1.000	1.000	0.325	0.043	1.000
POP	0.039	0.000	0.003	0.969	0.239	0.004	0.023	0.933
TOT	1.000	0.399	0.049	1.000	0.952	0.299	0.233	1.000
RO	0.059	-0.003	0.029	0.000	0.190	-0.400	0.233	0.000
OPEN	0.063	-0.003	0.009	0.802	0.049	0.000	0.009	0.699
GDP-OECD	0.993	0.003	0.009	0.799	0.990	0.002	0.006	0.922
GROWTH	1.000	-0.950	0.052	0.890	1.000	-0.930	0.235	0.999
DEMOC	1.000	0.024	0.014	1.000	1.000	0.298	0.009	1.000
CORR	1.000	0.248	0.019	0.996	1.000	0.775	0.002	0.977
BUREAU	1.000	0.044	0.016	1.000	0.957	0.169	0.011	0.992
INVP	0.945	0.395	0.077	0.899	1.000	0.266	0.072	1.000
LAW	0.965	0.215	0.026	0.974	0.998	0.189	0.042	1.000

While some of the fundamentals, such as oil balance and fiscal balance, were expected given that they are highlighted by most of the previous empirical work, this is not necessarily the case for other variables. Generally, these have little or no empirical research, and this study usually focuses on the traditional determinants of the current account without explicitly considering the particularity of the country under study. This highlights the value of the BMA method for determining the fundamentals of the current account without bias or ignoring the characteristics of the country studied. While it is important to determine the fundamentals of the current account, it is also important to check whether the signs of the coefficients associated with the different variables are consistent with the predictions of the theoretical model. The coefficient sign can result from the column "Cond.Pos.Sign," which displays the "Posterior probability of a positive coefficient expected value conditional on inclusion," and "Sign certainty," respectively (Zeugner, 2011). When the statistic is close to one, the variable certainly has a positive sign, but the variable has a negative sign when the statistic is close to zero.

5.2 GETS as an alternative to BMA

As a robustness analysis, we use the GETS approach as an alternative approach to BMA to deal with model uncertainty. Like BMA, GETS is one of the most influential econometric and statistical approaches for handling uncertainty modeling (Ding and Knight, 2011).

Table 3. GETS results for the whole sample

	Annual data		5-year average data	
	Coeff.	**P > |t|**	**Coeff.**	**P > |t|**
FIS	0.335***	0.000	0.295***	0.000
OIL	0.468***	0.000	0.465***	0.000
GROWTH	0.113***	0.000	0.117***	0.002
TOT	0.283***	0.000	0.279**	0.011
NFA	0.398***	0.000	0.329***	0.000
GVC	0.512***	0.006	0.552**	0.042
GDP-OECD	0.068***	0.000	0.119***	0.001
REER	0.242***	0.000	0.446*	0.073
DEMOC	0.425**	0.001	0.112**	0.042
CORR	0.228**	0.002	0.482**	0.001
BUREAU	0.715***	0.000	0.186***	0.000
INVP	0.258**	0.015	0.328**	0.018
LAW	0.482**	0.008	0.412**	0.007

Notes: The ***, ** and *represent significance at the one percent, five percent, and 10 percent levels, respectively.

While BMA solves model uncertainty by estimating models of all possible combinations of explanatory variables that lead to thousands of regressions, GETS solves the same problem by relying on a single model: the General Unrestricted Model (GUM). The latter contains all potential explanatory variables and undergoes a series of stepwise statistical tests (Hendry and Krolzig, 2004), leading to the removal of empirically unimportant variables in order to achieve the specific or final proposed model. Therefore, it is important to rely on economic theory and previous empirical results to determine the "general a priori model." The results obtained in tables 3 and 4 are perfectly consistent with the results of the BMA approach.

Table 4. GETS results for reduced sample

	Model A				Model B			
	Annual Data		5-year Average Data		Annual Data		5-year Average Data	
	Coeff.	P > |t|	Coeff.	P > |t|	Coeff.	P > |t|	Coeff.	P > |t|
FIS	0.445***	0.000	0.365***	0.000	0.665***	0.000	0.555**	0.000
OIL	0.388***	0.000	0.331***	0.000	0.422***	0.000	0.521***	0.000
GROWTH	0.113***	0.000	0.193***	0.000	0.107**	0.002	0.097**	0.002
TOT	0.223***	0.000	0.129***	0.000	0.163**	0.011	0.178**	0.011
NFA	0.399***	0.000	0.385***	0.000	0.389***	0.000	0.432***	0.000
GVC	0.312**	0.006	0.218**	0.006	0.425**	0.042	0.336**	0.042
GDP-OECD	0.128**	0.007	0.089**	0.012	0.103**	0.011	0.229**	0.001
REER	0.242**	0.033	0.142**	0.010	0.233**	0.023	0.128**	0.013
DEMOC	0.552**	0.041	0.485**	0.035	0.117*	0.075	0.225**	0.022
CORR	0.215***	0.000	0.315**	0.047	0.078**	0.009	0.178**	0.045
BUREAU	0.421**	0.007	0.584***	0.000	0.481**	0.005	0.248**	0.008
INVP	0.442***	0.000	0.456**	0.001	0.278*	0.081	0.119**	0.004
LAW	0.265**	0.049	0.328**	0.022	0.118*	0.067	0.266***	0.000
Constant	-0.822**	0.014	-0.222	0.144	0.539**	0.020	0.126**	0.028
R squared	0.896		0.755		0.661		0.786	

Notes: The ***, ** and *represent significance at the one percent, five percent, and 10 percent levels, respectively.

As in the BMA approach for the whole sample, eight variables are identified as the most likely to explain the evolution of the current account balance for both the five-year average data and the annual data. In both estimations, the same variables are selected by both approaches, reflecting the robustness of the selected methods. Thus, all variables selected by the GETS approach appear statistically significant at the one percent level.

5.3 Current account balance and GVCs

After determining the fundamentals of the current balance by the BMA and GETS method, we can now estimate the current account balance model, which allows for a causal interpretation of the relationship between the current balance and its determinants based on the GMM. Hence, the results of the empirical analyses of the current account determinants of MENA countries by using the GMM estimators are presented in Table 5. The estimates of regression coefficients are generally in line with the theoretical and previous empirical analyses. However, in all our model specifications, the Hansen test cannot reject the null hypothesis that our instruments are valid. The coefficient associated with the lagged current account (L.CA) has a positive and statistically significant impact on the current account. Therefore, the size of this partial regression coefficient reveals the relatively strong persistence of transitory shocks according to the theoretical literature. The results reflect a slow current account adjustment process, which can be affected by foreign creditors (Fratzscher et al., 2004). Surprisingly, stronger persistence was observed in the non-oil exporting MENA countries, with a partial regression coefficient

between 0.162 and 0.535 that confirms Edward's (2006) finding that the persistence of large surpluses is greater than that of large deficits.

A potentially fundamental element of the current account is the fiscal balance (FIS), the results of which show that the coefficient of this variable positively and significantly stimulates the current account balance. In this framework, the positive relationship between the fiscal balance and the current account balance provides evidence in favor of the twin deficit hypothesis, but we could not reject the intertemporal approach due to the short time frame. Moreover, we find that the real economic growth (GROWTH) coefficients are positive and statistically significant. The empirical result for the MENA countries is inconsistent with the theoretical expectations that domestic economic growth accelerates demand for foreign goods and services and hence deteriorates the current account (Gandolfo, 2004).

As for the price of oil (OIL), it is a potentially fundamental part of the current account. The coefficient of this variable positively and significantly stimulates the current account balance, which is relatively consistent with the H-L-M effect, which refers to the names of three economists: Harberger (1950) and Laursen and Metzler (1950). In fact, an increase of USD 10 in the price of oil results in a current account surplus of 0.133-0.689 percentage points. Indeed, countries with large oil-producing sectors tend to have a higher current account balance (model B).

Table 5. Current account balance estimations results

Variables	(1)			(2)			(3)		
	Model A	Model B	Whole sample	Model A	Model B	Whole sample	Model A	Model B	Whole sample
L.CA	0.335**	0.265**	0.482**	0.535**	0.451**	0.435**	0.162**	0.155**	0.325**
	(0.026)	(0.047)	(0.014)	(0.016)	(0.008)	(0.011)	(0.006)	(0.029)	(0.017)
FIS	0.239**	0.339**	0.411**	0.339**	0.366**	0.409**	0.427*	0.623***	0.559**
	(0.009)	(0.011)	(0.042)	(0.009)	(0.026)	(0.003)	(0.073)	(0.000)	(0.043)
OIL	0.133**	0.503*	0.689**	0.173**	0.481*	0.333*	0.223*	0.759*	0.413**
	(0.004)	(0.074)	(0.003)	(0.004)	(0.077)	(0.054)	(0.014)	(0.033)	(0.022)
GROWTH	0.123**	0.273*	0.118**	0.123**	0.212*	0.273*	0.113*	0.143*	0.195**
	(0.032)	(0.062)	(0.002)	(0.012)	(0.051)	(0.042)	(0.052)	(0.088)	(0.003)
TOT	0.338	0.238	0.123**	0.098**	0.144*	0.118**	0.098**	0.318**	0.216**
	(0.132)	(0.222)	(0.022)	(0.032)	(0.060)	(0.042)	(0.022)	(0.032)	(0.040)
NFA	0.121**	0.251**	0.185**	0.221**	0.237*	0.121**	0.121	0.326*	0.331**
	(0.008)	(0.028)	(0.015)	(0.028)	(0.081)	(0.002)	(0.602)	(0.082)	(0.022)
GDP-OECD	0.212**	0.312**	0.165	0.117	0.247**	0.155**	0.166**	0.385**	0.275**
	(0.028)	(0.018)	(0.115)	(0.118)	(0.011)	(0.008)	(0.033)	(0.002)	(0.001)
REER	-0.232*	-0.372*	-0.145*	-0.212**	-0.437*	-0.292*	-0.117*	-0.392**	-0.327**
	(0.058)	(0.006)	(0.065)	(0.028)	(0.001)	(0.098)	(0.079)	(0.018)	(0.022)
GVC	0.178*	0.358**	0.445**						
	(0.088)	(0.008)	(0.025)						
Forward GVC				0.272**	0.526*	0.348*			
				(0.011)	(0.071)	(0.058)			
Backward GVC							-0.378*	-0.208*	-0.311**
							(0.033)	(0.089)	(0.008)
Constant	0.553	0.895	0.456	0.115	0.968**	0.965**	0.420*	0.765	0.995***
	(0.332)	(0.422)	(0.628)	(0.132)	(0.015)	(0.002)	(0.052)	(0.522)	(0.000)
AR (2) (p-value)	0.554	0.668	0.421	0.518	0.621	0.695	0.569	0.620	0.415
Hansen (p- value)	0.444	0.684	0.234	0.726	0.536	0.443	0.965	0.896	0.869

Notes: GMM estimators use robust standards errors clustered by countries. The Hansen and AR (2) tests indicate that we cannot reject the validity of our instruments. The ***, ** and *represent significance at the one percent, five percent, and 10 percent levels, respectively.

The positive coefficient probably reflects the effect of rising oil prices over the sample period, and oil-exporting countries tended to save a large portion of their windfall income to smooth intertemporal consumption. Regarding the rise in oil prices since 2002, Ruiz and Vilarubia (2007) find that major oil exporters recycled about half of the earnings gains into higher imports and the other half into higher economies. The share devoted to imports exceeds that of previous episodes of similar increases in oil prices and may reflect the perception of its more permanent nature. This positive relationship between the price of oil and the current account balance is consistent with the H-L-M effect (Harberger, 1950; Laursen and Metzler, 1950). However, when comparing oil-exporting countries (model B) to oil-importing countries (model A), the former, according to expectations, indicate an even higher partial regression coefficient when the same increase in oil prices occurs; that is, an improvement in the current account of up to five percentage points.

The coefficient associated with the lagged ratio of the net foreign assets position to GDP (NFA) is positive and statistically significant. Part of the transfer of savings from some economies to international capital markets reflects the accumulation of official foreign exchange reserves under a fixed exchange rate policy. Indeed, an economy's net foreign asset flows have a direct effect on its investment income, and therefore on the current account balance. It should be noted that there is another contradictory effect that may be at play. In fact, countries with large NFA positions are able to run sustainable trade deficits while remaining solvent; a situation that can lead to a negative relationship between the NFA and current account positions.

Although there are differences between the estimated coefficients of the different proposed models, in all specifications, exchange rate appreciation (REER) tends to worsen the current account deficit. This reflects the usual impact of expenditure changes: international price changes increase exports and transfers at the same time.

The composition of domestic consumption and investment on the demand side is from foreign to domestic goods, and the transfer of resources on the demand side is from non-market to domestic market sectors. Note that we include the REER in the control variable because, from a theoretical point of view, it is generally accepted that changes in the real exchange rate will lead to changes in the current account (Comunale, 2018). This relationship is indeed recognized in various strands of international macroeconomic literature, such as the money market approach (Cassel, 1921), the elasticity approach (Robinson, 1947), the optimal currency area theory (Mundell, 1963), and the macroeconomic literature on the new open economy (Obstfeld and Rogoff, 1995). The introduction of the REER in the control variable can capture the relative price effect and the effect of expenditure changes. This is the main channel through which REER changes cause changes in the current account.

For the terms of trade (TOT), the coefficient of this indicator is also found to be statistically significant and positively signed for all specifications, indicating that countries with larger terms of trade tend to exhibit higher current account balances. Nevertheless, the variation in the

terms of trade makes it possible to understand the effects of fluctuations in world market prices on a country's exports and imports (Murphy, 1992; Lane and Milesi-Ferretti, 2007). The H-L-M effect implies that an improvement in the terms of trade leads to an increase in the current account. This effect can be explained by a positive change in the terms of trade that would increase real income and, assuming a constant marginal propensity to consume less than one, would therefore lead to an increase in private savings and an improvement in the current balance (Maruel, 2004).

For the economic growth of the OECD (GDP-OECD), an increase in the growth rate of high-income OECD countries generates a current account surplus for oil-exporting and importing MENA countries. This could be explained by both an increase in export demand from MENA countries and by the increase in capital flows between developed countries to the detriment of flows to MENA countries. We estimate that a one-percentage-point increase in the growth rate of OECD countries would lead to an improvement of between 11.7 and 35.8 percentage points in the current account. The results are consistent with the previous conclusions of Milesi-Ferretti and Razin (1996) and Calderon et al. (2002).

Our panel regression results show that participation in GVCs has a statistically significant impact on the current account balance. In fact, economies with higher GDP have larger current account surpluses (or smaller current account deficits). This empirical model holds whether we measure GVC participation by simple imports and exports of intermediate inputs or by more complex measures (such as the VAX ratio) (Johnson and Noguera, 2014; Johnson and Noguera, 2017).

Testing the robustness of the results to the selection bias of two subgroups, we confirm that the positive impact of GVCs on the current account balance holds for both surplus and deficit countries. Table 5 also presents the results of the estimation of the impact of backward and forward participation in GVCs on the current account. The estimation results are qualitatively similar. The coefficients were significantly estimated on the two different measures of GVC participation for the full sample and the two subgroups.

With respect to backward participation, it is negatively signed and consistent with the findings (López Villavicencio and Mignon, 2021), implying that backward linkage ages in GVCs tend to reduce current account balances. Importantly, our results are robust to the choice of specification showing that, all else equal, a country's current account balance will worsen if it imports intermediate products for export. As shown, an increase in backward participation relative to other countries is associated with a reduction in the current account between 0.208 and 0.378. Thus, access to international networks will allow MENA countries to mobilize their resources more effectively to capitalize on their competitive advantages.

For forward GVC participation, the coefficients are statistically significant and positive. If the coefficient of the forward GVC variable in model B is stronger and more significant than in

model A, this can be explained by the already relatively low average tariffs in the subgroup. In fact, the productivity gains associated with import and export tax reforms may already have been realized. With the exception of Tunisia, Algeria, and Egypt, tariffs in this region are, on average, lower than in other countries in the same income category. However, countries with good economic conditions and low tariffs are more widely involved in GVCs. Indeed, the low participation of the MENA region in GVCs is due to the lack of a vibrant logistics environment, non-tariff barriers, and insufficient fiscal transparency. However, the literature shows many studies that analyze the relationships between transparency and investment performance (Peridy and Javad, 2014). This issue is particular in the MENA region, where the 2017 Budget Transparency Survey gives the lowest regional score for budget transparency and accountability. Interestingly, countries are able to transfer to a more complex category move up the GVC and derive benefits from the diversification of their production and trade structures, as well as from increased opportunities for backward and forward linkages.

6. Current account, institutional quality, and GVC participation

In the sense of North's rules of the game (1994), the institutional environment is generally analyzed in the context of transaction cost theory (Williamson, 1985). It appears that the economic system, namely property rights and contractual rights, coordinates economic relations in production. The political system defines the structure of the country and the political process that shapes the creation and implementation of economic systems. At this level, the quality of the political system refers to the definition of the country. Countries with strong institutional quality tend to be more flexible to adapt to change so that market mechanisms can function effectively. To this end, it is important to note that the establishment of good quality private property rights institutions minimizes the transaction costs of the economy, thus stimulating economic growth and integration into the GVCs (Baldwin, 2016). However, Méonand Sekkat (2004) shows that good institutional quality promotes manufacturing exports and foreign direct investment. Hence, the execution of contracts, the procedures to encourage the creation of a business, the opening of trade, the laws and regulations for adapting to economic activities, and access to bank credit, have all fostered the institutional transformation of developing countries and enabled them to conform to democratic market economies.

Consequently, the quality of the institutional environment should play an important role in the process of integration into GVCs. This section attempts to explain the origins of the relationship between GVC participation and the current account by suggesting that the effect of GVC participation on the current account balance may operate indirectly through its impact on the institutional environment. In our view, a strong legal system is one of the most important mechanisms that can influence the relationship between GVC participation and the current account for several main reasons. However, the disappointing performance of regional and global trade integration in the MENA region is due to several political and economic factors. An empirical specification – which makes it possible to test the reactivity of the current account to GVC participation – depends on an indicator of institutional quality and takes the following form:

$$CA_{i,t} = \alpha_0 + \alpha_1 CA_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 GVC_{i,t} + \alpha_4 Inst_{i,t} + \alpha_5 \left(GVC_{i,t} \times Inst_{i,t} \right) + \vartheta_t + \cup_i + \varepsilon_{i,t}$$
$$(16)$$

Furthermore, $Inst_{i,t}$ represents the measures used to indicate the level of institutional development and $\left(GVC_{i,t} \times Inst_{i,t} \right)$ is the interaction term between the GVC participation and the institutional quality. $Inst_{i,t}$ is a set of indicators of the country's institutional performance (further details of the definitions of these institutional can be found in the appendix). To obtain consistent and unbiased estimates (under the hypothesis that unobserved heterogeneity exists but is fixed or time-invariant), we estimate the relationship between institutional variables and the current account using the GMM. This estimator was introduced by Arellano and Bond (1991) and then developed in a series of articles, including those by Arellano and Bover (1995) and Blundell and Bond (1998).

Table 6 reports the results of regressions analyzing the effect of institutions on the relationship between current account and GVC participation variable. The results interestingly show that, for all specifications, the control variables always have the expected sign. Subsequently, the results (Eq. 16) displayed in column (1) suggest that the positive relationship between GVC and current account is strengthened by institutional quality. From an economic point of view, MENA countries have a strong interest in integrating, as their production factors and comparative advantages are often similar. However, a certain degree of "mutual trust" between countries is necessary for regional trade integration to work, but political cooperation is problematic. Arezki et al. (2020) highlight two areas where lack of data and transparency weaken the credibility of MENA countries and hamper policymaking.

The variable measuring corruption representation appears with a negative and significant sign. Regarding the interaction term GVC×CORR in Column (2), estimates indicate that this measure negatively stimulates the current account balance. Indeed, corruption significantly reduces the efficiency of foreign direct investment and economic growth since it presents additional burdens (the "corruption tax") for multinational firms. This result is consistent with the study by Bougharriou et al. (2019) and corroborates the results found by Batra et al. (2002), who show that 66 percent of the firms surveyed in the MENA countries say that corruption is the most burdensome constraint to the development and growth of their firms. Column (3) reports the estimation results of the quality of the bureaucracy equation. The result indicates that the quality of bureaucracy is positively and significantly correlated with participation in GVCs, stimulating the current account balance. It also contributes to the reduction of uncertainty (public authorities' decisions will be predictable and achievable). Likewise, good bureaucratic efficiency will prevent red tape while improving mechanisms for conflict resolution. In this sense, MENA countries can attract foreign financing resources, either in the form of foreign direct investment or international bank loans, by improving the quality of bureaucracy.

In light of the estimation results of the law-and-order equation presented in column (4), it seems that the interaction term GVC×LAW positively stimulates the current account balance. This

shows, in fact, that the ability of the state to manage resources efficiently and formulate and implement good policies and regulations largely explains the long-term performance of nations in terms of attractiveness. The credibility of debt sustainability analyses depends on data transparency. However, public debt reporting systems vary widely across countries in the region. Moreover, current analyses of labor market conditions in MENA suffer from variations in data across countries, and there are still inconsistencies in definitions. Yet, any future trade integration must be based on sound policies, which require reliable regional data to develop.

Table 6. The relationship between current account balance, GVC, and institutional quality

Variables	(1)	(2)	(3)	(4)	(5)
L.CA	0.261***	0.316	0.416*	0.263*	0.221*
	(0.000)	(0.871)	(0.096)	(0.086)	(0.051)
FIS	0.366***	0.510***	0.411***	0.307**	0.481**
	(0.000)	(0.000)	(0.000)	(0.010)	(0.006)
OIL	0.339**	0.780**	0.809**	0.319*	0.428***
	(0.039)	(0.011)	(0.017)	(0.079)	(0.000)
GROWTH	0.216**	0.119**	0.366*	0.216*	0.111
	(0.006)	(0.008)	(0.061)	(0.051)	(0.421)
TOT	0.260**	0.369**	0.179*	0.330*	0.326**
	(0.018)	(0.016)	(0.090)	(0.081)	(0.076)
NFA	0.130*	0.139**	0.166**	0.119*	0.136
	(0.066)	(0.016)	(0.068)	(0.071)	(0.296)
GDP-OECD	0.176*	0.331**	0.118**	0.366**	0.513**
	(0.060)	(0.006)	(0.010)	(0.017)	(0.023)
REER	0.119*	0.616**	0.167**	0.416	0.366
	(0.096)	(0.033)	(0.011)	(0.983)	(0.181)
GVC	0.429*	0.113**	0.587**	0.208**	0.531**
	(0.008)	(0.023)	(0.002)	(0.003)	(0.001)
DEMOC	0.496**				
	(0.005)				
CORR		-0.201*			
		(0.078)			
BUREAU			0.424**		
			(0.007)		
LAW				0.594**	
				(0.032)	
INVP					0.623**
					(0.005)
GVC×DEMOC	0.422*				
	(0.073)				
GVC×CORR		-0.315**			
		(0.003)			
GVC×BUREAU			0.486**		
			(0.005)		
GVC×LAW				0.496**	
				(0.005)	
GVC×INVP					0.715**
					(0.001)
Constant	0.119*	0.289	0.108**	0.751	0.264**
	(0.081)	(0.215)	(0.003)	(0.917)	(0.013)
AR (2) (p-value)	0.411	0.911	0.627	0.788	0.812
Hansen (p-value)	0.212	0.521	0.136	0.221	0.426

Notes: The Hansen and AR (2) tests indicate that we cannot reject the validity of our instruments. The ***, ** and *represent significance at the one percent, five percent, and 10 percent levels, respectively.

When we refer to column (5), the result indicates that the measure of investment profile is the most relevant indicator of institutional quality in the current account-GVC participation nexus.

This means that, in order to benefit from participation in GVCs in terms of economic growth, MENA governments need to be embedded in strong institutional frameworks. The main conclusion is that the investment profile seems to play a key role in all areas of economic development. However, the establishment of a favorable business environment is of great importance to reduce investment risks, increase confidence, and attract foreign investors to stimulate economic growth. In addition, this measure summarizes a wide range of structural indicators, including the viability of contracts, the length of payment terms, and the ease of repatriation of profits by investors. Specifically, higher values of this variable indicate a greater capacity of the policy and regulatory framework of a country to promote the business climate, the investment environment, and the degree of openness of the country and therefore create an environment conducive to the establishment of efficient supply chains by companies. Nevertheless, MENA countries should adopt appropriate policy measures to improve the business environment and develop a transparent and sound institutional and legal framework to encourage integration into global production networks and markets.

The relative importance of the different determinants of the current account depends on the nature of the GVCs' participation and the characteristics of the countries in the region. Barriers specific to different countries in the region hinder their backward participation in GVCs (World Bank, 2020). However, all the coefficients strongly suggest that institutional development that ensures better implementation of regulatory policies and greater compliance with the law has gained importance in the process of determining the current account surplus. In order to ensure the transition between the different categories, all determinants and policy areas need to be improved, including tariffs, foreign direct investment, political stability within the region, and the quality of logistics. These factors contribute to improving the relationship between participation in GVCs and the MENA current account.

7. Conclusion and policy implications

In this paper, we investigate the significance of several current account fundamentals for 16 countries in the MENA region. In doing so, we also assess whether the increase in participation in GVCs has a significant impact on current account balances. Our paper contributes to the literature by identifying the main determinants of the current account of the MENA countries considered using the BMA approach complemented by the GETS approach and investigating the impact of interaction terms between indices measuring institutional quality and GVC participation on the current account balance in MENA countries. The estimation results using the GMM system approach show that only oil intensity, trade openness, fiscal balance, GVC participation, and growth rate of OECD member countries are relevant, according to the result found by Calemon and Guestos (2021) and Bousnina and Gabsi (2021).

We find evidence of a conditional relationship between GVC participation and the current account. In fact, institutional quality stimulates the positive effect of commercial integration. In addition, GVC participation and institutional quality are complementary to promote the current account surplus in the MENA region. To ensure the transition between the different categories, all determinants and policy areas need to be improved, including tariffs, trade openness, political stability, customs efficiency, and logistics quality. In the MENA region and

in fragile and conflict-affected countries, the main obstacle is the lack of political stability. Nevertheless, the ability to move from one level of participation to another in GVCs does not depend on the most important obstacle; rather, it depends on the ability to make substantial and simultaneous improvements in several policy areas.

In summary, our research highlights the importance of further integration among countries and an institutional framework for economic integration. Structural reforms affecting the business environment and governance should be accelerated. Understanding the value chains involved will help determine the costs of specific trade policies and assess the economy's sensitivity to protectionist measures. Moreover, since there is a link between value chains and global conditions, global policy imbalances should lead countries to participate in the supply chain. MENA countries are taking governance measures, including measures for delivering and maintaining the quality of public services, fighting corruption, and improving property rights; thereby promoting the legal formalization of cooperation at the regional level. Improving the institutional environment, creating a level of corruption processes, protecting property rights, and creating strong democratic institutions can help reduce the excessive deficits displayed in the countries of the region.

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Appendix

Table 7. Country list

Whole sample	Model A: MENA oil-importing countries included in the sample	Model B: MENA oil-exporting countries included in the sample
Algeria	Egypt	Algeria
Bahrain	Jordan	Bahrain
Djibouti	Morocco	Iran
Egypt	Djibouti	Iraq
Jordan	Lebanon	Kuwait
Kuwait	Turkey	Oman
Lebanon	Tunisia	Qatar
Morocco		Saudi Arabia
Iran		United Arab Emirates
Iraq		
Oman		
Qatar		
United Arab Emirates		
Saudi Arabia		
Turkey		
Tunisia		

Table 8. Variables' description and data source

Variables	Sources	Notation	Comments
Current account/GDP	IMF	CA	Percentage of GDP
Fiscal balance/GDP	IMF	FIS	Fiscal balance (percentage of GDP)
GDP growth rate	WDI	GROWTH	Real GDP growth
Terms of trade	WDI	TOT	Index, export prices / import prices
Trade openness	WDI	OPEN	(Exports + Imports) / GDP.
Old-age dependency ratio	WDI	OPOP	Ratio of the population aged 65 and older to the working-age population, and measured relative to a weighted average of country
Young dependency ratio	WDI	YPOP	Ratio of the population aged 65 and older to the working-age population, and measured relative to a weighted average of country
Population growth rate	WDI	POP	Annual growth of total population
Oil prices (US $)	WTRG Economics	OIL	Annual average of crude oil prices (in USD per barrel, inflation adjusted)
GVC participation	UNCTAD-Eora	GVC	Calculated by the author
OECD economic growth (Lagged)	OECD database	GDP-OECD	Average real economic growth rate of OECD members
Foreign direct Investment	UNCTAD	FDI	Foreign direct investment, net inflows, percentage of GDP
Net foreign assets/GDP	Lane and Milesi-Ferretti database	NFA	Percentage of GDP
Real effective exchange rate	EQCHANGE database	REER	Expressed in logarithm and defined such that an increase denotes a currency appreciation, taken from the EQCHANGE database
Democratic accountability	ICRG	DEMOC	Democratic accountability, scale of 0-6.
Bureaucracy quality	ICRG	BUREAU	Bureaucratic quality, scale of 0-4.
Control of corruption	ICRG	CORR	Corruption in government, scale of 0-6
Law and order	ICRG	LAW	Law and order, scale of 0-6
Investment profile	ICRG	INVP	Investment profile, scale of 0-12

Sources: World Development Indicators (WDI); Organization for Economic Cooperation and Development (OECD); United Nations Conference on Trade and Development (UNCTAD-Eora); EQCHANGE database provided by CEPII; International Country Risk Guide (ICRG); and World Integrated Trade Solution (WITS).