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Original Paper

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## VAT Revenue and Economic Growth in the Middle East and North Africa Region: Evidence from Panel Data Analysis

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### ABSTRACT

The Middle East and North Africa (MENA) region countries are characterized by a great diversification in the level of political, economic, and socio-political principles in the world. This diversity applies also to their tax regime, particularly VAT. Taxes are the primary source of funding for the government and public expenditures by generating considerable revenue to fund the national product. MENA region countries, like any other country with a population that typically keeps increasing throughout time, tend to boost their economic growth to ensure higher living standards, higher real income, and innovation. This study examines the impact of important drivers of MENA countries that affects GDP growth, based on a large sample of 14 countries from 2010–2020, information collected from unit cross-sections (country), and over time. Then, panel regression is the appropriate statistical method to analyze two-dimensional data, through a fixed effect panel data analysis. The sample of countries has been chosen based on pre-established criteria reflecting the availability of data for the study period. Collected data have been analyzed using the software STATA version 17. The findings obtained prove a positive significant VAT impact on economic growth for the sample of MENA region countries. This study helps policymakers in assessing and reviewing their tax policy related to VAT to maximize their source of revenue generated by this tax. The findings of this study supported that the unemployment rate and CPI decrease GDP growth, whereas VAT leads to an increase of economic growth in this region. This proves the importance of VAT tax in raising government revenue.

### KEYWORDS

Middle East and North Africa, Value added tax, GDP growth, unemployment, consumer price index

JEL H23, F43

УДК 336.22

## Поступления от НДС и экономический рост в регионе Ближнего Востока и Северной Африки: данные панельного анализа

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### АННОТАЦИЯ

Страны региона Ближнего Востока и Северной Африки (MENA) характеризуются большой диверсификацией уровня политических, экономических и социально-политических принципов в мире. Это разнообразие относится также к вопросам налогообложения, в частности к НДС. Налоги являются основным

источником финансирования государственных и государственных расходов, генерируя значительные доходы для финансирования национального продукта. Страны региона MENA, как и любые другие страны с продолжающимся в течение времени ростом населения, как правило, стремятся стимулировать свой экономический рост, чтобы обеспечить более высокий уровень жизни, более высокие реальные доходы и инновации. В данном исследовании изучается влияние важных факторов для стран MENA, влияющих на рост ВВП, на основе большой выборки из 14 стран в период с 2010 по 2020 гг., а также информации, собранной по срезам единиц (страны) на протяжении данного периода времени. Нами использовалась панельная регрессия, которая явилась подходящим статистическим методом для анализа двумерных данных с помощью анализа панельных данных с фиксированным эффектом. Выборка стран была осуществлена на основе заранее установленных критериев, отражающих наличие данных за исследуемый период. Собранные данные были проанализированы с помощью программного обеспечения STATA (версия 17). Полученные результаты доказывают положительное существенное влияние НДС на экономический рост для выборки стран региона MENA. Данное исследование поможет политикам оценить и пересмотреть свою налоговую политику, связанную с НДС, чтобы максимизировать выгоды, полученные от использования этого налога. Результаты этого исследования подтвердили, что уровень безработицы и индекс потребительских цен снижают рост ВВП, тогда как НДС приводит к увеличению экономического роста в регионе MENA. Это доказывает важность налога на добавленную стоимость для увеличения государственных доходов.

#### КЛЮЧЕВЫЕ СЛОВА

страны региона Ближнего Востока и Северной Африки, налог на добавленную стоимость, рост ВВП, безработица, индекс потребительских цен

### 1. Introduction

In the last few decades, the most important drivers of economic growth have been extensively studied. In this regard, Economic growth's relationship with the unemployment rate, consumer price index (CPI), and Value Added Tax (VAT) in developing countries specifically the Middle East and North Africa (MENA) region has been a topic that academics are interested in [1–4]. This is due to the reason that the MENA region has direct effect of oil resources on their economic changes and crucial socialist transformation over the past two hundred years [5]. Particularly, it is known for its progressive economic and political transformations and its prime geographical location for access to international markets [6].

Governments in the MENA countries are supposed to actively participate in attaining sustainable economic growth. Numerous nations in the area, particularly those that are part of the Gulf Cooperation Council (GCC), have vast oil reserves. Because many countries can rely disproportionately on oil money to maintain go-

vernment revenue levels and create limited tax bases, this character has an impact on the tax system [7].

As a result, the tax structures of many countries in this region are not resilient, and they run the danger of being disproportionately impacted by shocks to the global oil market, like the COVID pandemic and economic crisis. Many economists believe that one of the most important variables influencing a nation's growth is tax revenue. It has offered years of service to emerging nations with a predictable and stable fiscal climate to support economic growth and pay for the necessary social and physical infrastructure [8].

Although prior literature suggests that controlling CPI, VAT, and unemployment rate plays an important role in GDP growth (e.g., [9–12]), the effects, mechanism of actions of these drivers toward GDP growth have not been well studied. To the best of our knowledge, no studies so far have dealt with the impact of important drivers of MENA's economic growth.

*The purpose of this study* is to evaluate the impact of CPI, VAT, and unemploy-

ment rates on the economic growth of this region for the period 2010–2020 by utilizing a panel regression analysis for a sample of 14 countries of the MENA region.

Therefore, the paper examines the following three hypotheses:

*H1:* Increasing the consumer price index leads to a decrease in the economic growth of MENA countries.

*H2:* Increasing the VAT leads to an increase in the economic growth of MENA countries

*H3:* Increasing the unemployment rate leads to a decrease in the economic growth of MENA countries.

This study adds to the body of literature in two folds. First, it identifies the effects of GDP growth drivers in the MENA region. Second, it provides crucial policy for practical implications in the investment concepts of these countries.

The paper is organized as follow: section 2 sets out a literature review related to the relationship and effects of each of the independent variables (UR, CPI and VAT) on the dependent variable (GDP), section 3 designates the methodology applied, section 4 analyzes the simulation results, section 5 discusses the finding and alignment with other studies, while section 6 concludes.

## 2. Literature review

### 2.1. The effect of the consumer price index on economic growth

All expenditures are affected by inflation, including company costs, lending prices, living expenses, government bonds, and corporate bond rates, which have an influence on each country's total economy [2; 13].

Regulating inflation is a task of utmost significance to stabilize economies in the Middle East and North African (MENA) nations. These countries need to have strong economic and investment-friendly policies to generate sustainable and substantially enhanced economic growth [14].

The nexus between CPI and economic growth is a controversial concept. While some studies such as Mundell [15] and Tobin [16] found that inflation might in-

definitely increase economic growth, few researchers such as Eggoh & Khan [17] and Umaru & Zubairu [18] asserted a non-linear relationship between inflation and economic growth, majority of the literature state a negative relationship between inflation and economic growth. For example, Boujelbene [4] examined the relationship between economic growth and inflation by including the role of political stability in MENA countries. They discovered that there was still a two-way link between the CPI and the underground economy and that there was a one-way association among inflation and economic growth and the informal economy and growth.

Yet, maintaining political stability diminishes the inflation coefficient of the shadow economy. Hossin [11] stated a significant positive relationship between long-run GDP and to Gross Domestic Product Deflator (GDPD) in Bangladesh. However, if the inflation rate rises well above the threshold inflation level, inflation will adversely affect the economic growth of the country. The CPI and economic growth were shown to be negatively correlated by the monetarist theory and Stockman's (1981) model [19]. They underline that rising inflation results in fewer stable levels of well-being. The authors also noted that money is a component of capital and discovered a link between steady production levels and CPI that was unfavorable.

In a sample of over 100 countries from 1960 to 1990, Barro [20] indicated if a country's characteristics are held constant, such as fertility rate, and education level, there would be a significant negative relationship between CPI and economic growth. In the long term, this decline may affect people's living standards.

Moreover, Bruno & Easterly [21] used inflation data for 26 countries in the world experiencing inflation crises to test the determinants of economic growth. The authors indicated a negative correlation between CPI and economic growth when inflation is above a threshold. Furthermore, they argue that pre-crisis economic growth can be overcome if an inflationary crisis can keep inflation in check.

In Pakistan, inflation and unemployment were analyzed in relation to economic growth by Shahid [22], who found that political stability and a good educational system had a significant impact on lowering unemployment and boosting economic growth.

Erbaykal & Okuyan [23] stated no causality relationship between CPI to economic growth, a causality relationship has been found between economic growth to inflation. In certain South Asian nations, including India, Bangladesh, India, Sri Lanka, and Pakistan, Mallik & Chowdhury [12] investigate the link between CPI and both short- and long-term economic growth. Rather than the short-term, this circumstance has had a detrimental impact on the dynamics of long-term economic growth. In conclusion, we test the following hypothesis based on the literature review, monetarist theory, and Stockman's work [19].

*H1: Increasing the consumer price index leads to a decrease in the economic growth of MENA countries.*

## **2.2. The effect of VAT on the economic growth of MENA countries**

According to Daniel et al. [24], taxes are a major source of income for governments, and the amount of taxes collected in each nation varies according to its economic, demographic, political, and institutional conditions. Reduced taxes enable businesses to increase their income or cut their pricing [25].

Value Added Tax (VAT) is another type of indirect tax that is applied to the value added at every stage of manufacturing. Being a crucial instrument in fiscal policy in every country, it is sometimes known as a "goods and services" tax [10]. Each person is required to rate and accumulate while purchasing most goods and services since VAT is a significant source of revenue for the nation's budget. The VAT principle then connects to the registered payer supplier [26].

The tax system is a mechanism for a levying authority of the government to compulsorily collect money. Taxation is an accounting regulation [27]. The degree

to which distinctive regulations, which often come from specific political and legal systems, are followed varies among accounting systems in the MENA area.

According to the neoclassical theory of economic growth, short-term economic equilibrium can be achieved with more labor and capital, while technology is an exogenous factor that significantly affects the overall performance of the economy [28].

Jalata [29] discovered that VAT significantly increased the economic growth of Ethiopia. According to Hajdúchová et al. [30], the Slovak Republic's value-added tax sales increased from the years 1993 to 2015; nonetheless, sales from other types of taxes were larger than the VAT revenue [31].

Similar to this, some taxes, according to Stoilova [32], contribute to economic growth in Europe. The author concluded that tax revenue may increase GDP, but that production taxes, together with import taxes, were beneficial for the economy while value-added taxes were detrimental.

According to Bansal & Alfardan [33], the short-term effects of VAT are detrimental to Bahrain since they increase inflation and discourage foreign investment. Though and, over the long term, as public debt declines in addition to a 2% increase in GDP, the effect of VAT on economic growth turns out to be positive. Moreover, VAT can have an indirect effect on the economy, as Lan et al. [34] noted that in China, replacing company taxes with value-added taxes will stimulate companies to invest in R&D, modernize industries, and eventually spur economic growth.

Emmanuel [35] examined the effects of VAT on economic growth and total tax revenue in Nigeria and stated that VAT has a significant effect on GDP and also on total tax revenue. VAT stability thereby gave MENA countries a predictable and stable financial environment to spur their economic progress for many years [36]. The goods and services sector currently receives the most consideration under the general tax structure in the MENA area,

accounting for 39.23% of all tax revenue, followed by the income, profit, and capital gains sector at 23.83% [1].

The level and range of VAT rates in MENA are within the bounds of accepted worldwide practice, with the exception of standard rates in the European Union (EU), which are ordinarily higher than the highest MENA rate of 20 percent in Morocco [37]. Therefore, we assume that an increase in value-added tax would lead to a significant increase in economic growth in MENA countries and hypothesize as below:

*H2: Increasing the VAT leads to an increase in the economic growth of MENA countries.*

### **2.3. The effect of the unemployment rate on the economic growth of MENA countries**

Unemployment occurs when labor costs (wages) exceed final earnings for any reason. Unemployment remains an issue globally, and unemployment rates vary in each country. The unemployment rate is therefore viewed as a function of population growth [9]. Due to the critical role of the unemployment rate on the GDP and economic growth, the literature is replete with studies that reflect the relationship between unemployment and economic growth.

The nexus between the unemployment rate and GDP in the economy has been controversial and research in this area is vague and associated with different results. Okun [38] is the pioneer of this association and describes the link between short-term movements of real GDP and changes in unemployment. Okun's (1962) law [38] states the negative correlation between economic growth and unemployment. When GDP is growing rapidly, unemployment will fall, when growth is very low or negative, unemployment will rise consequently, and when growth is at potential, unemployment will remain flat.

In a similar line, several research (such as Niebuhr [39] and Sadiku et al. [40]) confirm the validity of the relationship between output and unemployment rate by applying Okun's law [38].

Real economic growth and unemployment typically have an inverse connection, according to studies like Huang & Yeh [41] analysis. Nevertheless, the degree of this correlation differs depending on the sample and location studied. According to Evans [42], unemployment and inflation hurt GDP because foreign debt, GDP, and unemployment are non-stationary and integrated at the first-order difference.

Chand et al. [43] determined whether the GDP of India is in charge of a 48% of unemployment rate with a strong inverse relationship. Li & Liu [44] examined the relationship between the unemployment rate, economic growth, and inflation in China. The authors revealed that unemployment impact negatively on GDP whereas inflation affects growth positively in China.

The MENA area has a diverse range of economies, each with its own labor markets and economic frameworks, though there are notable economic distinctions between the region's oil- and non-oil-producing nations. Therefore, unemployment with its financial and social implications is one of the most issues going through MENA countries [3]. Therefore, we complement prior literature in this attitude and develop the following hypothesis:

*H3: Increasing the unemployment rate leads to a decrease in the economic growth of MENA countries.*

## **3. Methodology**

### **3.1. Sample and Data Collection**

The paper includes 14 countries of the MENA region (United Arab Emirates, Turkey, Saudi Arabia, Palestine, Morocco, Malta, Lebanon, Jordan, Israel, Georgia, Cyprus, Azerbaijan, Armenia, and Afghanistan), a sample for which data is available over the study period.

The study has included a total of 11 years, from 2010 to 2020. The total number of observations in this grouping is 14 states for 11 years, a total of 154 observations. The study covers annual data for the period 2010–2020, retrieved from the World Bank database.

### 3.2. Empirical Model

Panel data analysis allows for the evaluation of both state and temporal differences. Panel regression is often known as longitudinal data or cross-sectional data. Taking data into a Panel enables us to have more data, which improves accuracy [45]. With regards to the variables of this study; GDP growth is the dependent variable, and the independent variables are VAT revenue, unemployment rate, and CPI.

Since it enables us to take into account the unobserved heterogeneous changes in the dependent variable that are peculiar to numerous countries, this study adopts the fixed effects (FE) model as its model specification. By generating various estimates for each cross-section unit (country), all the intercepts in this estimation varied across cross-section units.

A modeling approach called panel regression, often known as longitudinal data or cross-sectional data, is tailored to panel data [46]. In econometrics, where the statistical units are behaviorally provided in panel data to be evaluated over time, a longitudinal approach is used, and the applicability of this modeling strategy is widespread. In the context of this study, a cross-sectional analysis of secondary data collected from 2010 to 2020 was done while considering the presence of 14 countries, four variables, and 154 observations.

The econometric model used in this study has the subsequent form:

$$GDP_{it} = B_0 + B_1VAT_{it} + B_2UR_{it} + B_3CPI_{it} + \varepsilon_{it}, \quad (1)$$

where  $B_0$ ,  $B_1$ ,  $B_2$  and  $B_3$  are coefficients;  $i$  – indices for the cross-sectional countries which include 14 countries of MENA;  $t$  – are indices time/period (2010–2020);  $GDP_{it}$  – Gross Domestic Product;  $VAT_{it}$  – Value-added tax revenues;  $UR_{it}$  – Unemployment Rate;  $CPI_{it}$  – Consumer Price Index;  $\varepsilon_{it}$  – error term.

Based on the above-cited equation, we examine the sign, magnitude, and significance of coefficients  $B_1$ ,  $B_2$ , and  $B_3$ . For instance, we expect positive signs and high significance of the VAT revenue variable and a negative and significant impact on

the unemployment rate and consumer price index. The error term represents the effect of omitted variables that are unusual to both the individual periods and time periods.

Furthermore, the analysis determines the coefficient of correlation ( $r$ ), the coefficient of determination ( $R^2$ ), the  $F$ -statistics, the *Hausman test*, and the  $P$ -value in establishing the appropriateness of the selected model (fixed or random effect). And, in defining the probability values of different independent variables in relation to the dependent variable, if the p-values results are below 0.05 significance level using the 2-tailed test, then the relationship is established between the independent and dependent variables.

## 4. Results

### 4.1. Descriptive Statistics and Correlation Matrix

In this section, a summary of the key characteristics of the study's data, and descriptive statistics present the variables in the simplest possible terms has been provided. Continuous data contains percentages, frequencies, averages/means, and standard deviations. Contrarily, correlation assesses the intensity of a relationship or association between two variables. Additionally, correlation analysis is an important technique for anticipating the possibility of multi-collinearity. The results of the descriptive analysis and correlation analysis are summarized in Tables 1 and 2.

As shown in the above table, there are 154 observations in the study composed of 14 countries.

GDP growth ranges from -25.9% to 14.4% and averages 2.80%. Minimum values were revealed on the independent UR, 1.64; CPI, 1; VAT Revenue, 0.310943. Moreover, evaluation of the maximum values provided the following: UR, 26.26; CPI, 263.22; VAT Revenue, 5700.

Results from Table 2 revealed the correlations of the study constructs, without excluding the influence of other variables, Pearson's correlation coefficient evaluates the relationship between two variables

(Dependent and Independent). The table shows a low correlation between the dependent and each of the independent variables, since ( $r$ ) is less than 0.5, which means the absence of multicollinearity between independent variables.

#### 4.2. Results of Panel Regression

The panel regression version 17 was used in this study to determine the impact of VAT revenue on GDP growth. The random-effects model and the fixed-effects model establish the individual relationships between independent variables on dependent variables. To find out which of the model is most appropriate, the Hausman test was run, and the results showed a p-value of  $0.000 < 0.05$ , which means that the use of the Fixed effects model is suitable.

Tables 3, 4 and 5 illustrate, respectively, the results of the random-effects model, fixed effect and Hausman test respectively. The regression determines the individ-

ual relationships between independent variables (VAT revenue, unemployment rate, and CPI) on the dependent variable (GDP growth).

As shown in Table 6, there are fourteen groups or countries with a total number of 154 observations and with the data collected from 2010 to 2020. Results showed that 39.76% of the changes or variability of the dependent variable (GDP growth) can be explained by the independent variables included in the model, namely: Consumer price index, VAT revenue, and unemployment rate.

Furthermore, the model used is suitable with a p-value of 0.000 which is less than the 0.05 level of significance. From the outcome, it was revealed that all independent variables significantly impact the dependent variable (GDP growth). CPI has a negative ( $t = -3.72$ ) and significant impact ( $p = 0.000$ ) on economic growth. Which means that an increase in inflation rate will lower economic growth.

Table 1

#### Descriptive Statistics of Study Variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
GDP Growth	154	-25.9	14.4	2.801948	4.579386
UR	154	1.64	26.26	10.58034	5.921048
CPI	154	1	263.2236	117.1829	25.81475
VAT Revenue	154	0.310943	5700	438.1649	1276.384

Table 2

#### Correlation Matrix of the Study Variables

	Constructs	GDP	VATR	UR	CPI
GDP	Pearson Correlation	1	-0.188	-0.0085	-0.2768
	Sig. (2-tailed)		0.019*	0.2916	0.005**
	N	154	154	154	154
VATR	Pearson Correlation	-0.188	1	-0.0308	0.1065
	Sig. (2-tailed)	0.019*		0.3429	0.83429
	N	154	154	154	154
UR	Pearson Correlation	-0.0085	-0.0308	1	0.0769
	Sig. (2-tailed)	0.2916	0.3429		0.3429
	N	154	154	154	154
CPI	Pearson Correlation	-0.2768	0.1065	0.0769	1
	Sig. (2-tailed)	0.005**	0.83429	0.3429	
	N	154	154	154	154

Notes: \*\* Correlation is significant at the 0.01 level (2-tailed), \* Correlation is significant at the 0.05 level (2-tailed).



Table 3

Panel Regression- Random effects - Result					
Random-effects GLS regression		Number of obs	=	154	
Group variable: C_ID		Number of groups	=	14	
R-squared:		Obs per group:			
within	= 0.1654	min	=	11	
Between	= 0.0676	avg	=	11	
Overall	= 0.1066	max	=	11	
		Wald chi2(3)	=	18.87	
corr(u_i, X)	= 0 (assumed)	Prob > chi2	=	0.0003	
GDP Growth	Coefficient	std. err.	z	P >  z	[95% conf. interval]
vat Revenue Billion	0.007329	0.000301	-1.82	0.068	-0.0011397 0.0000414
UR	-0.0661089	0.064343	-1.03	0.304	-0.1922179 0.0600001
CPI	-0.0494674	0.013983	-3.54	0.000	-0.0768741 -0.0220606
_cons	9.53875	1.756491	5.43	0.000	6.096091 12.98141
sigma_u	0.51774419				
sigma_e	3.7562372				
rho	0.0186445	(Fraction of variance due to u i)			

Table 4

Panel Regression- Fixed Effect- Result					
Fixed-effects (within) regression		Number of obs	=	154	
Group variable: C_ID		Number of groups	=	14	
R-squared:		Obs per group:			
within	= 0.3112	min	=	11	
Between	= 0.4341	avg	=	11	
Overall	= 0.0108	max	=	11	
		F(3,137)	=	20.63	
corr (u_i, X)	= -0.9659	Prob > F	=	0	
GDP Growth	Coefficient	std. err.	z	P >  z	[95% conf. interval]
vat Revenue Billion	0.007329	0.0019023	3.85	0.000	0.0035673 0.0110908
UR	-0.6187928	0.1680608	-3.68	0.000	-0.9511215 -0.2864641
CPI	-0.05513	0.0148125	-3.72	0.000	-0.0844207 -0.0258393
_cons	12.59797	2.534033	4.97	0.000	7.587092 17.60884
sigma_u	11.380133				
sigma_e	3.7562372				
rho	0.90175716	(Fraction of variance due to u i)			
F test that all u_i=0: F(13, 137) = 5.08		Prob > F = 0.0000			

However, VAT revenue has a positive ( $t = 3.85$ ) and significant impact on GDP growth ( $p = 0.000$ ). this implies that an expansion of VAT revenue will contribute significantly to the improvement of economic growth. The unemployment rate has a negative ( $t = -3.68$ ) and significant impact ( $p = 0.000$ ), a high percentage of unemployment rate is harmful to economic growth.

**5. Discussion**

The findings of this study provide valuable insights into the relationship between VAT revenue and economic growth in the MENA region. The results indicate a positive impact of VAT on economic growth in the sample of 14 countries analysed.

Based on these findings, *H1* is supported since CPI has a negative and

Table 5

**Hausman test fixed Random effects**

__Coefficients__				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	Std. err.
VATRev~n	0.007329	-0.0005491	0.0078782	0.0018783
UR	-0.6187928	-0.0661089	-0.5526839	0.1552562
CPI	-0.05513	-0.0494674	-0.0056626	0.0048864

b = Consistent under H0 and Ha; obtained from xtreg  
 B = Inconsistent under Ha, efficient under H0; obtained from xtreg

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Test of H0: Difference in coefficients not systematic

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chi2(3)	=	(b-B)ᵛ[(V_b-V_B)^(-1)](b-B)
	=	447.67
Prob > chi2		0.000

Table 6

**Linear Regression Fixed effect specification Result**

Fixed-effects (within) regression	Number of obs	=	154
Group variable: C_ID	No. of categories	=	14
	F(3, 137)	=	20.63
	Prob > F	=	0.000
	R -squared	=	0.3976
	Adj R -squared	=	0.3272
	Root MSE	=	3.7562

GDP Growth	Coefficient	std. err.	z	P >  z	[95% conf. interval]	
vat Revenue Billion	0.007329	0.001902	3.85	0.000	0.0035673	0.0110908
UR	-0.6187928	0.168061	-3.68	0.000	-0.9511215	0.2864641
CPI	-0.05513	0.014813	-3.72	0.000	-0.0844207	-0.0258393
_cons	12.59797	2.534033	4.97	0.000	7.587092	17.60884

F test of absorbed indicator: F(13, 137) = 5.079                      Prob > F = 0.0000

significant impact on economic growth which is aligned with previous studies [4; 19]. Studies have found that high inflation is associated with a fall in economic growth measured by GDP. For 26 countries that had periods of high-level inflation, their GDP per capita was low-down [21].

*H2* also accepted that there is a significant impact of VAT revenue on economic growth in the MENA region. These results are comparable to previously published papers (e.g. [33–35]).

Furthermore, *H3* is assumed, so the unemployment rate negatively impacts the economic growth in the MENA region. The results aligns with the study of Li & Liu [44], Huang & Yeh [41] and Chand et al. [43].

Policy makers in the MENA region can use the results of this study to assess and review their tax policies related to VAT to maximize their revenue sources generated by this tax.

However, there are some limitations to this study.

First, the sample size includes only 14 countries from the MENA region. Therefore, the results may not be generalizable to other regions or countries.

Additionally, the study only looks at the impact of VAT on economic growth and does not consider other types of taxes, such as corporate tax and income tax.

Future research could expand on this study by including other types of taxes, direct and indirect, to assess which type contribute more to economic growth.

Despite these limitations, this study provides valuable insights into the impact of VAT on economic growth in the MENA region. The findings of this study can be used by policymakers to assess and review their tax policies related to VAT to maximize their revenue sources generated by this tax.

## 6. Conclusion

Governments use the value-added tax, commonly referred to as consumption tax, as a tool to raise money to assist the national economy. In comparison to other regions, the MENA region depends more on taxes on goods and services, as an es-

sential tax source. There is also a far lower reliance on other taxes, like income, capital gain, and social security taxes.

This study analyzed the effects of CPI, VAT, and the unemployment rate of GDP growth of 14 MENA countries in the period of 2010–2020 through panel data analysis. The findings of this study supported that the unemployment rate and CPI decrease GDP growth, whereas VAT leads to an increase of economic growth in this region. This proves the importance of VAT tax in raising government revenue.

The MENA nations will need to develop stronger tax capacities in the future to handle crises like the pandemic and rising debt levels. There is potential for those nations to raise more tax revenue and simultaneously address the rising inequality in the region, which is projected to get worse due to the pandemic, by raising their income taxes (and lowering their consumption taxes). The International Monetary Fund (2022) minutes that by passing more progressive taxes with fewer exemptions, governments may be able to meet existing expenditure goals and build more equitable societies.

The countries in the MENA area have some of the most different political, economic, and socio-political philosophies in the world. It is one of the most diverse regions in the world. Due to this variability, a smaller selection of countries must be considered when generalizing tax reform across the area.

In this study, we have been limited to a sample of 14 countries, given the difficulty in obtaining complete VAT tax revenue data in all countries of the region over the study period.

Future research will examine the impact of other types of taxes, within the government tax reform program for all countries members.

Moreover, using Difference-in-Difference (DID) estimation technique can be used to estimate the effect of a certain intervention or treatment, which can be in our context, a change in tax policy or large-scale tax program implementation.

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