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The Impact of Gender Equality on Economic Growth and Human Development in the MENA Region: Empirical Evidence from 2006-2022

Imane OUANAIM
Faculty of Economics and Management, Ibn Tofail University, Kénitra, Morocco.

Mariem LIOUAEDDINE
Faculty of Economics and Management, Ibn Tofail University, Kénitra, Morocco.

Ayoub SAADI
Faculty of Law, Economics and Social Sciences, Hassan II University, Casablanca, Morocco.

Abstract. Gender inequality represents a critical economic challenge, significantly affecting global economic prospects. This study aims to scientifically assess the influence of gender inequality and their diverse dimensions on the growth prospects of 16 nations in the MENA area from 2006 to 2022. Our research indicates that gender equality significantly enhances economic growth and human development in MENA nations. Moreover, it is clear that multiple facets of gender equality, economic participation and opportunity, educational attainment, health and survival, and women's political empowerment, positively impact the economic development of the region's economies.

Keywords: *Gender inequality; Economic growth; Human development index; Panel data; MENA.*

1. Introduction

The relationship between gender inequality and economic development is a major concern in the academic, economic, and political spheres (Duflo, 2012 ; Ferrant, 2015 ; Ram et al., 2022). Internationally, gender disparities are pervasive, with developing economies accounting for a significant share of this inequality (Altuzarra et al., 2021).

The Middle East and North Africa (MENA) region ranks relatively low in terms of gender equality compared with other regions (Balima and Gomes, 2022). Countries in the MENA region exhibit the highest levels of gender inequality worldwide. Despite closing 60% of the gender gap, the region still suffers from a substantial 40% disparity (Sharma et al., 2021). Although there have been significant changes in the social and economic context, including urbanization, industrialization, increased female education, and lower fertility rates, substantial disparities exist between men and women regarding their participation and access to opportunities in the economic and political domains (Karam and Afiouni, 2014 ; Bastian et al., 2019).

Women in the MENA region face a "double burden," limiting their participation in the labor market and influencing their ability to pursue highly skilled employment (Taheri et al., 2021; Begzsuren et al., 2022). This phenomenon is characterized by women taking on both paid and unpaid professional responsibilities, creating challenges in balancing work and personal life. The perception of this dual role often discourages women from participating in the workforce to avoid the associated challenges. While the double burden is not unique to the MENA region, it is particularly pronounced in this area, impacting women's engagement in highly skilled professions (Balima and Gomes, 2022).

Despite a growing body of empirical work on gender inequality and economic growth, the MENA literature suffers from three notable gaps. First, most studies focus either on aggregate gender indices or on a single sub-dimension, without exploring the differential contribution of each pillar within a unified framework. Second, very few studies jointly examine both economic growth (GDP per capita) and human development (HDI) as dependent variables, limiting the comprehensiveness of policy conclusions. Third, the period 2006–2022 encompasses major structural disruptions, including the Arab Spring, regional conflicts, and the COVID-19 pandemic, that have not yet been adequately addressed in the empirical literature. This study is designed to fill these gaps.

In this context, we examine the following question in detail: What is the impact of gender inequalities on economic growth in the MENA region? This involves analyzing the effects of gender inequality from a macroeconomic perspective. The argument is that gaps in pay and access to resources and jobs, among other factors, not only have negative microeconomic effects on women but also entail significant costs for the economy as a whole (Cuberes & Teignier, 2014; Belingheri et al., 2021). To support this argument quantitatively, our objective is to provide empirical evidence on the impact of gender inequality as well as gender gaps in different aspects: economic participation and opportunities, educational attainment, health and survival, and political empowerment of women. We use data from several databases, such as the World Bank, World Economic Forum, and Penn World Table, for the period 2006-2022. Our study relies on fixed-effects and random-effects panel data modeling for a panel consisting of 16 countries in the MENA region.

This study distinguishes itself from previous work by adopting a mixed approach, examining the relationship between the overall gender inequality index and economic growth, followed by a disaggregated study using sub-indices (economic participation and opportunities, educational attainment, health and survival, and political empowerment of women) to identify the factors that most influence the economic growth of countries in the MENA region.

This paper is structured as follows. The first section provides an overview of the theoretical and empirical literature to better understand the role of gender inequalities with a particular focus on studies conducted in the MENA region. The second section presents the empirical methodology and data used. The interpretation of the results and implications of gender inequalities are discussed in the third section. The final section concludes the paper.

2. Overview of theoretical and empirical literature

The participation of women in the economic sphere is crucial for the growth prospects of countries, especially in developing economies where educational, social, and economic advancement opportunities are generally significantly lower for women than for men (Stotsky, 2006; Cerra et al., 2021).

The complex relationship between gender inequalities and economic growth has been the subject of extensive theoretical analysis, highlighting a positive link between improving gender equality and key factors of economic growth (Bandiera and Natraj, 2013; Altuzarra et al., 2021). The literature emphasizes that promoting gender equality can play a significant role in economic growth by expanding the stock of human capital, increasing labor productivity, and ultimately enhancing economic growth (Cuberes & Teignier, 2014; Nguyen, 2021).

Various direct and indirect transmission channels have been suggested through which the status of women in society can have important implications for economic growth (Brummet, 2008). First, the gender gap in education and literacy appears to be detrimental to economic growth for several reasons. If women have equal access to educational opportunities, the overall stock of human capital in society can be reduced. This can also lead to inefficient resource allocation

if, influenced by social norms and cultural values, household investment decisions in children's education are biased in favor of less-talented boys over more-talented girls (Kabeer and Natali, 2013 ; Kabeer, 2021).

Low human capital and resource allocation can slow economic growth. Household fertility decisions can also be influenced by women's education levels. Educated women tend to have fewer children, which can increase female labor force participation and thus stimulate economic growth by expanding economic activities. Therefore, owing to direct and indirect effects, gender inequality is expected to have a significant impact on growth (Klasen and Lamanna, 2009 ; Karoui and Feki, 2018).

Similarly, and particularly in developing countries, women suffer from a "double burden" that hinders their labor market participation and affects their perceived ability to hold highly skilled jobs (Begzsuren et al., 2022). Lower labor market participation for women is mainly explained by their disproportionate responsibility for unpaid domestic and care work, gender segregation in higher-paying professions, earlier retirement age for women, and deeply rooted social norms and gender stereotypes (Baliamoune-Lutz and McGillivray, 2015).

Several studies empirically examine the relationship between gender inequality and economic growth in the MENA region. Using panel data regressions, Klasen and Lamanna (2003) investigate the extent to which gender gaps in education and employment reduced economic growth in the MENA region for the period 1960-2000. They find that the "costs" to growth from gender gaps in education alone amount to about 0.7 percentage points per capita per year, and the combined "costs" from gaps in education and employment result in growth differences of 0.7 to 1.5 percentage points. Gender gaps in employment appear to have a greater effect than those in education.

Similarly, Ibourk and Amaghouss (2013) empirically examined the extent of educational inequality and its impact on economic growth for a sample of 15 MENA countries over the period 1970-2010. Using panel regressions, they found that educational inequalities have explicitly decreased in all countries, for both men and women, and across all age groups. Additionally, gender inequality negatively and significantly affects economic growth in MENA countries.

Kucuk (2013) sought to identify whether the relationship between economic development and gender inequality in the MENA region represents an S-shaped Kuznets curve (a non-monotonic relationship). To identify the nature of this relationship, he used a dataset covering 17 countries over the period 1991-2015, employing a panel data model. The results show a linear, rather than curved, relationship between economic development and life expectancy at birth, maternal mortality ratio, and female employment in services. However, the results demonstrate an S-shaped Kuznets curve relationship between economic development and gender inequality, particularly for women's labor force participation and female unemployment rates.

Using a similar methodology, El Alaoui (2016) examined the impact of women's education on economic growth for four MENA countries (Morocco, Egypt, Tunisia, and Algeria) over the period 1960-2012. She finds that women's education, particularly at the tertiary level, female labor market participation, and institutional capital, positively impact economic growth. Conversely, primary and secondary school enrollment is negatively related to economic growth. The author concludes that tertiary education is a fundamental factor in the economic growth of the region.

Moreover, Tabari and Elmi (2016) examined the effect of both women's and men's education on economic growth in selected Middle Eastern and North African countries during the years 1990-2012. Using panel data modeling, they find that increasing the enrollment ratio of boys

relative to girls leads to a negative effect on economic growth. However, this does not imply that men's education is less important ; it shows a negative impact of gender inequality on the economy.

Al-Shammari and Al Rakhis (2017) empirically examined the influence of gender inequality on economic growth in the Arab region. The sample includes 19 countries for the period 1990-2014, using the fixed-effects panel data method. They show no evidence that gender inequality in education and labor force participation hinders economic growth in the Arab region. The findings of this study indicate that the main drivers of economic growth in the Arab region are capital accumulation and population growth.

Matallah et al. (2017) analyzed the impact of gender inequality and the labor market on economic growth, emphasizing the role of governance over the period 1996-2013 for 10 MENA countries (Algeria, Egypt, Iran, Jordan, Lebanon, Morocco, Syria, Tunisia, Turkey, and Yemen). Their results indicated that gender inequality has a negative and significant impact on economic growth. Furthermore, the employment rate has a statistically significant positive effect on economic growth.

Bessedar and Mokhtari (2020) analyze the impact of gender inequality on economic growth in MENA countries between 2006-2017, using gender indicators from the Global Gender Gap Index published by the World Economic Forum. The authors demonstrated a positive and statistically significant relationship between gender equality and economic growth in the MENA region.

Agu and Aguegboh (2021) studied the link between gender inequality and economic development in eight African countries for the period 1994-2018. This study uses the autoregressive distributed lag (ARDL) model to determine the short- and long-term relationships between variables. They find that, in the long term, women's labor force participation promotes economic development in Botswana, Egypt, and Mauritius. Conversely, their results reveal that the number of women in national parliaments and women's labor force participation decreases with economic development in Tunisia and Gabon.

More recently, Jaidane Mazigh et al. (2023) examined the relationship between gender inequality, corruption, and economic growth in 13 MENA countries during the period 2006-2020. Using the ARDL-PMG approach, the authors demonstrate that greater involvement of women in the economic and political spheres is associated with lower levels of corruption and higher economic growth. The results also indicate that the link between corruption and gender depends on context and institutional factors. The role of democracy and political stability in explaining this interaction is particularly important, especially when women are well-represented in decision-making positions.

The choice of sub-dimensions is theoretically grounded. The Economic Participation and Opportunity sub-index captures labour market exclusion and wage gaps that constrain aggregate productivity in MENA economies (Cuberes & Teignier, 2014). Educational Attainment reflects gender-differentiated human capital accumulation, whose negative consequences for growth have been extensively documented for the region (Klasen & Lamanna, 2009; El Alaoui, 2016). Health and Survival proxies for demographic constraints and reproductive health outcomes, which affect women's labour supply and intergenerational human capital transmission (Sinha et al., 2007). Finally, Political Empowerment captures institutional inclusiveness and governance quality, factors shown to condition economic performance in MENA countries (Matallah et al., 2017). Together, these four dimensions offer a comprehensive and theoretically coherent decomposition of gender inequality.

3. Empirical Methodology and Data Sources

To address our central question regarding the impact of gender inequalities on growth in MENA countries, we drew inspiration from empirical literature on the subject. Specifically, our econometric approach is based on the studies of Mitra et al. (2015), Al-Shammari and Al Rakhis (2017), Matallah et al. (2017), and Bessedar and Mokhtari (2020). We utilized a dataset comprising 16 MENA countries (Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Iran, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Oman, Qatar, Tunisia, Yemen) for the period 2006-2022. The data[1] are sourced from various sources, including the World Bank, World Economic Forum, Penn World Table 10.01, and Center for Systemic Peace.

From the above, our two econometric specifications are as follows:

$$\boldsymbol{Y_{it} = \alpha_i + \beta_1 Gender\_index_{it} + \gamma_i Z_{it} + \varepsilon_{it}}$$

$$\boldsymbol{Y_{it} = \alpha_i + \beta_1 EPO_{it} + \beta_1 EA_{it} + \beta_1 HS_{it} + \beta_1 PE_{it} + \gamma_i Z_{it} + \varepsilon_{it}}$$

Our empirical strategy consists of applying panel data regressions on two endogenous variables, denoted Y_{it}: GDP per capita growth (PPP) and the Human Development Index. Our variables of interest included the Global Gender Gap Index ($Gender\_index_{it}$) and its four dimensions: Economic Participation and Opportunity (EPO_{it}), Educational Attainment (EA_{it}), Health and Survival (HS_{it}), and Political Empowerment (PE_{it}).

The control variables include domestic investment ($INVST_{it}$), measured by gross capital formation as a percentage of GDP; human capital (HC_{it}), measured by a composite index based on years of schooling and returns to education; trade openness (OUV_{it}), measured by the sum of imports and exports as a percentage of GDP; foreign direct investment as a percentage of GDP (FDI_{it}); financial development, measured by credit to the private sector as a percentage of GDP (FD_{it}); and institutional quality ($INST_{it}$) .

The table 1 above describes the set of variables and mentions their sources.

Table 1 : List of variables and sources.

VARIBALE	DESCRIPTION	SOURCE
GDP	Gdp Per Capita Growth	World Bank
ECOPAR	Economic Participation And Opportunity	GGGR
EDUC	Educational Attainment	GGGR
HEALTH	Health And Survival	GGGR
POLIT	Political Empowerment	GGGR
INVST	Domestic Investment	World Bank
HC	Human Capital	PWT 10.01
OUV	Trade Openness	World Bank
FDI	Foreign Direct Investment	World Bank
FD	Financial Development	World Bank
INST	Institutional Quality	The Policy Project, Center For Sytemic Peace

Our methodology is based on panel data econometrics. The models used in this study are the fixed effects model (FE), the random effects (RE) model, and finally the Hausman test.

[1] A detailed description of the variables and data sources is provided in the appendix. (see Appendix, Table 4).

The choice of fixed-effects (FE) and random-effects (RE) estimators is motivated by the structure of our panel data and the specific characteristics of the MENA region. MENA countries are highly heterogeneous in terms of natural resource endowments, cultural norms, and institutional quality, sources of unobserved individual heterogeneity that would bias OLS estimates. FE estimation addresses this by sweeping out all time-invariant country-specific effects, regardless of their correlation with the regressors (Wooldridge, 2010). RE estimation is used in specifications where such correlation is assumed absent, yielding more efficient estimates. The Hausman (1978) specification test is then applied to determine which estimator is consistent, based on the null hypothesis of no correlation between individual effects and the regressors.

4. Results and discussion

Our estimation results, whether using fixed- or random-effects models, reveal a positive and significant correlation between gender equality[2] and both economic growth and the Human Development Index in the MENA region (Table 2). This finding corroborates previous studies suggesting that promoting gender equality contributes to the economic growth of developing countries, particularly those in the MENA region (Kucuk, 2013 ; El Alaoui, 2016 ; Bessedar & Mokhtari, 2020 ; Jaidane Mazigh et al., 2023).

The positive impact of gender equality in the MENA region can be explained through various channels (Pervaiz et al., 2023). Gender equality in education ensures access to educational facilities for all, regardless of gender, thereby increasing the overall stock of human capital. Given the importance of human capital in the economic growth process, an increase in the stock of human capital stimulates economic growth (Benavot, 1989 ; Ward et al., 2010 ; Altuzarra et al., 2021).

Gender equality can also enhance allocative efficiency. If parental decisions to invest in their children's education are not influenced by gender biases, they would invest in the education of the most capable and talented children, regardless of their gender (Pasqua, 2005; Shang, 2022). This would lead to optimal allocation of household resources. Improved allocative efficiency is beneficial for stimulating economic growth.

Beyond the direct effects of women's education, it can also have indirect effects on economic growth by reducing fertility and improving the education and health of the next generation (World Bank, 1994 ; Sinha et al., 2007).

Regarding the control variables, our empirical results also highlight that the quality of institutions negatively affects the creation of an environment conducive to improving economic growth in the MENA region (Gazdar & Cherif, 2015 ; Boukhatem & Ben Moussa, 2023). However, in the context of MENA countries, our estimates indicate that domestic investment and financial development have a positive and significant influence on the evolution of per capita GDP growth and the Human Development Index.

Domestic investment has emerged as a key driver of economic growth and Human Development Index in the MENA region. Increasing national investments contributes not only to the expansion of infrastructure but also to the improvement of growth (Bisat et al., 1996 ; Ofosu-Mensah Ababio et al., 2022). Similarly, financial development, measured by the share of credit to the private sector in GDP, is a major factor for economic growth in MENA countries. A robust financial infrastructure facilitates resource mobilization and encourages

[2] The Global Gender Inequality Index is measured on a scale of 0 (disparity) to 1 (parity) across four dimensions: Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment. It provides country rankings that enable effective comparisons between and within regions and income groups.

entrepreneurial activities, thereby boosting economic growth prospects in the region (Barajas et al., 2020).

Similarly, trade openness through increased international trade is a critical driver of economic growth in the MENA region. Active participation in international trade not only opens access to new markets but also leverages comparative advantages (Jaumotte et al., 2013 ; Taiwo Onifade et al., 2022).

Similarly, foreign direct investment (FDI) (% of GDP) plays a crucial role in the economic development of MENA countries. The influx of foreign capital promotes technology transfer and job creation, significantly contributing to a region's per capita GDP growth (Sanchez-Bella, 2018 ; Sattar et al., 2022).

Our estimation results confirm the role of human capital in improving the HDI in MENA countries. This positive relationship can be attributed to the fact that increasing the skills, knowledge, and training of the population directly contributes to improved living conditions and individual capacities (Becker, 1962 ; Kassouri & Altıntaş, 2020).

Regarding the statistical validity of our results, the Fisher and Chi-squared tests were below 5% and 10%, respectively, confirming the validity of our findings. Similarly, the probabilities associated with the Hausman test were below 5%.

Table 2 : Global index estimation results

Variables	GDP per capita growth				Human Development Index			
	Model 1		Model 2		Model 3		Model 4	
	FE	RE	FE	RE	FE	RE	FE	RE
GENDER_INDEX	19.066* (9.747)	9.199* (8.196)	14.687* (8.680)	6.541* (7.318)	0.346*** (0.054)	0.364*** (0.054)	0.237*** (0.049)	0.257*** (0.051)
INVST	3.690** (1.596)	2.488* (1.316)	-	-	0.029*** (0.006)	0.031*** (0.006)		
HC	1.200 (1.420)	0.075 (0.651)	1.678 (1.248)	0.610 (0.547)	0.011 (0.007)	0.016** (0.007)	0.014** (0.007)	0.019** (0.006)
FDI	-	-	0.459 (0.352)	0.741** (0.306)			-0.003 (0.002)	-0.003 (0.0021)
OUV	-	-	0.069*** (0.022)	-0003 (0.014)			-0.016 (0.0104)	-0.011 (0.016)
FD	1.082** (0.418)	0.752** (0.358)	-	-	0.002*** (0.001)	0.001*** (0.0006)		
INST	-0.286 (0.193)	-0.065 (0.088)	-0.303* (0.179)	-0.108 (0.075)	-0.0003 (0.001)	-0.0009 (0.001)	-0.0001 (0.001)	-0.0006 (0.001)
Constant	-27.402*** (8.502)	-14.00** (6.168)	-19.745** (6.149)	-5.792 (4.286)	-19.745** (6.149)	-19.745** (6.149)	0.661*** (0.061)	0.604*** (0.063)
Prob > F	0.000		0.0009		0.0000		0.0000	
Prob > chi2	0.068		0.0981		0.0000		0.0000	
Test d'Hausman	11.248		20.43		3.64		15.83	
Prob > chi2	0.0467		0.0010		0.6019		0.0074	

Source : *Author's calculations. Note: () Standard deviation, significant coefficients: *10%, **5%, ***1%.*

To further deepen our analysis of the impact of gender inequality in the MENA region, we explored the four dimensions of the Gender Index: economic participation and opportunities, educational attainment, health and survival, and political empowerment of women (Table 3).

Our estimation results reveal a positive and significant relationship between women's economic participation and opportunities as well as per capita GDP growth and HDI. These results, consistent with those of Mitra et al. (2015) and Bessedar and Mokhtari (2020), reinforce the idea that promoting gender equality in the economic domain contributes significantly to sustainable economic growth and human development.

When evaluating the impact of education on economic growth, the initially negative link with per capita GDP diminished when considering the overall HDI. This result suggests that the positive role of education in improving HDI outweighs its initial potentially negative impact on economic growth, as measured by per capita GDP (Brummet, 2008 ; Ward et al., 2010 ; Dauda, 2013 ; Mehrunisa et al., 2016).

The Health and Survival Index and women's political empowerment have a positive impact on human development. These results reinforce the idea that women's health, survival, and political empowerment play crucial roles in improving the overall HDI in the MENA region. These findings are compatible with those of Mandal et al. (2010) and Oztunc and Serin (2015).

Our analysis suggests that high levels of health, reflected in robust survival indicators, and increased political empowerment of women are key factors in human development progress in the MENA region. These results corroborate the conclusions of previous studies, such as Mandal et al. (2010) and Oztunc and Serin (2015).

Table 3: Estimation results by sub-index

Variables	GDP per capita growth				Human Development Index			
	Model 1		Model 2		Model 1		Model 2	
	FE	RE	FE	RE	FE	RE	FE	RE
EPO	11.815* (6.639)	8.202* (4.475)	3.667 (6.813)	7.732* (4.067)	0.079** (0.029)	0.097*** (0.030)	0.091** (0.035)	0.443*** (0.058)
EA	-27.733** (14.024)	(1.442) (6.076)	-6.988 (13.922)	-15.524** (5.057)	0.107* (0.062)	0.206*** (0.062)	0.387*** (0.064)	0.626*** (0.075)
HS	-70.520 (63.372)	16.921 (50.524)	-12.044** (58.220)	-5.089 (58.658)	-0.432 (0.279)	-0.336 (0.289)	-0.392 (0.272)	1.916** (0.798)
PE	1.826 (6.910)	4.097 (5.273)	-3.553 (8.141)	3.819 (6.886)	0.246*** (0.030)	0.239*** (0.032)	0.178*** (0.035)	0.112 (0.099)
INVST	-	-	4.514*** (1.487)	2.246** (1.056)	-	-	0.027** (0.008)	0.018 (0.017)
HC	-	-	2.738** (1.255)	0.304 (0.466)	-	-	0.010** (0.005)	0.0102 (0.007)
IDE	-	-	0.2531 (0.563)	0.140* (0.576)	-	-	-0.0004 (0.001)	-0.001 (0.0013)
OUV	-	-	0.075*** (0.022)	-0.015 (0.012)	-	-	-0.019** (0.0091)	0.049** (0.016)
DF	-	-	0.036 (0.155)	0.277 (0.159)	-	-	0.0003** (0.0002)	-0.0008** (0.0003)
INST	-	-	-0.188 (0.171)	-0.087 (0.062)	-	-	-0.0009 (0.0007)	-0.003*** (0.0009)
Constant	89.353 (66.570)	-21.550 (50.341)	-25.194* (13.844)	2.374 (4.516)	1.028*** (0.294)	0.833** (0.303)	0.668** (0.282)	-2.165** (0.806)
Prob > F	0.0037		0.0000		0.0000			
Prob > chi2	0.0301		0.0036		0.0036		0.0000	
Test d'Hausman	9.85		25.13		25.13		0.0000	
Prob > chi2	0.0430		0.0051		0.0051		25.1	
							0.005	

Source : *Author's calculations. Note: () Standard deviation, significant coefficients: *10%, **5%, ***1%.*

In summary, our estimation results highlight the positive and significant relationships between Gender Index and economic development. Additionally, there is a positive and significant relationship between the various dimensions of the Gender Index and key indicators, such as per capita GDP growth and the HDI in the MENA region.

5. Conclusion

Gender inequality is a significant characteristic of most developing economies, particularly in the MENA region where women lag behind men in nearly all aspects of life. Gender inequality restricts women's participation in various aspects of their lives. They have less access to education and healthcare services, less control over resources, and lower participation in economic activities than men. This acts as a detrimental factor to the economic development of these countries.

The Middle East and North Africa (MENA) region ranks relatively low in terms of gender equality compared with other regions. This result is not caused by significant gender differences in access to basic services, such as education and health, but rather reflects substantial disparities in economic participation and political empowerment. Despite substantial progress in recent years, women's labor force participation (LFP) in the MENA region remains the lowest globally, reaching only approximately 29% in 2020, which is almost half the level observed in other regions with similar per capita income. Furthermore, when women participate in MENA labor markets, they are more likely to be unemployed, work in the informal sector, earn lower wages, and work fewer hours than men.

In this context, this study analyzes the impact of gender inequality on economic growth and the Human Development Index (HDI) in sub-Saharan African countries. Specifically, our study relies on panel data estimations using data from 16 MENA countries for 2006–2022. Our results highlight the potential of investing in gender equality for economic growth and development in MENA countries. There is also a positive contribution of the different dimensions of gender equality (economic participation and opportunities, educational attainment, health and survival, and political empowerment of women) to the economic development of MENA economies.

Given the various results obtained in this study, it can be assumed that better integration of women into the economic landscape and the reduction of gender disparities could potentially positively influence the economic growth and HDI of MENA countries.

From this perspective, it is also conceivable that encouraging female entrepreneurship with supportive policies and initiatives could play a significant role in the economic empowerment of women. Greater integration of women into the entrepreneurial fabric could help stimulate economic activity, create job opportunities, and enhance the overall contribution of women to the socioeconomic development of the region.

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7. Appendix

Table 4: List of variables

Variables	Description
GDP per capita growth rate	It represents the gross domestic product divided by the mid-year population expressed as a growth rate.
Global Gender Gap index (GGGI)	The GGGI ranges from 0 to 1, with 1 indicating no gap. It assesses the gap between men and women in four fundamental categories (sub-indices): Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment.
Economic Participation and Opportunity Index	This dimension evaluates the gender gap in the labor market, including factors such as wage equality, the percentage of women in the workforce, and the ratio of earned income between men and women.
Educational Attainment	Examines the gender gap in educational attainment, including literacy rates and enrollment in primary, secondary, and tertiary education.
Health and Survival	Focuses on the gender gap in life expectancy and sex ratio at birth. It evaluates the overall well-being of women in terms of health outcomes.
Political Empowerment	Measures the gender gap in political representation and decision-making at the highest levels. This includes the ratio of women to men in ministerial positions and parliamentary representation.
Investment as a percentage of GDP	Gross capital formation consists of expenses devoted to acquiring fixed assets in the economy, plus net changes in inventories as a percentage of GDP.
Human Capital Index	It is calculated based on years of schooling and education outcomes.
Trade openness	Given by the formula: (Exports + Imports) / GDP
Foreign Direct Investment, inflows (% of GDP)	The sum of equity capital, reinvested earnings, other long-term capital, and short-term capital recorded in the balance of payments.
Financial Development	Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations.
Institutional Quality	It represents a score calculated by subtracting the AUTOC score from the DEMOC score. The resulting unified scale ranges from +10 (strongly democratic) to -10 (strongly autocratic).