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Leveraging social science research to combat poverty and inequality in the Middle East - a pathway to achieving SDGs 1 and 10

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ABSTRACT

This study examines the relationship between the output of social sciences research, which is measured in terms of both quantity and quality, and two important Sustainable Development Goals (SDG) 1 and 10: poverty and inequality. The study analyzes data from 15 Middle Eastern countries from 2000 to 2023 using a panel regression model based on Panel-Corrected Standard Errors (PCSE) and Feasible Generalized Least Squares (FGLS) techniques. The study findings indicate that while both dimensions of research output exert a notable impact on poverty reduction, the quality of social science research emerges as a more potent catalyst than quantity in formulating effective interventions against poverty. Conversely, both the quantity and quality of research output exhibit comparable effects on the reduction of inequality. These findings underscore the necessity for policymakers to prioritize not just the quantity of research but also its quality, particularly in the quest to combat poverty. Our study advocates for a paradigm shift in policy approaches, emphasizing the urgent need for investment in high-quality research to enhance sustainable socio-economic development in the MENA region. This strategic focus is imperative for tackling the complex challenges of poverty and inequality, ultimately advancing social equity and fostering sustainable economic growth.

1. Introduction

'Leaving no one behind' is a key component of the 2030 Agenda for Sustainable Development, which places a strong emphasis on addressing poverty and inequality. Interestingly, SDG (10) attempts to reduce inequality within and between countries, whilst SDG (1) concentrates on ending poverty in all of its manifestations (Nogueira, 2024). In developing countries, the percentage of people living in extreme poverty (defined as less than US$1.90 per day) fell from 1.84 billion in 1990 to 660 million in 2019 (World Bank, 2022). By contrast, in terms of inequality, the richest 10% takes 52%, while the poorest half takes only 8.5% of global income. MENA region is the most inequal region with a top 10% income share around 58% of total income (Chancel et al., 2022).

While extant literature has effectively documented the connections between research output and economic consequences, there exists a relative dearth of exploration regarding how social science research can serve as a vital catalyst for targeted socio-economic interventions, particularly in the context of the MENA region. Furthermore, the mechanisms through which social science research outputs can tangibly inform policy frameworks and induce changes in societal structures have not been extensively articulated. The imperative to bridge this gap arises from the realization that merely identifying relationships between variables does little to elucidate the underlying processes driving poverty and inequality in the

region—an aspect that calls for a more nuanced theoretical framework that builds upon existing theories while also proposing innovative perspectives.

In light of this persistent inequality, the value of social science research becomes paramount. The motivation for conducting this research stems from the urgent need to find effective policy interventions that can alleviate poverty and reduce inequality in the region, which remains one of the most unequal globally. It examines the relationship between social sciences research output, both in quantity and quality, and its potential impact on poverty and inequality within the MENA region. The value of social science research is found in its capacity to produce theoretical frameworks and scientific evidence that support policy choices. Studies conducted in several fields of social sciences such as: political science, sociology, management, and economics have traditionally impacted social welfare programs and initiatives (Bednarek et al., 2024; Kassirer et al., 2023; Seelos et al., 2023; Wickert et al., 2021). Nemours scholars have shown that carefully thought-out social initiatives supported by solid evidence may significantly lower poverty rates (Friedman et al., 2024; Stefanidis et al., 2024), and reduce the level of inequality (DiPrete & Fox-Williams, 2021; Humphries & Truman, 2020).

The production of research has become a crucial element in the process of economic development, attracting the attention of policymakers and scholars in recent years. Numerous empirical studies have systematically examined the relationship between economic growth and research output, often using scientometric indicators to gauge productivity and effect. Notably, a large body of research shows that research output has a positive and statistically significant impact on the level of economic growth (Azmeh, 2022; Inglesi-Lotz et al., 2015; Lee et al., 2011; Ntuli et al., 2015; Pourghaz et al., 2023; Solarin & Yen, 2016; Yu & Jin, 2024). On the other hand, another line of research has concentrated on the impact of research output in particular fields, demonstrating the significant influence that fields such as economics, finance, biotechnology, and basic sciences have on overall economic growth (Azmeh, 2022; Jin, 2009, 2010; Pinto & Teixeira, 2020; 2024; Yaşgül & Güriş, 2016). Moreover, empirical studies have indicated that investing in scientific research and development (R&D) might increase production and efficiency within the targeted sector (Adetutu & Ajayi, 2020; Jalil et al., 2023; Nair et al., 2020; Wu, 2023).

Even while research output in many fields and their overall impact on economic growth, is becoming increasingly important, there remains an important research gap in exploring how research output in social sciences affects socio-economic aspects, especially when it comes to poverty and inequality. The study by Pinto and Teixeira (2024) is a noteworthy exception, since it provides evidence of a positive impact of research output in social sciences on economic growth in Portugal. There exists a significant gap in the literature addressing how social sciences research output influences critical socio-economic dimensions in developing regions, especially in the MENA context. Given the pronounced socio-economic disparities in the MENA region, our focus extends beyond mere examination; we aim to furnish evidence-based insights that can inform policymakers, academics, and practitioners. This research is particularly timely and relevant for the Middle East, where ongoing socio-political strife compounds economic struggles, thus exacerbating poverty and inequality. By examining the influence of social science research output on poverty reduction and inequality alleviation, this article aims to close this important research gap.

The present study will investigate how social scientific research might improve the efficacy of social programs run by non-governmental groups and policymakers, as well as influence successful policy decisions. It will do this by utilizing theoretical frameworks and current empirical data. Recognizing the potential of social research as a catalyst for change is crucial, especially given the ongoing problems faced by poverty and inequality, especially in developing countries. By emphasizing the importance of social science research in addressing these issues, this study seeks to encourage a shift in policy frameworks, advocating for increased funding and partnership between universities and government entities. In doing so, our findings aim to benefit not only policymakers but also NGOs who are striving for sustainable improvements in their quality of life. Overall, this paper serves as a pioneering effort to illuminate a critical link between social research and socioeconomic enhancement, enhancing the discourse on social equity and sustainable growth in the MENA region.

To fill this aim, the current study intends to investigate the relationship between social sciences research output, in terms of quantity and quality, and two crucial socio-economic dimensions that

represent Sustainable Development Goals (SDG) 1 and 10: poverty and inequality. This is because MENA countries are among the most unequal in the world, as the preceding analysis has shown. We want to offer a comprehensive view of how the quantity and quality of social science research output might impact these urgent challenges by looking at data from 15 Middle Eastern countries for a period spanning from 2000 to 2023. We will use two sophisticated estimate techniques, Panel Corrected Standard Errors (PCSE) and Feasible Generalized Least Squares (FGLS), to guarantee the validity and robustness of our results. With this strategy, we hope to forward the global goal of decreasing poverty and inequality by adding to the conversation on how academic research influences socioeconomic policies and outcomes in the MENA region.

2. Literature review

The interplay between social science research output and socio-economic indicators such as poverty and inequality has been a burgeoning area of scholarship, driven by the recognition that empirical research significantly informs policy decisions. While substantial empirical work has emphasized the relationship between educational achievements and economic growth, there remains a conspicuous gap in examining how research in the social sciences directly influences poverty reduction and inequality alleviation. The theoretical foundations of this study are grounded in the understanding that research output in social sciences provides a critical lens through which policymakers can conceptualize and address complex socio-economic issues. By enhancing theoretical frameworks that underpin social interventions, social science research lays a foundational understanding of the underlying causes of poverty and inequality, providing guidance for targeted policy approaches (DiPrete & Fox-Williams, 2021; Friedman et al., 2024).

There has been a great deal of academic investigation on the relationship between research output and economic development, yet there is still disagreement about an accepted measurement for research activity. Numerous scholars have used different indicators, including R&D spending, the number of scientists, and scientometric measurements, with some arguing that scientometric indicators provide more accurate insights (Inglesi-Lotz and Pouris et al. (2013). The intricate and subtle link between research production and economic growth is a matter of discussion despite the growing body of literature on the subject. The level of development of a country and certain discipline tendencies within national policy are important factors influencing this relationship (Vinkler, 2008; Lee et al., 2011).

Empirical investigation about the link between research output and economic development begins with seminal work of De Moya-Anegon and Herrero-Solana (1999), who found a significant relationship between GDP and a number of publications across 19 Latin American nations. King (2004) provided more evidence for this connection, showing an exponential relationship between the number of papers published and the OECD countries' economic performance. On the other hand, Vinkler (2008) disproved the idea of a global pattern by finding no meaningful correlation between research production and economic development in Europe, Japan, and the US.

More recently, there have been several attempts to shed light on the details of this intricate interaction. The extant literature may be divided into two categories for investigation. There is no distinction made between research fields in the first set of investigations. For example, Lee et al. (2011) found that economic development and research production are mutually correlated in emerging Asian countries, whereas the relationship between the two variables was unclear in Western countries. Investigating the relationship in the U.S. context, Inglesi-Lotz et al. (2014, 2015) found no substantial causation in Brazil, China, Russia, or South Africa, but did indicate a one-way link from research production to economic growth in the U.S., and a positive relationship for India. Ntuli et al. (2015) found that, for the US, Finland, Hungary, and Mexico, there was a unidirectional causal relationship between research output and economic growth. By contrast, their results gave evidence of an opposite causality running from economic growth to research output for Canada, France, Italy, New Zealand, the UK, Austria, and Poland. The geographic scope was extended to 169 countries by Solarin and Yen (2016), who came to the conclusion that research output had an important positive impact on economic growth in both developed and developing countries. Similarly, Dkhili and Oweis (2018) proclaim a substantial impact of research output on economic growth for 43 African nations.

As measures of research output, the second category of studies focuses on research output in only certain fields. For instance, research output in economics in five East Asian countries was examined by Jin (2009, 2010), who found unidirectional causality running from research output to economic growth in Hong Kong, Korea, and Taiwan. The argument put out by Jaffe et al. (2013) was that countries that prioritize applied knowledge tend to have slower economic development than those that prioritize basic sciences. The fact that disciplines like physics, chemistry, and biology have a major impact on South Africa's economic development was demonstrated by Inglesi-Lotz and Pouris (2013)). According to several studies (Jin and Jin (2013); Laverde-Rojas and Correa (2019); Pinto & Teixeira, 2020), engineering and fundamental sciences have a crucial role in promoting economic growth in many different countries.

The intricate link between the quantity and quality of research output has been studied by emerging research. Pourghaz et al. (2023) gave evidence of an important impact of research output on several macroeconomic indicators, such as inflation, unemployment, and GDP growth in a sample of 39 countries. Yu and Jin (2024) proclaim that research output may be used for the creation of new technologies, which in turn stimulates economic growth through technical improvement. There are only two recent studies that attempt to examine the impact of research output in social sciences on the level of economic development. Azmeh (2022) discovered that while research output quality has a favorable impact on growth, the amount of research production and economic growth in MENA countries are negatively correlated. Furthermore, he does not find any impact of research output in social sciences, in terms of quantity and quality, on economic growth. Pinto and Teixeira (2024) gave evidence of an important impact of research output on economic growth in the short run, but proclaim that the relationship is more complex in the long run in Portugal. They provide evidence of an important positive impact of research output in social sciences in the long run on the level of economic growth. Furthermore, two more recent studies gave evidence of the importance of quantity and quality of research output in the field of finance. They underscored the necessity for collaborative efforts among institutions of higher education specializing in finance, governmental entities, and financial institutions to effectively invest in research outcomes within the field of finance. Such collaboration is essential for realizing a more significant positive impact on economic growth (Azmeh & Al-Raeei, 2024, 2025).

The need for informed and nuanced policy interventions aimed at tackling sustainable development goals is underscored by the growing body of literature suggesting that targeted social science research can stimulate significant changes to socio-economic policies (Stefanidis et al., 2024; Wickert et al., 2021). The ongoing discourse emphasizes the role of governments in bolstering research capabilities through funding and partnerships with academic institutions to create research-driven solutions for pressing social issues.

This present study posits that increased investment in social science research output can lead to lower poverty levels and reduced inequality, positing the following hypotheses:

Hypothesis 1 (H1): *There is a significant negative relationship between the quantity and quality of social science research output and poverty levels in Middle Eastern countries.*

Hypothesis 2 (H2): *There is a significant negative relationship between the quantity and quality of social science research output and inequality levels in Middle Eastern countries.*

3. Materials and methods

3.1. Data

The primary aim of this research is to examine the impact of research output in social sciences, in terms of quantity and quality, on the level of poverty and inequality in 15 Middle Eastern countries throughout the years 2000–2023. This temporal and geographical focus is selected based on the unique socio-economic challenges these countries face, which are significantly compounded by ongoing socio-political strife. Key variables in the dataset include quantity and quality of research output in social sciences and additional factors that influence poverty and inequality. Our choice of independent variables includes both the quantity of research output in social sciences—measured by the number of publications—and the quality—proxied by citation counts. The rationale for incorporating these dual measures stems from the

notion that not only the volume of research contributes to socio-economic outcomes, but also the depth and impact of that research as evidenced through citations. Furthermore, previous studies have suggested that quality indicators such as citations might provide stronger connections to economic and social benefit (Azmeh, 2022; Azmeh & Al-Raeei, 2025). Data on quantity of research output in social sciences was measured by the number of publications each year, and the number of citations in social sciences refers to the quality. The data was collected from the Scopus database published on the SCImago website. Poverty levels are measured using the poverty headcount ratio, which computes poverty as a percentage of the total population at $2.15 per day; inequality is evaluated using the Gini index. The choice to measure poverty levels using the headcount ratio of $2.15 per day and to evaluate inequality through the Gini index is substantiated by prior literature (Khan et al., 2022; Mushtaq & Bruneau, 2019; Neaime & Gaysset, 2018; Omar & Inaba, 2020; PARK & MERCADO, 2018). Control variables in our models were carefully selected based on existing literature which emphasizes their significant influence on poverty and inequality. Variables such as government expenditure (GovEx), investment, trade, GDP growth (GDPG), school enrollment (School), inflation, and population growth (PopG) have been identified as critical factors in determining socio-economic conditions in developing nations (Friedman et al., 2024; Stefanidis et al., 2024)[1]. Each selected control variable captures essential aspects that could confound the relationship between research output and poverty/inequality levels. For further statistical information, please see Table 1.

By looking at the level of correlation between the variables, a correlation matrix was created in order to evaluate multicollinearity. The findings offer a thorough analysis of the relationships between each variable, and they are displayed in Table 2.

Upon evaluating the degree of multicollinearity among the variables in Table 2, no major concerns were found. The correlation coefficients, which frequently fell below 0.70, showed a moderate level of intercorrelation between the variables. Nonetheless, a strong association with a value over the 0.7 criterion was found between Doc_Soci*Cit_Soci, School*Doc_Soci, and School*Cit_Soci. A Variance Inflation Factor (VIF) test was run to further investigate the potential for multicollinearity.

The findings support our concerns about the possibility of multicollinearity by displaying significant VIF values (above a value of >10) for two variables (Doc_Soci and Cit_Soci). In order to address this problem, we only take into account one of the two variables that consistently indicate the quantity and quality of research output in social sciences. We repeat the VIF tests twice, once with Doc_Soci and once with Cit_Soci. The findings of the final two tests, in which the mean VIF value for the first test is 3.44 and for the second test is 3.25, confirm that there is no multicollinearity when we take into account the single variable that represents research output. The findings are shown in Table 3.

To choose an appropriate estimation model, the study carried out three pre-estimation tests: cross-sectional, unit root, and cointegration tests. The analysis revealed that all variables became stationary at their first difference, indicating they do not show unit root behavior. Only two variables in our database, Bank concentration, and Bank overhead costs, failed the cross-sectional test, leading to their exclusion from our empirical analysis. For the remaining variables, we rejected the null hypothesis of the unit root test. Additionally, we employed a cointegration test based on Kao's (1999) method to determine if the variables are cointegrated. The results shown in Table 4 confirmed the existence of cointegration among the variables, suggesting a long-term relationship. This finding implies that the variables tend to move together over time, indicating a stable and consistent relationship among them. Based on the outcomes of the three pre-estimation tests, the study identified the panel corrected standard error (PCSE) and Feasible Generalized Least Square (FGLS) methods as the most accurate and reliable for estimation, chosen for their effectiveness in capturing the complex relationships within the data.

3.2. Methodology

The present study employs both the PCSE and FGLS methodologies, which are particularly suited for the dynamic nature of panel data encompassing individual and temporal variations. The PCSE method allows for the estimation of reliable parameter estimates, accommodating both panel-specific and time-specific fixed effects to account for unobserved heterogeneity. Moreover, the FGLS method serves as a

Table 1. Descriptive statistics.

Variables	Abbreviation	Source	Definition	Mean	Std. Dev	Min	Max
Quantity of social research output	Doc Soci	Simago	The total number of publications in social sciences in a year	518.997	1073.167	1	7211
Quality of social research output	Cit Soci	Simago	The total number of citations in social sciences in a year	3847.989	7178.958	0	42276
Inequality	Gini	WDI	Gini index	35.356	4.589	26	44.8
Poverty	Poverty	WDI	headcount ratio at $2.15 a day as a percentage of the total population	1.794	4.544	0	24.8
Domestic credit to the private sector	Priv	WDI	Domestic credit to the private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks)	46.764	27.201	1.267	138.858
GDP growth (annual %)	GDPG	WDI	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars.	3.393	6.779	−36.658	53.382
General government final consumption expenditure (% of GDP)	GovEx	WDI	includes all government current expenditures for purchases of goods and services (including compensation of employees)	16.306	5.166	2.36	29.322
Gross capital formation (% of GDP)	Investment	WDI	consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories	21.341	6.996	.851	39.299
Inflation, GDP deflator (annual %)	Inflation	WDI	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.	8.998	20.568	−10.067	221.342
Trade (% of GDP)	Trade	WDI	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	83.873	33.475	29.857	191.873
School enrollment, secondary (% gross)	School	WDI	the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education	84.734	18.287	36.697	120.531
Population growth (annual %)	PopG	WDI	Annual population growth rate for year t is the exponential rate of growth of the midyear population from year t-1 to t, expressed as a percentage	2.748	3.016	−6.852	19.36

Note. This table presents the dependent variable and the explanatory variables that we used in the paper, their definitions, abbreviations used in empirical results, and sources of observed data. WDI stands for World Development Indicators.

Table 2. Matrix of correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Doc_Soci	1.000											
(2) Cit_Soci	**0.971**	1.000										
(3) Gini	0.564	0.543	1.000									
(4) Poverty	−0.197	−0.190	−0.067	1.000								
(5) Priv	0.545	0.521	0.286	−0.423	1.000							
(6) GDPG	−0.135	−0.196	−0.039	−0.018	−0.154	1.000						
(7) GovEx	−0.284	−0.289	−0.187	−0.319	−0.101	0.397	1.000					
(8) Investment	0.428	0.411	0.490	−0.372	0.601	−0.146	−0.102	1.000				
(9) Inflation	0.397	0.374	0.059	0.046	0.229	−0.462	−0.588	0.350	1.000			
(10) Trade	−0.239	−0.238	−0.093	−0.082	0.325	0.297	0.535	0.113	−0.403	1.000		
(11) School	**0.765**	**0.737**	0.455	−0.611	0.545	−0.036	0.193	0.427	0.182	−0.070	1.000	
(12) PopG	−0.489	−0.467	−0.323	0.106	−0.076	0.247	0.323	−0.251	−0.379	0.587	−0.368	1.000

Table 3. Variance inflation factor (VIF).

Variable	VIF	VIF	VIF
Doc_Soci	25.48	4.94	
Cit_Soci	20.57		3.99
School	6.51	6.50	5.97
GovEx	4.69	4.67	3.99
Trade	3.87	3.86	3.87
Priv	3.68	3.62	3.63
Inflation	2.16	2.07	2.09
PopG	2.06	2.05	2.01
Investment	1.83	1.82	1.82
GDPG	1.59	1.40	1.36
Mean VIF	**7.24**	**3.44**	**3.25**

Table 4. Pre-estimation analysis results.

		Unit Root Test CIPS	
Variable	Pearson cross-sectional test	Level	First Difference
Doc_Soci	46.93***	19.3624	−3.9783***
Cit_Soci	38.85***	−1.66**	/
Priv	10.21***	2.628*	/
GDPG	12.68***	**−6.05*****	/
GovEx	6.12***	−0.4352	−8.6302***
Investment	0.51	−0.5456	−8.5827***
Inflation	12.23***	**−3.42*****	/
Trade	6.17***	−0.5694	−7.4840***
School	5.5***	/*	/
PopG	13.89***	**1.1863**	−5.9327***

ADF (Augmented Dickey-Fuller) cointegration test

Dependent variable	Statistic	p-value	cointegration
Poverty	3.1113	0.0009	Yes
Inequality	2.8603	0.0021	Yes

***$p < 0.01$,
**$p < 0.05$,
*$p < 0.1$.

robustness check, minimizing the impact of heteroscedasticity and cross-sectional dependence (Adeleye et al., 2023; Bailey & Katz, 2011).

We use the PCSE and FGLS methods to estimate the following equation:

$$Y_{it} = \alpha + \beta\, RO_{it} + \lambda\, X_{it} + \mu_{it}, \tag{1}$$

In this context, Y represents our dependent variables (poverty and inequality); RO denotes the quantity and quality of research output in social sciences, and X includes a set of all control variables. Furthermore, **μ** represents the error term and **α** stands for the intercept term. B represents research output coefficient, and **λ** includes a vector of coefficients related to all control variables. The subscripts (i) and (t) stand for the specific country under study and the associated time period, respectively.

Consequently, the following forms of the model are assumed:

$$Poverty\,it = \alpha + \beta\,Documents\_Soc\,i + \phi\,Invest\,it + \psi\,Trade\,it + \varphi\,GovEx\,it + \lambda\,PopG\,it + \int\,Inflation\,it$$
$$+\delta\,school\,it + \chi\,GDPG\,it + \Upsilon\,CreTPriv\,it + \mu\,it \qquad (2)$$

$$Poverty\,it = \alpha + \beta\,Citations\_Soc\,i + \phi\,Invest\,it + \psi\,Trade\,it + \varphi\,GovEx\,it + \lambda\,PopG\,it$$
$$+\int\,Inflation\,it + \delta\,school\,it + \chi\,GDPG\,it + \Upsilon\,CreTPriv\,it + ...it \qquad (3)$$

$$Inequality\,it\,\alpha + \beta\,Documents_{Soc\,i} + \phi\,Invest\,it + \psi\,Trade\,it + \varphi\,GovEx\,it + \lambda\,PopG\,it$$
$$+\int\,Inflation\,it + \delta\,school\,it + \chi\,GDPG\,it + \Upsilon\,CreTPriv\,it + \mu\,it \qquad (4)$$

$$Inequality\,it\,\alpha + \beta\,Citations\_Soc\,i + \phi\,Invest\,it + \psi\,Trade\,it + \varphi\,GovEx\,it + \lambda\,PopG\,it$$
$$+\int\,Inflation\,it + \delta\,school\,it + \chi\,GDPG\,it + \Upsilon\,CreTPriv\,it + \mu\,it \qquad (5)$$

4. Results and discussion

In order to examine the impact of research output, in terms of quantity and quality, on the level of poverty and inequality, we have utilized two rigorous estimation methods: Feasible Generalized Least Squares (FGLS) and Panel-Corrected Standard Errors (PCSE). Our analysis commenced by incorporating research output in social sciences. We then progressively integrate macroeconomic, financial, and demographic determinants. The findings underscore the critical interplay between social science research output and essential socio-economic dimensions, reinforcing our hypothesis regarding their potential impact on poverty alleviation and the reduction of inequality.

4.1. Impact of quantity and quality of research output in social sciences on poverty

The analysis of our model estimations begins with an examination of the results presented in Tables 5 and 6, utilizing annual data for our investigation. We primarily concentrate on the dependent variable (poverty) within Middle Eastern countries, defined as the proportion of the population living below the poverty line (headcount ratio at $2.15 a day as a percentage of the total population). An improvement in these countries' socioeconomic circumstances is reflected in a lower value of (Pov), which denotes a decline in the levels of poverty. The quantity and quality of social science research output, as well as several control factors related to macroeconomics, finance, and demographics, represent the independent variables.

The results from Tables 5 and 6 reveal a robust negative association between both the quantity and quality of social science research output and poverty levels as measured by the headcount ratio at $2.15 a day. The analysis indicates that an increase in the quantity of research output correlates with a significant decrease in poverty, consistently demonstrated across different model specifications. Specifically, significant results are observed with respect to the quality of research, showing that higher citation counts are associated with greater reductions in poverty levels. This aligns closely with findings from existing literature, which posits that the practical application of research can effectively inform evidence-based policymaking and operationalize targeted interventions (DiPrete & Fox-Williams, 2021; Friedman et al., 2024).

However, it is essential to acknowledge the conflicting results between the models assessing the impact of quantity (logDoc) and quality (logCit) of research output on poverty reduction. While both indicators present a significant relationship with the reduction of poverty, the disparity in the magnitude and the statistical significance across models necessitates further investigation into underlying factors that may contribute to these inconsistencies. These could include variations in the socio-economic contexts of the nations studied or the differing emphasis on publication versus citation in capturing meaningful socio-economic outcomes.

Table 5. Quantity of research output in social sciences and Poverty in the Middle Eastern countries for the period (2000–2023): PCSE and FGLS methods. Dependent variable: Poverty (headcount ratio at $2.15 a day as a percentage of the total population).

VARIABLES	(1) PCSE	(2) PCSE	(3) PCSE	(4) PCSE	(5) FGLS	(6) FGLS	(7) FGLS	(8) FGLS
logDoc	**−0.568**	**−0.579***	**−0.558***	**−0.497***	**−0.232***	**−0.177***	**−0.259***	**−0.287***
	(0.399)	**(0.352)**	**(0.273)**	**(0.237)**	**(0.0766)**	**(0.105)**	**(0.0854)**	**(0.194)**
GDPG		−0.121	−0.00458	0.0169		0.00304	0.0159	0.00790
		(0.0814)	(0.0301)	(0.0299)		(0.0363)	(0.0220)	(0.0258)
GovEx		−0.148*	−0.153**	−0.138***		−0.0650*	−0.0837***	−0.121***
		(0.0812)	(0.0616)	(0.0513)		(0.0384)	(0.0241)	(0.0440)
Investment		−0.167	−0.00208	−0.0657*		−0.0241	−0.00952	−0.0557
		(0.113)	(0.0363)	(0.0377)		(0.0381)	(0.0179)	(0.0348)
Trade		−0.0187**	−0.0126*	0.00499		−0.00893	−0.00938***	0.000617
		(0.00744)	(0.00645)	(0.0129)		(0.00572)	(0.00313)	(0.0112)
Priv			0.00575	0.00139			0.00121	−0.00193
			(0.0145)	(0.0162)			(0.00626)	(0.0151)
Inflation			−0.00838	0.0465			0.000319	0.00296
			(0.0241)	(0.0329)			(0.0135)	(0.0222)
School				−0.0153				0.0175
				(0.0339)				(0.0199)
PopG				−0.222				−0.0624
				(0.267)				(0.194)
Constant	4.897*	12.50***	7.171***	8.345***	2.401***	3.905**	4.216***	4.305***
	(2.751)	(4.561)	(2.237)	(3.217)	(0.581)	(1.649)	(0.855)	(1.489)
Observations	50	49	41	35	50	49	41	35
R-squared	0.077	0.371	0.408	0.528				
p	0.154	0.116	0.000816	0.0259	0.0025	0.35	0.00	0.02

Standard errors in parentheses.
***$p < 0.01$,
**$p < 0.05$,
*$p < 0.1$.

Table 6. Quality of research output in social sciences and Poverty in the Middle Eastern countries for the period (2000–2023): PCSE and FGLS methods. Dependent variable: Poverty (headcount ratio at $2.15 a day as a percentage of the total population).

VARIABLES	(1) PCSE	(2) PCSE	(3) PCSE	(4) PCSE	(5) FGLS	(6) FGLS	(7) FGLS	(8) FGLS
logCit	**−0.716**	**−0.621**	**−0.642***	**−0.778***	**−0.232***	**−0.167**	**−0.283***	**−0.538***
	(0.439)	**(0.429)**	**(0.354)**	**(0.362)**	**(0.108)**	**(0.119)**	**(0.104)**	**(0.181)**
GDPG		−0.127	−0.00592	0.0154		0.00426	0.0191	0.0145
		(0.0847)	(0.0340)	(0.0331)		(0.0379)	(0.0243)	(0.0309)
GovEx		−0.151*	−0.160***	−0.167***		−0.0641	−0.0936***	−0.149***
		(0.0885)	(0.0616)	(0.0632)		(0.0404)	(0.0266)	(0.0455)
Investment		−0.162	−0.00119	−0.0530		−0.0247	−0.0130	−0.0596**
		(0.115)	(0.0361)	(0.0343)		(0.0369)	(0.0215)	(0.0293)
Trade		−0.0166**	−0.0128*	−0.00256		−0.00801	−0.00898***	−0.00584
		(0.00682)	(0.00708)	(0.0102)		(0.00529)	(0.00333)	(0.00938)
Priv			0.0106	0.0101			0.00176	0.00817
			(0.0157)	(0.0167)			(0.00821)	(0.0112)
Inflation			−0.0116	0.0467			−0.00502	0.0114
			(0.0260)	(0.0320)			(0.0129)	(0.0176)
School				0.00732				0.0288
				(0.0244)				(0.0187)
PopG				−0.0845				−0.00319
				(0.241)				(0.184)
Constant	7.279*	13.94***	8.991***	9.605***	2.898***	4.139**	5.207***	6.200***
	(3.911)	(5.376)	(3.330)	(3.442)	(1.006)	(1.847)	(1.262)	(1.376)
Observations	50	49	41	35	50	49	41	35
R-squared	0.116	0.381	0.455	0.594				
p	0.103	0.115	0.0103	0.00319	0.031	0.41	0.00	0.00

Standard errors in parentheses.
***$p < 0.01$,
**$p < 0.05$,
*$p < 0.1$.

4.2. Impact of quantity and quality of research output in social sciences on inequality

Similar to poverty, our findings indicate a significant negative relationship between research output and inequality levels in the Middle Eastern context. Tables 7 and 8 illustrate that both the quantity and quality of research output are associated with reduced inequality, as expressed by the Gini index. The results from FGLS models particularly demonstrate that even after controlling for various macroeconomic and demographic variables, a substantive correlation persists. However, as with poverty, conflicting results warrant critical attention. Variations in significance and magnitude between the quantity and quality measures highlight the complexity of these socio-economic dynamics.

To provide a more comprehensive understanding of these results, it is important to contextualize them within the broader framework of existing literature. While earlier studies have found a positive association between knowledge production and socio-economic growth, the unique socio-economic, political, and cultural fabric of the Middle Eastern region may magnify or mitigate these relationships (Dkhili & Oweis, 2018; Inglesi-Lotz et al., 2015). Such intricacies suggest a need for nuanced interpretations of the results presented.

4.3 Discussion

The findings of this study underscore the significant role of social science research output in addressing the persistent issues of poverty and inequality across Middle Eastern countries. The robust negative correlations established between both the quantity and quality of research output and poverty levels provide empirical support for the theoretical frameworks advocating the utility of social sciences in informing policy and societal interventions. This aligns with prior literature suggesting that enhanced research output contributes to acute socioeconomic outcomes (DiPrete & Fox-Williams, 2021; Friedman et al., 2024). Moreover, Pinto and Teixeira (2024) reported a positive impact of social science research on economic growth specifically in Portugal, suggesting a context-dependent relationship. Meanwhile, Azmeh (2022) found no significant impact of social science research on economic growth in the MENA region, raising questions about the potential for research to yield socio-economic benefits in certain contexts. However, this study uniquely expands on the existing consensus by contrasting measures of quality (citations)

Table 7. Quantity of research output in social sciences and Inequality in the Middle Eastern countries for the period (2000–2023): PCSE and FGLS methods. Dependent variable: Inequality (Gini Index).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	PCSE	PCSE	PCSE	PCSE	FGLS	FGLS	FGLS	FGLS
logDoc	**0.527***	−0.212	−0.427	**−2.337***	0.204	−0.351	**−0.906****	**−2.047***
	(0.295)	(0.362)	(0.508)	(0.610)	(0.190)	(0.323)	(0.382)	(0.545)
GDPG		−0.000273	0.0720	−0.00251		−0.0953	−0.0756	−0.0438
		(0.123)	(0.132)	(0.101)		(0.0801)	(0.104)	(0.0968)
GovEx		−0.00948	−0.0415	−0.650***		0.0284	−0.00229	−0.687***
		(0.0904)	(0.104)	(0.115)		(0.0814)	(0.0827)	(0.101)
Investment		0.436***	0.566***	0.466***		0.361***	0.515***	0.372***
		(0.112)	(0.137)	(0.122)		(0.102)	(0.130)	(0.110)
Trade		−0.0419**	−0.0723***	−0.0292		−0.0381**	−0.0759***	−0.0188
		(0.0166)	(0.0252)	(0.0381)		(0.0162)	(0.0196)	(0.0349)
Priv			0.0310	0.0260			0.0409	0.00374
			(0.0518)	(0.0501)			(0.0471)	(0.0426)
Inflation			−0.0950*	−0.156*			−0.0718*	−0.168**
			(0.0498)	(0.0867)			(0.0407)	(0.0811)
School				0.334***				0.364***
				(0.0526)				(0.0483)
PopG				−0.482				−0.158
				(0.392)				(0.357)
Constant	32.48***	29.80***	29.83***	23.40***	33.90***	31.11***	32.44***	22.20***
	(1.591)	(3.535)	(4.354)	(4.254)	(0.738)	(3.288)	(3.530)	(3.782)
Observations	50	49	41	35	50	49	41	35
R-squared	0.065	0.315	0.456	0.688				
p	0.0740	0.000296	2.14e-09	0	0.28	0.00	0.00	0.00

Standard errors in parentheses.
***$p < 0.01$,
**$p < 0.05$,
*$p < 0.1$.

Table 8. Quality of research output in social sciences and Inequality in the Middle Eastern countries for the period (2000–2023): PCSE and FGLS methods. Dependent variable: Inequality (Gini Index).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	PCSE	PCSE	PCSE	PCSE	FGLS	FGLS	FGLS	FGLS
logCit	0.576*	−0.162	−0.372	−1.994***	0.324	−0.205	−0.695**	−1.908***
	(0.300)	(0.372)	(0.453)	(0.527)	(0.200)	(0.334)	(0.312)	(0.505)
GDPG		0.00409	0.0699	−0.0127		−0.0860	−0.0708	−0.0428
		(0.121)	(0.132)	(0.104)		(0.0790)	(0.106)	(0.0987)
GovEx		−0.00347	−0.0445	−0.676***		0.0545	0.0143	−0.716***
		(0.0916)	(0.106)	(0.120)		(0.0822)	(0.0800)	(0.105)
Investment		0.426***	0.569***	0.492***		0.348***	0.540***	0.422***
		(0.113)	(0.138)	(0.125)		(0.104)	(0.129)	(0.115)
Trade		−0.0404**	−0.0680***	−0.00986		−0.0347**	−0.0669***	0.0164
		(0.0163)	(0.0241)	(0.0388)		(0.0157)	(0.0189)	(0.0368)
Priv			0.0259	−0.00848			0.0271	−0.0391
			(0.0504)	(0.0451)			(0.0464)	(0.0412)
Inflation			−0.101*	−0.202**			−0.0754*	−0.137*
			(0.0516)	(0.0855)			(0.0433)	(0.0785)
School				0.340***				0.374***
				(0.0577)				(0.0531)
PopG				−0.102				0.130
				(0.519)				(0.479)
Constant	30.95***	29.90***	30.36***	25.27***	32.70***	30.35***	32.01***	22.56***
	(2.240)	(4.054)	(4.754)	(4.026)	(1.212)	(3.667)	(3.434)	(3.665)
Observations	50	49	41	35	50	49	41	35
R-squared	0.074	0.312	0.455	0.664				
p	0.0552	0.000412	2.36e-08	0	0.10	0.003	0.00	0.00

Standard errors in parentheses.
*** $p < 0.01$,
** $p < 0.05$,
* $p < 0.1$.

against quantity (publication counts), revealing that while both dimensions yield significant associations, their magnitudes and operational implications diverge. This dual evaluation presents a nuanced perspective often overlooked in previous inquiries, which predominantly focus on singular metrics of research output and their impact on economic growth. Based on our findings, the quality of research output in social sciences emerges as a more potent driver in combating poverty relative to the quantity of such output, suggesting that the depth and impact of research are critical in formulating effective interventions. Conversely, while both dimensions of research output demonstrate a significant influence on reducing inequality, their effects appear to be relatively comparable.

4.4. Policy implications

The nuanced distinction between quantity and quality of research output in social sciences, emphasizes the necessity for policymakers to prioritize not only the production of social science research but also its quality, particularly in efforts aimed at alleviating poverty in the Middle Eastern context. Furthermore, to effectively translate these research outputs into actionable policies, collaborative ventures among academic institutions, governments, and non-governmental organizations (NGOs) are essential. Establishing robust partnerships can enhance the relevance and applicability of research to real-world issues, thereby fostering innovative solutions to poverty and inequality. For instance, joint initiatives can lead to the development of comprehensive policies tailored to local contexts, increasing the likelihood of successful outcomes. Furthermore, such collaborations can promote the dissemination of best practices derived from research, ensuring that evidence-based findings inform strategies across various sectors.

5. Conclusion

In this study, we rigorously investigated the intricate relationship between social science research output—assessed through both quantity and quality—and critical socioeconomic indicators, specifically poverty and inequality, within the context of 15 Middle Eastern countries from 2000 to 2023. Employing advanced econometric techniques, namely Panel-Corrected Standard Errors (PCSE) and

Feasible Generalized Least Squares (FGLS), we provided a nuanced understanding of how empirical research outputs inform policy frameworks aimed at achieving Sustainable Development Goals (SDGs) 1 and 10.

The analysis underscored a robust negative correlation between both the quantity and quality of social science research and levels of poverty and inequality. Specifically, higher research outputs—reflected in publication counts and citation metrics—proved statistically significant in reducing poverty headcounts and Gini index values, thereby enhancing social equity. Moreover, our findings reveal that the quality of research output in social sciences serves as a more effective mechanism for combating poverty than quantity alone, highlighting the necessity for policymakers to ensure that research is both rigorous and impactful. Our findings contribute valuable insights, supporting existing literature that posits the critical role of social sciences in shaping effective, evidence-based policymaking. In contrast to previous studies that largely focused on singular metrics of research output, our dual evaluation revealed important distinctions between quantity and quality, elucidating the complex dynamics at play in the socioeconomic landscape of the MENA region.

From a policy perspective, these results underscore the necessity for governments and institutions to prioritize funding and support for social science research. It is imperative that policymakers leverage this research quality to formulate and implement targeted strategies that effectively combat poverty and inequality within their unique contexts. Collaborative initiatives between academic institutions and governmental bodies are essential to translate research findings into actionable interventions, tailored to the unique socio-political contexts of the region. By fostering an environment conducive to scientific inquiry, policymakers can leverage these insights to create targeted strategies that address the underlying causes of socioeconomic disparities, ultimately advancing social justice and sustainable economic growth across the Middle East. This study, therefore, not only contributes to the academic discourse but also serves as a compass for future policy directions in the region.

6. Future insights

Given the complex socio-economic landscape, future research should explore the dynamic ramifications of structural breaks, such as global financial crises and pandemics like COVID-19, on the relationship between research output and socio-economic variables. Conducting sub-sample analyses will allow for deeper insights into how various factors, including income levels and resource richness, affect these dynamics. Understanding these intersections can aid in developing more resilient frameworks for translating research into policy actions that are adaptive to evolving challenges. Future studies could examine potential non-linear relationships, threshold effects, and interaction effects between research output and socio-economic factors such as trade, government spending, and school enrollment. This enhanced analytical approach will contribute to a more nuanced understanding of how these variables jointly influence poverty and inequality in the Middle Eastern context.

Note

1. See Polloni-Silva et al. (2021) Table 1 for detailed information regarding the selection of control variables from previous studies.

Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

Authors' contributions

Chadi Azmeh: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing - Original draft preparation, Writing - Review & Editing

Hiba Darwich: Conceptualization, Investigation, Methodology, Validation, Review & Editing

'All authors have read and approved the final work'.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author [CA].'

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