

Examining The Impact of Freedom Index on Economic Growth: A Panel ARDL Analysis

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Abstract.

This article aimed to analyse economic freedom's impact on economic growth in Arab countries over the period 1995-2022 using the ARDL PANEL Model. In this research we analyse the impact of economic freedom represented by the economic freedom index, monetary freedom index, property rights index, trade freedom index, and government spending index as independent variables and economic growth as independent variables in the Arab countries. The results of the study show that economic freedom has a positive significant effect on economic growth in Arab countries, However, the impact of individual sub-indicators on growth rates exhibits variation among the Arab countries studied.

Keyword: Freedom index ; economic growth; Arab countries; Panel- ARDL

1. Introduction

Recent years have witnessed substantial focus on understanding the determinants of national economic growth rates. Increased output from higher growth supports higher living standards and enhances society's capacity to meet economic and social objectives

Previous research on these determinants has primarily focused on the importance of improving production factors.

In order to elevate the growth rate, policymakers traditionally focus on the factors of land, labor, and capital. However, recent research suggests that a broader array of internally determined variables Contribute substantially to economic growth. Recent studies have placed particular emphasis on the influence of institutional factors, political and economic traditions, and practices present within

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different nations. Economic decisions are shaped within specific institutional frameworks; this makes it challenging to precisely quantify the impact of these factors on economic growth. There is a general assumption that increased economic and political freedoms serve as drivers of growth, while economic growth, in turn, can bolster economic and political freedoms.

The essence of economic freedom is essential in assessing the caliber of institutions, serving as the foundation upon which businesses, individuals, investors, and consumers can engage in economic pursuits sans governmental intervention. Economic freedom enables individuals, cultivates accountability and judgement, advocates equity, and mitigates corruption. These aspects, as elucidated in the text, are pivotal in attaining stability and progress.

Problematic:

This research paper includes analyzing the indicators of economic freedom and how they affect the growth economic in the Arab countries, determining the type of correlation between them and understanding the impact and direction of freedom economic and economic growth For the Arab countries during this period from 1995 to 2022, the main question is as follows:

How does freedom index influence growth economic in the Arab countries ?

Hypothesis :

In this study, we relied on one basic hypothesis:

- ✓ In Arab countries, economic growth is positively impacted by economic freedom.

2. Theoretical Framework And Previous Studies

In tracing the origins of economic freedom among humans, (Olsson, 2024) reviewed literature on its deep determinants, linking them to subsistence strategies used by hunter-gatherers who dominated Earth throughout history.

These hunters were mobile, had no land property rights, and used exit as a primary strategy for conflict resolution. After the transition to settled agriculture around 11,000 years ago, physical capital accumulation increased, and property rights over food and land emerged. It can be argued that the potential increase in economic freedom during the agricultural era stemming from property rights was counterbalanced by natural constraints on mobility, This shift also intensified interdependence in food production and spurred elites and powerful states that levied tribute on populations. Ultimately, Olsson empirically demonstrated that foundational geographical and climatic variables such as elevation and temperature explain close to half of all modern cross-national differences in economic freedom.

(Moers, 1999) in his study examined the impact of institutions on transitional economies using a panel data model of 25 countries from 1990 to 1995 . The findings showed that official institutional indices and economic growth were positively and significantly correlated, but that unofficial institutions had a less noticeable impact.

This suggests that even in the presence of weak unofficial institutions, states can still foster economic growth by effectively managing official institutions. Notably, the study found that 25% of the variance in economic growth across the sample countries could be attributed to variations in official institutional indicators.

Regarding the level of investment, all indicators demonstrated statistical significance and a positive impact, as anticipated. The indicator of investment laws proved to be the most significant. The findings revealed that 35% of the uneven flows in foreign direct investment can be attributed to disparities in the institutional indicators examined.

Accordingly, enhancing economic freedom should be prioritized by policymakers. Conversely, (Some, 2003), in his exploration of institutional economics and national economic performance in Burkina Faso, advocated for an institution-based approach to expedite the country's growth trajectory. He emphasized that institutions can safeguard contracts and property rights, thereby stimulating investment and exchange. As a fundamental condition for the efficacy of any higher education policy,

geographically disadvantaged nations like Burkina Faso stand to gain from the implementation of this strategy, underscoring the imperative of robust institutional frameworks for successful growth initiatives.

(Aixala & Fabro, 2009) and (Saccone & Migheli, 2022) found that economic freedom, via economic growth, prevents countries from falling into so-called “poverty traps”.

(Acemoglu, Johnson, & Robinson, 2005) argued that institutions constitute the fundamental driver of long-term economic growth in the United States; Their research suggests that institutional differences are the primary driver of disparities in economic success across nations. They concluded that the social sciences should develop a comparative theory of economic growth grounded in institutions, one that can inform policy decisions aimed at improving institutions and fostering prosperity in developing countries.

(Huyuh, 2024) argues that economic freedom initially increases income inequality, but then, at a threshold level of economic development, it begins to reduce income inequality.

(Hajamini, Zare, & Masoud, 2024) emphasized in their study the role and importance of economic freedom in explaining the difference in gender development and gender inequality across countries. Their study's results also show that the sub-indices of economic freedom, particularly property rights, international trade, and government size, were the most significant. Consequently, the pursuit of economic freedom, especially from an institutional perspective, can facilitate achieving a society with fairer opportunities between men and women.

(Akinlo & Okunlola, 2025) find in their study that economic freedom has a significant positive effect on quality of life. However, in Africa, the fundamental elements of political risk namely civil liberties, political rights, and conflict cause economic freedom to undermine quality of life. This occurs due to the critical role political institutions play in shaping Africa's economic outcomes and well-being. Therefore, African governments should prioritize strengthening political institutions to enhance the positive impact of economic freedom on quality of life.

(Gwartney & Lawson, 2024) using the Economic Freedom of the World (EFW) database consistently demonstrate that countries in the top quartile of economic freedom average a GDP per capita nearly 8 times higher than those in the lowest quartile, along with significantly lower poverty rates.

As noted by (Strobel, 2010), the study incorporated the following variables: optimal tax burden, government policies, total tax income as a percentage of GDP, efficiency of human capital, trade openness, labor market freedom, government consumption, capital market freedom, and the growth index, measured as the rate of growth in labor productivity. This comparative analysis examined ten countries within the International Cooperation and Development Group over the period of 1992 to 2005.

The finding of the study point to a statistically significant and positive correlation between the productivity growth rate and the institutional climate quality index.

Furthermore, more than 30% of the variation in productivity growth rates can be explained by the institutional factors our study looked at.

(Islam, 1996) found a positive relation between economic freedom and growth (measured as an increase in per capita income), while (Tag & Degirmen, 2022) underlined how the institutions of countries that respect the rule of law and trade freedoms are much more attractive for foreign investment and, consequently, for economic growth. (Doran & Stratmann, 2020) claimed that economic freedom is a prerequisite for economic growth and for the reduction of absolute poverty; in particular, by analysing data on 151 countries over a 20-year period, they found that higher economic freedom reduced absolute poverty through its positive effect on economic growth.

the economists (Acemoglu & Robinson, 2008) present a compelling historical analysis of various societies, including the Mayan civilization, the Roman Empire, the medieval city of Venice, and the twentieth-century Soviet Union and China. Their research suggests that the prosperity or decline of nations is not solely determined by geographic, demographic, or resource-based factors. Instead, the

key determinant lies in the equitable distribution of opportunities and the establishment of inclusive political and economic institutions that empower all segments of society, regardless of ethnicity or religion.

(De Haan & Sturm, 2024) They found that while all components of economic freedom matter, business deregulation and freedom to trade internationally serve as the primary drivers of growth in emerging and developing markets.

(Obamuyi & Olayiwola, 2019) analysis indicates a complex relationship between corruption and economic growth in India, where the impact can be either detrimental or beneficial depending on specific factors.

(Helliwel, Huang, Grover, & Wang, 2018) conducted a comprehensive study utilizing the largest internationally available datasets, encompassing 157 countries from 2005 to 2012.

Their research aimed to evaluate the impact of governance quality on life assessments their study's main conclusion is that changes in governance quality over a period of time that is important to policy can have a big impact on people's quality life. for example, on a scale of 0 to 10 the top 10 nations with the most gains in government service delivery between 2005 and 2012 had average life ratings that were 0.4 points higher than those of the bottom 10

Additionally, their findings imply that, until service delivery reaches sufficient levels, service delivery quality typically surpasses democratic quality in terms of improving people's quality of life. But for nations that have previously achieved greater levels of service delivery, democratic quality becomes a favorable feature as development advances.

3. Data And Methodologie

In this study, we have relied on these indicators to measure economic freedom, which has been published annually since 1995 to 2022 This study uses an integrated database, cross-section and time series in standard analysis

Table 1 .Study variables

SERIES SYMBOL	SERIES NAME	SERIES SOURCES
GDP	GDP per capita	Database of the World Bank
OVER	Overscore index	heritage foundation
Mon	Monetary freedom	heritage foundation
Gouv	government spending	heritage foundation
PRO	Property rights	heritage foundation
Tra	Freedom of Trade	heritage foundation

Source: Database of the World Bank and heritage foundation

The analysis employs a balanced panel dataset with 13 cross-sectional units ($i = 13$ Arab countries), each containing a time series of 27 annual periods ($t = 1995$ to 2022). The total number of observations is 351 ($n \times t = 351$). Based on this sample, the model is specified as follows:"

$$GDP = f (PRO, TRA, OVER, MON, GOUV) \dots\dots\dots(1)$$

For estimation of the specified long-run relationship, we utilize the Pesaran et al. (2001) Autoregressive Distributed Lag (ARDL) framework; a robust alternative to conventional cointegration approaches. Unlike many cointegration tests, the ARDL approach accommodates variables integrated of different orders $I(0)$ or $I(1)$. Its primary requirement is that no variable exceeds $I(1)$ integration [i.e., none are $I(2)$].

3.1 Stationarity analysis of time series

To examine the stationarity of the time series, we relied on four basic tests: (LLC), (IPS), (ADF), and (PP).. The stationarity of the time series under study was tested at the constant level, and at the constant level and the general trend.

Table 2. Stationarity analysis of time series

	llc	ips	adf	Pp	llc		ips	adf	pp
	Constant only					Constant and trend			
		At the level							
GDP	-3.88530 (0.0001)	-5.49345 (0.0000)	78.8874 (0.0000)	138.540 (0.0000)	-2.60201 (0.0046)		-4.75591 (0.0000)	68.0069 (0.0000)	208.733 (0.0000)
PRO	-0.98317 (0.1628)	-0.72771 (0.2334)	25.5370 (0.4888)	28.6380 (0.3278)	0.57240 (0.7165)		2.10228 (0.9822)	10.8383 (0.9961)	17.1630 (0.9041)
TRA	-2.18721 (0.0144)	-1.64232 (0.0503)	35.5180 (0.1009)	36.6331 (0.0806)	1.67555 (0.9531)		0.41874 (0.6623)	22.6738 (0.6513)	24.2352 (0.5625)
OVER	1.28033 (0.8998)	0.20401 (0.5808)	23.2264 (0.6201)	28.1679 (0.3502)	2.64802 (0.9960)		0.74875 (0.7730)	19.3398 (0.8218)	30.8525 (0.2338)
MON	-1.90523 (0.0284)	-1.64381 (0.0501)	34.5033 (0.1228)	26.0045 (0.4629)	2.00977 (0.9778)		1.17506 (0.8800)	16.5014 (0.9234)	13.6595 (0.9772)
GOUV	-0.79469 (0.2134)	-2.35177 (0.0093)	43.3516 (0.0177)	54.5344 (0.0009)	-0.48967 (0.3122)		-1.00991 (0.1563)	35.1667 (0.1081)	39.0401 (0.0483)
		At the first difference							
PRO	-4.79360 (0.0000)	-7.58082 (0.0000)	106.418 (0.0000)	216.532 (0.0000)	-3.46516 (0.0003)		-6.56934 (0.0000)	89.5199 (0.0000)	197.394 (0.0000)
TRA	-7.54398 (0.0000)	-8.34545 (0.0000)	117.522 (0.0000)	239.164 (0.0000)	-5.95737 (0.0000)		-6.40698 (0.0000)	86.0839 (0.0000)	202.643 (0.0000)
OVER	-0.95894 (0.1688)	-7.93938 (0.0000)	114.601 (0.0000)	238.071 (0.0000)	1.52529 (0.9364)		-5.90106 (0.0000)	84.7371 (0.0000)	271.739 (0.0000)
MON	-3.66079 (0.0001)	-5.99138 (0.0000)	85.0301 (0.0000)	175.306 (0.0000)	-2.35165 (0.0093)		-4.29452 (0.0000)	62.2201 (0.0001)	149.501 (0.0000)
GOUV	-6.50395 (0.0000)	-9.44290 (0.0000)	134.074 (0.0000)	292.242 (0.0000)	-4.68033 (0.0000)		-8.02365 (0.0000)	107.603 (0.0000)	292.169 (0.0000)

Source: Prepared by researchers based on outputs E-views.13

Economic growth (GDP) is stationary at level $I(0)$, while all other variables are integrated of order one $I(1)$; Therefore, there is no variable integrated of order greater than one, which allows us to apply the ARDL approach.

Equation (1) is estimated using the following ARDL model:

$$\Delta GDP_{it} = \mu_i + \sum_{j=1}^{q_1} \vartheta_{1ij} \Delta GDP_{i,t-j} + \sum_{j=0}^{q_2} \vartheta_{2ij} \Delta PRO_{i,t-j} + \sum_{j=0}^{q_3} \vartheta_{3ij} \Delta TRA_{i,t-j} + \sum_{j=0}^{q_4} \vartheta_{4ij} \Delta OVE_{i,t-j} + \sum_{j=0}^{q_5} \vartheta_{5ij} \Delta MON_{i,t-j} + \sum_{j=0}^{q_6} \vartheta_{6ij} \Delta GOUV_{i,t-j} + \pi_{1i} GDP_{i,t-1} + \pi_{2i} PRO_{i,t-1} + \pi_{3i} TRA_{i,t-1} + \pi_{4i} OVE_{i,t-1} + \pi_{5i} MON_{i,t-1} + \pi_{6i} GOUV_{i,t-1} + \varepsilon_{it} \dots\dots\dots (2)$$

$$i = 1, 2, \dots, N \quad t = 1, 2, \dots, T$$

i represents the state, and t period.

GDP is the dependent variable, and PRO, TRA, OVE, MON, and GOUV are the independent variables.

μ_i represent individual effects .

ε_{it} represents the random error limit .

Δ represent the first differences.

The optimal lag length was determined based on the minimum values of (AIC) and (SIC) criteria (maximum lag *p* = 2).

Following Pesaran et al. (2001), the ARDL methodology employs first-differenced variables to model short-run effects and variables in levels to model long-run effects. Cointegration testing constitutes the first step, utilizing the following hypothesis:

$$\begin{cases} H_0 : & \pi_{1i} = \pi_{2i} = \pi_{3i} = \pi_{4i} = \pi_{5i} = \pi_{6i} = 0 . \\ H_1 : & \pi_{1i} \neq 0, \pi_{2i} \neq 0, \pi_{3i} \neq 0, \pi_{4i} \neq 0, \pi_{5i} \neq 0, \pi_{6i} \neq 0 . \end{cases}$$

The test statistic is the F-statistic (from the Wald test). The decision rule is as follows:

1. If the F-statistic exceeds the upper bound of the critical values, we reject the null hypothesis of no cointegration.
2. If the F-statistic falls below the lower bound of the critical values, we fail to reject the null hypothesis of no cointegration.
3. If the F-statistic lies between the upper and lower critical value bounds proposed by Pesaran et al. (2001), the test is inconclusive

3.2 Estimation results of PANEL ARDL model

The long-run estimation results using the Pooled Mean Group (PMG) and Mean Group (MG) models are shown in Table 3. We will estimate the parameters of this relationship using the ARDL methodology implemented in EViews 13 .Based on the Akaike and Schwarz criteria, the lag lengths were determined, and it was found that the model (0, 0, 0, 0, 0, 1) is the optimal model. The short- and long-run estimation results are shown in the following table:

Table 03 : Estimation of a panel ARDL model using the PMG and MG methods

Included observation : 351				
Variable	MG Coefficient	Prob	PMG Coefficient	Prob
Dependent Variable : GDP				
LongRun Coefficients				

PRO	-0.076381	0.0181	-0.070604	0.0001
TRA	0.092728	0.4383	-0.050176	0.0004
OVER	-0.174168	0.3891	0.191940	0.0000
MON	0.224893	0.0269	0.000369	0.9880
GOUV	0.060230	0.2623	0.001288	0.9351
C	-10.41857	0.2955	-1.631842	0.4436
Short-Run Coefficients				
COINTEQ (MG)	-0.982266	0.099062	-9.915714	0.0000
COINTEQ (PMG)	-0.738932	0.101854	-7.254846	0.0000

Source: Prepared by researchers using Eviews.13

The comparison between the two models is done through the Hausman test Table 4, whose results showed that the probability value is greater than the different levels of significance, which means accepting the null hypothesis, that is mean the short-term estimates are heterogeneous according to each country, so the combined group mean model (PMG) is the most appropriate compared to the group mean model (mg).

Table (4) Hausman Specification Test for PMG Estimation

Estimator	Stat.	p-Value
Mean Group	9.443292	0.1501

Source: Prepared by researchers using E-views.13

The findings from the error correction model estimation indicate a short-term dynamic relationship between the economic growth rate and the explanatory variables. This relationship is evidenced by the statistically significant and negative estimated error correction term. The error correction coefficient (-0.74) quantifies the rate at which deviations from long-run equilibrium are corrected. Furthermore, the negative sign of this coefficient confirms the existence of a stable long-run relationship among the variables.

We test for cointegration using the bounds testing approach within the Pooled Mean Group (PMG) framework. Short-term estimates are heterogeneous across cross-sections, necessitating country-by-country analysis.

The Table 05 shows that F-stat is greater than the upper limit of the critical value at a significant score (5%) that satisfies seven countries: 1, 2, 4, 8, 10, 11 and 13.

we reject the null hypothesis and accept the alternative hypothesis of a long-term equilibrium relationship in these countries.

F-stat in the rest of the countries did not exceed the upper limit of the critical value at different degrees of morality and therefore accept the hypothesis of nothingness that there is no longterm equilibrium relationship in these countries: 3, 5, 6, 7, 9 and 12 .

Table 5. Testing the relationship of co-integration using the boundary approach for each cross section

Cross-Section		F-Stat	ECM(-1)
1		6.411253	-1.026574 (0.0000)
2		3.562391	-0.158716 (0.2017)
3		2.630234	-0.373295 (0.0081)
4		4.471047	-0.630255 (0.0024)
5		1.671529	-0.365989 (0.0306)
6		2.425139	-0.704218 (0.0005)
7		2.846197	-0.938775 (0.0001)
8		5.365676	-0.978980 (0.0000)
9		2.952715	-0.978980 (0.0000)
10		5.819501	-0.724463 (0.0007)
11		3.500718	-0.780367 (0.0004)
12		18.88704	-1.631014 (0.0000)
13		2.455248	-0.625673 (0.0022)
Bounds critical values			
		Lower bound	Upper bound
5%		2.390	3.380
1%		3.060	4.150

() : Probability value.

Source: Prepared by researchers based on outputs E-views.13

4. Conclusion

Through this study, we tried to analyze the relationship between indicators of economic freedom represented by over score of economic freedom, the property rights index government spending index, the monetary freedom, trade freedom, and the economic growth, represented by the per capita GDP in The Arab for the period from 1995 to 2022 using Ardl Panel Model

Study results

The long-term coefficients in Table 3 varied across variables, with the effect of the independent variables on the dependent variable differing between negative and positive, and between significant and non-significant impacts.

Significant positive effects on economic growth were observed for the Overscore Index ($\beta = 0.19$), Monetary Freedom ($\beta = 0.0004$), and Government Spending ($\beta = 0.0012$). The coefficients for Monetary Freedom and Gove Spending are statistically significant. The coefficient for the Overscore Index is also statistically significant but achieves significance at different thresholds.

The influence of the remaining variables was negative and statistically significant at various degrees of moral. So that Property rights, Freedom of Trade adversely affected economic growth, its coefficients respectively are: -0.07 and -0.05.

There are no decelerations due to the fact that the optimal model according to the standards of AIC and Schwarz is (1,0,0,0,0), so the short-term parameters did not appear in the model. The error correction coefficient by country which was negative and statistically significant in 12 cross sections is shown in the Table 5

The finding of the study were in agreement with the results of several previous applied studies, Tomas (Strobel, 2010), (Donu & Janicko, 2018), which emphasized the positive effects of economic freedom on economic Growth.

Finally, This research confirms that whenever there was economic freedom with all its indicators, there was a positive impact on economic growth. Therefore, the Arab countries must work to improve the level of indicators of economic freedom to raise the levels of Economic growth, due to the low ranking of most Arab countries in the economic freedom Report issued by the Foundation (The Heritage Foundation).

Recommendations

Based on the previous results, the study proposes this set of recommendations that can guide decision-makers and economic policy makers in the countries under study:

Improve economic freedom indicators

The Encouragement of more freedom of investment, especially in countries such as Algeria, where investment is restricted is highly recommended.

The creation of an environment that supports freedoms, which in turn contributes to raising economic growth and thus achieving economic prosperity

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