Journal website : https://pse.razi.ac.ir

Razi University

Public Sector Economics Studies 15
Qurterly PSE
Department of Economics, Faculty of Economics and Accounting, Razi University
Vol. 5, Issue 15, Spring 2026 | Online ISSN: 2821-2681

# Examining the short-term and long-term effects of economic complexity on capability poverty: new evidence from D8 countries

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Type of Article: **Research**
10.22126/pse.2025.11825.1182
Received: 18 February 2025; Accepted: 17 June 2025
pp. 55-82

## Abstract

In addition to having extensive social dimensions, poverty also has undesirable economic consequences, and adopting policies to reduce it has always been at the forefront of economic issues at the macro level. According to the teachings of Islamic economics, justice in income distribution and combating poverty should be one of the basic pillars of policymaking, while examining this indicator in selected Islamic countries indicates its unfavorable situation compared to developed economies. Previous studies have analyzed the factors affecting this phenomenon from various angles, but the lack of research based on analyzing the effect of the knowledge-based economy on the poverty index is evident. Also, past studies have often considered the income poverty index in their analyses and have paid less attention to newer indicators that also pay attention to its capability dimensions. Therefore, the present study aims to investigate the long-term and short-term effects of economic complexity on the capability poverty index in D8 countries using a panel data model based on the PMG approach during the period 1997-2024. The results show that in the long-run equation, economic complexity has a negative and significant effect on capability poverty in the countries under study, and for each unit increase in the economic complexity index, capability poverty decreases by 21.2 units. Also, the effect of inflation and unemployment on capability poverty has been evaluated as positive, which is in accordance with economic theories. Fluctuations in economic growth, as one of the factors of economic instability, have also had a positive effect on the capability poverty index. Based on the research findings, adopting policies that strengthen the knowledge-based economy in selected Islamic countries is recommended to combat the problem of poverty. In addition, combating inflation and reducing the unemployment rate can lead to a reduction in capability poverty in these countries. Also, adopting policies that stabilize the economic growth rate and avoid fluctuations in it helps to improve the poverty situation.

**Keywords:** Capability Poverty, Economic Complexity, D8 Countries, PMG Approach.

**JEL Classification:** D2, I32, O14, R58, H11.

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**Citations:** Hosseini Doust, S. E., Jafari Seresht, D., & Moradjoi Hamedani, N. (2026). "Examining the short-term and long-term effects of economic complexity on capability poverty: new evidence from D8 countries". *Public Sector Economics Studies*, 5(15), 55-82.

**Homepage of this Article:** https://pse.razi.ac.ir/article_3783.html?lang=en

## 1. Introduction

Poverty, as a complex and multifaceted phenomenon that encompasses various aspects of social and economic life, is considered one of the greatest challenges facing the global economy and is at the center of development policies at the international level. At first glance, poverty may be considered merely an economic phenomenon and may seem to mean deprivation of access to some resources, but in fact, it has significant effects on other areas, such as the social and political atmosphere of countries, in various ways.

Accordingly, the present study aims to investigate the short-term and long-term effects of economic complexity on capability poverty in the D8 member countries. In this regard, first, economic complexity data, along with some other socio-economic variables (unemployment, inflation, fluctuations in economic growth rate) as explanatory variables of the model, were collected from the World Bank website, the KOF economic institute, and the World Development Indicators Database. Then, by applying the Panel-ARDL model, the effects of economic complexity on capability poverty in the D8 countries were examined in the short and long term.

## 2. Theoretical Framework

The prevailing thinking about the impact of economic complexity on poverty is that initially economic complexity can have a positive and increasing effect on income inequality and poverty and has a welfare loss, but over time and as new knowledge becomes widespread, economic complexity will have a negative and reducing effect on poverty (Hartmann et al, 2017; Le Caous & Huarng, 2020). The thinking of this group of analysts is based on the idea that in an economy with high knowledge diversity, complex industries can be expanded based on the progress and development of knowledge among the workforce. This will be followed by the weakening of traditional employment structures - which are often based on older knowledge. According to this analysis, when a new technology emerges, the demand for a higher-skilled workforce increases. At this stage, employers prefer a workforce with higher knowledge and more capable (i.e., more skilled) to a traditional workforce, and as a result, workers with low and old knowledge levels are either eliminated from the production process or hired at lower wages. As a result, the traditional or old workforce will have an incentive to learn new knowledge to enjoy higher wages and achieve better welfare. Therefore, poverty will initially increase due to the worsening of income inequality among the workforce. According to this analysis, after the accumulation of knowledge among the workforce and the knowledge enhancement of workers, which is reflected in the increase in their wages, a negative relationship will be established between economic complexity and income inequality and the poverty index; that is, the move towards a knowledge-based economy will ultimately help reduce income inequality,

increase job opportunities for all workers, and strengthen their bargaining power in determining wages and concluding labor contracts.

## 3. Methodology

In this study, the PMG estimator framework introduced by Pesaran, Shin, and Smith (1999) will be used. Pesaran et al. (1997) proposed the ARDL method for the analysis of the cointegration of single-equation models. To estimate this model, they proposed two estimators, including the between-group estimator (MGE) and the pooled group mean estimator (PMGE). The difference between these two estimators is that the slope and width are taken from different origins for the sections in the MG estimator and homogeneous slopes in the PMG estimator.

Given the aim of the present study, which is to examine the short-term and long-term effects of economic complexity on capability poverty the conceptual model of the research is presented in the form of following equation:

$$\Delta HPI_{it} = \emptyset_i\left(HPI_{i,t-1} - \beta_i x_{i,t-1}\right)\sum_{j=1}^{p-1}\lambda_{ij} + \sum_{j=0}^{q-1} HPI_{i.j}x_{i,t-j} + \mu_i + u_{it}$$

Where $HPI_{it}$ is the dependent variable and represents capability poverty, $x_{it}$ is the vector of explanatory variables of the model and includes ECI, UR, IFN, SDG and NI, which represent economic complexity, unemployment, inflation, economic growth volatility and economic growth, respectively. The sample of this study includes D8 member countries (Iran, Malaysia, Egypt, Indonesia, Nigeria, Turkey, Pakistan and Bangladesh) in the period 1997-2024.

## 4. Discussion

The findings indicate that in the long run, the economic complexity variable has a negative and significant effect on the rate of capability poverty in the countries under study. In other words, the selected Islamic countries under study in the present study can significantly reduce capability poverty by moving towards a knowledge-based economy and using modern technologies in their production processes. The results indicate that the unemployment rate has a positive and significant effect on the rate of capability poverty in the D8 countries. Work, as the most important source available to households, plays a significant role in providing the income needed by individuals and escaping poverty. The results of the model show that the inflation rate has a positive and significant effect on capability poverty in D8 countries. The effect of inflation on capability poverty is analyzed from different channels. On the one hand, inflation is like a hidden tax that reduces real disposable income, causing welfare damage to the household consumption basket and deepening poverty. On the other hand, the increase in the inflation rate is usually greater than the increase in the rate of increase in nominal wages of the labor force, which leads to a decrease in real income of the labor force and again increases poverty.

## 5. Conclusion and Suggestions

Moving towards a knowledge-based economy by improving the economic complexity index is a suitable path to combat capability poverty and move towards improving the level of development of selected Islamic countries. In addition, the effect of the variable of fluctuations in the economic growth rate as another influential variable on capability poverty is positive and significant, indicating that the increase in capability poverty occurs as a result of economic growth instabilities, which can be due to the failure to use the benefits of growth to improve the welfare infrastructure of the society in the countries under study. Considering the positive relationship between fluctuations in economic growth and the capability poverty index, it is suggested that the D8 countries provide a favorable environment for sustainable economic growth by adopting growth-stabilizing policies. Stable and sustainable growth, by reducing economic risk, creates a suitable environment for investment, and poverty reduction is achieved by increasing production and employment. Regarding the variables of inflation rate and unemployment rate, their positive and significant effect on the poverty index has been achieved, which is consistent with development theories and previous research. This finding recommends that in selected Islamic countries, policies to control inflation as well as create employment and reduce unemployment rates should be adopted to combat poverty.

## 6. Ethical Consideration

### 6.1. Compliance with ethical guidelines

The present study had obliged to all ethical standards and is in line with ethical guidelines.

### 6.2. Funding

The current study had no funding support.

### 6.3. Authors' Contributions

Every authors, which are named in the early of study had contributed in this manuscript.

### 6.4. Conflict of interest

There is no conflict of interest among the authors.

### 6.5. Acknowledgments

The authors are acknowledged all who had helped us in this study.