

Review Article

# Productivity Growth and Innovation in Iran's Economy with a Futures Study Approach

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## Abstract

The present article examines the growth of productivity and innovations in Iran's economy through a futures studies approach. Emphasizing the current economic developments and challenges facing the country, we analyze the strategies and solutions designed to enhance productivity and promote creative and inventive activities. In this study, the effects of technology and innovation on the productivity growth of Iran's economy are investigated, and solutions to accelerate the innovation process and increase production efficiency are introduced. Among these solutions are strengthening information technology infrastructure, upgrading employee skills, and encouraging research and development. This article, with a focus on creating an innovation ecosystem, reviews successful global experiences and then proposes strategies to achieve these goals in Iran. By presenting modeling and data mining approaches for future analysis, this research will help Iranian economic decision-makers and policymakers identify the best strategies for economic development with an emphasis on productivity. To predict future strategies, we utilize futures studies models and economic simulations. These analyses assist Iran's economic decision-makers in making the best decisions to improve economic productivity. Additionally, the article emphasizes promoting an entrepreneurial culture and establishing a knowledge-based economy to increase inventions and innovations. Enhancing collaboration between universities, industry, and the government is examined as one of the effective solutions in this field. Ultimately, this research, by providing practical guidance and suggestions, helps Iran's economic decision-makers move toward a sustainable, innovative, and high-productivity economy. In the outlook for Iran's economy, a combination of technology, innovation, resource management, and citizen participation can lead to productivity growth and value creation for the national economy. This futures studies approach, considering the recognition of economic motivations and challenges in the country, can aid in formulating appropriate strategies to achieve economic goals.

## Keywords

Futures Studies, Knowledge-Based Economy, Artificial Intelligence, Resistance Economy, Gross Domestic Product (GDP), Interpretive Structural Modeling (ISM)

## 1. Introduction

The study and understanding of the future have become essential requirements for modern organizations to survive in an intensely competitive and rapidly evolving environment.

The critical role of foresight lies in its ability to anticipate and manage future crises. The accelerating pace of change has rendered traditional approaches ineffective in dealing with

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these transformations, and any society that fails to adapt risks being overwhelmed by these sweeping shifts. One of the fundamental principles of futures studies is that the future is inherently uncertain; however, human agency plays a significant role in shaping it. Today, futures studies extend beyond mere prediction and the identification of future changes to include strategic foresight. Strategic planning serves as a framework for translating strategic thinking into actionable operations, leading to the realization of specific, planned outcomes. Accordingly, perhaps the greatest value of futures thinking and foresight lies in preparing for future challenges.

A key achievement of the emerging discipline of futures studies is the realization that the process of future evolution is far more complex than mere forecasting. This report, drawing upon various studies conducted by reputable global institutions, presents an overview of the projected global economic landscape up to 2030 and 2050, with a particular focus on the position of the Islamic Republic of Iran.

The goal of futures studies, with various approaches, is the systematic study of the future and is referred to by various names such as "futures studies," "futures research," and "futures field." Those engaged in this field of study are called "futurists." The aim of futurists is to discover or innovate, introduce, explore, and evaluate possible, probable, or preferable futures, and to prioritize them. They explore and analyze alternative and diverse futures to help people in making choices and creating the most desirable future. Futures studies encompass the possibility of viewing the future at various levels to better understand the interrelationships between humans, society, and the environment [1].

Over the past decade, particularly since 2012, strategic foresight initiatives have expanded significantly, gaining widespread adoption at regional, national, and even international levels [2]. Despite the rapid expansion of strategic foresight research—growing from approximately two published papers per year in 2001 to around eighteen in 2016—there remains a noticeable gap in theoretical advancement, particularly in the assessment of foresight initiatives [3]. Consequently, evaluating foresight projects is of critical importance for decision-making, long-term planning, and strategic policy formulation to enhance preparedness for future uncertainties and complexities. The issue of foresight evaluation has thus attracted significant attention from researchers, leading to an increase in scholarly efforts in this domain [4].

Nevertheless, a review of the academic literature highlights the lack of consensus among researchers regarding a standardized framework for evaluating strategic foresight [5]. Various scholars attribute this divergence to differences in the underlying logic of foresight projects, as well as the diverse managerial levels and topics upon which evaluation frameworks are based [6].

Iran's economy, as one of the key players in the region, faces numerous challenges and opportunities. In this context, the present study examines productivity growth, innovations,

and inventions in Iran's economy through a futures studies approach. This paper aims to provide a comprehensive analysis and propose practical strategies to enhance productivity and promote innovative activities within the Iranian economy.

In recent decades, Iran has encountered various challenges, including economic sanctions, oil price fluctuations, and domestic structural issues, all of which have underscored the need for innovative and sustainable solutions to improve economic efficiency. Emphasizing innovations and inventions as fundamental components of productivity growth, a knowledge-based economy, and sustainable development is crucial. Within this framework, we explore the long-term interaction between technology, innovation, and productivity. By employing advanced foresight models, we can identify more effective strategies to achieve economic productivity goals.

Drawing on successful international experiences, this paper examines effective measures in the fields of innovation and productivity while considering the realities of Iran's economic landscape. Specifically, in the pursuit of economic productivity improvement, we focus on fostering an entrepreneurial culture, enhancing collaborative interactions between the government, industry, and academia, and creating conducive conditions for incentivizing innovation.

By studying this paper, we hope that Iranian economic policymakers and decision-makers will benefit from its insights and, through the implementation of optimal strategies, steer the national economy toward sustainable and robust growth.

## 2. Literature Review & Theoretical Foundations

Productivity growth, innovation, and invention have been widely studied as fundamental drivers of economic development. In the case of Iran, these concepts have been particularly examined within the framework of futures studies. Below are key insights from the existing literature in this field:

*Impact of Sanctions and Oil Price Fluctuations:* Numerous studies have demonstrated that economic sanctions and fluctuations in oil prices have significantly affected Iran's economic challenges and the development of innovation. Research has explored these impacts and proposed strategies for better resource management in volatile conditions [7].

*Innovation and Invention Trends in Industry:* Several studies have analyzed the trends in innovation and invention within Iran's industrial sector. These studies focus on assessing the level of innovative activities across various industries and the enhancement of infrastructure to support technological advancements.

*Education and Skill Development:* Some research has been dedicated to examining the role of education and skill development in improving productivity and increasing the in-

novative capacity of individuals and organizations. These studies emphasize the importance of human capital in fostering a knowledge-based economy.

**Government Policies and Strategies:** A significant body of research has focused on governmental policies and strategies aimed at promoting innovation and enhancing productivity in Iran's economy. These policies include sanction mitigation measures, financial incentives, and legal reforms in the field of innovation [8].

**Futures Studies and Economic Foresight:** Several studies have investigated the future trajectory of Iran's economy, forecasting various strategies and their potential impacts on productivity growth. These papers present scenario-based analyses and foresight-driven recommendations for Iran's economic development [9].

Overall, economic futures research has been conducted extensively across various sectors, employing advanced analytical methods and up-to-date data to predict and develop policies and strategies aligned with Iran's economic future.

## 2.1. Key Topics and Approaches in Economic Futures Research

Economic futures research focuses on studying and analyzing potential forecasts and changes in the economy over time. This field aims to examine the future of the economy by utilizing data-driven approaches, analytical methodologies, mathematical models, and various forecasting tools to provide insights into potential economic scenarios. Below are some of the key topics and approaches in economic futures research:

- 1) *Analysis of Economic Trends:* Forecasting major economic trends such as economic growth, inflation, unemployment, and productivity rates remains a fundamental aspect of economic futures research.
- 2) *Impact of Technology and Innovation:* Investigating the effects of technological advancements, innovation, and automation on the economy and labor market is a crucial area of study. Research on the future of work and its implications holds significant importance.
- 3) *Business and Financial Market Research:* Analyzing financial markets and predicting their future behavior is essential for investors and major economic players.
- 4) *Effects of Environmental Changes:* Studying the impact of climate change and environmental issues on global and national economies is an increasingly important area of economic research.
- 5) *Financial Risk Management:* Research on identifying, managing, and predicting financial and economic risks, especially in stock markets and financial sectors, plays a vital role in economic stability.
- 6) *Influence of Government Policies and Decision-Making:* Examining the future impact of political and economic decision-making on society and the economy is a crucial subject in economic foresight.
- 7) *Behavioral Economics Research:* Analyzing economic

behaviors and psychological factors influencing individual and corporate decision-making in financial and economic contexts.

- 8) *Demographic Impacts:* Studying demographic changes and their effects on the economy and labor markets to anticipate future economic shifts.

Overall, economic futures research spans multiple disciplines, employing advanced analytical methodologies and real-time data to forecast trends and develop adaptive policies and strategies for future economic landscapes.

## 2.2. The Impact of Technology and Innovation on Economic Productivity Growth

Technology and innovation play an essential role in driving economic transformation and enhancing societal productivity. Below are key aspects that can be examined from a futures research perspective:

- 1) *Innovation in Fundamental Industries:* Analyzing how innovation in core industries such as manufacturing, agriculture, and energy contributes to economic productivity. This includes assessing the role of technology in improving processes and outputs within these sectors.
- 2) *Growth of the Digital Economy:* Exploring the transition to a digital economy and the transformation of business models through the adoption of Information and Communication Technology (ICT) and its impact on productivity growth.
- 3) *Artificial Intelligence and Automation:* Examining the effects of AI and automation on the labor market, skill requirements, and overall productivity improvements.
- 4) *Financial Tools and Investment in Innovation:* Investigating financial mechanisms and investment strategies that support technological advancement and innovation, along with their economic impact.
- 5) *Changes in Business Structures:* Evaluating how shifts in business structures driven by technology and innovation contribute to increased economic productivity.
- 6) *Education and Future Skills:* Studying the educational needs and skills development required for future societies to adapt to technological changes.
- 7) *Social and Cultural Impacts:* Analyzing the broader societal and cultural effects of innovation, including changes in social interactions, entertainment, and consumer behavior.

This future-oriented analysis highlights how the integration of technology and innovation can shape economic development, improve productivity, and foster long-term sustainable growth.

## 2.3. Economic Futures Research Methods

Economic futures research involves analyzing economic challenges and issues by considering future events, social

changes, technological advancements, and other influential factors. Below are some of the most common methods used in economic futures research:

1) *Scenario Planning*:

This method involves developing multiple future scenarios based on various factors, including social, economic, technological, political, and environmental influences. It helps in preparing for different possible futures.

2) *System Modeling*:

Using system modeling (such as Interpretive Structural Modeling - ISM), complex economic interactions and interdependencies can be modeled. These models often employ mathematical techniques and simulations to provide a more precise understanding of potential impacts.

3) *Agent-Based Modeling (ABM)*:

This approach simulates the behavior of individual agents (such as people, businesses, or organizations) and their interactions within an economic system. It helps in understanding policy implications and economic decision-making at a micro-level.

4) *Time-Series Analysis*:

This method analyzes historical time-series data to identify trends, patterns, and potential future developments. It relies on statistical and mathematical techniques for precise economic forecasting.

5) *Futures Studies Approaches*:

This broad approach examines past behaviors, current experiences, and potential future options to provide strategic insights into economic decision-making.

6) *Public Participation*:

Engaging the public in discussions about economic futures can lead to more informed and effective decision-making processes. Crowdsourced insights can help identify emerging trends and societal needs.

7) *Multi-Scenario Modeling*:

This method employs multiple models to simulate and visualize different future possibilities, allowing researchers to evaluate the strengths and weaknesses of various scenarios.

The most common tools used in economic futures studies are software and mathematical models. These tools analyze the impacts of various economic, social, technological, and political factors on the future. Some of the commonly used software and mathematical models in economic futures studies include: Any Logic, GAMS (General Algebraic Modeling System), Net Logo, Vensim, and others. Each of these tools and models has its own capabilities and applications, and their selection depends on the specific problem and research needs. These tools allow researchers and policymakers to model the impacts of various decisions in the economic field and make better decisions.

## 2.4. Examining the Future Scenarios of Iran's Economy

Examining the future scenarios of Iran's economy can pro-

vide a better understanding of the challenges, opportunities, and various paths for economic development in the country. Below are several future scenarios for Iran's economy:

*Scenario 1: Sustainable Growth and Technological Development*

In this scenario, Iran experiences improvements in living standards and economic productivity by focusing on sustainable growth and technological development. Supportive policies for innovation, the development of advanced technologies, and the enhancement of human capabilities will be the main features of this scenario.

*Scenario 2: Political and Economic Transformations*

In this scenario, significant political and economic changes occur. Deep reforms in the financial system, the removal of trade barriers, and facilitation of foreign investment led to strong economic growth and development across various sectors.

*Scenario 3: Economic Challenges and Social Tensions*

In this scenario, Iran's economy faces several challenges, such as sanctions, currency fluctuations, and domestic problems. This could result in social tensions and a decline in the economic system.

*Scenario 4: Development of Border Regions and International Trade*

Iran, focusing on the development of border areas, increasing international trade, and expanding regional cooperation, plays an important role as a bridge between countries in the regional economy.

*Scenario 5: Transformations in the Oil and Energy Industry*

Iran, by advancing technologies related to the oil and energy industry, increases the diversification of its revenue sources and focuses on expanding non-oil exports.

*Key Points:*

- 1) *Managing Transformations*: Smart management of economic and social transformations to seize opportunities and mitigate threats.
- 2) *Technological Development*: Investment in the development of technology and innovation as the main driver of economic growth.
- 3) *Strengthening Human Capabilities*: Raising education levels and developing new skills for society.
- 4) *Managing Natural Resources*: Intelligent management of natural resources to preserve the environment and create economic sustainability.
- 5) *Facilitating International Trade*: Creating more opportunities for international trade and facilitating the attraction of foreign investment.

Examining and analyzing these scenarios will help decision-makers and policymakers in Iran develop appropriate programs and policies for future economic development.

## 2.5. Iran's Economic Position in the World

A country's economic position in the world is influenced



by various factors such as the size of its economy, economic growth, financial markets, exports and imports, Gross Domestic Product (GDP), inflation rate, unemployment rate, and other economic indicators. In the case of Iran, some of its features and challenges are as follows:

1) *Size of the Economy:*

Iran is one of the largest economies in the Middle East, with a population of over 80 million people.

2) *Dependence on Natural Resources:*

Iran's economy is significantly dependent on natural resources like oil and gas, making it sensitive to fluctuations in exchange rates and energy prices, which have both positive and negative impacts.

3) *Sanctions and International Pressures:*

International sanctions have impacted Iran's economy and have become one of the main challenges for economic development.

4) *Economic Growth:*

Iran's economic growth has been affected by both internal and external variables, with some years witnessing positive growth and others experiencing a decline in growth.

5) *Financial Markets:*

Iran's financial markets are also influenced by policies, sanctions, and both domestic and global fluctuations.

*Gross Domestic Product (GDP):*

GDP is an important indicator showing the volume of production and the economy of a country.

6) *Inflation and Unemployment Rates:*

Inflation and unemployment rates are also crucial indicators reflecting the economic and social conditions of the country.

In general, despite its rich resources and large population, Iran faces challenges such as dependence on natural resources, international sanctions, and fluctuations in global markets. Developing strategic programs and policies can help improve Iran's economic position in the world [10].

## 2.6. Forecasting Iran's Economic Position in the World in 2030

Accurately predicting the future economic position of countries is challenging, as it is influenced by numerous complex and unpredictable factors. These factors include events and changes both within and outside the country, such as sanctions, fluctuations in global markets, political and economic transformations, and changes in industry and technology.

Currently, Iran's economic status is influenced by factors such as sanctions, oil market conditions, and internal issues. To provide an effective analysis and forecast for 2030, the following points should be considered:

1) *Political and Economic Developments:*

The potential for changes in internal policies and the economy, and their impact on Iran's overall economic outlook.

2) *Global Market Changes:*

Exchange rate fluctuations and oil price changes in global markets, and their effects on Iran's export revenues.

3) *Sanctions and International Relations:*

The likelihood of sanctions being lifted or altered, and how that would influence Iran's economy.

4) *Technological Advancements:*

The impact of technological changes on industries and broader economic markets.

5) *Economic Management:*

Iran's capacity to manage economic challenges and implement effective and sustainable policies.

Ultimately, for a more accurate forecast, continuous monitoring of economic conditions and up-to-date information is required. Additionally, the involvement of economists, researchers, and relevant institutions in the process of economic analysis and forecasting for Iran is crucial.

## 2.7. The Productivity Growth of Iran's Future Economy with a Focus on the Seventh Development Plan

Development plans in any country aim to achieve a variety of goals. The Seventh Development Plan is a five-year program for the economic, social, and cultural development of the Islamic Republic of Iran, which will run from the beginning of 2024 to the end of 2028. This plan is outlined in a bill and consists of 22 chapters and seven different sections, including economic, infrastructural, cultural and social, scientific, technological and educational, foreign policy, defense and security, administrative, legal, and judicial sectors.

The Seventh Development Plan contains important economic approaches that, if certain adjustments are made to these approaches and appropriate laws are approved, could play a significant role in correcting the country's economic structural issues. This article focuses on some of the strengths and weaknesses of the economic approaches in the Seventh Development Plan.

Some of the advantages of the Seventh Development Plan in terms of economic approaches include its focus on controlling monetary growth and inflation. According to Articles 7 to 11 of the Seventh Development Plan, which address the reform of the monetary system, and Articles 12 and 13 regarding the reform of the national budget structure, achieving a monetary growth rate of about 14% and an inflation rate of around 10% by the end of the plan is not out of reach, provided the banking laws are adequately reformed (the Comprehensive Banking Reform Bill is currently under discussion in Parliament), and the government adheres to a proper debt-to-GDP ratio.

Another advantage of the Seventh Development Plan is Article 5, which emphasizes the popularization of the economy and the implementation of the policies under Principle 44 of the Constitution. However, this article requires revision by Parliament. Parliament must consider the poor performance of the Privatization Organization in transferring

state-owned companies in previous governments. Privatization should only occur through the stock exchange, and appropriate laws must be enacted to ensure transparency, integrity in the privatization of shares, and the prevention of informational rent-seeking.

One of the drawbacks of the Seventh Development Plan is found in Article 29, which concerns the reform of pension funds. While this article provides a favorable approach for integrating pension funds and restructuring their management, its approach to increasing annual employment years is misguided [11].

One of the main shortcomings of the Seventh Development Plan is the lack of a comprehensive and practical approach to combating economic corruption and eliminating economic rent-seeking. One of the primary issues undermining the success of economic policies in the country is the rent-seeking nature of the core economy. Therefore, as long as rent-seeking and corruption persist in the economy, the success of effective development programs will not be achievable [12].

### 3. Research Methodology

The research method of this study is descriptive, and it is considered a systematic review in terms of its implementation approach. The statistical population of the study includes all the research works that have examined the role of productivity growth and innovation in Iran's economy from various aspects, with a futures studies approach. In order to access the research resources, keywords such as futures studies, knowledge-based economy, artificial intelligence, resistant economy, GDP, and structural interpretive modeling were searched in domestic scientific databases like Jihad Daneshgahi, Iranian Information and Documentation Research Institute, Noormags, and English keywords were searched in international scientific databases such as Scopus, ScienceDirect, and Google Scholar, and were studied accordingly.

### 4. Limitations of the Research

In every field, including economics and future studies planning, there are limitations that may directly impact the implementation of programs and growth. Below are some of the limitations related to the future-oriented economic planning of Iran:

- 1) *Sanctions and International Pressures*: Ongoing sanctions and geopolitical tensions can severely restrict trade, financial transactions, and access to global markets, undermining economic stability.
- 2) *Fluctuations in Global Markets*: Global economic volatility, including price changes in oil, commodities, and foreign exchange markets, can create uncertainty and hinder long-term planning and growth.
- 3) *Problems in the Financial Sector*: Issues such as a lack of financial reforms, inefficient banking systems, and

limited access to international financial markets can constrain investment and economic growth.

- 4) *Depletion of Natural Resources*: The country's heavy reliance on finite natural resources, such as oil and gas, poses long-term sustainability challenges, particularly as global demand shifts toward renewable energy sources.
- 5) *Demographic Changes*: Changes in population size, aging demographics, and migration patterns can affect labor markets, demand for goods and services, and the overall economic structure.
- 6) *Technological Transformations*: Rapid technological advancements may either provide opportunities for innovation or present challenges for industries that fail to adapt quickly enough, contributing to economic disruption.
- 7) *Lack of Investment*: Insufficient domestic and foreign investment in key sectors like infrastructure, technology, and education can hinder the development of a competitive, diversified economy.

### 5. Conclusions

In the modern global economy, often referred to as a knowledge-based economy, innovation is considered the main driver of economic growth, competitiveness, and the development of nations. The growth and development of innovation result from a complex set of relationships between active elements in a national innovation system. The innovation performance of countries is not solely dependent on their available resources but, perhaps more importantly, on the efficiency of their innovation systems. Following the Supreme Leader's emphasis on the importance of a knowledge-based economy and the goal to achieve the 1425 Vision, as well as the significant role of innovation in such an economy, it is essential for policymakers to prioritize methods for improving the innovation system and commercializing innovations as a cornerstone of this economic model.

Considering the challenges and opportunities of Iran's economy, fostering productivity growth and innovation through a futures-oriented approach can contribute to achieving the country's economic and social goals. In the future, technological development and innovation, transitioning to a knowledge-based economy, smart resource management, transformations in vital sectors such as agriculture and water, promoting a resilient economy, supporting entrepreneurship and startups, advancing the industrial sector, and effective human resource management are key actions that can improve productivity and innovation within the economy.

Planners and decision-makers, in light of a futures-oriented approach, must design strategies considering technological changes, societal needs, and global challenges. Additionally, involving the public and establishing transparent and participatory decision-making processes can help establish a dynamic and sustainable economy.

Overall, given the rapid changes occurring globally and the complexity of economic challenges, adopting a futures-oriented approach as a strategic tool could significantly impact Iran's economic development trajectory.

## 6. Suggestions for Future Research

For future research on the development of Iran's economy with a focus on productivity and innovation, there are various topics and aspects worth investigating. Below are some suggestions for future studies in this field:

- 1) *Analysis of the Impact of Sanctions on Economic Productivity:*
  - a. Examine the effects of economic sanctions on the growth and productivity of Iran's economy.
  - b. Evaluate strategies and solutions to counter sanctions and enhance productivity.
- 2) *Modeling Innovation in Different Sectors:*
  - a. Investigate and develop preventive models for innovation across different economic sectors in Iran.
  - b. Analyze the impact of changes in various sectors on the overall economy.
- 3) *Research on Technology and Innovation:*
  - a. Assess the role of technology and innovation in improving productivity and economic development.
  - b. Analyze opportunities and challenges in the continued development of technology in Iran.
- 4) *Analysis of Resilient Economy (Resistance Economy):*
  - a. Study resistance economy and strategies to cope with fluctuations in global markets.
  - b. Develop policies and strategies to strengthen the resilience of the Iranian economy.
- 5) *Studying Successful Experiences of Innovation in Other Countries:*
  - a. Investigate the experiences of leading countries in achieving economic innovation.
  - b. Transfer best practices and strategies to the context of Iran.

## Abbreviations

GDP	Gross Domestic Product
ISM	Interpretive Structural Modeling
ICT	Information and Communication Technology
ABM	Agent-Based Modeling

## Conflicts of Interest

The authors declare no conflicts of interest.

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## Biography



**Ali Kianifar** a PhD student in Financial Engineering and was born in Tehran. I graduated with an MBA from Iran University of Science and Technology in Tehran, Iran, in 2020. Currently a PhD student in Financial Management and a member of the specialized R&D team at JDEVS. He is an experienced and committed PMO manager with several years of experience at JDEVS in the field of UPS systems engineering and renewable energy applications in project management and organizational responsibilities.

## Research Field

**Ali Kianifar:** Financial engineering - financial management - risk management - strategy management - marketing management- Pro-

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**Elnaz Sabzei:** Stock Exchange - Financial engineering - financial management - Financial risk - Investment fund

**Zohreh Hajiha:** Accounting -Corporate Governance -Internal Audit - financial management - risk management-Artificial Intelligence -Machine Learning