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Assessment and Analysis of Iran's Long-term Competitive Industrial Performance Gap

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Abstract:
The Competitive Industrial Performance Index (CIP) measures a country's ability to produce, add value, export, and impact global trade through manufacturing industries. To improve industrial competitiveness, focus must be given to expanding production and enhancing its quality with technological advancements. Developing countries need to build technological capacity, increase production, and invest in infrastructure to upgrade their industrial competitiveness. However, Iran's Competitive Industrial Performance has fallen behind, lacking a favorable position in the region and the world. The annual reports of the UNIDO analyzing data from 1990 to 2020 shows that Iran's performance has been weak compared to similar economies. The gap between Iran and the global benchmark (Germany with a score of 0.416) and the regional benchmark (Turkey with a score of 0.117) has widened over the past three decades. Additionally, Iran's manufacturing industry production and export structures have experienced two different directions of transformation in the past two decades. From 2000 to 2010, concurrent with the Third and Fourth Development Plans, the Manufacturing Value Added share in total GDP (MVAsh) increased from 9% to 14%, and the Medium- and High-tech manufacturing Value-Added share (MHVASH) in total manufacturing value added increased from 41% to 45%. However, during the years 2010 to 2020, concurrent with the Fifth and Sixth Development Plans, both of these mentioned indicators regressed. Notably, the regression in the level of technology for high-tech products, from 0.9% to 0.5%, is continuously declining and poses a fundamental challenge for Iran's industrial competitiveness.

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1- Introduction

Industry, in the modern world, is one of the most important factors for development. Therefore, industrial indicators in recent decades have focused more on measuring and evaluating the influential factors on this crucial part of the economy. Labor force, productivity, competitiveness, and innovation, which are influenced by research and development costs, are among the key criteria for industrialization. At the macro level, these components also have an impact, but in addition, the issue of trade and trade patterns, especially in the field of exports, is also significant. Since the industry generates high value-added compared to other sectors, it has become essential for countries to adopt appropriate policies in this regard. Beyond the current developed countries, emerging economic giants are always striving to arrange their trade relations in a way that allows them to sustainably compete in this competitive environment.

What is important is that industrial indicators and trends related to industrial developments worldwide are indicative of the growth of emerging countries, especially in Asia. The key components that have facilitated such growth include improved productivity resulting from skill development and cost-effectiveness of labor, competitive pricing in the global market, and an export-oriented policy in the economic arena. On the other hand, in advanced industries such as technology and automotive, investment and research and development are of high importance, as employment trends of skilled individuals and the amount of input capital in these industries indicate. Industrial indicators in the 21st century also highlight some challenges. Economic growth reduction and tariff wars, especially for emerging countries, can be limiting factors as they affect employment levels and investment in these sectors. Additionally, reduced growth can lead to decreased purchasing power of people due to increased inflation, especially in developing countries. This can result in decreased demand for certain products in the markets and pose temporary challenges. Overall, in these years, at the end of the second decade of the 21st century, a promising outlook for the industry is observed, which can continue on the same path with continued investment in human and physical capital, along with innovation and creativity.

The " Competitive Industrial Performance Index (CIPI)" is one of the indicators used by the United Nations Industrial Development Organization (UNIDO) to assess the competitiveness and industrial performance of different economies based on the two dimensions of production and trade. This index evaluates and compares the production and export capacity of manufacturing industries in an economy using a set of relevant sub-indicators, reflecting countries' capacity to participate in domestic and international markets and engage in high value-added activities and advanced technologies. This index reflects the significant differences among countries in terms of production, value-added, exports, and their impact on global trade from their manufacturing industries, and measures the strength of countries in terms of industrial competitiveness on a scale ranging

from zero to one, with a higher score indicating greater strength in industrial competitiveness. According to UNIDO's definition, industrial competitiveness refers to countries' ability to sustain and increase their simultaneous presence in markets through the development of higher value-added industrial activities and the enhancement of the technological content of products.

Countries can enhance their competitiveness by learning from global markets. Achieving "learning from global markets" is contingent upon three important prerequisites: 1) improving technological capabilities, 2) developing productive capacities, and 3) making sufficient investments in infrastructure.

The increase in industrial competitiveness requires governments to adopt appropriate policies based on the attractiveness of relative advantages in order to create new competitive advantages through the development of possibilities. The year 2020 coincided with the outbreak of the COVID-19 pandemic, severely affecting individuals' personal and social lives. Many were forced to work remotely, while "essential workers" had to continue working despite the risk of infection, and many others lost their jobs. In these circumstances, governments had two main responsibilities: firstly, to prevent the spread of the virus, and secondly, to maintain the economy. Many businesses suffered losses and went bankrupt during this period. Therefore, the question arose as to how to analyze industrial competitiveness despite the COVID-19 pandemic?

Increasing industrial competition is the key to industrial development, and therefore today it has become a top priority on the agenda of many developing countries. UNIDO defines industrial competition as the capacity of countries to increase their presence in markets while simultaneously developing value-added industrial sectors and activities with "technological content." Improving industrial competition requires attention to two elements: "expanding production" to increase market presence at local and global levels, along with "raising the quality of production" or advancing along the "technology ladder."

The present study is structured into six sections. The theoretical framework and research methodology are outlined below. In this section, the dimensions of the industrial competitiveness index of UNIDO are explained. Then, the experiences and industrial competitiveness performance of countries are presented, followed by the results of the study, which are compared with the comparative study of industrial competitiveness performance in different countries around the world and the trends of the indices and industrial competitiveness performance of Iran in different time periods (in the form of years of development programs) are examined and evaluated. Finally, the article concludes with a summary and policy recommendations for the development of Iran's industrial sector.

2- Theoretical Concepts and Components of Industrial Competition

Over the past half-century, industrial development strategies have been among the most important pathways to development worldwide. Industry, as a provider of machinery and tools, has played a significant role in initiating or accelerating many processes related to economic growth. Industry is the main driver of growth, success, and innovation for countries, creating more value-added than other sectors and generating employment. Strong innovation in raw materials, information technology, and production and manufacturing processes, creating new opportunities for designing and producing new products and services, is one of the ways through which industry contributes to economic growth of a country.

There is no doubt that many jobs, both directly and indirectly, are dependent on the industry. In advanced economies, industry drives innovation, exports, and productivity growth, and the participation of developing countries in the supply chain of these industrial products, along with their demand for industrial goods from developed countries, drives global economic growth. Today, the development of communications has revealed the increasing importance of the relationship between industry and other sectors. The interactions between different industrial sectors, including agriculture, oil, energy, and construction, have expanded the scope of industrial activity and its impact beyond previous borders.

A look at successful trade in developed economies indicates that rapid industrial growth and a shift towards industrial goods in trade lead to further and sustained growth. This is due to structural changes and resource allocation from less productive sectors to more productive ones. Increasing global competition, shorter product life cycles, and technological advancements in industrial production are driving a shift in production structure towards participatory production beyond geographical boundaries, as well as a greater focus on service-related activities connected to production. As production systems become more complex and globalized, firms adopt strategies to reorganize value chains, resulting in different patterns of ownership and production geography. As a result, industrial activities are expected to become more fragmented and localized.

Goods are produced in various stages and in different geographic locations. Raw materials are sourced from one location, intermediate goods such as separate parts are produced in another location, and then they are exported to another geographic location for final processing and assembly. This strongly affects the production and industrialization levels of countries. For example, there are currently companies that produce products, but their employees never play a role in the production of the final product, as different stages of this product are produced in dispersed geographic locations. Therefore, the increasing global trade in intermediate goods has been experienced in the past two decades. Value chains play a key role in the process of industrial production from the first step in

the factory to reaching the end consumer. Today, production lines are fragmented and scattered globally, with developed countries focusing on activities and sectors with higher value-added, while developing countries focus on labor-intensive sectors that create less value-added.

Another issue is the development of global value chains and the rapid convergence of new geographic regions in the global economy, which has put increasing competitive pressure on countries that traditionally had an active role in the industrial sector. Specifically, China, Brazil, and India have experienced high growth in industrial exports and have become leading countries in competitive industrial production. India has been successful in software production and related information technology services, China in skill-intensive industrial products, and Brazil in agricultural products. Additionally, Latin America plays an important role in the production and supply of raw materials and food in the world. Moreover, Africa's role in raw material production has increased and is expected to surpass the current level in the future.

Predictions regarding the growth of BRICS countries (Brazil, Russia, India, China, and South Africa) indicate that these countries will reach a share equivalent to the share of the G7 industrialized countries in global gross production by the mid-21st century and by 2050. As a result of this trend, although traditionally considered as emerging economic regions in the world as assembly factories, the global trend shows that these countries have made heavy investments in increasing technical knowledge and industrial upgrading, and they are playing a more important role as global suppliers and competitors of industrialized countries.

In Asia, large-scale industries are currently major players in the global value chain. Rapid industrial development and the use of innovative and emerging technologies have created a competitive space in global production and trade. In this space, developing countries strive to develop these markets, and developed countries strive to maintain domestic and international consumer markets and to undergo fundamental changes and industrial upgrading and development.

The industrial competitiveness of countries is a fundamental factor for long-term sustainable growth, and the changing position of emerging and industrialized countries in terms of industrial value-added and industrial exports is strongly influenced by changes in industrial competition. In recent years, several indices have been used to assess the industrial competitiveness of countries, with particular attention to three indices: " Competitive Industrial Performance," "global industrial competitiveness," and "global competitiveness." Industrial competition is a key determinant of sustainable long-term growth, and the "industrial competitiveness index" effectively reflects the relative position of countries in this area.

The development of technological capacity, expansion of production capacity, and investment in infrastructure are key drivers of learning in developing countries and upgrading their industrial competitiveness. Therefore, increasing industrial competition requires policy interventions and systemic engineering to achieve new competitive advantages.

3- Some underlying key concepts in the industrial competitiveness index

Competitiveness is a reality that reflects a firm's capability to increase its market share, which entails higher profitability, space for development, and production scale. Various indicators are used to evaluate this capability and productive capacity, which depend on the benefits of production, market share, investment, productivity, and tariff structure. These indicators require data obtained from examining firms at the micro level or case studies.

3-1- Industrial Productivity

When it comes to productivity, the first thing that comes to mind is the theoretical and practical controversies about how to measure it. However, from the perspective of industry and industrial indicators, there is no doubt that modern production methods and advanced technologies play the most significant role in improving productivity. Since the industrial revolution and the adoption of modern methods and industrial automation in production, the optimal use of production factors and increasing per capita production has always been a topic of discussion, and various productivity indicators have been defined and evaluated among organizations and industries to determine their success in better utilizing production factors. In practical terms, industrial productivity can be reflected and measured at the micro level of the firm, macro level, and global trade level. However, the main principle is that in any firm with higher labor productivity, the cost per unit of production and the price of the finished product should decrease, and the competitiveness in the market should increase. In addition, as the ratio of value added to the value of the product increases, it is an indication of higher productivity and higher competitiveness in the market.

3-2- Industrial Diversification

One of the strategies that firms adopt to reduce potential risks is diversification of export markets. The more diverse these markets are, the more competitive power firms gain in those markets. Product diversification refers to the strategy of increasing sales through improving and enhancing products and services based on customer needs. Price differentiation of similar export products in countries reflects differences in features such as packaging, quality, and brand, which are the result of the firm's strategy towards increased diversification.

3-3- Industrial Value Added and Industrial Exports

There is a strong relationship between industrial competitiveness and "sustainable development goals". In fact, improving and enhancing industrial competitiveness to higher levels in any economy is considered a success in achieving sustainable

development goals, especially in version 9 of the sustainable development goals, which emphasizes on comprehensive and sustainable industrial development and faster innovation. Trade is a key element of industrial competitiveness, as it demonstrates the capacity of countries to increase their presence in global markets, the potential for industrial development penetration, and their growth prospects. World "industrial value added" has increased 2.5 times in 2015 compared to 1990, but "industrial exports" have increased more than 4.5 times during this period. The growth rate of industrial exports, especially from 2000 to the beginning of the 2008 financial crisis, has been high. Industrial goods constitute about 75% of total merchandise trade. The financial crisis had a more negative impact on industrial exports than on industrial value added. The common characteristic of the period from 1990 to 2015 was the rapid globalization of markets, such as the reduction of tariffs and other trade barriers, and technological advancements. During this period, countries with the highest growth rates in industrial value added have also experienced the highest growth rates in industrial exports. On the other hand, countries with poor performance in industrial exports showed weak industrial performance. For example, in China and Vietnam, the average annual growth rate of industrial exports has been over 13%, which is more than twice the global average.

3-4 Technology Absorption

The relationship between the performance of industrial exports and economic growth goes beyond statistical correlation. Positive correlation indicates conditions where a significant increase in exports, particularly in high value-added, technology-intensive industries, occurs with the utilization of economies of scale in key manufacturing industries. Therefore, successful industrial processes are experienced not only through the expansion of industrial exports, but also through "technology absorption," which means moving towards technology-intensive industries. The global trend of exports and industrial value-added in the past three decades, especially since 2001, has intensified and technological shifts during this period have transformed industrial business models from independent large industrial factories to multiple integrated industrial units in the global production chain for mass production. Technology absorption in industrial units has facilitated global trade of goods despite frictions such as industrial tariffs and other barriers over the past three decades. New markets and customers have allowed firms to take advantage of economic benefits and industrial firms have had to innovate and specialize in products where they had a competitive advantage. With various technological shifts and since 2016, the share of high- and medium-technology exports in total industrial exports has reached 37% in Hong Kong and 78% in Singapore. However, technology absorption factors can be divided into four categories, including "accessible production factors," such as sufficient capital in efficient capital

markets or labor mobility that can be transferred to innovative firms, "government policies" that play a crucial role in enhancing the economy's capacity to transition to high- and medium-technology industries, "quality of education and educational system" that determines the deployment of skilled labor capabilities in advanced production processes, and "infrastructure" that determines the capability of industrial locations to transition to high- and medium-technology.

4- The Competitive Industrial Performance (CIP) Index and its Sub-Indices

The UNIDO Competitive Industrial Performance Index (CIP) measures the industrial competitiveness of 145 to 155 countries in the long term, indicating how a country's industry contributes to development. This index explains and measures the success of a country's industries in production and exchange of goods in domestic and international markets, and the level of adaptability to structural changes and development. This index includes three main dimensions, each measured by two sub-indices. These dimensions include 1) Capacity to produce and export manufactured goods, 2) Technological deepening and upgrading, and 3) World impact. Higher scores in each of these three dimensions indicate higher industrial competitiveness and consequently a higher Industrial Competitiveness Performance Index. Thus, the Industrial Competitiveness Index has three main dimensions and eight sub-indices that collectively measure the three dimensions of production capacity, production technology, and production effectiveness.

4-1 Sub-indices of Countries' Capacity

The capacity index of countries reflects their ability to produce and export industrial products, and indicates the adjustment of country size with per capita income. This index consists of two sub-indices: "Manufacturing value added per capita (MVAPC)" and "Manufactured Export per capita (MXPC)". The Manufacturing value added per capita is measured by the per capita added value and Manufactured Export per capita. This index, known as the industrial value-added to constant price per capita, reflects the level of industrialization of each country. The sub-index of Manufactured Export per capita also indicates the ratio of industrial exports per capita (industrial export capacity), which demonstrates a country's technical ability to produce competitive goods along with technological changes.

4-2 Sub-indices of Technological deepening and upgrading

This index reflects the level of technological advancement and innovation in countries, and is indicative of the intensity of industrialization and the quality of exports, which are obtained through four sub-indices: "Technological Complexity", "Export Complexity", "Size of Industry", and "Size of Industrial Exports". The intensity of industrialization is calculated as the linear sum of the Medium- and High-tech manufacturing Value-Added share (MHVASH) in total

manufacturing value added, and the Manufacturing Value Added share in total GDP (MVAsh).

Based on empirical analyses, economic development generally involves a structural shift from resource-based and low-technology activities to medium- and high-tech activities. Increased opportunities for learning and technological innovations at the sectoral and inter-sectoral levels lead to higher complexity in the production structure of the country. The quality of exports is measured by the linear sum of the Medium- and High-tech manufactured Exports share in total manufactured exports (MHXSH), and Manufactured Export share in total Export (MXSH). The "Technology Complexity" sub-index measures the share of industrial goods with medium and high-tech in the overall value added of the industrial sector. The "Size of Industry" sub-index measures the share of industrial value added in gross domestic product. The "Export Complexity" sub-index measures the share of industrial exports with medium and high-tech in industrial exports. Finally, the "Size of Industrial Exports" sub-index measures the share of industrial exports in total exports.

4-3 World impact Sub-indices

The third dimension of industrial competitiveness encompasses the impact of each country on global industrial production. These impacts reflect not only the share of countries in global industrial value added but also their share in global industrial trade. This index is derived from two sub-indices: "Country’s Impact on World Manufacturing Value Added (ImWMVA)" and "Country’s Impact on World Manufacturing Trade (ImWMT)". The first sub-index indicates a country's share in global industrial value-added, reflecting the relative performance of a country and its impact on the global industry. The second sub-index calculates a country's share in global exports, indicating the relative competitiveness of a country compared to other countries in global markets. This indicator reflects the competitive position of a country relative to other countries in international markets through the benefits of market share in response to increased competitiveness, as opposed to significant losses from decreased competitiveness. Higher values of these indices indicate a country's higher ability resulting from the effects of economies of scale, size, and efficiencies, which can result from increased investment in infrastructure or greater bargaining power in trade agreements.

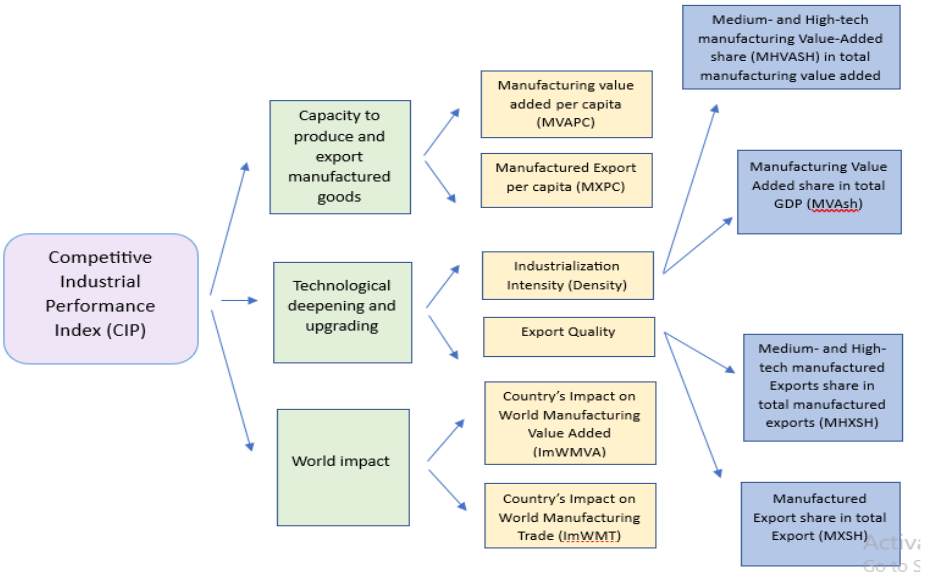


Figure 1: Competitive Industrial Performance Index (CIP) and Its Influential Factors

In calculating the final or composite index, the geometric mean with equal weighting is used, with the only consideration that the sub-indices (MHVASH and MVASH) and (MHXSH and MXSH) are added and divided by two, resulting in two sub-indices of intensity (ININT) and quality (MXQUAL), respectively. Therefore, the final formula for calculating the Competitive Industrial Performance Index (CIP) is as follows:

CIP = MVAPC * MXPC * INDINT * MXQUAL * IMWMVA * IMWMT.

5- Findings and Results of the Study on Iran's Competitive Industrial Performance Index (CIP)

This section of the study is presented and organized into three axes. First, the long-term trend of the Competitive Industrial Performance Index and its sub-indices for Iran are examined, followed by a comparative study of the Competitive Industrial Performance Index between countries with a focus on Iran. Then, an evaluation and analysis of the gap is carried out according to the latest available global and regional statistics. According to the article on the UNIDO's Competitive Industrial Performance Report 2020, based on the levels of technology, production, and trade structure, 54.1 percent of Iran's industries are "resource-based." These products, with Iran's comparative advantage, are mostly natural resources and raw materials, and are usually obtained through primary processes and under non-complicated and simple skills. Products with "medium technology" have a share of more than 32.5% in the second place, and this level of technology is more observable in the automotive and metals

industries. Products with "low technology" have a share of 12.9% in industrial products and in this type of technology, low research and development and relatively simple skills are required, and their major examples are clothing, shoes, and nondurable consumer goods. The range of penetration of "high technology" in the country's industrial products is low, and its share of the total factory industry products in the country is less than one percent (about 0.5%). The content of technology in these types of products is high in research and development costs and their rate of change is high, and they have a high added value and require high knowledge and skills, such as electronic products, medical equipment, and pharmaceutical industries. The changes in the level of technology in Iran's industrial products in recent years from 2017 to 2020 indicate a decrease in the share of resource-based industries from 65.8% to 54.1%, and an increase in the share of medium-technology industries from 25.5% to 32.5%, which is a positive and forward-looking development in the country's industrial technology level. However, the decline in the level of technology in advanced industrial products (with high technology) from 0.9% to 0.5% is a serious weakness and fundamental challenge for Iran's industrial competitiveness, which requires appropriate industrial policy measures in this area.

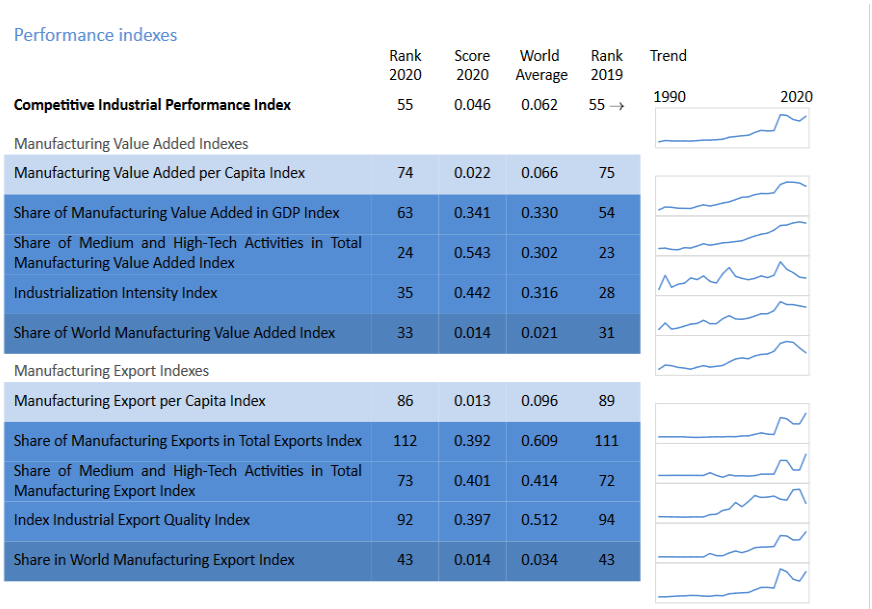
Over the past 20 years from 2000 to 2020, the production and export structures of Iranian industrial factories have experienced two distinct trends. Initially, during the first decade (1999-2009) and concurrent with the third and fourth development plans, significant structural changes occurred, increasing the share of manufacturing industries in gross domestic product (GDP) from 9 to 14 percent. During this period, the share of value added by industries with medium and advanced technology also increased from 41 to 45 percent of the total industrial value added.

In the past decade, this share initially experienced a sharp decline to less than 40 percent during the period of 2010 to 2013, and then remained stable at around 45 percent. Between the years 2010 to 2020 (corresponding to the fifth and sixth development plans), distinct conditions were experienced, and both indicators of the share of manufacturing industries in Gross Domestic Product (GDP) and the share of Medium- and High-tech manufacturing Value-Added share (MHVASH) in total manufacturing value added declined. Therefore, the structural changes in the production of manufacturing industries in the fifth and sixth development plans were different from the third and fourth plans, and in these recent development plans, the structure of Iran's industrial production has been weakened, and its role in the national economy has been reduced.

The structural changes in Iran's industrial exports in the long-term period from 2000 to 2020 show that, unlike the structural changes in industrial production, the structure of the country's trade has improved. The share of industrial exports in Iran's total non-oil exports increased from 9% in 2010 to nearly 40% in 2020, and

the share of exports of medium- and high-tech industrial products increased from 18% to 33%. In the first decade and during the years 2000 to 2010, over a period of 10 years at constant 2015 dollars, Iran's industrial value added increased from $20 billion to $63 billion in 2010, more than tripling. From 2010 to 2020, industrial value added in Iran fluctuated at an average of about $60 billion. In fact, the creation of value added in Iran's industries has remained unchanged in the 2010s, and the industrial value added in 2020 is equivalent to that of 2009.

The Iranian Competitive Industrial Performance Index (CIPI) gradually increased during the period from 1990 to 2008, coinciding with the onset of the global financial crisis. However, it experienced a decline from 2011 to 2013 due to the imposition and intensification of sanctions. In the following years, the index improved due to the emergence of the post-JCPOA era and the easing of sanctions. From 2017, the Competitive Industrial Performance Index began a downward trend, declining from 0.062 to 0.052 in 2018 and 2019. In 2020, the outbreak of COVID-19 and its consequences, like other countries in the world, caused a reduction in production capacity in the industrial sector; in this period, the performance score of the Iranian Competitive Industrial Performance Index has sharply decreased to 0.046 (Figure 2).



Performance indexes

	Rank 2020	Score 2020	World Average	Rank 2019	Trend 1990 2020
Competitive Industrial Performance Index	55	0.046	0.062	55 →	
Manufacturing Value Added Indexes					
Manufacturing Value Added per Capita Index	74	0.022	0.066	75	
Share of Manufacturing Value Added in GDP Index	63	0.341	0.330	54	
Share of Medium and High-Tech Activities in Total Manufacturing Value Added Index	24	0.543	0.302	23	
Industrialization Intensity Index	35	0.442	0.316	28	
Share of World Manufacturing Value Added Index	33	0.014	0.021	31	
Manufacturing Export Indexes					
Manufacturing Export per Capita Index	86	0.013	0.096	89	
Share of Manufacturing Exports in Total Exports Index	112	0.392	0.609	111	
Share of Medium and High-Tech Activities in Total Manufacturing Export Index	73	0.401	0.414	72	
Index Industrial Export Quality Index	92	0.397	0.512	94	
Share in World Manufacturing Export Index	43	0.014	0.034	43	

Figure 2: Iran's CIP Index and Its Influents Factors from 1990 to 2020

Source: UNIDO, CIPI, UNIDO Statics Data Portal, 1990-2022. (unido.org).

During the period of 1990 to 2020, the position or rank of Iran's Competitive Industrial Performance Index (CIPI) among the world countries was almost uniform and averaged at rank 85 from the beginning of the period in 1990 to 1998. After that, it faced a trend of improving its rank, which continues until now. A significant improvement in Iran's ranking, 20 steps from rank 73 to 55 with an increase in the score of the index from 0.037 to 0.065 in 2009, shows that basically, an increase in the numerical score of the index leads to an improvement in its rank. Currently, Iran's Competitive Industrial Performance Index ranks 55 among the 154 countries studied by UNIDO, just like its ranking in 2009 (Figure 2). The major challenge for Iran's industrial production in improving its competitiveness performance is its low industrial production capacity and resource-oriented production and export structure. To address the low capacity of industrial production and its trade and structural transformations, appropriate measures need to be taken.

5-1- Trend of Capacity to produce and export manufactured goods Sub-Index

The long-term trend of the share of the manufacturing industry in Iran's economy from 2000 to 2010 indicates an upward trend, but with the beginning of the second decade, the position of the industry in the Iranian economy has declined. In these years, industrial growth has been mostly declining. During the third and fourth development plans, industrial growth was in the range of 5% to 15%, both in terms of economic growth and industrial development. In fact, the Iranian economy has experienced convergence between the rate of industrial growth and economic growth, which indicates the importance of the impact of industries on the Iranian economy. However, in the second decade, economic and industrial growth has entered the "unpredictability" phase with a range of high fluctuations, from -7.5 to 7.5 percent.

5-2- Trend of Technology Intensity and Depth Sub-Index

The industrial intensity index is measured by the simple average of the industrial value-added share in Gross Domestic Product (GDP) and the share of medium and high-tech activities in industrial value-added. The first index represents the role of manufacturing industries in the economy, while the second index indicates the technical complexity of production in manufacturing industries. The trend of industrial intensity in Iran has been generally upward in the long run and essentially exhibits sinusoidal waves and political eras during the five-year development plan periods. For example, during the 2001-2005 period (including the third development plan years), we witnessed a suitable growth in the industrial intensity index, and in fact, the country's industrialization turning point occurred during this plan. The index of Medium- and High-tech manufacturing Value-Added share (MHVASH) in total manufacturing value added in Iran is one of the important components of the industrial intensity index with a trend that is

almost similar to it. The analysis previously mentioned is also applicable to this index.

Industrial Production and Trade Capacity: The Manufacturing value added per capita (MVAPC) index reflects the level of industrialization of Iran's economy. This index had a completely upward trend from 1990 to 2011 and declined simultaneously with the intensification of sanctions in the early 2010s, but has since improved and elevated during the middle of this decade. The share of industrial exports in total exports indicates the role of industrial production in export activities. From 1990 to 2008, including almost the first four development plans, Iran's Manufactured Export share in total Export (MXSH) was between 10% and 15%, and in 2009 there was a significant increase in this share, which increased from about 15% to 35%. This share decreased significantly in the early 2010s, to about 20%, but in the following years, the trend of this index improved again, and the Manufactured Export share in total Export of the country reached about 50%.

5-3- Trend of World impact Sub-Indices

The trend of Iran's Impact on World Manufacturing Trade (ImWMT) index on global markets demonstrates its relative competitiveness compared to other countries. Until 2000, Iran's role in World Manufacturing Trade was insignificant. However, with the beginning of economic foundation improvement and industrial development in the third and fourth development plans, these indices improved. In 2008, with the deepening of the financial crisis, the trend of Iran's increasing share in global trade intensified due to Iran's low sensitivity to global developments. However, at the beginning of the 1390s decade, the intensification of sanctions led to a decline in Iran's position in global industrial trade. In the following years, with the formation of the post-JCPOA era and the surge in Iran's impact on global industrial trade, this index improved. The trend of Iran's share in World Manufactured Exports (WMT) is similar to the aforementioned index (Iran's Impact on World Manufacturing). Initially, Iran's share was almost negligible from 1990, but with continued improvement, it faced a significant surge from 2008 onwards, and with the start of sanctions in the early 1390s, industrial exports and their share in global trade declined again.

Based on the examination of Iran's position in the long-term Manufacturing value added of the world, it can be concluded that Iran's share in the world's Manufacturing value added had an upward trend from 1990 to the beginning of the 2010s when severe sanctions were imposed. However, due to the decline in the growth rate of the industrial sector and mainly negative growth, the amount of Manufacturing value added decreased after the sanctions, indicating a reduction in the size of the industrial sector in the Iranian economy and a decrease in its share in the global economy. Internal statistics also confirm this claim, as the share of industry in gross domestic product has decreased from 20% to 12% in recent years.

6- Findings and results of comparing Iran's Competitive Industrial Performance Index (CIP) with other countries and gap analyzing

According to the latest available statistics in 2020, the study of the status of the World's countries' Competitive Industrial Performance Index score and ranking shows that Germany ranks first in the world with a score of 0.416. Following Germany, the next 9 countries with the highest industrial competitiveness scores and rankings are China, Ireland, Japan, South Korea, the United States, Switzerland, Taiwan, Singapore, and the Netherlands, ranked 2nd to 10th in this index. In fact, among 154 countries, these top 10 countries have the highest industrial competitiveness scores in the world. The study of Iran's position in 2020 shows that Iran ranks 55th among 154 countries in the world with a score of 0.046. Among the selected countries in the Middle East and North Africa, Iran ranks after Turkey with a score of 0.117 and a rank of 28, the United Arab Emirates with a score of 0.102 and a rank of 31, Saudi Arabia with a score of 0.072 and a rank of 41, Bahrain with a score of 0.053 and a rank of 48, and Qatar with a score of 0.053 and a rank of 51. It is noteworthy that the average score of the world's Competitive Industrial Performance Index in 2020 is 0.062, and with a score of 0.046, Iran is lower than the world average and is among developing countries with average income, with a performance gap of 74.2 out of 100.

Among the newly industrialized countries, the first generation (including South Korea, Mexico, Argentina, Brazil, India, Hong Kong, Taiwan, and Singapore) and the second generation (including Indonesia, Turkey, Malaysia, the Philippines, Thailand, Colombia, Morocco, and Tunisia), only five countries (Argentina, Brazil, India, Mexico, and South Korea) and five countries (Indonesia, Malaysia, Thailand, Tunisia, and Turkey) are members of the G20, as shown in Table (1) for comparison with Iran. One of the criticisms of this article is that it measures the performance of each country "relative to" the performance of other countries, only showing the relative position of each country in the competitive industrial performance environment. Therefore, if a country improves its industrial competitiveness performance in the two-year period, but other countries have achieved greater improvements, the ranking of that country does not improve, and this effort by the country is not observable in statistics. Therefore, there is a need for a measure that shows absolute rather than relative improvement in industrial competitiveness performance.

Another issue is that apart from the inability to observe the trend of improvement over time, it is not possible to judge the level of gap between two countries in a specific period, as ranking countries only reveals, for example, that in 2020 Turkey ranks 28th and Iran ranks 55th, but does this really mean that Turkey's situation is twice as good as Iran's? Of course, this is not the case. Therefore, during the long-term annual periods, especially since the 2010s when Iran's rank in Competitive Industrial Performance has not improved despite the improvement

in numerical score, responsible authorities have stated that they have made efforts and improved Competitive Industrial Performance. However, some countries have made more efforts and as a result, have been able to advance in the rankings. Of course, in the long-term period of 1990-2010, Iran's rank and value of Competitive Industrial Performance improved significantly with a rank of 29+ and a numerical score of 0.04+, respectively. However, in the 2010s, there has been no significant change in Iran's rank and numerical score in Competitive Industrial Performance. Until the end of the decade, in 2020, despite the improvement in rank, Iran's numerical score has decreased by 0.028%.

Table1 : Iran's Position in Comparison to Other Countries in Terms of Competitive Industrial Performance Index

Country	1990			1995			2000			2005			2010			2015			2020		
	rank	score	%	rank	score	%	rank	score	%	rank	score	%	rank	score	%	rank	score	%	rank	score	%
Germany	1	0.59	3.39	1	0.55	3.64	2	0.53	3.77	1	0.57	5.26	1	0.55	10.91	1	0.47	10.64	1	0.46	10.87
America	3	0.47	4.26	3	0.51	3.92	1	0.54	3.7	3	0.47	6.38	3	0.44	13.64	3	0.37	13.51	3	0.35	14.29
Japan	2	0.52	3.85	2	0.54	3.7	3	0.5	4	2	0.47	6.38	2	0.45	13.33	5	0.35	14.29	4	0.35	14.29
China	32	0.09	22.22	24	0.14	14.29	23	0.18	11.11	16	0.26	11.54	5	0.36	16.67	2	0.37	13.51	2	0.39	12.82
R. Korea	16	0.2	10	12	0.27	7.41	10	0.32	6.25	5	0.36	8.33	4	0.41	14.63	4	0.36	13.89	5	0.35	14.29
Mexico	29	0.11	18.18	21	0.17	11.76	19	0.22	9.09	21	0.19	15.79	21	0.18	33.33	20	0.17	29.41	20	0.17	29.41
Brazil	27	0.11	18.18	27	0.12	16.67	31	0.11	18.18	29	0.12	25	32	0.12	50	37	0.09	55.56	42	0.08	62.5
Argentina	43	0.07	28.57	36	0.09	22.22	40	0.08	25	41	0.09	33.33	38	0.1	60	42	0.07	71.43	55	0.05	100
India	61	0.04	50	55	0.05	40	57	0.05	40	55	0.06	50	43	0.08	75	40	0.07	71.43	38	0.08	62.5
Malaysia	28	0.11	18.18	20	0.17	11.76	21	0.19	10.53	22	0.19	15.79	23	0.18	33.33	22	0.15	33.33	22	0.16	31.25
Indonesia	54	0.05	40	41	0.08	25	37	0.09	22.22	42	0.08	37.5	39	0.09	66.67	39	0.08	62.5	40	0.08	62.5
Türkiye	39	0.07	28.57	37	0.09	22.22	34	0.09	22.22	30	0.12	25	31	0.12	50	29	0.12	41.67	28	0.12	41.67
Thailand	34	0.09	22.22	26	0.13	15.38	25	0.14	14.29	26	0.15	20	25	0.17	35.29	24	0.15	33.33	25	0.14	35.71
Tunisia	69	0.03	66.67	59	0.04	50	62	0.04	50	64	0.04	75	66	0.05	120	63	0.04	125	68	0.04	125
Vietnam	98	0.02	100	94	0.02	100	81	0.02	100	70	0.04	75	64	0.05	120	45	0.07	71.73	36	0.09	55.56
Iran	87	0.02	100	87	0.02	100	82	0.02	100	72	0.03	100	58	0.06	100	55	0.05	100	56	0.05	100

Source: UNIDO

By observing the distance-to-desired-border metric, one can precisely understand Iran's real and absolute performance. To this end, the Competitive Industrial Performance Index, including numerical value (score), rank, and percentage from the highest global (Germany) and regional (Turkey) performance for annual periods from 1990 to 2022, is presented in Table (2). This metric is calculated as a percentage, and 100 means the highest performance observed in each index. Therefore, the distance of each country from the border is expressed on a scale from zero to one hundred, where zero means the lowest performance and one hundred is on the ideal border point (completely desirable) based on the best performance among all countries. For example, a country that has achieved a score of 75% means that it is 25% away from the border established based on the best performance among all countries, and if the score of that country reaches 80% in 2020, it undoubtedly means that its Competitive Industrial Performance has improved. Thus, the distance-to-desired-border metric complements the ranking of industrial competitiveness, comparing countries with each other at a specific point in time.

Based on this criterion, it is determined that Iran's annual distance from the ideal border and point from 1990 to 2010 has been a few percentage points. For

example, Iran's Competitive Industrial Performance has been at a minimum and maximum level of 3.4% and 10.9%, respectively, compared to the global ideal point, Germany, over a 30-year period from 1990 to 2010. In fact, from 1990 to 2010, despite the significant gap with the global ideal, Iran's Competitive Industrial Performance has been improving with fluctuations. However, in the 2010s, this gap did not decrease, but even worsened, and even in 2020, this gap has become worse. Furthermore, Iran's Competitive Industrial Performance, compared to the regional ideal point, Turkey, has been at a minimum and maximum level of 22.2% and 50.0%, respectively, over a 30-year period from 1995 to 2010. In fact, from 1990 to 2010, despite significant gaps with the regional ideal, Iran's Competitive Industrial Performance has improved despite fluctuations in competition. However, in the 2010s, this gap did not decrease towards the regional ideal border; rather, it worsened significantly, reaching from 50 to 24.7 in 2020. Currently, Iran's gap with Turkey in the Competitive Industrial Performance index for 2010 and 2020 is 50% and 25%, respectively, meaning Turkey's situation is 25 percentage points better than Iran. Thus, despite improvement, Iran's lowest and highest levels of Competitive Industrial Performance relative to the global and regional ideals have remained very high in the long run. Although there is no stable trend during this period, from the beginning to 2010, this index has fluctuated towards improvement, but in the 2010s, particularly in 2020, it has fluctuated towards severity and the gap with the global and regional ideal points has reached from 11 and 50 in 2010 to 5 and 25 in 2020, respectively.

Table 2: Iran's Industrial Competitiveness in Comparison to the Best Global and Regional Performances

Period	The scope of the development program	Iran				Iran's performance compared to the world's top-ranked country: Germany			Iran's performance compared to the top-ranked country in a region: Turkey		
		Rank	Change Score	Score	Change Score	Score	Percent	Gap	Score (Rank)	Percent	Gap
1990	Start of the first program	87	...	0.02	...	0.59	3.39	96.61	(39) 0.07	28.57	71.43
1995	Start of the second program	87	0	0.02	0	0.55	3.64	96.36	(37) 0.09	22.22	77.78
2000	The beginning of the third program	82	+5	0.02	0	0.53	3.77	96.23	(34) 0.09	22.22	77.78
2005	The beginning of the fourth program	72	+10	0.03	+0.01	0.57	5.26	94.74	(30) 0.12	25	75
2010	The beginning of the fifth program	58	+14	0.06	+0.03	0.55	10.91	89.09	(31) 0.12	50	50
2015	End of the fifth program	55	+3	0.05	-0.01	0.47	10.64	89.36	(29) 0.12	41.67	58.33
1019	The sixth development plan	56	-1	0.05	0	0.46	10.87	89.13	(28) 0.12	41.67	58.33
2020		55	+1	0.022	-0.028	0.416	5.29	94.71	(28) 0.089	24.72	75.28

Source: UNIDO

The important point is that although Iran ranked 55th in Competitive Industrial Performance among 154 countries in 2020, which means it is relatively low, when looking at Iran's situation absolutely, it is much better than a middle-income country. So, although Iran's rank (55) is better than the middle-income

countries, which is 77, the gap to the ideal global and regional border is much wider. Iran's Competitive Industrial Performance has improved in line with the third and fourth development plans until 2010, but it has stopped in the 2010s. In the following, in the dimensions of the 8 sub-indices of Iran's Competitive Industrial Performance compared to the ideal global (Germany) and regional (Turkey) borders, it is measured, analyzed, and evaluated annually from 1996 to 2020.

6-1- Trend of sub-index of Capacity to produce and export manufactured goods

Iran, ranking 78th in Capacity to produce and export manufactured goods, has a significantly weaker performance in the CIPI component of this sub-index. Moreover, the two explanatory sub-indices for this component are also evaluated as extremely weak. Regarding the Manufacturing value added per capita (MVAPC) (in constant 2015 dollars), Iran's index has increased from $269 in 1996 to $676 in 2020, with a long-term performance index of 251. However, for Germany and Turkey - two ideal (desirable) global and regional border countries - the index has increased from $5831 and $926 in 1996 to $7928 and $1984 in 2020, with a long-term performance index of 136 and 214, respectively. In fact, there is still a significant gap in this index between what is and what should be (ideal global and even regional border) for Iran. Regarding the Manufactured Export per capita (MXPC) (in current dollars), this index has significantly increased for Iran from $35.6 in 1996 to $462 in 2020, with a long-term performance index of 1298. However, for Germany and Turkey - two ideal (desirable) global and regional border countries - the index has increased from $5661 and $331 in 1996 to $14857 and $1768 in 2020, with a long-term performance index of 262 and 534, respectively. The performance gap of Iran in comparison to these two countries in this index has increased from 0.6 (less than 1) and 10.8 in 1996 to 3.1 and 26.1 in 2020 respectively. Despite the long-term increase in Iran's Manufactured exports during this period, there is still a significant performance gap in this index between what exists and what should be (the ideal global and even regional standard). Undoubtedly, by Iran achieving the top position in both indices (the ideal and desirable global standard), the value-added and per capita exports of Iran's Manufacturing can increase up to 3 to 4 times. This level of growth requires a set of international, national, and domestic obligations as well as the utilization of fundamental factors of productivity, technology, and innovation, along with the elimination of various barriers ahead. Achieving the capacity for production and export of Iran's Manufacturing is feasible by implementing these requirements.

6-2- Trend of sub-index of Technological deepening and upgrading

Iran has achieved the weakest pillar of the three dimensions of the Competitive Industrial Performance index by ranking 82nd in the sub-index of Technological deepening and upgrading. In the following, the four sub-indices that explain it

and analyze Iran's gap will be evaluated. Regarding the share of Medium- and High-tech manufacturing Value-Added share (MHVASH) in total manufacturing value added (% in current US dollars), this index has increased from 34.8% in 1996 to 44.7% in 2020 for Iran, with a long-term performance index of 128. Meanwhile, this sub-index has increased to 61.3 and 36.7 in 2020, with long-term performance indices of 123 and 136, respectively, for two ideal global and regional border countries. The gap in Iran's performance compared to these two countries in this index has reached 73 and 121.7 in 2020, respectively, from 69.8 and 128.7 in 1996.

In fact, despite being far from the desirable global benchmark, Iran has surpassed Turkey in this index. A careful study of this issue shows that the reasons and roots lie in the gap in the size and structure of industrial factories and the definition of industries with high and medium technology. Chemical industry products, which play a prominent role in Iran's industries, are defined in this spectrum of industries. Regarding the Manufacturing Value Added share in total GDP (MVAsh) (fixed USD 2015), this index for Iran has increased significantly from 7.6% in 1996 to 14.2% in 2010, but it has faced a halt and even a decrease in the 2010s. Meanwhile, this sub-index for the two ideal (desirable) countries in the world and the region respectively, has improved from 18.2 and 15.2 in 1996 to 19.3 and 16.5 in 2020, with a long-term performance index of 106.2 and 108.1 respectively. The performance gap between Iran and these two countries in this index has increased from 41.5 and 49.5 in 1996 to 66.8 and 78.3 in 2020. In fact, despite the distance from the desirable global and regional benchmark in this index, the gap has relatively decreased in the long run compared to the global and regional performance gap. Regarding the share of Medium- and High-tech manufactured Exports share in total manufactured exports (MHXSH) (in current dollars), the value of this index for Iran has improved significantly from 13.9% in 1996 to 33.0% in 2020, with an impressive long-term performance index of 238. Meanwhile, for the two ideal (desired) world and regional countries, the sub-indexes have improved from 70.3% and 24.2% in 1996 to 73.4% and 44.4% in 2020, respectively, with long-term performance indexes of 104 and 183. Both countries show significant improvement in the structure of industrial exports at the ideal and desirable global border, but the development of the structure of hi-tech exports, especially in Turkey, is more exponential in the long run. As previously mentioned, the root of this increase in the size of industrial factory exports, especially for Iran, is in the structure of manufacturing and the definition of high and medium technology industries. As for the share of Manufactured Export share in total Export (MXSH) (in current dollars), the value of this index for Iran has seen an exponential growth of 320.7% with an impressive long-term performance index, from 12.2% in 1996 to 39.0% in 2015. Meanwhile, for the two ideal (desired) world and regional countries, the sub-indexes have improved

from 87.8% and 85.3% in 1996 to 89.8% and 87.9% in 2020, respectively, with long-term performance indexes of 102.3 and 103.1. Both countries show significant improvement in the structure of industrial exports at the ideal and desirable global border.

Both countries have taken steps to improve their industrial structure in the long term despite having a completely industrial export structure for achieving the ideal global and regional borders. However, despite a 3.2-fold increase in this index for Iran in the long term, it is still far from the ideal global and even regional border. Undoubtedly, if Iran reaches the first place in the aforementioned four indices (ideal and desirable global and regional border), the share of Manufactured Export share in total Export (MXSH) with the ideal border of the region can be increased by more than twice. Achieving this increase requires a set of international, national, and domestic requirements and the use of fundamental factors of productivity, technology, and innovation by eliminating various obstacles. It is achievable through the realization of production capacities, especially the quality of the export structure of Iranian industries, to facilitate access to global markets.

6-3- Trend of sub-index of World impact

Iran has achieved a relatively suitable performance compared to the other two components of the Competitive Industrial Performance Index in the field of global penetration by ranking 42nd. However, there is still a gap between Iran's performance and the ideal global and regional border. The two sub-indicators explaining this component are not appropriately evaluated. As for the Country’s Impact on World Manufacturing Value Added (ImWMVA) (in constant 2015 dollars), this index has shown a significant jump from 0.28% in 1996 to 0.57% in 2010, but in the 2010s, it has faced a halt and even a decline, reaching about 0.15 percentage points lower than in 2010, a 0.42% decrease in 2020. It is worth noting that this sub-indicator has reached 7.9% and 0.9% in the ideal (desirable) global and regional border countries, respectively, in 1996, and 4.9% and 1.2% in 2020, with a long-term performance index of 61.7 and 123.7, respectively. It should be noted that with the powerful presence of China, which has increased its share of production (value-added) in the world's industries from 5.4% in 1996 to 30.08% in 2020, the share of key global players, including Iran, in global industrial production has decreased.

Table 3: The Competitive Industrial Performance Gap in Iran in Eight Sub-Indices

period		Germany	Türkiye	Iran	The Gap between Iran and Ideal World and Regional Countries.	
					Germany	Türkiye
Competitive Industrial Performance Score and Ranking	1996	0.54	0.089 (36)	0.022 (87)	4.1 (95.9)	24.7 (75.3)
	2000	0.525	0.090 (34)	0.024 (80)	4.6 (95.4)	26.7 (73.3)
	2010	0.56	0.125 (30)	0.062 (56)	11.1 (88.9)	49.6 (50.4)
	2020	0.416	0.089 (28)	0.022 (55)	5.29 (94.7)	24.72 (75.28)
Manufacturing value added per capita (MVAPC)	1996	5830.5	925.6	269	4.6 (95.4)	29.1 (70.9)
	2000	6627	995.2	344.9	5.2 (94.8)	34.7 (65.3)
	2010	7487.7	1322.3	787.7	11.9 (88.1)	59.6 (40.4)
	2020	7928	1983.5	675.6	8.52 (91.48)	34.06 (65.94)
Long-term index (1996=100)		136.0	214.3	251.2	185.2	117
Manufactured Export per capita (MXPC)	1996	5661.2	330.7	35.6	0.63 (99.37)	10.77 (89.23)
	2000	5913.7	385.1	40.4	0.68 (99.32)	10.49 (89.51)
	2010	13943.2	1381.1	381.1	2.73 (97.27)	27.59 (72.41)
	2020	14857	1768.1	462.2	3.11 (96.89)	26.14 (73.86)
Long-term index (1996=100)		262.4	534.7	1298.3	493.65	242.7
Country's Impact on World Manufacturing Value Added (ImWMVA)	1996	7.91	0.92	0.28	3.54 (96.46)	30.43 (69.57)
	2000	7.64	0.89	0.32	4.19 (95.81)	35.96 (64.04)
	2010	5.94	0.94	0.57	9.60 (90.4)	60.6 (39.4)
	2020	4.88	1.23	0.42	8.61 (91.39)	34.15 (65.85)
Long-term index (1996=100)		61.69	133.7	150	243.2	112.22
Country's Impact on World Manufacturing Trade (ImWMT)	1996	11.42	0.49	0.05	0.44 (99.56)	10.20 (89.80)
	2000	9.93	0.5	0.05	0.50 (99.5)	10.0 (90.0)
	2010	10.47	0.93	0.26	2.48 (97.5)	27.96 (72.04)
	2020	9.7	1.16	0.27	2.78 (97.22)	23.28 (76.72)
Long-term index (1996=100)		84.94	236.73	540	631.8	228.2
Medium- and High-tech manufacturing Value-Added share (MHVASH) in total manufacturing value added	1996	49.84	27.05	34.81	69.84 (30.2)	128.69 (?)
	2000	53.95	26.76	41.25	76.46 (23.54)	154.15 (?)
	2010	59.08	30.23	45.03	76.2 (23.78)	148.96 (?)
	2020	61.25	36.74	44.71	73.0 (27.0)	121.69 (?)
Long-term index (1996=100)		122.89	135.82	128.4	104.52	94.56
Medium- and High-tech manufactured Exports share in total manufactured exports (MHXSH)	1996	70.32	24.24	13.87	19.72 (80.28)	57.22 (42.78)
	2000	72.97	31.94	18.13	24.85 (75.15)	56.76 (43.24)
	2010	72.11	42.5	23.91	33.16 (66.84)	56.26 (43.74)
	2020	73.36	44.38	33.01	45.0 (55.0)	74.38 (25.62)
Long-term index (1996=100)		104.32	183.09	238	228.19	12.99
Manufacturing Value Added share in total GDP (MVAsh)	1996	18.21	15.24	7.55	41.46 (58.84)	49.54 (50.46)
	2000	19.03	15.21	9.13	47.98 (52.02)	60.03 (39.97)
	2010	19.61	15.57	14.17	72.26 (27.74)	91.0 (9.0)
	2020	19.34	16.48	12.91	66.75 (33.25)	78.34 (21.66)
Long-term index (1996=100)		106.21	108.14	170.99	161	158.13
Manufactured Export share in total Export (MXSH)	1996	87.83	85.26	12.2	13.89 (86.11)	14.31 (85.69)
	2000	87.59	88.6	9.35	10.67 (89.33)	10.55 (89.45)
	2010	88.9	87.71	33.55	37.74 (62.26)	38.25 (61.74)
	2020	89.82	87.89	39.13	43.56 (56.44)	44.52 (55.48)
Long-term index (1996=100)		102.27	103.08	320.74	313.61	311.11

Source: UNIDO

Among the newly industrialized countries, including Turkey, it has been able to increase its share of global industrial production from 0.9 to 1.2, with a long-term performance index of 124. Regarding its impact on World Manufactured Export (current dollar), Iran's performance index has increased from 0.05% in 1996 to 0.26% and 0.27% in 2010 and 2020, respectively, with a long-term performance index of 540. In fact, in the long term, this sub-index has increased by 5.4 times. However, the reality is that Iran's share of World Manufacturing Trade was not significant at 0.05% in 1996. Meanwhile, this sub-index has reached 9.7% and 1.16% with a long-term performance index of 85 and 237 for two ideal world and regional border countries, respectively, which were 11.4% and 0.5% in 1996 and 9.7% and 1.16% in 2020. Iran's performance compared to China and Turkey in this sub-index has been 1.1 and 8.19 times, respectively, out of 100 units. Undoubtedly, by Iran's achievement in both of the aforementioned indices to the first rank (ideal and desirable world border), Iran's Impact on World Manufacturing Value Added and trade can increase up to 3 to 4.3 times. This increase is achievable by meeting international, national, and domestic requirements and utilizing fundamental factors of productivity, technology, and innovation while eliminating various obstacles, especially the quality of the structure of industrial exports, to facilitate access to global markets.

7- Summary of Results and Recommendations

There is a strong positive correlation between industrial exports and economic growth in different countries around the world, and usually countries with more industrial exports and growth have experienced greater economic growth. Examination of long-term time series statistics of GDP growth rate and industrial export growth rate with high economic growth such as China, South Korea, Vietnam, and even Iran support this claim. Based on the opinions of economic activists and the results of business environment monitoring studies conducted by chambers of commerce, the Ministry of Economic Affairs and Finance, and Parliament (Majlis) Research Center, the rapid jump in the exchange rate in the spring of 2018, simultaneous with the US withdrawal from the JCPOA, instability in government regulations and circulars, weakness in the supply chain of industrial raw materials, lack of financing for production units, and ultimately a sharp increase in transaction costs have been the main reasons for the halt in Manufacturing value added in Iran during the past decade. The major challenge to Iran's Competitive Industrial Performance in recent years has been due to the decline in the production of industrial products and the low per capita value-added of factory products, which has occurred concurrently with macroeconomic variables such as the exchange rate and its subsequent effects on the Iranian economy since spring 2018. In addition, the low share of industrial products with advanced technology (hi-tech) and its declining share in recent years in the Iranian economy and the decline in net investment and negative growth rates due

to the uncertain post-JCPOA environment, intensified sanctions, and unstable macroeconomic environment in Iran highlights the need for the government's policy choice to focus on developing industrial production in the framework of the forward development plan, with the possibility of improving industrial competitiveness in driving industries first and then through structural changes in production and trade and upgrading the quality of technological content.

References:

1. Energy, Industry and Mining Studies Office (Industry Group). (1401). An analysis of industrial competitiveness in the Iranian economy from the perspective of UNIDO 2022, Subject Code 310, Serial Number 18512. Published on 23/08/1401. (APA format does not include the number of pages).
2. Honarvar, N, Hemayoon, R., & Ghobadi, S. (2020). Investigating the causal relationship between market efficiency and economic success (Case study: Asian countries with weak industrial competitiveness performance). Industrial Economics, 4(13), 75-88.
3. Hosseini, M. A. (2019). The Competitive Industrial Performance in Iran. Global Developments in Industry, Mining, and Trade, Institute for Trade Studies and Research, No. 75. Retrieved from http://www.itsr.ir
4. International Energy Agency. (2018). CO2 Emissions from Fuel Combustion 2018. Paris: IEA.
5. International Monetary Fund. (1998-2018). Direction of Trade Statistics Yearbook. Washington, DC: IMF.
6. Krugman, P., Obstfeld, M., & Melits, M. J. (2014). International Economics: Theory and Policy (9th ed.). Addison-Wesley.
7. Lall, S. (2000a). The Technological Structure and Performance of Developing Country Manufacturing Export, 1985-1998. Queen Elizabeth House, University of Oxford, working paper number 44.
8. Ministry of Industry, Mine and Trade. (2016). International Statistics and Indicators: Competitive Industrial Performance 2013. Statistics and Data Processing Office of the Planning and Program Deputy, Report No. 26, September.
9. Nili, M., & colleagues. (2003). Summary of the Studies of the National Industrial Development Strategy Plan. Sharif University Publications Institute.
10. Qasemian, A. (2014). Industrial Competitiveness. Economic Research Department of Tehran Chamber of Commerce, Khordad Month.
11. Queen Elizabeth House, University of Oxford. (n.d.). Manufacturing Export, 1985-1998 (Working paper No. 44).
12. Research Center of the Islamic Consultative Assembly. (2019). Analysis of Industrial Competitiveness Performance in Iran's Economy. Expert Group, Deputy of Foundational and Production Affairs Research, March, Subject Code 310, Serial Number 16940.
13. Tabatabaei, S. M. A. (2019). Measuring Industry. World of Economy, Special Issue, No. 4643, date: 2019/04/10.
14. UNCTAD. (2022). World Investment Report 2022.
15. UNCTAD. (n.d.). TRADES (Trade Analysis and Information System). Retrieved from https://unctad-trains.org
16. UNCTAD/INFOCOMM. (n.d.). Market Information in the Commodities Area. Retrieved from https://www.unctad.org/

17.United Nations Conference on Trade and Development. (1978-2021). Handbook of International Trade and Development Statistics. New York and Geneva. Retrieved from http://www.UNCTAD.Org
18.United Nations Department of Economic and Social Affairs. (2021). Yearbook of International Trade Statistics.
19.United Nations Industrial Development Organization. (2021). A Statistical Review of the World Industrial Situation. Vienna.
20.United Nations Industrial Development Organization. (2021). International Yearbook of Industrial Statistics (IYIS). Vienna: Edward Elgar Publishing.
21.United Nations Industrial Development Organization. (2022). Annual Report 2021. Vienna.
22.United Nations Industrial Development Organization. (2022). Competitive Industrial Performance Index Report 2013-22. Retrieved from https://stat.unido.org/database/CIP%202022
23.United Nations Industrial Development Organization. (2022). Competitive Industrial Performance Index Report 2013-22. Retrieved from https://stat.unido.org/database/CIP%202013-22
24.World Bank. (n.d.). About Us: Annual Report. Retrieved from https://www.worldbank.org/en/about/annual-report
25.World of Economy. (2016). Industrial Powers in 2020. No. 3977. Print date: 2016/11/18.
26.World of Economy. (2017). Slow Movement of Iran's Industrial Competitiveness. No. 4128. Date: 2017/06/04.
27.World of Economy. (2018). The Secret to Improving Industrial Competitiveness. No. 4352. Date: 2018/03/28.

ارزیابی و تحلیل شکاف عملکرد رقابت صنعتی بلندمدت ایران[1]

چکیده:
رقابت صنعتی ظرفیت کشورها برای افزایش حضور در بازارها و توسعه بخش‌ها و فعالیت‌های صنعتی با ارزش افزوده و «محتوای فناورانه» تعریف می‌شود. عملکرد رقابت صنعتی (CIP) برای ارزیابی توان رقابت و عملکرد صنعتی کشورها از دو بعد تولید و تجارت به‌کار می‌رود. در این مقاله، عملکرد رقابت صنعتی (CIP) ایران و مولفه‌های 3 گانه آن را در سه دهه گذشته تحلیل و ارزیابی می‌شود. نتایج مطالعه حاکی است تحولات ساختاری صنایع کارخانه‌ای در دو برنامه پنجم و ششم توسعه متفاوت از دو برنامه سوم و چهارم بوده، و در این دو برنامه توسعه اخیر، ساختار تولید صنایع ایران تضعیف، و از نقش آن در اقتصادملی کاسته شده است. شاخص عملکرد رقابت صنعتی (CIP) ایران از سال۱۹۹۰ تا ۲۰۰۸ پس از جهش صعودی، و در ابتدای دهه 2010 با آغاز تحریم‌هاو تشدید آن تنزّل یافت و در ادامه به‌دلیل شکل‌گیری فضای پسابرجامی و کم‌ترشدن فشار تحریم‌ها بهبود یافت. از سال ۲۰۱8 روند نزولی رقابت صنعتی ایران آغاز و به ۰,۰۵۲ در انتهای دهه تنزّل و مجددا در سال ۲۰۲۰ با همه‌گیری‌کووید–۱۹ و پی‌آمدهای آن بر تولید و تجارت، ظرفیت صنعتی کشور کاهش یافت و امتیاز شاخص عملکرد رقابت صنعتی (CIPI) ایران به ۰,۰۴۶ رسید. طی سه دهه گذشته شکاف CIP ایران با نقطه ایده‌آل جهان و منطقه همچنان بالاست. بهبود رقابت صنعتی مستلزم توجه به عناصر «گسترش تولید» برای افزایش حضور در بازارهای جهانی توام با «ارتقای کیفیت تولید» یا بالارفتن از «نردبان فناوری» است. تحقق «یادگیری از بازارهای جهانی» منوط به پیش شرط های مهم بهبود قابلیت‌های فناورانه، توسعه ظرفیت‌های تولیدی و سرمایه‌گذاری کافی در زیرساخت‌ها است. نگاهی به تجارت موفق، حکایت از رشد صنعتی و تجارت صنعتی فراگیر ناشی از تغییر ساختاری، بهره‌مندی از مزیت‌های رقابتی و انتقال منابع به بخش‌های با بهره‌وری بالاتر است.

کلمات کلیدی: عملکرد رقابت صنعتی، سطوح فناوری، محتوای فناورانه، تحولات ساختاری، ایران.
طبقه‌بندی JEL: F12، F14، F17، F47

[1] مقاله حاضر برگرفته از گزارش پژوهشی با عنوان «ارزیابی و تحلیل شکاف رقابت صنعتی ایران» می‌باشد که در گروه پژوهشهای بازرگانی خارجی پژوهشکده توسعه بازرگانی معاونت پژوهشی مؤسسه مطالعات و پژوهشهای بازرگانی در بهمن ماه سال ۱۴۰۱ به انجام رسیده است.