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Industrial Policy (ISSN-2757-9840) is the prime outlet for research on industrial policy and its impact on the society. The INDPOL publishes high quality research on the process of economic and technological development, in particular industrialization. INDPOL is published via OJS and DergiPark platforms. INDPOL is indexed by Google Scholar.

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The Effects of Economic Policy Choices on Industrialization in Turkiye

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Abstract

This study examines the impact of Turkiye's economic policy choices on industrialization since the Global Crisis. For the study period, TurkStat and World Bank data on the main industrial sector indicators such as production, value added, exports and imports, and technology intensity were used. The study concludes that such choices were shaped in parallel with the global economy until 2019. In terms of the second observation, the relationship between economic policy preferences and industrialization, industrialization increases during periods of protectionist economic policies, and although the industrial sector loses its top priority during periods of liberal economic policies, increased integration with the world economy and private sector entrepreneurship add momentum to industrialization. The third observation is that the structural problems of the Turkish economy lead to economic instability and adversely affect industrialization, regardless of the choice of economic policy. The fourth observation is that after the Global Crisis of 2008, global competition has been increasingly based on technology, an area where Turkiye lags behind. Aiming for short-term economic growth through wrong macroeconomic policy choices, the country moves away from ensuring long-term economic growth and economic development through industrialization based on technological development, and the whole economy faces increasing risks.

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Industrialization, Economic policy, Turkish economy, Economic development.

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1. Introduction

Since the early 1980s, neoliberal policies have led to the financial sector replacing the real sector in economy. The Global Crisis in the mid-2000s changed the direction of economic policies in the world. On one hand, Keynesian policies gained prominence, and on the other hand, the importance of the real economy and the manufacturing industry was resurfaced.

Economic policy in Turkiye has generally followed a trend parallel to developments in the global economy. The economic policy adopted also determined the country's industrialization policy and shaped industrialization. However, industrialization in Turkiye has been greatly affected not only by economic policy choices but also by structural problems in the economy.

In the Turkish economy, the founding period of 1923-1929, the 1950s and the post-1980 period are generally regarded as periods in which liberal economic policies were adopted, while the 1930s and the 1963-1980 period are generally accepted as periods in which statist and protectionist economic policies were implemented. In periods of statist, protectionist, import substitution-based economic policy and industrialization strategy, the first priority was industrialization. In liberal periods, when private sector entrepreneurship and integration with the global economy increased, productivity and production increased thanks to the dynamism of private enterprise, but industrialization ceased to be a priority sector. The impact of economic policy preferences on industrialization was influenced by the structural problems of the economy on one hand, and

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developments such as the 2008 Global Crisis, the Covid-19 pandemic and the fourth industrial revolution as external factors on the other.

The study first touches upon definitions, classifications and indicators related to industrialization. The second section includes literature on the relationship between economic policy preferences and industrialization. In the third section presents a periodic analysis of Turkiye from its foundation to the present day. The industrialization that took place within the framework of the economic policy adopted in each sub-period is outlined. Turkiye's economic policy and the current state of the industry in the face of revolutionary technological developments in the aftermath of the Global Crisis, especially since the early 2010s, are presented through the interpretation of statistical data. The conclusion includes the assessment of the situation and recommendations.

2. Industrialization: What is it, Indicators, Expectations from Industrialization

Industry is one of the main sectors of economy. In literal sense, industry is the processing of raw materials and intermediate goods using labor and capital and transforming them into finished goods. In a broad sense, industrialization refers to the use of new production techniques in production, improving product quality, reducing production costs, increasing productivity, and ultimately the positive change and progress achieved by the country in economic, social and political terms (Karluk, 2014).

Fisher (1939) and Clark (1940) first classified economic activities into three sectors. According to this universally accepted approach, goods produced in the Primary (Agriculture) sector are obtained directly from natural resources. In the secondary (industrial) sector, new products are produced from previously produced goods. Tertiary (Service) sector is the economic activities that are not subject to production and are outside the primary and secondary sectors. In a broad sense, industrialization can also manifest itself as the use of developing technology in primary and tertiary sectors (Karluk, 2014).

On the basis of this tripartite classification, industry-related economic activities can be represented according to NACE Revision 2 (Classification of Economic Activities in the European Community/Nomenclature des Activités Économiques dans la Communauté Européenne) and ISIC Revision 4 (United Nations' International Standard Industrial Classification of All Economic Activities) as shown in Table 1.

Table 1. Classification of economic activities in the European Community and United Nations

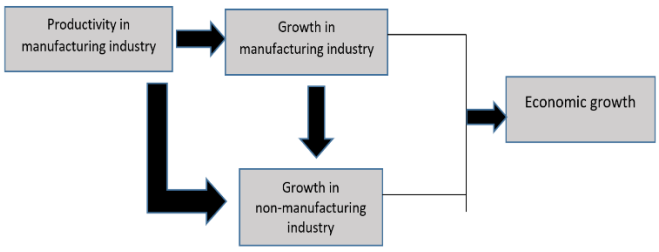
ISIC Rev. 4 / NACE Rev. 2 sections	**Description**
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air-conditioning supply
E	Water supply, sewerage, waste management and remediation

Source: European Commission 2008.

To analyze the level of industrial development of an economy, the importance and weight of industry in the country's economy and the level of development of the country, some indicators related to industry are required. The main indicators are industrial production index, capacity utilization rate, employment, productivity, turnover index, share in gross domestic product (GDP), share in foreign trade, technology level of exported and imported industrial goods (https://ec. europa.eu/eurostat/ data/database).

Within the concept of industry, the manufacturing industry is particularly important in terms of the process of transforming raw materials and intermediate goods into finished goods. The development of the manufacturing industry is parallel to the development of the country's economy. Figure 1 shows expectations from industry in an economy.

Figure 1. Manufacturing industry and economic growth



Source: Yülek, 2017.

We can explain the direct and indirect effects of industrialization with Kaldor's Laws (1966). According to Kaldor's first law, manufacturing industry is the engine of GDP, that is, economic growth. According to Kaldor's second law, the manufacturing industry grows through productivity growth. According to Kaldor's third law, the growth of the industrial sector increases the productivity of non-industrial sectors. High productivity growth in industry leads to a decrease in the share of industry in total production and total

employment in the economy. The employment depot is now the service sector. The manufacturing industry is an incubator for productivity and innovation. Therefore, the manufacturing industry continues to be the driving force of economic growth. Although industry has been replaced by the service sector in advanced economies, productivity growth in industry is higher than in the service sector, as explained in Kaldor's third law. Productivity in the service sector increases thanks to productivity increase in industry (Yülek, 2019). Although the manufacturing industry is the driving force of economic growth, the multiplier effect of the manufacturing industry on economic growth is higher in countries with strong domestic suppliers in the production of industrial goods. In countries with weak domestic suppliers, imports of manufactured goods reduce the multiplier effect (Yülek, 2019).

3. The Relationship between Economic Policy Choice and Industrialization

There are two basic strategies that enable a country to industrialize: i) Import substitution strategy, ii) Export-based industrialization strategy. Import substitution strategy is generally favored by countries with low national income, a small domestic market, and technologically underdeveloped countries which intend to achieve rapid economic development. However, most industrialized countries implemented this strategy in the early stages of their industrialization. According to this strategy, the main objective is to produce imported goods domestically. To this end, consumer goods are produced domestically in the first phase of the import-substitution industrialization strategy, followed by production of intermediate goods and investment goods in the next phase. Therefore, domestic industry is supported by protectionist policies until it reaches a certain level of development. Export-led industrialization strategy is based on the economic idea that the driving force for industrialization and economic growth comes from foreign demand rather than domestic demand. Both the increase export value and the change in the composition of exports in favor of industrial goods render exports an important financing tool for the economic development of developing countries (Eşsiz & Özdemir, 2013; Kazgan, 2000: Minibaş, 1992).

The main expectation of newly industrialized countries from the import substitution policy is to ensure economic development. These countries do not have sufficient export potential and foreign exchange to finance development, and their demand for foreign exchange is high due to imports. This situation causes problems such as deficits in the balance of payments, foreign borrowing, etc. Producing imported goods domestically enables foreign exchange savings. However, saving foreign exchange is not sufficient to create sustainable industrialization. To import advanced technologies and investment goods in the later stages of industrialization, foreign exchange earning strategies are needed rather than foreign exchange saving strategies. Therefore, the import substitution strategy, which is no longer sufficient, gets replaced by an export-oriented industrialization strategy. The export-oriented industrialization strategy is an industrialization path that is in line with the theory of comparative advantage, as it is a strategy to develop the country only in industries with export potential. Since the aim of this strategy is to focus on foreign markets, it is possible to benefit from economies of scale. Since industrialization is based on foreign competition instead of protectionism, the power of monopoly and oligopoly markets decreases, product quality increases, the economy gains dynamism, and technological developments accelerate. The success of countries such as South Korea, Hong Kong, Taiwan and Singapore in terms of exporting industrial goods and the economic growth they have achieved can be considered as examples in this respect (Bhagwati, 1986; Eşsiz & Özdemir, 2013; Yülek, 2019).

F. List laid the foundation of economic nationalism within the framework of objections to the social and economic consequences of the Classical School of Economics. In the 18th century, this foundation played a major role in Germany's economic unification and industrialization. Strictly adhering to List's doctrine of national economy, Germany established and developed industry by implementing protectionist macroeconomic policies and laid the foundations of being a powerful industrial country even today (Levi-Faur, 1997; Turanlı, 2011).

From this perspective, it can be said that there were two different economic structures with two different models of capitalism in continental Europe before the fall of the Berlin Wall in 1989. One was the Rhine Model, led by Germany, based on building a strong industry; the other was the Anglo-Saxon Model, led by the United Kingdom, based on the liberalization of financial markets. 1989 was a turning point in this respect. After the fall of the Berlin Wall, neoliberal policies gained momentum. The 1990s was a decade of accelerating deregulation and integration in financial markets. The Anglo-Saxon Model became popular, while Rhine capitalism and industrialization fell out of favor (Mosconi, 2015).

But developments in the early 21st century have changed the roles between the two models of capitalism. Today, industrial policies are back on the agenda in both developed and developing countries (Yülek, 2018). Especially the corporate scandals in 2001-2002 and the 2008 Global Crisis shook the Anglo-Saxon Model to its foundations. These developments reminded us of the importance of the real sector and the manufacturing industry.

Thus, the direction of macroeconomic policy preferences in the world began to change. Purely neoliberal policies that linked the liberalization of financial markets and economic

development to financial markets were replaced by more interventionist and/or protective policies that prioritized the real sector and industrial production. As a result of these developments, which paved the way for the emergence of a new industrial revolution, the first signs of the Fourth Industrial Revolution began to emerge in Germany in the early 2010s.

4. Changes in Turkiye's Macroeconomic Policy and Industry

The Izmir Economic Congress (February 17-March 4, 1923) was an important event which determined the macroeconomic policy of the newly established Republic of Turkiye. Congress adopted a liberal economic policy and the private sector was incentivized to develop industry. Türkiye İş Bankası (1924) and Sanayi ve Maadin Bankası (1925) were established to finance trade and industry. In 1927, the Law on Incentive Industry was enacted. The low customs duty practice, which had continued under the Lausanne Treaty, ended in 1929. Thus, customs duties were raised, protecting the domestic market and enabling the development of the domestic industry (Yülek & Gür, 2022a).

At the end of the 1920s, it was observed that the expected level of industrialization could not be achieved under the lead of the private sector due to various internal and external reasons. The private sector had failed to accumulate sufficient capital. The Economic Crisis of 1929 emerging at the end of the decade had begun to spread. All countries turned to closed, protectionist policies (Gür, 2006). Thus, a statist economic policy was adopted to achieve industrialization in the 1930s. Two five-year industrial plans were prepared during this first industrialization period. The Second World War did not allow for the implementation of the Second Industrial Plan, but with the First Industrial Plan, which began to be implemented in 1934, it was aimed to establish 23 factories in weaving, mining, paper, pulp, chemical and soil industries. Sümerbank (1933) and Etibank (1935) banks were established to build factories. In cooperation with countries such as Russia and the United Kingdom, technology was imported in the establishment and operation of factories, and the know-how of these countries was utilized. This plan was largely put into effect (Yülek & Gür, 2022b). Throughout the period, the growth rate of industry outpaced other sectors and was generally above 10%. The import-substitution industrialization policy based on protectionist and statist economic policy yielded successful results; approximately 80% of domestic demand in the weaving, sugar, cement, bottle-glass sectors was met by domestic production (Karluk, 2014).

The Second World War years was a period of war economy conditions. After the war, liberal economic policies were adopted in the 1950s. The Vaner Plan (Turkiye Development Plan) (1947) was adopted instead of an İvedili (Urgent) Industrial Plan (1946), which was prepared within the framework of the statist industrialization policy. This plan, although not officially implemented, is evidence that the statist-protectionist industrialization policy was abandoned. Instead of industrialization based on the domestic market, an economic growth oriented towards the foreign market and based on mining, construction and infrastructure investments, especially in agriculture, was envisaged. The number of state-owned enterprises (SOEs) gradually increased during this period of liberal economic policy due to reasons such as the end of the expansionary conjuncture after the Second World War, the decline in demand for export goods, the increase in the foreign trade deficit, increasing foreign dependency, the decline in imports of consumer goods and the desire to meet the demand for consumer goods with domestic production (Boratav, 1998). Therefore, it can be said that the industrial policy of the early Republic, which was based on producing basic consumer goods by using domestic raw materials (agriculture, mines), largely continued until 1963. Especially in the period between 1952-1957, the industrial sector grew by a record 12.5% on average due to the buoyant domestic demand after the war. In technological terms, the structure of industry did not change much. Private sector industrial enterprises were mostly SMEs, technology was outdated and agricultural equipment had been provided under the Marshall Plan. However, the private sector was developing significantly (Karluk, 2014).

The 1960s and 1970s were years of import substitution policies in industrialization. Three five-year development plans were prepared covering this period. The aim was to start with durable consumer goods and move on to intermediate goods and capital goods. Although the target was not sufficiently achieved despite significant industrial investments, the private sector concentrated on the production of durable consumer goods during the period between 1963-1980, while the state concentrated on the production of intermediate goods and investment goods, almost creating a division of labor between them (Cengiz and Öruç, 2016; Karluk 2014). Thus, while the industrial sector grew, the structure of industry also changed. In particular, intermediate goods began to be produced domestically to a large extent. For the first time in 1973, the share of industry in GDP overtook agriculture. However, the import-substitution industrialization policy led to more imports, resulting in import dependency and thus a foreign exchange bottleneck. At the end of the third development plan (1977), intermediate goods production accounted for 37.7% and capital goods production for 13.3% of the manufacturing industry. While energy prices rose due to oil crises, oil crises also slowed the flow of remittances. Despite the emerging foreign exchange bottleneck, industrial investments continued. The protection of industry against foreign competition led to a decline in industrial productivity. In order to overcome the foreign exchange bottleneck, a new

short-term borrowing instrument called the foreign currency convertible deposit account (DCA) was developed with an exchange rate guarantee. However, increased borrowing, import dependency, rising oil prices, political instability and social unrest fed each other (Karluk, 2014; Yenal 2010).

After 1980, a liberal economic policy was adopted. An export-oriented industrialization strategy began to be pursued. Business operation by state was ended. In the 1990s, state industrial investments were privatized. The Anglo-Saxon capitalism spread by globalization also affected the Turkish economy. In the 1990s, the real sector and the production of manufactured goods were replaced by an economic structure based on financial markets. In the 1980s, the export-led industrialization strategy increased industrial productivity. In the 1990s, the 5 April 1994 crisis (Turkiye), the Asian Crisis (1997), the Russian Crisis (1998), the Marmara Earthquake (1999), and the November 2000-February 2001 economic crisis (Turkiye) reduced total factor productivity and slowed down industrial production. The state withdrew completely from industry, which it left to the private sector. As a result of the implementation of a fixed exchange rate regime to reduce inflation and severe exchange rate-inflation-interest rate shocks in the environment of a fragile banking system, private consumption expenditures and domestic demand contracted, leading to the 2002 Crisis. After the 2000s industrial production increased, making up for the lost years. Despite this increase, the industry's structural problems still persist in the form of increased import dependency in energy, raw materials and intermediate goods. The recession that had started in the Turkish economy deepened with the impact of the Global Crisis (2008) (Gürsel, 2013; Şahin, 2016). In the early post-1980 liberal period, productivity and exports increased, but over time the competitiveness of the private sector declined, and low value-added sectors developed in the face of increasing competition due to globalization. China's increasing competition in global markets resulted in market losses in labor-intensive markets (Karluk, 2014).

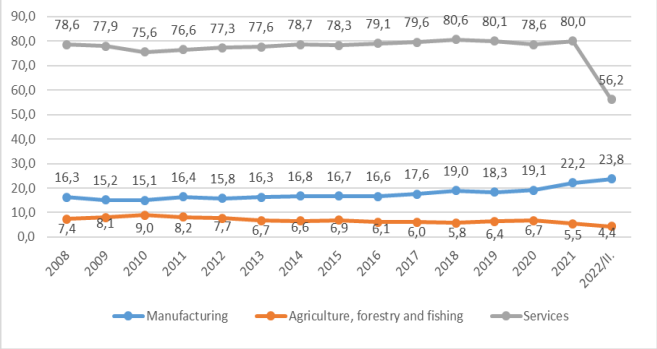
Table 2. Manufacturing, value added, export and import shares (2008-2021)

Years	Manufacturing, value added (annual % growth)	Manufacturing, value added (% of GDP)
2008	0.5	16.3
2009	-9.0	15.2
2010	9.2	15.1
2011	20.2	16.4
2012	2.2	15.8
2013	9.8	16.3
2014	5.6	16.8
2015	5.9	16.7
2016	4.0	16.6
2017	9.3	17.6
2018	1.2	19.0
2019	-2.4	18.3
2020	3.2	19.1
2021	17.2	22.0

Source: https://databank.worldbank.org/source/world-development-indicators

According to World Bank data, while the share of manufacturing industry value added in GDP was around 20% in the early 2000s, it declined steadily after the 2008 Global Crisis. Both the annual growth rate and the share of manufacturing industry value added in GDP increased significantly, especially after 2019, due to the expansionary macroeconomic policies pursued as a result of the Covid-19 pandemic (Figure 2). The value added of the manufacturing industry increased by a high rate of 17% in 2021 (Table 2).

Figure 2. Manufacturing industry and annual economic growth (%)



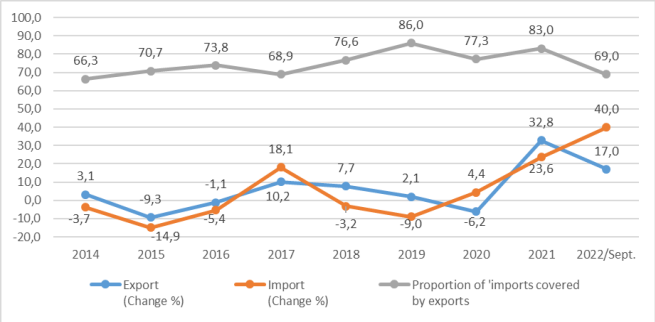
Source: https://data.tuik.gov.tr/

Continuation of expansionary macroeconomic policies during and after the pandemic exacerbated price instability. Turkiye's Economic Model, which was put into practice in September 2021, has opted for economic growth instead of fighting inflation. Therefore, despite high inflation, expansionary macroeconomic policies were continued, aiming to increase production and exports through low interest rates and a competitive exchange rate policy, and ultimately to ensure economic growth.

Thus, the annual consumer price index (CPI) according to the chained index rose from 14.6% in December/2020 to 36%

in December/2021, 61% in March/2022 and 85.5% in October/2022 in a short period of time. Economic growth was 19.1% in 2020, 22.2% in 2021 and 7.6% in Q2/2022, as targeted. However, it should be noted that the sector which had the largest share of the 7.6% growth was the finance and insurance sector with 26.6% (TurkStat, 2022).

Figure 3. Proportion of imports covered by exports and foreign trade by years (2014-2022)



Source: https://data.tuik.gov.tr/

Despite the policy of increasing industrial production and exports based on a competitive exchange rate since 2019, the ratio of exports to imports has been steadily declining. Exports increased by 32.8% in 2021 and by 17% the following year in September/2022. The increase in imports nearly doubled in September/2022 from 23.6% in 2021. In September/2022, exports increased by 17%, while imports more than doubled exports by 40% (Figure 3). This is because both the export-enhancing effect of the competitive exchange rate is not sustainable and a large share of exports is based on the manufacturing industry. Compared to imports, 94% of total exports come from the manufacturing industry (Table 3).

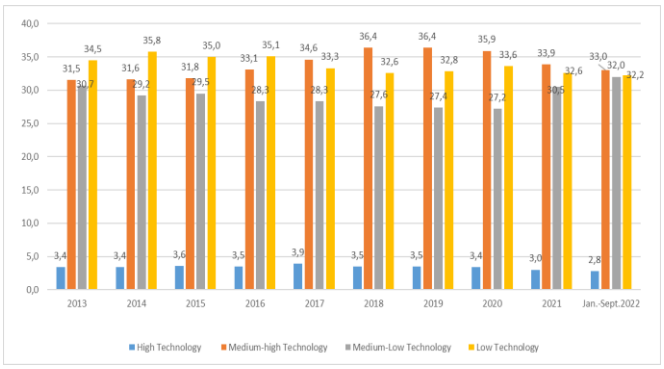
Table 3. Percentage of manufacturing in total exports

Years	Manufacturing/Total Export	Manufacturing/Total Import
2013	93.8	79
2014	93.9	78
2015	94.2	81
2016	94.0	85
2017	94.0	82
2018	94.2	80
2019	94.6	77
2020	94.2	82
2021	94.5	76
2022	94.7	71

Source: https://databank.worldbank.org/source/world-development-indicators

However, on average 65-70% of manufacturing industry exports consist of low and medium-low technology goods. Exports of high-tech goods average 3.5%. It is difficult to say that any significant progress has been made in this regard since 2013 (Figure 4).

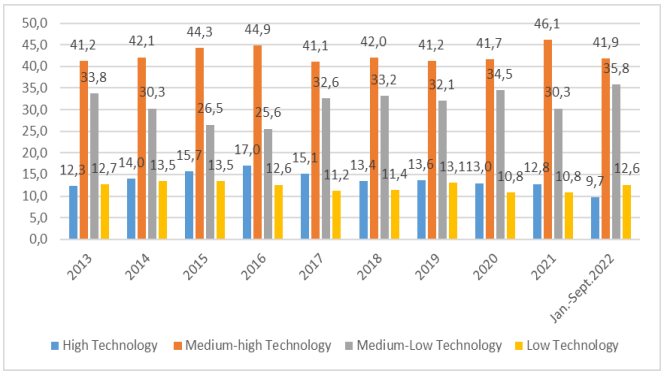
Figure 4. Percent of manufactured exports (FOB) (2013-2022)



Source: https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104

In the same period, medium-high technology goods accounted for 45% of total manufacturing industry imports. Imports of high-tech products are around 13%. Imports of high- and medium-high technology goods account for 50-60% of total manufacturing industry imports (Figure 5).

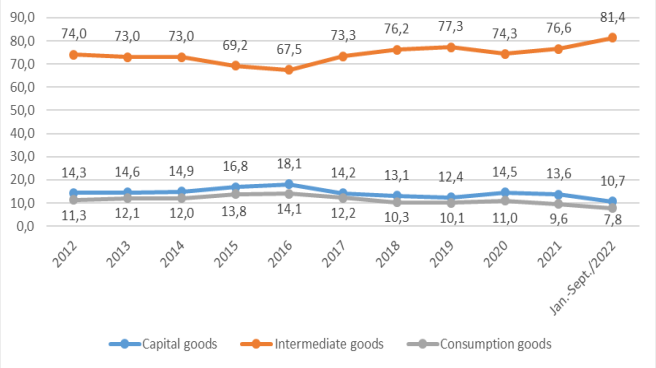
Figure 5. Percentage of manufactured imports (CIF) (2013-2022)



Source: https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104

It is far from sustainable to import high and medium-high technology goods, which account for more than half of total manufactured goods imports, while exporting low-tech manufactured goods with low added value.

Figure 6. Import (CIF) according to general trade system by classification of broad economic categories (BEC) (%) (2012-2022)



Source: https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104

Another obstacle is the increasing dependence on imports for capital goods and intermediate goods used in the production of exported goods. Imports of investment goods increased from 74% to 81.4% from 2012 to September 2022. In the same period, imports of intermediate goods averaged around 15%. Exports of capital goods reached 10.7% in September 2022. Imports of consumption goods lag behind intermediate and investment goods (Figure 6).

Both the export and import figures of the manufacturing industry in terms of technology intensity and the import dependency in intermediate and investment goods used in the production of manufactured goods, which account for more than 90% of exports, pose various risks to the economy when considered together with foreign energy dependency. Moreover, this structure of the industry prevents getting the expected results from the Turkish Economic Model.

5. Conclusion

There is a close relationship between countries' economic policy choices and their industrialization strategies. This study analyzes this relationship for Turkiye in the period from the 2008 Global Crisis to the present. In this respect, first of all, from a periodic perspective, the 1920s, 1960s and 1970s were periods when industrialization was attempted through economic policies with a protectionist, central planning approach. The 1960s in particular was a period of industrialization that was much more institutionalized than the statism of the 1930s and in which planning was more dominant. However, although the 1950s are generally accepted as the years when liberal economic policies were adopted, industrialization by the state also continued to increase. After 1980, when neoliberal policies were established within the framework of the Anglo-Saxon capitalist understanding, industrialization continued to increase thanks to the dynamism and efficiency of private sector entrepreneurship. However, increases in capacity utilization and industrial production, enabled by the revival of the economy following the 2008 Global Crisis, are to be expected. However, due to incorrect macroeconomic policy choices in the face of global economic developments, there has been no industrialization in recent years to ensure long-term economic growth.

The distrust of financial markets following the Global Crisis, the questioning of neoliberal policies, and the realization of the importance of the real sector and the manufacturing industry led to a new process of technological transformation and development in Germany in the early 2010s, which can be called the fourth industrial revolution. Therefore, the importance of technological superiority in global competition has become more important than ever. Creating new and/or additional production capacity based on advanced technology rather than increasing the utilization of idle capacities is now essential for long-term economic growth and economic development.

However, Turkish economy is relatively lagging behind in following this industrial revolution. Although it has succeeded in producing high-tech products, especially in the defense industry and the automotive sector, the technologies developed in the defense industry are not intended for the production of commercial products, and the production process has not yet started in the automotive sector.

As of the early 2010s, manufacturing now accounts for around 94% of exports. In terms of the technology intensity of the manufacturing industry, exports of high-tech products average 3.5% of total manufacturing industry exports. Even when medium-high technology products are included, this ratio is only one-third of total exports. The remaining 70% is exports of medium-low and low technology manufactured goods. Exporting such products is not sustainable to compensate for imports of high and medium-high technology manufactured goods, which account for 60% of total manufacturing industry imports. Moreover, these imported goods are mostly intermediate goods and capital goods. This shows that exports are highly dependent on imported inputs. The expansionary macroeconomic policies that have been in place, and that have continued with the pandemic, constitute an economic policy aimed at short-term economic growth that aims to increase exports and thus industrial production through competitive exchange rates and low interest rates. However, this policy has also made it difficult to produce export goods due to the high dependence on imported inputs and energy due to the rising exchange rate. Therefore, the increase in imports, which reached twice the rate of exports, made it difficult for exports to meet imports even in the short term.

In the long run, for sustainable foreign trade and economic growth, technology intensity needs to be raised in all branches of the manufacturing industry. It may also be important to prioritize certain sectors in a selective manner, such as the defense industry and automotive, but the fact that technology is changing and developing very rapidly, and that there are

increasing and rapidly developing competitors in global markets shows that it is necessary to ensure technological development in many manufacturing industry sectors.

For long-term and lasting economic growth and development, it is not enough to develop technological infrastructure. Capacities of other production factors must also be increased. Education policy is one of these factors. Both the development of vocational education and the organization of the education system within the framework of technological transformation are important for increasing human capital capacity. Because the main factor for the development of the entrepreneurship ecosystem and for catching up with technological developments is the human capital of a country.

In this respect, it will not be sufficient to ensure industrialization, long-term economic growth and economic development of a country only within the framework of economic policy preferences or short-term macroeconomic policies. Similarly, it is not sufficient to stay limited to economic policies either. Economic and social policies need to be addressed in a holistic manner.

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Innovation Management in Defence and Aviation Industry in Turkiye - A case study on Ostim Defence and Aviation Cluster

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Abstract

The Defence and Aviation Industry (DAI) is one of the critical sectors where the world's most significant technological advances are experienced. According to a report prepared by Deloitte entitled 2020 global aerospace and defence industry outlook, military expenditures are rising as security threats continue to intensify worldwide. In addition, technological developments and innovation continually shape the DAI. Today, innovation management is again at the forefront of the global rivalry reshaping the international security environment. In this context, Turkiye's recent defence industry investments have become a significant issue that should be analysed regarding innovation management. This article aims to provide factual information regarding the implementation of an innovation management system in the companies affiliated with the OSTIM Defence and Aviation Cluster and to investigate the organisational capabilities of these companies' compliance with ISO 56002 standards on innovation management.

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1. Introduction

DAI is a high-tech industry that manufactures civil, military, aerospace, and defence equipment. It has become an essential component of global infrastructure, economic growth, international trade, and globalisation. DAI also has a crucial role in the state's national security. (Antonio, et al., 2019) According to a 2020 global aerospace and defence industry outlook report, demand for military equipment is on the rise as governments across the globe focus on military modernisation, given increasing global security concerns (Deloitte, 2020).

Turkiye has been making significant investments in the DAI sector recently. Hence, Turkiye has become a country making an impression in the world with its successful projects in the defence industry. The progression in the DAI sector under the leadership of large-scale public companies has led to the emergence of an ecosystem. One of the most critical elements of this ecosystem is undoubtedly the clusters created by small and medium-sized (SME) companies. Therefore, the innovation activities of SME companies in the defence and aerospace ecosystem are vitally crucial in terms of Turkiye's international economic and competitive capacity and global and regional political objectives. Suppose the right strategies and policies are set and followed. In that case, SME companies have the potential to lead the trail-blazing initiatives, which might be entirely affected by all existing balances on a global scale. In this study, the activities of SME companies conducting projects in the defence and aviation sectors in the OSTIM industrial zone will be analysed and evaluated in the context of innovation management.

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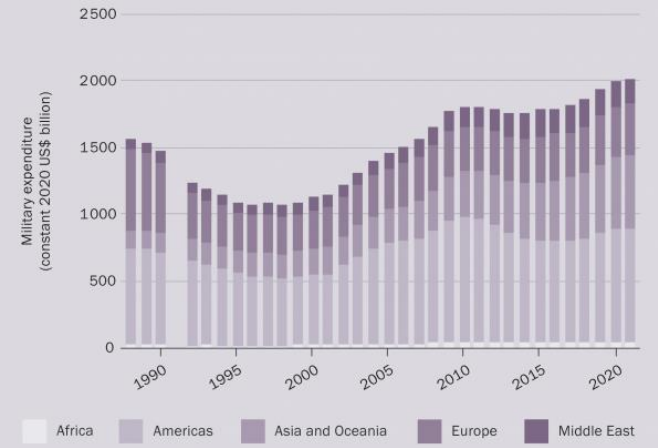
Before analysing the innovation implementations of SME companies conducted a project on DAI in Ostim, it would be empirically and methodologically beneficial to take a glance at the current worldwide situation of DAI to grasp the size and importance of the sector on a global scale.

2. DAI's Worldwide Status

According to a report published by Stockholm International Peace Research Institute (SIPRI), world military expenditure has surpassed $2 trillion for the first time. The chart in Figure 1 illustrates the world military expenditure from 1988 to 2021 by region (SIPRI).

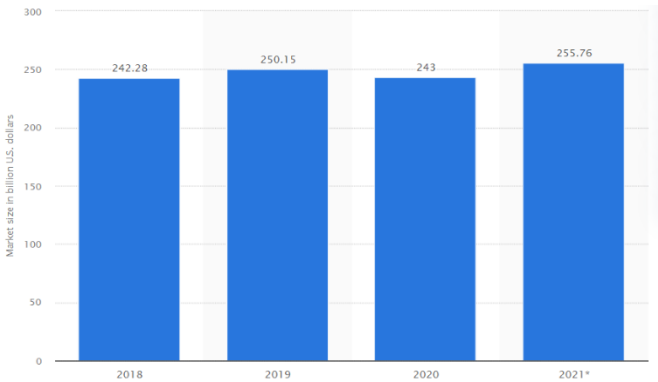
Figure 1. World military expenditure from 1988 to 2021 by region



Source: https://sipri.org/media/press-release/2022/world-military-expenditure-passes-2-trillion-first-time

The chart in Figure 2 illustrates the size of the military aircraft and aerospace manufacturing market from 2018 to 2021 (Statista).

Figure 2. The size of the military aircraft and aerospace manufacturing market worldwide from 2018 to 2021



Source: https://www.statista.com/statistics/1185271/global-military-aircraft-and-aerospace-manufacturing-market-size/

After the Russian Military intervention in Ukraine, countries worldwide are developing and operationalising DAI for military purposes. In light of current global developments, it is predicted that competition in the field of the defence industry will be at its highest level worldwide after the second world war period. Hence, the matter of innovation and its management, which is currently assumed as one of the driving forces behind global competition and which is likely to constitute the most vital dimension of international competition shortly in the field of DIA, will be discussed in the next subtitle.

3. Innovation Management

Innovation is defined as creating better, more effective, or more efficient processes and services, as well as developing the ideas and culture that will foster creativity (Crumpton, 2012, p.98). DAI is a sector that must properly implement innovation management to catch changes and new trends, as well as for optimisations such as cost reduction, quality improvement, and productivity growth. In this regard, innovation can make a difference on both the demand and cost sides of any business by helping them maintain its competitive edge (Nicolau & Maria, 2012, p.44). That is why innovation has been at the centre of competitiveness (Denton,1999, p.1).

International competition has pressured companies to continuously innovate to produce differentiated products and services (Schilling, 2020, p.1). For this reason, innovation has become a survival imperative for countries due to competition in international markets. Therefore, almost all governments offer companies special incentives and support opportunities to increase their country's share in international trade. Hence, innovation management has become an essential matter in the international arena, which has a highly dynamic structure.

Before delving into the specifics, it is worth noting the focus of the studies on innovation management. Igartua and Albors attempted to define the scope of innovation management for SMEs and created the table below, which depicts the various aspects of innovation management on which different authors have focused (Igartua & Albors, 2011, p.109).

Table 1. Authors' focus areas on innovation management (Igartua & Albors, 2011, p.109)

Innovation Management Areas	Authors																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOT
Strategy	*	*	*	*	*	*	*	*		*	*	*	*				12
Portfolios	*						*						*	*	*		5
Projects	*							*					*	*			4
Leadership and culture	*	*	*		*	*	*	*							*	*	9
People	*		*	*	*	*		*					*				7
External Relations	*	*	*			*					*	*					5
Organisation	*	*		*	*	*	*	*			*	*			*		10
Processes	*	*	*	*	*	*		*	*	*		*	*		*	*	13
Performance measures	*		*														2
Market							*		*		*	*				*	5
Resources										*						*	2
Knowledge												*					1
Technology											*			*		*	3

(1) (B+I Strategy, 2007)	(2) (Bessant and Tidd, 2007)	(3) (European Foundation for Quality Management, 2005)	(4) (Goffin and Mitchell, 2005)
(5) (Storey and Salaman, 2005)	(6) (Tidd et al., 2005)	(7) (Yang et al., 2003)	(8) (Dankbaar, 2003)
(9) (Durand, 2003)	(10) (Hidalgo Nuchera et al., 2002)	(11) (Trott, 2005)	(12) (Dodgson, 2000)
(13) (Goffin and Pfeiffer, 1999)	(14) (Escorsa Castell et al., 1997)	(15) (Brown, 1997)	(16) (Chiesa et al., 1996)

While innovation may have been defined differently by different writers over the years, there is a strong consensus on what innovation is fundamentally about, namely the creation of something useful that has a value derived from its novelty (Williams, 2020, p.3).

Nowadays, innovation is defined as an extended process of picking up on ideas for change and turning them into effective reality (Tidd & Bessant, 2021, pp. 44-45). Additionally, the matter on which every author agree is that innovation is a complex process that carries risks and needs careful and systematic management. Innovation management includes the phases of managing an organisation's innovation procedure, from the first stage of an idea to the final stage of successful implementation. It covers the decisions, activities and practices of designing and implementing an innovation strategy. In this regard, a vital guidance document entitled ISO 56002:2019 Innovation Management System needs to be examined.

3.1 ISO 56002:2019 Innovation Management System (IMS)

The 56002:2019 International Standard – Innovation Management System is a guidance document. It has great importance due to well-organised operational Innovation Management Systems that will drive long-term growth, economic viability, increased employee morale, improved return on investment, lower attrition rates, and increased market share. Innovative companies focus on design quality and reduce the number of difficulties encountered during the production phase, allowing them to focus less on problems and more on the potential for development. (ISO Standards, 56002:2019)

The 56002:2019 International Standard – IMS consists of an introduction and ten clauses. In the latest version of ISO Standards 56000:2020, innovation is defined as a "new or changed entity, realising or redistributing value." (ISO Standards, 56000:2020)

A company's management creates an environment conducive to work innovation, which grows as they build the standards and systems required to either kickstart or nourish an individual's creativity so that it blooms across the company's branches and individuals. Management must incorporate creativity into daily activities to create a positive example for their personnel. Every manager should set a goal to make creative/innovative improvements in their daily operations. An IMS helps a company decide its innovation vision, strategy, policy, and objectives, as well as the support and processes required to accomplish the desired results. ISO 56002:2019 explains why doing an innovation evaluation is desirable, what to anticipate from a good one, how to conduct one, and how to act on the findings. (ISO Standards, 56002:2019)

3.1.1 The Potential Benefits of Improving IMS

- Improving IMS has several advantages, including:
- Becoming a market leader in product categories.
- Increase the stock's worth.
- Increase employee value-added.
- Increase asset return on investment
- Reduce the number of unknowns/ uncertainties.
- Boost staff morale.
- Expand market share.
- Enhance client satisfaction.
- The ability to foresee the demands of customers.
- Keep workload variations to a minimum.
- Build a resilient company by being better equipped to handle change with less opposition.
- Increase the investors'/shareholders' dividends.
- Efficiencies, effectiveness, and adaptability will all improve.
- Improve sustainability and resilience.
- Increase critical personnel bonuses.

- Increase stakeholder satisfaction.
- Engage and empower people in the organisation.
- Increase ability to attract partners, collaborators, and funding.
- Attract challenging and resourceful people to join the organisation.
- Improve the organisation's reputation and valuation.
- Reduce legal expenses.

The potential benefits of IMS mentioned above are the essential milestones which substantially constitute the IMS Principles.

3.1.2 IMS Principles

A management principle is a broad and basic guideline governing all management aspects. A management principle is a promise made by each manager to regulate their interactions and conducts. Principles are the pledges that the organisation makes to its stakeholders that these are the rules that it will follow. Many companies choose to have a set of beliefs or values rather than principles because they believe principles are too restrictive with criteria. Therefore, ISO 56002: 2019 International Standard – IMS has vital importance as it standardises several principles that may differ from company to company.

ISO 56002:2019 establishes eight IMS principles such as 1. realisation of added-value, 2. future-focused leaders, 3. strategic direction, 4. culture, 5. exploiting insights, 6. managing uncertainty, 7. adaptability, 8. system's approach. (Benraouane & Harrington, 2021, p. xxix)

4. IMS in OSTIM Defence and Aviation Cluster (OSSA)

OSSA, one of Turkiye's leading defence and aviation clusters, was founded on July 1, 2008, under the direction of OSTİM. OSSA now has over 260 member companies with almost 10,000 workers. R&D, design, software, composite manufacturing, electronics, electromechanics, harness, machining, sheet metal forming, surface development, test/calibration, coating/painting, optical systems, hydraulic systems, machinery/equipment manufacturing, unmanned systems, and many other final products and subsystems are among the capabilities of these companies. OSSA creates significant synergies to encourage R&D and innovation activities. OSSA offers services to member companies in finding new markets and promoting international cooperation to provide a competitive advantage by adapting technology (digitalisation). It improves institutionalism, quality systems, and specialisation. OSSA's main focus is to create a roadmap for domestic and international cooperation and collaboration by increasing the competitive level of member companies. OSSA continues to work on SME-specific strategies by organising events to gain competitive advantages in Turkiye and abroad. It organises delegation visits, domestic and international promotion, representation, marketing activities, press and public relations, technology transfer, and joint projects as part of the university-industry collaboration (OSSA). This research article has emerged due to the cooperation between OSSA and Ostim Technical University.

4.1 Innovation Management in OSSA

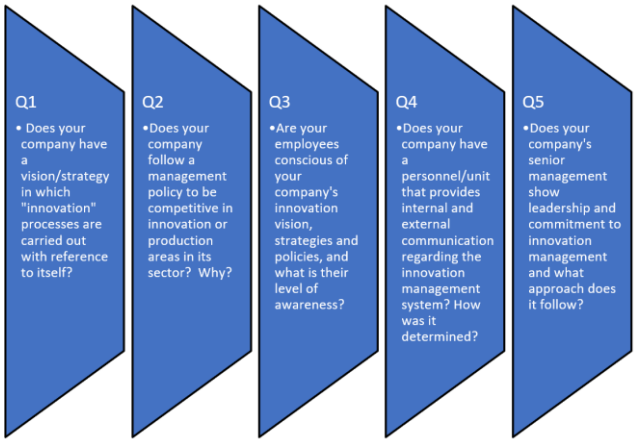
Within the scope of this research, interviews were conducted with the managers of four companies that are OSSA members. In these interviews, a series of questions were asked to the companies regarding awareness and implementation of ISO 56002:2019 International Standard – Innovation Management System.

In this context, the first question asked to companies is whether they have information about the ISO 56002 standard or not. All the companies interviewed stated they needed relevant information about ISO 56002 Standard, as seen in Figure 3.

Figure 3. Awareness of the Companies regarding ISO:56002 IMS

Because the ISO 56002 standard is a relatively new standard published just before the pandemic, the following questions were asked to determine whether the companies' innovation activities are by the ISO 56002 standard.

The question set and the empirical findings obtained within the scope of the research is given in the tables below. The question set has been carefully crafted to reflect the critical issues in ISO 56002 standards. The figure below depicts the first question set prepared to assess awareness of Innovation Management.



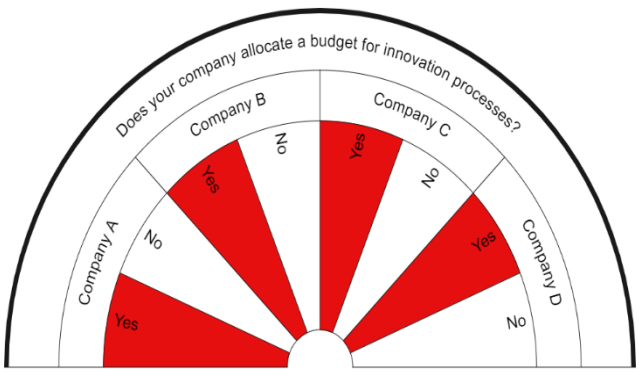
The companies' responses to the first set of questions are summarised in the table below.

Question Set: 1	**Answers Given**	
Q.1 Does your company have a vision/strategy in which "innovation" processes are carried out about itself?	Company A	We do not have any.
	Company B	Our strategy is determined by the public defence industry companies that we work with as sub-industry.
	Company C	Yes, it has. First of all, we started to work as an R&D company. We have an R&D department. We follow the AS-9100 standard, which is vital for companies making R&D for the defence industry. We carry out all processes related to both design and production according to this Standard.
	Company D	We do not have any.
Q2. Does your company follow a management policy to be competitive in innovation or production areas in its sector? Why?	Company A	We follow a competitive policy; we want to sell our products to the world. Our goal is to be competitive across the globe. We are looking for ways to achieve this.
	Company B	We have to be competitive as there are many competitors in the industry.
	Company C	We do not have a written management policy. We have the strategy. It is done every year, but it is done every three years. It is renewed every year for three years. What are we going to do in the next three years? So right now, we have a 2023-2025 plan. This document will be revised next year; it will be 2024-2026.
	Company D	We do it because we have to do it. We work primarily for public defence industry companies. We allocate space for new needs and expansions in our technical work as much as possible. We are allocating resources to other projects that we want to do with our resources.
Q3. Are your employees conscious of your company's innovation vision, strategies and policies, and what is their level of awareness?	Company A	We are trying to design and manufacture something new. We are walking the road with friends who want to do this.
	Company B	The awareness level of our staff is relatively high. We have a team that follows the developments in the world. Their English level is satisfactory. This way, we can follow the publications (literature) in foreign languages.
	Company C	In particular, the awareness level of the R&D team is very high. There are even some rewards related to them. If you get a patent, this is what happens if the TÜBİTAK project is approved; if you do it, that is, if you get support, R&D nor KOSGEB, TÜBİTAK, such as premiums. This is what we call an award regulation. If innovation is not the case, we do not limit innovation only to R&D. We have such a suggestion and reward mechanism that will provide an innovative motivation for better processes in production and even among blue-collar workers.
	Company D	There is no specific process defined for Innovation or R&D in our company. We have processes related to the overall goals of the company. That includes Innovation and R&D. For this reason, we do not make any innovation-specific notifications to the personnel.
Q4. Does your company have a personnel/unit that provides internal and external communication regarding the innovation management system? How was it determined?	Company A	We do not have.
	Company B	We opened an office in Ostim Teknopark for R&D activities. That is an environment where incentives can be obtained for R&D projects. We are assigning staff with more academic aspects.
	Company C	We do not have Innovation Department; we have an R&D department. Our company, the branches in which we do business, and our sectors are already evident in those strategic plans. All of us, including myself, follow the processes related to incentives. We follow TEYDEB and KOSGEB programs. These are precious things. Because if you do not have these supports, you are spending it out of your pocket. R&D and innovation are

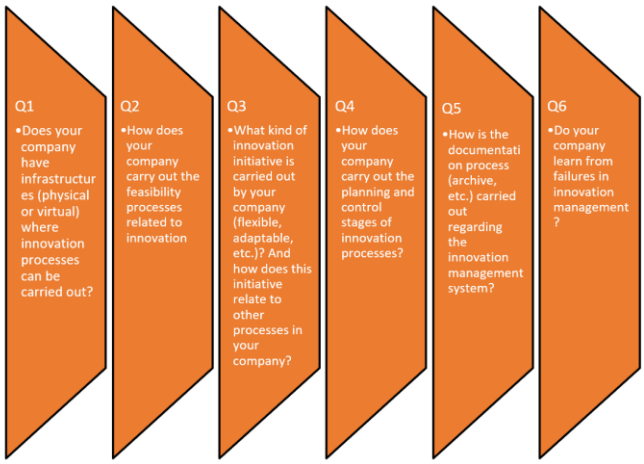
		businesses that have little chance of turning into money. You found something you did market research, but that is relatively low stuff.
	Company D	No. There is no particular person or department. We have activities related to TUBITAK and ASGEB's incentives. But we do not have a special department for that.
Q5. Do your company's senior management show leadership and commitment to innovation management, and what approach does it follow?	Company A	Unfortunately, we do not have such processes. As the company management, we are inspired by the developments in the world.
	Company B	Our company management is very enthusiastic about investing in R&D projects; we have plans to take advantage of the necessary incentives. Our senior management has plans to transform the company into an R&D company.
	Company C	I am the owner of the company. I started as an R&D personnel. Now I want everyone to do R&D. This is not very possible. There are better approaches than this. Our managers are looking for a trained man for R&D. That is the problem. Let me hire an engineer to solve this problem. This is a complicated thing.
	Company D	We work on being innovative or competitive; we evaluate possibilities. This happens mainly at the senior management level.

In the second set of questions, there are seven questions assessing companies' capacity for innovation practices. In this context, the first question asked was about budget allotment to determine whether companies value innovation.

Figure 4. Budget allocation for innovation processes



The allocation of budgets for innovation processes of all companies, as seen in the table above, is an essential indicator of the importance given to innovation. The figure below depicts additional six questions from the second set.



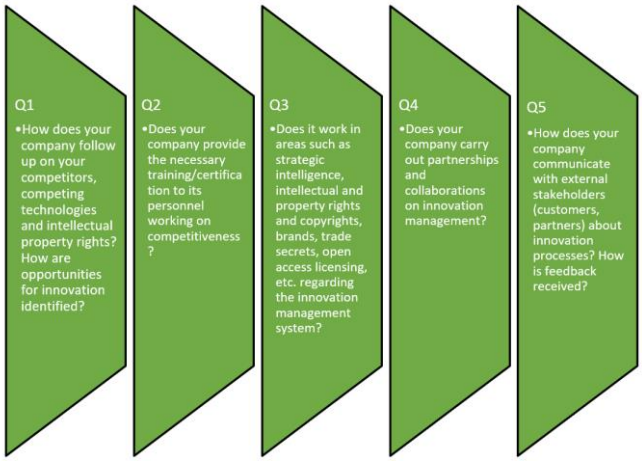
The table below summarises the companies' responses to the second question set.

Question Set:2	**Answers Given**	
Q1. Does your company have infrastructures (physical or virtual) where innovation processes can be carried out?	Company A	We are trying to determine innovation-related documents or roadmaps ourselves. We have yet to be very successful as a new company in its infancy. However, we can set target points for which products we make ourselves and where we can reach them. We define a roadmap. Nevertheless, we did not turn them into written documentation.
	Company B	We need to be able to conduct healthy experiments in a laboratory environment. Of course, this happens with infrastructure investments, and we are currently trying to invest in these areas.
	Company C	Well, once there are the tools required for design. So mechanical engineers need some equipment. In a soft or hardware sense, electronic engineers need some equipment. Of course, we call it both design tools and facilities. In other words, what is meant by this facility is an excellent place where the staff will work for once. We have them.
	Company D	Yes, we have. Firstly, we provide a suitable working environment with our company building. Secondly, we have the necessary

		equipment, the necessary tools, and devices to be used in the development process, and we buy new ones if necessary. We use outsources or the method of renting devices.
Q2. How does your company carry out the feasibility processes related to innovation?	Company A	Very detailed feasibility works are carried out outside of SME scale companies. We have done the feasibility works on simple excel spreadsheets. Now we want to employ new personnel to work on R&D and developing new products. This personnel will only make feasibilities on what is being done in the world, where the world is going, where we are in this, or how we can be involved in the processes.
	Company B	The feasibility works of our company are generally carried out in the form of meetings held to correctly understand the need for the products we have developed for public defence industry companies.
	Company C	There is an R&D that will be offered outside. That is to the customer, that is, the customer wants R&D from our company. In such a case, the technical requirements are precise. This kind of feasibility process is easy. There are also R&D projects that we carry out ourselves. In this context, we search for technological capabilities, including literature research. We experiment with it through technology. Whether it can be done or not, we make the feasibility of it.
	Company D	The feasibility activities that we do the most are the works that the current main contractors want to have done. For this, we are doing a few days of research work. Here, we determine the amount and cost of labour and materials used. We evaluate the opportunity and risk of doing this project and compare it with other possible projects. Then we try to determine a price. In every new project, we increase efficiency or make it scalable.
Q3. What kind of innovation initiative is carried out by your company (flexible, adaptable, etc.)? Moreover, how does this initiative relate to other processes in your company?	Company A	We have yet to have a specific innovation initiative that we carried out.
	Company B	We are making R&D indexed to meet the demands of our customers. Therefore, flexibility is decreasing; we must fulfil customers' needs and requests.
	Company C	What we call innovation or/and R&D is something more fundamental. What we do much more often is adaptive solutions. We usually do not call it innovation; we call it product development. We customise the answers by changing the shape-schematic functions according to customer requests.
	Company D	Our R&D activities are as piecemeal engineering works. We strive to make the products we develop generally adaptable. So, it can be used elsewhere as much as possible.
Q4. How does your company carry out the planning and control stages of innovation processes?	Company A	We have yet to follow any plans because we are a firm trying to stand on its feet. SME-sized companies like us, unfortunately, need help managing these processes correctly or knowing. That is somewhat driven by the company's manager's or employees' vision, but it will take time to establish a corporate form of it in a management style.
	Company B	Our R&D planning is shaped within the scope of the nationalisation program of public defence industry companies. We have products that we plan to sell abroad. However, this type of R&D project remains in the background. Cause the primary motivation is to survive. We prefer to invest in products with a market instead of more innovative products that are risky in marketing.
	Company C	There is an R&D representative in our company; we have a meeting about all departments that we call a monthly management review meeting. That is just a meeting with managers. There is a weekly business plan follow-up among them. However, we do the general proceedings once a month, and when we do it once a month, it is about every department, including R&D and Innovation.
	Company D	First, our overall R&D process has a plan. It has it is quality and process flow chart. We use this. Secondly, we adapted our R&D process to the project we received. We are preparing a project plan for this, and we plan workforce, equipment, devices etc., to be used in this project plan. We try to comply with this throughout the project.
	Company A	The documentation process is done regularly. These documents are recorded or revised at annual management review meetings.

Q5. How is the documentation process (archive, etc.) carried out regarding the innovation management system?	Company B	Our projects are recorded in a particular folder so our relevant personnel can access them. All phases of the project are archived.
	Company C	ISO 9001 is more superficial. It starts with a business idea in aviation. It is imperative to determine how the business will be managed and how it will be documented. Our R&D department has staff responsible for verifying processes by AS9100 standards.
	Company D	Initial planning is done regarding all our projects' design and production processes, and documentation is created throughout the process. Later, if the R&D project turns into production, this documentation is transferred to production and kept in the production network. The information remaining in R&D is stored in our design network, specifically for the project, on the design side.
Q6. Do your company learn from failures in innovation management?	Company A	At least 6-7 out of 10 R&D activities fail. We encounter failure in most of the things we do, but when we sit down and analyse the reason for failure, we learn the way to success.
	Company B	We need more than saying that our product is perfect. The customer should not like the product. Therefore, we consider customer requests as R&D. This is what we learned.
	Company C	There are such examples. Did you learn from this? This is not something that will make us give up on R&D.
	Company D	There are some projects we fail, but only a few projects. There are things we need to catch up with in engineering. Apart from that, there are also solved problems. We have a particular system in which certain documents exist. Successful or unsuccessful issues are documented. Newcomers also use that information in general in their new projects.

The third set of questions addressed other issues related to ISO 56002 standards concerning companies' innovation processes, such as relationships with stakeholders or competitors and strategies for collaborating with partners. The questions in this set are illustrated in the figure below.



The table below summarises the companies' responses to the third question set.

Question Set:3	**Answers Given**	
Q1. How does your company follow up on your competitors, competing technologies and intellectual property rights? How are	Company A	In Turkiye, there is no competitor company in our field. We first conduct a literature review for our competitors in the world. We are examining whether a patent has been obtained or not. If a patent has been received, we look at what we can do as an alternative to this and what kind of processes we can do. Then we move on to the product development processes.
	Company B	It is essential to be fast in competition with companies. Because every company follows the need, and if you do it first, the customer becomes a little attached to you. The most important thing in competition is that when we are successful in the test processes, and you satisfy the customer, they prefer your product.
	Company C	Our industry has some advantages. We are different from many industries. We are in an industry with less competition or even more qualified competition. So we know each other, and we talk to each other too. If the topic is R&D, competition may even be easier on the high-production side. Therefore, there is

opportunities for innovation identified?		no difficulty in following domestic competitors. They follow us; we follow them very quickly. If the competitor is foreign, you must look for the products and find the parameters of the comparisons related to this competition; you have to deal with it. Since our products are a complex structure that includes software and hardware, we call that review a benchmark. If there is a patent, buy it; if there is a product, buy it. If you need to travel, go on a business trip, or go to the fair.
	Company D	These are mostly done with one-on-one relationships. That is how we follow our competitors. We evaluate the opportunities according to the impressions we get from those conversations.
Q2. Does your company provide the necessary training/certification to its personnel working on competitiveness?	Company A	Investing in R&D or Innovation for SME-sized companies is generally seen as commercially risky. We are trying to overcome this, but we need a personnel assignment.
	Company B	We do not have such a study. We ensure that our employees are at a level to compete at a sufficient level. But we do this to do our job better and more appropriately. So, we do not have special training for this.
	Company C	We need personnel related to competitiveness. In other words, we do not have personnel under this title. We do not have any training under this heading. As a business development, there is a position called program management. Business development, marketing and sales activities are carried out here. If these personnel compete in their jobs, they must follow the process and submit reports. That is how we manage the competitive process.
	Company D	No.
Q3. Does it work in areas such as strategic intelligence, intellectual and property rights and copyrights, brands, trade secrets, open access licensing, etc., regarding the innovation management system?	Company A	We have an opinion about all of them, and we know them. But no planned and programmed work is carried out on any of them.
	Company B	The developed product must be documented. We obtain a domestic product certificate for the products we create. Apart from that, our company's trademark has been registered, and we patent the products we have developed under this brand name.
	Company C	For us, this process has two aspects. One is about patenting our work outside; we have to divide this into two categories, defence and civilian. We have yet to receive patents in security so far. But we have patents in civilian applications. We have experience in selling or buying intellectual property rights.
	Company D	Most of what we have done so far has already been customer-owned projects with intellectual and industrial rights on the customer's side. We make engineering rather than R&D. Of course; we add innovative things to it within the limits of what the customer wants. We have our internal projects; of course, we need to catch up with them from other projects. When we finalise our projects, we will do the necessary work on issues such as patents.
Q4. Does your company carry out partnerships and collaborations on innovation management?	Company A	No.
	Company B	Yes, we carry out the partnership with companies and academicians. There are companies we work with in the technopark. Additionally, we do not make some mechanical parts of our products. There are companies that we work with for these.
	Company C	We are a manufacturing company. In the electronics industry, the product industry is multi-layered. Now there are the software, hardware, mechanics, industrial design, and other various components related to production. However, we are in Technokent due to our insistence on being in this ecosystem. We choose many subcontractors from here. We find it valuable to be in the technology ecosystem and use it a lot.
	Company D	In some projects, we used collaborations with universities. We also received consultancy services. Information sharing with other companies is constantly happening. We are in constant interaction, especially with our subcontractors.

Q5. How does your company communicate about innovation processes with external stakeholders (customers, partners)? How is the feedback received?	Company A	We receive feedback from public defence industry companies on the test processes and application processes of the product we have developed. If there are negatives in line with the feedback, we analyse the reasons for this and reflect them for the products we will grow again.
	Company B	We receive feedback from public defence industry companies both on requests and validations. We do the tests together; we examine the returns of the tests together. While the product development process continues, it is necessary to discuss them step by step.
	Company C	Our projects have phases; each phase has milestones, and each milestone should have an output. That is an interactive process. Sometimes something comes out for you to reach that milestone; something has to come from our external stakeholders, such as customers, partners, etc. We call this interactive process "feedback."
	Company D	People in the project team provide communication with the customer or supplier. The necessary communication conditions are defined in the job description of each project. Matters regarding meeting periods and document sharing are determined.

5. Evaluation

The companies interviewed within the scope of this research carry out innovation activities at a certain level. Despite this, they all needed to familiarise themselves with the ISO 560002 standards. One of the primary reasons for this situation is that the ISO 56002 standard is still relatively new. It is predicted that this Standard will spread over time. The fact that the companies interviewed allocate budgets for innovation is the most crucial indicator of this prediction. During this research, it was considered that companies have a certain level of awareness about innovation. Furthermore, it is evaluated that companies are willing to advance the innovation processes.

Companies have been shown to learn from failures in innovation management. According to research, companies have a positive attitude toward collaboration opportunities in innovation management. It has been noted that the documentation process (archive, etc.) associated with innovation management is generally attempted to be carried out by AS9100, ISO 9001 and ISO 27001 standards. That demonstrates that companies are adhering to the standards with which they are compliant. This situation supports the theory that if a certain level of awareness is created and regular inspections are performed, the ISO 56001 standard will be implemented as well.

Companies are considered to invest in physical or virtual infrastructure where innovation processes can be carried out. Accordingly, companies require a vision/strategy or/and management policy through which their innovation processes are carried out. It has been observed that the concepts of R&D and Innovation often need clarification with each other. Therefore, companies' executives and employees must receive extensive training on terminological and methodological distinctions between these two concepts.

6. Conclusion

DAI is one of the world's pivotal and strategic sectors due to its unique distinction of being the locomotive of technological and economic progress. That is the reason why countries place a special emphasis on DAI investments. The world's current developments indicate that investments in DAI will continue to increase. This remarkable fact demonstrates that DAI will be one of the most outwardly visible dimensions of global competition in the coming years.

Turkiye has recently held a unique position worldwide with its outstanding investments in DAI, primarily in UAVs and UCAVs. DAI investments which prominent public and private companies mainly make with public financing, have elevated Turkiye to the forefront of the global competition in this sector. With these developments, a large ecosystem in the field of DAI has emerged in Turkiye. The SMEs that supply large DAI companies as subcontractors are undoubtedly the most vital components of this ecosystem. As a necessary consequence, improving SMEs' innovation management capacity is not only critical for the success of national-scale projects but also a matter that must be addressed in terms of global competition.

The innovation capacities of companies that are members of OSSA, Turkiye's one of leading Defence and Aviation clusters, were attempted to be analysed in this study. During the interviews conducted as part of this research, it was determined that companies have the potential to carry out promising successful works if they are accurately guided in the field of innovation management. Without a doubt, the most crucial priority of these companies is to be a subcontractor of large public DAI companies, to sign new contracts with them and to fulfil their commitments by making a profit with certain/limited sources. Expecting these companies to progress in innovation management with their resources will be unrealistic in this commercial cycle. Awareness and implementation of innovation management should be handled on a macro scale and should be planned independently of these companies' microscale economic priorities. In this context,

large public DAI companies and OSSA bear significant responsibilities. OSSA should provide managers and employees in its member companies with training on matters relevant to the global competition vision, such as innovation management.

Large public DAI companies should provide administrative and financial support for SMEs' innovation management activities. Instead of the lowest price being the most crucial criterion in large public DAI companies' purchase/procurement process, new models should be determined that will support strategic topics, particularly IMS, which will pave the way for innovations. The IMS:56002 Standard should evolve into a mandatory document requested in purchases and controlled/inspected in specifications, similar to other ISO standards, such as information security management systems and quality management systems, as well as other standards requested in specific fields and purposes. Only when all stakeholders widely accept IMS in the DAI ecosystem will it be at a sustainable level that can compete with the rest of the world. Global competition can only be achieved through macro-scale public policy at the level of the Defence Industry Presidency.

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University-Industry Cooperation in Turkey: The Case of OSTIM Technical University

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Abstract

Within the scope of this study, the scope of university-industry cooperation is discussed, and sectoral cooperation studies in Turkey have been evaluated. While the study examines the University - Industry Cooperation activities in Turkey through OSTIM Organized Industrial Zone and OSTIM Technical University, it also reflects a regional flow perspective. Turkey's view of these cooperation studies in terms of Development Plans, current situation and strategic targets have been analyzed. The role and effectiveness of Technology Transfer Offices, which is one of the most important interfaces for University-Industry Cooperation, has been evaluated. While interdisciplinary work and sectoral clusters are discussed in cooperation studies, the difficulties experienced in this process and examples of how to overcome them are given.

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1. University-Industry Cooperation in Turkey

In this study, there is information about the historical development, current situation and current conditions of university and industry cooperation in Turkey. When we look at it historically, it is possible to say that university-industry cooperation mechanisms are maintained with traditional methods in our country. Within the framework of development plans, university-industry cooperation processes, strategic goals and the role of technology transfer offices in these processes will be evaluated in the study. Universities, which have enabled the discussion of knowledge at an academic level in the history of the world, have played a very important role in the development of knowledge and its transfer from academic level to production. Universities, which work as the main source of knowledge, have undertaken important tasks in the dissemination of information throughout the society. From the middle age, when the first university emerged, until the 19th century, the focus of universities was education. In the 19th century, besides education, which is known as the first academic revolution, research and development studies were among the main activities of universities. (Arslan, 2017)

The most basic factors of industrialization can be defined as science, technology and economy. Today's growing technology needs scientific knowledge-based and constantly innovative approaches. While universities are producers of innovative science, industry has been the biggest factor in the growth of economy and technology. In this framework, the State has the duty to implement scientific studies by providing financial support to scientific studies. Although the university, industry and state trio have an important effect on economic growth, this cooperation may not always be fruitful. University, industry and government cooperation can be seen as an area in need of improvement at all levels, and even a mandatory field for the mutual benefit of the parties.

1.1 University-Industry Cooperation in the Historical Process of Turkey within the Framework of Development Plans

When we look at the details of University-Industry Cooperation, the Five-Year Development Plans have been an important source for this issue. In the 1st and 2nd Five-Year

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Development Plans, the topics for the management of technology, the relationship between science and technology and R&D were determined (Kurt, Yavuz, 2014). The relationship between education policies and technology transfer processes has been tried to be explained. When we look at the 3rd Five-Year Development Plan, advanced technologies and R&D management issues have an important place. In this context, the lack of infrastructure and institutional structures of universities or other institutions in terms of production technologies were emphasized. In the 4th Five-Year Development Plan, the inadequacy of R&D resources, the lack of which institutions and sectors will be the interface for university and industry cooperation were determined. Accordingly, technological inadequacies and high costs were mentioned within the scope of the plan. In the 5th Five-Year Development Plan, it was stated that the inadequacy of industrial policies should be resolved within the framework of R&D activities. In the 6th and 7th Five-Year Development Plans, the necessity of starting Technology Development Zones (Technopark / Technokent) initiatives and allocating a budget for R&D activities came to the fore. On the other hand, in the 8th Five-Year Development Plan, the development of new technologies and the encouragement of the work of industry and technology centers within the framework of joint cooperation were discussed. In the 9th Five-Year Development Plan, it was emphasized that the necessity of contributing to the development of the industry with new technologies by revealing the competitive structure of the industry was emphasized, and at the same time, it was emphasized that it was to ensure the completion of the structural reforms by providing stability. In the 10th Development Plan, it was decided to increase R&D resources under the title of Technological Development and Innovation, to evaluate and encourage industrial policies in terms of university and industry cooperation, and to carry out studies for the development of these mechanisms. In the 11th Development Plan, incentive systems will be established for projects developed in industry and technology zones within the scope of university-industry cooperation. At the same time, there are issues that will be carried out to train qualified human resources for this field. (Kurt, Yavuz, 2014)

1.2. Strategic Targets in University-Industry Cooperation

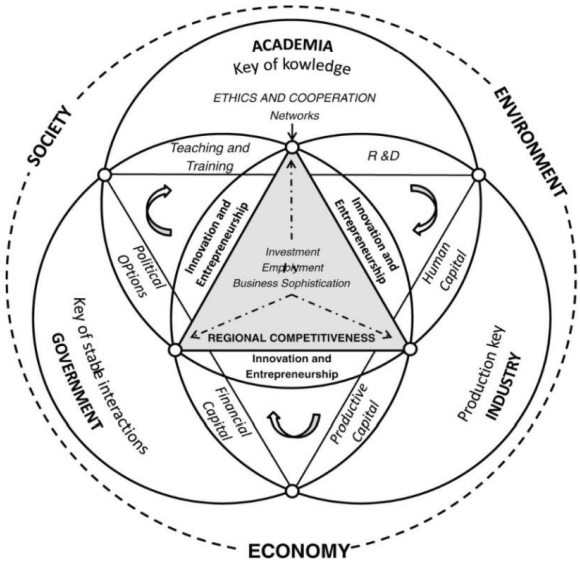
First of all, it is very important to achieve domestic production targets in the university industry ecosystem. Various resources will be developed and activated within the framework of R&D and innovative planning. Qualified knowledge production of universities and commercialization processes of technology transfer offices will be encouraged. Accordingly, technology-based entrepreneurship, 3rd generation university features will be handled with the industry and cooperation will be ensured.

Production frameworks with high added value will be determined for the formation of the market for the products that will be commercialized with R&D. Export studies should be carried out for the commercialization of high technologies and national added values that will arise in university-industry cooperation. In this way, the import dependency of the economy will be reduced in the medium and long term. In this respect, it will be important to reduce the foreign dependency of the country's industry and to increase the qualified human resource capacity of universities. From this point of view, the most important goal is to create an ecosystem that will bring universities and industry together in order to transfer the information that will emerge as a result of R&D studies of universities, technoparks and research and development centers to production.

1.3. Why University Industry Cooperation?

In University-Industry cooperation, only these two factors are not enough, and we should not forget the public part. Because legal regulations need to be prepared and implementation-oriented procedures should be carried out. The element that will ensure this is the public. For this reason, the element called University-Industry-Public and called the Triple Spiral is important. The triple helix model of innovation, as defined in concepts such as the knowledge economy and knowledge society, refers to a series of interactions between academia (university), industry and government to promote economic and social development (Compagnucci & Spigarelli, 2018).

Figure 1. Triple Helix Model for innovation.



Developing projects for solutions that will address the problems of universities, industry,

Carrying out studies for the funding of production research of universities,

Contributing to the development of high value-added products to be produced by the industry,

Revealing studies for the commercialization of both knowledge and products developed within the scope of university-industry cooperation,

Ensuring the employment of qualified human resources for the industry,

Developing the basic infrastructures (laboratories, research centers) of universities,

It is possible to count the transfer of products developed within the scope of cooperation among the main reasons.

Preparation of projects supporting the innovation capacities of universities and preparation of production-oriented studies for industry cooperation,

Increasing the technology competencies of universities accurately and effectively,

To define the roles of industry in the regional and then national R&D systems of universities and to increase their motivation in this regard,

Developing public-supported cooperation programs in project-oriented studies of universities,

It is important in terms of creating an export-oriented structure and producing information about technology so that our country can compete on an international scale within the scope of industrial policies.

1.4. The Current Situation

From past to present, many studies have been carried out within the scope of University-Industry Cooperation and various suggestions have been put forward. As a result of these studies, the practices put forward by both public institutions and the private sector, universities, research centers and industrial environment were highlighted. When we look at these studies, it has been seen that university-industry cooperation has not been established sufficiently in our country. The basis of this approach is the fact that the industry does not know universities well, approaches with prejudice, university curricula are not close to industry, and lack of legislation.

In Turkey, this situation clearly reveals that universities will take their work further, while the industry allocates financial resources to this phenomenon while trying to fulfill the human resource task that universities will train in the eyes of researchers. In the current situation, universities need to be financially autonomous in order to ensure university-industry cooperation and to ensure good progress. The main purpose is to contribute to the transformation of scientific developments in the university into both commercial and economic value by transferring them to the industry, and to encourage companies to direct them to R&D activities. Accordingly, it should be ensured that university academics establish a mutual relationship with industrialists. Undoubtedly, universities are the most important institutions that will realize the transfer of knowledge and technology. Ensuring this cooperation has started to accelerate with the increase in the efficiency of technology transfer offices. When we look at the last 20 years, it is seen that with the increase in R&D studies, industrial cooperation has increased concretely with the existence of technology transfer offices.

In our country, it is seen that determining the current situation of the regions for university-industry cooperation, encouraging entrepreneurship and training industry-oriented personnel are insufficient. Accordingly, with the current situation, it is known that the entrepreneurial university structure in Turkey is not at a sufficient level and Technology Transfer Offices and Technopark structures are trying to do this with insufficient resources. In the current situation, it is seen that the companies do not have enough knowledge of the literature, it is seen that the disconnection between both the public sector and the private sector is an obstacle to the development of university-industry cooperation.

1.5. Technology Transfer Offices within the Scope of University-Industry Cooperation

Technology Transfer Offices are mechanisms that make great efforts for the commercialization of scientific and technological developments carried out by universities, the protection of intellectual property rights, the realization of needs-oriented activities and the delivery of technology to the industry. When we look at the purposes of the Technology Transfer Office, they focused on the main issues such as providing university-industry cooperation, acting as a bridge that will bring industry and academicians together, providing support in R&D issues, and supporting the patents of products that will emerge in University-Industry cooperation.

Today, the interaction of countries with each other has increased, economic rivalries between countries have grown and it has been accepted by everyone that productivity and innovation are the greatest power. Considering the regional economies, it is seen that the innovation-based economies are one step ahead of the economies of other countries. In many studies in the literature, the necessity of the national innovation system and the importance of university-industry cooperation have been emphasized. In addition, the necessity of having a special and expert team to manage university and industry collaborations, which is frequently mentioned in the literature, is also stated. In the light of these developments, TTOs have played an important role in transferring and using ideas or inventions that will benefit the industry in a beneficial way to society (Keleş, 2007).

Technology Transfer Offices have close relations with universities, industry and the public sector. It is important to transfer the technologies and knowledge that will emerge within the framework of university-industry cooperation. Accordingly, supporting the development of university-

industry cooperation and contributing to the development of products at an international level is one of the main roles.

Technology, knowledge, experience, know-how, design, production methods and systems; scientific and research institutions, industry, public, etc. Sharing the relations between the parties is one of the main goals of Technology Transfer Offices.

2. University-Industry Cooperation in Turkey: The OSTIM Model

OSTIM Organized Industrial Zone, which started its production and activities in 1967 with 1748 members, continues its activities as an important industrial zone of both Ankara and Turkey, with 6200 enterprises from 17 different sectors and nearly 70,000 employees. Thousands of products are also produced by small and medium-sized companies in the OSTİM Organized Industrial Zone, where production is carried out in the main headings of metalworking, construction equipment, automotive, manufacturing equipment, machinery manufacturing, electrical-electronics, plastic, rubber, medical equipment. For the success of the OSTİM Model, institutions and systems established in the fields of R&D, construction and investment, foreign trade, consultancy and promotion, in which industrialists, businessmen and non-governmental organizations are involved, provide solutions for SMEs both in an up-to-date and permanent way. While OSTİM Organized Industrial Zone is preferred as "pilot application" areas for supporting projects for SMEs in the industrial sector, it is also recommended as a regional development model for developing countries (OFİM, 2022). All companies in the OSTIM Ecosystem attach great importance to vocational training. Companies continue to work with both technology development and R&D activities. Accordingly, all institutions and organizations in this ecosystem not only support the work for the national industry, but also continue their activities in the pioneering position of our country. OSTIM Ecosystem, which is in close cooperation with OSTIM Technical University, carries out important studies in joint cooperation to strengthen the regional industry, increase R&D projects, and reach international competition. OSTIM has been in close cooperation with both regional and national universities in ensuring university-industry cooperation. At the same time, today, it has accelerated the activities of companies in a common competition at the international level and working in cooperation. It is obvious that the Organized Industrial Zone has made many plans in both micro and macro dimensions from the past to the present. Supporting regional companies with different sectors, increasing both the production and commercialization activities of the region, and accordingly, the OSTIM Ecosystem contributes to the formation of the infrastructure of many business lines.

Figure 2. OSTIM Model

Source: https://www.ostimvakfi.com/bolgeselisbirlikleri/detail/47

2.1. OSTIM Clusters

In the OSTIM Organized Industrial Zone, which draws attention as the region with the highest number of initiatives in the field of clustering activities in Turkey; There are 7 different clusters in Business and Construction Machinery, Renewable Energy and Environmental Technologies, Defense and Aviation, Rubber Technologies, Anatolian Rail Transportation Systems, Medical Industry and Communication Technologies sectors.

The first clustering activities of our country have emerged within the scope of companies, institutions and organizations within the OSTIM Ecosystem. When we look at these clusters; Business and Construction Cluster, Renewable Energy and Environmental Technologies Cluster, Defense and Aviation Cluster, Rubber Technologies Cluster, Anatolian Rail Transportation Systems Cluster, Medical Industry Cluster and Communication Technologies Cluster, in addition to doing very successful works in their fields of activity, as well as to ensure university-industry cooperation. They put a lot of effort into it.

The close cooperation with OSTIM Technical University has been very important in terms of both increasing the field of study of academics and contributing to regional development. The role of clusters continues to increase day by day in terms of making Sectoral Competitiveness Analysis and contributing to international projects. In addition, they operate in the companies' concentration on their own business competencies, and their contribution in terms of technology transfer and knowledge production has also been an important factor.

2.2. The Role of OSTIM Technical University Technology Transfer Office in the OSTIM Ecosystem

The OSTIM region was established in 1967, and with its previously formed and developing structure, it took on an institutional structure in this date. A series of steps have been taken to produce solutions for industrial needs in its ecosystem that has developed over time. Established Technical High School, Vocational Education Center, TechnoPark and finally OSTIM Technical University have been complementary to this step. The Technology Transfer Office and Research Center established within the university undertakes the task of being an interface in university-industry cooperation (OSTIMTech, 2022).

OSTIMTech Technology Transfer Office, which aims to produce solutions for industry needs in the OSTIM Ecosystem, undertakes the task of being an interface in university-industry cooperation. For this purpose, it aims to ensure correct cooperation that enables to produce high value-added technologies. OSTIMTech TTO plays an active role in its activities aimed at the needs of the industry, in developing communication, promotion, business development and R&D activities with companies. It contributes to the OSTIM Ecosystem by activating both national and international projects with companies. Simultaneously, it provides cooperation by acting as a bridge between academics and industry.

The main university-industry cooperation models carried out by OSTIMTech TTO;

Project-based, need-oriented university-industry collaborations,

To produce projects between public-university, industry and university,

To manage the patent, utility model and design registration processes that will emerge within the scope of University-Industry Cooperation,

To provide university-industry cooperation within the scope of training programs,

Making Business Development and Academic-Industry matching accurately and effectively,

Managing medium and long term commercialization activities,

Creating company profiles regionally,

To organize joint research and training programs that will develop cooperation between our university and companies, NGOs and public institutions, which may be within the scope of intellectual property rights, and to ensure the creation of products and services at a level that will fall within the scope of intellectual property rights,

To enable industry and universities to meet on a common platform,

By organizing BN (Business Network) programs on a sector-based and continuous basis, to constantly bring together academics and the business world, to ensure the formation of possible pairings on academic-business, business-business, business-academic-business axis,

Producing solutions to the problems revealed within the scope of company visits,

To develop the project production capabilities of both sector and corporate representatives,

To ensure the coordination of projects supported by both national and international funds,

To carry out studies for the benefit of OSTIMTech laboratories and industrial organizations.

Within the scope of University-Industry Cooperation, OSTIMTech TTO is in the position of interface in terms of reaching the technologies obtained as a result of technology transfer to the industry, one of the most important details here is the licensing and commercialization of inventions (OSTIMTech TTO, 2022). The gains created by OSTIMTech TTO in Market Research, patent and contract portfolios contribute to the development of the industry at national and international level.

Since OSTIMTech TTO started its activities, it has made 14 patent applications, 3 design applications and 12 trademark registration applications in a short time. R&D consultancy services were carried out under the sub-titles of TÜBİTAK, KOSGEB and European Union programs with the R&D enterprises operating in the region. OSTİM Technical University has started to be an interface between academic staff, TechnoParks in the region, sectoral clusters and academic staff. It contributes to the OSTİM ecosystem with the activities it has carried out in the last 1.5 years.

2.3. Difficulties Before University-Industry Cooperation

The role of technology transfer offices and technoparks is extremely critical for the development of university-industry collaborations. It is important to transfer information and technologies as a result of R&D studies carried out in universities, to encourage economic growth and to improve innovative activities. However, establishing collaborations between universities and industrial companies is a difficult and sensitive issue. There are usually differences between institutions in terms of expectations, requirements, evaluation of the results of R&D and cooperation objectives between the parties. The two most important issues are the sharing of intellectual property rights and the determination of the sharing model of the parties in the commercialization phase. One barrier to innovation is lack of access to finance. The fact that businesses that carry out innovative studies with academic staff at universities cannot find finance to implement is an obstacle to this cooperation (D'Este, Rentocchini, & Vega-Jurado, 2014).

The fact that the mission of universities is prepared for education and training and acting within a student and research-oriented definition can make industry cooperation difficult. The fact that OSTIM Technical University defines

itself as a Third Generation University, expresses itself as the "University of Industry" as a mission and is established within the borders of the Organized Industrial Zone are the factors that make it stand out in this regard (Toprak, Bayraktar, Erdoğan, Kolat, & Şengül, 2019).

Another problem that prevents the development of cooperation is the personnel turnover rate in the enterprises. The fact that the change processes of the qualified human resources working in the enterprise are high, hinders the R&D-oriented cooperation studies. The fact that the sharing model related to the product with commercialization potential was not determined at the first stage after the R&D study is among the problems (Bruneel, D'Este, & Saltera, 2021). While the company that makes the R&D expenditures expects to own more of the income rights of the product, the university that gives an academic direction to this study can make a similar request. This is seen as an important problem in cases where working conditions and income sharing are not predetermined.

R&D activity is considered as a work that takes a certain time in terms of quality. While companies want research to be done in the short term so that problems can be solved as quickly as possible with R&D, research projects for universities are considered as a job that needs to be carried out in the long term (D'Este & Patel, 2007).

3. Conclusion and Evaluation

In order to ensure university-industry cooperation, the relationship between the parties must be correctly established and the factors must be planned. To increase interaction;

- Physical facilities with new common use opportunities should be established and machinery and equipment infrastructure should be designed accordingly.
- Appropriate legal preparations should be made in order to ensure that cooperation studies where information sharing will complement each other theoretically and practically.
- The processes between Intellectual Property Rights and the parties should be planned as prescribed by law, researchers and parties who will commercialize them should be involved in the work knowing their rights.
- Cooperation between disciplines should be ensured in R&D activities, and commercialization processes should be carried out in parallel while conducting R&D work on a technical equipment.
- The support mechanisms provided by the public for R&D activities should be more effective and the budget level should be higher.
- Expanding the tax exemption processes for expenditures on R&D activities will enable greater University-Industry cooperation.

Since there are technoparks, vocational schools and training centers of different universities in the OSTIM region, it is in a structure suitable for this cooperation model. With the establishment of OSTIM Technical University, it has been directly involved in the OSTIM ecosystem and has developed cooperation with sectoral clusters and companies that are affiliates of the region. As a result of this, an increase has been observed in the number of patent, utility model, design registration applications in the region and the applications made to TÜBİTAK, KOSGEB, Development Agency, European Union and similar institutions providing R&D funds. With the evaluation of the above listed items as applicable, cooperation activities can be carried out more effectively. In particular, more effective use of public funds for R&D and the revision of legal regulations in this direction are of critical importance.

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Banks and Poverty Alleviation: An Assessment of the African Development Bank's Activities

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Abstract

This article aims to highlight the banks' role in Poverty Alleviation, in particular, the contributions of the African Development Bank, considered one of the most critical regional financial institutions with economic dominance over the African banking system. The study adopted a qualitative method and found that there is a nexus between Financial Inclusion (Banks) and Poverty Reduction in countries such as Nigeria, Rwanda, Bangladesh, and India for instance. The paper also revealed that in Africa, significant efforts have been made by the African Development Bank, particularly in Nigeria and Rwanda. Furthermore, the article sheds light on the tremendous efforts of the AfDB in terms of poverty alleviation over the continent in the last decades, especially from the achieving landmark general capital increase, the successful African development fund replenishment, resource mobilization for women-owned businesses, and a platform for raising capital to support Africa's investment initiatives as well as the successful set up of covid-19 social bond and support for agriculture among others. Nonetheless, the study pointed out that the financial assistance from the African Development Bank Group has not been equitably allocated among all countries as its foreign partners influence the distribution of the funds among the nations.

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1. Introduction

Banks are financial intermediaries that connect borrowers and lenders to ensure the smooth functioning of economies (Gavras, n.d.-a). According to P. A Samuelson: "A Bank provides service to its clients and receives perquisites in different forms.''As far as Sir John Pagette is concerned: "A Bank is such a financial institution which collects money in current, savings or fixed deposit account; collects cheques as deposits and pays money from the depositors account through cheques."(Bank: Definition, Evolution, and Development. Functions and Roles of Central Bank and Commercial Bank and Their Relationship, n.d.)

The African Development Bank group is "African Development Bank (AfDB) Group is a multilateral development finance institution comprising three distinct entities: the African Development Bank (AfDB), the parent institution, and two affiliates, the African Development Fund (ADF) and the Nigerian Trust Fund, (NTF). The AfDB Group is Africa's premier development finance institution. It is one of the five central global multilateral development banks (MDBs)" (AfDB in Brief, 2013).

The leading regional bank in Africa is the African Development Bank Group; it was set up to streamline the administrative operations of banks in Africa to assist the deprived, including the help of financial institutions, and commercial and national banks, to achieve a high rate of financial inclusion of the lower-income segment of the population.

It is believed that financial inclusion is an essential tool that banks can use to provide financial help to the poor to improve their financial situation and reduce poverty.

The Research methodology of this article is qualitative. It is based on the consultation of various articles and books to have a deep dive into the linkage between Banks and Poverty alleviation. The paper sought to provide insightful information

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into studying the close relationship between the aforementioned concepts.

The preference for this methodology sought to gather enough qualitative data to shed light on the positive impacts of the efforts of the African Development Bank on poverty reduction in the cradle of Humanity. According to Mahajan& Mahajan (2018:2), qualitative research is an important way of analyzing how people interpret and give sense to their experiences in a way that will allow the understanding of a social phenomenon (Mahajan & Mahajan, 2018).

This article is structured as follows. The first section deals with the Introduction that clearly states the purpose and goals of the article. The second section covers the literature review on the role of the African Development Bank in poverty reduction in Africa. The third section covers the Conceptual framework and provides details about poverty, Banks, Poverty in Africa, and The African Development Bank (AfDB).

The fourth section covering the theoretical framework provides insightful information on poverty reduction through the African Development Bank. It highlights the tremendous positive contribution of the African Development group in the fight against poverty through Achieving Landmark General Capital Increase, a Successful African Development Fund (ADF15) replenishment, resource mobilization for Women-Owned Businesses, a platform for raising capital to support Africa Investment initiatives, the successful set up of COVID-19 Social bond and the support for agriculture among others. The conclusion section representing the fifth and last section of the article, covers the study goals, the findings, and the recommendations in light of the research results.

2. Literature Review

Yülek & Yeda (2018) explained that despite the high growth rate of Sub-Saharan African countries and the liberalization of their economies back in the 1980s, the Sub-Saharan African region is still experiencing major issues in terms of financial development and Inclusion required for its economic take-off. Furthermore, the Authors explained that some of the major issues hindering the effective economic development and long-term growth of the SSA region are due to low financial intermediation, which is highlighted by the 13% difference between the median deposit to GDP of non-African Developing countries compared to those in the SSA region. As the second reason, they pointed out the low level of financial inclusion, which aims to make financial services available for all, in particular the most deprived in society. The third reason mentioned is the lack of financial development, hence, the major financial services providers are banks, which do not offer long-term loans, but rather short-term loans; the fourth major obstacle is the crowding out effect, meaning that the Waste majority of loans are directed toward governments instead of households or businesses, which are the engines for economic growth and poverty alleviation. Additionally, the informal financial system emerges as an alternative to a bureaucratic and less effective formal financial system operated by the banks. Authors Finally concluded that unless financial reforms are followed by better educational systems, stability of Macroeconomic aggregates, and above all, a system of Good Governance, the current trend is not adequate for Sustainable economic development for the betterment of the Sub-Saharan African economies (Yülek & Yeda, 2018).

According to Yülek & Yağmur (2018), economic growth is powered by the Manufacturing sector engine. However, the development of the Manufacturing sector requires huge investments, hence massive long-term loans (Yülek & Yağmur, 2018). Unfortunately, the Sub-Saharan African banking system is not only suffering from the lack of a wide range of banking services such as long-term loans so badly need for massive Capital investment but also from the Crowding effect of governments, hence reducing the loans directed to households and businesses (Yülek & Yeda, 2018).

Uddin & Kyophilavong (2012) examined the nexus between the banking sector development and poverty alleviation in Bangladesh and found a causal relationship between the development of the Banking sector and poverty reduction in Bangladesh. Importantly, their study revealed the directional relationship between poverty alleviation and the development of the banking sector in Bangladesh. They concluded their investigation by recommending that the government promote the development of the financial institution to curb the rising precarity in Bangladesh (Uddin & Kyophilavong, 2012).

Similarly, Dandume (2014) studied the impact of the development of the financial sector, Economic Growth, and Poverty Reduction in Nigeria and found that even though economic growth is necessary but not a sufficient factor for poverty alleviation. Dandume highlighted the necessity of working toward economic development, which is considered a tool for the development of the financial sector, which could play a significant role in promoting the private sector, hence contributing in the long run to the achievement of poverty alleviation in Nigeria.

Additionally, Dandume mentioned that the financial sector development requires first economic growth. Nonetheless, it is not enough to overcome widespread poverty. Dandume concluded by explaining that without equitable distribution of loans and a sound governance system, the battle against poverty would be hard to win in the most populated country in the cradle of humanity.

Basu et al. (2004), investigated the Microfinance situation in Africa and pointed out that Banks and Microfinance institutions constitute complementary institutions in the process of fostering financial inclusion efforts by bringing banking and financial services close to households and businesses in order to boost economic growth. The study further highlighted the need for the banking sector and

financial institutions to be supported by good practices from NGOs under the watchful eyes of government authorities in order to realize the financial inclusion goal (Basu et al., 2004).

Oladapo (2021) investigated Specialized Bank's provision and Poverty Alleviation in Nigeria and found that lending of Specialized Banks have positive implications for Poverty Reduction in both the short and long run.

Moreover, he pointed out that Microcredit lending in Manufacturing and Food processing, Transport, and Commerce contribute to Poverty Reduction in the short run. Oladapo summed up by recommending Inclusive and Sustainable Economic Development in Nigeria (Oladapo, 2021).

John (2015) investigated the nexus between Microfinance Banks and Poverty Reduction in Nigeria and found that Microfinance Banks have positive implications in Poverty Reduction in urban areas of Nigeria. However, the Author explained that banks did not significantly impact poverty alleviation in rural communities.

In addition, the study revealed that the banks' locations in urban areas were not suitable for rural dwellers to have access to loans easily.

Moreover, the researcher explained that the lack of information on rural populations' banking activities constitutes another obstacle to banks' positive and significant impact on the fight against poverty in Nigeria. The Author suggested that the government incentivizes establishing banks in rural areas to ease access to funds for rural dwellers in Nigeria (John Ayodele, 2015).

Stanley & Ezeanyeji (2017) conducted a study on the effects of Microfinance on poverty reduction in Nigeria and revealed a fundamental difference between people using financial institutions and those who do not take advantage offered by the banking system. Moreover, Stanley & Ezeanyeji highlighted banks' positive and significant impact on income increase, poverty alleviation, and social status improvement of those who use financial services.

Furthermore, Stanley & Ezeanyeji shed light on the close relationship between Microfinance Development and Economic Development. Stanley & Ezeanyeji concluded their study by emphasizing the necessity of promoting outreach programs on the importance of microfinance in improving the standard of living of Nigerians (Stanley & Ezeanyeji, 2017).

Okpara (2010) studied the linkage between banks and poverty alleviation in Nigeria and discovered a link between the poverty rate increase and the decrease in microfinance credits. Additionally, Okpara found that a constant increase in microfinance loans induces a reduction in the poverty index in Nigeria. Okpara concluded his research by urging the government to take necessary measures to incentivize the creation of microfinance institutions in all communities to effectively address the issue of poverty throughout the country (Okpara, 2010).

Johan (2013) investigated the nexus between financial development and poverty alleviation. He found that financial product has a positive and significant impact on economic growth that can translate to poverty reduction. Hence, the Author highlighted the indirect positive effect of financial institutions' development in the fight against poverty. However, he mentioned that the impacts of economic growth on poverty reduction vary according to region. Johan also explained that economic growth in some areas may have adverse effects and that instead of combatting poverty, economic advancement results in worsening widespread poverty (Johan Rewilak, 2013).

Chaouachi & Chaouachi (2021) investigated the linkage between Financial Development and Poverty Reduction in crisis periods and revealed a correlation between financial development and poverty alleviation proxies.

Moreover, their study paper showed a direct linkage between economic development and poverty reduction through access to funds, increasing the household's income, which translates into increased consumption, asset acquisition, and savings.

The authors concluded by highlighting that financial development can be a shield that protects poor people by helping them be more resistant to shocks, hence reducing their vulnerability to relapse into poverty (Chaouachi & Chaouachi, 2021).

Bamwensigye (2008) studied the relationship between Microfinance and Poverty Reduction in Rwanda and found that the promotion of Microfinance outreach positively impacts the poverty reduction goals of the Rwandan government. Nonetheless, his study highlighted differences in the impacts depending on whether the targeted population is located in rural or urban areas.

He pointed out the significant effect of financial development on the poverty reduction efforts of those in urban areas compared to those in rural communities. Furthermore, Bamwensigye noticed that Economic Development efforts were directed toward small business owners and that the absolute poor were far from the financial centers. He concluded by highlighting the importance of broadening financial assistance to people who are the most affected by the lack of sufficient income to cover their basic needs in the short term and get out of the poverty trap in the long run (Bamwensigye, 2008).

Burgess & Pande (2005) investigated the impact of rural banks on poverty alleviation based on the Indian social banking experiment and found that Financial Development coupled with Banks expansion in rural areas contributes positively to the increase of the income of the poor, hence significantly contributing to poverty reduction in rural areas. Additionally, Burgess & Pande shed light on the effectiveness of the Indian Central Bank's policy on licensing banks based on banks' locations tremendously contributing to the success

in the battle against poverty proliferation in rural areas of India. The Authors concluded by highlighting the positive and significant effect of the Indian Central Bank licensing policy on the increase of the income of the poor in rural areas, their ability to obtain long-term loans for investment purposes, and that the implementation of the licensing policy successfully contributed to alleviating poverty in India (Burgess & Pande, 2005).

3. Conceptual Framework

3.1 Poverty

According to the World Bank, ‘’poverty is the deprivation of well-being’’; it signifies the lack of resources to acquire needed commodities for one’s subsistence. This also includes the lack of access to a sound healthcare system, good education, and other public services in general (Haughton & Khandker, n.d.).

3.2 Banks

According to Jeanne Gobat (2012), banks are institutions that connect possessors of savings and those in need of cash and ensure the smooth functioning of economies (Gavras, n.d.-b).

3.3 Poverty in Africa

Africa is a continent with vast reserves of natural resources; despite the riches of its soil and its recent average annual growth of 4.5%, it is easy to notice the outbreak of poverty coupled with natural income inequality among its dwellers. According to the statistics of the World Bank, in 1990, about 43% of its population lived on less than 1.90 dollars a day, making the continent one of the poorest in the World. Despite the government's efforts and support from international organizations to contain the widespread poverty across Africa, results have shown that strategies put in place did not deliver the expected results, and hence need to be improved to lift the people of the cradle of humanity of extreme poverty (Main messages on poverty in a rising Africa poverty report, n.d.).

3.4 Banks in Africa

In recent years, Africa has observed a boom in its financial sector through the establishment of branches of internationally renowned banks. Moreover, financial instruments have constantly developed to ease access to banks via mobile banking systems such as MoMo (Mobile Money of MTN) or Orange Money (Orange).

The availability of these platforms has strengthened the financial transaction between people in many regards, including business, households, and remittances from abroad (transfer between bank accounts and from bank accounts to MoMo or Orange Money accounts). These platforms have increased the banking system's liquidity and fluidity in many African countries such as Ghana, Nigeria, Guinea, and others. However, the banking system in Africa is still shallow and not penetrated enough, as in the case of developed countries. Nonetheless, the sector remains well regulated, with entry regulation and competition rules clearly defined and subject to the respect of national and international standards (Bale 1). Despite the low level of development in comparison to Western or some Asian countries, Africa has succeeded in containing the systematic crisis. Since the mid-1990s, the continent has experienced only 43 systemic banking crises compared to the rest of the World, which has experienced 47. These successes result from solid financial control of African banking systems and global Governance improvements (Africa Economic Brief, n.d.).

4. Theoretical Framework

4.1 Trickle-Down Theory: Alleviating poverty through financial development and financial inclusion

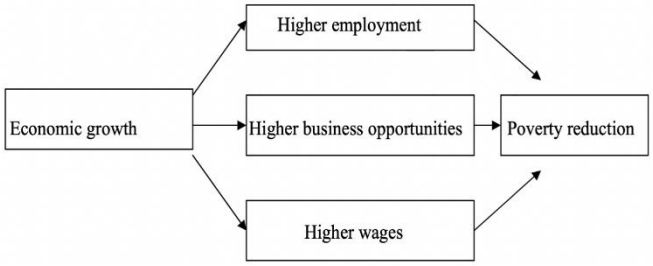
This theory originates from economics, which postulates that for structural economic policies formulated at the macro-level to be effective, they must trickle down to the micro-level to impact the individual financial well-being (Aghion & Bolton, 1997). These policies used taxes and other payments to initiate programs that increased the low-income level of households, enabling them to meet their basic needs (Sethi & Acharya, 2018). Thus, the theory is extended to explain the impact of Banks' policies and programs taken at the macro level to influence the financial inclusion of the poor and deprived individuals and groups. They explained further that the theory follows three procedures:

- The first is to initiate policies and programs that create an enabling and less restrictive environment for formal credit access to lower-income individuals and groups. This enables low-income individuals at the pyramid's base to access loans and other bank products needed to invest in their businesses. This improves their capital and income base to take advantage of entrepreneurship opportunities available in the market.
- The second is to advance individuals' financial awareness of the significance of creating saving accounts and benefitting from banking services that improve their economic sustainability (Boskov, 2018).
- Third, the financial inclusion of new lower-income individuals increased income level will trickle down to impact the various sector growth that causes new employment opportunities for the poor. Thus, the poor can receive income from new employment and afford their basic needs, reducing poverty in the long run (Burlando & Canidio, 2015).

This theory, therefore, implies that there will be a direct positive link between financial inclusion and poverty reduction through bank actions. Thus, the idea examines banks' role in poverty reduction in Africa.

Financial development and inclusion allow households and businesses access capital for both consumption and investment. Investment from the private sector boosts economic activities that lead to economic growth. Figure1 shows the dynamism of the economy through the investment of the private sector creates jobs, which substantially contribute to the decrease of the unemployment rate, provide high wages for workers and contribute to the reduction of poverty by providing a decent revenue (income) to the least privileged of the society (Poverty reduction strategies in south Africa by, n.d.).

Figure 1. Economic Growth and Poverty Reduction



Source: Poverty Reduction Strategies by Bhekizizwe Nthuthuko Nbuli (2008:136)

4.2 Role of African Development Bank Group in Poverty Alleviation in Africa

The African Development Bank through its know-how strategies and financial support had succeeded to achieve the increase of the Landmark General Capital, the replenishment of the African Development Fund, the mobilization of Funds to support women engaged in entrepreneurial activities; the creation of a platform dedicated to the collection of Funds in order to support the Investment of Developmental projects, the support for a special Covid-19 bound to minimize the impact of the pandemic on both the mainstream and businesses and the tremendous contributions in the development of the African Agricultural sector.

4.2.1 Achieving Landmark General Capital Increase

At an extraordinary shareholders' meeting in October 2019 in Abidjan, Governors of the African Development Bank, representing shareholders from 80 countries, approved a landmark $115 billion increase in capital for the continent's foremost financial institution. The increase, the largest in the history of the Bank since its establishment in 1964, more than doubled its capital from $93 billion to $208 billion (Agence France-Presse, 1 November 2019). This solidifies the Bank's leadership in development financing for the continent. Thus, with this considerable capital reserve, the banks finance social and infrastructural projects such as roads, schools, hospitals, and dams that improve the poor access to social amenities.

4.2.2 Successful African Development Fund (ADF15) replenishment

In December 2019, donors announced a remarkable $7.6 billion to replenish the African Development Fund. The replenishment represented a 35% increase in financing for low-income African countries at the end of the fifteenth replenishment of the African Development Fund, the concessional window of the Bank Group.

The ADF contributes to poverty reduction and economic and social development in the 38 least developed African countries by providing concessional funding for projects and programs and technical assistance for studies and capacity-building activities.

4.2.3 Resource mobilization for Women-Owned Businesses

For poverty reduction, the most vulnerable groups are women. That is why the African Development Group has always put on its agenda the financing of programs to increase women's income levels in poorer communities. Several agreements initiated by the African Development Bank Group were signed to raise funds from donor partners to facilitate project financing for women entrepreneurs in Africa.

4.2.4 A platform for raising capital to support Africa Investment initiatives

Following a highly successful inaugural event, the Bank secured more than $40 billion worth of investment interest in less than 72 hours at the second edition of the Africa Investment Forum held in Johannesburg, South Africa. The Forum, Africa's largest marketplace for mobilizing capital, featured 56 boardroom deals valued at $67.6 billion–a 44% increase from the 2018 debut.

4.2.5 Successful set up of COVID-19 Social Bond

In March 2020, the Bank raised an exceptional $3 billion in a three-year bond to help ease the economic and social impact of the Covid-19 pandemic on livelihoods and Africa's economies (Mureithi, 2021). The Fight Covid-19 social bond garnered interest from central banks and official institutions, bank treasuries, asset managers, and socially responsible investors, with bids exceeding $4.6 billion (Sophie et al., August 2020). It was the most significant dollar-denominated social bond ever launched in international capital markets and the most significant US dollar benchmark ever issued by the Bank. It will pay an interest rate of 0.75%.

4.2.6 Support for agriculture

Agriculture in Africa is growing with investment and finance. Numerous farmers in Africa are utilizing all the sources of finances available to them in terms of capital, aid, and grants. The Bank's Technologies for African Agricultural Transformation Program (TAAT) is leading the charge in helping to transform local staple crops across the continent, including maize, rice, wheat, cassava, high-iron beans, sorghum, millet, orange-fleshed sweet potatoes as well as livestock and fish. TAAT aims to raise food output in Africa by 100 million tons and lift 40 million people out of poverty by 2025 by harnessing high-impact, proven technologies to raise productivity, mitigate risks, and promote diversification and processing (Zorobabel et al., 2015).

5. Conclusion

This article sought to explore the role of Banks in Poverty Alleviation with a special focus on the achievement of the African Development Bank (AfDB) in terms of poverty reduction in the second most populated continent of the World.

On one hand, the article argues that there is a positive nexus between Financial Inclusion (Banks) and Poverty Reduction such as in Nigeria, Rwanda, Bangladesh, and India. However, the paper noticed that populations in urban areas tend to have more benefits from banking services than those in rural areas. Finally, the article

suggests that Banks establish subsidiaries in rural areas to facilitate access to funds for deprived people with bankable projects to substantially contribute to the reduction of poverty.

On the other hand, the article revealed that the African Development Bank Group (AfDB) had positively and significantly impacted poverty alleviation throughout the cradle of humanity by Achieving a Landmark General Capital Increase, Successful African Development Fund (ADF15) replenishment, Resource mobilization for Women-Owned Businesses; Creation of a platform for raising capital to support Africa Investment initiatives, Successfully setting up a COVID-19 Social Bond and Supporting the efforts of agricultural Development. However, the paper sheds light on the interference of the partners of the AfDB in some of its poverty alleviation supporting plans, which has negatively affected some of the Bank's projects designed to contribute to the reduction of poverty in Africa. Finally, the paper suggests that the African Development Bank Group's partners be more sensitive about the current poverty level in Africa by allowing the AfDB to realize its projects without any obstacle to uplift millions of Africans out of poverty in the coming years.

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The Last Twenty Years of Economic Growth in Turkey (2000-2020) Turkey-China Comparative Analysis[1]

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Abstract

The Last Twenty Years of Economic Growth in Turkey (2000-2020) Turkey-China Comparative Analysis Book examines the differences in economic growth between countries and their causes, with 29 different indices under 4 main headings that try to explain their effects on economic growth. The study, which makes Turkey-China comparisons with the indices, offers a rich content with over 1000 literature reviews. The aim of the study is to reveal how Turkey and China have performed in terms of economic growth in the last 20 years (2000-2020) by examining 29 different indices, which are indicators of economic growth. After mentioning the concept of economic growth and theories in the introduction, the book makes a global and Turkey-specific analysis between 2000-2020. In the following sections, the authors examine the relationship between economic growth and public expenditures, public investments, public consumption, tax burden as well as exports and imports and analyze the situation in Turkey.

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1. Review

The book primarily seeks to answer the percentage of the share Turkey, which is in the developing country category, receives from within the total Gross Domestic Product in US Dollars created by Turkey together with Brazil, Russia, India, China, South Africa, and Mexico, Indonesia, Nigeria, called with the acronym BRICS+MINT. Simply, what percent of the 100-unit product these nine countries created during the year Turkey could get as a share. The first year in which the calculation was made was 2000, and while Turkey had 6.92 percent of the total wealth in this year, this rate decreased to 5 percent with the economic crisis in 2001. In the period between 2002 and after that, especially by the economic crisis in 2008 when the recovery started with the "Transition to a Strong Economy Program" and the structural reforms implemented in May 2001, this rate was above 6-7 percent. However, the share of welfare created between 2002 and 2008 started to decrease continuously after the global financial crisis in 2008, and by 2020, this share decreased to 3 percent.

Comparing Turkey, which was exposed to the loss of welfare in the 2010s, with other countries, the authors witnessed the unstoppable rise of China when they investigated the country or countries that turned this loss in their favor. China, which had a share of 30-35 percent of the total welfare created by the nine countries between 2000 and 2010, turned the global crisis in 2008 into an opportunity, steadily increasing its share of total welfare after the crisis, and

[1] Nimet ÇAKIR and Güray KÜÇÜKKOCAOĞLU (2022), The Last Twenty Years of Economic Growth in Turkey (2000-2020) Turkey-China Comparative Analysis, Ankara: Siyasal Kitabevi, 1st Edition, no. 568. ISBN: 9786257424448

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by 2020, showed a great success story by owning more than 60 percent of the total welfare created by the BRICS-MINT countries.

This book examines the factors behind China's unstoppable rise in the last 20 years and tries to determine what lessons Turkey should learn from this change. In this book, the authors examine many factors that contributed to the economic growth of both Turkey and China and try to show the sort of realities the changes in these factors have left the countries with.

In the book, the authors who examine the economic growth differences between countries and the reasons for this, models that try to explain with new factors as well as traditional models that support capital accumulation, new growth theories and research, examine the indices that affect economic growth under four main headings. These are as follows:

I) **The Role of Geographical Factors:** There are studies suggesting that the geography of countries has effects on long-term economic growth in terms of health, population, food production, resource transfer and the mobility of production factors (Hall and Jones, 1999; Gallup et al., 1999; Diamond, 1997; Sachs, 2003; Porter, 1990). On the other hand, there are also studies suggesting that geographical factors do not explain the differences in growth, income and firm competition in countries with the same advantages Rodrik et al. (2004), Easterly and Levine (2003)

II) **The Role of Human Capital:** Harrod (1939) and Domar (1946) linked supply-side growth and demand-side growth with physical capital and labor as the main determinants. Neoclassical economists Solow (1956) and Swan (1956) focused on labor growth and capital accumulation as drivers of economic growth and viewed technological progress externally. Lucas (1988), Romer (1990), Jones (1995) stated that human capital is the primary source of economic growth because it successfully attracts other factors of production such as physical capital. They also extended the neoclassical growth model by internalizing technological change. Gama et al. (2020) found that there is a positive relationship between the impact of education on the per capita growth of countries and economic and political institutions. Hanushek (2016) found that differences in cognitive skills—countries' knowledge capital—can explain most of the differences in growth rates between countries, but historically adding more years of education (university education) without increasing cognitive skills has had little systematic effect on growth. Wang and Yao (2001) argue that the growth of total factor productivity (TFP) and human capital is necessary to accelerate economic growth. When we take a look at the studies examining the contribution of human capital to growth in the Turkish economy, Kuzören and Çeştepe (2019) found that the schooling rate and political freedom index have a positive effect on growth. Dursun and Yeşilmen (2021) found that qualitative growth in higher education has a negative effect on economic growth. Çelik (2021) determined a cointegration relationship between human capital and economic growth in the long run, and also stated that increases in human capital positively affect economic growth.

III) **The Role of Institutional Structure:** Another theory of economic growth is that institutions play an important role in economic growth and that the convergence or differentiation between countries can be explained by institutional factors (North (1990); Murphy et al. (1993), Acemoğlu and Robinsen (2010)).

IV) **The Role of Total Factor Productivity:** According to Albeaik et al. (2017), the factors in these theories trying to explain economic growth could not fully explain growth even when taken together. Consequently, economic growth raises questions embodied in the idea of Total Factor Productivity (TFP), a measure of an economy's output that is not explained by the availability of factors. That is, he argued that it is a measure of how much output an economy can produce per unit of input. When we take a look at the studies examining the contribution of total factor productivity to growth in the Turkish economy, Yanar and Oğuz (2019) found that economic growth has a positive effect on total factor productivity in the short term, and that economic growth and foreign direct investments do not have a significant effect on factor productivity in the long term. Bakış and Acar (2021) determined that total factor productivity increases should be around 1 percent for a sustainable growth in the Turkish economy, but the average TFP increase rate was only 0.30 percent in the examined period. They claimed that this situation led to the fact that the GDP growth was not at the desired level despite the relatively high capital and employment increases.

After examining the concepts, methodologies and related studies related to 29 different indices under 4 main headings, which are indicators of economic growth in the book, the

authors compared the world rankings and values of Turkey and China between the relevant index values in the 2000-2020 period in terms of economic growth.

I) **The Role of Geographical Factors:** Indices used to measure the role of geographical factors in economic growth; "Foreign Direct Investments % GDP", "Globalization Index" and "International Trade Freedom Index";

II) **The Role of Human Capital:** Indices used to measure the role of human capital in economic growth; "Pisa Reading Performance", "Pisa Mathematics Performance", "Pisa Science Performance", "Human Capital Index" and "Human Development Index", "Gini Index"

III) **The Role of Institutional Structure:** Indices used to measure the efficiency of institutions in economic growth; "Current Account Balance (Percent of GDP)", "Public Size Index", "Net Foreign Portfolio Investments", "Exchange Capitalization Percent of GDP", "General Government Gross Debt Percent of GDP", "General Government Net Debt" Percent of GDP", "Gross Capital Investment", "Fragile States Index", "Economic Freedom Index", "Strong Access to Money Index", "Legal System and Property Rights Index", "Rule of Law Index", "Regulation Index" " , "Political Stability Index", "Percent of Informal Economy GDP" and "GDP Per Capita";

IV) **The Role of Total Factor Productivity:** Indices used to measure the role of total factor productivity in economic growth; "Total Factor Efficiency Index", "Economic Complexity Index", "Global Competitiveness Index" and "Global Innovation Index".

The most crucial point in the book is that, of the 29 indexes showing the development of the Turkish economy in the twenty-year period (2000-2020), 7 of them increased positively, 2 of them did not change, and 20 of them decreased negatively.

When the authors examined the 29 index values of Turkey between 2000 and 2020, they stated that the only index in which Turkey, a G20 country, is in the top 20 among the world's countries is Gross Capital Investment. In the index measuring Gross Capital Investment, Turkey's ranking in 2020 is 20/147, and the index consists of the additions to the fixed assets in the economy and the net changes in the stock level. Fixed assets measure investments in land improvements, purchases of plants, machinery and equipment, construction of highways, railways, bridges, tunnels and the like, including schools, offices, hospitals, private residences, commercial and industrial buildings

Among the 29 indices examined in the book, the G20 country China was respectively successful in the indexes of Pisa Reading Performance, Pisa Math Performance, Pisa Science Performance, Stock Market Capitalization Percent of GDP, Gross Capital Investment, Total Factor Productivity Increase, Economic Complexity Index, Global Innovation Index. The success factor of China is to invest in education, science, industrial production and technology that create high added value, develop innovation, increase Total Factor Efficiency, get rich by selling sophisticated products with high economic added value, and develop the country's infrastructure by making Gross Capital Investments with this wealth.

The authors state that Turkey's mistake is to finance the Gross Capital Investments realized in the last 20 years by borrowing (direct borrowing in private sector investments, indirect borrowing through Public Private Partnership Projects in public investments). They emphasize that Turkey, which allocates its capital use mainly to Gross Capital Investments for the development of infrastructure, unfortunately leaves education, scientific development, industrial production that create high added value, R&D and innovation-enhancing activities in the background.

The book also compares the ratio of total external debt stock to gross domestic product between 2000 and 2020 for Turkey and China. China's Total External Debt Stock/GDP ratio is observed to be the lowest in 2008 with 8.36% and the highest in 2020 with 16.07%. Looking at the same rates from Turkey's point of view, it is seen that the lowest rate is 34.66% in 2005 and 61.29% in 2020. The authors see that the resources created by Turkey's ever-increasing external debt stock from 2012 to 2020 are not transferred to technology-based production that provides high added value, but instead focuses on Gross Capital Investments.

The academic studies examined in the book show that economic growth can be increased by increasing the 29 index values under 4 main categories. In other words, increasing index values means increasing and strengthening economic growth. As a matter of fact, some index values are directly related to economic growth, while others are indirect and supportive. While the results of some indices have an impact on economic growth in the short run, the results of others are felt in the long run.

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