CONSIDERING ISTANBUL AS THE DRIVING FORCE OF THE MARMARA CITY REGION: AN ANALYSIS FOCUSING ON THE INDUSTRIAL SECTOR

Fatih Eren[1*], Muhammed Ziya Paköz[1]

[1]Department of Urban and Regional Planning, Faculty of Architecture, Istanbul Technical University, Türkiye
**Corresponding author's email: feren@itu.edu.tr*

ABSTRACT
The Marmara city region which covers fourteen cities (İstanbul, Edirne, Tekirdağ, Kırklareli, Çanakkale, Balıkesir, Bursa, Yalova, Bilecik, Eskişehir, Kocaeli, Sakarya, Düzce and Bolu) is a highly accessible place where commodities and services needed by 5.7 billion people are met with each other and transferred among continentals. This study aims to define the role of Istanbul within the Marmara city region; to present the current state of the industrial sector in terms of site selection and regional specialization within the city region; and to discuss the future of the sector from the perspective of risks and opportunities. The research follows a qualitative methodology and uses document analysis and workshop methods for data collection. Verbal and written materials are organized into two major themes for thematic content analysis. The study shows that Istanbul has strong interaction and sharing with its thirteen neighbouring provinces. If Istanbul and these thirteen neighbouring provinces are considered and planned together under the umbrella of the Marmara city region with a holistic approach, the Marmara city region will soon transform into an assertive focal region and a dominant centre of attraction that manages/directs global flows of information, finance, people, goods and services. The Marmara city region needs a common vision with its integrated ecosystem, intertwined production-consumption relations, and strong and competitive economic structure. The future prosperity of the city region depends on the creation of more intelligent, dynamic, innovative and diversified clusters with strong infrastructure in the industrial sector. For new industrial investments within the city region, it would be beneficial to focus on cities where outward migration takes place.

Keywords: Driving Force, Industry Sector, Istanbul, Marmara City Region, Regional Specialisation.

1.0 INTRODUCTION
The world has entered a period in which spatial boundaries have lost their influence on the global level, and labor-intensive economic and social organization is replaced by knowledge and technology (Dalby, 2013). It is possible to define this period as a composite global order in which communication and transport technologies are diversified, the friction of distance becomes insignificant, and international integration is strengthened (Petrella, 2005; Curtis, 2016). In this highly dynamic and fast-moving process, cities with high flexibility can better integrate into global networks compared to nations (Sassen, 2016). The regions where this integration occurs emerge with significant economic advantages and opportunities. In this process, the determination of the technical, human, and physical infrastructure potential of countries, regions, and cities, as well as understanding the dynamics of the development of the network structures that involve nested urban/rural relations, have gained importance. "City region" is a popular concept produced by this new era (Ellingsen & Leknes, 2012).

The reorganization of the distribution of production activities on a global scale and the transformation of technology in parallel with the information society now take place in city regions rather than cities (Ravetz, 2016). In city regions that emerged as a spontaneous phenomenon in different parts of the world, research and analyses aimed at determining the structure and operation of the industrial sector have gained momentum in recent years (Li & Yuan, 2022). On the one hand, these studies show the trends of industrial investors and enterprises, the competitiveness of the industry sector, and the

geographic/ecological constraints, and on the other hand, they contribute to the transformation of urban areas into network structures that make digital industrial productions based on information technologies by using planning tools.

This study aims to define the role of Istanbul within the Marmara City Region to present the current state of the industrial sector in terms of site selection and regional specialization within the city region; and to discuss the future of the sector from the perspective of risks and opportunities. The study is important in understanding the relationship between Istanbul and neighboring cities and revealing the potential of the Marmara city region as an ambitious focal region that manages/directs global information, finance, human, goods, and services flows. In addition, the study includes important determinations on how to protect natural ecosystems throughout the city region, reduce regional costs, spread intra-regional specialization, to establish solidarity and role-sharing optimally within the region. These findings guide the decision-makers and the practitioners on how to consider and plan Istanbul from an international perspective and restructure the industrial sector activities in the Marmara city region (Figure 1).

Fig. 1: Integrated Natural Ecosystem of the Marmara City Region (sea and basin connections)
Source: (IBB, 2017)

2.0 CITY REGIONS

Our world is undergoing a rapid transformation. The free-market economy and information technologies eliminate the existing borders and create new international neighborhoods (Fishman, 2007). The fact that cities, towns, and villages have ceased to be isolated places and begun to build strong social, cultural, and economic ties with their immediate or distant surroundings has brought the concept of "city region" to the agenda. In the literature, similar to the city region concept, "metropolitan regionalism" (Yankson, 2023), "new regionalism" (Zvyagel'skaya, 2022), "global

city nodes" (da Silva Corrêa & Perl, 2022), "megacity regions" (Della Sala, 2023) and "polycentric urban region" (Pain et al., 2023) concepts are used. Through these concepts, scientists try to identify and make sense of new urban formations in the world. *"*The city regions, whose definition has just begun to be clarified, are the cluster structures formed by connecting different cities around the world's leading global cities*"* (Harrison, 2007, p 323).

These clustering structures are the first places to meet the waves of globalization, soften economic flows of information, and transfer them to other cities within the country. Therefore, it can be said that a city region is a place that first accesses global knowledge, first transfers local knowledge to the world, and first commercializes original information.

Today, rather than the economic links between countries, economic network structures between city regions are mentioned. The most distinctive feature of the networked city regions is that they are globally competitive and foresee an innovative knowledge-based industry structure. In addition, the labor market, transportation infrastructure, and land use system in the city regions are integrated and reconstructed (Pain, 2008; Pamuk & Soysal, 2018). This means the birth of a new spatial scale. Economical shrinkage, population, and labor loss are expected for areas outside city regions.

City regions are places where economic activities, in symbiotic relations with each other, accumulate and thus reach a high economic growth capacity. These regions have a high movement of people, goods, and services within themselves (Scott & Storper, 2003). Within these regions, natural resource reserves and systems are evaluated. The method of financing and decision-making varies from one city region to another. Depending on the changing type of information, the shape of industrial production and trade in city regions is changing. This creates a new economic energy in city regions (Nelles, 2013).

Globalization has a dark side as well as a promising aspect. Globalization brings a new economic order and governance in a spatial sense (Scott, 2001). The global competition environment can positively and negatively affect city regions' sustainability. Eliminating the negative effects of globalization requires identifying the city region first and then developing spatial strategies on a regional scale. The regional outlook is necessary to ensure the planned strengthening of a city region that has emerged as a phenomenon, to cope with the adversities the process will bring, and to increase its global competitiveness (Kidokoro et al., 2008). Most global city analysis is done through European, US, and Japanese cities, which have reached a certain economic strength and sectoral specialization (Robinson, 2002). The type and nature of intricate relations established in city regions that emerged as phenomena in different parts of the world have not been well defined yet.

Administrative boundaries are unable to adapt to geographical realities or settled journey patterns over time. City regions are forcing administrative boundaries to change to the spirit of the time and to be more realistic. City regions do not have a symmetrical form. They can take size and shape depending on the geographical conditions, the intensity of the socio-economic activities, and the power of influence. City regions are considered to be the most suitable scale for the implementation of development policies (Rodriguez-Pose, 2008). Here, the sectoral development is left to the regional development strategies. The governance structure becomes more complex in the horizontal and vertical (Pezzini, 2001). In city regions, prominent actors are diversifying and policies are different from the usual urban policies, and innovative thinking comes into play (Rosen, 1999; Brenner, 2004; Christopherson, 2010).

In developed and developing countries, city regions are predicted to be the dominant urbanization form of the 21st century. City regions emerge when small, medium, and large-scale cities come together under a functional network around one or two major metropolises. These regions, which are economically strong and have a unique labour force distribution and industrial production structure, are nourished by the neo-liberal economy model and are based on global competitiveness (Aguilar & Lopez, 2018). "Traditional industrial production forms are replaced by a new entrepreneurial paradigm, innovative industrial production forms, and service sector activities" (Vicino et al., 2007, p. 361).

City regions will be the first places where the effects of the fourth industrial revolution will be seen in the world. The Industrial Revolution, which started with mechanization in the first stage, has passed the stages of electricity and information technologies (IT) and has reached the fourth stage today. The fourth industrial revolution corresponds to the stage in which the internet is fully involved in industrial production environments and where industrial production is digitized (Anshari et al., 2022). Machines, factories, storage areas, supply chains, and industrial activities are connected over the internet, and all these elements within the global network become remotely manageable in a cyber-physical environment. While the process creates a new industrial value production chain in the horizontal plane, a new business chain (sales, logistics, marketing, finance, etc.) occurs in the vertical plane where everything is connected through information technologies (Alçın, 2016). Not only industrial production tools but also industrial products produced by this new system become smart. A lot of information will now be stored in that product, such as what are the features of that industrial product when it is produced, and when it needs to be repaired. Industry 4.0 transforms traditional large industrial enterprise structures into medium and small-scale industrial enterprises. This increases productivity, profitability, and diversity, facilitates and flexes decision-making processes, and provides more dynamic control over the industrial production process. Dynamic business and engineering processes will bring creative and innovative business models (Gilchrist, 2016). The Marmara city region, which emerged as a phenomenon in such a process, is one of the exceptional urban formations that will carry Türkiye to the fourth industrial revolution and make the country an important part of the global industrial production network.

3.0 AN OVERVIEW OF THE MARMARA REGION

The region is located around the Marmara Sea. The Marmara Sea and the straits separate Türkiye's lands in Europe and Anatolia. Marmara Region constitutes 8 per cent of Türkiye. It is the second smallest region of the country. Mountainous areas do not occupy much space in the region. In the Marmara Region, there are no high mountain ranges to prevent and direct air currents. For this reason, cold and hot air currents coming from the Balkans affect the region. Çatalca-Kocaeli Plateau, Adapazarı, Bursa and Balıkesir plains are the main plains of the region (Kuzucuoğlu, 2019).

The main lakes in the region are Sapanca, Iznik, Ulubat and Manyas lakes (Günaçtı et al., 2023). North Anatolian Fault Line passes through the centre of the region (Yaltırak, 2002). Simav, Gönen and Biga, which are the main rivers in the region, flow into Marmara, an inland sea, is located in the centre of the region. In the sea, which is not very deep, the continental shelf occupies a large area and the continental shelf expands further in the southern part. However, there are deep depressions in Marmara, which cannot be found in a small sea. The straits, which are old river valleys, are deltaic and wide, allowing even the largest ships to pass through them easily (Beşiktepe et al., 1994). For this reason, the straits have had an important strategic position throughout history (İnan, 2004). There

are two current systems, upper and lower, in the straits. Thanks to the currents in the straits, the Marmara Sea has been a very productive area in terms of fishing (Zengin, 2008).

Marmara Region is a transition area in terms of climate and vegetation. All three of the Mediterranean, Black Sea and continental climate effects are encountered in various parts of the region. Natural vegetation up to a certain height on the coasts is maquis. Forests are located at higher altitudes (Maden & Aslan, 2019). Although the Marmara Region is small, about a quarter of Türkiye's population lives here. The population density in the region is much higher than Türkiye's average. The main factor in the rapid increase in the population of the region is the migration. Marmara Region has the highest urbanisation rate and the most developed region in Türkiye (Garipağaoğlu, 2013). Industry and trade constitute the basis of the economy in the region with a strong economic structure. More than half of Türkiye's industrial production takes place here (Yaşar, 2013).

Boron, lignite, tungsten, chromium, manganese, copper, iron, lead, zinc, marble and natural gas are among the underground riches of the region. Agricultural activities (wheat, sunflower, broad bean, olive, corn, hazelnut) are quite intensive in the region due to the abundance of arable lands and the favourable climate (Taşlıgil & Şahin, 2015). There are many hunting protection and breeding areas in the region. Istanbul is the most important factor in the development of the region. With its large urban population, the region is an important market for agricultural and animal products of other regions. Marmara Region has a great tourism potential in terms of its natural and historical values. Cities such as Istanbul, Bursa and Edirne are lively tourism centres in every part of the year with their historical monuments and natural beauties.

4.0 METHODOLOGY

In this research, a qualitative methodology was followed; document analysis and workshop methods were used together in the data collection process. In this context, the publications and documents which contain information about the industrial structures and production of the cities in the Marmara city region were examined. Using the data obtained through document analysis, the fifth part of this article titled "CASE STUDY: THE MARMARA CITY REGION" was written. Then, a professional workshop was conducted titled “The Marmara City Region Evaluation Workshop” in Istanbul within the scope of “1/100.000 Istanbul Master Plan and 1/25 000 Development Plan Research and Application Project” (BİMTAŞ, 2023). The data obtained at the workshop were used to produce the sixth part of this article entitled "RESULT AND DISCUSSION".

In this workshop, five key issues concerning the Marmara city region were discussed:

a. The role of Istanbul within the Marmara city region
b. Changes in the industrial sector of Istanbul
c. The status of the existing industrial areas in the Marmara city region
d. Demand for new industrial investment by subsectors coming to cities of the Marmara city region
e. The most suitable areas of specialization within the Marmara city region for industrial investments

The workshop aimed to evaluate the situation of the existing industrial areas in the Marmara city region, to see the new industrial investment demands based on sub-sectors, and to determine the areas of specialization. The workshop targeted creating an international perspective based on the

industrial sector, enabling the cities of the Marmara city region to decide jointly on site selection, clustering, and specialization, and to make predictions of industrial areas in Istanbul. During the workshop, a general presentation about the Marmara city region was made to the participants; information notes and various visuals were shared. In the workshop, participants were divided into three groups (Table 1). A total of 37 people attended the workshop, including one senior official representative from each institution.

Table 1 Workshop Participants

WORKSHOP PARTICIPANTS		
Group 1	**Group 2**	**Group 3**
Ministry of Science, Industry and Technology General Directorate of Industrial Zones	The Istanbul Metropolitan Municipality	Istanbul Chamber of Industry
Ministry of Science, Industry, and Technology Istanbul Provincial Directorate	Tekirdağ Metropolitan Municipality	Tekirdağ Chamber of Commerce and Industry
Ministry of Development, General Directorate of Investment Programming, Monitoring and Evaluation	Kocaeli Metropolitan Municipality	Kocaeli Chamber of Industry
Ministry of Development, General Directorate of Regional Development and Structural Adjustment	Sakarya Metropolitan Municipality	Sakarya Chamber of Industry and Commerce
TR10 Istanbul Development Agency	Balıkesir Metropolitan Municipality	Balıkesir Chamber of Industry
TR21 Trakya Development Agency	Bursa Metropolitan Municipality	Bursa Chamber of Commerce and Industry
TR22 South Marmara Development Agency	Eskişehir Metropolitan Municipality	Eskişehir Chamber of Industry
TR41 Bursa Eskişehir Bilecik Development Agency	Municipality of Edirne	Edirne Chamber of Commerce and Industry
TR42 East Marmara Development Agency	Municipality of Kırklareli	Kırklareli Chamber of Commerce and Industry
-	Municipality of Yalova	Yalova Chamber of Commerce and Industry
-	Municipality of Düzce	Duzce Chamber of Commerce and Industry
-	Municipality of Bolu	Bolu Chamber of Commerce and Industry
-	Municipality of Çanakkale	Çanakkale Chamber of Commerce and Industry
-	Municipality of Bilecik	Bilecik Chamber of Commerce and Industry

Verbal and written materials obtained from the workshop are organized for this paper into two major themes for thematic content analysis which are “The present situation of the industry sector in the Marmara city region” and “The future of the industrial sector in the Marmara city region”.

5.0 CASE STUDY: THE MARMARA CITY REGION

5.1 Geographical Setting

In this study, the region that covers Istanbul, Edirne, Tekirdağ, Kırklareli, Çanakkale, Balıkesir, Bursa, Yalova, Bilecik, Eskişehir, Kocaeli, Sakarya, Düzce and Bolu provinces and surrounds the Marmara Sea is named as "The Marmara city region" (Figure 2). These cities have a strong interaction with each other and support each other in many ways. This city region stands out in the world as a focal region and attraction centre that manages/directs global information, finance, human, goods, and services flows. The Marmara city region is where many people and the goods and services they need to meet and transfer between continents with the high level of accessibility provided by the developed transportation networks (Paköz et al., 2019).

Thanks to its geographical location, the Marmara city region has assumed an important role in the world for millennia. In the western part of the city region, the European continent, which has an intensive production and consumption area with a population of about 1 billion, is located. In the eastern part of the city region, with a population of about 3.5 billion, there is a very intensive production and consumption region of Asia. In the southwestern part of the city region, the African continent, which has a population of approximately 1.2 billion people, exhibits a low-density production and consumption region. Therefore, the Marmara city region is a point where 5.7 billion people and the goods and services they need are brought together and transferred from east to west and north to south through the Eurasian + African Continents. The cities within this point have a common fate (Eren & Paköz, 2017).

Fig. 2: Provinces and Subregions in the Marmara City Region
Source: (IBB, 2017)

5.2 Population

According to 2023 Census data, more than 28 million people live in the city region. The population of the city region is estimated to reach 31 million in 2030. According to approved development plans for cities within the city region, the maximum population capacity is 38 million. There is continuous human mobility (migration) between the cities of the city region where 32.3% of the country's population lives (TUİK, 2017). Istanbul, the region's dominant city, received 66,115 migrants from Bursa, 22276 migrants from Eskişehir, 64,081 migrants from Tekirdağ, and 90,521 migrants from Kocaeli between 2010-2015.

On the other hand, from Istanbul, 63,790 people migrated to Bursa, 20,584 to Eskişehir, 108,098 to Tekirdağ, and 125,210 to Kocaeli during the same period. There is also a dynamic migration movement among cities outside Istanbul. For example, Tekirdag received 15,571 migrants from Edirne, and 13,843 migrants from Kırklareli as it sent 11,672 people to Edirne and 10,123 people to Kırklareli between 2010-2015. In the same period, Çanakkale received 7,119 migrants from Bursa, and 11,415 migrants from Balıkesir as it sent 5,898 people to Bursa and 10,859 people to Balıkesir (TUİK, 2017). Migration data shows that people living in the region think regional rather than local, and they can go and live from one city to another in the city region to live and work.

5.3 Regional Framework

The Marmara city region is important for road, rail, sea, and air transport. The region has a very significant advantage in accessing international markets. Commercial networks and energy infrastructure are concentrated in the region, located in the middle of many international corridors. The most important international transport, infrastructure and energy projects directly affecting the Marmara city region are the Trans-European Transport Networks Project (TEN-T), the Pan-European Transport Network, the Transport Corridor European-Caucasus-Asia (TRACECA), the International Network of E-Roads, Trans-Anatolian Natural Gas Pipeline Project (TANAP), Channel Europe Project, One Belt One Road Project and the Russia-Türkiye-Europe Natural Gas Pipeline Project (TurkStream) (KGM, 2016; Eren, 2019). It is possible to say that the city region is a natural logistics base thanks to its “intercontinental transit zone” feature.

Many regional transportation and infrastructure investments in the Marmara city region are ongoing or completed. The most prominent regional projects include the Yavuz Sultan Selim Bridge and the Northern Marmara Motorway, the Gebze-Orhangazi-Izmir Motorway, the Kınalı-Tekirdağ-Çanakkale-Balıkesir Motorway, the Three-Storey Grand Istanbul Tunnel, the Eurasia Tunnel, the Marmaray Bosphorus Tube, the Istanbul-Eskişehir-Ankara High-Speed Train Line, the Istanbul-Ankara High-Speed Railway, the Halkali-Kapikule High-Speed Railway, Kanal Istanbul, Yesilbayir Logistics Center, Halkali Logistic Center, Gokkoy Logistics Center, Bozuyuk-Bilecik Logistics Center, Finance Technopark Technology Development Zone, Advanced Technology Industrial Park, the 1915 Çanakkale Bridge, the Osmangazi Bridge and the new Istanbul International Airport (TremGlobal, 2017; Baş et al., 2018). A powerful and integrated Marmara city region phenomenon will be encountered when the aforementioned regional investments are completed.

The city region is abundant in terms of natural and cultural heritage. Many ecosystems are working integrated in the region, especially the Marmara Sea and the Straits. While cultural and archaeological tourism is concentrated in the cities in the north of the Marmara Sea, nature and thermal tourism are concentrated in the cities in the south of the Marmara Sea. There are coastal tourism areas in all cities in the city region that are on the coast of Marmara, the Black Sea, and the

Aegean Sea. Kartepe Ski Centre (Kocaeli), Kartalkaya Ski Centre (Bolu), and Uludag Ski Centre (Bursa) are the points that serve winter tourism in the city region (Kalkavan, 2021; Erdoğan, 2023).

A close look at the city region shows that each settlement has several distinct features. Istanbul means a lot for the city region in terms of having more than one feature. Istanbul is a "trade, tourism, finance, service, and culture center" in the city region. Tekirdağ, Kocaeli, Sakarya, Düzce, Bilecik, Bursa, and Balıkesir are the industrial production centers. Bursa is the tourism center. Tekirdağ, Balıkesir, Bursa, and Bolu are the agricultural production centers. Tekirdağ, Balıkesir, Bursa, Bilecik, Düzce, Sakarya, and Kocaeli are the service centers in the city region. All these settlements are socially and economically interdependent and strongly interacting with each other (Kara & Köne, 2012).

6.0 RESULT AND DISCUSSION

6.1 The Current Situation of the Industry Sector in the Marmara City Region

Specialized sub-regions of certain industrial sectors emerged due to the presence of natural resources and geographical characteristics in the Marmara city region. For example, Istanbul's industry which has the characteristic of a "traditional manufacturing centre" has an intense relationship with the industry of the provinces to the east (Kocaeli, Sakarya, Yalova, and Bursa). In the sub-region of Balıkesir, Bilecik, and Eskişehir, "stone and soil-based industry" comes to the fore, while "agriculture and animal-based industry" comes to the fore in Edirne, Kırklareli, Tekirdağ and Çanakkale sub-regions. In the sub-region of Düzce and Bolu, "controlled industrial development supported by incentives" has been observed (Eren & Paköz, 2017).

In the city region, the industrial sector has a share of 44%, the services sector 48%, and the agricultural sector 8%. These rates demonstrate that the city region is highly industrialized. 46.2% of the Gross Domestic Product produced in Türkiye (943.76 billion Turkish Liras) is produced in this region (TÜİK, 2022). 53 of 100 industry employees in Türkiye are in the Marmara city region. Of the 100 industrial sector employees in the Marmara city region, 58 are in Istanbul. The Marmara city region is the backbone of Türkiye's economy in the urban industrial sector. According to the 2016 Ministry of Science, Industry, and Technology data, 94 of the available and planned 248 OIZs (Organized Industrial Zone) in Türkiye are located in the Marmara city region (Figure 3). OIZs are concentrated in Istanbul, Tekirdag, Kocaeli, Sakarya, and Bursa provinces. When the OIZ sizes and occupancy rates are examined according to the provinces, it is seen that 8 OIZs in Istanbul operate at a rate of 99% occupancy, and in OIZs in other provinces, gaps range from 16% to 85%. In the Marmara city region, there are manufacturing activities in almost every sub-sector of the industry. In particular, specialization in technology-intensive manufacturing sectors has emerged.

Approximately half of TDZ (Technology Development Zone), universities, R&D, patent and incentive expenditures, and activities in Türkiye are carried out within the Marmara city region. 30% of the 64 TDZs in Türkiye and 38% of the 50 most innovative universities in Türkiye located in the Marmara city region. 45% of the R&D sector expenditures of 20 billion Turkish Lira and 42% of the 224,000 people in the country's R&D sector are realized in the Marmara city region. 76% of the total 178,906 patents received in Türkiye have been received in the Marmara city region. 40.2% of a total of 4,564 incentives were given to the Marmara city region, according to the 2016 data of the Ministry of Science, Industry and Technology. With these features, the Marmara city region is the centre of the country that produces information, technology, and design.

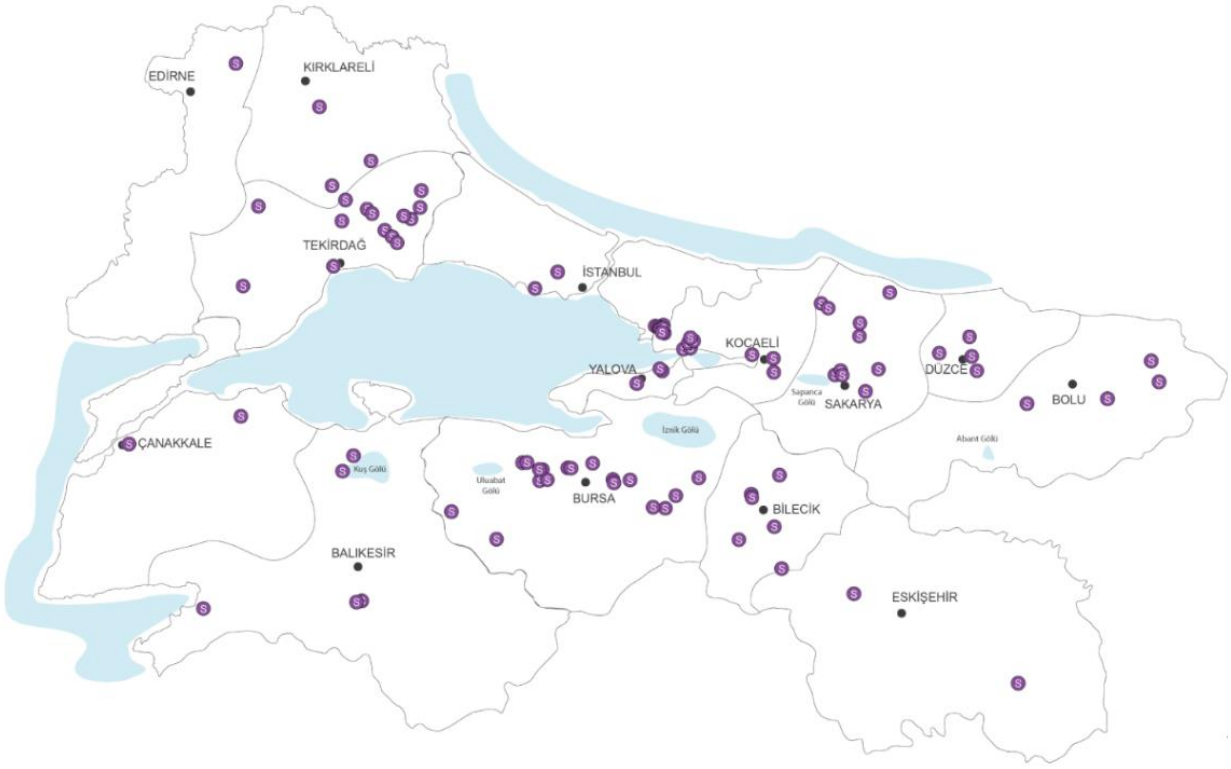

Fig. 3: Spatial Distribution of Organized Industrial Zones in the Marmara City Region
Source: (IBB, 2017)

In the city region, it is useful to look at the situation of the industrial sector based on provinces. Istanbul is very advantageous in terms of logistics facilities and access to labor. This advantage lies in the fact that the city attracts traditional manufacturing industry investments. The limited logistical infrastructure has been an obstacle to the development of the industrial sector in Edirne**.** Textile, food, and beverage industries are at the forefront of the Edirne industry.

The share of the industrial sector in Tekirdağ has increased rapidly in recent years. Glass, food, pharmaceutical, and textile industries stand out in the city. The transition of the Remediated Organized Industrial Zones to the status of Organised Industrial Zone (OIZ) has led to an increase in land prices. The increase in land prices in the OIZ areas creates pressure on the transformation of the new urban lands to the industrial area in Tekirdağ. Health problems and diseases have emerged due to water and air pollution caused by industrial facilities in the city. This situation causes the Tekirdag people to react with new industrial investments. In Kırklareli, 30% of the industrial area of 360 ha is empty. The existence of the Ergene Protection Basin and the lack of a port connection make the city unattractive in terms of industrial investments. The existing industries in Kırklareli have developed mainly in glass, food, medicine, apparel, and textiles. Geographical limitations, the presence of protected areas, the lack of infrastructure investments, and the dominance of the tourism sector led to the inadequacy of industrial sector development in Çanakkale.

The fact that Balıkesir is located at the intersection of road networks and has a strong position in terms of accessibility supports the development of a multifaceted industrial sector in Balıkesir, mainly based on agriculture and animal husbandry. However, the industry, which has developed in the food, forest products, petrochemicals, base metals, mining, glass, and composite sectors

throughout the city, has scattered places. Bursa is a city that has diversity and potential in the industrial sector, but it is a city that feels much of the lack of skilled labor. Space, aerospace, food, textile, construction, and automotive sectors are developed in Bursa. The multitude of natural and geographical thresholds is an obstacle to the formation of new industrial areas in the city. Moreover, the fact that the industry has chosen to be intertwined with the living spaces in the city brings about various urban problems such as traffic congestion and environmental pollution. Bilecik is located on the crossroads of many inter-urban roads and has suitable areas for industrial development but does not prefer industry-oriented growth. While Bilecik tries to restrict the uncontrolled development of industrial areas within its borders, it has to face the various effects of the industrial development decisions of neighbouring cities. In Kocaeli**,** production types such as chemical, petrochemical, and sub-industry are prominent. There is a specialization in the chemical, petrochemical, automotive, machinery, and recycling sectors in the city. Industrial investments increased the population density in the city. In a city where there is no suitable land for industrial types that require production in large areas, industrial development does not progress adequately and is planned.

Although there is no specialization in the Sakarya industries, the facilities were automotive, truck, and tractor. Vehicles are produced come to the fore in the city. The relatively low land prices make the city attractive to industrial investors. However, due to the negative urban/rural impacts of industrial investments in Kocaeli, locals and officials in Sakarya stand aloof from the demands of new industrial investments. Industrial facilities in Yalova are active in shipbuilding, ready-mixed concrete, plastic, textile, fibre, marble, chemistry, frozen food, paper products, packaging, and automotive spare parts. Yalova's industrial sector, which has an average growth of 7% per year, is moving towards a specialization in shipbuilding, composite, and chemistry subsectors. Eskişehir stands out with its visionary industry and trained workforce. On the other hand, it has no institutionalized mainstream industries and a common business culture. There are SMEs with insufficient equity capital behind the city's focus on sub-industry activities with low added value. The biggest shortage of Eskişehir, which wants to progress in aviation, rail systems, and machinery-metal industries, is the limitations in logistics and transportation facilities.

Düzce, which is close to two big cities such as Istanbul and Ankara, attracts industrial investments in the textile, automotive, and forestry sectors. High logistics capacity, proximity to raw material sources, easy access to energy and renewable energy sources, and high government incentives make the city attractive regarding industrial investments. Bolu, which cannot be qualified as an industrial city with the employment of 20,000 industrial sectors, is a city that hosts 372 small industrial enterprises, especially in the metal and machine sectors. In the city, which cannot benefit from government incentives for industrial development, the abundance of natural environment and agricultural land is an obstacle to the development of the industrial sector.

6.2 The Future of the Industrial Sector in the Marmara City Region

In this section, the future of the industrial sector in the Marmara city region is discussed from the perspective of risks and opportunities.

6.2.1 Risks

The biggest risk for the city region is the clutter of the location of the industrial areas. To establish relations based on mutual benefits between different industrial areas within the city region easily and with low costs, it is necessary to eliminate the clutter in the area of industrial space in the urban area and to establish large industrial clusters (Large Industrial Zones). In

this way, among the different or the same kind of industrial enterprises, issues such as change of substance and energy, personnel exchange, use of common infrastructure, access to common clean water, common wastewater treatment, common maintenance and repair, joint training and R&D, joint product marketing and common use of transportation infrastructure, etc. will be raised; and efficient applications can be launched.

The location and functionalisation of industrial areas within the Marmara city region should be considered with a regional approach. In the region, there is a disconnected and unplanned progress in the form of a "supply of industrial space due to the demand from the industrialist". This causes inefficiency and environmental damage and increases production and transfer costs. The lack of a structure that brings together the cities and the actors of the region in line with the common benefits is noteworthy. There is no strong regional will. It is imperative that a new institution with a regional thinking, collaborative perspective, and strong financial resources (public or semi-public nature) is created to manage this process or that an existing public institution is specifically assigned to this task. This requires a strong public will and direction. This institution should be responsible for developing a regional industrial policy, harmonising the approved Territorial Plans in the region, and closely monitoring the implementation of regional plan decisions.

Environmental issues are the biggest obstacle to regional development based on industrial activities. Industry has a direct view of the pollutant industry in people's minds. For this reason, the phenomenon of the so-called "pollutant industry" has to be eliminated in every sense by utilising advanced technologies and industrial symbiosis applications, and the full transition to the "green industry", which produces clean production in the region, seems necessary. Due to pollutant effects, all regional cities are currently resistant to industrial development within their boundaries. This situation triggers the conflict or bargaining processes between local governments and industrial investors and causes tensions between the local government and the people.

There are labour shortages and a need for more intermediates in the industrial sector in the city region. Industrialists look for cheap labour, and job seekers find their salaries low. Working in the industrial sector in the city region needs to be more attractive. The industrial areas in the region are highly dependent on the highway. This situation causes cost differences in production and distribution and increases product costs. The fact that the highway is used instead of the railway for logistics purposes reduces the attractiveness of the industrial sector. Industrial parcels in the region have become very expensive. Therefore, industrial investors are pressuring local governments to transform alternative lands into industrial areas. There are speculation and royalty-based initiatives in areas suitable for industrial installation. This situation causes the parcel prices in industrial areas to increase even more.

6.2.2 Opportunities

There is a strong demand for replacing the "pollutant industry perception" with the "clean industry phenomenon" by the people of the region. The use of advanced technology and industrial symbiosis applications are becoming increasingly common. It is possible to create a new regional authority with a public or semi-public nature with regional thinking, cooperative perspective, and strong financial resources. The emergence of a regional

authority will enable the development of a regional industrial policy, the preparation of a "Marmara City region Industry Plan", the harmonisation of approved development plans in the region, and the implementation of regional plan decisions. In this way, the Marmara city region will be transformed into a smart region that is well organised, goes to cooperation and role sharing locally, and manages global pressures easily.

The region's provinces have begun to connect with the highways, bridges, and high-speed train lines that facilitate passenger and freight transportation. This means that the opportunities provided by Istanbul to the labour force working in the industry start to be presented to the people working in other cities of the region. The white-collar accumulation in Istanbul can be avoided in the future. Port and rail connections of industrial areas in the region can be well established, and thus, industrial freight transport in the region can be largely shifted to maritime and railway. It is planned to establish "Large Industrial Zones", which will be the pole of the region. Since the development of industrial areas on these large investment islands will take place in the port and airport axis, it becomes possible for the problematic industrial facilities trapped in Istanbul and its surroundings to shift to other cities of the region. This means that the dense population will move away from the earthquake zone.

On September 15, 2012, the Regulation on "Clustering Support Program" was published by the Ministry of Science, Industry and Technology. Increasing regional competitiveness, establishing ties based on win-win relationships among industrial enterprises, and developing port and railway cantered regional industry are currently supported in legal and institutional terms. Opportunities are ready to materialise the change of substance and energy, personnel exchange, use of common infrastructure, access to common clean water, common wastewater treatment, common maintenance and repair, joint training and R&D, joint product marketing, and common use of transportation infrastructure possibilities among the different or the same kind of industrial enterprises.

7.0 CONCLUSION

Findings show that Istanbul has strong interaction and sharing with its thirteen neighbouring provinces. If Istanbul and these thirteen neighbouring provinces are considered and planned together under the umbrella of the Marmara city region with a holistic approach, the Marmara city region will soon transform into an assertive focal region and a dominant centre of attraction that manages/directs global flows of information, finance, people, goods and services. The Marmara city region needs a common vision with its integrated ecosystem, intertwined production-consumption relations, and strong and competitive economic structure. The Marmara city region is experiencing a restructuring process in the industrial sector nowadays with advanced technology and industrial symbiosis. Today, opportunities that prepare the ground for this transition are more than obstacles and risks. When the planned and implemented international transportation and infrastructure investments affecting the city region in various ways are completed, the Marmara city region and Türkiye are expected to rise to a very different and advantageous international position. The first important result of international investment is in every sense of Türkiye's integration with Europe. More broadly, this unification means the social and economic integration of the European and Asian continents. The goods and services in the European and Asian markets are becoming much more comfortable and faster flowing through the Marmara city region. European and Asian continents are integrated not only in terms of trade but also in terms of energy. The high energy demand of these continents is provided by the oil,

natural gas, and electricity lines formed on Türkiye's energy corridor. In a way, all the international investments planned and put into practice, including the country, allow the best use of the geographic location advantage of the Marmara city region.

A strong Marmara city region phenomenon will be encountered when the regional investments are completed. The city region is transformed into an international centre, which skillfully and intelligently deflects the burden of people, goods, and services it draws. Regional investments ensure the controlled reduction and balanced distribution of traffic load within the boundaries of the Marmara city region. With these investments, important points (cities, harbours, industries, etc.) are connected with strong and multifaceted modes of transportation, and the relationship between these points is strengthened due to the shortening of travel times and expansion of public transport facilities. Marmara city region is on the way to becoming an important industrial and logistics centre. International and regional investments in Türkiye also strengthen its relations with the Balkans. Thus, Southern Europe is becoming more integrated within itself. The central and local bodies should adopt the phenomenon of the Marmara city region and accept a regional perspective based on the industrial sector. A regional industrial policy and an industrial development plan need to be established in the city region to help industrial actors in the Marmara city region act in coordination. If a competent authority at the regional level creates a regional industrial policy and an industrial development plan, the restructuring process in the industry may progress healthy.

In conclusion, Marmara city region shows the characteristics of being an old industrial region. There is a partial clustering within the region but this clustering lacks diversity. The city region faces a high rate of internal and external migration problem. Insufficient clustering weakens the resilience to sectoral economic downturns. The future prosperity of the city region depends on the creation of more intelligent, dynamic, innovative and diversified clusters with strong infrastructure in the industrial sector. For new industrial investments within the city region, it would be beneficial to focus on cities where outward migration takes place.

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