Mersin University
Journal of Maritime Faculty

EXPORT DIVERSIFICATION IN TERMS OF COUNTRIES AND PRODUCTS: AN ASSESSMENT OF MERSIN PROVINCE IN TURKEY

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ABSTRACT

While the globalization process makes the world a big market without borders, it offers important opportunities to the economies. On the other hand, it increases the risk of fragility for economies that cannot manage the process properly. If the export mix is dependent on a small number of products and markets, the balance of the economy may deteriorate when there is a problem specific to these products or markets. In this direction, it is aimed to reduce the economic and political risks that may arise from being dependent on several products or markets with diversification in exports. Of course, first of all, it is necessary to determine whether such a situation exists or not. In this study, the product and market concentration level in the export of Mersin province in Turkey was determined by using the Concentration Ratio and the Gini-Hirschman Index. The findings showed that the product concentration in Mersin province exports is at the highest level and the country concentration is at the medium level. It has been observed that the concentration, which had an increasing trend between 2011 and 2014 in both product and country concentration, showed a decreasing trend in the 2014-2020 period. In the agricultural sector, which accounts for more than half of Mersin's exports, the option of increasing product diversity by turning to processed agricultural products and diversifying the market with geographical indications, branding and innovative products should be considered.

Keywords: Export, Concentration Ratio, Gini-Hirschman Index, Mersin, Turkey

1. INTRODUCTION

Globalization has left its mark especially in the last fifty yerars with its effect in economic, political and social fields. With the increasing economic integration and relations as a result of globalization, international trade is also developing (Metin and Akcan, 2017: 257). Turkey has also taken its share from globalization. Especially as a result of the export-based and foreign-open policy implemented since January 24, 1980, Turkey's foreign trade volume has increased in the following years (Erdoğan, 2006: 32). According to the official data of the Turkish Statistical Institute for the year 2020, Turkey is in a position that she can export from all 81 provinces, with a large number of product groups and to almost all countries in the world. However, it will be useful to look at the data in more detail to understand how healthy the export profile is. Because, in the details of export data, it can be observed that only a few of the countries and product groups are concentrated. In this case, fluctuations occur in export earnings as a result of fluctuations in the prices of products and contractions that may occur in foreign demand. However, it is possible to have a more stable structure with an export profile where there is diversity in terms of country and sector (Meilak, 2008: 35). Macbean & Nguyen (1980), in their study investigated the stability of export earnings, touched on the debate in the literature and stated that diversification is not the only factor in guaranteeing export earnings, it should be evaluated on its own, and the same result should not be expected in all circumstances. This is valid for a country, region or even a firm's exports to have a more stable structure. For this reason, it would be more beneficial to study for each case rather than a general evaluation.

In this context, the aim of the study is to examine the country and product diversity in exports in terms of Mersin province, which has an important place in the Turkish economy. The level of diversification of Mersin province exports according to products and countries was calculated with the help of Concentration Ratio (CRm) and Gini-Hirschman Index (GHI). In the study, after the introduction, the concept of diversification in exports and the literature related to the field are given in the second part, the method and data set in the third part, the findings in the fourth part, and the results and recommendations in the fifth part.

2. CONCEPTUAL FRAMEWORK

The increasing importance of international trade with globalization has increased the desire of economies to export. At this point, what should be done in order for the economies to have a healthy and stable export profile has been the subject of discussion. Product and market diversity and density in exports stands out as one of the topics discussed and researched in this context. In this section, the concept of product and market diversification in exports and the related literature will be given.

2.1. Product and Market Diversification in Export

Exports remain one of the few channels that contribute to higher per capita income growth in the long run, especially for emerging economies. While exports are so important, research on the healthy profile of exports is always ongoing. This profile is also associated with export diversification. Michealy (1958), one of the leading researchers in the field, found that countries that diversified their exports more were in a better position in terms of per capita income. Wilhelms (1967), Al-Marhubi (2000), Herzer and Novak (2006), Parteka and Tamberi (2008), Cadot et al. (2011) determined the positive effect of export diversification on economic growth in their research on different economies. Many countries that do not diversify their exports and display a narrow basket of products and markets suffer from export instability, often driven by inelastic and global demand. Export diversification is a way to alleviate this situation and have a healthier export profile (Hesse, 2009: 55).

Diversification in exports is the change in the product mix of a firm, region or country or in the number of markets it exports to (Siegel vd., 1991:7). Export diversification can take the form of product and market diversification (Pacheco and Pierola, 2008: 4). Product diversification is divided into two as horizontal and vertical. While horizontal diversification is in the form of increasing the scale or quantity of products at the same production stage, in vertical diversification, products at different stages of the production process are exported (Wilhelms, 1967: 46).

Export diversity can be analyzed at many different levels like firm, country and regional effects (Siegel vd., 1991: 8). Analysis of the effects of export diversification assists in the design and implementation of export diversification policies.

2.2. Literature

In the literature, export diversity can be handled individually or together at firm, regional and country levels, specific to product and market. Table 1 presents some of these studies that are most closely related to the subject of the study.

The studies given in Table 1 also show that the concentration analysis is a widely used analysis that gives important results both in determining the market structure and competitiveness, and in examining country and product-based changes. In this study, the concentration level of Mersin province, which has a significant share in Turkey's foreign trade, on the basis of product and country, has been examined.

3. DATA SET AND METHOD

Various methods such as Concentration Ratio Analysis (CRm), Entropy Index, Gini-Hirschman Index, Theil Entropy Index, Herfindahl-Hirschman Index, Hall-Tidemann index are used to measure product and market diversity (Şen, 2021: 148). Concentration Ratio Analysis (CRm) and Gini-Hirchsman Index will be used in this study. These analyzes are frequently used in the literature due to their ease of application. Concentration rate is a concept that reveals the total shares of a certain number of companies, products, sections (sectors) or countries and is calculated with the help of the formula given below (De Vany and Kim, 2003: 4).

$$CRm = \sum_{i=1}^{m} P_i * 100$$

Although m can take a value between 0 and 100, mostly CR4 and CR8 values are used in studies in the literature. In this study, CR4 and CR8 values will be used. In the formula, CRm is the concentration ratio and Pi is the share of the firm, product or country.

Table 1. Literature Research

Author, Year	Scope
Wolf (2000)	For the period 1970-1993, market and product concentration in Malaysia was examined. It has been determined that product concentration is an important variable explaining the imbalance of export revenues.
Cadot et all (2007)	Data for 156 countries were analyzed with the Gini and HHI Index for the period 1988-2006. Export diversification was found to be low in middle-income countries and high in high-income countries.
Kösekahyaoğlu (2007)	The foreign trade of the 1980-2005 period was analyzed on a sectoral and country basis using the Gini-Hirschman concentration index. Especially in the early 1980s, it was concluded that there were significant changes in the product variety of exports.
Hesse (2008)	It has been found that export diversification in developing countries leads to higher growth and, in its absence, causes export instability.
Naude and Rossouw (2008)	The export diversification of South Africa in the 1962-2000 period was analyzed with the HHI index and the Export Distribution Index and it was determined that the diversification in exports was at a low level.
Secer (2008)	With the help of the HHI Index, it was determined that the market concentration in Turkey's hazelnut exports decreased in the 1990-2007 period.
Ayrancı (2009)	Turkey's foreign trade concentration was examined for the period 1996-2004 and the analysis was made using the Herfindahl-Hirschman Index. It was determined that foreign trade concentration showed a decreasing trend in the related period.
Hamid (2010)	Malaysia's exports for the period 1970-2003 were analyzed with the Gini-Hirschman concentration index. A decrease was determined in the product and market concentration coefficients.
Doğan and Kaya (2011)	Concentration analysis was conducted with the concentration ratio (CR) and Herfindahl Index (H-I) in order to reveal the country and chapter-based changes in Turkey's foreign trade after the Customs Union. It has been determined that there is no change in the CR4 ratio in both imports and exports on country basis. On the basis of products, it has been determined that while the share of low-technology group goods in exports has been shifted to medium-high technology group goods, the share of medium-high technology group goods in imports has not decreased.
Kaynak and Ari (2012)	Concentration level in the Turkish automotive sector has been analyzed with the help of Firm Concentration Ratios (CR4 and CR8) and Herfindahl-Hirschman Index. According to CR4, it has been observed that there is a high level of concentration in the domestic passenger and domestic light commercial vehicle sector, and according to CR8, in the domestic light commercial and imported light commercial vehicle sectors.
Çukurova Development Agency, CKA (2014)	The sectoral and country-based concentration level of Mersin exports were analyzed with the Concentration Ratio and Herfindahl Index for the 2002-2012 period. It has been determined that the sectoral concentration in Mersin's exports is higher than the country's concentration, and it has been emphasized that especially the sectoral product diversity should be increased.
Erkan and Sunay (2016)	The level of product and market diversification in Turkey's exports for the period 2000-2014 was determined using the Gini-Hirschman Index and the Trade Concentration Ratio. It has been found that Turkey has realized market and product diversification in its exports in the relevant period.
Yıldız (2018)	The relationship between the export intensity and performance of 192 manufacturing companies traded in Borsa Istanbul between 2005 and 2015 was examined. It has been shown that there is a positive relationship between export intensity and firm performance, but this positive relationship is valid for companies that invest in R&D.
Karadayı (2019)	In the period of 2012-2016, export and import concentration ratios for Denizli, South Aegean (TR32) Region were calculated and market and sectoral concentration situations were evaluated. The study showed that sectoral concentration in foreign trade is higher than market concentration. In addition, information on the sectors and countries with high concentration in the results of the study is also included.
Şen (2021)	Within the scope of the study, the geographical diversity of Gaziantep exports for the period of 2010-2019 was investigated using the Trade Concentration Index and the Hirschman-Herfhindal Index (HHI). In the relevant period, the HHI value of the province decreased by about half, and it was observed that geographical diversity increased. The highest TII values were observed in the Middle East countries.

Concentration Ratios (CRm) are interpreted as follows (Akar ve Ay, 2019: 120);

 If CR4 < 30, low level of concentration
 If 30≤CR4<50, moderate concentration
 If 50≤CR4<70, high degree of concentration
 If CR4≥70, there is a very high degree of concentration.

The Gini-Hirschman Index, on the other hand, is an important concentration criterion used especially in the comparison between periods and is formulated as follows (Erkan ve Sunay, 2016: 1830);

$$GHI = 100 \sqrt{\sum_{i=1}^{n} \left(\frac{X_{it}}{X_t}\right)^2}$$

GHI in the formula; shows index value, X_{it}; shows country's export of a certain good (i) in period t, X_t; shows the country's total exports in period t. In the same formula, the i symbol can be defined as a country and used for market concentration. The index value takes a value between 0 and 100. If the value is close to 0, it indicates low concentration, if it is close to 100, it indicates high concentration.

Province-based export data for the period 2011-2020 used within the scope of the study were obtained from the website of the Turkish Exporters Assembly. Since the number of sub-sectors in the data set changed as of 2011, 2011 was taken as the starting year and the period 2011-2020 was examined. The data set was created based on the province where the legal headquarters of the companies are located. The data were analyzed with the Concentration Ratio and Gini-Hirschman Index to determine the product and market diversity of Mersin's exports in the relevant period. It is expected that the study will contribute to the literature in terms of addressing the sector and market concentration in Mersin province, as well as creating input for policy makers at the national and local level.

4. FINDINGS

Mersin is one of the largest cities in Turkey, which hosts well-established institutions and organizations in foreign trade and logistics. In addition to having the largest port in Turkey, Mersin also hosts trade institutions with a long history such as Exporters' Associations, Chambers and Exchanges of Commerce. According to the 2020 data of the Turkish Statistical Institute, Mersin has a share of 2.8 billion dollars (1.3%) from Turkey's total imports and 3.2 billion dollars (1.9%) from its exports (TUİK, 2021). According to 2020 data, Mersin is a city with a foreign trade surplus. Agriculture and manufacturing sectors have an important place in the export and import of the city.

The product concentration in the export of Mersin province is presented in Table 2. A high CR value, which means product concentration ratio, means that exports are made from a small number of sectors. The CR4 value, which shows the share of the top four sectors in the province, increased to 77% in 2014, then gradually decreased to 71% in 2020. This ratio indicates a very high degree of product concentration. Likewise, the GHI value has gradually decreased over the years after reaching its highest level in 2014.

Table 2. Product Concentration in Mersin Export

Year	GHI	CR4	CR8
2011	45	71	85
2012	43	71	85
2013	45	73	86
2014	47	77	87
2015	46	75	88
2016	46	74	87
2017	43	72	86
2018	43	70	85
2019	41	68	85
2020	44	71	85

Table 3 shows which sectors receive how much share in Mersin's exports. As can be seen, the fresh fruit and vegetable sector and the cereals, pulses, oilseeds and products sector have a very important share in the province's exports. The share of only two sectors in exports was 59.1% in 2020. The chemical materials and products sector is also the third sector that receives the largest share from the province's exports.

Table 3. Mersin Province Exports by Sector in 2020 ($1,000)

CRi	Sector	Export	Share (%)	CRi Ratio (%)
CR1	Fresh Fruit and Vegetable	671.770	33,0	33,0
CR2	Cereals, Pulses, Oilseeds and Products	530.736	26,1	59,1
CR3	Chemical Substances and Products	147.726	7,3	66,3
CR4	Steel	95.071	4,7	71,0
CR5	Machinery and Parts	92.424	4,5	75,5
CR6	Furniture, Paper and Forest Products	73.721	3,6	79,1
CR7	Fisheries and Animal Products	59.781	2,9	82,1
CR8	Automotive Industry	59.495	2,9	85,0

The market concentration of Mersin exports is presented in Table 4. A high CR value, which means the market concentration ratio, means that exports are made to a small number of countries. The CR4 value, which shows the share of the top four countries with the highest exports from the province, increased to 55% in 2014, then gradually decreased to 37% in 2020. This ratio shows that there is moderate market concentration. Similar to the product concentration, the GHI value, which increased until 2014, decreased gradually from this year.

Table 4. Market Concentration in Mersin Exports

Year	GHI	CR4	CR8
2011	27	44	57
2012	32	48	59
2013	32	49	61
2014	35	55	65
2015	29	47	57
2016	28	44	55
2017	26	42	52
2018	23	36	49
2019	23	38	50
2020	23	37	50

The distribution of exports from the province by country is presented in Table 5 in more detail. According to the table, the first four countries with the largest share in the province's exports are respectively; Russia, Iraq, Syria and Germany.

Table 5. Mersin Province Exports by Country in 2020 ($1,000)

CRi	Country	Export	Share (%)	CRi Ratio (%)
CR1	Russian Federation	290.069	14,2	14,2
CR2	Iraq	281.988	13,9	28,1
CR3	Syria	91.281	4,5	32,6
CR4	Germany	91.263	4,5	37,1
CR5	Ukraine	75.666	3,7	40,8
CR6	Israel	70.835	3,5	44,3
CR7	Egypt	66.705	3,3	47,5
CR8	U.S.A.	51.458	2,5	50,1

5. CONCLUSION

In this study, covering the years 2011-2020, it is aimed to determine the level of product and market diversification in the exports of Mersin, one of the most important foreign trade cities of Turkey, by using the Concentration Ratio and the Gini-Hirschman Index. Reducing the dependency on certain products and markets by spreading to more countries with more diverse products in exports is important in terms of increasing the competitiveness of the provincial economy. It is seen that the sectoral concentration in Mersin's exports is higher than the market concentration. This finding is similar to the study of CKA (2014) on the concentration level of Mersin province exports. Sectoral concentration may not be considered as a negative situation if it is due to real specialization in concentrated sectors and high value-added production (Karadayı, 2019: 246). Mersin has always been an important agricultural city from past to present. In this context, it is usual for the agricultural sector to come to the fore in exports. However, it is possible to increase the product variety and to have a more value-added product range by turning to processed agricultural products, especially in the fresh fruit and vegetable sector, which is the most exported. Focusing more on geographical indications, branding and innovative products is key to value-added production. In this way, not only will the added value increase, but also the potential to access different markets will increase

(Pektaş et all., 2018: 74). The agricultural sector, which stands out in the export product range of the province, is prone to be adversely affected by seasonal fluctuations and weather events. On the other hand, the tendency of Russia, Iraq and Syria, which are in the top three in exports, to be affected by international political developments are other issues that increase the importance of branding and innovative products. In this framework, it is recommended that the focus of institutions, both at the national and regional level, be directed more towards studies that prioritize branding, design and innovation, and to be supported with funds. At the same time, it will be beneficial for both universities and researchers in the field to carry out studies that will increase the value-added product range of the sectors with a multidisciplinary approach and thus serve to diversify in exports.

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