Evaluation of Sugar Factory Privatization Practices in Turkey: The Case of Kayseri Sugar Factory-Turhal

ABSTRACT

The primary aim of this research is to assess the privatization process of sugar factories in Turkey, with a particular focus on the perspective of sugar beet producers. The study specifically examines sugar beet producers associated with the Turhal Sugar Factory. The distribution of the sample size across the production regions was determined by considering the number of producers in each region. The nine production regions in question exhibit similar characteristics in terms of geography and general agricultural features. The sample size was determined to be 150, with a 90 %confidence interval and 5% margin of error from the mean.The findings indicate that 43,3% of the farms experienced a reduction in sugar beet cultivation areas following privatization, with this decline being more significant among small scale farms. This suggests that small farms require additional support to maintain their sustainability. When compared to Türkşeker, producers generally expressed satisfaction with the services provided by the factory post-privatization. However, concerns about the factory's future inactivity grow as farm size increases.While many studies have demonstrated that privatized factories tend to be more efficient and effective, this research also highlights the producers' apprehensions regarding the operations of private factories. Thus, it is crucial to address these concerns with privatization policies and implement measures to ensure the continued operations of these factories. Another significant issue is the pricing of pulp, a vital by-product for livestock farming. Therefore, then setting pulp prices, consideration should be given to both the market price and the region's livestock potential.

Keywords: Sugar beet, privatization, sugar factory, producer, Turkey

1. INTRODUCTION

Agriculture has made numerous contributions to the economy and the process of capital accumulation, playing a significant role in the early stage of economic development. These contributions can be associated with production, marketing and production factors. One of the prominent examples of agricultural and industrial integration in Turkey is the sugar industry. Since its inception, the sugar industry has undergone a series of changes and has become an indispensable sector making substantial contributions to Turkey's development process.

Given Turkey's climatic conditions, sugar beet which has the highest nutritional value per hectare, plays a crucial role in meeting the demand for essential food. While sugar beet ranks second in terms of the additional value it provides among industrial crops, it has become a model production sector in regions where sugar cultivation is practices. Additionally, it has been a pioneer in crop rotation practices and a key factor in promoting irrigated agriculture [1].

The primary reason for the prioritization of sugar beet in agricultural policies in Turkey and many other countries is its status as an industrial crop. Almost all of the by-products obtained from the processing of sugar beet are strategically important products. These include significant substances such as pulp, molasses, and ethanol. Pulp and molasses are used not only as animal feed but also for the production of alcohol, a key raw material in the beverage industry. In addition, sugar beet serves as a raw material for many products such as sugar, yeast, antibiotics and bioethanol [2].

Globally, approximately 79% of the sugar produced comes from sugarcane, while 21% is derived from sugar beet[3].Although, there are no quality differences between sugar produced from sugarcane and sugar beet, sugarcane which can only be grown in tropical and subtropical regions, is more economical due to its lower production and processing costs compared to sugar beet [4]. While sugarcane can remain in the field for 6-7 years after planting, allowing for 2-3 harvests per year, sugar beet can be planted on the same field only once every 3 or 4 years. The annual sugar yield per hectare is about 3-4 tons for sugarcane, whereas it is approximately 1 ton for sugar beet [3].

Sugar beet is an industrial crop that requires intensive labor from the moment it is planted until the completion of the production process, making it a significant source of employment. One hectare of sugar beet cultivation generates a total of 93 hours of employment - 80 hours for agricultural activities and 13 hours for secondary processing. In comparison, wheat farming requires 3 hours per hectare, and corn farming requires 12 hours per hectare. Environmentally, sugar beet is also of great importance as it produces three times more oxygen than an equivalent area of forest land[5].

The primary factors determining global sugar prices are supply and demand conditions. However, external factors such as speculation, oil and commodity prices, energy policies, freight costs, exchange rate fluctuations, interest rates, trade policies and preference agreements, inflation, political and financial fluctuations, and the economic conditions of countries increasingly influence prices. When the amount of sugar produced falls below demand, stocks decrease, leading to higher prices, while the opposite situation causes prices to fall [4].

In many countries, the issue of high production costs in the sugar industry is a significant concern. In Turkey, however, many sugar factories were established and operated not for profit but for political reasons. These factories were primarily intended to fulfill social functions, such as creating employment in rural areas, preventing internal migration , and reducing regional development disparities [6,7].Sugar production is important in terms of creating a livelihood for the farmer and employment [8].

The first major initiative toward sugar factories in Turkey was taken by a producer named UşaklıMollaÖmerOğlu Nuri (Şeker). In 1923, Nuri Efendi, along with several associates, established UşakTerakkiZiraat A.Ş. with a capital of 600.000 Türkish Lira. The Uşak Sugar Factory, established by UşakTerakkiZiraat A.Ş. on December 17, 1926, marked the beginning of sugar production in Turkey and became the country's first sugar factory. Around the same time, in 1925, the İstanbul and Thrace Sugar Factories were founded in İstanbul through a collaboration between TürkiyeİşBankası, ZiraatBankası and the Special Provincial Administrations of the Thrace region, along with private individuals. Following the establishment of this first factory, the Eskişehir Sugar Factory was established in 1933, and the Turhal Sugar Factory in 1934. In 1934, with the merger of these four existing factories, TürkiyeŞekerFabrikaları A.Ş. was founded to centralize the management of sugar policies and ensure the technical and financial cooperation of the factories [9].

To meet the country's sugar demand, the production capacities of existing factories were gradually increased. The rise in population and living standards led to a corresponding increase in sugar demand. In this context, alongside capacity expansions, the aim was to effectively meet the country's overall sugar needs. Between 1953 and 1956, 15 new sugar factories were established in Adapazarı, Amasya, Konya, Kütahya, Burdur, Kayseri, Susurluk, Elazığ, Erzincan, Erzurum and Malatya. The factories in Ankara and Kastamonu began production in 1962 and 1963, respectively. The Afyon Sugar Factory started operations in 1977, while the Muş, Ilgın, Bor, Ağrı, Elbistan, Erciş, Ereğli, Çarşamba, Çorum and Kars factories began production between 1980 and 1982, followed by Yozgat Sugar Factory in 1988 [10].

The Kırşehir Sugar Factory commenced operations in 2001. Before the enactment of the Sugar Law No.4633, the Çumra Sugar Factory, one of the three private sugar factories that received permission to establish from the Council of Ministers, began its production activities in the 2004-2005 marketing year, while the Boğazlıyan and Aksaray Factories started in the 2006-2007 marketing year. With this process, the number of factories producing sugar from sugar beet reached 33. Of these factories, 15 are state-owned, 12 are privately owned and 6 are owned by beet cooperatives. Sugar beet production in Turkey is annually programmed by companies according to the sugar quotas determined by the Sugar Borad[11].In other words, state owns the sugar sector.

The aim of this study is to evaluate the developments in the privatization process of sugar factories in Turkey, particularly from the perspective of sugar beet producers. The research focuses on sugar beet producers operating at the TurhalŞeker Factory. Following the auction held on April 17, 2018, Kayseri Sugar included the Turhal Sugar Factory within its operations. The study thoroughly examines the attitudes and behaviors of producers before and after privatization. In this context, the study seeds to uncover their expectations from privatization, levels of satisfaction, and the challenges they have faced. Additionally, it addresses the changes in sugar beet cultivation areas with privatization, the effects of planting area and production quota limitations, as well as future concerns arising from privatization. The research findings reveal both positive and negative aspects of the privatization of sugar factories from the producers' perspective. It is anticipated that the study will have a guiding influence on the formulation of privatization policies.

2. MATERIAL AND METHODS

The material for the study consists of data obtained from surveys conducted with sugar beet producers in villages within the production area of the Turhal Sugar Factory. A survey method was used as a data collection tool and the

surveys were administered face to face by the researcher. The primary population of the study is the sugar beet producers in villages located within the production area of the Kayseri Sugar Factory – Turhal. Table 1. presents the reception centers (weighbridges) of the Kayseri Sugar Factory – Turhal for the year 2021, the number of villages associated with these centers and contracted production quantities, and the total cultivated areas. As it is seen at the table, there are a total of 9 regions and 25 weighbridges in the Kayseri Sugar Factory – Turhal production area. As of 2021, 5421 producers from 178 villages in the relevant production region signed contracts for sugar beet cultivation. The total contracted cultivation area is 121,536 decares, with a contracted sugar beet production of 758,495 tons. Accordingly, the average contracted production quantity per producer is 140.15 tons.

To determine the producers' perspectives on the privatization practices of the sugar factory, their levels of impact, and their future concerns, the number of surveys was determined using a probability sampling method. Since the levels of impact and future concerns of the producers were unknown, the sample size was calculated using the following formula, based on the assumption that half of the population was affected [12].

n=N*p*q/(N-1*D)+p*q

Here, N = 5.412 producers, p and q have been taken as 0,5. The sample size was determined to be 150, with a 90 %confidence interval and 5% margin of error from the mean.

The distribution of the sample size across the production regions was determined by considering the number of producers in each region. The nine production regions in question exhibit similar characteristics in terms of geography and general agricultural features. Therefore, the study aimed to be conducted with producers from these nine production regions (Table 1).

Table 1. Information About the Production of Kayseri Sugar Factory

Production Region	Weighbridge Name	Number of Villages	Number of Farmers Cultivating Beets	Contracted Quantity (tons)	Contracted Cultivation Areas (da)	Average Cultivation Area per Farmer (da)	Average Contracted Quantity per Farmer (tons)	Number of Surveys
Turhal	Fabrika	20	375	37.500	4.920	13,12	100,00	30
	Ezine	8	177	8.500	1.380	7,80	48,02	
Artova	Artova	10	276	28.030	5.048	18,29	101,56	17
	Sulusaray	6	457	50.325	8.268	18,09	110,12	
	Üçyol	7	160	35.630	5.335	33,34	222,69	
	Yeşilyurt	8	258	39.015	6.294	24,40	151,22	
Çamlıbel	Çamlıbel	19	1.093	140.000	22.870	20,92	128,09	3
Niksar	Boğazbaşı	5	66	8.225	1.020	15,45	124,62	0
	Gürçeşme	5	78	7.310	1.014	13,00	93,72	
	Niksar	4	82	8.765	1.054	12,85	106,89	
Pazar	Pazar	16	357	42.000	5.018	14,06	117,65	25
Sivas	Hafik	1	21	19.660	3.538	168,48	936,19	0
	Menteşe	8	224	119.480	20.402	91,08	533,39	
	Sivas	2	20	13.345	2.205	110,25	667,25	
	Zara	1	7	3.515	688	98,29	502,14	
Tokat	Almus	1	131	11.600	1.960	14,96	88,55	20
	Çamağzı	9	324	18.400	2.555	7,89	56,79	
	Gümenek	0	0	0	0	0,00	0,00	
Yıldızeli	Çırçır	5	81	30.200	6.630	81,85	372,84	0
	Yavu	6	72	31.250	5.316	73,83	434,03	
	Yıldızeli	3	131	28.550	4.054	30,95	217,94	
Zile	Akyazı	12	257	19.989	3.372	13,12	77,78	55
	Boztepe	6	404	29.549	4.053	10,03	73,14	
	Güzelbeyli	8	152	12.181	2.079	13,68	80,14	
	Reşadiye	8	209	15.476	2.463	11,78	74,05	
TOPLAM		**178**	**5.412**	**758.495**	**121.536**	**22,46**	**140,15**	**150**

Source: Kayseri Sugar Factory, 2021

The data obtained from the survey were transferred to a computer using the SPSS software package. To align with the research objective, the surveyed producers were categorized into three groups (small, medium and large farms) based on the total size of their farm holdings. The results were presented in the form of frequency and percentage calculations, as well as cross tabulations. The scale of the farm was considered a determining criterion for evaluating the sugar beet producers' perspectives on the privatization practice (Table 2).

Table 2. Grouping of Analyzed Farms by Total Land Holdings

Characteristics	Farm Size Groups (da)			
	Small (1-50 da)	Medium (51-100 da)	Large (101 +da)	Total
Number of Farms	54	51	45	150
Average Farms Size (da)	36,0	78,9	187,3	96,0
Average Sugar beet Cultivation Area (da)	11,9	21,2	37,2	22,6
Cultivation Areas for Other Crops (da)	24,1	57,8	151,1	73,6
Sugar Beet Cultivation Area Ratio (%)	33,1	26,8	19,8	23,6

3. RESULTS AND DISCUSSION

3.1.1. General Characteristics of Farmers

Of the farmers who participated in the survey, 95,3% are male with an average age of 52,8 years. Among the farmers, 56,0% have completed primary school, and the average family size is five members. 89,0% of the producers have social security coverage. The average income from sugar beet is 37.356,6 TL, the average total agricultural income is 126.730,0 TL. And the share of sugar beet in the total agricultural income is 29,5% on average. While both sugar beet income and total agricultural income increase with the scale of the farm, the share of sugar beet income in the total agricultural income increases as the farm size decreases. The average experience of sugar beet producers is 3,16 years. The experience in sugar beet production increases as the size of the farm decreases.

The average total cultivated area by the producers is 96,0 decar. As the size of farm increases, the total cultivated area also expands. The average sugar beet cultivation area increases with the size of the farms, its proportional share decreases. In addition to sugar beet, producers also cultivate various other crops, including wheat, barley, vegetables, sunflower, corn, soybeans, chickpeas and potatoes.

The sugar beet is cultivated entirely under irrigated conditions. Sugar beet is a water-demanding crop. Apart from sugar beet, the selection and cultivation of other crop types are based on either dryland or irrigated farm techniques. In Tokat province, among producers engaged in sugar beet production, tenancy and sharecropping are at low levels. Most producers cultivate their own land.

3.1.2. Farmers' Reasons for Sugar Beet Cultivation

Among the most significant reasons for producers cultivating sugar beet are that it is a traditional family occupation (81,3%), it as a familiar and well-known type of production (62,7%), and there is a guarantee of selling the product at a predetermined price (49,3%). While 33,3% of the producers indicated that they produce sugar beet because it is profitable, 29,3% stated that sugar beet is more profitable compared to alternative crops. Additionally, 16,0% of the producers mentioned that they produce sugar beet because they can easily obtain support for combating diseases and pests during the production process. Other reasons include; 8,0% produce sugar beet due to the company's provision of in-kind and cash advances; 7,3% do so because the company provides input support; and 4,7% cited crop rotation requirements as their reason for cultivating sugar beet. Only 1,3% of the producers stated that they cultivate sugar beet because they trust the privatization process.

In the region, Turhal Sugar Factory is operated by Kayseri Sugar. Following the privatization process, Kayseri Sugar has been processing sugar beets at Turhal Sugar Factory for the past five years. Consequently, producers in the research area enter into contracts with Kayseri Sugar for sugar beet cultivation, carry out production, and sell their harvested crops to this company.

3.1.3. Problems in Sugar Beet Production

There are various challenges encountered during the sugar beet production process which vary due different reasons. Labor, with 52,7% of producers indicating this as their main problem. Additionally, 30,7% of problems are related to product control, pesticide application and weeding. Beyond these issues, 16,7% of producers cited other factors, 8,0% reported problems with delivering the product to the scales or factory, 2,7% faced difficulties in securing seeds, 1,3% had issues with field preparation, 1,3% during planting and 1,3% during harvesting. Among producers, 41,3% reported that they were somewhat satisfied and 40,2% were satisfied with the factory's approach to solve the problems. Similar problems have been found by Eser and Bahşi[13].

3.1.4. Producers' Evaluation of the Differences in Practices Between Kayseri Sugar Factory and Türkşeker

Before its privatization, Turhal Sugar Factory was operated by Türkseker until five years ago, after which it has been managed by Kayseri Sugar. Almost all producers (99,3%) had also been producing sugar beets during the Türkseker period. This indicates that nearly all producers were involved in sugar beet production before privatization.

In response to the question regarding the land measurements and crop rotation requirements of Kayseri Sugar Factory, 79,4% expressed satisfaction and 6,0% were dissatisfied. When evaluating the post-harvest land control and

inspection practşces of factory compared to Türkseker, 60,7% of the producers rated it as good, 27,3% found it similar and 12,0% considered is not good. Regarding the question on how the advanced payments for sugar beet made by Kayseri Sugar Factory compare to those during the Türkseker period, 60,0% stated that it was good, 25,3% found it similar and 14,7% considered is not good. When comparing the time taken for producers to deliver the beets with the previous practices under Türkseker, 80,0% indicated that the time was shorter, 18,7% found it similar and 1,3% reported that it was longer.

3.1.5. Producers' Perspectives on Privatization

In sugar beet farming, there are restrictions on production areas. These restrictions, known as quotas, were implemented during Türkşeker period. A total of 150 producers' responded to the question of how privatization has affected their cultivation areas. Of these, 43,3% reported that they reduced their cultivation area, 40,7% stated that it had no effect and 16,0% indicated that they increased their cultivation area.

Among the producers, 76,7% expressed a negative view on the privatization of Turhal Sugar Factory, while 23,3% held a positive view. It was found that the proportion of those with a positive view was higher among small scale farms (33,3%). As the farm increased, the proportion of those with a positive view of the factory's privatization decreased.

3.1.6. Producers' Future Perspectives on Sugar Beet Production

Among the producers, 60,7% declared that they will continue to produce sugar beet in coming years. However, 23,3% of them indicated that they will not continue to produce sugar beet in future. Remaining 16,0% were undecided about production sugar beet near future. It was observed that the proportion of those who planned to continue sugar beet production was higher in small scale farms (70,4%). As the size of farm increases, the percentage of those considering sugar beet production in coming years' decreases. The percentage of those indicating that they will not produce sugar beets in coming years, at 23,3% across all farms. It is found out that the proportion of undecided producers is higher among young producers (25,0%). Among producers with an education level of primary school or below, 26,6% stated that they do not plan to cultivate sugar beets in the coming years. However, it should be noted that producers' decisions on this matter may change once the production season begins. This is because sugar beet is an important crop in terms of crop rotation and is considered one of the most profitable crops in the region.

4. DISCUSSION

The development of sugar industry is closely related to the efficiency and productivity in sugar beet production. In Turkey, changes in sugar policies since the 2000s have led to a significant decline in the area cultivated with sugar beets and the numbers of producers involved. This decrease is largely attributed the abandonment of support policies for sugar beet production, although the impact of privatization polices can also be noted. In the last five years, while the cultivated area has stabilized, an increase in productivity has led to a steady production volume[14].

The Turhal Sugar Factory, which is focused of this study, was established as a public enterprise in 1934 and was included in privatization process in 2018, being integrated into the Kayseri Sugar Factory under the Pankobirlik organization. According to data from the 2004-2017 period, the average cultivated area was 114,541.1 decares, but after 2018 this number decreased by 11,6% to 101,243.2 decares[15].Based on the findings of the research, it has been determined that in 43,3% of the producers, the area cultivated with sugar beets decreased after privatization, with this decline being relatively higher in small-scale farms. This situation is another indication that small-scale producers demonstrate continuity primarily through increased support. It was also found that in 35,6% of large scale farms, the cultivated area for sugar beets has shrunk. These farms tend to have a wide variety of crops, resulting in a smaller proportion of land allocated to sugar beet cultivation. Also Demirdöğen (2023) mentioned that sugar beet acreages decreased by more than 15% due to the 2018 privatization of several sugar factories [16].

The reduction in sugar beet cultivation areas after privatization is also clearly visible in macro data and the research results. It is predicted that this ratio will continue to decrease in the coming years. Compared to other field crops, sugar beet has higher production costs and requires more labor. Therefore, suitable market conditions are important in the farmer's decision to plant. According to the research findings, farmers stated that polar ratio was determined to be low after privatization. Although the region does not face significant irrigation issues, quality may decrease due to factors such as incorrect irrigation practices and seed selection. At this point, it is believed that more active services from the factory's field staff and proper guidance to the producer could positively impact quality and yield.

5. CONCLUSION

In the study, the average cultivated area for the farms was 96,0 decares. With 23,5% of them engaged in sugar beet farming. It was found that producers had sufficient experience in sugar beet cultivation (31,6 years). It was observed that sugar beet production in the region continues more due to experience than profitability. However, as previously

mentioned, it can be stated that small scale farms require support to maintain this continuity. Regarding the intention to continue sugar beet cultivation in the coming years, it was determined that 60,7% of the farms plan to continue, 16,0% are undecided, and 23,3% do not intend to continue. Among medium scale enterprises, 29,4% do not plan to continue.

When compared with Turkish Sugar Factory, it was found that farms were largely satisfied with the services provided by the factory after privatization. However, they were not satisfied with financial issues such as the sugar beet's polar ratio and pulp prices. This situation negatively affects overall satisfaction, despite the fact that many services are appreciated after privatization. Especially in large scale farms, the perception and satisfaction with privatization are negative. Çınar et all. (2021) found that their research implies a positive effect for the privatized factories [17].

Another important issue revealed in the research related to privatization is the continuity of the operations of the privatized factory. As the scale of the enterprise increases, so does the concern that the factory may not remain operational in the coming years. While public factories operate with both profit and development goals, the private sector's focus on profit is a fundamental factor contributing to farmers' concerns. In the past, one of the main reasons for farmers to engage sugar beet farming was the purchasing guarantee provided by the factories. Especially in the period before privatization, sugar factories, which held a monopoly were seen by producers as guarantors. Although many studies have shown that factories became more effective and efficient after privatization, the concern that private factories may not sustain their operations has been demonstrated in many studies, including this one. In this context, it is necessary to address this issue in privatization policies and to take measures to guarantee the continued activity of the factories.

Another important issue concerns the prices of pulp, a significant by product. Since pulp is also important for livestock farming, it is necessary to consider the region's livestock potential and the market price of pulp when determining prices.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

REFERENCES

1. Tosun, F. Sugar Beet Product Report. Agricultural Economics and Policy Development Institute. TEPGE. 2017. No: 291.
2. Sunulu, S., Sunulu, A. Cercospora Leaf Spot Disease İn sugar Beet,Pankobirlik, 2016. 27 (108).
3. TürkŞeker. Sector Report 2020. Turkey Sugar Factories A.Ş. 2021.
4. Kaya, F. An Example of the Effects of Global and Regional Sugar Policies on Turkish Sugar Factories: Ağrı Sugar Factory. Journal of Geography, Faculty of Literature, Istanbul University, 2015. 31, 41 – 61.
5. Türk-İş. 2017.https://www.sekeris.org.tr/multimedia/33/sekerisnbs.pdf
6. Karabulut, T., Topak, A. Cost and Efficiency Analysis in the Sugar Industry: A Comparison of the Public and Private Sectors. Selçuk University, Journal of the Vocational School of Social Sciences, 2017. 10 (1–2).
7. Altaytaş, K. M. Agrarian Change in Neoliberal Turkey: Insights from Privatization of The Sugar Industry. Journal of Agrarian Change. 24 (1). 2023.
8. Çimenderoğlu, S., Erenoğlu, O. A study on the Evaluation of the Socioeconomic Effects of Sugar Factories: A Case of Kastamonu. International Journal of Social sciences. 6 (3). 2021.
9. TürkŞeker, Information on Turkey Sugar Factories,. 2017.
10. Avcı, S. Changes in the Sugar Industry in Turkey and Their Geographical Impacts. National Geography Congress 29-30 September 2005.
11. TürkŞeker . Sector Report 2020. Turkey Sugar Factories A.Ş. 2021.
12. Çiçek, A., Erkan, O. Research and Sampling Methods in Agricultural Economics. GaziosmanpaşaÜniversity. Faculty of Agriculture Publication. 1996. No: 12, Tokat.
13. Eser, H., Bahşi, N. Sugar Beet Production Structure and Challenges in the Ilgın District of Konya Province. Türkish Journal of Agriculture – Food Science and Technology. 2020, 8 (1).
14. Demirdöğen, A. Sugar in Turkey: A Brief Discussion of Production, Consumption, Trade and Policies. TEAD, 2022; 8(1), 85-95, Review Article,
15. Pankobirlik. World, EU. and Turkey Sugar Statistics. Union of Beet Growers' Cooperatives..2020.
16. Demirdögen, A. Before Privatization There was Its Impact: Sugar Factories İn Turkey. Rev Ind Organ. 62 (2). 2023.

17. Çınar, Y., Atıcı, K., Menten, C. Evaluating Technical Efficiency of Turkish Sugar Production in Pre and Post Privatization Periods. Sosyoekonomi, 29 (47). 2021.