



European Sugar Production and its Control in the World Market

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Abstract The European sugar industry which mainly relies on sugar beet is unique with its production quotas, minimum beet price and trade mechanisms. This study aimed to outline and specify the current production structure of the sugar quota holder system in the European Union (EU) and to determine the competitiveness and level of concentration in the system which is operated by more than a hundred sugar factories owned by approximately fifty companies. The study reveals that EU quota holder system is highly concentrated in certain regions like Germany, France, Great Britain and The Netherlands regardless of sugar-producing destinations and individual factories and is controlled by the companies/alliances operating in these regions. The study also reveals that monopoly of these regions has created unfair competition in European sugar market.

Keywords European Union · Sugar companies · Sugar alliances · Sugar production · Quota holder system

Introduction

The European sugar industry is primarily depended on sugar beet to which the Common Market Organisation and the related system of production quotas are applied. The European sugar market is unique with its sugar quota holder systems and other regulations that came into existence in 2006. It is, to some extent, still influenced by the effect of the Napoleonic

wars. The British blockade of European ports during the war led to massive reduction in cane sugar imports and subsequently, to the development of a viable sugar beet industry in this region. Due to the existing quota system and other restrictions that will be in place until 2017, the European sugar market is protected from cane sugar imports and also to a certain extent from cane sugar production within the EU. While there are more than one hundred beet sugar factories which process only sugar beet, twenty production facilities are either combined sugar factories or cane refineries, capable of processing imported raw cane sugar. The market is largely divided among a limited number of players engaged in sugar trade in the EU. Due to the limited number of big players, substantial profits are being generated. The European sugar industry under the sugar quota system has been undergoing numerous changes and reforms. Some of the players have left the quota holder system, and many others have reduced their production capacities. Consequently there has been a dominance of specific groups of players in the system. Alliances of successful producer groupings have led to increasing concentration of the sugar production quota with unfair competition. The formerly competitive market has become highly concentrated, with limited competition and a gradual shift towards a monopolistic market. This has resulted in common price policy which will strongly influence the future course of the entire sugar sector in EU (Severová and Bendl 2013).

Objective and Analysis Parameters

The objective of this study is to understand the current production structure of the beet sugar quota holder system within the European Union, to define the subjects that possess production capacities and to determine the level of quota holder system concentration in the beet sugar quota.

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The quota holder system in beet sugar industry is analysed in the following ways using the Herfindahl–Hirschman Index (Hirschman 1964):

1. The identification of the companies operating in the EU quota holder system including the number of available sugar factories.
2. The identification of alliances that control the European sugar quota production, including their ownership and contractual structures (joint stock companies, cooperatives of the beet growers, etc.).

The beet sugar quota market within the Single Market (Quota R 1308/2013) is analysed from the perspective of EU members' situation and quota holder concentration in the beet sugar quota, sugar producers and also with respect to the prevailing ownership structure of the production units.

The focus is on the analysis of the current distribution and control of production capacities across the EU. The analysed data provide an overview of the situation in the EU quota holder system during the period 2013/2014. The database was created and is managed by ISO (the International Sugar Organization) and is based on F. O. Licht's "International Sugar and Sweetener Report" (2015), the CEFS's sugar statistics (2013), the European Commission DG Agri's "Sugar and isoglucose balance sheets" (2014) and the "Study on price transmission in the sugar sector" (2012).

The HH index is used to measure the quota holder system concentration and to monitor the anti-monopoly policies. The index ranges from 0 (no concentration and a highly competitive system) to 10,000 (complete monopoly) (Hirschman 1964). The index is calculated by squaring the quota share of each firm competing in a quota system and adding up these values:

$$HHI = \sum_{i=1}^N s_i^2 = s_1^2 + s_2^2 + \dots + s_N^2$$

where s_i is the quota share of the firm/alliance "i" in the quota system and N represents the number of firms/alliances in the market. Alternatively, if whole percentages are used, the index ranges from 0 to 10,000 "points". If the HHI is lower than 0.01 (100 points), the market (quota system) is highly competitive. An HHI ranging from 0.01 to 0.15 (100–1500 points) indicates a diluted market (quota system) with significant presence of several companies. Values of the HHI from 0.15 to 0.25 (1500 and 2500 points) reveal significant market (quota system) concentration (mostly monopolistic competition) and an HHI above 0.25 (2500 points) indicates a highly concentrated market (mostly an oligopoly). An HHI close to 1 (10,000 points) suggests the existence of a single company with complete monopoly. This methodology is used to identify the real strength and position of the firms involved

in sugar production in different countries in the European sugar quota system and also of the member countries in the system.

Data Analysis

EU Sugar Quota System Concentration

The European Union is a major producer of sugar with a significant hold in the global sugar markets. Its production capacities are concentrated primarily in sugar beet processing (Rezbová et al. 2013). The total annual production, of about 17 million tonnes and 1.2 million tonnes of exports (2014), makes EU one among the top players in the global market. The European sugar market is unique due to the presence of the Common Market Organisation as well as strong EU market protection with regard to the external environment—the world market and the respective markets of other countries and regions (Spettmann 2008).

Among the 100 sugar factories that are currently operating in the EU Single Market, 96 specialise in sugar beet processing. The others are combined processors and/or specialised in cane sugar processing. Sugar factories/companies are spread throughout Europe. Some companies are represented by individual private sugar factories, while others are represented by alliances operating within national markets and quota systems. International companies are also operating in the market. Some of these companies have strong linkages with sugar markets outside the EU. It is important to note that many sugar factories like Südzucker and Tereos, who specialise in products other than sugar also operate at national and international levels, as sugar production and sugar trade represent only part of their activities.

Although there are a large number of companies operating in the EU sugar market with the expectation of a high level of competition, the reality is far more complicated. Many companies operate within multinational alliances and maintain their independent legal entity. In reality, they are often controlled by large multinational companies. The European beet sugar market is dominated by 5 large multinational alliances. Their respective market shares are as follows: Nordzucker (24.1 %), Südzucker Alliance (15 %), Tereos Group Alliance (10.9 %), Pfeifer & Langen Alliance (10, 8 %) and Associated British Food Alliance (8 %).

Thus, the European sugar market (and quota holder system) seems to have moved towards a multi-national status with the prominence of these important and influential alliances in the sugar production system. They control most of the European sugar production. The production capacities of these alliances are spread throughout the EU. For example, Nordzucker AG controls about two dozen

Table 1 Sugar quotas of EU member states (quota R 1308/2013)

Member state	Number of beet sugar factories	Production quota 2013–14 (tonnes)	Share in total quota (%)
Austria	2	351,027	2.59
Belgium	3	676,235	5.00
Croatia	3	192,877	1.43
Czech Republic	7	372,459	2.75
Denmark	2	372,383	2.75
Finland	1	80,999	0.60
France (without DOM)	25	3,004,811	22.21
Germany	20	2,898,256	21.42
Greece	1	158,702	1.17
Hungary	1	105,420	0.78
Italy	4	508,379	3.76
Lithuania	2	90,252	0.67
Netherlands	2	804,888	5.95
Poland	18	1,405,608	10.39
Romania	4	104,689	0.77
Slovakia	2	112,320	0.83
Spain	5	498,480	3.68
Sweden	1	293,186	2.17
UK	4	1,056,474	7.81
Total (excl. French DOM, Azores) ^a	106	13,087,445	95.73
Total (incl. French DOM, Azores)		13,529,618	100.0

Source CEFS, F. O. Licht, EU, DG AGRI, own calculation 2014

^a The Azores and French DOM are not included

sugar factories in Denmark, Lithuania, Germany, Poland, Slovak and Finland. Südzucker is the largest producer of sugar in the EU and operates about three dozen sugar factories in the Czech Republic, Romania, Austria, Belgium, France, Slovak, Germany and Poland. Tereos controls more than ten sugar factories in France, Romania and the Czech Republic. Pfeifer and Langen control nearly two dozen sugar factories in Germany, Poland and Romania. France, Germany and Poland dominate in terms of the number of sugar factories. It can be concluded that the quota holder system is concentrated to a great extent with limited competition, mainly because German (Südzucker AG, Nordzucker AG, Pfeifer and Langen) and French (Tereos a Cristal Union) companies control production capacities throughout the European Union.

EU Sugar Quota Holder Concentration: Sugar Quota R 1308/2013

Beet sugar is currently produced in 19 EU member states. Sugar quotas are also applied in French overseas regions or territories as well as in Portuguese production capacities in the Azores Islands. The analysis performed in this article is focused on the production capacities located in the 19 EU member states.

Table 1 provides an overview of the market situation in EU member states in terms of the number of active sugar factories and the available sugar quota (R 1308/2013) assigned to the member states by the European Commission. It is clear that France, Germany, Poland and the UK dominate in terms of quota size. These countries operate about 67 sugar factories located in the EU and produce over 61.8 % of the EU sugar quota. It can be expected that the influence of the European companies will continue to grow if no significant liberalisation or market controls of the European sugar market are implemented and cane sugar from overseas could not get better access to European markets. These companies (alliances) will either increase their own production capacities or absorb capacities at the expense of other, smaller EU producers. From this point of view, a precarious situation is arising in Finland, Greece, Lithuania, Hungary, Sweden, Denmark, the Netherlands, Slovakia and the UK, where the allocated sugar quota is controlled by limited number of companies/alliances, sometimes even by one or two companies. Table 2 provides information about the quantum of sugar that is produced by individual companies/alliances in EU member states. The data indicate that the distribution of the production quota is unequal or imbalanced. Five companies (Südzucker, Nordzucker, Associated British Foods, Tereos

Table 2 Sugar production within quota R 1308/2013 by the major companies

EU country ^a	Südzucker	Nordzucker	Associated British foods	Tereos	Pfeifer and Langen	Suiker unie/Royal Cosun	Cristal union/Cristal Co	KSC Polski Cukier S.A.	Other sugar factories
France (without DOM)	600,962			1,231,973			1,111,780		60,096
Germany	1,159,302	985,407			637,616	115,930			
Poland	351,402	132,485			371,621			549,632	
UK			1,056,474						
Netherlands						804,888			
Belgium	486,889								189,346
Italy					284,692		116,927		106,760
Spain			368,875	129,605					
Czech Republic	93,973			208,716					69,770
Denmark		372,383							
Austria	351,027								
Sweden		293,186							
Croatia					71,364				121,513
Greece									158,702
Slovakia	43,841	68,479							
Romania	36,536			33,396	28,653				6103
Hungary	105,420								
Lithuania		64,200							26,052
Finland		80,999							
Total	3,229,821	1,997,138	1,425,349	1,603,689	1,393,946	920,818	1,228,707	549,632	738,342
Quota share (%)	24.68	15.26	10.89	12.25	10.65	7.04	9.39	4.2	5.64
Cumulative quota share (%)		39.94	50.83	63.08	73.73	80.77	90.16	94.36	100.0

Source CEFS, F. O. Licht, EU, DG AGRI, own calculation 2014

^a The Azores and French DOM are not included. The quota without these countries reached 13,087,445 tonnes in 2013/2014; the total quota in 2013/2014 reached 13,529,618 tonnes

and Pfeifer and Langen) possess nearly three quarters (73.73 %) of the total European sugar production quota which is allocated to EU member states. These five companies control the production of more than 8 million tonnes of beet sugar from the total quota of more than 13,087 million tonnes (without the Azores and French DOM). Among the member states, Germany and France are clearly the dominant players in terms of the share of these states in the sugar production quota.

The analysis indicates that the sugar quota system is concentrated in all the member states surveyed (Table 3). Only a limited number of companies/alliances operate in the sugar market to produce sugar, based on the quota system in EU countries. No real competitive environment exists in any of the member states. The concentration is high, almost to the point of being an oligopoly or strong monopoly. France, Germany, Poland, the Czech Republic and Romania are exceptions where the number of operating subjects is higher. Nonetheless, these markets except Czech Republic also can be considered highly concentrated

due to the high share of sugar quota to the leading alliances. In the Czech Republic, the sugar quota system is operated by seven sugar factories under the control of five companies (Spicka and Janotova 2013). The Czech sugar quota system is therefore considered as one of the least concentrated or least monopolistic.

While the quota holder system of individual EU member states is highly concentrated, the EU quota holder system as a whole seems to possess a relatively low level of concentration which is paradoxical. The HHI of the quota holders operating in the Single Market reaches the level of 0.1444 (i.e. 1.444 points). The HHI reflecting the quota distribution according to the national allocation indicates a low level of concentration as well: 0.13648 (1.3648 points). While applying the HHI methodology to the EU quota holder system and assigning the quotas controlled by companies/alliances to individual countries according to the location of the company headquarters, it is found that again a strong concentrated system exists which could be attributed at the oligopoly level. There appears to

Table 3 Quota R 1308/2013 sugar system concentration based on the allocated production quotas in EU member states

	HHI for a given country	Quota sugar volumes produced in EU countries	Number of companies in the market
France (without DOM)	3454	3,004,811	3
Germany	3256	2,898,256	4
Poland	2938	1,405,608	4
UK	10,000	1,056,474	1
Netherlands	10,000	804,888	1
Belgium	5968	676,235	2
Italy	4106	508,379	3
Spain	6152	498,480	2
Czech Republic	2842	372,459	5
Denmark	10,000	372,383	1
Austria	10,000	351,027	1
Sweden	10,000	293,186	1
Croatia	5741	192,877	3
Greece	10,000	158,702	1
Slovakia	5242	112,320	2
Romania	3338	104,689	3
Hungary	10,000	105,420	1
Lithuania	10,000	90,252	1
Finland	10,000	80,999	1
Production volume in countries with higher quota holder concentration		7,785,823	
Production volume in countries with very high quota holder concentration		1,795,414	
Production volume in countries with monopoly quota holder concentration		3,313,331	

The Azores and French DOM are not included

Source CEFS, F. O. Licht, EU, DG AGRI, own calculation 2014

be a large discrepancy between the political efforts to distribute equitable R 1308/2013 sugar quotas among states and the actual distribution. While the EU quota holder system does not indicate an extreme concentration (HHI 1.364.8; unconcentrated system), an analysis according to the headquarters' location and the quotas allocated to owners of production capacities provides evidence of extreme concentration (HHI 3.222; oligopoly). Thus, overall, the study indicates that the sugar quota holder system in the EU is becoming more and more concentrated with limited competition.

Conclusion

Based on the above-mentioned findings, it can be concluded that the European sugar market is highly distinctive. Even though more than one hundred factories owned by about fifty companies operate in the quota holder system, the system is still highly concentrated and even monopolistic at specific locations. Most of the sugar-producing capacities are located in Germany, France and Poland. However, the sugar quota holder system is controlled by

companies or alliances at Germany, France, the UK and the Netherlands (regardless of the final destination of the production). The system is controlled by seven dominant alliances: Südzucker, Nordzucker, Tereos, ABF (Associated British Foods), Pfeifer and Langen, Royal Cosun and Cristal Union. These companies/alliances control nearly 90 % of the total EU sugar quota production while sharing the protection from imports due to the high duties and taxes.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

References

Anonymous 2012. European Commission. DG Agriculture and Rural Development. 2012. Study on price transmission in the sugar sector.

- http://ec.europa.eu/agriculture/external-studies/2012/sugar-price-transmission/fulltext_en.pdf. Accessed 20 March 2015.
- Anonymous 2013. European Association of Sugar Producers (CEFS). 2013. Statistics. <http://www.comitesucre.org/site/statistics/>. Accessed 27 March 2015.
- Anonymous 2014. European Commission. Committee for the Common Organisation of Agricultural Markets. 2014. Sugar and isoglucose balance sheets. http://ec.europa.eu/agriculture/sugar/balance-sheets/balance-sheet_en.pdf. Accessed 27 March 2015.
- Anonymous 2015. F. O. Licht. 2015. International sugar and sweetener report. <https://www.agra-net.net/agra/international-sugar-and-sweetener-report/login/>. Accessed 11 March 2015.
- Hirschman, A.O. 1964. The paternity of an index. *American Economic Review (American Economic Association)* 54(5): 761.
- Rezbová, H., A. Belova, and O. Skubna. 2013. Sugar beet production in the European Union and its future trends. *Agris On-line Papers in Economics and Informatics* 5(4): 165–178.
- Severová, L., and S. Bendl. 2013. Cartels and their behaviour on food markets. *Agricultural Economics* 59(2): 81–89.
- Spettmann, T. 2008. European sugar in a competitive world. *Zuckerindustrie* 133(9): 589–595.
- Spicka, J., and B. Janotova. 2013. Cost of sugar beet growing in the Czech Republic and international comparison. *Listy cukrovarnické a řepářské* 129(7–8): 210–214.