Determining the Nature of Competition in Bulgarian Food Industry

T Gigova¹ and K Valeva²

¹ Faculty of Mechanical Engineering, Department of Industrial Business, Technical University-Branch Plovdiv, Technical University - Sofia, Plovdiv Branch, 25 Tsanko Diustabanov Str., Plovdiv, 4000, Bulgaria
² Faculty of Economics, Department of Industrial Business and Entrepreneurship, University of Food Technologies, 26 “Maritza” Bld, 4000 Plovdiv, Bulgaria

E-mail: t_gigova@abv.bg, tomika888@yahoo.com

Abstract. The highly competitive environment for the food industry after the accession of Bulgaria to the European Union puts companies under conditions where the focus is on the quality and products’ safety. Both the competitiveness theory and the topic of food safety have been widely discussed in recent years, and research in this area is growing, but there is a lack of in-depth information in the Bulgarian literature on the relationship between competitiveness ↔ food safety systems and the open question of how strategies food safety would increase corporate competitiveness. Examining this relationship, it is possible to uncover those factors stemming from the requirements of food safety systems, the improvement of which can help the food industry companies to increase their competitiveness. The subject of the study is the different approaches and methods of assessment and analysis outlining the opportunities for increasing the competitiveness of enterprises from the food industry through the implementation of food safety systems. The report aims to reveal the interrelationship between competitiveness and food safety systems and the implementation of methodologies to increase their competitiveness. The study and assessment of factors to improve the competitiveness of food business enterprises through the implementation of food safety systems is based primarily on expert judgment as well as on marketing and diagnostic analysis. Emphasis is placed on factors that arise from the requirements of food safety systems and a few extras that are important for the formation of strong competitive advantages.

1. Introduction

Competition is a driving force and an incentive to increase the efficiency of business operations. It is an integral part of the market economy and should be considered in relation to the market as a whole system [1]. Since competition is a competition between different business entities, it allows for the most efficient use of resources and the most successful organization of business to achieve the ultimate goal of making more profits [2]. Competition can be defined as a driving force for the development of society. It provokes the use of the best of abilities and knowledge, leads to increased human wealth and diversity, leads to rational behavior on the part of sellers and buyers, and rational use of resources [3],[4]. According to Joseph Schumpeter, in the economic system, the new combinations make their way, defeating the old ones, and for him this process is the basis of competition. Enhancing the ability of enterprises to meet standards more stringently is likely to create...
new forms of competitive advantage [5]. In this regard, research has been carried out on some sectors - Spring and Isaac emphasize the fundamental importance of food safety to the competitiveness of the meat industry in Australia, Canada, the UK and the United States. Issues related to increasing business competitiveness are particularly relevant as they affect in particular the food industry and, more generally, they are also linked to national competitiveness [6], [7].

Under increasingly sophisticated market relationships, the success of the food industry is driven by their flexibility and adaptability to the demands of their environment, as well as the prudent management of intra-company processes focused on the quality and safety of production.

The research is focused on the food industry - a sector with long traditions, occupying a major share of the Bulgarian industry. In addition, food productions fall into a risk group from a safety perspective and it is appropriate to target food companies and their food safety systems as an area that can be developed and used as a source of competitive advantage;

The main purpose of the study is to reveal the interrelationship between the competitiveness of the food safety systems and to implement a methodology for increasing the competitiveness of the enterprises in the food industry.

The objective is decomposed into the following research tasks:
First, to review the current state of the food industry and to develop a methodology algorithm for increasing the competitiveness of enterprises in the food industry through food safety systems.
Second, to approve the established methodology in Bulgarian food industries selected on the basis of relevant criteria and to provide recommendations for increasing the competitiveness of the sector through the implementation of food safety systems.

The object of research is 198 enterprises, representing food sector of the Bulgarian economy.

The subject of the study is the different approaches and methods of assessment and analysis outlining the possibilities for increasing the competitiveness of the food enterprises by applying the food safety systems.

The research supports the main research hypotheses, namely that the food safety management systems are tied to company competitiveness and competitive advantages and a methodology can be applied to reveal opportunities for increasing the competitiveness of food business companies by systems of food safety.

In the present study, the following methods were used: methods for collecting primary empirical information, questionnaire, deep interview method, expert assessment were applied. Methods of analysis and synthesis, comparison and analogies are also used; dialectical, logical, causal, economic-statistical and comparative analysis.

Studies, strategies, outcomes and guidelines of work from national and regional programs have been used. In the development of the analysis, results of the Association of Meat Processors in Bulgaria and the Association of Industrial Capital in Bulgaria surveys, as well as similar surveys and relevant information sources on the subject of analysis were used.

Literature Review
The term competition "concurrentia" derives from the Latin word "co cures", which means I run to the goal [. In daily vocabulary, it is used in the sense of rivalry, competition, and race between people, companies, countries and regions to achieve a particular goal. There are different definitions of competition in economic literature. Porter describes it as a "competition between companies in which they use national, regional, and global strategies" [1]. According to Ribov, "competition is an interaction between business entities, each of which strives to realize its interests, regardless of the other subjects." According to Ganchev, [3] “competition, each pursues one's own interest, but at the same time the interests of society are realized”. Vladimirova defines it as "a rivalry between economic agents to achieve the goals set (the most efficient use of resources, maximizing profits, achieving a high market share, etc.), which takes place in the conditions of interaction between them [2].

The diversity of competitive relations in the economy is divided into three levels:
• Micro level - for individual types of products, productions or companies;
• **Meter level** - for a given industry, corporate unions and conglomerate type companies;
• **Macro level** - for a country.

The study of competition takes place through the so-called competition mechanism, which consists of the following elements:

• **Sources of competitive advantage.** There are two types - lower costs and differentiation of goods and services.
• **Subject to competition** - these are: consumer demand (domestic and international), factors of production (labor, land, capital and information) and power.
• **Subject of competition** - here are individuals (physical or legal) leading to competition for the objects of competition, i.e. competing companies that produce or sell similar products and services.
• **The subject of competition** is goods, services or products.
• **Competitive struggle methods** - applied by subjects to the competition process for sites.

To survive on a highly competitive market, subjects can apply different methods of competitive struggle - to reduce prices, improve quality, expand service, and more [7]. Unlike competition, which is characteristic of the market, competitiveness is a characteristic of the particular economic entity / system. In other words, competitiveness can be defined as the ability to compete [8].

There is no complete and accurate definition of competitiveness. It is so comprehensive that different definitions are not contradictory but rather complementary. The existing definitions of competitiveness differ depending on the level they are relevant to. According to some of them, competitiveness is linked to the production and distribution of manufactured products [9]. Other definitions are based on the understanding of the efficiency of the production process and the potential for innovation and technological excellence. According to Michael Porter, competitiveness refers to the way in which the available resources are used [1]. The link between the notions of competition and competitiveness can be explained in the following way: competition and competitive relations predetermine the competitive advantages that are a factor of competitiveness. enterprises, corporations, economic systems, the national economy of the country or the world as a whole” [10].

### 1.1. Form the model of perfect and imperfect competition

The neo-classical theory of perfect competition is based on unrestricted competition between business entities. The main moments in it were developed by Adam Smith, and A. Marshall, L. Walras, E. Djevins and Pareto are involved in the development of the model [1],[2]. The main points in A. Smit's theory of perfect competition are:

- Defines the notion of competition as rivalry, rising prices when supply is reduced and prices fall in surplus supply.
- Defines the main principle of competition - "The principle of the invisible hand". Competition forces market players to follow the instructions of the "invisible hand" and is a mechanism to automatically achieve market equilibrium.
- Develops the theoretical foundations of a flexible competition mechanism that balances the industry's profit rate, leading to an optimal allocation of resources across the various sectors of the economy.
- Defines the basic conditions for effective competition, including the availability of a large number of sellers and buyers, the mobility of the resources used, the availability and availability of information on the level of demand, supply and prices, which makes it possible to make optimal choices.
- Defines competition as a means of solving contradictions between private and public interests.

**Perfect competition** - characterized by a large number of players (sellers and buyers) on the market. Each of them has enough full market information and none of them can control market demand, delivery of goods and their price.

Perfect competition is growing into its antipode - the monopoly, that is, in imperfect competition. It appears in a market where individual producers (sellers) can have some impact on the price.
In the monopoly theoretical model there is only one producer or consumer who has no competitors on the market, there are no substitutable goods or services [8]. There are different circumstances in which a firm may become a monopolist. In this sense, it is a closed, natural or open monopoly.

- **Closed monopoly** - is typical for cases where the company is protected by competition by means of legal restrictions (by the Copyright Agency).
- **Natural monopoly** - exists when there is a company producing a unique product on the market and there are some limitations on the factors of production (unique natural resources).
- **Open monopoly** - for a while, a company is the only supplier of a particular product without any specific protection from competition, as in the closed and natural monopoly, but in the future a competitor may appear.

When examining market conditions, the authors of the theory of *imperfect competition* focus their attention on the situations of *polypole, oligopoly* and *monopoly*

- **Polypol** is a market with many participants, but they are mostly small companies;
- **The oligopoly** is a market with a small number of participants, but medium-sized companies;
- **The monopoly** is a market with only one bidder on the demand or supply side, but it is a big company.

In order to regulate competition, Bulgaria adopt and enforce anti-monopoly legislation.

There are quantitative methods defining market conditions for determining the nature of competition. Widespread indicators are two: the concentration ratio of leading (usually four) firms and a Herfindal-Hirschman index.

Concentration ratio of the four largest companies - represents the sum of the relative shares of the sales value of the four largest companies. Determined by the formula:

$$CR4 = MS1 + MS2 + MS3 + MS4$$

where:

- $CR4$ is the concentration factor (concentration ratio);
- $MS1, 2, 3, 4$ – market share (as a percentage) of the four largest companies.

The index may range from zero in pure competition to 100% in monopoly. An indicator value above 40% is indicative of oligopolistic competition, and below 40% for monopolistic competition.

**Herfindahl-Hirschmann Index** - represents the sum of squares of market shares of major competitors. Determined by the formula:

$$HHI = \sum_{i=1}^{N}(MS_i)^2$$

where:

- $HHI$ is the Herfindal-Hirschman index;
- $MS$ - market share in percent;
- $N$ - the number of competitors.

The higher the index, the more monopolized the relevant market and:

- $HHI \leq 1000$ means a competitive market;
- $1000 \leq HHI \leq 1500$ - Slightly monopolized market;
- $1500 \leq HHI \leq 2500$ - moderately monopolized market;
- $HHI \geq 2500$ - high concentration of monopoly power;
- $HHI = 10,000$ - full monopoly of 1 company.

### 1.2. Functions and importance of competition

The **first function** is a counterpart. It finds expression in the impact of competition in two directions:

- Competition is a universal tool for comparing the effectiveness of different companies to discover and stimulate the most economically active [5], [7].
Such a match meets the interests of the consumer, who chooses the trader giving him the most advantageous terms.

The second function is selective. It involves removing market participants who work economically ineffective. As a result, overall efficiency of production and trade is increasing.

The third function is related to its disciplining power in the market economy. The availability of alternative sellers and buyers in the market to some extent forces companies to comply with consumer wishes and to seek more efficient ways to carry out their business. Companies that fail to provide consumers with quality goods and services at competitive prices will suffer losses and will eventually go bankrupt.

The fourth feature focuses on the dynamics. Firms operating under strong competition find new ideas, develop new offers on the market, new channels for realization, new forms of service, and make profits as innovators. At the same time, they take the risk that new ideas and developments will not be accepted by the market, which would bring them losses. This is how dynamic changes are made, in which the old methods and methods give way to the new ones.

1.3. Competition and efficiency

Competition is a driving force and an incentive to increase the efficiency of business operations. It is an integral part of the market economy and should be considered in relation to the market as a whole system [3], [9].

Since competition involves a struggle between different business entities, it enables the most efficient use of resources and the most successful organization of the business to achieve the ultimate goal of gaining more profits [6], [10].

Competition is closely related to efficiency as:

- Involves actions whereby the business seeks to offer higher quality and more efficient products and services to achieve higher turnover and hence greater profit than other manufacturers and traders.
- Competition stimulates efficiency by introducing innovation. Scarce public resources and limited demand necessitate the introduction of new ideas, methods, tools, knowledge and experience that, under the influence of competition, provide businesses with high performance and success in competitive struggle.
- The market raises the drive for greater profit and maximizing profits. It forces manufacturers to implement the latest advances in science and technology, creating conditions for increasing production efficiency. Universal competition is a prerequisite for thriving the one who is quicker and best adapted to changes in consumer demand and most effectively introduces the latest advances in scientific and technological progress by reducing production and labor costs.

1.4. Analysis of the company's competitiveness

The research and analysis of the competitiveness of a company is carried out at three levels - national (macro level), sectoral and company level. It can take place both in the order and in the opposite direction: company, industry, national level. The relationship of the analysis levels with the analysis tools is presented in Fig. 1.

At national level, the Porter Diamond tool is most commonly used to analyze competitiveness. The four main tips in the "diamond" are: Factors of production; Demand conditions; Connected and supporting industries. Company strategy. Structure and competition.

The elements are: Competition between existing companies; The threat of new firms entering; The emergence of substitute products; Contractual power of suppliers; The contractual strength of customers is directly reflected not only on the particular firm, but also on the competition in the industry, which may cause a direct clash between different companies. As a result of the sectoral level analysis, we need to get an evaluation of the competitive advantage over the rivals.
At company level, the competitive advantage can be determined by the following methods:

**Competitive triangle** - is a comparison with the leading competitor. It is often used also the abbreviation three K (client, company, competitor). The competitive triangle reflects the fact that the consumer perceives the value offered by a particular company and its main competitor.

**Value chain.** It uses the system approach to form the market advantage of the company. It divides company activities into two types: primary and secondary.

At the industry level, the "Porter's Five Force Model" is the most widespread [2]. Its main

**Benchmarking method - drawing up a profile of competence.** The method allows for ongoing monitoring of the main rivalries and comparison with customer requirements, not the establishment of the results after the occurrence of the unfavorable events or at the end of a certain period [3],[9].

In the current conditions of increasing competition between rivals, the idea of the dynamic nature of competitive advantage and hyper-competition is becoming more and more popular [4],[10]. These models emphasize the speed and aggressiveness of the action taken and the countermeasures in the particular market, resulting in competitive advantages quickly becoming eroded.

**Hyper-competition.** The model is based on the following prerequisites. Any competitive advantage may be copied or undermined by other market participants. Once overcome, it becomes a burden. Blindly following the idea of maintaining the market advantage can be a fatal delusion because the pursuit of perfecting the advantage diverts attention from the formation of a new competitive advantage. Overtaking of the immediate competitors is not once established forever. It represents a number of small steps, each of which allows to undermine, destroy the advantage of the opponent or build the next competitive advantage before eroding the present. In this direction, the following strategies can be implemented:

1. **The strategy of undermining the market advantage** includes two elements: consumer satisfaction and strategic prediction (prediction). They help to explore in more detail the requirements of current users or to open new customers whose needs are not satisfied. This strategy can also be used by the market leader, and in this case, it will be possible for him to preserve his position [1].

2. **The tactic of erosion of the market advantage** includes three types of possible actions: changing the game's rules - the conditions of competition by opening new ways of servicing consumers; disclosure of strategic intentions - to drive action and track competitors' responses; simultaneous and consistent attacks on rivals to confuse and block their efforts to maintain the market advantage. These actions shape the direction or nature of the response of competitors.

3. **The possibilities of undermining the competitor's market advantage** are two: speed and surprise. Positioning the product and brand with the ability to reposition it as quickly and in a way that will surprise the competition.
**Exploration**

The survey of was conducted between September of 2018 and February of 2019 among companies of various food industry subsectors and sizes. The survey is based on open and closed questionnaire distributed by email. A questionnaire was used to collect data from a sample of 198 enterprises which were selected through stratified random sampling method from all subsectors of Bulgarian food industry.

Respondents are representatives of all major subsectors of the food industry in Bulgaria and their relative shares are shown in figure 2.

![Figure 2. Share of respondents from food subsectors in Bulgaria](image)

It appears that the largest share is the respondents representing the subsector - production of other food products - 35%; followed by representatives of the meat processing industry - 19%, the dairy sector - 15%, followed by preserved plums and vegetables - 11%, canned fish - 8%; the production of vegetable oil and animal oil - 6%, manufacturer of beverages are 4%, and with the smallest share being the respondents-bakers and producers of starch products - 2%.

**Table 1. Determining the nature of competition in Bulgarian food industry**

| Manufacture of food products | Widespread indicators | The nature of competition |
|------------------------------|-----------------------|---------------------------|
|                              | the concentration ratio of leading firms | Herfindal-Hirschman index |                          |
| 1. Meat production and processing | 48 % | HHI < 1 000 | Competitive market |
| 2. Diary production | 62 % | 1 000 < HHI < 1 500 | Slightly monopolized market |
| 3. Processing and preserving of fruits and vegetables | 79% | 1 500 < HHI < 2 500 | Moderately monopolized market |
| 4. Production of vegetable and animal oils | 82% | 1 500 < HHI < 2 500 | Moderately monopolized market |
| 5. Processing and preserving of fish and other aquatic animals | 99% | HHI = 10 000 | Full monopoly |
| 6. Manufacture of other food products | 45 % | HHI < 1 000 | Competitive market |
| 7. Manufacture of grain mill products and starch products | % | HHI > 2 500 | High concentration of monopoly power |
| 8. Manufacture of beverages | 52% | HHI < 1 000 | Competitive market |

We applied the quantitative method to measure market conditions for determining the nature of competition in Bulgarian food industry (see Table 1).
The analysis of the survey results shows that the meat industry companies in Bulgaria are operating under conditions of monopolistic competition. Dairy firms are operating under a slightly monopolized market, with the concentration ratio of leading firms CP > 40%, which is indicative of working in oligopolistic competition. Companies in the beverage sector in Bulgaria, as well as those from the sub-sector of other food products, operate under conditions of monopolistic competition. Companies in the canned fruits and vegetables sector and the production of vegetable and animal oil work in a moderately monopolized market. The companies from the subsector of grain mill manufacturing and starch products works in the condition of high concentration of monopoly power.

2. Conclusion
The most important sectors (meat processing, production of other food products and beverage production) are identified as well as those with the best prospects from an economic point of view (canned fruits and vegetables, vegetable and animal oil, dairy products). An analysis of the industrial structure and the market conditions in which they work is carried out. As a result of the survey, it has been established that the food industry in Bulgaria is experiencing difficulties in marketing and innovation activity, offering products that meet specific consumer needs, using modern methods of analysis, applying management practices, building on voluntary standards. The conclusion is that the main subsectors of the food industry in Bulgaria are operating in the conditions of monopolistic competition, which requires the adoption of concrete strategic decisions for affirming their competitive advantages and expanding the market positions.

Acknowledgements
The authors would like to thank the Research and Development Sector at the Technical University of Sofia for the financial support.

References
[1] Porter M., (2004) „The Competitive Advantage of Nations“, Ed. Classics and Style
[2] Vladimirova, J. (2012), “Competition and Competitiveness of Commercial Companies”, Avangard Prima. Sofia
[3] Ganchev D. and Naidenov S.,(2018), Bulgarian Industry and Technology Challenges. Eleventh International Scientific Applied Conference "Digital Economy and Blockchain Technology"- Varna, ISBN 978-619-7026-28-3; pp. 203-209
[4] Mihova, T., Angelov, K., (2018), Research on interactions among universities and high-technological enterprises at qualification of employees, IX National conference with international participation ELECTRONICA, Sofia
[5] Tepavicharova, M., (2016), “Possibilities of benchmarking for measuring the effectiveness of the human resources management in the organization”, In: KNOWLEDGE, International Journal Scientific papers, Vol.15.2, p. 549 – 554, ISSN 1857-92
[6] Londev A.,(2015) „Fiscal Stability of the Economy“, Yearbook of the Higher School of Security and Economics, Plovdiv, vol 12, ISSN 1313-8472, pp. 197-206
[7] Angelova, M., Pastarmadzhieva, D. et al (2017) “Innovative model for business financing in the area of wine production”; International scientific conference „Applied Modeling in Economics, Finance and Social Sciences“ 27-31.08.2017, Hisar, Bulgaria, bhttp://dataconferences.org/page/publications
[8] Zlatanova-Pazheva, E., Survey of food preferences of children and teenagers in Southern Bulgaria, Scientific works of University of Food Technologies-Plovdiv, 2016, Volume 63, Issue 2, p. 321-327
[9] Ganchev D.,(2016), “Prospects for Economic Growth of the Bulgarian Economy”, International Scientific Conference "Economic Welfare through Sharing Knowledge", 80th Anniversary of "D. A. Tsenov", November 9-10, Svishtov, vol. 1, ISBN 978-954-23-1185-0; pp. 217-222
[10] Kulova, I.,(2016), “Challenges in front of pricing policy of the companies in bulgaria at the beginning of 21st century”, Міжнародної науково-практичної конференції: «Досягнення науки в 2016 році», Центр наукових публікацій, Київ, ISSN: 5836 – 4978, pp. 126-128