



Evaluating the Competitiveness of Non-financial Corporations by Modeling Sales

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ABSTRACT

The objective of this paper is to assess the competitiveness of non-financial business entities, which are defined by NACE Rev. 2 division 26 as the Manufacture of computer, electronic and optical products, and by NACE Rev. 2 division 27 as the Manufacture of electrical equipment. Data were obtained from the Register of Financial Statements of the Ministry of Finance of the Slovak Republic and from the financial statements of the studied companies. The survey sample consists of 138 non-financial corporations based on the amount of sales generated in the period 2016-2017. This paper is devoted to the issue of financial models in the evaluation of non-financial corporations with the aim of increasing competitiveness in the electrical engineering industry. An analytical view of competitiveness is provided based on the number of competitors in the electrical engineering industry. Selected factors are used to model the volume of sales of non-financial corporations in this industry. The production function model is used to quantify the concentration measure expressing the growth of a company's market share. The competitiveness factor is determined for non-financial companies based on the multiple regression and production function. The concentration rate is assessed through the Gini coefficient of concentration. It quantifies the growth of the company's market share and hence its hierarchical position on the market. By modeling the volume of revenue produced by each company, through the competitiveness factor, the results of analyses have shown which non-financial corporations in the electrical engineering industry are the most competitive and least competitive.

INTRODUCTION

The electrical engineering industry (EEI) has a long tradition in Slovakia. This industry is a priority sector with products of high and medium-high technology both having high added value.

Based on the data of the Statistical Office of the Slovak Republic in 2010, 2437 enterprises were registered in the EEI. The importance of this industry for the national economy is due to the creation of added value, in particular, the added value of the employee. This industry is one of the most important contributors to the creation of gross added value with regards to industrial production (11.56%) in general, and even more so with large employers with a share of 12.54% in industrial production. Continued positive growth in the future would indicate an increase in the share of newly created revenue. In the field of material and energy recovery and return on costs, EEI contributes little to the industrial production, but there exist prerequisites for further development as EEI has a high reserve of liabilities coverage by equity and above-average liquidity. The aim of this paper is to assess the competitiveness of Slovak non-financial corporations of EEI.

1. THEORETICAL BACKGROUND

Competitiveness can be monitored at different levels, from different perspectives and different criteria. It can be defined from various points of view, such as economic, marketing, management, and so on. Competitiveness has been assessed by many authors through a lot of definitions and models, for example by H. Kruk and A. Wasniewska (2017); K. Aiginger, S. Bärenthaler-Sieber and J. Vogel (2013); A. Balaz, A. Hamara and G. Sopkova (2015); E. Kislingerova et al. (2011, 2014); Krugman (1991); Mikolas et al. (2011). At both the macro and micro levels, the concept of competitiveness studied, for example Balaz, Hamara and Sopkova (2015). Horvathova and Mokrisova (2017) stated that "microeconomic competitiveness can be assessed based on the quality of business environment and strategies of business performance". The problem of defining the concept of the competitiveness of national economies with regards to their international dimension is dealt with by O. Krpec and V. Hodulak (2013).

The main focus of this paper is based on the concept of company-level competitiveness in the industry. The concept of business-level competitiveness represents the ability to consistently and positively deliver the products and services that customers prefer over those of competitors. At the company level, the concept is based on the ability of companies to continually and profitably produce products and services that are successful in open markets. Any company that wants to maintain a position in the market or grow must meet these requirements, while more competitive companies gaining more market shares. On the other hand, uncompetitive companies, despite the various protective measures that are provided to them, will eventually have to leave the market (Korec, Macanga and Sopkuliak, 2011).

E. Kislingerova et al. (2014) emphasizes that, in the modern economy, competitiveness is not something that a business, an entrepreneur, a region or a state can control once and for all, but rather the opposite is true. In many cases, innovation, production quality or the ability to apply information technology is often cited as a factor for the competitiveness of business entities. In reality, however, the competitiveness of companies is correlated with different assumptions and factors, the structure of such components being based primarily on the immediate geographic, trade union and national economic situation of the enterprise. Kislingerova et al. (2014) further explains that according to R. Brealey and S. Myers (1998), "*there is no capital ratio that would be given by God, there is no recipe for a competitive cocktail*".

E. Kislingerova et al. (2011) describes innovations in the context of increasing the competitiveness of enterprises. Authors points to a significant impact on increasing the competitiveness of an economy by the importance of innovative business activities from universities (spin-off firms) and the importance of academic entrepreneurship. I. Jac, P. Rydvalova and M. Ziska (2005) define competitiveness as the ability of companies, industries, regions, nations and transnational regions to generate a high level of income and employment. Businesses are able to compete with their market rivals if they achieve sustained labor and productivity growth. Competitiveness determinants seem to be contradictory in the short run, but in the long run, in particular, innovation and

the development of enterprise information systems are important in the process of creating a competitive strategy. Thus it reduces unit costs and improves the related competitiveness of the business in comparison with other firms.

P. Krugman (1991) tried to answer the question of what are the causes of the concentration of industry and economic activities in general in several key regions in a country, which in turn leads to significant regional polarization. He stated that raising revenues, transport costs and the importance of industry in the economy are the main three factors of localization behavior of the company. With the growth of importance of the given industry in the state economy, there is a growing tendency towards polarity. P. Korec, M. Macanga and A. Sopkuliak (2011) dealt with regional competitiveness. In any business environment, there is a large amount of intangible, tacit knowledge of the region's resources that cannot be found in statistics or in various reports and analyzes. According to E. Kacirkova (2015), the most commonly applied definition of competitiveness, both at the microeconomic and the macroeconomic levels, is the tautological expression of the definition, in which competitiveness is the ability to compete, to face competition and survive its pressures. According to M. Porter (1994), competitiveness is based on identifying and exploiting competitive advantages that respect the specifics of the economy and its individual sectors. A competitive advantage results from the value that an enterprise is able to generate for its customers. It focuses on low cost and differentiation.

The competitiveness in the Slovak economy was studied by A. Balaz, A. Hamara and G. Sopkova (2015, p. 62-63), who provided in their scientific paper several definitions of the competitiveness concept, from which we have chosen the definition from the Report of the Select Committee of the House of Lords on Overseas Trade (1985): *"The company is competitive if it is able to produce products and services of better quality, with lower costs than domestic and foreign competitors. It is synonymous with its long-term profitability, its ability to reward employees and achieve higher returns for its owners"*. Besides that B. Scott and G. Lodge (1985) provided the following: *"National Competitiveness refers to the ability of the country to create, produce and distribute products in international trade to increase returns to its sources"*. P. Buckley, C. Pass and K. Prescott (1988) wrote: *"Competitiveness includes the ability (achieving goals at the lowest possible cost) and efficiency (setting the right goals). In this selection of industrial objectives, these are crucial. Competitiveness includes both goals and means to achieve them"*. Further definitions of competitiveness provided by Balaz, Hamara and Sopkova (2015) are presented in Table 1.

Table 1. Definitions of competitiveness

Definition of competitiveness	Source
"Competitiveness implies elements of productivity, efficiency, profitability. But it is not an end in itself or a target. It is a powerful means to achieve rising standards of living and increasing social welfare - a tool for achieving targets. Globally, by increasing productivity and efficiency in the context of international specialisation, competitiveness provides the basis for raising peoples' earnings in a non-inflationary way."	Ciampi et al. (1995)
"Competitiveness should be seen as an essential tool for raising standards of living, providing jobs to the unemployed and reducing poverty."	Ciampi et al. (1995)
"Competitiveness is the ability of companies, industries, regions, nations or supra-national regions to generate, while being and remaining exposed to international competition, relatively high factor income and factor employment levels."	OECD (1996)

Source: Balaz, Hamara and Sopkova (2015)

"Competitiveness is relative and not absolute. It depends on the values of shareholders and customers, the financial strength that determines the ability to act and react in a competitive environment, and the potential of people and technology to implement the necessary strategic changes. It can be sustainable only in the case of a certain balance between these factors" (Feurer and Chaharbaghi, 1994). According to the OECD (1996), *"Competitiveness is defined by the ability to produce goods and services that compete in the test of international competition and, at the same time, show the ability to maintain or increase real GDP. Competitiveness is the level at which a nation is able to produce goods and services in a free market and good competitive conditions while meeting the requirements of the market and simultaneously maintaining or, increasing the level of real income of the population over a long period."*

The current and future ability and opportunity for business entities to compete is based on their ability to create products whose price and non-price quality will be more attractive than foreign and domestic competitors. The ability of a company to sustain a long-term trend in competitiveness is dependent on its ability to generate goods and services based on the needs of international markets and these markets' ability to achieve a defined standard of living for their population.

By using the econometric version of the Constant Market Shares Analysis, P. Cekmeova (2016) explains, in detail, the relationship between the competitiveness of the Czech economy and its export potential by applying the concept of external and aggregate competitiveness as two dimensions of national competitiveness. E. Kacirkova (2015), in her scientific work, mentions the factor of competitiveness according to the Institute for Management Development IMD, while the efficiency of the enterprises is determined by 71 factors, namely productivity (11), labor market (24), finance (20), management (9), approaches and values (7). It focuses on assessing the country's competitiveness based on the World Economic Forum's competitiveness index, emphasizing that the competitiveness of the country is influenced not only by economic but also by non-economic factors, especially in countries with a highly developed market economy.

2. THE MOST IMPORTANT NON-FINANCIAL CORPORATIONS IN THE ELECTRICAL ENGINEERING INDUSTRY

Non-financial corporations in the EEI are one of the largest employers in the industry and the second most important exporter. There are a few domestic businesses in Slovakia (e.g. Avex Europe, OMS Dojc, Tesla Stropkov, Tesla Liptovsky Hradok), which until recently grew thanks to metalworking shops. Slovak companies successfully supply electrical engineering giants such as Dana, Eltec, Vyklad Schabel or Samsung, but they cannot find the so-called *"blue oceans"* of growth that W. Kim and R. Mauborgne (2005) mentioned as new and unique market opportunities. Own innovations with market success are an exception to the rule. If this trend continues and if these businesses do not disappear, they will be bought by foreign investors, who will not have any interest in development of more sophisticated activities, and will only support assembly line production.

S. Ferencikova et al. (2013) addresses the international expansion of a company, analyzes, in detail, the largest company Samsung Electronics Slovakia, Ltd., Galanta, as an example in its genesis and its manufacturing. The total value of the investment was SKK 3.001 billion (EUR 99.6 million). Samsung did not receive investment aid, but it received total state aid of € 36.4 million. In addition to this, the company received a substantial component (96%) of aid in the form of a tax allowance of more than € 35 million. The remainder of the aid was aid for newly created sites worth € 1.2 million. Of the total investment, the share of state aid was 36%. In 2016, Samsung Electronics ranked 5th among the largest companies, 12th as the largest taxpayer and 16th as the largest in terms of employment. In 2016, the company gained the largest share of the global market through cutting edge technology and innovative design, which strengthened its unrivaled

leadership in the field of flatscreen televisions and monitors. It also extended its portfolio of mobile devices, focusing on the development of a new generation of products.

Foxconn Slovakia, Ltd., Nitra, is among the world's leading manufacturers of laptops, TVs, digital cameras, gaming consoles, and so on. In terms of production capacity, it is the largest supplier of LCD TVs for the entire European market. As part of the group of the largest companies in the Slovak Republic, it holds a leading position. Export development of Samsung Electronics Slovakia, Ltd. and Foxcom Slovakia, Ltd., is shown in Figure 1.

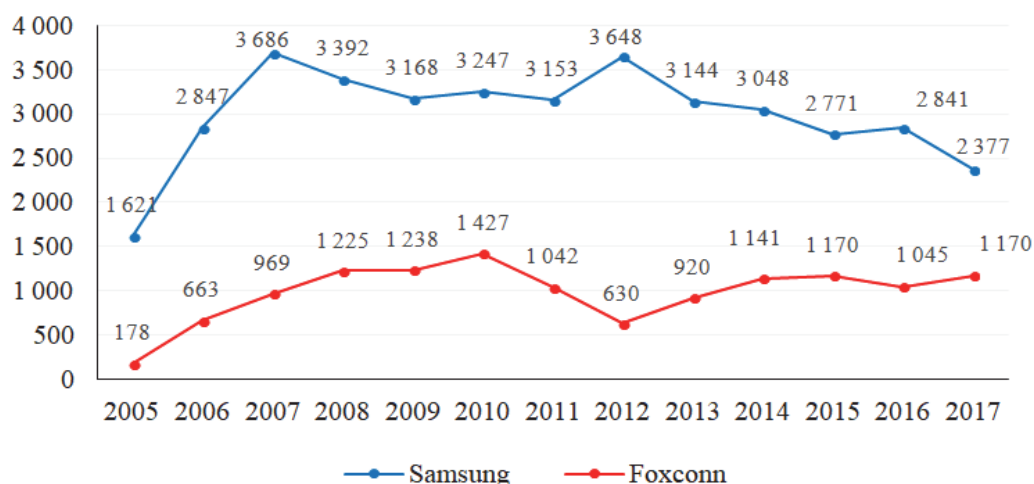


Figure 1. Export Development of the Largest Corporations of EEI (EUR Thous.)

Source: own processing

Whirlpool Slovakia, Ltd., Poprad, is a manufacturer of white goods, household appliances and household equipment for more than 100 years. It focuses on the development of the exclusive technology 6. MILLING™. ZKW Slovakia, Ltd., Krusovce, is one of the leading strategic partners of the automotive industry in the North American Free Trade Agreement (NAFTA) region and a specialist in innovative premium lighting systems and electronics. ZF TRW, Ltd., Nove mesto nad Vahom, focuses mainly on personal and operational safety in automobiles, and is a leader in the field of safety systems for the automotive industry. Visteon Electronics Slovakia, Ltd., Namestovo, focuses on the assembly and testing of instrument panels for customers such as BMW, Mercedes, Ford, PSA, Renault, Skoda and VW.

2. DATA

The research sample consists of a set of Slovak corporations of the EEI (units of the set) for the period 2016-2017. These are private non-financial corporations S.11002 (natural persons registered in the Business Registry and legal entities that are not controlled by public authorities or are not under foreign control; i.e., private entrepreneurs registered in the Business Register, public company, Limited Liability Company, limited partnership, privately owned Joint Stock Company); non-financial corporations under foreign control S.11003 (all non-financial corporations and quasi-corporations under foreign control; i.e., foreign persons registered in the Business Registry of the Slovak Republic, foreign companies (business companies) with foreign ownership or with predominant foreign ownership). Foreign control means the power to appoint a manager of a business by a

foreigner. Domestic legal entities with foreign ownership are included here in case, when the foreign capital is more than 50% or is the largest share of the registered capital in the corporation.

In order to meet the aim of the paper, 138 non-financial companies of the EEI took part in the analyses. The regional breakdown of these companies follows: 24 are in the Bratislava Region; 14 in the Trnava Region; 27 in the Trenčin Region; 23 in the Nitra Region; 25 in the Žilina Region; 6 in the Banská Bystrica Region; 12 in the Prešov Region; and 7 in the Košice Region. In terms of NACE Rev. 2 designation, the research sample consisted of 73 corporations in the NACE Rev. 2 division 27, and 44 corporations in the NACE Rev. 2 division 26. There are also 21 other companies split between NACE Rev. 2 division 33 (18) and NACE Rec. 2 division 22 (3). The breakdown in terms of ownership follows: foreign ownership is the largest (61); followed by private domestic ownership (51); international ownership (24); and domestic ownership (2). To estimate the model for 2017, data from 141 non-financial corporations were used.

Development of selected indicators of EEI divided by the NACE Rev. 2 divisions 26 and 27 is presented in Table 2.

Table 2. Development of Selected Indicators of the EEI

NACE	26	27	26	27	26	27
Year	Employment (People)		Labor Productivity from Revenue from Own Work and Merchandise (EUR)		Sales (EUR Thousand)	
2008	21670	35468	278950.12	71324.65	6044779.3	2529766.4
2009	21804	26840	282534.50	78070.68	6160382.3	2095379.6
2010	20493	26770	332597.69	88307.20	6816063.1	2369998.4
2011	18191	28295	333354.01	93252.49	6064126.2	2638594.8
2012	16499	26948	382609.47	99496.25	6312482.3	2681216.6
2013	16184	27205	365595.42	114470.84	5916765.8	3114188.8
2014	15208	29966	398445.21	112281.41	6059654.3	3364596.6
2015	14605	32139	406367.95	112627.93	5935173.3	3619758.6
2016	15248	33954	390115.48	111342.69	5948448.3	3780501.7
2017	15037	35793	370741.61	112236.39	5517997.4	3932994.0

Source: own processing

3. METHODOLOGY

3.1 Modeling Sales Volume Depending on the Influence of Selected Factors

Jencova, Litavcova and Vasanicova (2016) assess the competitiveness of non-financial corporations in the selected sector according to the several coefficients of competitiveness. According to the computed competitiveness ratios (e.g. the competitiveness factor k is determined as the ratio of the difference between real and model estimated revenues to the real revenues), non-financial corporations in the EEI are grouped into three groups (competitive non-financial corporations, less competitive non-financial corporations, non-competitive non-financial corporations).

According to Chajdiak (2015), competitiveness represents the relationship between the analyzed company and the environment of the analyzed company, with the environment being those companies that produce the same products and services as the analyzed company, or provide complementary products and services. The volume of realized sales is a practical manifestation of the company's competitiveness. Higher revenues indicate higher competitiveness and vice versa. The revenue generating factor is directly related to the amount of assets because the larger volume of assets represents the potential for generating more revenue and vice versa. One of the

other revenue generating factors is personal expenses, with the volume of sales being directly dependent on the amount of work that is quantified by the average number of workers in the firm. Higher volume of consumed work, i.e., the larger volume of personal consumption (SC) indicates a higher volume of sales and vice versa.

Revenues of the EEI, which indicate how successfully businesses operate, are determined by many factors. In the analysis of revenue modeling, sales represent net turnover. The net turnover (line number 01 in the Profit and Loss Statement) expresses the additive relationship between the status indicators that according to the financial statements are Revenue from the sale of merchandise (line number 03 in the Profit and Loss Statement), Revenue from the sale of own products (line number 04 in the Statement Profit and Loss), Revenue from the sale of services (line number 05 in the Profit and Loss Statement), and Revenue from the sale of non-current tangible and intangible assets and raw materials (line number 08 in the Profit and Loss Statement).

3.2 Application of the Cobb-Douglas Function

The relationship of sales volume (S) to personal (staff) costs (SC) and assets (A) can be quantified using Production Function (PF) as the equivalent of the Cobb-Douglas function according to (1). Estimated parameters β_1 , β_2 are the coefficients of relative elasticity and indicate how many percentages average increase the dependent variable (sales), if the independent variable (personal expenses, assets) increases by 1% under otherwise unchanged conditions.

$$PF(S) = \beta_0 \cdot SC^{\beta_1} \cdot A^{\beta_2} \quad (1)$$

The law of diminishing marginal returns can be applied only in the analysis of short-term production effects. In the long run, the company sees a growing, declining or constant rate of return caused by the change of the i -th variable input. Whether in a given situation and for a particular firm is a constant, increasing or decreasing rate of return is an empirical issue that needs to be addressed on a case-by-case basis. There is no unambiguous answer or identification rule. However, the determining factor is, in any case, the specific characteristics of the company's technological processes.

To estimate parameters β_0 , β_1 , β_2 , in this paper, we use regression analysis based on the logarithmic version of the model (2):

$$\ln(S) = \beta_0 + \beta_1 \cdot \ln(SC) + \beta_2 \cdot \ln(A) \quad (2)$$

3.3 Assessing the Competitiveness of the Company

The higher the difference $\Delta \ln(S_i)$ (3) between the actual and the estimated value of the revenues, the more competitive the i -th electrical engineering business entity.

$$\Delta \ln(S_i) = \ln(S) - \ln(\hat{S}) \quad (3)$$

The i -th ($i = 1, 2, \dots, n$) position of the electrical engineering company in the sample of the non-financial corporations of the EEI, according to the sales concentration, is determined by the coefficient of competitiveness (4).

$$k_{S,i} = \frac{\Delta \ln(S_i) - \Delta \ln(S_{min})}{\Delta \ln(S_{max}) - \Delta \ln(S_{min})} \quad (4)$$

The main indicators of a company's rating include the concentration rate quantifying the growth of market share and thus the hierarchical position of the market. It is judged by the Gini coefficient of concentration (G), according to the formula (5).

$$G = 1 - 2 \sum_{i=0}^1 (kfx_i - kfx_{i-1}) \cdot (kfp_i - kfp_{i-1}) \quad (5)$$

In the set of values, the moving values are ordered, the cumulative sums of the classical and moving variables of the analyzed variable (kfx_i), and the cumulative relative frequency of the relative average frequency (kfp_i) are calculated.

4. RESULTS AND DISCUSSION

The linearized model is quantified by logarithms of revenue, personal costs, and asset. On the basis of the estimated coefficients, the model for the period 2016 has the form $\ln(S)$, according to (2), and the production function is given in the form $PF(S)$, according to (1). The model does not contradict the theories under consideration; the sign of the coefficients are as expected.

$$PF(S) = 0.2119 \cdot SC^{0.4319} \cdot A^{0.7213} \quad (3)$$

If the amount of personal costs increases by one percent and the state of the assets remains unchanged, the volume of sales will increase by an average of 0.4319%. If the assets rise by one percentage point and the amount of personnel costs will remain unchanged then the volume of sales will increase by 0.7213%. Each of the inputs shows diminishing marginal returns.

The compliance rate of the actual and estimated revenue model is equal to 88.28% of the variability of the original model, but in the logarithm version. Since the calculated F -statistic (554.052) is greater than the critical value $F_{0.05}(2, 134) = 2.996$, we find that the model, as a whole, is statistically significant at a significance level of 5%. For the period 2016, the estimated confidence intervals for parameter β_0 is $P\{-2.635 \leq \beta_0 \leq -0.467\} = 95\%$; for parameter β_1 is $P\{0.288 \leq \beta_1 \leq 0.575\} = 95\%$; for parameter β_2 is $P\{0.596 \leq \beta_2 \leq 0.846\} = 95\%$. For the period 2017, the estimated confidence intervals for parameter β_0 is $\{-3.424 \leq \beta_0 \leq -0.841\} = 95\%$; for parameter β_1 is $P\{0.467 \leq \beta_1 \leq 0.841\} = 95\%$; for parameter β_2 is $P\{0.358 \leq \beta_2 \leq 0.707\} = 95\%$.

After evaluating the assumptions for using the model (Table 3), we verified the normal distribution of residuals. The multicollinearity was not confirmed, because Variance Inflation Factor (VIF) was less than 10. To verify homoscedasticity, a general White Test was used. The value of White statistics, for the 2016 period, is 18.902, and for 2017, it is 25.876. The values in both periods are greater than the critical value, $WH > \chi^2$, therefore, the test rejects the null hypothesis of homoscedasticity. Enterprises have a different size, which is a heterogeneous structure, in which we can assume heteroscedasticity.

To remove heteroscedasticity, it is possible to repeat the model estimation with robust estimates of standard regression coefficient errors, respectively, use a so-called "bootstrap". Coefficient values have not changed, but their significance have changed. After taking into account heteroscedasticity, the model can still be considered statistically significant at the significance level $\alpha = 0.05$. The above indexes ^{a, b, c, d} in Table 3 express the significance of Wald's statistics at $p < 0.1$; $p < 0.05$; $p < 0.01$; $p < 0.001$.

Table 3. Estimated Regression Models

	2016	2017
<i>Constant</i>	-1.551 ^b	-2.132 ^c
<i>ln (SC)</i>	0.431 ^d	0.672 ^d
<i>ln (A)</i>	0.721 ^d	0.532 ^d
<i>Coefficient of Determination</i>	0.892	0.90
<i>White Test for Homoskedasticity (p-value)</i>	0.002	0.000
<i>Maximum VIF</i>	3.925	3.630
<i>Akaike Information Criterion</i>	245.705	259.966
<i>Hannan-Quinn Information Criterion</i>	249.265	263.561
<i>Schwarz Information Criterion</i>	254.465	268.813

Source: own processing

In the set of 138 non-financial corporations of the Slovak EEI, according to the sales concentration in 2016, the Gini coefficient $G = 0.985$ represents a high concentration value (for comparison, in 2013 $G = 0.968$). Many companies have small sales and some companies have very high sales. Figure 2 shows the Lorenz curve. The coefficient of concentration is the difference between the area of the triangle and the area bounded by the Lorenz curve. It illustrates the situation, where the closer the curve approaches the diagonal, the lower the concentration, and vice versa. The closer the curve approaches the x-axis, the greater the concentration (the phenomenon signals the monopolistic position of large companies in the EEI).

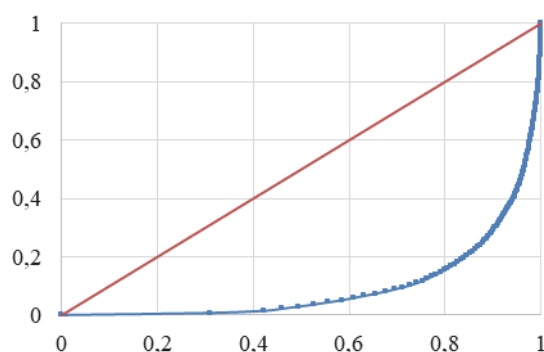


Figure 2. Lorenz Curve

Source: own processing

In 2013, the most competitive were the non-financial corporations Vicente Torns Slovakia, Inc., Velke Kosihy with a coefficient of competitiveness (1); TRW Automotive (Slovakia), Ltd., Nove Mesto nad Vahom (0.84); Dometic Slovakia, Ltd., Fil'akovo (0.837); BSH Drives and Pumps, Ltd., Michalovce (0.833). The less competitive companies include OVP Orava, Ltd., Trstena; Progyr, Ltd., Kosice (0); BBF elektro, Ltd., Spisska Nova Ves (0.1). In 2015, the most competitive non-financial corporations were Hansol Technics Europe, Ltd., Voderady (1); Topaz LGP, Ltd., Piestany (0.84); Seong Ji Slovakia, Ltd., Bratislava (0.82); Nuritech SK, Ltd., Hurbanovo (0.8); Foxconn Slovakia, Ltd., Nitra (0.77). In 2016, the most competitive Hansol Technics Europe, Ltd., Voderady (1.0); Seong Ji Slovakia, Ltd., Bratislava (0.789); Nuritech SK, Ltd., Hurbanovo (0.742); Topaz LGP, Ltd.,

Piestany. Among the less competitive companies are Elteco, Inc., Zilina (0); AU Optronics (Slovakia), Ltd. (0.07), Trencin; and Kiwa, Ltd., Trnava.

The figures in brackets indicate the achieved coefficient of competitiveness for the company that was calculated according to (4). Table 4 lists the largest non-financial corporations in the Slovak EEI for 2017 ordered according to the generated sales. For each corporation, there was calculated coefficient of competitiveness k (4), production function PF (1), and Gini coefficient of concentration G (5).

Table 4. Selected Indicators of Non-financial Corporations of the Slovak EEI for 2017

<i>Non-Financial Corporations ETP</i>	<i>Sales</i>	<i>k</i>	<i>PF</i>	<i>G</i>
Samsung Electronics Slovakia, Ltd., Galanta	2377288000	0.800	1292717111	0.001909
Foxconn Slovakia, Ltd., Nitra	1169773000	0.917	395845320	0.000939
ZKW Slovakia, Ltd., Krusovce	362653000	0.583	476168319	0.000291
TRW Automotive (Slovakia), Ltd., Nove Mesto nad Vahom	290192582	0.894	107709227	0.000233
Whirlpool Slovakia, Ltd., Poprad	277159000	0.673	252388999	0.000223
Visteon Electronics Slovakia, Ltd., Namestovo	262935083	0.903	93896212	0.000211
Hella Slovakia Signal-Lighting, Ltd., Banovce nad Bebravou	254857000	0.504	462091358	0.000205
Datalogic Slovakia, Ltd., Zavar	208350676	0.865	87047510	0.000167
Panasonic Industrial Devices Slovakia, Ltd., Trstena	206281258	0.686	178111667	0.000166
BSH Drives and Pumps, Ltd., Michalovce	203836262	0.732	146128368	0.000164
Universal Media Corporation /Slovakia/, Ltd., Bratislava	202725402	0.934	64071819	0.000163
Leoni Slovakia Ltd., Trencin	185906964	0.520	315765504	0.000149
Hella Slovakia Front-Lighting, Ltd., Kocovce	177975000	0.556	260688253	0.000143
Elster, Ltd., Stara Tura	142976230	0.731	103008430	0.000115
Semikron, Ltd., Vrbove	112913512	0.773	68479706	0.000091
Osram, Inc., Nove Zamky	103933883	0.621	117099104	0.000083
KraussMaffei Technologies, Ltd., Sucany	90727920	0.746	61476676	0.000073
Enics Slovakia, Ltd., Nova Dubnica	80104142	0.740	55513092	0.000064
Shin Heung Precision Slovakia, Ltd., Saľa	75733371	0.837	35491768	0.000061
Delta Electronics (Slovakia), Ltd., Dubnica nad Vahom	72843032	0.571	100646512	0.000058
Siix Ems Slovakia, Ltd., Nitra	67690445	0.766	42208224	0.000054
Eltek, Ltd., Liptovsky Hradok	66885481	0.742	46045830	0.000054
PPA Energo, Ltd., Bratislava	66108778	0.551	99076238	0.000053
Vicente Torns Slovakia, Inc., Velke Kosihy	63366417	0.906	22428904	0.000051
PPA Controll, Inc., Bratislava	61661406	0.825	30241872	0.000050
ABB, Ltd., Bratislava	57453359	0.764	36136979	0.000046
Seong Ji Slovakia, Ltd., Bratislava	56801825	0.998	13826887	0.000046
Dometic Slovakia, Ltd., Filakovo	51443066	0.909	17947742	0.000041
Vertiv Slovakia (Emerson, Inc.), Nove Mesto nad Vahom	48316288	0.312	190877681	0.000039
OMS, Ltd., Dojc	48249570	0.556	70647462	0.000039
LEONI Cable Assemblies Slovakia Ltd., Bizlink Trencianska Tepla	48125646	0.670	44360139	0.000039

Robertshaw (Elektronika Slovensko), Inc., Trnava	43529469	0.782	25458315	0.000035
Askoll Slovakia, Ltd., Potvorice, NMnV	42751912	0.614	49612600	0.000034
Sensus Slovensko, Inc., Stara Tura	39576366	0.754	25978898	0.000032
Branson Ultrasonics, Inc. Nove Mesto nad Vahom 2016	37581909	0.593	47435210	0.000030
Bel Power Solutions, Ltd. (Power One), Dubnica nad Vahom	35949060	0.581	47702045	0.000000
Hydac Electronic, Ltd., Tvrdosin	35403139	0.653	35049993	0.000028
Bauer Gear Motor Slovakia, Ltd., Zlate Moravce	32127743	0.639	33691006	0.000026
Elster Water Metering Ltd., Stara tura	30854548	0.737	21674069	0.000025
Honeywell, Ltd., Bratislava	30825587	0.637	32518504	0.000000

Source: own processing

There are a number of factors or assumptions of the competitiveness of enterprises, and many of them are defined as essential in a number of management models (Kislingerova et al., 2014). The main impact on competitiveness will always have the correct decisions of the business managers or the proper decisions of the entrepreneurs themselves, i.e. their strategy and tactics. None, even a thoroughly crafted management and modern management guide will ever reduce the responsibility of the company's executives for their decisions. The quality of these decisions will be the main determinant of competitiveness. Good results are achieved by companies that do not underestimate their innovation, research, patents and development spending (for example, Samsung, Ltd.).

CONCLUSION

Based on the size of EEI decision-making units, according to the volume of sales, competitiveness was assessed through multiple regression models, where the competitiveness coefficients were then quantified and included into groups of competitive, less competitive and uncompetitive decision-making units. The relationship of sales volume to personal costs and assets was determined using production function as the equivalent of the Cobb-Douglas function. The companies' ratings were assessed using the concentration rates determining the growth of the market share of the companies and thus the hierarchical position of the market through the Gini coefficient of concentration, which represented a high concentration value. Many companies have small sales and some companies have very high sales. The concentration of sales has an objective growth in the process of developing the market economy, while the growth of the economy is objectively linked to the growth of market share, which may lead to the monopolization of the economy.

A broader economic outlook requires comparisons of revenue growth with the development of production across the industry by looking at the inequality of the index of industrial sales development of business entities, the industrial sales development index, and the production volume index of the gross domestic production method. In the field of strengthening production, it is essential to ensure the optimal use of aid to increase the competitiveness of the industry, especially in increasing the efficiency of materials and energy recovery through the innovation of processes and products of industrial production. There are a number of factors or assumptions about the competitiveness of businesses, and many of them are defined as essential and decisive in a number of governance models, bearing in mind that even their compliance does not mean that success will be achieved. "Financial performance of an industry or a company is very important for the management" (Dluhosova, Ptackova and Richtarova, 2017). It is "affected by many microeconomic as well as macroeconomic factors" (Michalkova et al., 2018). According to I. Pauhofova and B. Stehlikova

(2017), the regional level and the factor of time will be an important factor in ensuring the competitiveness of enterprises. Enhancing competitiveness is desirable for an optimal investment rate in the industry, which is currently insufficient to sustain the development trend.

According to experts, if entrepreneurs want to be competitive in the future, they need to focus on investing in Industry 4.0 and Smart Technology, and to focus on the development of digitization, automation and virtualization. From the large companies in the EEI, Siemens, and Bosch use the elements of Industry 4.0, with an increasing share of their strategic and research program invested in these systems. It is an exceptional research and development center, the only center for this kind of human resource utilization, where interesting software products are constructed for Siemens. According to Pauhofova and Stehlikova (2017), the fourth industrial revolution, processes of digitization, shared economy, shrinking economy and greening are already leading to the transformation of traditional production systems and a change in the understanding of production, services and consumption. Automation is associated with technological unemployment. It is estimated that this will be 56% of the work activities in the automotive and electrical engineering industries.

In the case of electrical engineering enterprises, taking into account seasonal impacts (e.g. summer production depreciation, production assortment as well as situations in particular countries, concerns about the slowdown of the Chinese economy, the conditions in which the United Kingdom will emerge from the European Union, the Russian-Ukrainian conflict, etc.), the share of the total production of the industry is increasing. In this sector, companies with a considerable growth in sales and value added need to be highlighted, such as Visteon Electronics Slovakia, Ltd., Namestovo, which produces dashboards; ZKW Slovakia, Ltd., Krusovce, which produces lights for most European car manufacturers; TRW Automotive (Slovakia), Ltd., Nove Mesto nad Vahom, which manufactures power steering; and Hella Slovakia Signal-Lighting, Ltd., Banovce nad Bebravou, which focuses on the production of lights. These companies sell to the growing automotive industry.

Industrial production and EEI offers many opportunities that can be used to change certain business environment settings by reducing the administrative and regulatory burden on businesses. The investment in science, research and innovation should provide a major boost to the performance of EEI. It would motivate firms to support and expand production with higher added value. One of the key factors in the decision to place the investment of the state-of-the-art European Minebea Electrical Engineering Plant in Kosice, which includes the Research and Development Center, was the presence of the Technical University in Kosice, the Faculty of Electrical Engineering and Computer Science, which is capable of preparing people for the development of research centers as needed. In support of the EEI, the effective setting-up of European funds and their strong focus on the financing of applied research in companies, geared to real development and production problems of electrical engineering companies, would help. Currently, investment in the EEI is the lowest in the economy, significantly lower than in the engineering or automotive industries.

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