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The Impact of the Deteriorated Political and Security Situation on the Financial Stability of Arms Companies Operating in an Oligopolistic Market Environment

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Abstract

Economic measures, stability, efficiency, and effectiveness of arms expenditure are among the sources of national defense. The technological level of the industry, the ability of firms to carry out their development and innovation, together with the state's ability to specify and acquire requirements for new technologies promptly, in the short and long term, form the structure of factors that significantly determine success in a potential war conflict. This paper, conducted by a team of experienced researchers, aims to assess whether and to what extent the current deteriorated international and security situation impacts the employment and revenues of selected arms companies in the Czech Republic. The paper presents the results of the first research phase on 18 technological arms companies, commercial firms or manufacturers of technologically advanced products, which have been operating on the market of special military and security equipment for a long time. In the case study, we present a qualitative analysis of the impact of government demand and human and material capital on the level of potential products.

KEY WORDS: *capacity of the arms industry, comparative advantage, defense, development and innovation in the arms industry, oligopolistic market environment, research.*

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1. Introduction

The current state of the arms industry in the Czech Republic is a consequence of the transformation processes after 1989. Many state-owned companies are being broken up into private economic entities. The state-owned technical research institutes remain, but apart from research and development, they enter the market with their production and thus create competition for the private sector. On the demand side, there have been a series of successive reorganisations of the armed forces, accompanied by a sharp decline in the number of members of armed forces units and establishments. The international political situation is assessed as favourable to the peaceful coexistence of countries in Europe, irrespective of NATO or Warsaw Pact membership. The outbreak of a military conflict in Europe is not foreseen for a long time. The exceptions are the Balkan wars of 1991-1994 and the Kosovo War in 1999, culminating in the bombing of Yugoslavia. However, there is currently an escalation of the conflict between Ukraine and Russia, which two milestones can characterise, the occupation of Crimea in 2014 and Russia's armed entry into Ukrainian territory in 2022 [1,2,3].

The reduction of the armed forces affects the general demand for weapons systems. The overall situation since 1993 can be characterised as a disproportion between the development of the Czech Republic's national wealth and the trend in the acquisition of weapons systems for its defence (see Figure 1).

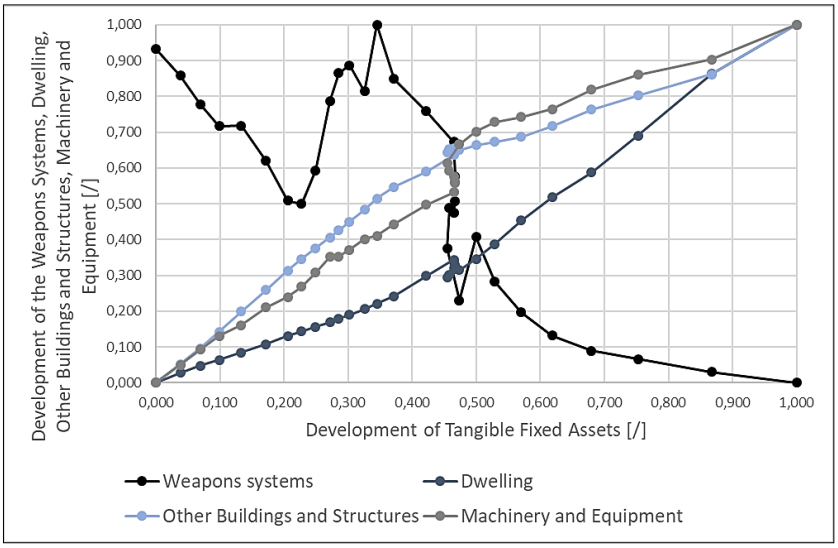

Fig. 1. Wealth development of the Czech Republic and acquisition of weapon systems until 2023. Data are normalised to the unit vector [7].

Given the above, especially with the emphasis on the deteriorating international security and political situation, it is important to address the capabilities of the domestic industry to provide such equipment with weapon systems and other segments of the arms product portfolio that correspond to the current situation, characterised by an increased likelihood of the outbreak of a so-called hot armed conflict. This is also the motivation for the research described below. [4,5,6]

2. Formulation of hypothesis

The basic idea of the article is that the negative change in the international and security situation in Europe impacts the economy of economic entities involved in arms production.

The hypothesis is formulated as follows: "*The worsened political and security situation has an impact on employment and revenue levels of arms companies in the Czech Republic, so that employment and revenues of arms companies are steadily increasing.*"

3. Literary research

The Ministry of the Interior of the Czech Republic (2024) defines the concept of defensibility as "The ability of a state to secure its sovereignty, territorial integrity and constitutional establishment against any military threat. It is achieved through international political, security, economic, protective, technical and other measures" [8]. In terms of the topic under study, the economic measures in the above quotation have particular relevance in terms of the specification of the state's demand for arms production. Defensiveness as a concept is mentioned alongside the concept of defence. Defensiveness is seen as a complex concept, including the measures discussed above, while defence, as a task of the armed forces, is one of the formulated capabilities. This capability is practically manifested mainly by security measures.

Oligopolistic market environments are often defined in the literature. Schiller (2004, p. 191) states, "Oligopoly, a market in which a few firms produce all or most of the market supply of a given good or service" [9]. Volejnikova (2017, p. 10) states, "An oligopoly is a form of market structure in which few firms operate in an industry, so that each firm has a significant market share" [10]. Similarly, Samuelson and Nordhaus (2013, p. 171) state, "The term oligopoly means "a few sellers" [11]. Several in this context can mean 2, 10, or 15. An important feature of an oligopoly is that each firm can influence the market price." In principle, these authors agree in their definitions. The subject of the article is the relationship between the state and arms firms with the expected increased demand for weapons systems on the state's part under a deteriorated security situation. Awareness of the existence of an oligopolistic market environment is essential. It has implications for the price demands of the state on the one hand and the pricing of supply on the part of firms. This situation is significantly different from an environment of perfect competition. In addition, there are natural barriers to entry into the arms industry in the form of secrecy requirements, increased risk of developing new technologies and reduced ability of firms to offer arms production to customers outside the security industry. This possibility is reflected in the level of revenue.

Potential output corresponds to the full use of available resources - factors of production. Dornbusch and Fischer (1994, p. 31) define potential output as "Output at full employment of resources" [12]. CNB (2024) lists several methods for determining potential output - a technique based on the Cobb-Douglas production function, the Kalman filter as "a multi-equation model estimated by a recursive algorithm", and the Hodrick-Prescott (HP) filter on time series GDP. The latter method includes a forecast of developments. As seen from the above source, each method gives completely different results [13]. Of particular interest in terms of the research addressed in this paper is the contribution of Cizek (2023), who notes the complications of empirical research on potential output caused by the fact that it is "an unobservable quantity that can only be estimated" [14]. She extends the current state of knowledge by forecasting the impact of the war in Ukraine using a

simulation approach to determine confidence intervals for the level of potential output. The research results presented in this paper do not use potential products in the sense of the above definitions. The confidence intervals of the development of revenues, particularly its upper bound, are constructed as the maximum possible with the acceptance of the hypothesis that increasing government demand for weapons systems increases the demand for labour, and more workers contribute to higher revenues. Thus, growth in the economy is reflected in revenue growth and in the upper bound of the revenue forecast band.

The paper's subject is the analysis of the relationship between the demand for weapon systems, the derived demand for human capital with the subsequent impact on the level of revenue. In this area, the results of existing research are mixed. Korkmaz (2015) examines the causal relationship between defence spending, economic growth and unemployment. He conducted the analysis using a panel data method about Mediterranean countries between 2005 and 2012 and concluded that military spending hurts economic growth and increases unemployment [15]. Odehnal et al. (2023) analyse the evolution of indicators characterising military spending using NATO member countries from 1999 to 2020. Besides recommending further research, their conclusions could be more precise. They do not conclude on an apparent effect of arms spending on reducing unemployment. Still, they point to a possible relationship between military expenditure and unemployment using the examples of Poland, Bulgaria, Romania, and Albania [16]. Navarro and Cabello (2015) examine the relationship between military spending and unemployment in 15 selected European Union countries and conclude that it is minimal [17]. These sources generally point to a minimal relationship between demand for weapons systems and employment. However, apart from Odehnal, all the relevant sources cited focus on research from 2015, one year after the occupation of Crimea. The significance of the research results presented in this article lies in the analysis after 2014, a period expectedly affected by the deteriorating relationship between the Russian Federation and Ukraine in particular, which is graduated by the occupation of Crimea and the entry of Russia and its armed forces into the territory of Ukraine. In contrast, Krtalic and Major (2010) point to the need, in the long term, to increase defence spending and invest in the armed forces [18]. They base their view on the emergence of new threats, the development of technology and drastic changes in warfare, which significantly impact the structure and size of military spending.

An essential aspect of the subject analysis is the capability of the industry firms in terms of their production. Modern approaches to categorising firms in the arms industry emphasise the importance of product portfolio analysis, which allows for a better understanding of the economic aspects of doing business in this sector. According to Krtalic and Major (2010), it is crucial to identify how product diversity affects firms' financial performance and market position. Firms with a broader range of products can spread risks more effectively and exploit synergies between different segments. This approach is particularly relevant in the context of the arms industry, where innovation and adaptation to changing security requirements play a crucial role. Analysis from Krtalic and Major shows that firms that invest in developing a wide range of defence technologies tend to achieve higher revenues and are better prepared to face geopolitical uncertainties [18].

4. Characteristics of the arms industry in the Czech Republic

The Czech arms industry is characterised by a long history and specialist know-how, which predisposes it to an innovative approach to developing, producing and integrating defence systems and technologies. The sector is structured to respond effectively to customers' specific needs and requirements, which include state security and military forces and international markets. The sympathetic detonation can be used by units of combat forces in certain circumstances (e.g. demolition of objects of a minor nature, especially in built-up areas, demolition of enemy equipment, during mobility measures - passage in an obstacle, etc.). This activity, as well as the method of rapid demolition, is particularly useful in those places and tasks where the units are limited by time, the amount of ammunition and the establishment of a more demanding firing mechanism.

Companies in this sector develop and produce their own products, distribute products created abroad, and provide services for implementing new technologies into armaments. These activities are complemented by service and product lifecycle capabilities, enabling companies to maintain long-term relationships with customers and provide the necessary support throughout the systems' life.

Companies in this industry focus on domestic and international markets, with customers including NATO and other non-NATO countries. This focus allows Czech arms companies to adapt to changing international security trends and requirements, which requires flexibility in production processes and research and development of new technologies.

The Czech arms industry offers a wide range of products and capabilities, reflecting the diversity and specific focus of individual companies.

One crucial sector is developing and manufacturing optical and electronic systems, including night vision and targeting equipment, which are critical for modern military operations. Companies also specialise in distributing a wide range of sophisticated military and security equipment, including aircraft, radar systems, air defence systems and anti-drone systems. Another segment in which Czech companies excel is the development and production of munitions and explosives, where innovations in material and chemical technologies bring new opportunities for more efficient and safer use. In software solutions for military applications, companies focus on air traffic control systems and other specific applications requiring high precision and reliability. The production and maintenance of armoured vehicles also represent an essential part of the Czech arms industry, where companies offer comprehensive services from design to maintenance. Research and development in defence systems is another crucial pillar, with an emphasis on the integration of new radar and sensor technologies.

The arms industry in the Czech Republic has partial potential for integrating defence systems, which allows companies to combine domestic and foreign technologies effectively. This aspect is crucial for strengthening the Czech

Republic's ability to participate effectively in its armament development. Cooperation with international partners and suppliers plays a vital role in improving the quality and functionality of the systems supplied, which contributes to maintaining the competitiveness of Czech companies in the international market. This strategy enables the implementation of complex defence solutions and supports technological development and innovation throughout the sector. On the other hand, international cooperation is necessary for Czech companies to avoid significant challenges in maintaining competitiveness in the current competitive environment of the defence industry.

Although many Czech companies have historically acquired know-how and the ability to develop their products and systems, current end customers prefer proven, functional systems with references. This trend leads to the fact that the Czech defence industry often uses its capabilities more in reselling and distributing products developed by foreign partners or engages in industrial cooperation where it can introduce and adapt foreign technology. In the past, when end customers were willing to invest in products developed based on the demonstrated capabilities of domestic companies and adapted to their specific requirements, the situation was different. Today, however, the market prefers entities capable of rapid integration and adaptation to global technological standards and innovations.

5. Initial statistical data

The data source is the Public Register and the Collection of Deeds of the Ministry of Justice of the Czech Republic (2024) [19]. The Public Register and the Collection of Deeds contain information on companies registered in the Czech Republic, including annual accounts and reports. The basis for data processing and analysis is the data dictionary specified by the author and shown in Table 1.

Table 1.

Data dictionary [19]

Name	Literal title	Description
Year	Year of occurrence in the MS CR database (2024)	The period examined is from 2014 to 2022.
Company	Company, firm, registered company in the Czech Republic, economic entity	Individual company names. Only publicly available sources are used in this article. Nevertheless, due to the sensitivity of the conclusions, the individual companies are referred to as C_i for i ∈ ⟨1; 18⟩. The complete dataset for all companies is available from 2015 to 2021.
Revenue	Company Revenue	The company's revenue for the accounting period, generally from 1 January to 31 December, is under review from 2014 to 2022. Revenue ∈ ⟨0; 7 105 000 KCZK⟩; KCZK = 1 000 CZK.
NOE	Number of Employees	Expresses the average number of employees reported by the firm for the accounting period, usually from 1 January to 31 December of the year under review, from 2014 to 2022. N0E ∈ ⟨0; 2 375⟩

Chapter 3 examines the impact of the deteriorated political-security situation between 2014 and 2022 on the potential output of arms firms in the Czech Republic. It analyses 18 armaments companies, C1 to C18, members of the Association of the Defence Industry (AOBP), with different revenue levels and different numbers of employees.

Although the data source for the statistical investigation is information from publicly available portals, it is decided to anonymise the companies under investigation. This is because the marketing aspects of these firms are not the focus of this research paper and may influence perceptions in the public community. Therefore, the business names of the companies are replaced in this paper by the designations C1 to C18. These substitute names are listed in a random unordered order but correspond to the company names from the Czech Commercial Register, separated by a semicolon: Meopta – optics, s.r.o.; OMNIPOL a.s.; Forte a.s., DELINFO; spol. s.r.o.; Glomex MS, s.r.o.; Pramacom Group, s.r.o.; CS SOFT a.s.; Česká zbrojovka a.s.; EVPÚ Defence a.s.; LP Prague s.r.o.; Explosia a.s.; Military Technical institute, s.p.; RETIA, a.s.; ELDIS Pardubice, s.r.o.; URC Systems, s.r.o.; TATRA DEFENCE VEHICLE a.s.; ERA a.s.; Sellier & Bellot, a.s.

Figure 2 and Figure 3 provide a basic overview of the analysed firms concerning their revenues (T) and number of employees (NOE). The purpose of the figures 2 and 3 is to provide a basic overview. The clustering and how to construct the clusters are presented in the following section. Figure 2 provides information about the companies in 2015 and shows the two bare clusters on the Linkage Distance 2. One is formed by companies C2, C15, and C11, which are among the largest employers. The other companies create the second cluster. The tree diagram shows that the analysed sample of companies is composed of companies of different sizes, determined by revenues and number of employees. These clusters presented here play only an informative role and make it possible to draw a partial conclusion that the production of the Czech defence industry is based on companies of different sizes according to the number of employees. These private companies form an oligopolistic market structure in each product segment except for one single company.

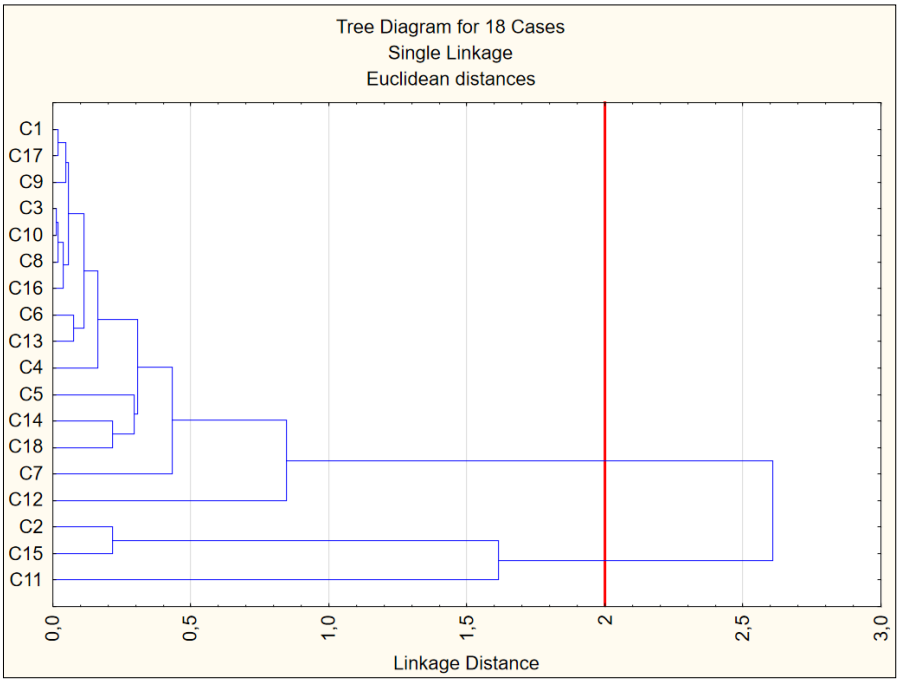

Fig. 2. Tree diagram of the position of the analysed defence industry companies in 2015

Figure 3 shows a similar situation in 2021. Comparing Figures 2 and 3, there is no significant change in the position of C2, C11, and C15. These companies are still among the most insignificant in the arms industry in the Czech Republic regarding the number of employees and revenues.

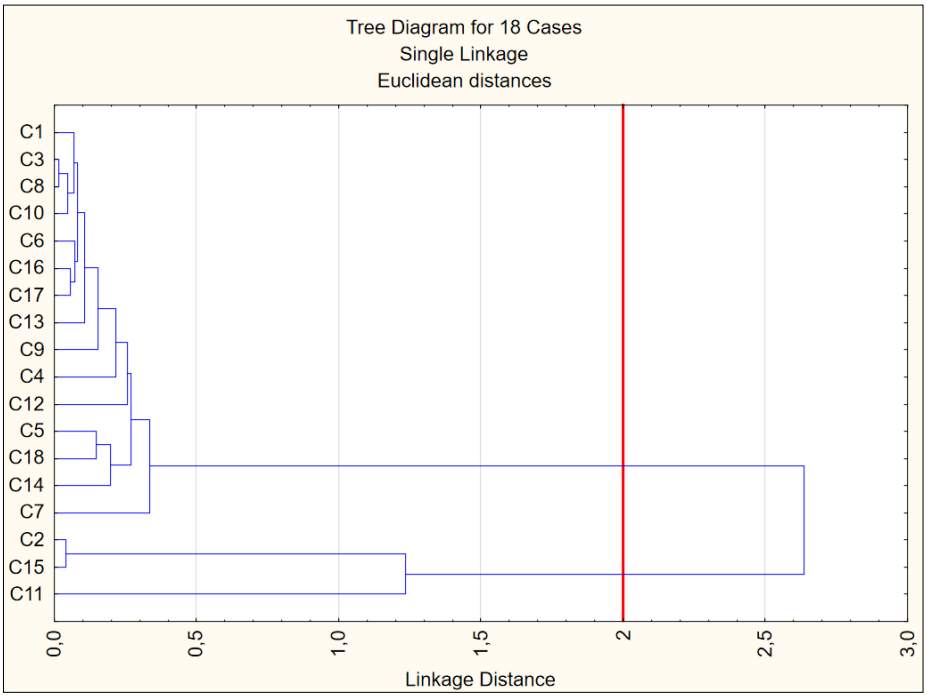

Fig. 3. Tree diagram of the position of the analysed defence industry companies in 2021

6. Partial conclusion

- Chapter 5 provides a basic view of the situation of selected arms companies in the Czech Republic.
- A cluster analysis of companies according to the amount of revenues and number of employees of the selected companies in 2015 and 2021 is performed.
- The Czech Republic's defence industry, represented in the article by a selection of 18 companies with a diverse range of product portfolios, is made up of private firms and a single state-owned firm, which form an oligopolistic market structure.

- The analysed companies are quite different in terms of number of employees.
- The analysed sample includes three companies that form a single cluster and exceed the other analysed companies regarding the number of employees and revenues.
- There are no significant changes in clustering over the period considered.
- No company in the sample is moving from a cluster of smaller companies to a cluster of larger companies.

7. Description of statistical processing of observations

The theoretical description of the statistical treatment of the observations consists of:

- The procedure for analysing the development of revenues from 2014 to 2022, depending on the number of employees.
- The description of the construction of clusters of companies based on the evolution of their revenues concerning the evolution of the number of employees.

In terms of the formulated hypothesis, this means:

The deteriorating political and security situation is affecting employment. This impact is reflected in an increase in the number of employees. The demand for employees is a derived demand. Its growth is a consequence of the demand to produce arms companies. One of the manifestations of increased government demand for the arms segments is the rising level of revenues. A situation where the revenues of arms firms are stagnant, or declining is a failure of the hypothesis. The increasing gap in the number of workers is reflected in the growing gap in the revenues achieved. The hypothesis is unconfirmed if increasing workers is not reflected in increasing revenues.

8. Development of revenue and number of employees

The situation is illustrated in Figure 4. The graph shows the timeline, the evolution of revenue, and the number of employees. The above observation evaluates the aggregated situation of all the analysed companies. The evolution of revenue over time and the evolution of the number of employees over time are monitored. The aggregate revenue growth was detected at 7.5 mld. CZK in 2014 to 28 mld. CZK in 2022, and the number of employees increased from 6 990 in 2014 to 7 327 in 2022. The observations are further elaborated and evaluated on a company-by-company basis in the following chapters.

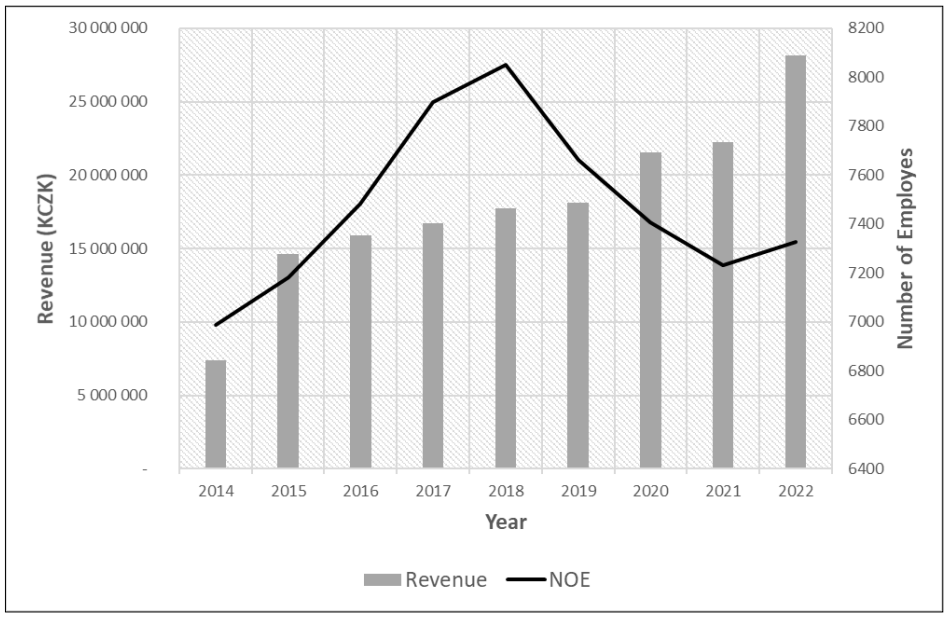

Fig. 4. Comparing the revenues and number of employee's development

where: Revenue – the sum of revenues achieved by the analysed companies in [KCZK = 1 000 CZK]; NOE – number of employees of all analysed companies.

9. Clusters of companies based on the evolution of their revenues concerning the evolution of the number of employees

The previous chapter contains basic information on the total revenues of the analysed companies and the total number of employees at the beginning and end of the period under study. The following chapters provide an analysis of the development of revenues and employment. The subject of this chapter is:

- cluster analysis of companies based on the variables revenues (T) and number of employees (NOE) in 2015 (complete data for 2014 are not available for all companies).
- cluster analysis of companies based on the variables revenues (T) and number of employees (NOE) in 2021 (complete data for 2022 are not available for all companies).
- cluster analysis of companies based on the regression relationship of the effect of number of employees (NOE) on revenue (R) for the entire analysed period from 2014 to 2022.

The purpose of the chapter is to categorise the companies into classes and see whether the evolution between 2014 and 2022 affects the categorisation of the companies. That is, whether there is a company in the analysed portfolio that gains a more significant market share at the end of the period under study compared to 2014, with respect to the volume of revenues and the number of employees.

Procedure and conditions:
- The input data are the companies' T and NOE data.
- For cluster analysis, the input data are standardised.
- Linear regression is chosen to determine the dependence of R on NOE.

$$T = \propto + \beta . NOE \tag{1}$$

- α and β are the parameters of the regression line, which are the variables of cluster analysis of companies based on the dependence of T on NOE.

10. Input data

Table 2 summarises the input data for the cluster analysis.

Table 2.
Revenues (T) and number of employees (NOE) of the analysed companies in 2015 [19]

Company	Revenue (T, 2015)	NOE (2015)	Revenue (T, 2021)	NOE (2021)
C1	131 838	56	148 086	71
C2	3 391 385	1 574	5 839 905	1 542
C3	18 322	18	41 982	21
C4	152 817	161	388 202	240
C5	902 868	276	787 668	359
C6	255 813	51	346 952	80
C7	834 815	552	920 951	558
C8	9 882	29	13 688	24
C9	90 039	21	556 942	16
C10	30 269	15	50 682	48
C11	2 106 351	2 287	3 674 883	1 769
C12	1 772 394	91	945 785	95
C13	309 682	15	281 996	24
C14	604 894	205	872 366	250
C15	3 469 490	1 443	5 772 429	1 535
C16	2 407	54	234 576	108
C17	124 144	45	330 275	120
C18	412 398	288	1 049 585	373

The outliers are:

- Company C11 - most significant number of employees in 2015;
- Company C10 - smallest number of employees in 2015;
- Company C15 - highest revenues in 2015;
- Company C16 - lowest revenues in 2015;
- Company C11 - most significant number of employees in 2021;
- Company C9 - smallest number of employees in 2021;
- Company C2 - highest revenues in 2021;
- Company C8 - lowest revenues in 2021.

The results of the cluster analysis are presented in Table 3.

Table 3.
Company clusters by number of employees and revenue in 2015

The year 2015					Year 2021				
No. 1	**No. 2**				**No. 1**	**No. 2**			
C2	C12	C5	C1	C3	C2	C12	C5	C4	C1
C11		C7	C4	C8	C11	C9	C7	C6	C3
C15		C14	C6	C9	C15		C14	C16	C8
		C18	C13	C10			C18	C17	C10
			C17	C16				C4	C13

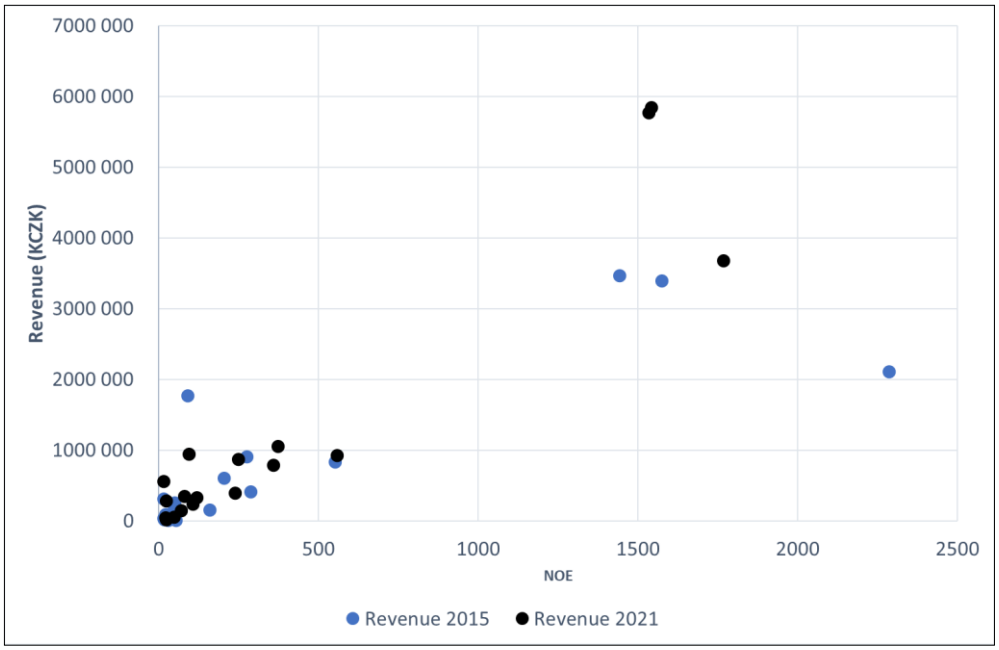

Fig. 5. Company revenues by NOE in 2015 and 2021

Figure 5 illustrates the clusters created. The graph shows NOE on the x-axis and T on the y-axis, and their relation reflects the situation in 2015 and 2021. The problem of the three companies analysed at the beginning and end of the period is quite different compared to the situation of the remaining companies. Figure 5, together with Table 3 and the clusters, as seen in Figures 2 and 3, clearly demonstrates the different situations of the analysed defence industry companies in the Czech Republic.

11. Partial conclusion

The companies are divided into two clusters. A comparison of the individual clusters shows:

- C2, C11, and C15 belong to the same cluster (No. 1) in both years (2015, 2021). The companies are among the largest in the sample despite the decrease in NOE for C11; at the same time, an increase in revenues is detected for all companies in the cluster;
- all the remaining companies form a cluster No. 2;
- the structure of the clusters of companies with the highest revenues remains unchanged, i.e. the deterioration of the security situation does not lead to a diametrically different market situation regarding the companies' revenues and number of employees.

12. Cluster analysis of companies based on the regression relationship

Cluster analysis based on the regression relationship between T and NOE forms clusters according to the functional dependence of T on each company's NOE development. The situation is illustrated in the following Table 4. It contains the values of the parameters of the regression function and the value of the coefficient of determination R^2. Data for the whole analysis period is processed, and linear regression is used. The coefficient of determination measures the model's accuracy and can take values from 0 to 1. The higher the value, the higher the accuracy of the model. Low values, usually below 0.5, indicate that other influences are related to the dependent variable. In the present analysis, this means that the movement in the number of employees is not a sufficient explanatory variable, and the conclusion of a close relationship between R and

NOE cannot be accepted. The regression relationship calculations are performed using Statistics software, and the chosen significance level is 0.05.

Table 4.

Regression function parameters and coefficients of determination

Company	α	β	R^2	Summary
C1	46 451	1 705.8	0.0594	Existence of unobserved independent variables.
C2	3 000 000	529.97	0.0009	
C3	-59 638	4 316.1	0.5394	54% accuracy of the model of the dependence of R on NOE.
C4	-211 670	3 561.5	0.2602	Existence of unobserved independent variables.
C5	-311 877	4 134.7	0.3632	
C6	73 489	2 477.1	0.3438	
C7	621 043	544.45	0.0064	
C8	4378.3	273.37	0.154	
C9	144 913	6 112.7	0.0462	
C10	-23 200	3 866.1	0.5536	55% accuracy of the model of the dependence of R on NOE.
C11	10 000 000	-3 472.5	0.8252	82% accuracy of the model of the dependence of R on NOE.
C12	5 000 000	-40 027	0.1006	Existence of unobserved independent variables.
C13	-7641.6	10 583	0.2011	
C14	23 755	1 944.4	0.0628	
C15	-10 000 000	11 796	0.4321	
C16	-306 136	8 827.8	0.2297	
C17	-25 727	2 179.5	0.5568	56% accuracy of the model of the dependence of R on NOE.
C18	-3 000 000	11 742	0.6168	62% accuracy of the model of the dependence of R on NOE.

Figures 5, 6, and 7 show the progression of the regression functions, cluster by cluster. The graphical representation provides a clear overview of the distribution of companies into clusters. Figure 5 shows the regression functions of the companies that always form a separate cluster. The waveforms are quite different.

Symptomatic for individual companies are:

- company C11 - decrease in NOE and increase in R, 82% accuracy of the model of the dependence of R on NOE, the development of the number of employees does not lead to an increase in revenue;
- company C12 - a slight increase in NOE and a decrease in R, due to R2 = 0.1006, the existence of other unobserved independent variables can be assumed;
- company C15 - increase in NOE and increase in R, 43% accuracy of the model of the dependence of R on NOE, the existence of other unobserved independent variables can be assumed;
- companies clustered in cluster 4 show a steep growth of the regression line (compared to the other clusters). For companies C18 and C16, the development of R and the growth of NOE are detected, but only for company C18, with a high precision of 62% (more than 50%, author's limit). For companies C13 and C16, the existence of other unobserved independent variables can be assumed;
- The other companies comprise cluster 5, except for C3, C10, C11 and C17, and other unobserved independent variables can be assumed.

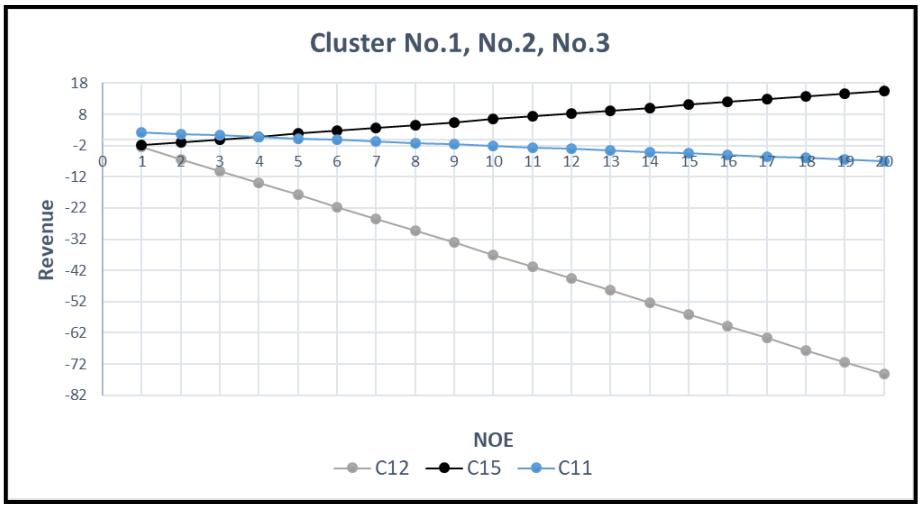

Fig. 6. Cluster analysis depending on regression function parameters – cluster No. 1, 2, 3

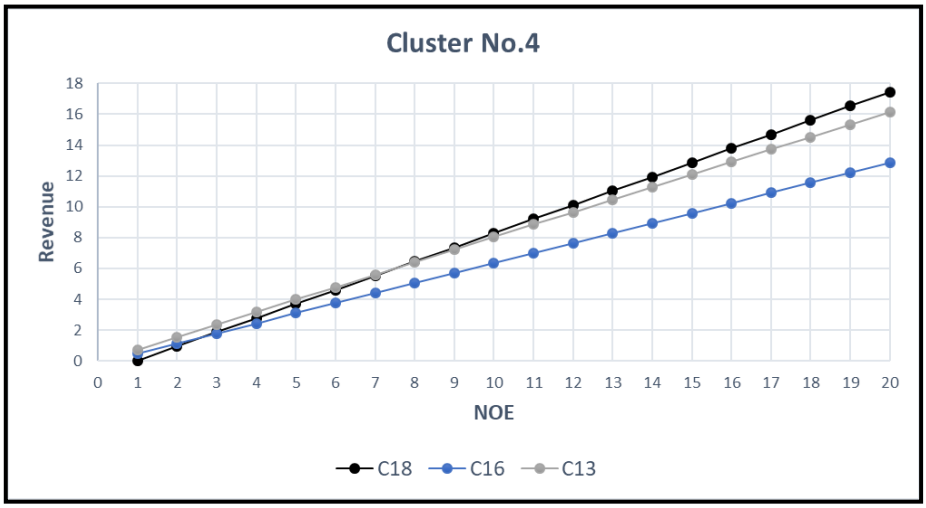

Fig. 7. Cluster analysis depending on regression function parameters - cluster No. 4

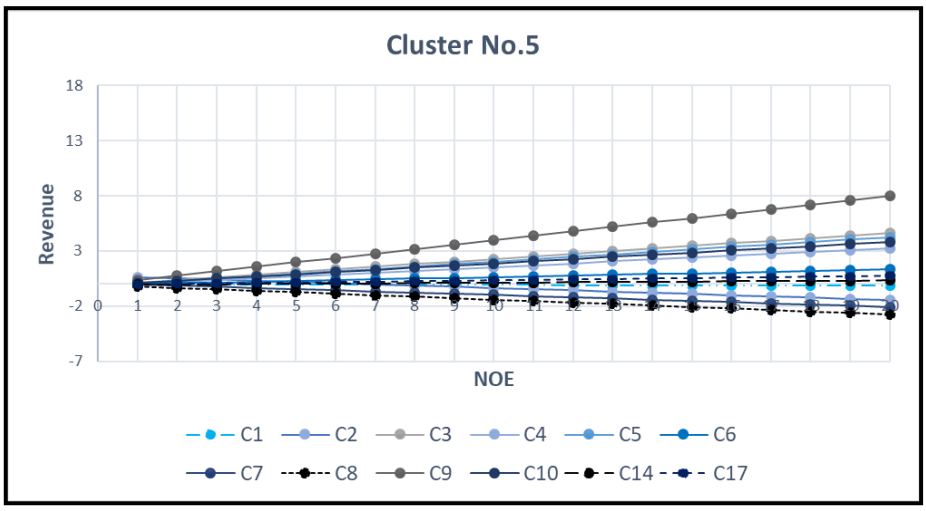

Fig. 8. Cluster analysis depending on regression function parameters - cluster No. 5

Partial summary of the cluster analysis:

- The overall worsened political and security situation is reflected in an increase in revenues and an overall increase in the number of employees.
- At the company level, the sample includes companies with a decline in revenues or a decline in the number of employees at the end of the period compared to the beginning of the period; in this sense, the hypothesis is rejected.
- The above chapter describes the situation in total and for individual companies. The situation for the analysed companies can be described as cyclical, with a rise and fall of R and NOE during the monitored period.
- With the exception of C3, C10, C11, C17, and C18, the effect of NOE on revenue development cannot be considered proven. The revenue of these companies is affected by other unobserved independent variables. The regression model proves this, and its accuracy is shown in Table 4. The high value of the R2 determination index of the regression function is not related to noise generation, with the exception of C11.
- Cluster analyses, depending on the individual variables R and NOE and the parameters of the regression function, yield different results.
- Different results indicate different company situations—the sample of arms companies varies from the smallest to the largest in terms of number of employees and revenues.
- There are no companies in the sample for which it is possible to detect a significantly different situation compared to other companies at the end of the period under review, as shown by the results of the cluster analyses, see Tables 4.

13. Conclusion

The article's subject is the results of the first stage of the research on changes in the revenue level in connection with the worsening international political situation due to the outbreak of the war conflict between the Russian Federation and Ukraine. The hypothesis is formulated: "*The worsened political and security situation has an impact on employment and revenue levels of arms companies in the Czech Republic, so that employment and revenues of arms companies are steadily increasing*."

The hypothesis must be rejected, both in the context of the above micro-view and because of the existence of companies whose revenues in 2022 are lower than in 2014.

Overall, the Czech arms industry is responding to the requirements of the dynamic international security environment, as evidenced by its technological level and ability to innovate. This capability is closely linked to the oligopolistic market structure, which shapes pricing strategies and encourages the development of new products, as shown by the economic analyses presented in the paper. Integrating systems and technologies form the basis for developing defence solutions and ensuring national defence capability in an unstable geopolitical climate.

Emphasis on research and development in the future is necessary for maintaining Czech companies' competitiveness and adaptability in the markets. Given the importance of these factors, future research should focus on strategies for state support of innovation in the arms industry to effectively counter current and future security threats [23, 24].

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