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THE PROBLEM OF THE OPTIMAL VOLUME OF ENTERPRISE PRODUCTION IN THE LIGHT OF THE THEORY OF TRANSACTION COSTS AND THE PRACTICE OF OUTSOURCING

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ABSTRACT

The purpose of the article was to determine the importance of outsourcing and transaction costs accompanying it in the process of optimizing company structures. The practical reference of the adopted research objective was to indicate the optimal size of the enterprise. The aim is also to indicate, based on literature research, the impact of the transaction cost theory on the development of outsourcing.
The findings of research show that the optimal size of the enterprise corresponds to the production volume at which the transaction function indicates the decreasing level of their marginal product, until the value reaches 0. With a high specificity of the company's resources, which requires the use of specific technologies, there are transaction costs on this account that shape the price of the goods being the subject of the transaction. Thus, when further increasing the size of the production company, one should also take into account the added transaction costs, among others, control and monitoring of transactions. Modern enterprises focus their actions on key areas of activity. They give up production of what outsourcing providers can do more effectively, leaving what is specific for a given product, determining the company's identity and the essence of production.

Key words: transaction costs, outsourcing, enterprise production volume

INTRODUCTION

Enterprises in the modern economy are constantly looking for solutions leading to more and more effective strategies that would ensure achieving and maintaining a market advantage. One of such solutions is the use of outsourcing since the 1980s. The analysis of outsourcing issues indicates that this concept is still developing dynamically. This is evidenced by numerous publications of scientific articles. The analysis of data based on the EBSCO database shows that in the 1980s the problem of outsourcing was discussed in a dozen articles on average in a year. In the nineties, such articles appeared from several hundred to 1,800. Currently, researchers even in around 7,000 scientific articles undertake the problem of outsourcing. The number was determined based on the EBSCO database analysis, access January 2018.

The use of outsourcing, according to practitioners and theoreticians is currently the basic means of improving the efficiency of enterprises on a global scale. In contrast to the process of internalisation, developed in large, global enterprises, outsourcing enables the coordination of internal and external processes, whose suppliers are specialized units, leaders on the local, national or even global market.

In the past, enterprises more often chose development through the implementation of basic and aux-

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iliary functions within the enterprise (development through autarchy that is economic self-sufficiency). This increased the possibility of achieving returns to scale by the individual, but at the same time reduced its mobility and resistance to crises. n centralized organizations, economic self-sufficiency additionally led to shifting decision-making powers from lower to higher levels of management (the problem of excessive centralization of structures). Nowadays, managers realize that the rationality of business management can be achieved through proper allocation of resources as part of vertical integration [Urbanek 2012]. Where costs of coordination by prices are greater than the cost of coordination by the company, maintaining or creating company structures is economically justified. However, as Coase points out [1993], where the costs of market coordination are lower or equal to the costs of management, there is no justification for maintaining the structures of the enterprise. Therefore, the implementation of the outsourcing process remains, which becomes justified due to economic reasons.

An important aspect of the conducted research was the presentation of the possibilities of using outsourcing in small enterprises in the context of the level of transaction costs. From this point of view, this is an innovative approach, since the research attempt actually addresses the question of what the optimal size of enterprises is, due to the level of transaction costs and the use of outsourcing.

A certain limitation of the presented research is the lack of empirical verification. However, on the other hand, this is another stage, which the author undertakes to verify the considerations presented in the article based on the research sample of small enterprises. The results of these tests will be presented in a separate article.

MATERIAL AND METHODS

The purpose of the article was to determine the importance of outsourcing and transaction costs accompanying it in the process of optimizing company structures. The practical reference of the adopted research objective was to indicate the optimal size of the enterprise. The aim is also to indicate, based on literature research, the impact of the transaction cost theory on the development of outsourcing.

The problem of using the services of external suppliers or developing structures that may provide such services inside the enterprise is present in economics and management, practically from the beginning of their historical development. In practice, this problem referred to the entrepreneur's dilemma whether to produce or buy ("make or buy"). For a long time, there have been categories such as cooperation and co-operators in management, vertical integration and horizontal integration, experience curve and returns to scale of production. Increased interest in outsourcing in the sector of small and medium enterprises results from the need to find such a management system that would significantly expand the possibilities of dealing with the growing complexity of the environment, especially turbulent changes in the area of technology and management quality. Enterprises have practically always used the services of external suppliers, mainly in the area of auxiliary functions (non-core business), but also basic functions (core business) [Sobiecki and Pietrewicz 2011].

RESULTS AND DISCUSSION

The theory of transaction costs as justification for outsourcing

An example of the practical application of the Coase theorem is the outsourcing practice applied since the 1970s [Trocki 2001, Radło 2013]. In essence, it consists in transferring tasks and processes to be implemented by external units specialized in a given field. It means separating the functions they carry out from the organizational structure of the enterprise and transferring them to other external entities.

Modern enterprises can operate and develop according to one of two alternative management concepts that is, based on hierarchical (vertical) or market (horizontal) coordination [Urbanek 2012]. Hierarchical coordination means the implementation of various activities (production) in the enterprise, ultimately leading to the self-sufficiency of such units. This model of development was used in conditions of difficulties in

supplying enterprises and led to very limited contacts with the market environment. In turn, the concept of market coordination assumes that enterprises operating on the principle of an open system fulfil their supply needs through the market. This translates to the process of resource management, which in this case can be sourced from the environment.

Production costs are not the only determinants of the dichotomous division of the resource allocation mechanism, i.e. hierarchical and market coordination. They are actually a reference to the expenditures incurred and the result of the involvement of production factors in the enterprise. However, the total costs associated with the application of different resource allocation rules also include transaction costs [Allen 1999, Hardt 2009].

Transaction costs generated within the company include:
- costs of making decisions;
- costs of supervision over the implementation of decisions;
- information processing costs;
- costs of employee productivity measurement.

It is also possible to add the costs of moving within the enterprise, for example, logistics costs. Their size depends on the scale of production. After exceeding a certain level of company's resources, there may be a decrease in the effectiveness of the company's operations.

Transaction costs in the market dimension (accompanied by horizontal coordination) include [Daniłowska 2007]:
- costs related to obtaining and processing information about prices;
- costs of creating contracts and costs of their negotiations.

Many factors determine the level of transaction costs associated with choosing a coordination mechanism. Transactions carried out within a vertically integrated organization are not subject to a market mechanism, which in turn is the essence of market coordination. Therefore, enterprises are forced to increase the number of management levels, which results in greater problems in the decision-making process. The natural mechanism of opportunistic behaviour develops, which consists in presenting the goals of the organizational unit over the goals of the entire organization [Hard 2009].

In turn, transactions conducted as part of the organization's market coordination (horizontal) may generate a high level of transaction costs, which in this case may reduce the effectiveness of the entire mechanism. According to Williamson [1998a], this phenomenon is conditioned by:
- the specificity of assets;
- uncertainty;
- transaction frequency.

When the subject of the transaction are specific resources requiring the use of specific technologies, capital-intensive or inaccessible due to their innovative nature, there is a need to apply appropriate guarantees and security. There are transaction costs connected with such activities, which ultimately shape the price of the goods being the subject of the transaction [Williamson 1998a].

Figure 1 shows the relationship between the specificity of an enterprise's assets and the types of transactions. The symbol "k" denotes specific assets required in the transaction, whereas in transactions related to common and generally available technology, $k = 0$. However, if the technology is specific, $k > 0$. The parties to the contract enter into strong interdependencies and it is in their interest to introduce appropriate guarantees and security (s). $S = 0$, when no security is applied, and when it is used, $s > 0$.

In the case of the ideal transaction (case A), when there is no dependence related to the specificity of assets, i.e. $k = 0$, the only security is the competition mechanism on the market ($s = 0$). Case B presents the exchange risk, which requires investment in specific assets ($k > 0$), but no forms of security have been applied ($s = 0$) [Williamson 1998b]. By stating the existence of risk, the parties will include them in the price. C and D are cases in which additional security has been applied, either in the form of a formal contract (C) or in the form of vertical integration (D), within a single ownership structure. According to Urbanek [2011a, b], hybrid solutions: capital compounds, joint ventures, long-term contracts, bilateral agreements, franchise are more flexible than

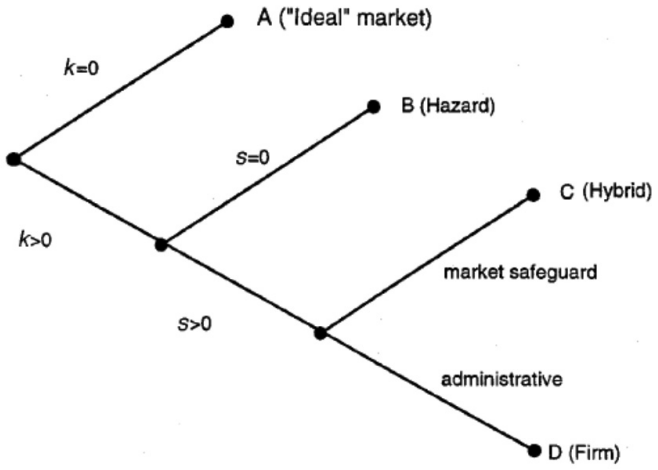

Fig. 1. Simple contracting schema
Source: Own compilation based on Williamson [1998b].

hierarchical coordination and at the same time more formalized than market coordination.

As Williamson points out [1998b], the problem of the specificity of enterprise resources affects the level of transaction costs. The author distinguishes six characteristics of resource specificity:

- location that reduces logistics costs;
- specialized physical assets (machines and devices);
- intangible assets that shape the level of market perception, e.g. a brand;
- the level of investments in buildings and their equipment in order to build long-term relationships with key market segments;
- the specificity of human resources (e.g. including unique competences, experience, etc.;
- schedule for the use of individual resources.

Specific resources cannot be easily replaced without additional transaction costs. These resources significantly affect the formation of competitive advantages of the company. The company's resources are a subsystem, so the previously mentioned elements are closely related [Pietrzak 2002]. This leads to an increase in the complexity of contracts between independent enterprises [Barthelemy and Quelin 2006]. The reasons for this complexity are seen by the authors in the problem of securing the interests of recipients, mainly due to the inevitable opportunism of suppliers. Secondly, contracts should protect against over-reliance on suppliers. Contracts should also be flexible enough to allow the company to adapt to changing environmental conditions. The discussion shows that with a high level of resource specificity (which results in a high level of transaction costs), vertical integration can provide greater efficiency than market coordination.

Transaction costs can be considered on a micro and macro scale. On a micro scale, transaction costs are usually analyzed along with production costs. It can be said that enterprises aiming at improving the efficiency of resources used in the transformation process of expenditures, also strive to minimize the total production costs and transaction costs. However, there are fundamental difficulties with the measurement of the parts of transaction costs especially the costs of obtaining information, costs of time involved or costs of corruption [Staniek 2005]. In this sense, transaction costs relate to a more efficient institutional system, which is a constantly wanted value. It can be assumed that the level of transaction costs determines the limits of effectiveness of institutional solutions in the country. It is worth noting that a good level of legislation reduces these costs.

Figure 2 shows the transaction costs in a model approach, using the neoclassical approach. Therefore, it

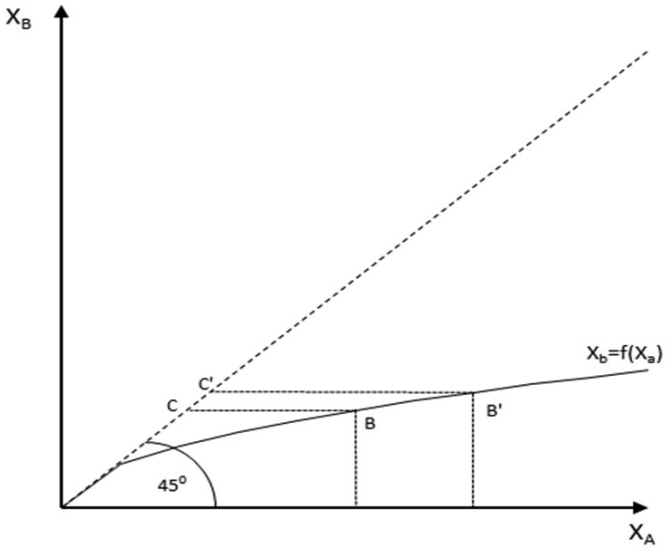

Fig. 2. Transaction function and transaction costs.
Source: Own compilation based on Staniek [2005].

was assumed that there is a lack of complete information on the market participants, i.e. the outsourcer and the client. This is an example of the occurrence of information asymmetry [Mènard 2005], which affects the opportunistic behavior of the parties. It also emphasizes the limited rationality of the behavior of suppliers and recipients. Figure 2 shows the amount of transaction costs, based on the difference between the planned production volume – *Xa* and the actual size and accepted by the buyer – *Xb*. The dashed line at a 45-degree angle illustrates the theoretical situation of the lack of occurrence of transaction costs between transaction participants. This is a hypothetical assumption, adopted for quantifying transaction costs, based on the planned and actually depicted production volume.

Section 0*A* presents the planned production volume, which corresponds to the *AB* section measuring the size of consumer demand. The flattening of the transaction function along with the increase in the number of transactions conducted indicates a decreasing level of their marginal product. At the same time, transaction costs are increasing, measured by the distance between the 45-degree line and the transaction function – the *B*'*C* section is larger than the *BC* section. This increase in transaction costs results from the limitation of opportunistic behaviour on the part of suppliers – outsourcers. The costs of controlling and monitoring transactions are increasing.

The problem of optimal production volume of the enterprise and the criterion of transaction costs

Contemporary enterprises strive to improve production and economic results through activities that optimize the size and structure of the resources involved. It affects the efficiency of their operation both from the supply and cost side. On the one hand, actions affecting the shaping of the level of revenues, both on the quantitative and qualitative side, are used, but actions aimed at optimizing production costs and fixed costs that are independent of the production volume are introduced.

The measure of the company's efficiency is to minimize the total sum of transaction costs and production costs. Considerations on this topic are presented in Figure 3. According to it, the higher the production and the level of specialization of production, the lower the production costs per unit. The growing specialization of production aids the reduction of production costs.

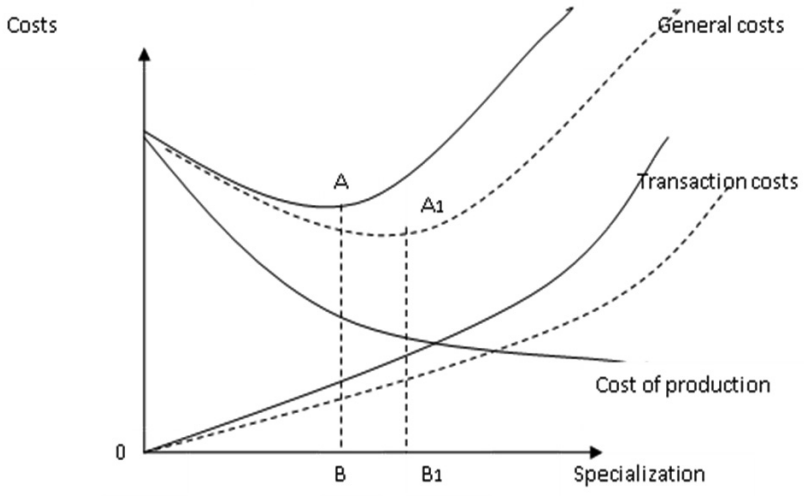

Fig. 3. Transaction costs and optimum business production
Source: Own compilation based on Staniek [2005].

Simultaneously, transaction costs increase, which is associated with the complexity and the greater frequency of interaction with entities, specialized in providing specific services. Figure 3 shows that the company's overall costs reach a minimum at point *A*. The optimal size of the enterprise is determined by point *B* (assuming the constancy of the institution), where the total transaction and production costs are the smallest. If a better institution appears (a unit positively verified and checked by the market, having a positive image on the B2B market), the transaction costs are reduced, which means moving down the cost function, shown in the figure. As a result, production costs are reduced and the production optimum increases to point *B*1. It should also be remembered that with the increase in the size of the enterprise, the average costs of production are decreasing, but also the transaction costs are growing. Each company should aim to reduce transaction costs. However, there are such costs that you always have to bear, such as the costs of obtaining information about contractors (outsourcers). Enforced cost reduction may negatively affect the effectiveness of the company [Trocki 2001].

Thus, the mutual comparison of production costs and transaction costs gives the opportunity to determine the right size of production. In practice, this is not an easy process, as there are serious problems with the operationalization of transaction costs, which Hardt points out [2009]. It can be seen that the larger the enterprise, the lower the average production costs, assuming the use of labor-saving and more efficient production technologies.

However, labor-saving technologies are very capital-intensive and therefore inaccessible to the majority of enterprises characterized by the small scale of their operations. Such technologies can be effectively used for production purposes by large enterprises or by entities providing specialized services for smaller enterprises. The essence of implementation of progress in small and medium-sized entities is to cross the barrier of technical and economic opportunities. This enables the use of the outsourcing concept in practice.

CONCLUSIONS

1. Based on the analysis of articles available in the EBSCO database, starting from the 1980s, there is a dynamic increase in interest in the subject of transaction costs and outsourcing among scientists.
2. The optimal size of the enterprise corresponds to the production volume at which the transaction function indicates the decreasing level of their marginal product, until the value reaches 0.

3. With a high specificity of the company's resources, which requires the use of specific technologies, there are transaction costs on this account that shape the price of the goods being the subject of the transaction. Thus, when further increasing the size of the production company, you should also take into account the added transaction costs, among others, control and monitoring of transactions.
4. Modern enterprises focus their actions on key areas of activity. They give up production of what outsourcing providers can do more effectively, leaving what is specific for a given product, determining the company's identity and the essence of production.
5. A certain limitation of the presented research is the lack of empirical verification. However, this is another stage, which the author undertakes to verify the considerations presented in the article based on the research sample of small enterprises.

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PROBLEM OPTYMALNEJ WIELKOŚCI PRODUKCJI PRZEDSIĘBIORSTWA W ŚWIETLE TEORII KOSZTÓW TRANSAKCYJNYCH I PRAKTYKI OUTSOURCING

STRESZCZENIE

Celem artykułu było określenie znaczenia korzystania z zewnętrznych zasobów (z ang. *outsourcing*) oraz scharakteryzowanie towarzyszących temu kosztów transakcyjnych w procesie optymalizacji struktur przedsiębiorstwa. Praktycznym odniesieniem tak przyjętego celu badawczego było wskazanie optymalnych rozmiarów przedsiębiorstwa. Wskazanie na podstawie analizy literatury przedmiotu wpływu teorii kosztów transakcyjnych na rozwój działalności outsourcing.

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Optymalna wielkość przedsiębiorstwa odpowiada takiej wielkość produkcji, przy której funkcja transakcji wskazuje na malejący poziom ich produktu krańcowego, aż do osiągnięcia wartości 0. Przy znacznej swoistości zasobów przedsiębiorstwa, wymagających zastosowania konkretnych technologii, pojawiają się koszty transakcyjne z tego tytułu, które ostatecznie kształtują cenę dobra będącego przedmiotem transakcji. Tak więc przy dalszym zwiększaniu rozmiarów produkcji przedsiębiorstwa należy również uwzględniać dodatkowe koszty transakcyjne, m.in. kontroli czy monitorowania transakcji. Współczesne przedsiębiorstwa koncentrują swoje działania na kluczowych obszarach aktywności. Rezygnują więc z produkcji tego wszystkiego, co mogą zrobić bardziej efektywnie dostawcy zewnętrzni, tzw. outsourcingowi, pozostawiając to co jest dla danego wyrobu specyficzne, decydujące o tożsamości firmy i o istocie produkcji.

Słowa kluczowe: koszty transakcyjne, outsourcing, wielkość produkcji w przedsiębiorstwie