

STATISTICAL EVALUATION OF DIFFERENT KINDS OF OUTSOURCING ACTIVITIES

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Abstract

Increasing importance of revenue emerges the necessity to move from price policy to revenue policy. Developing business of outsourcing suppliers and contractors stimulates discussions in different countries about such essential elements as employment inside the country, wage disparities and dependence of companies on foreign outsourcing suppliers. However, attitudes of different authors towards the importance of outsourcing differ, starting with the exceptional provision with goods and services from a foreign outsourcing supplier and ending with the competitive stock trading.

Keywords: outsourcing, statistical evaluation, costs, theory of transaction costs.

JEL Classification: D21, M21.

Introduction

Outsourcing has become one of the main characteristics of corporation behaviour since 1990. Outsourcing changes the limits of business activities and plays an important role in global economics, where increasing competition makes companies look for more effective and flexible ways of business activities. Business service outsourcing is, at present, one of the most dynamic spheres in economics. Although decisions of outsourcing are often considered as a single decision, the impact of some outsourcing promoting variables can differ, depending on the service that is going to be outsourced.

Object of the research. Different kinds of outsourcing activities.

Aim of the research. To present the statistical evaluation of different kinds of outsourcing activities with reference to transaction costs economics.

The following **objectives** have been set to achieve the aim of the research:

- to distinguish and systematize the kinds of outsourcing from the standpoint of transaction costs.
- to present the analysis of the parameters of economic intercourse (sales revenue and the number of the companies) in outsourcing companies during the period of 2000-2011.

Methodology of the research. The research includes systemic comparative analysis of the scientific literature. The secondary data was obtained from the particular Lithuanian institutions (The Lithuanian Department of Statistics and the Central Bank of the Republic of Lithuania) and the World Bank. Statistical processing of the empirical data was carried out using SPSS (*Statistical Package for Social Sciences*) and Microsoft Excel software. The analysis of the data was carried out using the methods of descriptive statistics (arithmetic average, standard deviation and other calculations), correlation analysis (*Spearman* correlation coefficient, *Cronbach's alpha* coefficient, Kendall's coefficient of concordance), and statistical data verification (using Willcoxon and Friedmann criterion) methods.

Different kinds of outsourcing activities

Feenstra and Hanson (Feenstra & Hanson, 2001) state that there are two groups of outsourcing:

Strategic outsourcing services – all infrastructure of information technologies in the company are transferred to outsourcing suppliers. By the contracts of this type, suppliers are transferred part of customer's employees and main work means. Such projects are characterized by special financing terms and models.

Selective outsourcing services – companies transfer to an outsourcing supplier only chosen parts of information technologies, e.g. net management, internet infrastructure and so forth.

The research has revealed that types of outsourcing can be very different. The statement that each outsourcing task can be concentrated only in one group is invalid because there can exist several kinds of outsourcing activities, which can be grouped by their nature and functions. Outsourcing activities can also take new forms, requiring non-standard decisions. The main kinds of outsourcing activities, analysed in the scientific literature, are presented in Table 1.

Table 1. The main kinds of outsourcing activities (with reference to Schniederjans *et al.*, 2005)

Kinds of outsourcing activities	Description
International outsourcing	Outsourcing supplier and customer are in different countries.
Outsourcing of neighbouring countries	International outsourcing of neighbouring countries, e.g. USA and Canada, Germany and France.
Mediate outsourcing	While new systems are being implemented, the work is performed with the old ones. This way, business processes do not stop.
Secondary outsourcing	Secondary enterprise is joined to the outsourcing company, and so a completely new separate enterprise is created.
Business process outsourcing	Services of full or partial optimization of business processes.
Outsourcing of business process changing	Helping customers to create new business models.
Additional value outsourcing	Customers' and suppliers aim is joining products/services for sale.
Internet outsourcing	Renting computers, software and technologies by the internet.
General outsourcing	Supplier works with several customers at the same time.
Multiple outsourcing	Some outsourcing suppliers work together in order to ensure, for instance, a competitive price.

The analysis of the scientific literature showed that the biggest Western concerns practise transferring a part of their production to the countries, where labour force is cheaper, for instance, to Asia (Swenson, 2004; Stewart, 2007; Siegel & Griliches, 2002). According to Friedman (Friedman, 2005), "due to modern technologies, individuals from any country all over the world will be able to compete in American market". Outsourcing conditions re-distribution of business processes from internal to external sources. The choice of an outsourcing supplier is determined by the kind of company's activity, size and procurement.

The number of employees working in the sector of information technologies grows faster than the one in other service sectors. Some scientists forecast that in the future it will grow even further (McCarthy & Peach, 2003; McClelland, 1992; Hilsenrath, 2003; Apte, 1991; McIvor, 2000). The research carried out by Paul and Siegel (Fixler & Siegel, 1999) showed that technological development conditions the changes of labour structure in developed countries (skilled work force takes comparatively bigger part than unskilled work force and this tendency is going to continue). According to Feenstra and Hanson (Feenstra & Hanson, 2001), this tendency explains the increase of wage differences for the workers with different qualification. On the other hand, the number of 100 000 skilled workers, emigrating to foreign countries, is a comparatively small part of all labour market. Therefore, according to Hilsenrath (Hilsenrath, 2003), even the biggest workplace losses, pointed in the scientific literature as caused by outsourcing transactions, make only a small part of all workplaces lost for other reasons. Besides, advanced technologies and communications require skilled work force, so the countries often lack skilled workers to fill free workplaces (Reca & Zieg, 1995). With reference to the demographical data (Prahalad, 2005; Prahalad & Hamel, 1990), aging of population and lack of skilled work force are the main problems emerging in developed countries. These problems can be solved in two ways: 1) filling free workplaces with the immigrants, 2) applying the elements of outsourcing transactions and making contracts with companies working in India, China, Russia or Eastern Europe (Tomiura, 2005).

Application of outsourcing can also be explained as the improvement of trade conditions in the country because when production costs of particular goods/services go down, demand for them increases, so the volumes of the export also increase. On the other hand, the demand can get to high. However, in most cases the result of outsourcing is creation of goods/services with high additional value. Economic benefits are gained because of the access to the resources which can be hard to find inside the country. For example, if creation/development of a particular good/service requires specific knowledge or equipment, the use of outsourcing can help to create a unique product (or the product of much higher quality), which would enable creation of a short-term monopoly for this product and earning high profits.

Outsourcings are extremely important for the service sector, where uncertainty makes it hard to compare labour productivity and prices, which reduce market transparency (Gorzig & Stephan, 2002). Asymmetric information causes the problems of unfavourable choice and moral risk. The arguments for "buying" include cost reduction, bigger effectiveness of suppliers in comparison with vertically integrated companies by both economies of scale and flexibility (Grossman & Helpman, 2002; Grossman & Helpman, 2004). In order to highlight the importance of outsourcing transactions for companies and economy of the country, referring to the statistical data of the Lithuanian Department of Statistics, Eurostat, the Bank of

Lithuania and the World Bank, the authors carried out the analysis of the main economic intercourse (sales revenue and the number of the companies) in outsourcing companies during the period of 2000-2011.

The results of the statistical comparison of different kinds of outsourcing

The authors analysed the links of the parameters with GDP and their dynamics (variation in time). Dependence on GDP was analysed using linear regression, and strength of correlation in the sense of monotony was determined using Spearman correlation coefficient (R_s). Correlation between two variables is considered as very weak, when the value of the correlation coefficient falls into the interval 0.4-0.6, strong when it falls into the interval 0.6-0.8, and very strong when it is over 0.8 (Bagdonas *et al.*, 2004). The dynamics (variation in time) of the parameters was analysed using linear regression. Determination coefficient (R^2) (*R-squared value*) was used for the evaluation of the accuracy selecting particular type of the regression function.

The research of the outsourcing companies is presented using the sampling method. Companies for the research were selected from the database of the Centre of Registers, considering their sales revenue and the number of the employees. A random stratified sample was made, i.e. the entirety of the companies, performing each kind of business activity to be researched, was stratified by the size of sales revenue. Number of the stratum for each kind of activity was selected so that the size of the sample would be the smallest. The research included 22 different kinds of outsourcing activities: telecommunications (J61), computer programming, consultancy and related activities (J62), computer programming activities (J6201), computer consultancy activities (J6202), computer facilities management (J6203), other information technology and computer service activities (J6209), information service activities (J63), data processing, web server services (web hosting), related online activities (J631), other information service activities (J639), accountancy, bookkeeping, audit activities, tax consultations (M692), head office activities (M701), management consultancy activities (M702), administration and maintenance activities (N), rent and leasing activities (N77), employment activities (N78), security and investigation activities (N80), building and landscape maintenance activities (N81), cleaning activities (N812), building and industrial cleaning activities (N8121, N8122), other cleaning activities (N8129), landscape gardening activities (N813). These are almost all business service activities by the European classification of economic activities. An outsourcing company is considered as having reported, if it provided the Department of Statistics with the report or has been liquidated, bankrupted, suspended its operations or performs the main activity, different from the outsourcing services to be researched.

The interdependence between GDP and sales revenue for different outsourcing services has been presented in Figure 1.

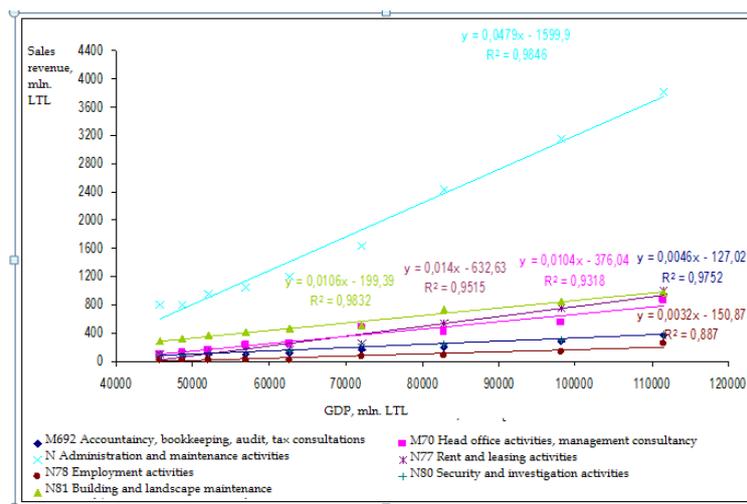


Figure 1. Interdependence between GDP and sales revenue for outsourcing services

The research results revealed that linear relationship between sales revenue and GDP for telecommunications (J61) is close ($R^2 = 0.94$, $R_s = 0.93$). When GDP increased by one million, sales revenue increased by 0.021 million LTL. Sales revenue for computer programming, consultancy and related activities

(J62) tended to linearly ($R^2 = 0.9$) go up when GDP increased. With growth of GDP, sales revenue for computer programming activities (J6201) grew significantly faster than for computer consultancy activities (J6202) or computer facilities management (J6203).

Information service activities (J63) include such dominating services as data processing, web server services (web hosting) (J631). Other information service activities (J639) practically do not depend on GDP. The interdependence between sales revenue and GDP is middling close ($R^2 = 0.58$, $R_s = 0.8$). With the increase of GDP by one million LTL, the sales revenue tends to rise by 0.001 million LTL.

Linear relationship between sales revenue and GDP for accountancy, bookkeeping, audit activities, tax consultations (M692) is close ($R^2 = 0.88$, $R_s = 0.95$). When GDP increased by one million, sales revenue tended to increase by 0.004 million LTL.

Management consultancy activities (M702) are predominant from the activities of this kind while head office activities (M701) make only a small part, their volumes hardly changed with the changes of GDP, and they generated the smallest amount of sales revenue (5.38 million LTL).

Linear relationship between sales revenue and GDP for landscape gardening activities (N813) is not strong ($R^2 = 0.68$, $R_s = 0.97$); when GDP increased by one million LTL, sales revenue increased only by 0.0002 million LTL.

The interdependence between sales revenue and GDP for administration and maintenance activities (N) is close ($R^2 = 0.98$, $R_s = 0.99$). When GDP increased by one million LTL, sales revenue increased by 0.04 million LTL.

Linear relationship between sales revenue and GDP for rent and leasing activities (N77) is close ($R^2 = 0.95$, $R_s = 0.98$). The increase of GDP by one million caused sales revenue to increase by 0.014 million LTL.

Linear relationship between sales revenue and GDP for employment activities (N78) is close ($R^2 = 0.78$, $R_s = 0.94$). When GDP increased by one million, sales revenue increased by 0.0032 million LTL.

The interdependence between GDP and sales revenue for security and investigation activities (N80) is rather close ($R^2 = 0.97$, $R_s = 0.97$), and the increase of GDP by one million causes the increase of sales revenue by 0.0046 million LTL.

At last, the interdependence between GDP and sales revenue for building and landscape maintenance activities (N81), cleaning activities (N812), building and industrial cleaning activities (N8121, N8122) and other cleaning activities (N8129) is close ($R^2 = 0.98$, $R_s = 0.99$). GDP influenced the increases of sales revenue for cleaning activities (N812) more than for other activities of this kind.

The results of the research on the interdependence of GDP and the number of outsourcing companies are presented in Figure 2.

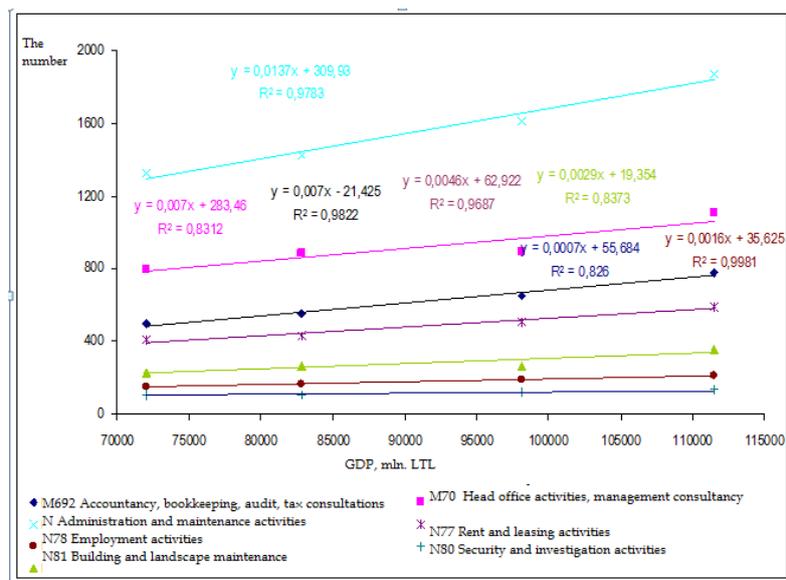


Figure 2. Interdependence of GDP and the number of outsourcing companies

It can be seen that variation of the number of outsourcing companies depended on GDP, and had a tendency to grow linearly (on average 100 a year, $R^2=0.83$). Administration and maintenance activities showed the fastest growth of the number of outsourcing companies (174 companies a year, $R^2=0.97$). This

confirms theoretical presumptions that increased popularity of these services conditioned creation of outsourcing companies, working in this service sector.

Evaluating the rates of revenue increase for different outsourcing services, it was noticed that growth of the revenue was positive every year only for administration and maintenance (N), rent and leasing (N77) and building and landscape maintenance activities (N81). Average rates of revenue growth exceeded average rates of the growth of GDP for all kinds of outsourcing activities, except telecommunications (J61). Employment (N78), rent and leasing (N77) and head office (N701) activities showed middle rates of the revenue growth – respectively 45.0, 38.2 and 34.9 per cent, while the revenue for telecommunication (J61) services grew slower of all (7.7 per cent). It is doubtful, whether it is purposeful to apply the model of linear regression for evaluation of the revenue growth in such service sectors as telecommunications (J61), computer programming, consultancy and related activities (J62), management consultancy (M70), rent and leasing (N77), building and landscape maintenance (N81) because the determination coefficients (R^2) did not exceed 0.25.

Business services are heterogeneous: from consultancy or rent to security services. That is why the decision to use outsourcing can also depend on the kind of the activity and the factors, necessary for the provision of the service: human capital, wages, geographical distance, the need of specific investment, uncertainty of the outsourcing contract, employees' functions. Geographical distance between a supplier and a customer can play different role, depending on the kind of activity. For example, it is desirable that security service team should work close to the company or inside it, so potential choice of the suppliers of this service is restricted within the particular geographical area. Too long distance becomes a restrictive factor in such service sectors as cleaning, security, control, maintenance while the services of tax and law consultancy, software supply and maintenance are not restricted by the geographical factor.

It can be also stated that the decision to outsource a part of business services is influenced by the need of specific investment. For example, specific means or high-skilled workers are not required for the provision of building and landscape maintenance (N81), cleaning (N812), building and industrial cleaning (N8121, N8122), other cleaning activities (N8129), so no specific investment are necessary to be made, although other companies are inclined to use these outsourcing services. On the other hand, the quality of the specific outsourcing services is hard to control (for instance, it is hard to control the quality of the consultation on taxes), which increased imperfection of such contract. In order to reduce this possibility, companies often choose to perform a particular (not very big) part of the service inside. Analysing provision of administration services, it is important to consider such components as the task, time, contract parties and institutional environment (regulations, additional services, suppliers). Time is not a specific asset because there are many alternatives how it could be used. However, the need of human capital for completion of particular administrative tasks can be very specific, but it is related to the alternative use of the time saved.

The results of the research propose that Lithuania is rather favourable country to provide rent and leasing services (N77). The country is in favourable geographical position, at the intersection of the rivers, with the seacoast and the harbour. The level of education in Lithuania grows fast, and many young professionals come to the labour market. The services of the rent and leasing could be developed in the sectors of logistics and information technologies. The biggest towns of the country have decent road intersections, which can also be strongly developed. One more advantage is that there are favourable conditions to export production from Lithuania to other European countries by both land and water. Besides, provision of rent and leasing services could be developed in the industrial sector where wages are not so high as in the Western Europe.

Conclusions

1. The analysis of the main parameters of economic intercourse (sales revenue and the number of the companies) in outsourcing companies during the period of 2000-2011 was carried out. For this reason the links of the above mentioned parameters with GDP and their dynamics (variation in time) were analysed.
2. Variation of the number of outsourcing companies depended on GDP, and had a tendency to grow linearly (on average 100 a year). Administration and maintenance activities showed the fastest growth of the number of outsourcing companies.
3. Growth of the revenue was positive every year only for administration and maintenance (N), rent and leasing (N77) and building and landscape maintenance activities (N81). Average rates of

revenue growth exceeded average rates of the growth of GDP for all kinds of outsourcing activities, except telecommunications (J61).

4. Lithuania is a rather favourable country to provide rent and leasing services, which could be developed in the sectors of logistics and information technologies.

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