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**Evaluation of the impact of outsourcing  
on the performance of Lithuanian electricity industry**

**Abstract**

The article is aimed at evaluation of the impact of outsourcing on the performance of Lithuanian electricity industry. Research methods include systematic analysis of the scientific literature and expert evaluation. Theoretical analysis of the literature has enabled to identify the most significant outsourcing determinants, which have the impact on the performance of electricity industry, and the main outsourcing-related risks for the companies operating in this industry. The results of the empirical research have revealed the effects of various outsourcing determinants on the performance of Lithuanian electricity industry as well as negative outcomes of outsourcing application in the researched industry.

**Keywords:** outsourcing, electricity industry, Lithuania.

**JEL Classification:** M550, L8.

**Introduction**

Under the pressure of modern business conditions, public sector companies, as well as the ones operating in private sector, seek for efficiency gain. Outsourcing is one of business strategies applied as a recognised way of cost reduction and efficiency increase [Gonzalez et al. 2013; Shoup et al. 2012; Furlong, Al-Karaghoulis 2010]. Providing so many organizational benefits, outsourcing has extended to different spheres of public sector including electricity industry [Raiborn et al. 2009; Vilko 2011]. In spite of that, the scientific literature still

lacks of the research to analyze the determinants of outsourcing contracts in electricity industry. In general, the main dimensions of the research on outsourcing in public sector include:

1. Aims (objectives) of outsourcing [Joha, Janssen 2010; Gerstlberger, Schneider 2013];
2. The impact of outsourcing determinants on the performance of public sector enterprises [Duhamel et al. 2014; Mutiganda 2014];
3. Negative outcomes of outsourcing (Rajabzadeh et al. 2008; James 2011).

The scientists who have analyzed the outsourcing in electricity industry mostly focused on the first and second of the dimensions mentioned above. However, the studies were mainly performed in Scandinavian electricity industry [Trygg et al. 2010; Tanskanen et al. 2007; Lassila et al. 2009] while other countries were hardly analyzed. That is why this article is **aimed** at evaluation of the impact of outsourcing on the performance of Lithuanian electricity industry. The following **objectives** were raised to fulfil the aim of the research: 1) to research theoretical material on the impact of microeconomic outsourcing determinants on the performance of electricity industry; 2) to analyze the structure of Lithuanian electricity supply network; 3) to present the methodology of the research; 4) to introduce the results of the empirical research on the impact of outsourcing on the performance of Lithuanian electricity industry.

The **object** of the research is the impact of outsourcing on the performance of Lithuanian electricity industry. The **methods** of the research include systematic analysis of the scientific literature and expert evaluation.

## **1. The impact of microeconomic outsourcing determinants on the performance of electricity industry: theoretical background**

According to Vilko [2013], an outsourcing decision is always based on the hypothesis that the outsourcing will bring some benefits – operational, strategic or both – to the company. Operational advantages usually provide short-term trouble avoidance, whereas strategic advantages offer longer-term contributions in terms of maximizing opportunities [Rajabzadeh et al. 2008]. The main aims (objectives) of outsourcing in public sector enterprises, highlighted by the scientists, are as follows:

- At operational level – cost reduction, substitution, current state improvement [Raiborn et al. 2009; Vilko 2013];
- At strategic level – capability enhancement, competitive advantage, corporate restructuring [Gewald, Dibbern 2009; Immonen et al. 2011].

Operational aims are usually related to cost reduction meaning lower expenditure. However, some authors [Hagy, Flynn 2001] criticize the over-concentration on costs and suggest treating cost reduction not only as ordinary expenditure calculation but also as cost control, increased availability of capital funds, cash infusion, access to external resources and the chance to off-load problematic functions [Lassila et al. 2009; Chodzaza, Gombachika 2013]. Anyway, according to Pérez-Reyes and Tovar [2010], many companies consider outsourcing to be a solution when they are looking for better operational efficiency – usually purchasing operations from the private sector, which is commonly thought to be more efficient.

Strategic aims are associated with the need to focus on core activities, acceleration of re-engineering benefits, risk sharing and the re-direction of resources [Vilko 2013]. In this case, feeling the pressure of a competitive market, enterprises start carefully looking at business needs and available options [Halldorsson, Svanberg 2013], so outsourcing becomes a strategy that enables an enterprise to focus on value-adding activities and utilize its core competences in the best way to hence the efficiency and profitability.

Awareness of the aims of outsourcing application enables transferring to the analysis of the impact of different outsourcing determinants on the performance of public sector enterprises. Since evaluation from macro perspective (the impact of outsourcing on the budget of the country, infrastructure, state funding gap reduction, etc.) requires the research of the wide spectrum of different public sector spheres while the aim of this article is to research the impact of outsourcing on one particular sphere – Lithuanian electricity industry, this research will be carried out considering only micro perspective. The analysis of the scientific literature has enabled to identify microeconomic outsourcing determinants that have the impact on the performance of electricity industry (see Table 1).

**Table 1.** The impact of microeconomic outsourcing determinants on the performance of electricity industry

Author, year	Country	Analyzed outsourcing determinants	The established impact of outsourcing	Researched field of electricity network industry
1	2	3	4	5
Vilko 2013	Finland	Reputation and references, concept requirements fulfilment, management time saving, staff issues, staff skills	Positive – management time concentration to core activities, fitting to corporate strategy, better employee issues management, personnel skills development	Electricity distribution
Tanskanen et al. 2007	Finland	Governance structures	Bidirectional: positive – better operational management, benefits to field work activities; negative – more complicated governance of control room activities	Electricity retail and distribution

**Table 1 cont.**

1	2	3	4	5
Chodzadza, Gombachika 2013	Malawi	Service quality, customer satisfaction and loyalty	Positive – higher degree of customer loyalty and customer satisfaction, better service quality	Electricity supply for industrial customers
McAdam et al. 2003	UK	Quality management	Positive – possible generalization to other utilities (water, roads, gas, telecoms)	Electricity retail
Jacobs 2009	Australia	Accuracy of the entity's financial accounts	Positive – tax reduction, accounting information adjustments	Electricity retail and distribution
Barbatunde et al. 2012	Nigeria	Risk allocation, risk sharing, infrastructure delivery, technical feasibility	Positive – access to private sector resources, shared authority between public and private sectors	Electricity delivery and operation

With reference to the data presented in Table 1, microeconomic outsourcing determinants that have the impact on the performance of electricity industry can be attributed to the following groups:

1. Consumer determinants (consumer satisfaction, consumer loyalty, enterprise's reputation and references, ability to fulfil concept requirements).
2. Operational determinants (efficiency improvement, flexibility of resources, access to external resources, technical feasibility, quality management improvement, management time saving, IT system improvement, combining of economic and technical targets).
3. Economic determinants (more flexible pricing, cost saving, cost control).
4. Technical determinants (technical implementation of projects, electricity transition and distribution facilitation, infrastructure delivery, field work improvement).
5. Strategic determinants (competitive advantage, governance structure improvement, fitting to corporate strategy, generalization to other utilities, risk sharing, risk allocation).
6. Personnel determinants (alignment of responsibilities, personnel issues management improvement, personnel skills improvement).
7. Ecological determinants (availability of renewable resources, the use of environmentally friendly technologies).
8. Other determinants (information adjustment, accuracy of financial accounts).

Summarizing, the significant outsourcing determinants that have the impact on the performance of electricity industry fall into the groups of operational and strategic determinants. The other groups include a smaller number of determinants although they are not less significant.

Although the impact of particular microeconomic outsourcing determinants on the performance of electricity industry is generally treated as positive, it is

also admitted that outsourcing may cause particular negative outcomes for the companies operating in this industry. The analysis of the scientific literature [Tanskanen et al. 2007; Tanskanen et al. 2010; Vilko 2013] has revealed that the main negative outcomes of outsourcing transactions in the researched industry are as follows:

1. Dependency on suppliers.
2. Loss of the security of confidential information.
3. More complicated governance.
4. Requirement of investments.
5. Losing synergies.
6. Increased number of transactions.
7. Necessity of contract standardization.
8. Long-term commitments to external service providers.
9. Loss of bargaining power.

It can be seen that the main outsourcing-related risks for the companies operating in electricity industry rise due to their relationship with external service provider on the basis of the outsourcing contract (dependency on suppliers, loss of the security of confidential information, long-term commitments to external service providers). On the other hand, even if outsourcing is expected to provide cost economy, initial preparation for making an outsourcing contract might require much investment in the research of the market and potential suppliers, contract standardization and so forth. Anyway, the risk of negative outcomes can be properly managed, but only on condition that the company has clearly defined its management requirements and strategic priorities.

## **2. The structure of Lithuanian electricity supply network**

Existence of an independent electric energy provision market in Lithuania ensures free competition, and consumers have the opportunities to select a reliable and competitive electricity supplier. The biggest part of electric energy consumed in Lithuania is imported, the other part – produced in Lithuanian power stations. Joint Stock Company Lietuvos energija is the largest electric energy producer in the country. With reference to the statistical data [National Commission for Energy Control and Prices 2014], during 2011, Lithuanian power plants produced 4.8 TWh electric energy, 2018 TWh of which was produced by Lietuvos energija.

Joint Stock Company LITGRID is the central enterprise in Lithuanian electricity industry, responsible for the balance of the consumed and produced elec-

tric energy in the network as well as for a reliable transmission of electricity and assurance of a smooth work of the system all over the country.

The role of distribution network operator in Lithuanian electricity supply network is played by joint-stock company LESTO, which is responsible for transmission of electricity to consumers via distribution channels, meeting consumers' needs, attraction of new consumers, exploitation, maintenance, management and development of electricity distribution networks, assurance of electricity distribution security and reliability.

With reference to the data of the National Commission for Energy Control and Prices [2014], in the fourth quarter of 2014, 73 companies with licences of an independent electric energy supplier were registered in Lithuania. 21 of 73 newly licenced companies actually performed the registered activity.

### **3. The methodology of the research**

The empirical research is based on the method of expert evaluation. This method was selected for the research since is advisable to be engaged when analysis of a particular problem or phenomenon requires an access to specific knowledge and abilities, and the results of the research are presented in motivated conclusions and recommendations [Augustinaitis et al. 2009]. What is more, selection of the method of expert evaluation was determined by the lack of statistical data on employment of outsourcing (types, scopes, frequency) in Lithuanian electricity industry. Lack of the statistical data on the researched topic can also be treated as a limitation of the research since it burdens conduction of quantitative analysis.

Managers of four largest enterprises currently operating as independent electricity suppliers in Lithuanian electricity supply industry – joint stock company Litgrid, companies of limited liability Enefit, InterRao Lietuva and Imlitex – with sufficient experience and competence in the researched field were selected as the experts for the research. It should be noted that half a year before the research, Lithuanian electricity supply system included 10 active participants (independent suppliers). However, during the process of the research, 2 of them were announced to be bankrupt, and 4 started changing the nature of their operations. Since questioning of such participants would not match the defined aim of the research, they were not included in the expert evaluation, and the evaluation was restricted with the survey of the representatives from four enterprises.

During the survey, the experts were asked to evaluate each of the presented outsourcing determinants in Likert evaluation scale, where the ranks from 1 to 5

would reflect experts' agreement or disagreement with the particular statement (marginal ranks 1 and 5 respectively meaning "Completely disagree" and "Completely agree"; depending on the strength of agreement or disagreement, intermediate ranks 2, 3 and 4 could be selected). The numerical values, calculated on the basis of the experts' evaluations, were systematised in the rank table. The data collected during the expert survey was processed using Statistical Package for Social Sciences (SPSS) and Microsoft Excel software.

#### 4. Empirical results on the impact of outsourcing on the performance of Lithuanian electricity industry

The results of the expert evaluation have revealed the effects of various outsourcing determinants on the performance of Lithuanian electricity industry as well as negative outcomes of outsourcing application in the researched industry

Calculated Cronbach alpha coefficient equal to 0.799 proposes that the questionnaire reflects the researched phenomenon with appropriate accuracy. The value of Kendall's coefficient of concordance ( $W^a$ ) is equal to 0.440, and value p is equal 0.002. This data proposes that experts' opinions on the impact of particular microeconomic outsourcing determinants on Lithuanian electricity industry were not unanimous. Nevertheless, the results of the performed research are statistically significant. The determinants with mean rank equal to 4.5 points and higher are considered extremely significant, the determinants with mean rank from 3.6 to 4.4 points are considered significant, and the determinants with mean rank equal to 3.5 points and lower are considered insignificant. The results of the calculations have been summarized in Table 2.

**Table 2.** Summary of the empirical research results on the impact of microeconomic outsourcing determinants on the performance of Lithuanian electricity industry

Determinant group	Significant determinants	Determinant group	Insignificant determinants
1	2	3	4
<b>Consumer determinants:</b>	Mean rank	<b>Consumer determinants:</b>	Mean rank
<i>Enterprise's reputation</i>	4.50	Consumer satisfaction	3.25
Consumer references	3.75	<i>Consumer loyalty</i>	2.50
Ability to fulfil consumers' concept requirements	3.75		
<b>Operational determinants:</b>		<b>Operational determinants:</b>	
<i>Efficiency improvement</i>	4.25	Access to external resources	3.25
<i>Management time saving</i>	4.75		
IT system improvement	3.75		
Combining of economic and technical targets	3.75		

Table 2 cont.

1	2	3	4
<b>Economic determinants:</b>		<b>Economic determinants:</b>	
<i>Cost saving</i>	4.00	More flexible pricing	3.25
		Cost control	3.50
<b>Technical determinants:</b>		<b>Technical determinants:</b>	
		Technical implementation of projects	3.50
		Electricity distribution facilitation	3.00
		Infrastructure delivery	3.00
		Field work improvement	2.50
<b>Strategical determinants:</b>		<b>Strategical determinants:</b>	
<i>Competitive advantage</i>	4.25	Governance structure improvement	2.75
		Generalisation to other utilities	3.25
<i>Fitting to corporate strategy</i>	4.25	Risk sharing	3.25
		Risk allocation	3.50
<b>Personnel determinants:</b>		<b>Personnel determinants:</b>	
Personnel skills improvement	3.75	Alignment of responsibilities	3.25
		Personnel issues management improvement	3.00
<b>Ecological determinants:</b>		<b>Ecological determinants:</b>	
		Availability of renewable resources	3.00
		The use of environmentally friendly technologies	3.25
<b>Other determinants:</b>		<b>Other determinants:</b>	
<i>Information adjustment</i>	4.75	Accuracy of financial accounts	3.50

With reference to the results of the expert evaluation, performance of Lithuanian electricity industry in respect of outsourcing application is positively influenced by such extremely significant and significant microeconomic determinants (mean ranks are equal to 4 points and higher) as:

- enterprise's reputation,
- efficiency improvement,
- management time saving,
- cost saving,
- enterprise's competitive advantage in the market,
- fitting to corporate strategy,
- information adjustment.

The determinants such as consumer references, ability to fulfil consumers' concept requirements, IT system and personnel skills improvement, and combining of economic and technical targets (mean ranks are equal to 3.75) are also considered to have a positive impact on the performance of Lithuanian electricity industry, although the determinants are less significant.

On the other hand, with reference to the results of the expert evaluation, application of outsourcing services does not ensure consumer loyalty (mean rank is equal to 2.50), does not facilitate electricity distribution and does not deliver



improved infrastructure (mean ranks are equal to 3). In addition, engagement of outsourcing does not contribute to field work improvement (mean value is equal to 2.5). The experts also disagree that the companies applying outsourcing will improve their governance structure or personnel issues management.

In order to establish whether the companies operating in Lithuanian electricity industry envisage any negative outcomes of outsourcing contracts in respect to the efficiency of their performance, the experts were also asked to evaluate particular possible negative outcomes of outsourcing, drawn with reference to the scientific literature analysis (see Table 3).

**Table 3.** Summary of the empirical research results on the possible negative outcomes of outsourcing in Lithuanian electricity industry

Negative outcomes	Mean rank
Dependency on external suppliers	2.50
Loss of the security of confidential information	2.75
More complicated governance	3.00
Requirement of investments	2.50
Losing synergies	3.50
Increased number of transactions	1.50
Necessity of contract standardization	1.75
Long-term commitments to external service providers	1.75
Loss of bargaining power	1.75

The results of the expert evaluation have revealed that representatives of Lithuanian electricity industry do not envisage any negative outcomes of outsourcing application in their companies.

Summarizing the results of the empirical research, it can be concluded that the positive impact of outsourcing application in Lithuanian electricity industry emerges by cost and management time saving, efficiency improvement and promotion of enterprise's reputation. The gains of outsourcing are also determined by acquisition of enterprise's competitive advantage in the market as well as by information adjustment in the operational field. However, the results of the expert evaluation have revealed that application of outsourcing is not a universal solution to enterprise's problems, especially considering staff (alignment of responsibilities, management improvement), technical (technical implementation of projects, electricity distribution facilitation, infrastructure delivery, field work improvement) and strategical (governance structure improvement, risk sharing or allocation, generalization to other utilities) issues.

## **Conclusions**

This article was aimed at evaluation of the impact of outsourcing on the performance of Lithuanian electricity industry. With reference to the results of the research the following conclusions can be made:

1. Theoretical analysis of the scientific literature has enabled to identify that the most significant outsourcing determinants, which have the impact on the performance of electricity industry, fall into the groups of operational and strategical determinants. The main outsourcing-related risks for the companies operating in the researched industry rise due to their relationship with external service provider on the basis of the outsourcing contract (dependency on suppliers, loss of the security of confidential information, long-term commitments to external service providers).
2. Lithuanian electricity supply network consists of Joint Stock company Lietuvos energija – electric energy producer, Joint Stock Company LITGRID – the central enterprise in Lithuanian electricity industry, responsible for the balance of the consumed and produced electric energy in the network as well as for a reliable transmission of electricity and assurance of a smooth work of the system all over the country, Joint Stock Company Lesto – a central distribution operator, and nearly 21 active independent electric energy suppliers.
3. Due to the lack of the statistical data on the scope and types of outsourcing in Lithuanian electric industry, the method of expert evaluation was selected for the research.
4. The results of the empirical research have revealed that performance of Lithuanian electricity industry in respect of outsourcing application is positively influenced by operational (efficiency improvement, management time saving), strategical (gain of competitive advantage, fitting to corporate strategy, consumer (enterprise's reputation), economic (cost saving) and other (information adjustment) determinants. No negative outcomes of outsourcing application in the researched industry have been established.

A comparatively small number of the enterprises operating in Lithuanian electricity industry testifies that market entrance barriers are extremely high, and the entrance as well as operation in this industry require considerable investment. Providing strategic and operational benefits, outsourcing, in this case, can be treated as one of the available solutions allowing enterprises to remain competitive and survive in the market. The risk of conceivable negative outcomes can be properly managed on condition that an enterprise has clearly defined its management and strategic priorities. Hence, the future research might cover an in-depth analysis of the impact of outsourcing determinants on different types of outsourcing services (i.e. continuous, one-off, etc.) in electric industry by service subjects and volumes.

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