CHARLES UNIVERSITY IN PRAGUE

FACULTY OF SOCIAL SCIENCES

Institute of Economic Studies

Hana Reimarová

Transaction Costs in Public Procurement

Rigorous Thesis

Prague 2012

Author: **Mgr. Hana Reimarová**
Supervisor: **PhDr.Mgr. Jana Chvalkovská**

Academic Year: **2011/2012**

Abstract

The term public procurement refers to a contract between public entity and private companies. The public procurement contracts are regulated by the Public Procurement Act, which specifies the rules under which the public procurement should be performed and sets conditions of award procedures of public contracts. The quality of execution of the award procedure influences the efficiency and the transparency of the contract. The award procedure can be executed by internal employees of the contractor or outsourced.

The main aim of this thesis is to analyze whether the contractors behave rationally when they outsource the award procedure; this thesis evaluates the differences between an in-house administration and an outsourced administration in prices, efficiency in terms of number of bidders in the contract and probability of formal errors in the award procedure. The results of the analysis shows that small contractors behave rationally; when they administrate the award procedure in-house they tend to make more formal errors thus they outsource the procedure. On the other hand, the large contractors do not behave rationally, because they outsource the administration of award procedure even if all three indicators show that they administrate the procedure in-house more successfully. The behavior of large contractors is explained with use of the agency theory.

The main contribution of this thesis consists of the evaluation of award procedure in terms of quality and transaction costs as there are only very limited economic literature to this topic. The thesis further contributes to the existing literature by collecting and sorting the data about public procurement contracts in the Czech Republic.

JEL Classification	H57, D23, D03
Keywords	Public Procurement, Award procedure, Transaction costs, Efficiency

Abstrakt

Termín veřejné zakázky se vztahuje k obchodu mezi veřejným a soukromým subjektem. Zadávání veřejných zakázek je upraveno zákonem o veřejných zakázkách který stanovuje pravidla pro veřejné zakázky a zároveň urrčuje podmínky pro zadávací řízení. Právě kvalita provedení zadávacího řízení může významně ovlivnit efektivitu a transparentnost veřejné zakázky. Zadávací řízení může být provedeno interními zaměstnanci nebo outsourcováno.

Hlavním cílem této práce je analyzovat zda se zadavatelé chovají racionálně pokud outsourcují zadávací řízení; srovnávací analýza hodnotí rozdíly mezi interní

administrací a outsourcovanou administrací zadávacího řízení na základě srovnání cen, efektivnosti ve smyslu počtu bidderů a pravděpodobnosti formálních chyb v zadávacím řízení. Výsledky ukazují, že menší zadavatelé se chovají racionálně, protože při interní administraci dělají více formálních chyb a proto je z jejich strany racionální outsourcovat zadávací řízení. Naopak u velkých dodavatelů se ukázalo, že se chovají neracionálně protože outsourcují zadávací řízení přestože ho podle všech tří indikátorů provádějí interně lépe. Chování velkých zadavatelů vysvětluje teorie agenta a principála.

Hlavním přínosem této práce je hodnocení kvality zadávací řízení veřejných zakázek a jejich transakčních nákladů – k tomuto tématu existuje jen velmi málo ekonomické literatury. Práce dále přispívá k existující literatuře analýzou a tříděním dat o veřejných zakázkách.

JEL klasifikace H57, D23, D03

Klíčová slova veřejné zakázky, zadávací řízení, transakční náklady, efektivita

Bibliographical Record

REIMAROVÁ, H. (2012): *Transaction Costs in Public Procurement* (Rigorous thesis). Prague. Charles University in Prague, Faculty of Social Sciences, Institute of Economic Studies. 88 pages. Supervisor: PhDr.Mgr. Jana Chvalkovská

Extent of the work: 88 pages

Declaration of Authorship

The author hereby declares that she compiled this thesis independently, using only the listed resources and literature.

The author grants permission to Charles University to reproduce and to distribute copies of this thesis document in whole or in part.

Prague, February, 2012 _____

Signature

Acknowledgements

I would like to thank especially my supervisor PhDr. Mgr. Jana Chvalkovská for guiding me through the topic.

I am also very grateful to Jiří Skuhrovec for providing me valuable comments and suggestions.

TABLE OF CONTENT

LIST OF FIGURES

Chapter 1: Introduction

Rigorous Thesis Introduction

Compared to the original master thesis, the rigorous thesis underwent some significant changes incorporating formal and factual remarks of the opponents. The changes concerning the legislation of public procurement, which were enacted after the submission of the master thesis, are incorporated in the part 2.6.1. which describes the legislative framework of public procurement in the Czech Republic.

The chapter 2, describing the public procurement system in the Czech Republic, is further extended by a subchapter 2.6.3.1 which aims to identify reasons of outsourced administration in connection with the features of public procurement system. These reasons are further examined in chapter 3 in context of the results of the analysis evaluating the quality of award procedures in the Czech Republic, which offers comparison and connection of the chapters 2 and 3.

The data analyzed in part 3 are described in the subchapter 3.1, which also offers explanation of why the authors excluded particular data from the analysis. As for the remarks of the opponents, their comments and suggestions were incorporated in the rigorous thesis as described above.

Introduction

Public procurement is a highly monitored area, since through these contracts flow significant share of public funds; in the Czech Republic it was about 15.5 % of GDP in 2010. The importance of public procurement lies mainly in its high value in relation to GDP, yet the difference between public procurement contract and ordinary contract between two private subjects has different roots. In the case of public procurement, employees of public entities manage public resources what creates risk of self-interested behavior resulting in agency inefficiencies.

Due to this issue and high value of procurement contracts, the administration of public contracts is regulated more than regular contracts. In the Czech Republic, these rules are set by Public Procurement Act[1] which defines conditions of award procedures of public procurement contracts which should lead to higher transparency and efficiency in the discussed area. Thus the rules of public procurement contracts are significantly more complicated than rules concerning general contracts; additionally the transaction costs of public procurement are higher. These transaction costs can be approximated by the costs of administering award procedures.

In this thesis, the transaction costs of public contract awarding procedures are estimated to be between 4-8 % of the contract value. This is a significant part of public spending and thus administration of award procedures deserves attention and evaluation in terms of efficiency.

Recently, a significant share of public contracts were administrated by external consulting companies and, according to estimates made in this thesis, charged at a higher price than when the administration was processed by public entities. Given the fact that the difference between administration costs in case of outsourcing and in-house administration can reach significantly differing values, it is important to evaluate whether outsourcing has reasonable economical justification and what are the ultimate effects of outsourcing on the quality of public contracts.

This thesis evaluates the advantages and disadvantages of outsourced administration of award procedures in terms of price and quality. The central hypothesis of the empirical part is based on the theory and expresses the idea that the public entities behave as rational economic agents and they outsource the procedure because the price is lower or the quality higher. It comes to the following conclusions; while small contractors behave rationally and hire consulting companies because they alone make more formal errors during the administration of the procedure, large contractors outsource the procedure even if they are able to process it in-house at lower price and higher quality. This behavior of large contractors is in

[1] Act (137/2006). Act no. 137/2006 Coll. On Public Contracts.

the thesis explained by a microeconomic model based on agency theory and behavior of officials.

The paper is structured as follows; the first chapter describes the theories concerning the institute of public procurement contracts, with emphasis on the award procedure, in terms of make-or-buy approach and asymmetric information causing the agency problem. This part also includes a brief description of the system of public procurement in the Czech Republic. The second part is devoted to the analysis of price and quality of public procedure depending on the administrator. In the analysis, three indicators are used to evaluate the efficiency of this behavior. The first one is price, second one is quality as determined by the number of bidders and the third is the quality determined by the number of formal errors in the awarding procedures. To the actual assessment two methods are used; the evaluation of the costs and the statistical comparison of data files using statistic tools.

This thesis is unique, in that it processes the public procurement topic from a point of view of transaction costs on the side of the contractor. The analysis, which provides new and relevant results which can be adapted by public entities, is based on data obtained and processed in cooperation with the Centre of Applied Economics.

Chapter 2: About Public Procurement

The aim of the first part of this thesis is to describe the theoretical overview of public procurement and the system of public purchases in the Czech Republic.

2.1.Definition of Public Procurement

In the topic-relevant literature, there are many definitions of the term public procurement. However, the most suitable one from the economic point of view is as follows: public procurement is defined as any process by which government or its agencies purchase goods or services from the private sector (Pavel (2009)). However, some authors prefer more general definition of public procurement as any purchase of goods or services, which is realized with public sources (Medveď (2005)).

The exact law definition used in the Czech legislative concerning public procurement is:

"*Public contract' shall be a contract for pecuniary interest concluded between the contracting entity and one or more economic operators, having as its subject-matter supply of products or the provision of services or the execution of public works. The public contract which the contracting entity shall be obligated to award under this Act shall be carried out on the basis of a contract in writing.*"[1]

2.2.Literature Overview

Despite their importance, institute of public procurement contracts have remained exempted from economic analysis and are discussed mainly from a legal point of view and from the point of procurement improvements and reforms. Thai (2001) indicates that the first important publication in which significant discourse was devoted to public procurement is Thomas (1919). Nevertheless we focus on modern public procurement theories. Public procurement in neoclassical economics

[1]Act no. 137/2006 Coll. On Public Contracts, Paragraph 7 (1), pages 5-6

can be seen as important part of public spending which has been well documented e.g. in Stiglitz (2000). However, this thesis concentrates also on public procurement form the point of view of behavioral economics, which is described by McCue and Prier (2007) or Laffont and Martimort (2002). The connection of public procurement with transaction costs has been addressed in the past e.g. Bajari and Tadelis (2001) or in the Czech Republic Pavel (2009).

Most of the contemporary authors concentrate on connecting public procurement with its respective efficiency quotient. Important papers in which authors try to find methods for evaluating public procurement are Mandl, Dierx et al. (2008), Hong and Shum (2002), Vogel (2009) or Gómez-Lobo and Szymanski (2001).

2.3.Basic Terms in Public Procurement

Contracting Entity

From the economic point of view, the contracting entity is public body which uses public sources to meet public needs. The contracting entity acts as a representative or agent of the public. From the legal point of view, the contracting entity is any subject which is obliged to award public procurement according to the relevant act valid in the particular country.

Supplier and Bidder

Supplier can be anybody who is able to provide goods or services which are subject of the demand of contracting entity. However, when the supplier submits a request to participate in the award procedures of the procurement process, he becomes a bidder. Unlike the supplier, the entity bidding for a particular procurement contract enters to the regulated relationship and must comply with applicable law.

Award Procedure

Awarding is defined by any activity of contracting entity which should lead to assigning a public contract. This activity is regulated by the law of particular country. In general, the contracting entity may award public contract by either open procedure or closed procedure and has different possibilities how to award the request of

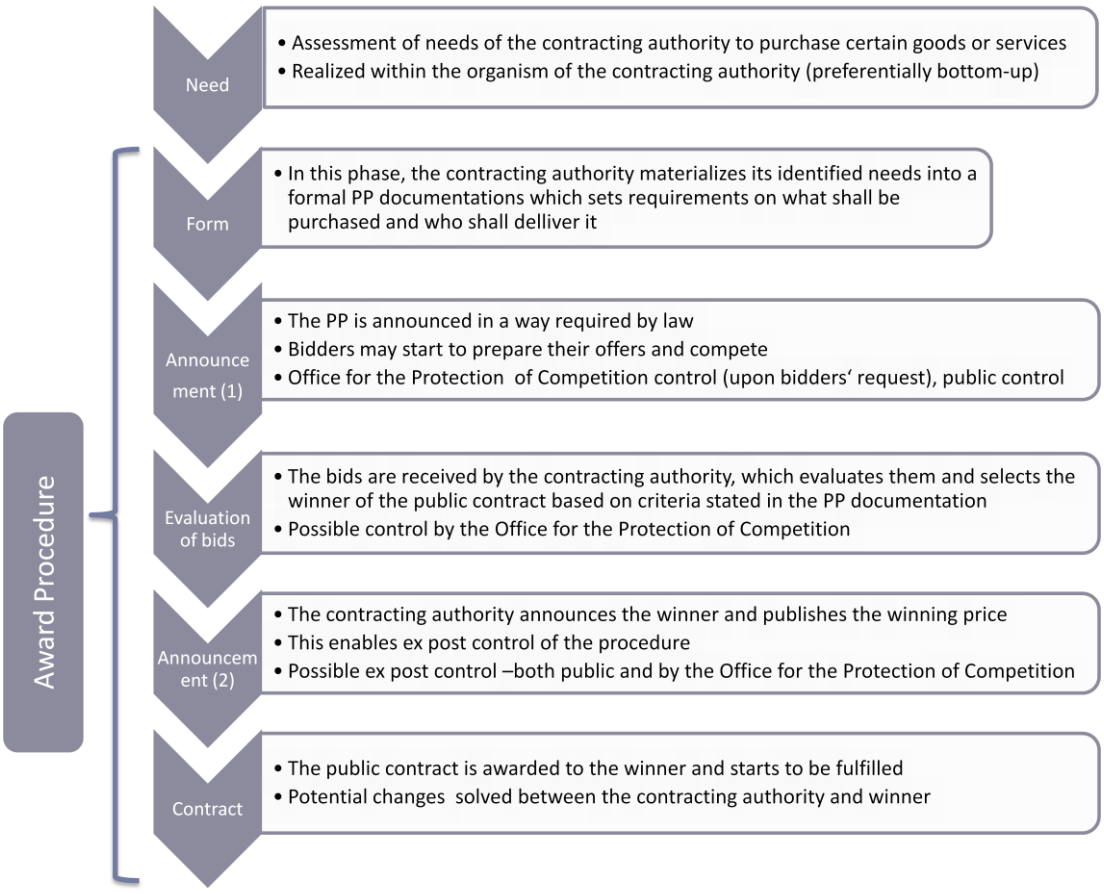
bidders. The choice of the procedure significantly influences the efficiency and transparency of public procurement, and thus, is of great importance.

Administrator of Award Procedure

The award procedure can be administrated directly by the contracting entity (in-house administration) or by external company (outsourced administration). In the second case is administrator any external company providing to the contracting entity help with any part of the preparation of public procurement contract or with implementation of public procurement contract in exchange for financial reward.

The process of decision-making and award procedure by public contracts is illustrated by following figure.

Figure 1: The process of public procurement beginning with assessment of needs until the fulfillment of the contract



Source: Based on Centre of Applied Economics

2.4.Specific Features of Public Procurement Contracts

Public purchases are different from the standard transaction between two private economic entities and thus is subject to different laws and economic rules. Pavel (2009) defines the difference in following facts:

- The public agency which buys the good or service is not final consumer of it.
- By public purchase, there are usually more persons who decide about the purchase than by private transactions.
- The value of public purchases is usually higher than the value of private transactions.
- The process of decision making by public procurement is standardized and formalized by law in form of the award procedure of public contracts which is complicated than the process by general contracts.

2.5.Theoretical Background of Public Procurement

Theories concerning public procurement can be described as a special case of theories of public sector. The theory of public purchases is a topic which is discussed across majority of economic theories. This thesis is based on the approach of externalization and internalization of the costs of public purchases in connection with transaction costs.

The basic decision, whether to buy or produce goods at the level of public sector can be described with the make or buy decision. However, the people who participate in public purchases usually act in the environment of uncertainty. Thus the make or buy decision in the case of public procurement needs to be discussed with regard to specific features as asymmetric information and agency theory. These features exist in case of public procurement at multiple levels as discussed further.

2.5.1.Transaction Costs

The term transaction costs was first mention by Commons (1931), who described the concept of transactions as follows:

"*…Transactions are, not the "exchange of commodities," but the alienation and acquisition, between individuals, of the rights of property and liberty created by society, which must therefore be negotiated between the parties concerned before labor can produce, or consumers can consume, or commodities be physically exchanged. Transactions, as derived from a study of economic theories and of the decisions of courts, may be reduced to three economic activities, distinguishable as bargaining transactions, managerial transactions and rationing transactions*."[1]

The concept of transaction costs was further developed and extended to public awareness by Coase, who stresses (in Coase (1998)) that the transaction costs are influenced by the institutional system of given country (legal system, political system, culture) and that the institutional environment is one of the most important aspects which influence the performance of an economy.

These institutions are divided to formal and informal institutions (e.g. Feige (1990)), while to the formals belong the legal system, rights guarantee, administrative regulations, penalties in case of violation and others.

In general, the transaction costs can be described as any costs that arise from a contract, other than actual production costs. These costs are not compensated by any increase in production and their value is determined by the institutional environment of the country.

2.5.1.1.Transaction Costs and Public Procurement

In this section, the author concentrates mainly on the transaction costs on the side of the public contractor[2].

[1]Commons, J. R. (1931). "Institutional Economics" American Economic Review 21. Page 653

[2] The aim is to evaluate efficiency of public spending.

For the purposes of this thesis, the transaction costs of public procurement contracts can be approximated by the costs of award procedure of the contracts:

$$TC \sim P_{awarding\ procedure}$$

These costs can be defined as administration costs connected with the contract awarding procedure[1]. The award procedure is regulated by law and must consist of specified activities[2].

The transaction costs or the costs of award procedure consist of ex ante, continuous and ex post costs. Formally;

$$TC_{AP} = TC(TCea; TCc; TCep) \quad (1)$$

Where

$TCea$	*Transaction costs ex ante – costs of recalling the tender, evaluation of the bids and contract completion*
TCc	*Continuous transaction costs - costs of monitoring*
$TCep$	*Transaction costs ex post - costs which occur by inaccurately executed tender – delay of tender, correction of formal errors, penalization and control*

As mentioned above, the transaction costs in case of public purchases are usually higher than in case of normal purchase between two private entities.

2.5.2.Neoclassical Approach and Make or Buy Decision

The theory of public purchases was described e.g. by Stiglitz (2000). One of the central points of neoclassical economics is the competition, which should lead to efficient resources allocation under the conditions of functioning markets. This allocation produces an equilibrium which is Pareto-efficient. Neoclassical economics

[1] We assume that the transaction costs on the side of the seller are reflected in the price.
[2] The award procedure is regulated by the Czech law are described in the chapter 2.6.2.

classifies goods and services as private and public (under some circumstances goods and services can also be mixed), while the proportion of the share of private and public goods should be determined through competition and functioning markets.

Let us assume that the public entity behaves as homo oeconomicus, because the assumption of rational economic thought enables analysis of certain aspects of behavior. Homo oeconomicus was defined by Altr (1982) as;

"The utility-maximizing consumer who attempts to allocate his income in such a way that he obtains the highest possible degree of satisfaction."[1]

The foregoing shows that goods and services should be produced when the public entity is able to produce it with lower costs than the private company. According to this model the issue of public purchasing is from a certain perspective of the make-or-buy decision. This decision can be described as a strategic choice between producing the good internally (make) or buying it externally (buy). The external purchase is often referred to as outsourcing. This decision can be formalized with the simplified equation as follows:

$$P_{Make} \gtreqless P_{Buy} \tag{2}$$

Where

P_{Make} *price of internal production*

P_{Buy} *price of external purchase*

This equation holds under the condition that the goods and services produced internally are the same quality than the goods bought externally. However, in most situations this not the case; usually the quality of external purchase and internal production differ. Thus, we have to compare utility, which is influenced by both, price and quality, and not only price. We can express it in following equation;

[1]Altr, M. (1982). "Carls Menger and Homo Oeconomicus: Some Thoughts on Austrian Theory and Methodology." Journal of Economic Issues 16. Page 149

$$U(P_{Make}; Q_{Make}) \gtreqless U(P_{Buy}; Q_{Buy}) \quad (3)$$

Where

$U(P, Q)$	*utility function which is increasing in P and Q*
P_{Make}	*price of internal production*
Q_{Make}	*quality of internal production*
P_{Buy}	*price of external purchase*
Q_{Buy}	*quality of external purchase*

Because $U(P, Q)$ is increasing in Q, we can also compare only;

$$\mathrm{Q}_{\mathrm{Make}} \gtreqless \mathrm{Q}_{\mathrm{Buy}} \quad (4)$$

If the public contractor behaved as rational economic agents, these two equations would be the crucial factor influencing the decisions concerning public procurement.

Make-or-Buy Decision and Transaction Costs

Let us get back to the general theory of transaction costs. In general the price of the public contract can be divided in two parts;

- Price of the goods or services
- Transaction costs, which can be in case of public procurement contracts described as costs of the award procedure of the contract

Taking into account the assumption $TC \sim P_{awarding\ procedure}$ from the previous subchapter, we can rewrite the equation as follows:

$$P_{Make} \gtreqless P_{Buy} + TC_{AP} \quad (5)$$

Where:

TC_{AP}	*costs of award procedure of public contract*
P_{Make}	*price of internal production of the good*
P_{Buy}	*price of external production of the good*

The issue of transaction costs in public procurement describes e.g. Pavel (2009). However, in his text, as in most of the papers, the division of transaction costs between the contractor and the supplier is emphasized. In this thesis the author concentrates mainly on the costs on the contractor`s side. Pavel (2009) also doesn't discuss the outsourcing of administration of award procedure in his work.

2.5.3.Agency Theory and Asymmetric Information

Agency theory is an economic concept, which originated in 1970s, when the problem of different attitude to risk and risk sharing between two parties that should cooperate was first described. With this topic dealt for example Arrow (1971).

Later on, the problem of different attitudes to risk was transformed to more a general problem of different objectives. In the concept were included the terms: principal, agent and asymmetric information. Eisenhardt (1989) defined the concept as follows;

"*Agency theory is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work*."[1]

[1]Eisenhardt, K.M. (1989). „Agency Theory: An Assessment and Review." The Academny of Management Review 14, pages 57-74. Page 59

In this relationship can be found two levels of problems;

- The goals of the principal and agent are often not the same ones.
- There is information asymmetry between the agent and the principal, thus for the principal is difficult to check what is the agent doing and which target he is following.

Under the condition that the principal knows the agent's possibilities and result of the steps taken by the agent, he can force the agent to behave in his favor. However in real economy there usually exists asymmetric information while the agent has the advantage.

The most common examples of principal agent relationships are (Laffont and Martimort (2002));

- Owner of a company and manager of a company;
- Creditor and debtor;
- Insurance company and insured person;
- Voters and voted members of parliament;
- Firm and salesman;
- Investor and portfolio manager.

The problem of agency theory is closely connected the concept of adverse selection, which is described e.g. by Akerlof (1970). Adverse selection refers to behavior in which lower quality products are selected because of asymmetric information flows between seller and buyer.

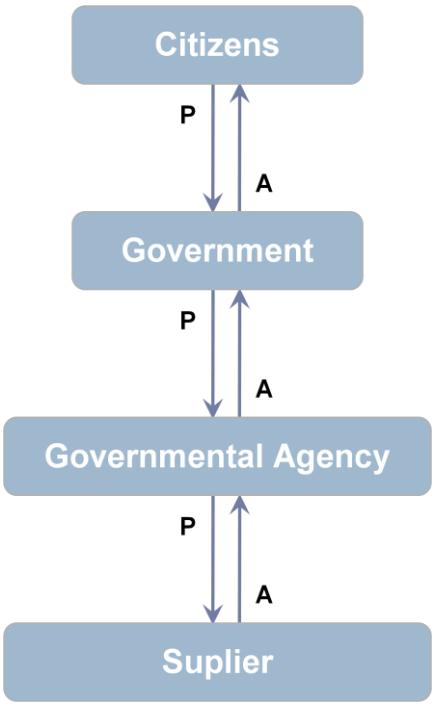
2.5.3.1. Agency theory and Asymmetry Information in Public Procurement

The above described theories can be connected with the problem of public procurement. In this case, the belief that the ex ante information is of the main concern prevails. First level of agency theory problem in the public procurement issue can be found in the relationship between the buyer (government agency) and the supplier (private company). However, for the purposes of this thesis is more

important the agency problem on the "second stage", which means the relationship between government, its employees and the final consumers of public good.

For example, McCue and Prier (2007) deal with this phenomena. The authors connect the problem of public purchases with the principle agent theory. The government, which should be interested in gaining benefits for the citizens, is in this case the agent of the citizens. Moreover, there are other levels of this relationship; the governmental agencies are agents of the government, and the above mentioned relationship between the seller and the government agency. Thus this model works in three stages, as shown in following graphics

Figure 2: Diagram of Principal-Agent in Public Procurement Contract



Source: Own Construction

Citizens – Government Relationship

In this case the citizens stand for the principal and the government for the agent. The government should follow the wishes of citizens and should enter into public contracts which are in best interest in the citizens. However the supervision of government from citizens is rather complicated and fast and direct enforcement impossible.

Government - Governmental Agency Relationship

In this case is government the principal and the governmental agency the agent. The governmental agency should behave in favor of the government however, as far as the governmental agency has better information, it moreover follows the aim of maximizing its budget.

Governmental Agency – Supplier Relationship

In this case is the governmental agency the principal and the supplier the agent. The governmental agency who wants to buy goods or services doesn't know the exact prices, thus the seller has information about production costs the buyer doesn't have. The supplier than may maximize its profit even if it would lead to higher costs for the governmental agency. In this relationship the adverse selection problem can thus occur.

2.5.4.Implications for Award Procedure of Public Procurement Contracts

Let us connect the above described theories with the award procedure of public procurement contracts, which is the essential topic of this thesis, and with the possibility of outsourcing of the award procedure. We already approximated the transaction costs of public contracts by the costs of administration of award procedure. Now we can get back to the make or buy decision and transaction costs. The government entity (e.g. ministry, city, municipality) can "make" the awarding process, what means to use its current employees, or to "buy" the implementation of the awarding process by an external firm. However, the "buying" of the awarding process would mean emergence of other transaction costs; in this case transaction costs of entering into contract with the external firm. Than we can rewrite the equations above described equation as;

$$P_{AP\ Make} \gtreqless P_{AP\ Buy} + TC \qquad (6)$$

Where

$P_{AP\ Make}$	*Price of administration of award procedure in-house*
$P_{AP\ Buy}$	*Price of outsourced administration of award procedure*
TC	*Transaction costs of signing a contract with company which administrates award procedure*

For the purpose of this thesis, the transaction costs can be neglected, as they are to low in comparison with the costs of the awarding procedure. Then we have

$$U(P_{AP\ Make}; Q_{AP\ Make}) \gtrless U(P_{AP\ Buy}; Q_{AP\ Buy}) \qquad (7)$$

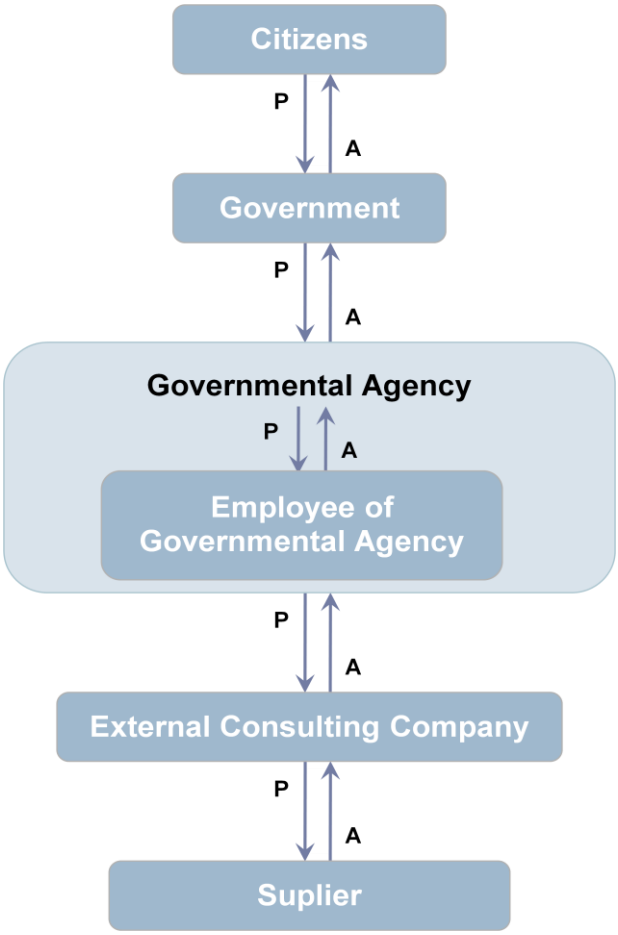
Where

$U(P;Q)$	*Utility function*
$Q_{AP\ Make}$	*Quality of administration of award procedure in-house*
$Q_{AP\ Buy}$	*Quality of outsourced administration of award procedure*

These equations suggest that the implementation of awarding process should be outsourced only in the case of lower price offered by an external company or in case of higher quality offered by an external company.

Now let us progress to related behavioral theories. The possibility of outsourcing award procedures means another level of relationships involving asymmetric information can arise and thus agency theory and moral hazard. Figure 2 can be adjusted as follows;

Figure 3: Diagram of Principal-Agent in Public Procurement Contract Including Employees of Governmental Agency



Source: Own Construction

To the above described string were added two actors; employer of governmental agency and the external consulting company.

Governmental Agency – External Consulting Company Relationship

In this case the governmental agency is the principal and the external consulting company is the agent. As we defined the award procedure as a good which should be purchased, the relationship between these two actors is similar as between the governmental agency and supplier. The governmental agency who wants to buy administration of the award procedure doesn't have exact information about prices and the quality of the goods offered by the external company, thus the external

company may maximize its profit even if it would lead to higher costs for the governmental agency.

External Consulting Company – Supplier Relationship

This relationship only replaced the above described relationship between the governmental agency and supplier.

Employee of Governmental Agency – Governmental Agency

In this case is the employee of the governmental agency an agent and the governmental agency the principal. The employee should follow best interests of the agency, however, it usually has better information than his employer. The results of the governmental employee usually aren`t connected with the success of the governmental agency, thus the employee may tend to follow his own interests. This can reflect in the decision to outsource the administration to outsource the award procedure thus the employee of governmental entity is the person who makes the decision whether external company will be hired to administrate the award procedure of public contract.

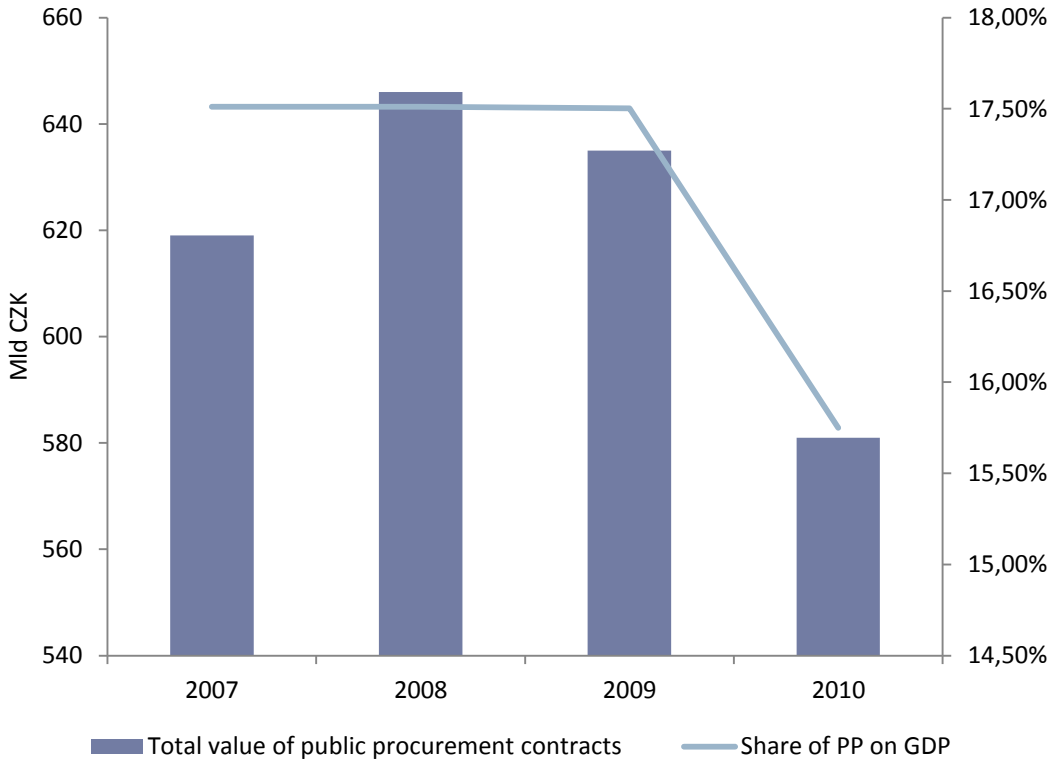
At this place, space for adverse selection and moral hazard arises, while the employee of governmental agency uses asymmetric information to follow his own interest rather than interest of the governmental agency.

In the chapter were discussed basic theories which can be connected with the public procurement and transaction costs, or in extension, with the award procedure of public procurement contracts and possibility of outsourcing of this activity. In the analytical part of this thesis would be tested which of these theories better reflects the behavior of employees of public entities.

2.6.Public Procurement in the Czech Republic

Public procurement is important area due to the fact that it concern public spending and creates significant share of GDP. The development of public procurement contracts as a share of GDP in the Czech Republic is shown in Figure 4.

Figure 4: Development of Total Value of Public Procurement and Share of Public Procurement on GDP in the Czech Republic between 2007 and 2010



Source: MMR (2011)

The institutional environment of the country mainly influences efficiency and transparency of public procurement contracts. Laws concerning public procurement and the system of public contracts wield the greatest influence in shaping this aspect of the institutional environment. A Summary of this institutional framework is offered following subchapter.

2.6.1.Legislative Framework of Public Procurement

The definition of the public procurement contract according to Czech legislation was stated cited at the page 7.

The legislative framework for public procurement in the Czech Republic is recently a discussed topic and has undergone many changes in the last few years. The first law passed after 1989 concerning public procurement was Act no. 73179/1991 Coll., On work contracts, which regulated public contracts on works and buildings. In 1992 the government adopted Resolution no. 458 which obliged the public contractors to implement public procurement contracts. The Resolution also stated assumption of simplified award procedures – addressing at least three candidates. Since 1995 had been valid Act no. 199/1994 Coll., on Procurement. This had to reflect former membership of Czech Republic in international organization and thus was novelized twelve times until 2004.

In 2004 Act no. 40/2004 Coll., on public procurement passed. It was adopted mainly because of the need to harmonize national legislation with the European one. An example of this harmonization can be new definition of public procurement contract or wider definition of the public contractor. The division of public contracts according to the type of the contract as we know it today was also created in this act. This act also determines exceptions when the set award procedure doesn't need to be fulfilled. The act from 2004 is considered to be "pre-EU-accession" act and was 8 times novelized.

However, already in 2004 EU Directives 2004/18/EC and 2004/17/EC were amended. Thus new act, which is considered to be "harmonization act", was adopted already two years later and has been valid until today.

The current situation is that public procurement is regulated by the Act no. 137/2006 Coll. On Public Contracts and Act no. 139/2006 Coll. On Concession Contracts and Concession Procedure. The last change of the Act no 137/2006 (the Act) is valid since 1.1.2012 according to the Amendment no. 258/2011 Coll, Amendment 367/2011 Coll and Amendment no. 420/2011 Coll. The bellow described "current system of public procurement" is described on the basis of this Act and listed amendments.

However, in the end of January 2012, the Amendment to the Act was approved by the parliament. This Amendment is not valid yet, but the author of this thesis

considers it important to mention important changes which can this Amendment mean to the public procurement system in the Czech Republic.

The Act on Public Procurement should ensure higher transparency and the transposition of EU Directives into Czech law, namely the Directive 2004/17/EC and 2004/18/EC. The Act changed some of the basic prerequisites of public procurement; it defined the small-scale public contracts and introduced new division of the types of the contracts. The Act is described in detail in following subchapter.

The legislation of the public procurement in the Czech Republic is approximately in70 % harmonized with the EU legislation. It is based on the Treaty establishing the European Community and the European procurement directives. The legislation should be based on principles of

- Transparency,
- Proportionality,
- Mutual recognition,
- Equal treatment.

National Legislation Concerning Public Procurement

As stated above, the public procurement in the Czech Republic is regulated by;

- Act No. 137/2006 Coll., Procurement (The Czech Public Contract Act – including Amendments mentioned above) and Act No. 139/2006 Coll., Concession Contracts and Concession Procedures (Concessions Act). This Act should ensure the principle of transparency and proportionality in public procurement.

Other Acts and decrees which amend or change the Act no 137/2006 Coll;

- Explanatory Report to Act no. 137/2006 Coll. This Report completes certain aspects of the act.
- Act no. 138/2006 Coll. This Act changes the act on public contracts and other acts.
- Act no. 110/2007 Coll. This act amends the values and limits in the act of public procurement in the EUR currency.

- Government Executive Order no 304/2006 Coll. This order concerns electronic tools of public procurement.
- Decree no. 326/2006 Coll. This decree notifies the purpose of the act.
- Decree no. 339/2010 Coll. This decree describes in detail the electronic tools of public procurement.
- Decree no. 9/2011 Coll. This decree lists products in the field of defense, which should be awarded according to the Act on public contracts.
- Decree no. 274/2006 Coll.

Other acts and decrees which amend or change the Act No. 139/2006 Coll., Concession Contracts and Concession Procedures;

- Act no. 140/2006 Coll. This act implements the Act No. 139/2006 Coll.
- Decree no. 217/2006. This decree deals with Essentials of the Application for Prior Opinion on conclusion concerning the Act No 139/2006 Coll.
- Decree no. 238/2006 Coll.

Act no. 137/2006 Coll. On Public Contracts

The Act no. 137/2006 Coll, On Public Contract (Act) has been valid since July 2006. It consists of 9 titles;

- Title one – General Provisions; this part describes the contracting body and contracting entities, which have to award contracts according to this Act.
- Title two – Award Procedures; this part describes the process of the contract from the beginning to the termination as follows;
    - Types of award procedures as well as with the conditions under which the particular procedure can be used,
    - Initiation and time limits of award procedures,
    - Tender documentation and technological specifications of public contracts,
    - Qualification requirements,

    - Tender specification and the process of envelopes opening with tenders,
    - Termination of award procedures.
- Title three – Special Procedures in Award Procedures; This part describes other requirements concerning some cases of public contracts, as;
    - The requirement of prior information notice and periodic indicative notice by above –the-threshold contracts,
    - Obligation of general provisions on framework agreement,
    - Settings of dynamic purchasing system,
    - Conditions of use of electronic auctions,
    - And other.
- Title four – Special Procedures; this part describes the conditions and use of the design contest and selection of a subcontractor by a public contract in case of defense or safety.
- Title five – Protection Against Irregular Practices of Contracting Entity; this part describes how the bad practice in public procurement can be challenged (e.g. with help of objections) and how the process is supervised.
- Title six – List of Approved Economic Operators, System of Certified Economic Operators, Foreign List of Economic Operators, Black List of Person Banned to Perform Public Contracts; this part describes these lists and their use.
- Title seven – Common Provisions; this part describes publication of the contract, communication between contracting authority and economic agent and the information system of public contracts.
- Title eight – Transitional and Final Provisions
- Title nine – Entry into Effect

2.6.2.Description of the Public Procurement System in the Czech Republic

The system of public procurement in the Czech Republic is based on division of public contracts into different groups according to the different features relating to

the contracting bodies, value of the contract and awarded process of the contract. These features are important in relation to the obligation of use procedures set by the Act.

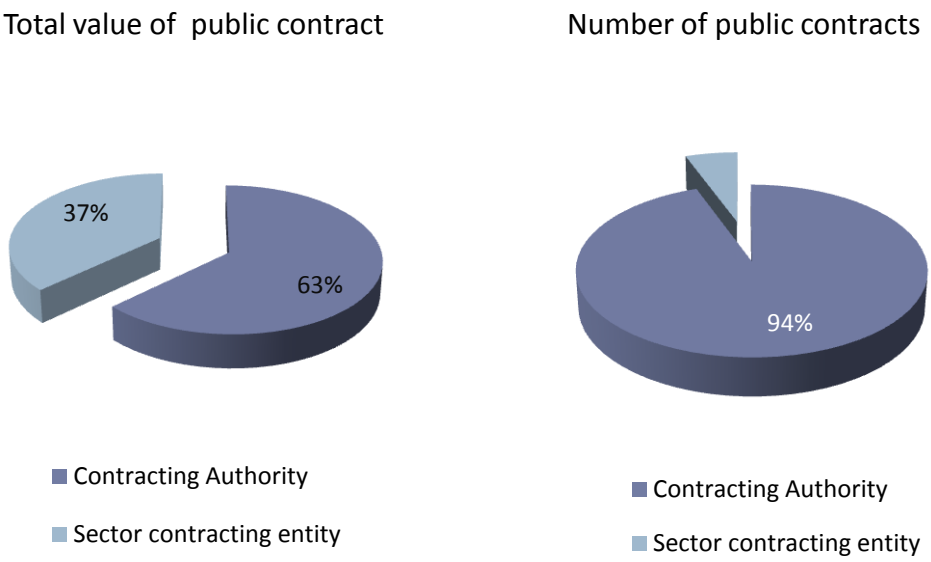
2.6.2.1.Contracting Entity

The entities, which are subjected to awarding public procurement according to the Act are divided into three parts;

- Contracting Authorities - Czech Republic, state organizations, territorial self-governing units and their organizations and of other non-commercial organizations set or financed by the Czech State.
- Subsidized contracting entities - Entities awarding public contracts that are reimbursed by more than 50 % from financial means provided by the contracting authority. Subsidized contracting entity should award public contract according to the Act applicable to the contracting authorities.
- Sector contracting entities pursuing relevant activities in e.g. energy sectors, public transportation, postal services, etc.

Figure 5 shows that over 90 % of all contracts in 2010 were awarded by the contracted authority and the rest by the sector contracting entity. However when we compare the value of public contracts, we can see that contracts awarded by sector contracting entity are much more important; they stand for more than 35%.

Figure 5: Distribution of Public Contracts According to Contractor in 2010



Source: Centre of Applied Economics

This means that the sector contracting entities award more expensive contracts than contracting authorities.

2.6.2.2.Types of Public Procurement Contracts

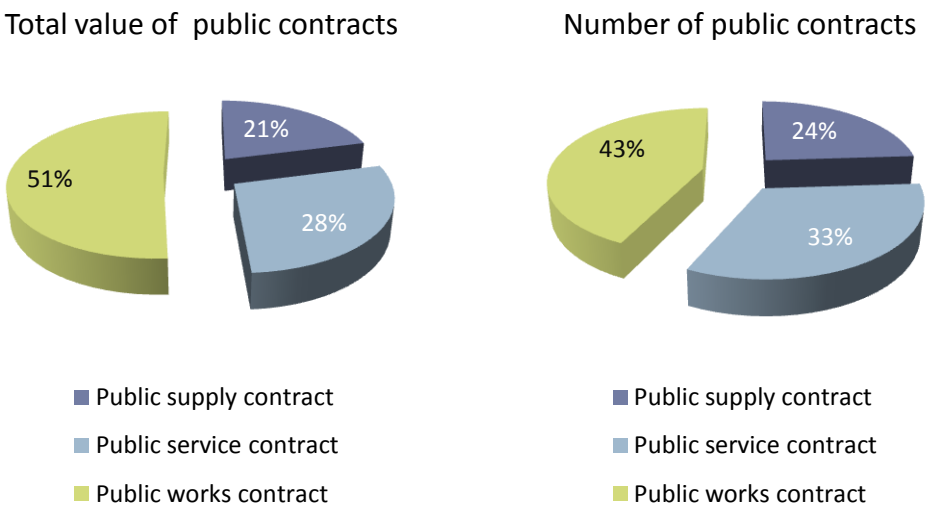
According to the Act, the public contract is contract between the contracting entity and one or more economic operators, when the aim of the contract is to supply products, services or public works. The Act stresses that the contract shall be awarded under the principles of transparency, equal treatment and nondiscrimination. Public contracts are classified according to the subject of matters (public supply contract, public service contract and public works contract) and according to the estimated value (small-scale public contract, below-the-threshold public contracts and above-the-threshold public contract).

Public contracts according to the subject of matters

- Public supply contract – the subject of the contract is good or product
- Public service contract – the subject of contract shall be provision of services
- Public works contract – by this contract should the subject of matter execution or realization of work

Figure 6 shows that in terms of value of contracts as well as number of contracts most of the contracts are public works contracts.

Figure 6: Distribution of Public Contracts According to the Type of Contracts in 2010



Source: Ministry of Industry and Trade of the Czech Republic

Public contracts according to their estimated value

- Above-the-threshold contract - any contract by which the estimated value exceeds the values set in the Act
- Below-the-threshold public contract – the estimated value of the contract is greater than CZK 2,000,000 (exclusive VAT) in case of public supply contract or public service contract and CZK 6,000,000 in case of public works contract
- Small-scale public contract – the estimated value of the contract shouldn't exceed CZK 2,000,000 (exclusive VAT) in case of public supply contract and CZK 6,000,000 in case of public work contract. In the new bill concerning the Act, the value of the small-scale public contract shouldn't exceed CZK 1,000,000 in case of public supply contract and CZK 3,000,000 in case of public work contract. The contracts exceeding this value should be according to the new bill considered as the below-the-threshold contracts. Thus by the small-scale public contract isn´t required so strict awarding procedure

(discussed in the subchapter 3.2.1) this change would probably lead to increase in overall costs on award procedures in public contracts. [1]

- Significant public contract - the Amendment to the Act from January 2012 introduces the concept of significant public contract. The contract is significant, when it´s value exceeds CZK 300,000,000 for the Czech Republic and CZK 50,000,000 for the territorial self-governing unit. These contracts will be approved by the government or council.

The contracts, by which is the award procedure regulated according to the Act, are above-the-threshold contract and below-the threshold contract.

2.6.2.3.Award Procedures of Public Procurement Contracts

In the Act, there are discussed following types of procedures;

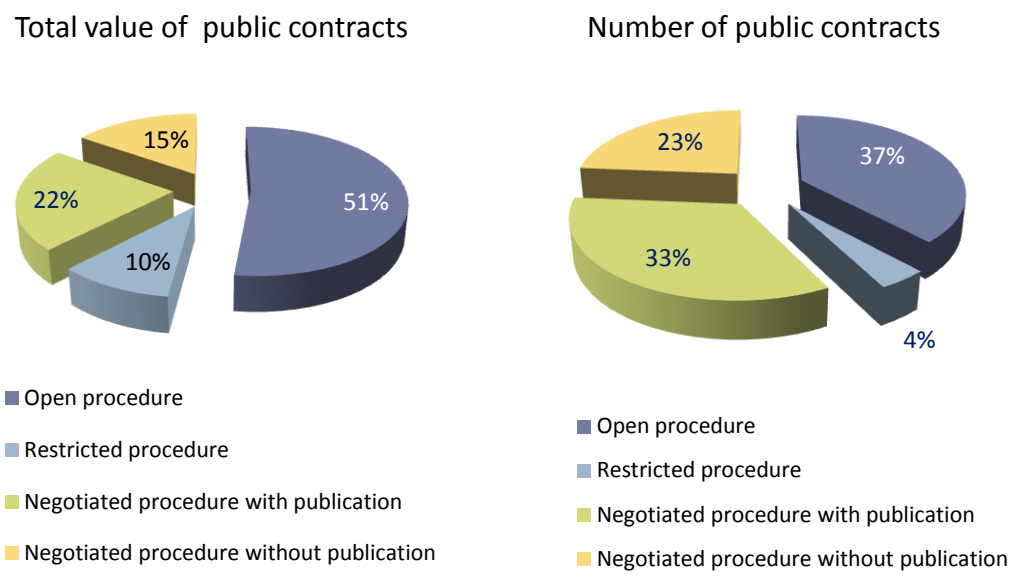
- Open procedure
- Restricted procedure
- Negotiated procedure with publication[2]
- Negotiated procedure without publication
- Competitive dialogue
- Simplified below-the-threshold procedure

The contracting entity may award contract by open procedure, restricted procedure, negotiated procedure with publication or by negotiated procedure without publication. The contracting authority may use also the competitive dialog and below-the-threshold procedure.

[1] The data evaluated in the Chapter 3 are from the period 2006-2010, thus the limit of small-scale contracts is set according to the legislation in force during the examined period.

[2] The new Amendment of the Act from January 2012 abolishes the possibility to reduce the number of candidates by random selection carried out by a draw.

Figure 7: Distribution of Public Contracts According to the Award Procedure in 2010



Source: Ministry of Industry and Trade of the Czech Republic

As showed in Figure 7, mostly used is the open procedure. In terms of number of the contracts, important is also negotiated procedure with publication.

2.6.2.4. Supervision of Public Procurement Contracts

Supervision of public procurement, as is required by the act, is practiced by the Office for the Protection of Competition (UOHS). The office has been in charge of the supervision since 2005. The main aim of UOHS is the preservation of environment supportive to competition.

Participants of public procurement may complain to UOHS when they suspect a breach of the law. When the office detects some errors it may opt remedial measures such as;

- Reinstating the unjustly excluded bidder to the process
- Canceling the entire tender

- Penalties[1]

Monitoring of Public Procurement - ISVZUS

All public contracts should meet the conditions set by the Act. One of the conditions is that all above-the-threshold contracts and below-the-threshold contracts has to be published in the central publishing subsystem – ISVZUS. This subsystem is operated at http://www.isvzus.cz. Information published in ISVZUS should contain data about the public contract; the most important are following;

- Identification number of public procurement contract
- Information about the contractor
    - Identification number of contracting entity
    - Contact adress of the contractor (usually email adress)
- Information about supply side of the contract
    - Identification number of supplier
    - Number of bidders
- Information about price of the contract
    - Expected value of the contract
    - Real value of the contract
- Date of dispatch of the contract
- Information about the contract
    - CPV number
    - Location of works
- Awarding criteria

The publication of these data on publicly available and easy reachable web page should ensure higher transparency of public procurement contract.

[1] According to the new Amendment of the Act from January 2012, the penalties should be doubled compared to the current situation. This step was taken to ensure greater transparency in the field of public procurement in the Czech Republic.

2.6.3.Administration of Award Procedures in the Czech Republic

As stated above, many contracting entities outsource the work on the awarding of public contract and hire external companies which administrate the whole project starting with the invitation to the tender and ending by conclusion of the contract. In following subchapter is described the administration of award procedure in the Czech Republic in connection with the information about public procurement system analyzed above.

2.6.3.1. Features Possibly Influencing Administration of Award Procedure

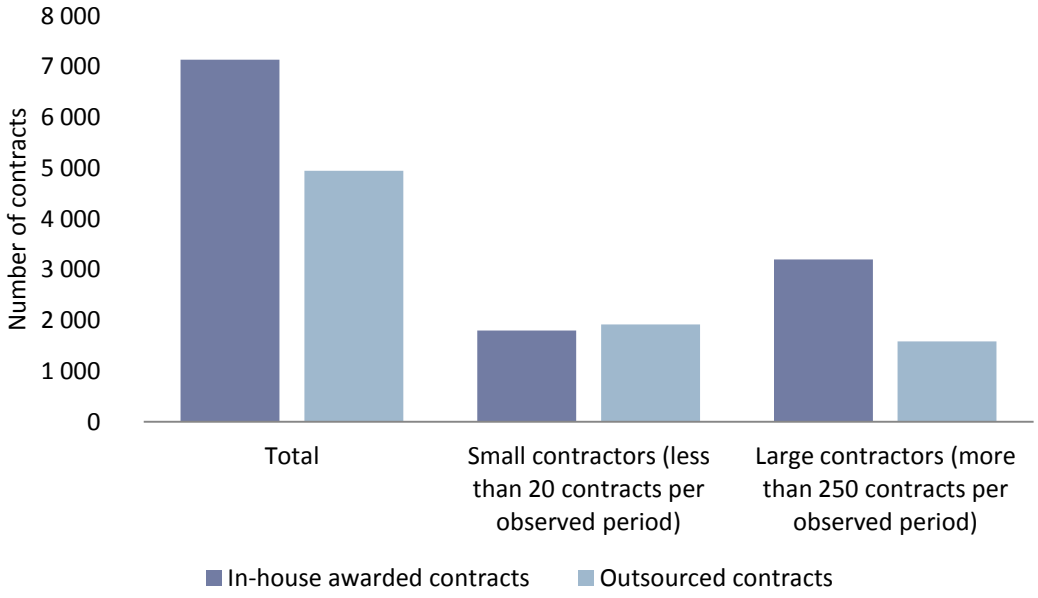
The features which may influence the decision to outsource the award procedure identified by the author are;

- Size of the contractor
- Type of the award procedure
- Size of the contract

Size of the contractor

First of all, it is important to see how the size of the contractor influences the administration of award procedure. The following figure shows that more than half of contracts were administrated in-house.

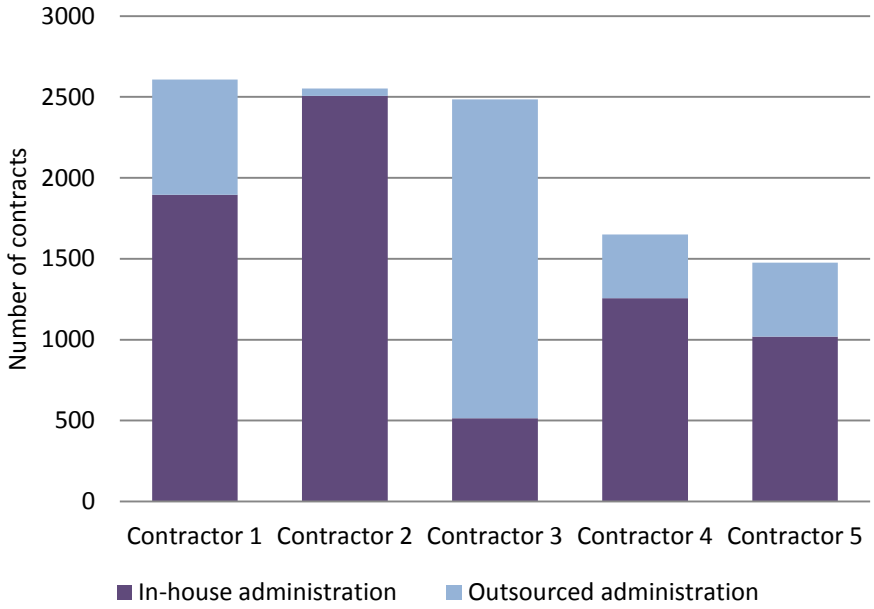
Figure 8: Comparison of In-House Administrated Contracts and Outsourced Contract According to the Size of the Contractor between 2006 and 2010



Source: Centre of Applied Economics

Higher tendency to outsource the procedure can be seen by small contractors, while large contractors prefer administrating of the procedure in-house. The following figure shows the distribution of in-house administration and outsourced administration by five largest contractors in the Czech Republic. Four of the largest contractors administrated majority of the award procedures in-house, while one outsourced majority of the procedures. Interesting fact is that all of the five largest contractors outsourced at least some of the procedures.

Figure 9: Distribution of In-house Administration and Outsourced Administration of Award Procedure in the Czech Republic between 2006 and 2010



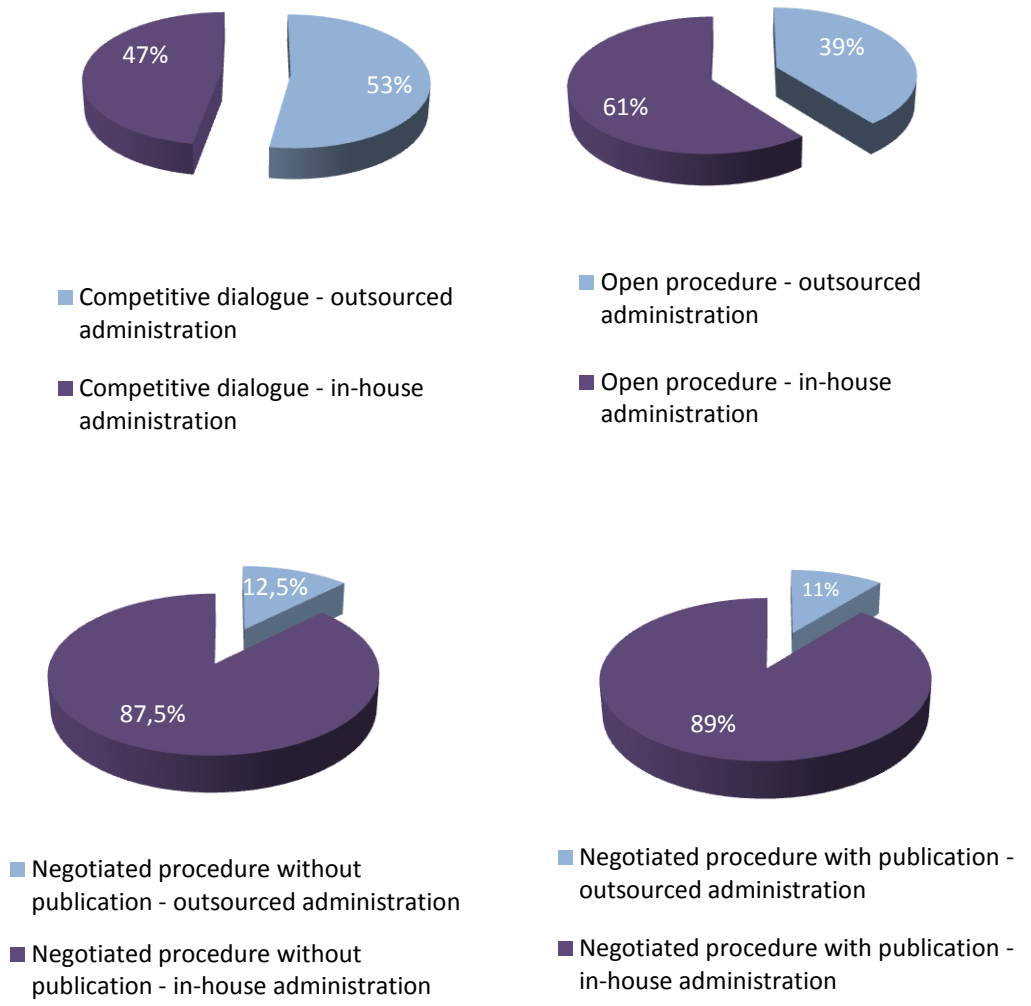
Source: Centre of Applied Economics

The influence of the size of the contractor on the administration of the award procedure is further analyzed in part 3 of this thesis.

Type of the award procedure

The administration of award procedures can be influenced also by the type of Award Procedure. The following figure illustrates that administration of award procedure was mostly outsourced by the use of competitive dialogue; by 53 % of contracts was the administration outsourced. By the other types of award procedures, was majority of the contracts administrated in-house; it was 61 % by open procedure and more than 87 % by negotiated procedure.

Figure 10: Administration of Public Contracts According to the type of Award Procedure in 2010



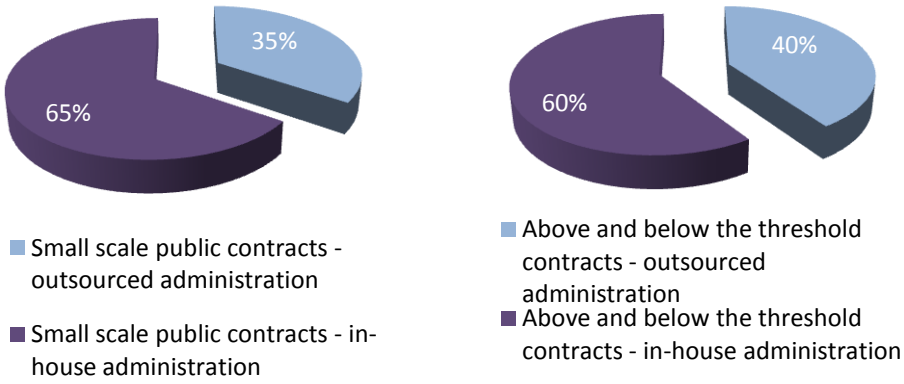
Source: Centre of Applied Economics

The type of the award procedure and the decision to outsource the administration procedure is further examined in chapter 3.

Size of the contract

Other feature that can influence the administration of the award procedure can be the value of the contract. As can be seen in the following figure, the ratio of administration in house and outsourced administration is not significantly different by small scale public contracts and bellow and above the threshold contracts.

Figure 11: Administration of Public Contracts According to the Value of the Contract in 2010



Source: Centre of Applied Economics

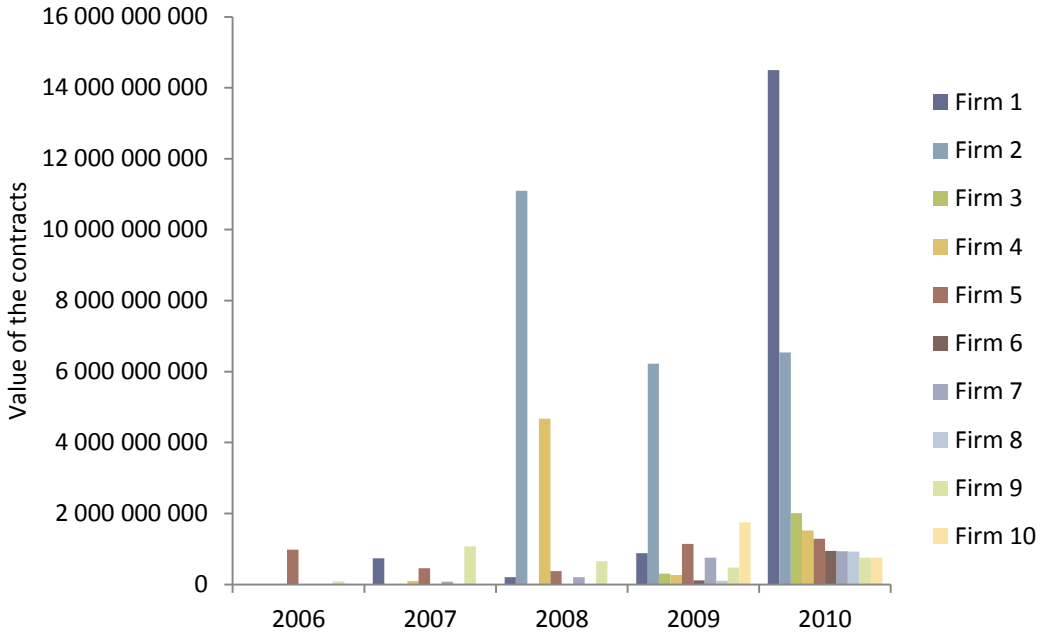
However, the contractors are not obliged to publish the data about small scale public contract in the central system. Thus the data concerning small scale public contracts are not reliable, and are excluded from further analysis.

2.6.3.2. Market with Administration of Award Procedures

There are many companies which are engaged to the activity of administration of award procedure. The market with consulting in the field of award procedure of public contract is wide and not concentrated. In the data sample (which consists of contracts awarded between the years 2006 and 2010) out of cca. 12,000 contracts was administration of over 4,000 contracts "outsourced".

Out of these 4,000 contracts 29 % were administrated by 12 biggest consulting companies in the field of administration of public contract. The concentration in this market shows following graph.

Figure 12: Share of 10 Largest Firms on the Market of Administration of Award Procedures of Contracts in the Czech Republic According to the Value of the Contracts (2006-2011)



Source: Centre of Applied Economics

As shown in Figure 12, the market distribution in the field of administration of award procedures changes very quickly. Since 2006 the value of contracts administrated by external companies had increased significantly.

There are three types of companies which offer administration of award procedures;

- Consulting firms which usually offers also consulting services in the field of European funds
- Law companies
- Construction companies

The consulting companies administrate more than half of the contracts.

These companies have to execute all activities as the public entity if it awards the contract by itself and should fulfill the same conditions of transparency, non-

discrimination and equal treatment. The description of the activities is thus the same as in the previous subchapter.

Chapter 3: Award Procedure in Public Procurement – Case of the Czech Republic

The aim of this thesis is to evaluate the award procedure of public procurement contracts in terms of transaction costs and analyze the reasons why public contractors and their employees in some cases hire external companies to undertake the award procedures. Besides, the author wants to evaluate the consequences of the outsourced award procedure on the public contract.

In the first part of the thesis three theoretical backgrounds connected to public purchases were defined. The transaction cost approach explains the specific position of the award procedure in the public procurement contracts.

The make-or-buy decision and agency theory deal with the behavior of the government, governmental entities and employees of contractors in the course of public procurement contract. Each theory assumes different behavior of persons in the process of public procurement which stems from different motives and results in different results.

This thesis tests whether the contracting entities and their employees behave as rational economic agents and follow the make-or-buy decision or rather use the information asymmetry to their advantage which would stem into the agency theory problem. The zero hypothesis reflects the rational economic behavior and make-or-buy decision represented by the equations (2) and (3);

$$P_{Make} \gtreqless P_{Buy}$$

$$U(P_{Make}; Q_{Make}) \gtreqless U(P_{Buy}; Q_{Buy})$$

These equations express that the price and quality of the award procedure in case of in-house administration and outsourcing should be evaluated and compared. Let us assume that price and quality are indicators of "good" award procedure. Rational contractors prefer lower price over higher price and higher quality over lower quality.

When the indicator is better in case of outsourced administration than in case of in-house administration, then hiring the external consulting company corresponds to the rational economic behavior. When the indicator is worse, the behavior is not rational and should be explained with agency theory. By equality of the indicator the contractor is indifferent between the possibility to administrate the contract in-house or outsource the administration and still behaves rationally. However, we compare three indicators;

- Price (rational behavior - lower price is preferred over higher price)
- Quality in terms of efficiency (rational behavior - more bidders is preferred over less bidders[1])
- Quality in terms of formal errors (rational behavior - less formal errors is preferred over more formal errors)

The evaluation of rationality of the contractor used in this thesis can be formalized as follows;

- If the contractor behaves rational concerning all three indicators, than he is rationally.
- If the contractor behaves rational concerning one or two indicators, irrationally in the rest, he still behaves rationally.
- If the contractor behaves irrationally concerning all three indicators, his behavior cannot be concerned to be rational.

The analysis is divided into three parts A, B and C. In each part is defined tested hypothesis, which is based on the above explained theoretical background.

[1] Why is number of bidders taken as a proxy of efficiency is explained in the chapter 3.3.1.

Part A: Evaluation of the administrative costs of the award procedure depending on the operator of the procedure (public contractor or external company).

To be able to evaluate prices of the award procedure outsourced and administrated in-house, we have to estimate these prices. We assume that the transaction costs of hiring external consulting companies to administrate the award procedure are negligible (especially in comparison with the prices of administration of award procedure). Part A is divided into three parts;

- Estimation of administrative costs based on hours worked and average wage.
- Estimation of administrative costs based on contracts of public entities with external consulting companies.
- Comparison of the prices

Hypothesis H0: The price of outsourced award procedure by external consulting company is equal or lower than the price of in-house administrated procedure.

$$P_{AP\ Make} \geq P_{AP\ Buy}$$

Part B: Evaluation of the quality of award procedure realized by the public contractor and external company in terms of efficiency.

The quality of award procedure in terms of efficiency is measured using number of bidders in public contract.

Hypothesis H0: By outsourced award procedures administrated by external consulting company compete more bidders than in-house administrated award procedure.

$$Q_{AP\ Make} \leq Q_{AP\ Buy}$$

Part C: Evaluation of the quality of award procedure realized by the public contractor and external company in terms of formal errors in the procedure.

The quality in terms of formal errors in the procedure is measured by the number of incorrectly listed data in the ISVZUS.

Hypothesis H0: By outsourced award procedures administrated by external consulting company can be found less formal errors than in-house administrated award procedure.

$$Q_{AP\ Make} \leq Q_{AP\ Buy}$$

In the end of this chapter the possible explanation of the irrational behavior of public entities is also provided, with the help of microeconomic model. This model is based on the concept of homo se asecurans described by Hlaváček (1986).

3.1.Data

Data about public procurement in the Czech Republic are published in the ISZVUS. This system is described in chapter 2.6.2. Although the data published in the ISZVUS are publicly available, they are always given for a single contract and can´t be automatically transferred into a database form. This lack of statistically useful data is probably one of the reasons why is the topic of this thesis in the Czech Republic empirically unexplored.

The data used in thesis were automatically selected from the ISVZUS and formed into a form of database by the Centre of Applied Economics. Author of this thesis helped with creation of this database especially with data cleansing[1]. The data are from the period 2006-2011.

Data used in this thesis are in following format;

[1] The difficulties with ISZVUS are illustrated in the appendix.

Table 1: Format of the Data

Administration of the award procedure is outsourced	0	1	...	...
Contractor	MĚSTO BOSKOVICE	Středočeský vzdělávací institut Akademie J. A. Komenského	...	...
Supplier	MiTTaG spol. s r.o. pozemní a průmyslové stavitelství	DOPRAVNÍ STAVBY BOHEMIA a.s.	...	...
Price	21930683	21426180	...	...
Identification number of the contract	6000000403001	5002391203001	...	...
Formal error in the award procedure	0	0	...	...
Contractor ICO	279978	430790	...	...
CPV	70112000-9	45223200-8	...	...
Date	2009	2011	...	...
Type of the contract	Open Procedure	Open Procedure	...	...

Source: Centre of Applied Economics

The data doesn´t include all public procurement contracts in the observed period, but only those by which can be determined whether the contracts were administrated in-house or whether was the administration outsourced, what was possible by more than 95 % of the complete data sample. These data were excluded form the analysis, because the unknown administrator make it impossible to assign the particular contracts to the two examined groups; in-house administrated contracts and outsourced administration. The exclution of the data didn´t change the mean of number of bidders in the whole sample, thus it shouldn´t bias the results.

The data set without exluded contracts contains approximatelly 12,000 data rows.

3.2.Part A: Evaluation of the Administrative Costs of the Award Procedure

Hypothesis H0: The price of outsourced award procedure by external consulting company is lower than the price of in-house administrated procedure.

$$P_{AP\ Make} \geq P_{AP\ Buy}$$

To be able to test the hypotheses that external companies are hired to process the award procedure because they can offer lower prices, it is necessary to compare the price of the award procedures.

Unfortunately, the data concerning the prices of award procedures are not publicly available, thus it is necessary to estimate the administration costs. As stated above, in the literature concerning the administration of awarding public procurement contract is very difficult to find any information about the actual costs.

Very rough estimate could be found in Economics (2006). According to this data, one open procedure costs in whole Europe approximately CZK 170,000. This information is very general, because the conditions in Member states differ significantly. These estimates also doesn't include the project documentation, thus even the lower boundary of the administration costs can be considered a very high estimation. Due to these reasons, the author decided to estimate the administration costs.

In this text are used two types of estimations;

- Estimation of the administration costs based on the estimation of hours worked on award procedure and the average wage of officials.
- Estimation based on publicly available data about the contracts between public contractors and external consulting companies who offer outsourcing of the award procedure.

As stated above, the following estimations include also the price of project documentation. This documentation should define the way in which the project will be managed. It should contain following parts;

- Plan of the project
- Analysis of requirements of the project and technical specification
    - Structure and description of the goals of the project
    - Suggestions of solutions in form of case studies
    - Description of integration with possible external applications
    - Analysis of risks and safety requirements
- Schedule of the project

We are well awarded that the project documentation and its price differs significantly depending on the type of the project; while construction works require detailed document, purchase of office supplies does not. However, for the purpose of this thesis we assume that project documentation is part of each project. This assumption does not influence the output because this assumption is same for in-house administrated contracts as well as for outsourced contracts.

3.2.1.Estimation of the Administration Costs Based on Hours Worked and Average Wage

The administration costs of award procedure of public contracts differ according to the type of contract and goods or services bought. For the purpose of analysis made in this thesis is suitable to divide the estimations into two types;

- Small-scale public contract
- Below-the-threshold and above-the-threshold public contracts.

This distribution was chosen because the award procedure of these groups of contracts differs due to the Czech legislation concerning public contracts.

To simplify the calculations, following estimates are made for the open procedure only[1].

3.2.1.1.Methodology

The estimation is based on time spent on administration of one contract. One contract is administrated by more than one person, the total activity is recalculated to head-hours. The number of hours is based on following;

- The activities which are compulsory when administrating the public contract are primarily listed in the Act (137/2006). Other description of the activities offers e.g. Ochrana (2008).
- The estimation of number of hours spent on particular activity is based on discussions with the employees of public contractors, publicly available information published by the public contractors and pricelists of companies who offer the administration of public contracts.

The evaluation of costs of employees of public entities is based on evaluation according to RIA (Regulatory Impact Assesement), as stated in methodological guide published by Ministry of the Interior of the Czech Republic[2]. The evaluation of the head-hours wage starts with the determination of the salary class and then proceeds as follows;

$$wage = gross\ wage\ * (1 + \gamma) * (1 + \delta) \qquad (8)$$

Where

$\gamma = 0.2$ *the multiplier of non-tariff costs of government employees*

$\delta = 0.34$ *the multiplier of mandatory contributions to social and medical insurance*

[1] The negotiated procedure would be more expensive, because there are more requirements in terms of more rounds of the procedure. The dialog can`t be easily evaluated and any procedure without publication is not a competition thus there is no reason to deal with it in any theoretical work of this type. This holds for both evaluation methods.

[2] MVČR (2007). "Metodika stanovení plánovaných nákladů na výkon státní správy." Ministry of the Interior of the Czech Republic.

3.2.1.2. Assumptions

- It is assumed that the award procedure is performed by officials who belong to 8^{th} -13^{th} salary class. This assumption is based on publicly available information published by government entities that award public contracts as well as on formal requirements on employees of public entities who should deal with public contracts.

3.2.1.3. Estimation of the Administrative Costs

Small Scale Public Contract

Award Procedure of Small-Scale-Public Contract

Due to the Act the small-scale-public contract is define as an contract, by which the estimated value of the contract shouldn't exceed CZK 2,000,000 (exclusive VAT) in case of public supply contract and CZK 6,000,000 in case of public work contract. (Paragraph 12, Article 6).

The contracting authority doesn't have to but may follow the procedures set by the Act and practically can choose any procedure he considers appropriate, it only need to comply with these principles (Paragraph 6);

- Transparency,
- Equal treatment,
- Non-discrimination.

But it is rather difficult to define the terms of transparency and non-discrimination. However, these terms can be explained in connection with the act as follows;

- Transparency – the procedure of the award process should be published
- Non-discrimination – more applicants should be approached.

In the Czech Republic, the award procedure by a small-scale-public contract is frequently determined by the contracting authorities through an announcement or internal regulation. In general can be said, that the contracting entities set a lowest

limit price of the contract, under which the contract is solved by the direct purchase from only one addressed supplier. This limit is usually set 100,000 CZK.

By more expensive contracts the contracting entity usually requires formal conditions of the awarding process, which should ensure that the market research was made and the best possible offer was chosen. These formal requirements should simulate the award procedure and can be divided in four steps;

- Written invitation to submit tenders,
- Evaluation of submitted tenders,
- Selection of the winning tender,
- Conclusion of the contract.

Evaluation

To make an analysis of administrative costs of award procedure of small-scale public contracts, further assumption has to be set;

- In following analysis will be taken into account only contracts whose price is higher than 100,000 CZK. Cheaper contracts are usually executed as direct purchases, thus the administrative costs are negligible.

Table 2: Estimation of Costs of Administration of Award Procedure of Small Scale Contracts Based on Average Wage and Hours Worked

Activity	Hours	Costs - lower estimate (CZK)		Costs - higher estimate (CZK)	
		Tariff (CZK / Hour)	*140*	*Tariff (CZK / Hour)*	*195*
Written invitation to the submit tenders	7	980		1,364	
Evaluation of submitted tenders	30	4,200		5,846	
Selection of the winning tender	10	1,400		1,949	
Conclusion of the contract	3	420		585	
Total	50	7,000		9,743	

Source: Own calculations

By the small-scale public contracts in not assumed necessity of project documentation; this assumption is based on the fact that these contracts don´t achieve such values by which would be the project documentation required. However, the author admits the possibility that even by small-scale public contracts is in particular cases can be the project documentation compiled, but the price of the documentation wouldn't be high enough to influence the analysis.

Below-the-Threshold Contracts and Above-the-Threshold Contracts

Award Procedure

The award procedure of above-the-threshold contracts and below-the-threshold contract differs from the award procedure of small-scale contract because the process of award procedure is exactly specified by law. The particular steps differ by different procedures (Open procedure, restricted procedure, negotiated procedure with publication, negotiated procedure without publication, competitive dialogue, and simplified below-the-threshold procedure). It also depends on the value of the contract (below-the-threshold or above-the-threshold contract). The exact process of the award procedure is set in the Act in Title Two, which is called "Award Procedures". The process has to follow the principles set in Paragraph 6 as in the

case of small-scale contracts. Also the process itself doesn't differ too much from the award procedure of small-scale-public contracts. In general, it has to consist of the same steps described in previous subchapter.

However, the particular steps of the process are more complex and time-consuming than by the small-scale contracts, and are strictly set by the Act. Even if, as stated above, the awarding process differs by different types of procurement contract, the differences are not of high importance. For the following analysis will be used as a proxy the open procedure of below-the-threshold public contact.

The activities associated with this award procedure can be described in extended versions as follows (all the described actions are not necessarily set by the law, but the following activities should ensure award procedures which would be in compliance with the Act and simultaneously ensure good praxis in public procurement);

- Invitation to submit tenders
    - Formulation of the notification
    - Formulation of the tender documentation
    - Notice about the contract at the official site of public contracts (http://www.isvzus.cz)
- Evaluation of submitted tenders
    - Preparation of the method of tender evaluation, structuring of evaluation criteria and preparation of evaluation manual
    - Appointment of evaluation committee
        - Three meetings of evaluation committee (familiarization with the object of the public contract, evaluation of the tenders)
- Selection of the winning tender
    - Selection of the winning tender
    - Report on assessment of the tenders
- Conclusion of the contract
    - Publication of the decision
    - Conclusion of the contract

Evaluation

Table 3: Estimation of Costs of Administration of Award Procedure of Above-the-Threshold and Bellow-the-Threshold Contracts Based on Average Wage and Hours Worked

Activity		Hours	Costs - lower estimate (CZK)		Costs - higher estimate (CZK)	
			Tariff (CZK / Hour)	*140*	*Tariff (CZK / Hour)*	*195*
Invitation to submited tenders						
	Formulation of the notification	16	2,240		3,118	
	Formulation of the tender documentation	20	2,800		3,897	
	Notice about the contract at the official site of public contracts (http://www.isvzus.cz)	10	1,400		1,949	
Evaluation of submitted tenders						
	Preparation of the method of tender evaluation, structuring of evaluation criteria and preparation of evaluation manual	24	3,360		4,677	
	Appointment of evaluation committee	5	700		974	
	Three meetings of evaluation committee (familiarization with the object of the public contract, evaluation of the tenders), the commission has at least three members (the hours spent on the activity is multiplied by three)	54	7,560		10,523	
Selection of the winning tender						
	Selection of the winning tender	5	700		974	
	Report on assessment of the tenders	8	1,120		1,559	
Conclusion of the contract						
	Publication of the decision	5	700		974	
	Conclusion of the contract	15	2,100		2,923	
Total	Total	162	22,679		31,569	

Source: Own construction

The above calculated costs include only the administration costs of the awarding process. However, in case of public contract, where it is necessary, the whole administration procedure includes also project documentation. One could argue that the project documentation is necessary and expensive only by construction public

contract, but also by other contracts is by the awarding entities usually required a document which sets technical conditions of the purchase. The lower price of technical documentation by other than construction works is accounted by the lower boundary of the estimation of the price of the technical documentation.

Price of the documentation differs by different project; however, most estimations set this price to be around 3-5 % of the price of the project. This estimate is also supported by the practical experience and pricelists of companies who offer compilation of project documentation.

Table 4: Estimation of Costs of Administration of Award procedure of Above-the-Threshold and Bellow-the-Threshold Contracts Based on Average Wage and Hours Worked Including Project Documentation

	Lower Estimate - In house administration	Higher Estimate - In house administration	Average
Cost of administration by minimal value of the contract without processing of project documentation (in CZK)	22,679	31,569	27,124
Cost of processcing of project documentation as % of the contract value	3%	5%	4%
Total costs of administration by contract value of CZK 3,000,000 (in CZK)	112,679	181,569	147,124

Source: Own construction

3.2.2.Estimation Based on Contracts between Public Contractors and External Companies

The companies which offer administration of public contracts rarely publicly indicate the price of their services. Scarcely, they state the base price which doesn't include the compilation of the technical documentation and is valid only for the lowest price of the contract which is CZK 2,000,000. Many indicators suggest that the price is in the end quite different and also reflects the final price of the contract. Due to this fact the author decided to estimate the costs of administration made by external firms in a different way.

3.2.2.1.Methodology

The estimation is based on publicly available data about public contracts on administration of the award procedure of public contracts. Into account were taken only contracts, by which can be determined the price of administration, number of contracts for which the administration was outsourced or total value of these contracts.

The information can be slightly distorted due to the fact that in a majority of these cases the information about particular administrated procedures wasn't stated in the contract, thus the author uses as a proxy of total value of the contracts all contracts of public entity in the discussed period of time. In praxis could be the prices of administration of the procedure by external companies slightly higher.

The estimation of costs including project documentation is calculated as follows;

$$Costs\ (\%) = \frac{\begin{array}{c}Price\ paid\ by\ contractor\ to\ the\ consulting\ company \\ for\ given\ period\ of\ time\end{array}}{\begin{array}{c}Total\ value\ of\ public\ procurement\ contracts\ awarded \\ by\ the\ contractor\ during\ the\ given\ period\ of\ time\end{array}} \quad (9)$$

The weighted average was calculated as follows;

$$Weighted\ Average\ = \sum \gamma_i * \omega_i \quad (10)$$

Where:

γ_i *share of i-estimation of costs on total costs used in the estimations*

ω_i *i-estimation of costs*

This estimation should reflect the real price which was paid to the consulting company.

3.2.2.2. Evaluation

Table 5: Estimation of Costs of Administration of Award procedure of Above-the-Threshold and Bellow-the-Threshold Contracts Based on Contracts Between Contractors and Consulting Companies

	Lower Estimate	Higher Estimate	Weighted Average
Cost of administration by minimal value of the contract without processing of project documentation (in CZK)	31,000	52,000	35,550
Cost of processcing of project documentation as % of the contract value	4%	14%	8%
Total costs of administration by contract value of CZK 3,000,000 with project documentation (in CZK)	136,000	472,000	265,241

Source: Own Construction

As can be seen in the table, the estimations vary more than the estimations in previous subchapter. Especially the estimations based on the processing of the project documentation vary from the value of 4 % to 14 %. These differences only reflect the differences in the contracts between public contractors and advisory companies; the prices and terms of the contracts differ. Due to this fact the following comparison is focused on the weighted average of the estimates, which according to the author reflects the situation in the best way.

3.2.3.Results Comparison

The prices of in-house administration of public contracts are significantly lower than the prices of outsourced administration. Exact comparison offers Table 6.

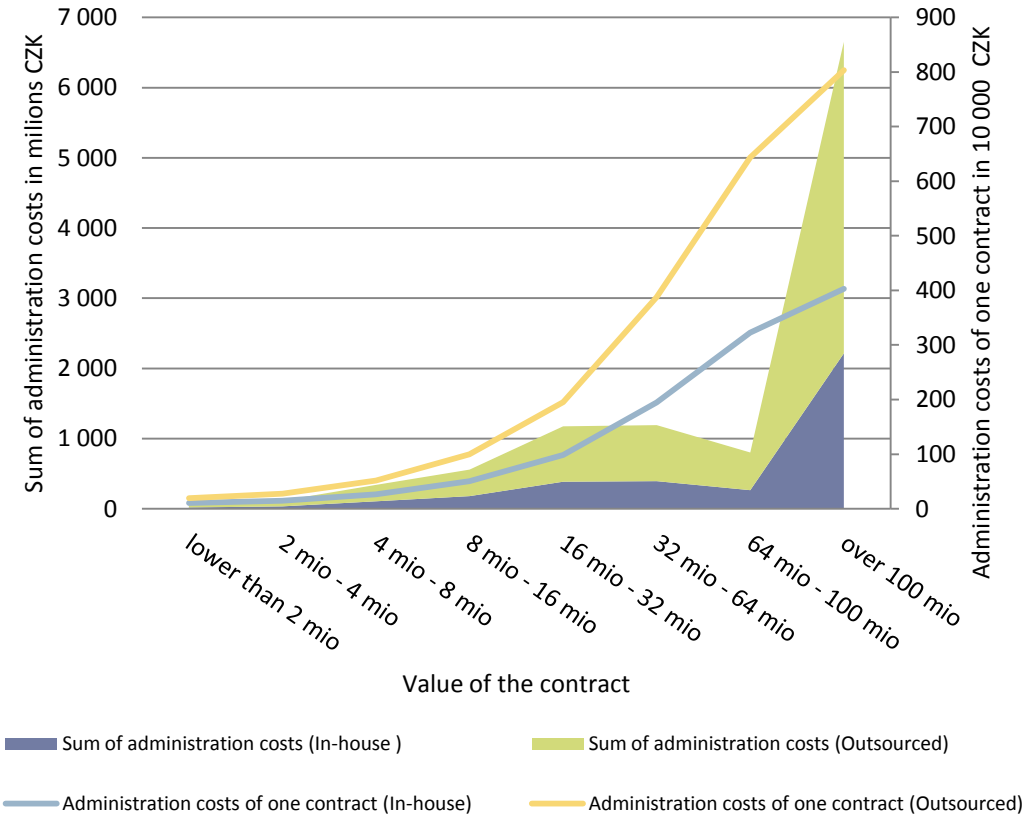
Table 6: Comparison of the Prices of Administration of Public Procurement Contracts

	Lower Estimate – In-house administration	Higher Estimate – In-house administration	Average
Cost of administration by minimal value of the contract without processing of project documentation (in CZK)	22,679	31,569	27,124
Cost of processcing of project documentation as % of the contract value	3%	5%	4%
Total costs of administration by contract value of CZK 3,000,000	112,679	181,569	147,124
	Lower Estimate – Outsourcing	Higher Estimate – Outsourcing	Average – Outsourcing
Cost of administration by minimal value of the contract without processing of project documentation (in CZK)	31,000	52,000	35,550
Cost of processcing of project documentation as % of the contract value	4%	14%	8%
Total costs of administration by contract value of CZK 3,000,000	136,000	472,000	265,241

Source: Own Construction

The average prices by contracts worth CZK 3,000,000 can differ by more than CZK 100,000. A more accurate picture of the impact on budgets which are mostly funded by public money can be seen in the following graph, which shows not only the price of administration depending on the contract value (right axis) but also the sum of administration of all contracts awarded in the Czech Republic during the observed period.

Table 7: Comparison of Costs of Award procedure between 2006 and 2011 by In-House and Outsourced Administration (Average Estimates)



Source: Own construction

The difference between area showing the costs of awarding in-house and outsourced awarding accounts for one billion CZK, what means approximately 200 million CZK per year[1].

[1] Figures for particular estimates of prices of administration costs of award procedures can be found in the Appendix.

3.2.4.Results Interpretation

As showed the analysis in previous subchapter, the price of outsourced award procedure is higher than the price of award procedure made by the public contractor itself. The difference is so high that it can´t be neglected. According to this result, **the hypotheses that external consulting companies are able to process the award procedure cheaper than the officials of contracting entities and therefore hire these companies, is refuted.**

But that returns us to the question, why hire the public contractors the external consulting companies to process the award procedure of public procurement contract, if the costs are significantly higher.

Possible answer can be that external companies are hired because they process the award procedure more qualitative than the contractor itself.

3.3.Part B: Evaluation of the Quality of the Award Procedure in Terms of Efficiency

Hypothesis H0: By outsourced award procedures administrated by external consulting company more bidders compete than in-house administrated award procedure.

$$Q_{AP\ Make} \leq Q_{AP\ Buy}$$

$$B_{AP\ Make} \leq B_{AP\ Buy}$$

Where:

$B_{AP\ Make}$	*Number of bidders in case of in-house administration*
$B_{AP\ Buy}$	*Number of bidders in case of outsourced administration*

The quality of award procedure in terms of efficiency is measured using number of bidders in public contract. Why is explained in following subchapter.

To indicate any action as quality action is tricky. First, the measure of quality should be specified. In terms of award procedure of public contract can be determined two fields which are somehow connected to the quality, each in different way. The first field is in context with the formal correctness of the award procedure itself, and the second field should be associated with quality of results of the award procedure. Let us discuss the second issue first.

3.3.1.Quality of Public Procurement Contracts in Connection with Award Procedure

The award procedure can influence the quality of public contracts without any doubt. But the question is how to define and measure this quality. This brings us to general terms efficiency and effectiveness in public procurement. Both, efficiency and effectiveness connect the inputs, outputs and outcomes of any economic activity. Mandl, Dierx et al. (2008) define the efficiency of through technical and allocation efficiency, while the higher output for a given input or lower input for given output,

the more efficient production. Effectiveness is according to the authors more difficult to describe; it is influenced by the objectives, and in case of public spending also by terms as welfare and political choices. However, they state that effectiveness indicates how was accomplished the task to achieve the set objectives with the given resources. While the evaluation of political choices or niveau of welfare is not aim of this thesis, Let us concentrate on the term efficiency. Sabiiti, Mjuhumuza et al. (2007) connect the term efficiency directly with the organizational process of public procurement system, because it is influenced through the awarding of the contract.

The second question is how to evaluate or measure the efficiency of public procurement. The exact calculation concerned with resources, output and inputs requires quantitative information. But it is not only difficult to define relevant variables but mainly to collect the data. Due to the lack of these data were created various methods how to evaluate quality of public procurement.

Majority of the researches define as the efficiency corresponding variable the difference between the pre-bid price and the final price of the contract. When the pre-bid price is higher than the final price, the procurement contract is efficient, when the final price is higher than the pre-bid price, the contract is inefficient. This idea was adopted for example by Domberger, Hall et al. (1995), who can be considered as founder of this approach, Gómez-Lobo and Szymanski (2001), Carr (2005) or in the Czech Republic Pavel (2008). The number of studies based on the described principle where the difference between previously set price and the final price of the contract stands for efficiency measure of public procurement shows that this concept is widely used, however, according to the authors of this thesis it contains essential error, which stems from following facts;

- The previously set price expresses opinion of the contractor how much should the good or service cost. However, the contractor isn´t in many cases able to estimate the price, e.g. if he is purchasing the particular good for the first time. The contractor does not simply always have enough information to evaluate the value of the contract, what is consequently "made by the competition". This happens usually in the areas, where is

difficult to set the price for people outside the market; e.g. specific services in telecommunications.

- The contractor can set the price lower only because he hopes it can have psychological effect on the bidders; they won´t offer significantly higher price than the estimated one. The same effect on the analysis would have any reason of setting different price.

Due to the above stated reasons the author decided not to use this approach to measure efficiency of public procurement contract, even if it is widely and often used method[1].

However, we can again recall the idea, on which are the above stated analyses partly based, that number of bidders promotes the competition. That the number of bidders increases competition and competition decreases price suggest already intuition.

Increased number of bidders basically means increased competition. It should encourage more aggressive behavior in terms of lower price. This process was described e.g. by Hong and Shum (2002).

Also the empirical findings support this hypothesis. Reports of European Union (e.g. Economics (2006)) suggest that there is a correlation between number of bidders and savings.

Due to above stated facts, in following analysis is used number of bidders in contracts as a proxy of efficiency.

3.3.2.Assumptions

Due to above stated facts increased efficiency of public procurement contracts awarded by external consulting company will be tested with help of number of bidders. The logic is simple; the more bidders the higher competition, the higher

[1] And in the Czech Republic as known the only approach how to measure efficiency.

competition the better results of the award procedure. Straightforward comparison of number of bidders in two subsamples – in-house administrated contracts and outsourced contracts for all contractors together – would produce misleading results. The reason is following; the contracts differ according to their subjects. Each subject is exposed to different market conditions and competition. The same situation is by contractors. They have different conditions due to the size – number of contract they award. Due to these facts the author decided to compare number of bidders in contracts under following changes which should eliminate above stated pitfalls;

- Subject of the contract
- Size of the contractor

Subject of the Contract

As stated above, different subjects are traded in different markets and under different conditions. At the market with specialized medical equipment is not as high competition as at the market with office equipment. Let us imagine two public contracts, in one should be bought specialized medical equipment, in the second one office equipment. Most likely would the second contract lead to higher number of bidders, not due to better award procedure but due to higher competition in the market with office equipment. However, in the following analyses should be evaluated quality of award procedure and its influence on the possible increased competition within the defined market. Thus the data should be divided in the way reflecting the division of the markets.

In 2008 European Union adopted regulation[1] which establishes single classification of goods and services in public procurement contracts. This classification is called CPV codes and is created of codes of up to nine digits. Each digit is associated with the subject of the contracts in following way;

- First two digits identify divisions.

[1] Regulation, C. (2008). "(EC) No 213/2008 of 28 November 2008." Offical Journal of European Junion.

- The first three digits identify the group.
- The first four digits identify the classes.
- The first five digits identify the categories.

The contracting entities in the Czech Republic should follow the CPV classification while awarding public contract. Thus, to divide the contracts while ensuring objectivity in comparing similar products with similar market conditions, in following analysis are the contracts divided into groups according to first three digits of CPV.

So that the number of bidders per contract can be compared and tested for the whole period, the data have to be cleansed. The following procedure was chosen;

- Calculation of the average number of bidders for all 3-digits CPV groups
- Subtraction of this average from every single number of bidders by each contract

This method ensures that the differences in number of bids due to market specific properties are eliminated. After this cleansing, the data can be compared as a whole sample.

Size of the Contractor

The contractors in the Czech Republic are divided as follows;

- Contracting Authorities - Czech Republic, state allowance organizations, territorial self-governing units or allowance organizations and of other non-commercial organizations set or financed by the Czech State.
- Subsidized contracting entities - Entities which are reimbursed by more than 50 % from financial means provided by the contracting authority.
- Sector contracting entities pursuing relevant activities in e.g. energy sectors, public transportation, postal services, etc.[1]

[1] 137/2006, A. n. Act no. 137/2006 Coll. On Public Contracts.

It is clear, that these contractors differ in number of employees who are specialized in public procurement and frequency of awarding public contracts. The quality of award procedure and incentives to deal with external company may also vary among different contractors. The most recognizable and significant character of contracting entity is the number of contracts during the given period of time. It concludes not only frequency of award procedures but also in some way captures the number of specialized employees; the more contracts, the higher incentive to allocate certain employees to specialized in award procedures. Thus in the following analysis are the contractors divided into following groups;

- All data per observed period
- Up to 20 contracts per observed period
- Over 250 contracts per observed period

All calculations in following analysis are tested in these subsamples.

3.3.3. Methodology

The data were divided into two main subsamples – Contracts awarded by public entities "in home" (Variable 1) and contracts outsourced and awarded by external companies (Variable 2). By each contract is calculated the cleansed number of bidders as;

$$cnb = number\ of\ bidders - average\ number\ of\ bidders\ for\ particular\ CPV$$

We test sub-hypothesis that the cleansed number of bidders is by in-house administration is lower than by outsourced administration;

$$H0: \mu_1 = \mu_2$$[1]

$$H1: \mu_1 > \mu_2$$

In following analysis, we use Two-sample unpooled t-test with unequal variances in Excel (the one-tail version of the test)

[1] For better consenus with the general hypothesis stated in the first chapter of the thesis the zero hypothezis could be formulated as $H0: \mu_1 \leq \mu_2$ because we use one-tail test. However, formally the hypothesis should be formulated as $H0: \mu_1 = \mu_2$. It doesn't influence the results.

T-Statistics[1]

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - d_0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Degrees of Freedom

$$df = \frac{\left(\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$$

Where:

$\bar{x}_1$ ……..*sample mean 1*

$\bar{x}_2$ ……..*sample mean 2*

d_0 ……..*hypothesized population mean difference*

s_1 ……..*sample 1 standard deviation*

s_2 ……..*sample 2 standard deviation*

n_1 ……..*sample 1 size*

n_2 ……..*sample 2 size*

This test is used for normal population or $n_1+n_2 > 40$ and independent observations and σ_1 and σ_2 unknown.

In the whole analysis, we use the significance level of $\alpha = 5\%$.

[1] Lehmann, E. L. (1997). Testing Statistical Hypotheses, Springer.

3.3.4.Results

Table 8: t-Test Results – All data

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*-0.169217145*	*-1.454595935*
Variance	*15.1243968*	*12.96470547*
Observations	*7020*	*4701*
Hypothesized Mean Difference	*0*	
Df	*10586*	
t Stat	*18.33948771*	
P(T<=t) one-tail	*2.78E-74*	
t Critical one-tail	*1.644997582*	
P(T<=t) two-tail	*5.57E-74*	
t Critical two-tail	*1.96018805*	

Source: Own Calculation

The t-statistic is higher than the one tail quantil of t-distribution. **We reject the hypothesis $H0$: $\mu_1 = \mu_2$ on the significance level of 5 %.** Furthermore, data listed in the table show that the mean of cleaned number of bidders is by in-house estimations in more than 1 bidder higher.

Table 9: t-Test Results – Contractors with over 250 Contracts

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*-0.162386495*	*-2.497886228*
Variance	*17.87224226*	*17.82636229*
Observations	*2576*	*1242*
Hypothesized Mean Difference	*0*	
Df	*2454*	
t Stat	*16.00598834*	
P(T<=t) one-tail	*3.17E-55*	
t Critical one-tail	*1.645474796*	
P(T<=t) two-tail	*6.35E-55*	
t Critical two-tail	*1.960931098*	

Source: Own calculation

The t-statistic is higher than the one tail quantil of t-distribution. **We reject the hypothesis $H0$: $\mu_1 = \mu_2$ on the significance level of 5 %.** Furthermore, data

listed in the table show that the mean of cleaned number of bidders is by in-house estimations in more than 2 bidders higher.

Table 10: t-Test Results – Contractors with up to 20 contracts

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*-0.460424181*	*-1.399660344*
Variance	*12.41201003*	*10.68174811*
Observations	*1637*	*1721*
Hypothesized Mean Difference	*0*	
Df	*3305*	
t Stat	*7.99853279*	
P(T<=t) one-tail	*8.63E-16*	
t Critical one-tail	*1.645314807*	
P(T<=t) two-tail	*1.73E-15*	
t Critical two-tail	*1.960681973*	

Source: Own Construction

The t-statistic is higher than the one tail quantil of t-distribution. **We reject the hypothesis $H0: \mu_1 = \mu_2$ on the significance level of 5 %.** Furthermore, data listed in the table show that the mean of cleaned number of bidders is by in-house estimations higher in almost 1 bidder.

3.3.5.Results Interpretation

We rejected the hypothesis that $H0: \mu_1 = \mu_2$ in all subsamples. That means that the quality in terms of efficiency o public contracts awarded in-house is higher than by outsourced administration. The difference is highest by large contractors which awarded over 250 contracts in the observed period.

3.4.Part C: Evaluation of the Quality of Award Procedure in Terms of Formal Errors

The quality in terms of formal errors in the procedure is measured by the number of incorrectly listed data in the ISVZUS.

Hypothesis H0: By outsourced award procedures administrated by external consulting company can be found the same amount or less formal errors than in-house administrated award procedure.

$$Q_{AP\ Make} \leq Q_{AP\ Buy}$$
$$FE_{AP\ Make} \geq FE_{AP\ Buy}$$

Where:

$FE_{AP\ Make}$	*Formal errors in case of in-house administration*
$FE_{AP\ Buy}$	*Formal errors in case of outsourced administration*

The award procedure must be administrated according to the rules which are set by the Act. These rules include also publication of certain information about the contract in the ISVZUS[1]. In following analysis is analyzed publication of identification numbers of contractor and supplier.

This information may not seem at the first sight important however it provides a view about transparency of the public contract. The identification number of contractor is one of the first indicators when somebody tries to find particular public contracts. Both numbers also serve as liaison between contractors and bidders. From these reasons the publication of correct identification numbers can serve as a proxy of transparency of the public contract and thus is important.

3.4.1. Assumptions

As in part B, also in this case are contractors divided into following groups;

[1] Described in the subchapter 2.6.2.4.

- All data per observed period
- Up to 20 contracts per observed period
- Over 250 contracts per observed period

3.4.2.Methodology

The data were divided into two main subsamples – Contracts awarded by public entities "in home" (Variable 1) and contracts outsourced and awarded by external companies (Variable 2). By each contractor and consulting company is calculated probably of error as;

$$p = \frac{Number\ of\ contracts\ with\ error}{Total\ number\ of\ contracts}$$

We test sub-hypothesis that the probability of formal error is higher by in-house administration;

$$H0: \mu_1 = \mu_2{}^1$$
$$H1: \mu_1 < \mu_{12}$$

In following analysis, we use Two-sample unpooled t-test with unequal variances in Excel (the one-tail version). We test the opposite hypothesis than in part B, thus we have to compare the t-statistics with the negative value of the quantile.

T-Statistics

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - d_0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

[1] For better consenus with the general hypothesis stated in the first chapter of the thesis the zero hypothezis could be formulated as $H0: \mu_1 \geq \mu_2$ because we use one-tail test. However, formally the hypothesis should be formulated as $H0: \mu_1 = \mu_2$. It doesn't influence the results.

Degrees of Freedom

$$df = \frac{\left(\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$$

Where:

$\bar{x}_1$ *……..sample mean 1*

$\bar{x}_2$ *……..sample mean 2*

d_0 *…….hypothesized population mean difference*

s_1 *…….sample 1 standard deviation*

s_2 *…….sample 2 standard deviation*

n_1 *……..sample 1 size*

n_2 *……..sample 2 size*

This test is used for normal population or $n_1+n_2 > 40$ and independent observations and σ_1 and σ_2 unknown.

In the whole analysis, we use the significance level of $\alpha = 5\%$.

3.4.3.Results

Table 11: t-Test Results – All Data

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*0.1088629*	*0.142523581*
Variance	*0.07686017*	*0.088005614*
Observations	*1178*	*494*
Hypothesized Mean Difference	*0*	
Df	*871*	
t Stat	*-2.157579301*	
P(T<=t) one-tail	*0.015616686*	
t Critical one-tail	*1.646604949*	
P(T<=t) two-tail	*0.031233371*	
t Critical two-tail	*1.962691284*	

Source: Own construction

The t-statistic is lower than the negative value of one tail quantil of t-distribution. **We reject the hypothesis $H0$: $\mu_1 \geq \mu_2$ on the significance level of 5 %.** Furthermore, we can see that the probability of error is by external companies in 4 % higher.

Table 12: t-Test Results – Contractors with over 250 Contracts

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*0.012831566*	*0.089980855*
Variance	*0.000450005*	*0.021287788*
Observations	*28*	*4701*
Hypothesized Mean Difference	*0*	
Df	*44*	
t Stat	*-16.99802887*	
P(T<=t) one-tail	*2.95242E-21*	
t Critical one-tail	*1.680229977*	
P(T<=t) two-tail	*5.90484E-21*	
t Critical two-tail	*2.015367547*	

Source: Own construction

The t-statistic is lower than the negative value of one tail quantil of t-distribution. **We reject the hypothesis $H0$: $\mu_1 = \mu_2$ on the significance level of 5 %.** Furthermore, we can see that the probability of error is by external companies in 0.3 % higher.

Table 13: t-Test Results – Contractors with up to 20 Contracts

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	*0.091434336*	*0.089980855*
Variance	*0.055535806*	*0.021287788*
Observations	*888*	*4701*
Hypothesized Mean Difference	*0*	
Df	*1019*	
t Stat	*0.177479987*	
P(T<=t) one-tail	*0.429583328*	
t Critical one-tail	*1.646350353*	
P(T<=t) two-tail	*0.859166655*	
t Critical two-tail	*1.962294699*	

Source: Own construction

The t-statistic is not lower than the negative value of one tail quantil of t-distribution. **We can´t reject the hypothesis $H0$: $\mu_1 = \mu_2$ on the significance level of 5 %.**

3.4.4.Results Interpretation

We rejected the zero hypothesis $H0$: $\mu_1 = \mu_2$ in two cases, by;

- All data and
- More than 250 contracts per observed period.

In these two cases is the quality in terms of formal error higher by in-house administrated contracts than by outsourced administration.

By small contractors (up to 20 contracts per observed period) can´t be the hypothesis rejected. As se we closer look at the results, in this case the probability of formal error in case of in-house administrations is in 0.3 % higher than by outsourced administration.

3.5.Economic Interpretation of Results

The aim of this subchapter is to summarize and interpret results of all three parts together. Table 14 provides overview of the three analysis, tested hypothesis and results.

Table 14: Summary of the Results

	H0	H1	Result	
Part A: Price comparison	$P_{AP\ Make} \geq P_{AP\ Buy}$	$P_{AP\ Make} < P_{AP\ Buy}$	All data	Reject H0
			Up to 20 contracts	Reject H0
			Over 250 contracts	Reject H0
Part B: Efficiency comparison – number of bidders	$B_{AP\ Make} \leq B_{AP\ Make}$	$B_{AP\ Make} > B_{AP\ Make}$	All data	Reject H0
			Up to 20 contracts	Reject H0
			Over 250 contracts	Reject H0
Part C: Efficiency comparison – formal errors	$FE_{AP\ Make} \geq FE_{AP\ Buy}$	$FE_{AP\ Make} < FE_{AP\ Buy}$	All data	Reject H0
			Up to 20 contracts	Can´t reject H0
			Over 250 contracts	Reject H0

Source: Own construction

As we can see, in case of the whole data set, we reject the hypothesis H0 in all three parts. As stated in the beginning of Chapter 3:, when we reject all three hypotheses **we reject also the hypothesis that the contractors behave as rational economic agents.** The same situation is by the large contractors (over 250 contracts per observed period).

However, in case of small contractors (up to 20 contracts per observed period) we can´t reject the hypothesis that by in-house administrated contracts is the probability of formal error higher than by outsourced administration. Just so **we cannot reject the hypothesis that the small contractors behave as rational economic agents.**

Let´s recall the discussion, stated in subchapter 2.6.3.1, which features of public contract can influence the possible outsourcing of administration of award procedure.

As the results show that there is significant difference between small and large contractors, it can be stated that the size of the contractor is one of the determinative feature.

Thus the following text divided to two parts according to the tested subsamples;

- Small contractors (up to 20 contracts per observed period)
- Large contractors (over 250 contracts)

The difference in these two groups and behavior of the contractors among these groups is explained in following subchapter.

The second feature possibly influencing the decision to outsource administration of award procedure stated in subchapter 2.6.3.1 was the type of the award procedure. While the difference in results is by the contractors with less than 20 contracts in the observed period, it is necessary to examine whether these small contractors use the negotiated procedure, which was in subchapter 2.6.3.1 identified as an award procedure by which contractors mostly outsource the award procedure, more than the larger contractor. However, the results show that the small contractors use the negotiated procedure in 2,7 % cases while the other contractors in 2 % cases. This difference is not sufficient to explain the different results between small contractors and the rest, thus in further text is taken into account only the size of the contractors as described above.

3.5.1.Small Contractors

As stated above, we can´t reject hypothesis of rational economic behavior of contractors, in extension of the employees who make the decision about the administration procedure of public procurement contracts. The decisive indicator why small contractors outsource administrative procedure is the probability of formal error, which is higher by in-house administration.

The reason can be easily identified. Contracting entities, which awarded less than 20 contracts in the period 2006 - 2011 are mainly small villages with very few employees. Due to the small frequency of public procurement it is not probable that

these contractors would train special workers only on agenda of award procedures of public contracts. The employees then tend to make more formal errors than in other cases. The contractors hire external companies to avoid these errors.

3.5.2.Large Contractors

Different situation is by large contractors, by which we rejected the hypothesis of rational economic behavior. As showed the analysis, the price and quality of award procedure is worse by outsourced contracts than it is by in-house administrated contracts. But what can the contractors or their employees lead to the outsourcing of the procedure?

One featured theory is that the contractors tend to outsource the procedures by types of contract they should award for the first time. However, upon closer examination of the data from large contractors, it can be deducted that only 28 % of the contracts are unique in terms of contractor and CPV[1]. This means that for over 70 % of the contracts would not be the motivation of unknown types of contracts explanatory, thus we have to find another explanation.

3.5.3.Officials Maximizing the Probability of Economic Survival

To explain the economically non rational behavior, we have to recall the principal-agent model discussed above. We can recall the Figure 3: Diagram of Principal-Agent in Public Procurement Contract Including Employees of Governmental Agency which shows possible pitfalls of the relationship between governmental agency and the employees of governmental agency (officials). The Governmental agency is in this case the principal while the official is agent. The behavior of officials which could lead to selection of administration of award procedure in conflict with rational economic principles is described and modeled in the following text.

[1] Matching contractor and CPV ensures that in the statistics are only contracts which are awarded for the first time by particular contractor.

The government entities buying goods and public services through public procurement process should try to ensure the most possible efficient purchase, what means that they should maximize the outcome of the contract while minimizing the total costs of the contract (price of the good plus transaction costs). The employees of the public entities should follow the same target in the best interest of their employer.

However, the officials tend to follow rather their own interest. Because they have better information than the public entity, moral the agency problem can occur in this stage of the whole process.

To describe their behavior, Let us recall the "homo se asecurans" concept which was used by Hlaváček (1986). In the standard economic analysis, the aim of any economic agent is to maximize the utility. But the utility of economic agents can be defined in many ways, while the most common approach in the perfect competition is the concept of homo oeconomicus who tries to survive in the competition through maximizing of the profit. But, unlike the homo oeconimicus, who´s aim is to maximize the economic profit, the homo se asecurans tries to maximize the probability of its survival in the company where he is employed. Hlaváček (1986) uses the concept of homo se asecurans to describe the behavior of producer in the planned economy, who tries to increase its survival chance by meeting the set plan in the current period and minimizes the probability of not meeting the plan in the next period.

However, the concept of homo se asecurans can be generalized for other situations. Let us examine the behavior of any employer, who is trying to keep his job. To do so, he has to meet following condition

- To minimize probability of being fired (or other punishment as reduction of the wage) because of problems caused to the employer.

This concept can be transformed to the problem of employees of public entities (officials) in procurement and connected with the transaction costs of procurement. To do so, Let us define the properties of officials of public entities.

In public procurement award procedure, there can occur many situation, which would lead to the following consequences for the public entity;

- Formal errors in the award procedure would lead to increased costs of the procedure.
- Factual errors in the award procedure could lead to the investigation of the procurement contract. The investigation could lead to the fine (again, increased costs), or just to the worsening of the reputation of the public entity.

Both cases are from the point of view of the official a reason to dismissal or other punishment usually in form of reduced salary. The self insuring official tries to reduce probability of this situation.

In relation with public procurement award procedure, he can do so by outsourcing of the activities connected with this procedure through hiring of external company. This company is then responsible for all formal and factual errors in the award procedure and covers the financial costs with correcting of these errors as well as fines. These companies are usually insured against damage caused to their clients. Even if there occurs of worsened reputation of the public entity, for this situation would be blamed the external company who was responsible for the award procedure and not the official.

The above explained behavior of officials can lead to the situation when public entities outsource the awarding process of public procurement even if the price is higher and the quality lower than in case of the internal implementation of the whole process. The officials tend to rather insure themselves even if this action worsens the overall performance of the public entity, because they would be personally responsible for the possible problems of the awarding process, but specification of the personal responsibility of particular officials for the overall performance of the entity is rather difficult.

3.5.3.1.Model Describing the Behavior of Officials

The above described behavior of self insuring official can be expressed by following microeconomic model, which is based on the work of Hlaváček and Hlaváček (2006). The authors created an optimization model of economic agent, who doesn't maximize the income but the probability of survival. With this model, they described behavior such as altruism, donating or behavior of firms in the centrally planned economy. Their model can be expanded and used to model the behavior of officials who try to secure their job.

The basic prerequisite of using this model is to define the decisive variable and the utility function of the economic agent (in our case the employee of governmental agency - official). In our case is the decisive variable the income of the official. This income is influenced by the quality of the administration of award procedure.

Hlaváček and Hlaváček (2006) used the Pareto distribution type 1. This distribution meets following requirements which correspond to the above described behavior of the officials and thus is suitable also for the modified model;

- The value at certain level is zero – when the income of official decreases under certain level, the official "terminates". Let us call this level the extinction limit (b). In our case is this value the minimum income the official needs to be able to live with.
- The higher the differences between the extinction limit and the real value of the decisive variable, the higher the value of the probability function.
- The limit value of the probability function goes to one when the decisive variable increases.

In the beginning is necessary to define basic prerequisites of the model. In this model we suppose two subjects;

- Agent – official, who minimizes the probability of punishment due to his failure which can lead to loosing a job. Agent is marked by a symbol a.

- Principal – the governmental entity which maximizes its economic performance. Principal is marked by a symbol p.

Both, agent and principal are dependent on the process of administration of the award procedure. When is the process without problems, they receive the initial wealth, which is defined as follows;

Initial wealth of the principal $y_p(0) = y_p$

Initial wealth of the agent $y_a(0) = y_a$

As stated above, the subjects survive only in case that the value of their wealth doesn`t fall under the extinction limit, which is defined;

Extinction limit of the principal b_p

Extinction limit of the agent b_a

Then we can define the probability of survival of the subjects;

Probability of survival of the principal $v_p = \frac{y_p - b_p}{b_p}$

Probability of survival of the agent $v_a = \frac{y_a - b_a}{b_a}$

We assume that the wealth (salary) of the agent (official) doesn`t depend on the performance of the principal (contracting entity). This assumption is based on the fact that we describe the behavior of large contracting entities – e.g. ministries. These entities are too big to fail, thus the official does not have to be afraid of loosing a job due to bad economic performance of the entity.

At this stage is necessary to define the states of the world which can occur. The agent can influence the fact weather the award procedure is administrated in house or weather is the administration outsourced;

- In – house administration is not marked with any symbol
- Outsourced administration is marked by a symbol o

- This case means, that the governmental agency has to pay for the administration of the process, thus its initial wealth decreases in o (payment for the administration)

The administration can lead to two different results;

- The administration of award procedure contains no errors
  - Probability of the situation is $(1 - \pi(c))$
- The administration of award procedure contains errors
  - This situation is marked by a symbol c
  - Probability of the situation is $\pi(c)$
  - In case of in-house administration of the process decreases the wealth of the agent in A (fine for errors in the administration process) and the wealth of the principal in *L-A* (*L* is the fine the governmental entity has to pay to remedy the situation, *A* is the amount the governmental entity selects from the erring official)
  - In case of outsourced administration decreases the wealth of the principal in *L-K* (*K* is the penalty charged to the external consulting company. These companies are insured against the damage caused to the customers.)

Now, we can summarize the possible situation in terms of equations;

Table 15: Equations Comparing the Principal and the Agent Behavior

	In-house administration of the award procedure	Outsourced administration of the award procedure
No error in the administration	$y_p(0) = y_p$ $y_a(0) = y_a$ $v_p = \frac{y_p - b_p}{b_p}$	$y_p(0) = y_p - o$ $y_a(0) = y_a$ $v_p = \frac{y_p - o - b_p}{b_p}$

of the award procedure	$v_a = \frac{y_a - b_a}{b_a}$	$v_a = \frac{y_a - b_a}{b_a}$
Error in the administration of the award procedure	$y_p = y_p - L + A$ $y_a = y_a - A$ $v_p = \frac{y_p - b_p - L + A}{b_p}$ $v_a = \frac{y_a - b_a - A}{b_a}$	$y_p(c) = y_p - o - L + K$ $y_a(c) = y_a$ $v_p = \frac{y_p - b_p - i - L + K}{b_p}$ $v_a = \frac{y_a - b_a}{b_a}$

Source: Own Construction

As stated above, the probability of occurrence of an error c can be express as $\pi(c)$. Now we can express the equation together using the probability.

In-house administration of the award procedure:

$$y_p(c) = \big(1 - \pi(c)\big) * y_p + \pi(c)\big(y_p - L + A\big)$$
$$y_a(c) = (1 - \pi(c)) * y_a + \pi(c) * (y_a - A) \quad (11)$$

Outsourced administration of the award procedure:

$$y_p(c) = \big(1 - \pi(c)\big) * (y_p + i) + \pi(c)\big(y_p - i - L + K\big)$$
$$y_a(c) = \big(1 - \pi(c)\big) * y_a + \pi(c)(y_a) = y_a \quad (12)$$

Now, we should compare the wealth of the agent (official) in case of in-house administration

and outsourced administration;

$$y_{a\ (in-house)}(c) = \big(1 - \pi(c)\big) * y_a + \pi(c) * (y_a - A) \leq y_a = y_{a\ (outsourced)}(c) \quad (13)$$

The equation shows that the wealth of the official is equal or higher in case of outsourced administration indeptendently on the consequences on the contracting entity. By outsorced administration is the official not responsible for possible problems with the public procurement contracts and simultaneously doesn´t personally bear the increased costs of the administration. It provides possible explanation, why large governmental entities hire external companies to administrate award procedures.

Chapter 4: Conclusion

Public procurement is an important area due to the fact that it concerns public spending and represents a significant share of GDP. The public contracts are regulated by the Public Procurement Act, which states the conditions of award procedures of public contracts. It is the award procedure that should ensure efficiency and transparency of the contracts, but it also creates a significant part of the total value of the contract, thus this topic is of a high importance. The administration of award procedures can be processed in-house, by the employees of the public entity, or it can be outsourced and processed by an external consulting company.

This thesis has evaluated the administration of award procedures from the point of view of economic rationality; to asses, whether the employees of contracting entities behave rationally when they outsource the award procedures, or whether they rather misuse the information advantage and follow their own interest stemming in the principal-agency relationship. The zero hypothesis expresses that the contracting entities behave rationally in the economic point of view, while the principal agent theory stands for the alternative hypothesis.

The analysis was divided into three parts and in each are compared quality measures of administration of award procedure in case of in-house administration with outsourced administration.

The first part compared pricing. The results of the analysis showed that the price is significantly higher by outsourced procedure. While by in-house administration the estimates of the costs of complete administration procedures ranges among 4 % of the contracts' value, by the outsourced administration ranges among 8 % independently on the size of the contractors. Thus we reject the hypothesis that the contractors hire external companies because of lower price.

The second part compared the quality of the award procedure in terms of efficiency, which is expressed by the number of bidders in the contract; the more bidders, the more efficient the contract is. The results suggest that more bidders compete by in-house administrated contracts than by the outsourced one. The difference is most significant by large contractors, where the contracts administrated in-house attracted on average 2 more bidders than the outsourced administrated contracts. By small contractors was the difference „only“ one bidder as well as by data including all contractors.

The aim of the last part of the analysis was to evaluate the award procedure in terms of efficiency expressed by the number of formal errors in the procedure; less errors means a more effective procedure. In this case the results differed between small contractors and large contractors with the overall data. With large contractors and data including all contractors, the probability of formal errors in case of in-house administration is lower than in case of outsourced administration. However, in case of small contractors the probability of errors is slightly lower by outsourced administration of award procedure.

Summary of the results therefore suggests that by the small contractors can´t be rejected the hypothesis of rational economic behavior. Their behavior can be explained by the fact that small contractors do not have employees specialized on the public procurement contracts and ordinary employees do not have enough experience with the award procedures.

The different situation is seen in the case of larger contractors, by whom the hypothesis of rational economic behavior in terms of outsourcing of the award procedure can be rejected. In several cases, these contractors hire external companies even if these companies administrate the award procedure in a worse way in all three observed measures. The explanation can offer the microeconomic model of behavior of public officials who tend to protect their job rather than follow the best interest of their employer. This model is based on Hlaváček and Hlaváček (2006) and explains that the officials may shift the responsibility for the problems which can occur during the administration of public procurement contracts on the external companies, even if it means higher costs for the contractor.

This thesis has shown that the costs of award procedures of public contracts create significant part of public spending and the quality of award procedure can influence quality of the public contracts, thus the administration of this procedure deserves attention. Although the importance of the procedure is publicly recognized, this topic is in the field of scientific research neglected. Also in the discussions about legislative changes should be the award procedure more emphasized because the regulation can influence severity as well as costs of the administration.

The government should also support the contractors in terms of training for officials and advisory services in the field of public contracts, so that the contractors can administrate more procedures in-house in higher quality and lower costs. Further, the employees of public entities should have clearly defined responsibilities and accountability so that the problem of "shifted" responsibilities for possible failures in the administration can`t occur.

Chapter 5: Literature

137/2006, A. n. Act no. 137/2006 Coll. On Public Contracts.

Act (137/2006). Act no. 137/2006 Coll. On Public Contracts.

Akerlof, G. A. (1970). "The Market for "Lemmons": Quality Uncertainty and the Market Mechanism." The Quartely Journal of Economics **84**(3): 488-500.

Altr, M. (1982). "Carl Menger and Homo Oeconomicus: Some Thoughts on Austrian Theory and Methodology." Journal of Economic Issues **16**(1).

Arrow (1971). "Essays in the theory of risk bearing." Chicago **Markham**.

Bajari, P. and S. Tadelis (2001). "Incentive versus transaction costs: a theory of procurement contracts." RAND Journal of Economics **32**(3): 381-407.

Carr, P. G. (2005). "Investigation of Bid Price Competition Measured through Prebid Project Estimates, Actual Bid Prices, and Number of Bidders." Journal of Construction Engineering and Management **2005**(1).

Coase, R. (1998). "The New Insititutional economics." The American Economic Review **88**(2): 72-74.

Commons, J. R. (1931). "Institutional Economics." American Economic Review **21**(1931): 648-657.

Domberger, S., C. Hall, et al. (1995). "The Determinants of the Price and Quality in Competitively Tendered Contract." The Economic Journal.

Economics, E. (2006). "Evaluation of Public Procurement Directives." Report for the European Comission **DG Markt**(Available at: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/executive-summary_en.pdf).

Eisenhardt, K. M. (1989). "Agency Theory: An Assessment and Review." The Academy of Management Review **14**(1): 57-74.

Feige, E. L. (1990). "Defining and Estimating Underground and Informal Economies: the New Insititutional Economics Approach." World Development **18**(7).

Gómez-Lobo and S. Szymanski (2001). "A Law of Large Numbers: Bidding and Compulsory Competitive Tendering for Refuse Collection Contracts." Review of Industrial Organization **18**(1).

Hlaváček, J. (1986). "Homo se asecurans." Politická ekonomie **34**: 633-639.

Hlaváček, J. and M. Hlaváček (2006). Morální hazard a nepříznivý výběr při maximalizaci pravděpodobnosti ekonomického přežití. IES Working Paper. Praha, IES.

Hong, H. and M. Shum (2002). "Increasing Competition and Winner´s Curse: Evidence from Procurement." The Review of Economic Studies **2002**(69).

Laffont, J. and D. Martimort (2002). "The Theory of Incentives." Princeton University Press.

Lehmann, E. L. (1997). Testing Statistical Hypotheses, Springer.

Mandl, U., A. Dierx, et al. (2008). "The Effectiveness and Efficiency of Public Spending." Economic Papers, European Commision(301).

McCue, C. and E. Prier (2007). Using Agency Theory to Model Cooperative Public Purchasing. Advancing Public Procurement: practices, Innovation and Knowledge-sharing. B. Raton, FL: PrAcademic Press**:** 45-70.

Medveď, J. (2005). Verejné financie. Bratislava, SPRINT.

MMR (2011). "Regulatory Impact Assessment (RIA)– k novele zákona č. 137/2006 Sb., o veřejných zakázkách." Ministry of Regional Development CZ.

MVČR (2007). "Metodika stanovení plánovaných nákladů na výkon státní správy." Ministry of the Interior of the Czech Republic.

Ochrana, F. (2008). Zadávání, hodnocení a kontrola veřejných zakázek (ekonomická analýza). Praha, Ekopress.

Pavel, J. (2008). "Vliv počtu nabízejících na cenu stavebních zakázek v oblasti dopravní infrastruktury 2004 - 2007." Transparency International.

Pavel, J. (2009). Veřejné zakázky v České republice. Studie Národohospodářského ústavu Josefa Hlávky. Praha, Národohospodářský ústav Jana Hlávky. **2009**.

Regulation, C. (2008). "(EC) No 213/2008 of 28 November 2008." Offical Journal of European Junion.

Sabiiti, C. K., E. Mjuhumuza, et al. (2007). "Developing Public Procurement Performance Measurement Systems in Developing Countries: The Uganda Experience."

Stiglitz, J. E. (2000). Economics of the public sector. New York, Norton.

Thai, K. V. (2001). "Public Procurement Re-examined." Journal of Public Procurement **1**(1): 9-50.

Thomas, A. G. (1919). "Principles of Government Purchasing." D. Appleton and Company.

Vogel, L. (2009). "Macroeconomic effects of cost savings in public procurement." Economic Papers, European Commision **389**.

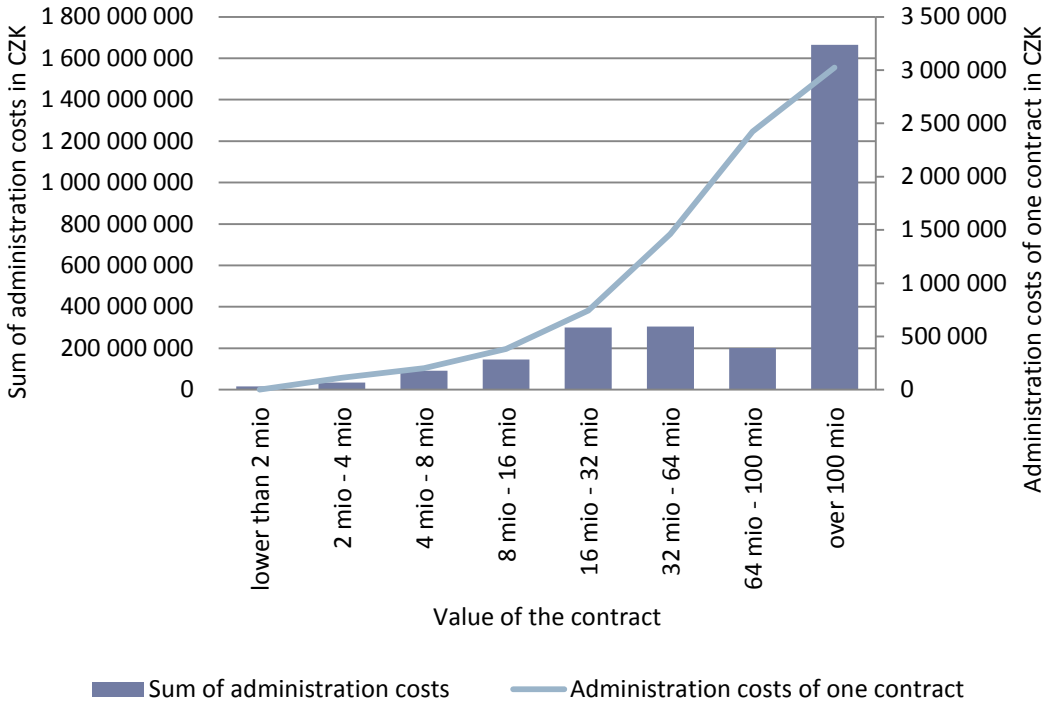
http://www.isvzus.cz

http://www.mvcr.cz

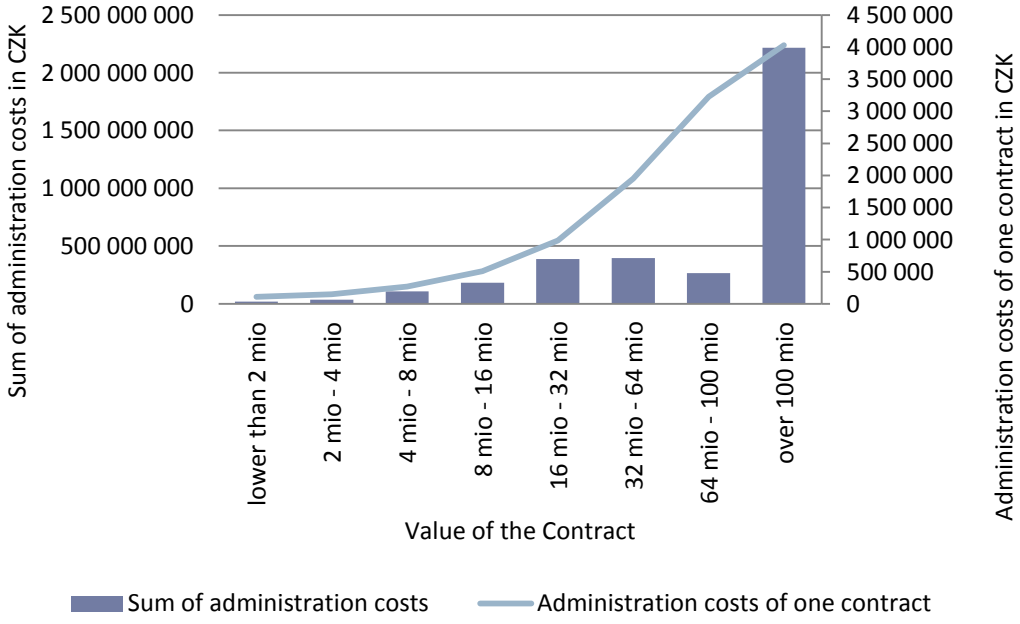
APPENDIX

Appendix 1: Estimation of Costs of Award procedures between 2006 and 2011 According to the Particular Estimates

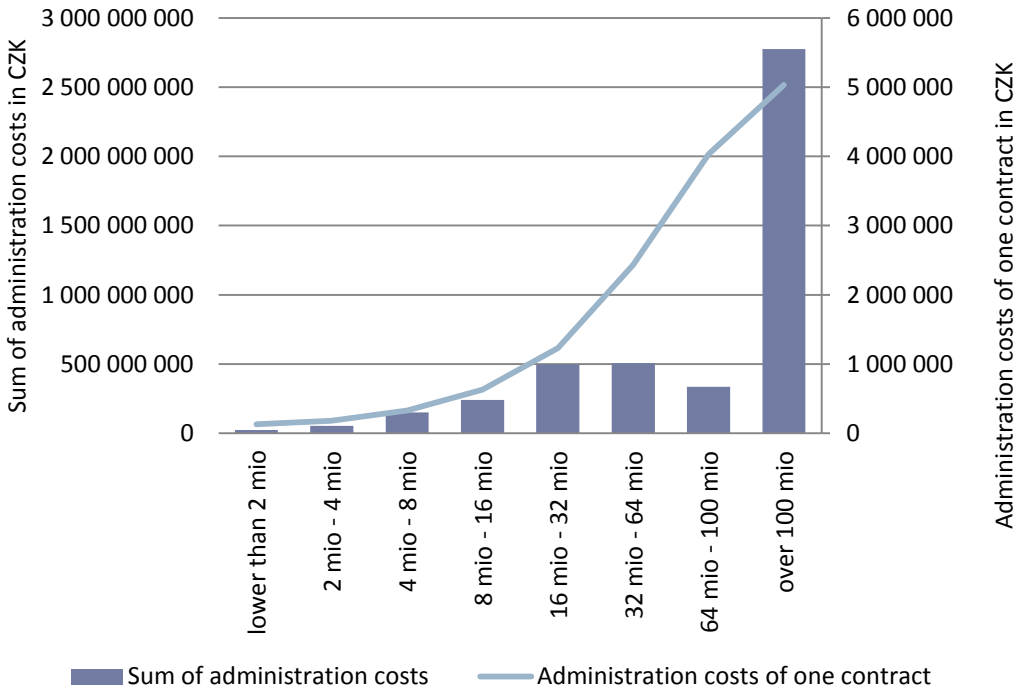
In-House Administration – Low Estimate



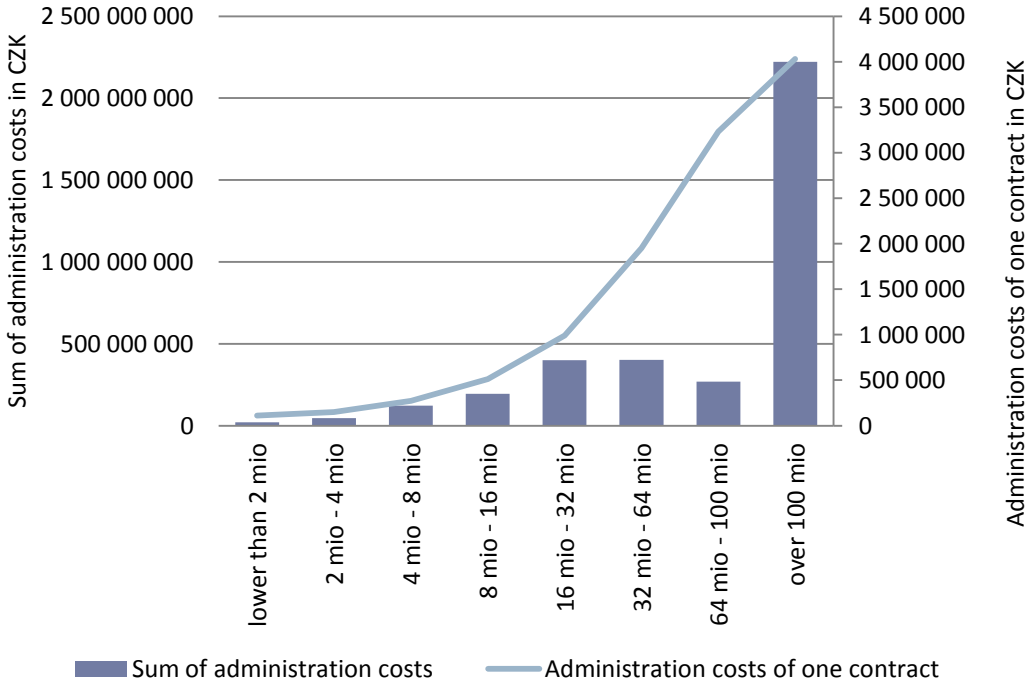
In-House Administration – Average Estimate



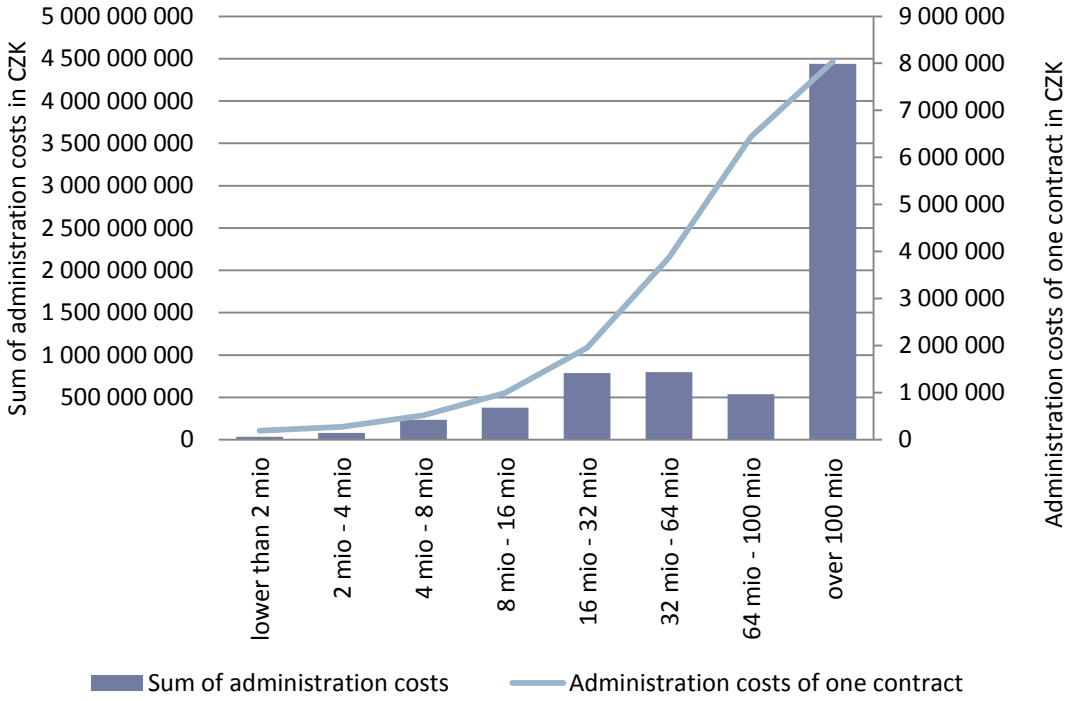
In-House Administration – High Estimate



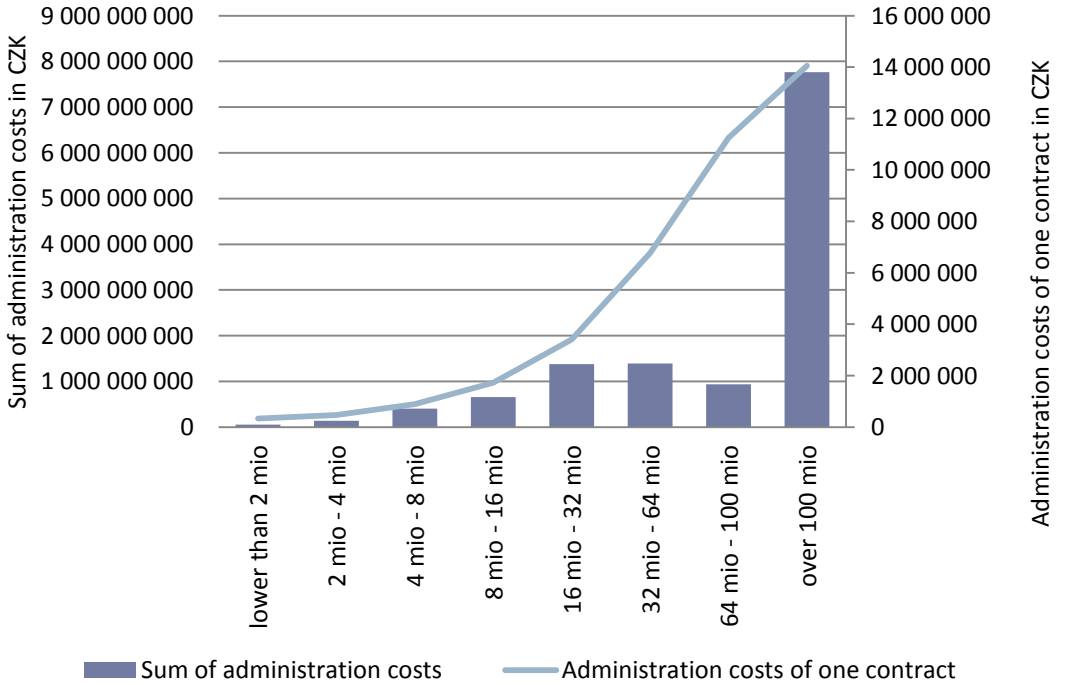
Outsourced Administration – Low Estimate



Outsourced Administration – Average Estimate



Outsourced Administration – High Estimate

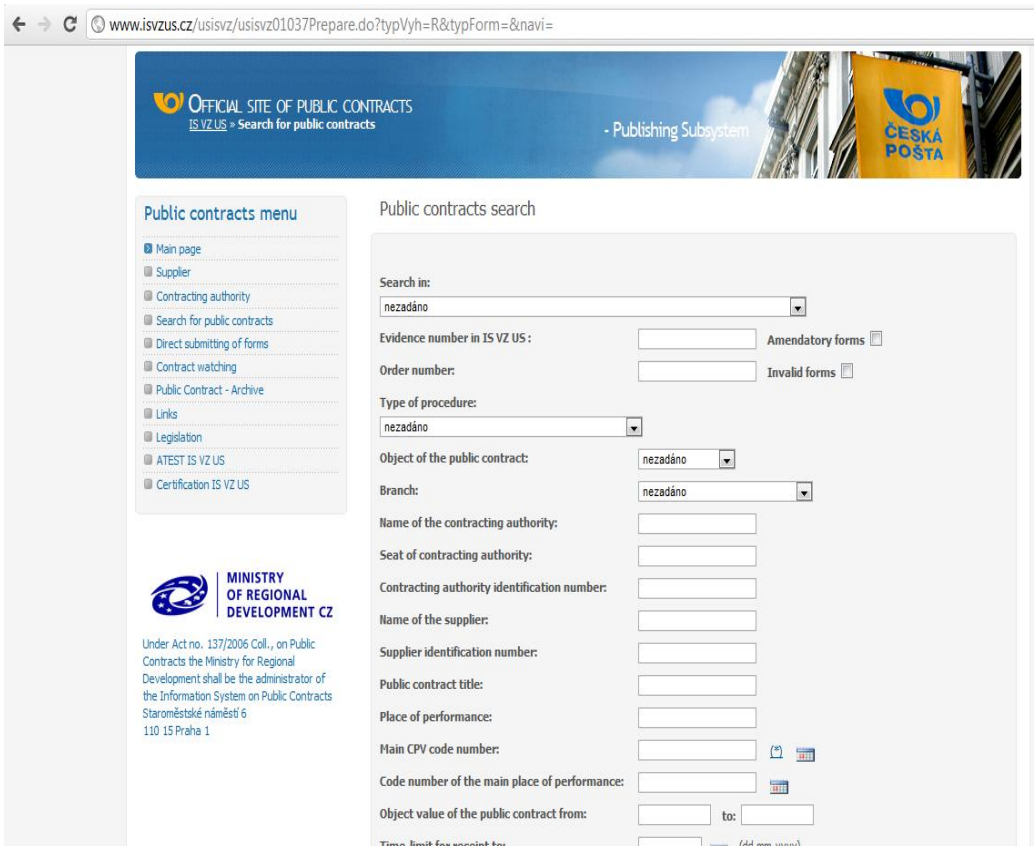


Appendix 2: ISVZUS Database

The following figures should ilustrate the difficulty of data collection from the ISVZUS system.

Firstly, the particular contract has to be found at the search site, where can be the contract searched according to evidence number, name of the contract, contractor, bidder and other.

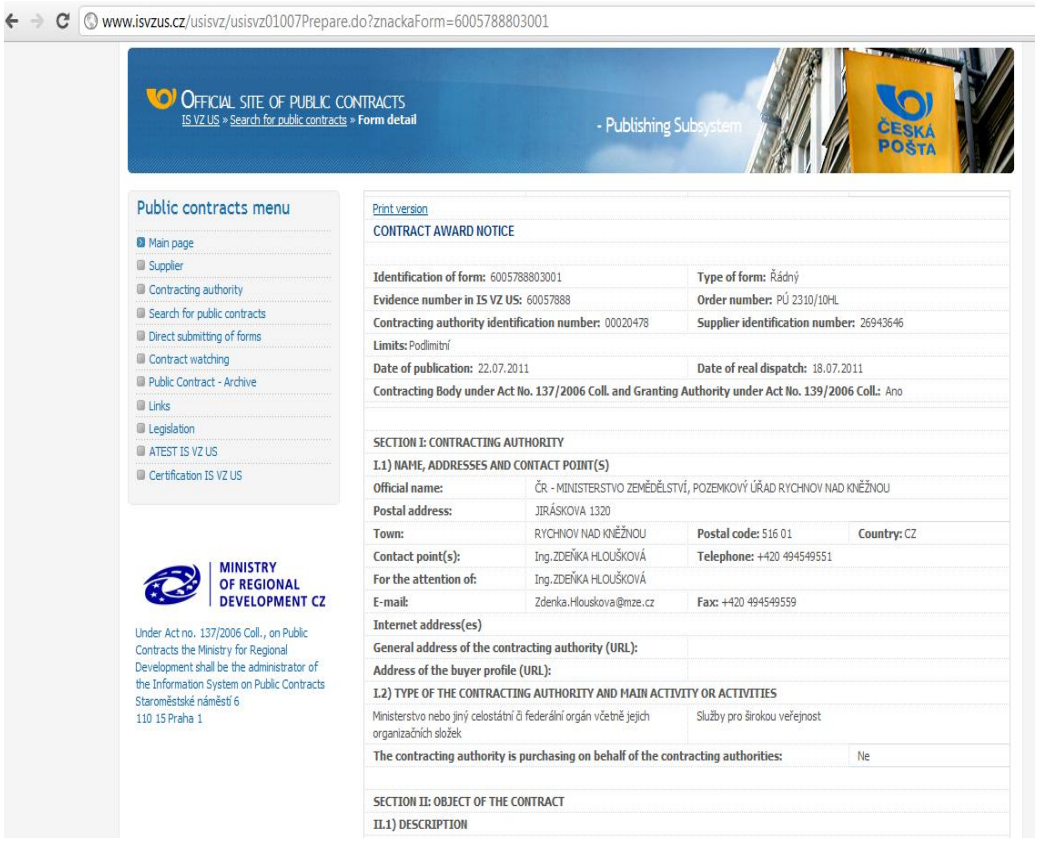
Figure 13: Search site of the isvzus system



Source: http://www.isvzus.cz

The following figure shows the results of the search.

Figure 14: Output from the isvzus system



Source: http://www.isvzus.cz

As we can see, the data are in the form which cannot be easily transformed to any database.