Minimizing Transaction Costs in Project-Based Organizations: A case study on suppliers’ engagements in delivery projects in the Swedish Construction Industry

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Abstract

In this changing world, companies have had to learn how to formulate and implement their strategies through projects and organizational structures in order to successfully face threats and opportunities. However, the management of multiple projects is not easy and due to this complexity, a new type of organization has emerged, called Multi-project organization. Depending to its characteristics, this new organization can be classified in project oriented (POO) or project based (PBO) (Arvidsson, 2009).

Before to execute a project, the organization needs to evaluate its resources and decide if should buy the project through contractors or make it with its own resources (Müller and Turner, 2005). A Project Based Organization (PBO) which manages multiple projects at the same time through contractors requires to keep a good monitoring and controlling project performance, and to create the best project governance structure. About these subjects, there have been journals and books published since an academic perspective; but, not all of them have described these topics in a real organization. The aim of this research is to learn how these concepts are applied in a real project based organization, as well as the problems that can be faced and how they have solved them.

The purpose of this thesis is to show how a PBO deals with the governance of its contracts, considering how the PBO estimates the cost of the project, how it deals controlling the contractors and their projects, as well as how it minimizes the transaction’s (i.e. the project’s) economic and administrative costs. Based in the purpose of the study, the research question is: “How do project-based organizations (PBOs) minimize transactions costs in supplier engagements in delivery projects in the Swedish construction industry?” In order to answer, it was selected an organization created for the construction of a railway in the north of Sweden and due to it has 130 major contracts, can be considered as a multi-project organization. The Unit of Analysis used is the transaction cost in supplier involvement in project. A single case study was chosen to present and analyze the information from the organization. It was analyzed qualitative data collected through semi-structured interviews which were applied inside and outside the company, in order to make a triangulation of the data collected.

The findings explained that the railway company analyzed, achieved to minimize its transaction costs on supplier’s investments during the delivery project phase due to: the right selection of types of contracts, as well as those process and systems implemented in all the project offices. These process and systems helped it to detect on time potential problems as well as take decisions and covered: the selection of suppliers through the bidding process, the negotiation of contracts, the monitoring, controlling and reporting performance, the closure of the project and the last payments for contractors. The PBO tried to keep a good communication with contractors and at the same time, it developed a team work feeling in which both parts supported each other. It could be observed that it is possible to achieve successfully the organization’s objectives and minimize the transactions costs during the execution through essential factors as a careful and detailed planning, team work with all the areas involved, communication and hardworking.

Keywords: project management, project-based organisation, project governance, control in projects, estimation process, estimating projects, agency cost, transaction cost economic, TCE.
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Astridh Lorena Paradela Dominguez Aguilar

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CHAPTER I: INTRODUCTION
I. Introduction

This section introduces the reader to the topic and purpose of this research, and gives a short description about the chapters included in this thesis.

Nowadays, the only constant in the business is change, where companies have had to adjust to sudden threats and extraordinary opportunities and to learn how to formulate and implement their strategies through their projects and organizational structures in order to succeed. As Partington (2000) mentioned, it has been observed that the most successful way of exploiting a strategic opportunity or implementing a change in a company is through a temporary process or structure: a project team focused on the project task and objectives in order to solve a problem or implement a new strategy. On the other hand, Dinsmore and Cabanis-Brewin (2006) mentioned that every organization depends on projects; its ability to effectively implement change is related to the management of the projects. For that reason, if a company wants to apply its strategies to achieve its goals, it must look for the best implementation of the project.

A project is defined by Grundy and Brown (2004) as a group of planned actions that are executed to achieve determined objectives, time and budget. Meanwhile, Angus et al (2000) described a project in a simplest way: a structured effort to achieve something guided by a leader identified as a project manager. In conclusion, for this thesis a project is defined as an activity planned with a beginning and end; where everything has specific time, costs and performance required, as well as a defined objectives to achieve.

To manage a project is a real challenge (Dooley et al, 2005), however, nothing compared with the challenge of managing multiple projects at the same time, when each project is in a different stage of its life cycle; in this case, those problems related with the management of multiple problems are higher than those associated with the individual projects (Dooley et al, 2005). Due to this complexity, a new type of organization has emerged, called Multi-project organization. This Multi-project organization needs to create a clear structure based on defined roles, values and responsibilities, as well as procedures and policies that can support the decision making process in order to achieve the objectives in the best way for all the shareholders, this is called project governance (Müller, 2009).

The Multi-project organization can be found mainly in software development, engineering, consulting, and civil engineering (Geraldi, 2009). They have been classified in two categories: those who are project oriented (POO) and those who are project based (PBO) (Arvidsson, 2009). This thesis will be based in a PBO, which manages multiple projects at the same time, and in order to achieve the optimum organisational outcome, it requires to maintain control over a varied range of specialist projects and to make the best planning possible (Thiry, 2008; Bredin, 2006).

In any Project Based Organization, the control of projects should be executed through actions focused on monitoring and controlling project performance, starting with the make or buy decision, which refer to the decision of making the projects with own resources or through contractors (Müller and Turner, 2005). About this, Williamson (2002, p. 178) recommends to make this question: “Should a firm make an input itself, perhaps by acquiring a firm that makes the input, or should it purchase the input from
another firm?”. This research is focused in those situations when a project based organization (PBO) decides to execute the “buy” decision.

After the “buy” decision is taken, the company should select the type of contract appropriate to the management structure, the owner involvement in the project and the expected use of contractors and contract strategy (Turner, 1999). This contract selection should consider a governance structure which includes incentives for the contractors (Turner, 2004), choosing the most convenient payment terms and the right allocation of risk in the best part to deal with it (Turner, 1999), as well as finding the way to minimize the transaction costs as possible (Turner, 2004).

The purpose of this thesis is to present a Project Based Organization (PBO) which works with contractors and show how they deal with the governance of its contracts, considering how the PBO estimates the cost of the project, how it deals controlling the contractors and their projects, and how it minimizes the transaction’s (i.e. the project’s) economic and administrative costs. Based in the purpose of the study, the research question is: “How do project-based organizations (PBOs) minimize transactions costs in supplier engagements in delivery projects in the Swedish construction industry?”

According to the question and purpose, the Unit of Analysis used in this research is the transaction cost in supplier involvement in project. A case study was chosen to present and analyze the information from the organization selected, because of a case study research contributes to our knowledge and is preferred when the researcher has no control over the events and the research is about real-life context (Yin, 2003).

The organization selected was created for the construction of a railway company in the north of Sweden and due to it has 130 major contracts, “the company” as it will be called in this thesis, can be considered as a multi-project organization, where the control it is crucial for the success of the main project. The aim of this research is a result of exploring different literature about this new type of organization, which is achieving its goals successfully in different business sectors. To manage a project based organization requires a different structure of governance from the classic perspective, as well as flexibility, constant negotiation with all the parts involved and effective systems for planning and controlling projects and contractors; so I considered that this new topic was so interesting to learn it on practice and document it in my thesis.

The thesis consists of this introductory part followed by a theoretical background, which includes the literature review analyzed about projects and organizations, their types and characteristics of each of them, such as project-oriented (POO) and project-based (PBO); contracting: what a contract is, types, criteria for selecting the right one, estimation process, project governance as well as agency control, which are two important aspects in order to control costs; finally, the literature review will finish talking about transaction cost economics (TCE). Then, the methodological considerations are presented, explaining the research strategy, method and process, type of data, importance of the methodology selected, sampling approach and a discussion of validity and reliability. The next chapter is about the multi-project organization, it describes the analysis and findings of the research, starting with the description of the studied company and interviewers, and followed by the analysis and findings divided by subject: Estimation, Control Process, Agency Control and Transaction Cost Economics. The last chapter is about the concluding remarks and suggestions for further research.
CHAPTER II:  THEORETICAL BACKGROUND
II. Theoretical Background

This chapter provides the reader with a literature review on Projects, Organizations and Contracting, as well as the theory related to Project Governance, Agency Control and Transactions Cost Economics. The objective is to give a clear understanding about the previous literature published in this area.

The information referenced in this literature review, has been taken from different books, published papers and conferences; all these sources has been found in electronic databases as well as hard copies at Umeå University Library. The most of the published papers in journals which have been mentioned in this chapter were taken from two electronic databases: Emerald Full text and Business Source Premier (EBSCO). The access to these databases has been through the website of the Umeå University Library. The keywords used during this research were: project, project management, project-based organisation, project oriented organization, project oriented organization in construction industry, contractors, contract, type of contracts, payment terms for contractors, project governance, control in projects, estimation process, estimating projects, agency control, agency cost, agency theory, transaction cost economic, TCE, PMO’s and projects in construction industry.

In addition, several books have contributed with important information, they have been found thanks to the search engine of the Umeå University Library e.g. ALBUM and have been consulted at the university building, taken on a loan in the case of hard copies or consulted through electronic databases of the website of the Umeå University Library such as: EBRARY and NETLIBRARY. During the research on books, the same keywords mentioned before have been used.

Additional information has also been found looking for the sources of interesting articles in their bibliography and then repeating any of the process explained before.

It has been done an effort for explaining the ideas of the authors, in order to avoid writing citations exactly as it was said in the original source. In those cases when an author cited an interesting idea for this chapter from another author, the process has been to look for the original sources and if found it, reference it. Besides, the page number of each reference has been indicated in the bibliography, just in case somebody would like to find out more about it.

This Theoretical Background has been organized in this way: it starts explaining about projects and its importance to adapt the organization to them; then continue with the explanation of the main characteristics and differences of the two types of organization working with projects: Project Oriented (POO) and Project Based Organization (PBO).

Following, will be presented the Contracting part: the decision about make or buy the project, once that the “buy” decision is taken, the different contracts that can be chosen and when use it according to different views of some of the most representative authors in the field. Then, the Estimating part will be briefly mentioned.
Later, the Project Governance and its importance will be explained, followed by the description of the way to Control projects, and the description of the Agency Control. At the end, it will be presented information about Transactions Economic Costs (TCE).

2.1 Projects and Organizations

There are so many definitions about projects in the literature, the one selected to define projects in this thesis is from Turner and Müller (2003), they describe a project as “a temporary organization to which resources are assigned to undertake a unique, novel and transient endeavour managing the inherent uncertainty and need for integration in order to deliver beneficial objectives of change” (2003, p.7).

In all projects, the teamwork is crucial for the success. As explain Smith and Dodds (1997), as a result of the teamwork, projects provide a way to find new insights; each member of the group has its own perspective which can be shared with the whole team in order to find the best way to execute the project.

Other success factor in projects is the need to manage efficiently their life cycle; indeed, a good management it is a real challenge for those organizations executing multiple projects at the same time with different life cycle and needs (Dooley et al, 2005). In fact, due to the amount of demands and factors surrounding multiple projects, companies tend to compensate rather than reconcile conflicting demands (Geraldi, 2009). Turner (1999) mentioned that those classic organizations that wish to manage successful different projects, need to make huge changes in order to adopt the right culture for projects. However, this author also explains that these companies can adopt project’s culture creating a hybrid environment or a project environment. In a hybrid environment, projects and operations work together, meanwhile in a project environment the management of the whole organization is through projects.

Dooley et al (2005) clarify that the sum of the problems associated with individual projects are considerable, however, the number of problems associated with the management of multiple projects are higher. For that reason, the main issues in the success of projects are: the control of the cost of management, and the identification of the influential factors with positive or negative relation over productivity (Dooley et al, 2005).

An example of company with different projects is the construction industry, where the measurement of productivity, control cost and collaboration with the contractors are keys for the success. About this, Herbsman and Ellis (1991) classified the critical factors affecting construction productivity as technological and organizational influence factors. Technological influence factors include specifications, design, location and materials. While the organizational influence factors should consider production, labour, and social aspects.

In order to manage more effective their projects, organizations has needed to adopt more flexible structures that allow them to react to the recently changing environment (Turner, 1999). About this, Turner and Müller (2003) explain that if a company wants to achieve the goals of the projects in which is working on, as well as the objectives from
the organization, it is necessary that the company aligns its operational process with the needs of the projects in order to save costs using the resources available in the best way.

Organizations are based on projects in different levels, also, each organization chooses different ways of working with them; this is called by Müller (2009) as “levels of projectization”. Due to their own characteristics, governance and needs, the organizations working on projects has been classified in two categories: those who are project oriented and those who are project based. In the next part, it will be explained more about each of them.

2.1.1 Project Oriented Organizations

The implementation of projects has been a management strategy widely used during the last years for achieving company goals. And due to the nature of projects, which size and duration can have huge variances; the successful management of a network of projects requires according to Smith and Dodds (1997) a project-oriented management strategy.

According to Huemann et al (2007), the ideal project-oriented organization (POO) is a flat organization with a project oriented culture. In order to reach this, the company should adapt its process and practices for working, its organizational culture, as well as its strategy.

Furthermore, Gareis (2000) is more explicit defining a POO, the author mentioned that these companies have the management by projects as an organizational strategy; for that reason, they apply temporary organizations for the performance of complex processes (projects), managing a project portfolio of different project types, but at the same time, they have specific permanent organization structures to provide integrative functions and have an explicit project management culture.

POO’s can be found in different industries, as well as the public sector. However, the organizations can vary in the degree of their project-orientation, depending on the size, the number and types of projects; some organizations choose to become project oriented as a whole or only some of its units (Huemann et al, 2007). There are examples of whole project oriented companies in the construction industry; meanwhile, product development department of a manufacturing company could be an example of those companies which have a project oriented unit or department.

The effective allocation of people resources in the project-oriented companies is an important key in order to achieve a balance and blend of the hard skills (such as planning, organizing, directing and controlling) with the softer skills (as influencing, persuading and team working). In these companies, there is a good influence between projects and business strategies (Smith and Dodds, 1997, p.166).

In the POO, the project management is the core business process which starts with the formal project assignment and ends with the project acceptance by the project owner (Gareis, 2000). Furthermore, the management staffs needs to focus on decision making, target setting, and communication among projects, employees and external environment (Artto, 2001).
In a project oriented organization, the management system should clearly define the appropriate allocation of resources, based on the established priorities for business operations and successful project portfolio. In this process, responsibilities as well as ownership of projects and resources should be defined and organizational structures should be clearly connected with project structures (Artto, 2001).

Finally, the POO has dynamic boundaries and contexts, due to the sizes of the projects and programmes which are constantly changing, as well as the permanent and temporary resources employed and cooperation among the virtual teams (Gareis, 2000). In this case, the strategic alliances are needed among the different projects and programmes are managed.

Next, will be explained the definition and characteristics of a project based organization, as well as its differences and similarities with project oriented organization.

### 2.1.2 Project Based Organizations

Nowadays, a new management for those companies working with lots of projects is known as project based organization (PBO) (Turner, 1999). This is a company which needs to be structured in order to create synergy between strategy, project, programmes and portfolio management. This type of company realizes the most of its activities with an organization based on projects (Thiry, 2008). Hodgson and S. Cicmil (2006) defined projects based-firms as organizations with an administrative structure which supports the projects; the authors add that in this kind of organization almost all the operations are done through projects.

According to Thiry (2008), a PBO can be observed on entire firms, multi-firm consortia, networks or in some cases, any division or support area in a large corporation; some examples of entire firms can be seen in the construction, consultancy and professionals services.

A benefit of this type of organization is an integrated vision of projects and programmes which can be linked to coherent governance and focused strategy. This benefit allows the organization to prioritize resources into project portfolio, achieving better management and creating more value. A PBO is expected to focus more on organizational effectiveness than financial investment (Thiry, 2008).

According to Turner (1999), the advantages of a PBO structure are:

- The reporting mechanism that can be adopted in order to monitor the progress across all projects in a programme,
- The calculation of the resource requirements which makes easier the management of capacity constraints,
- The movement of people between projects avoiding the training in the organization’s approach followed by the projects and
- The advantage that future managers of large projects can be trained with small ones.
• In addition, according to Thiry (2008), a good governance of projects and programmes in PBO’s can be addressed with:

• A vertical integration of projects across the project portfolio, linking them with the corporate strategy;

• A horizontal integration of projects across the product life-cycle, starting with the formulation of the business strategy and finishing with the delivery of business benefits;

• An integrative project governance structure oriented to create and deliver value.

Another characteristic from PBO’s is the amount of highly educated and competent employees in its project teams. According to Bredin (2006, p. 5), “the employees and their competences become the main competitive advantage, which implies that also the work situation of single employees becomes a critical strategic competitive factor”. Bredin has observed during her researches, that every year, more and more companies are changing from their traditional functional structures to project-based structures.

Bredin’s (2006) research about PBO is focused on Human Resource Management (HRM), where she has found that the temporary nature of projects affects the possibilities to build trust and confidence between co-workers, as well as with the organization. For that reason, some of the challenges for HRM in PBOs is to achieve trust among project workers in order to enhance efficient project operations, as well as to achieve trust between the project worker and the organization. Furthermore, HRM should focus on defining and developing the core competences which should be used and built on a long-term basis, but, engaged in projects on a short-term basis (Bredin, 2006).

Nevertheless the organizations usually are not born being a PBO, indeed, they usually start as a Matrix Organization (Thiry, 2006) and then, during their life cycle and according to their interests, they can become a PBO. In this process of change, Thiry (2008) mention that a key of success is to respect the original culture and purpose of the existing organization, instead to fight with them.

A case of a company which changed from a traditional matrix organisation into a project-based organisation was explained by Bredin and Soderlund (2007) from a HRM perspective. According to their paper, this transformation created a new management role called competence coach – that substituted the former line management role. Becoming a PBO represented a challenge for HRM due to increased requirements on individual employees, the need to handle long-term competence development and evaluation, as well as continuous high levels of work intensity.

The same case study was illustrated by Lindkvist (2004), but, in this paper, it is explained from the governance perspective. The author makes emphasis that a PBO is extremely dependent on the abilities and knowledge of its project teams to self-organize and execute the work. Besides, the author observed that during the change process, the employees including supervisors, felt disoriented as a result of the dissolution of the functional units and line of command where they worked. At the end, it was like a “mini-society”, where governance is established and people are motivated and doing
their activities in a self-organized manner. The new organization generated processes of mindful, flexible action and interaction.

Hodgson and S. Cicmil (2006) mentioned that as in everything, there are also project based-organizations failing, mainly due to delays and budget overruns. However, in several sectors of society, such cultural life, European Union Programmes and research, among others; projects can represent a challenge for an organization looking for the implementation of long term strategies.

Arvidsson (2009) explicates the main differences about POO, PBO and the traditional organization, see Table 1

**Table 1.** Categories of organisations with different mixtures of permanent and/or temporary structures and processes (Source: Arvidsson, 2009, p. 99)

<table>
<thead>
<tr>
<th>Traditional administrative organisations</th>
<th>Project-oriented organisations (POO)</th>
<th>Project-based organisations (PBO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisations where permanent structures and processes generate revenues and bear the main bulk of costs.</td>
<td>Organisations where permanent structures and processes generate revenues while temporary structures and processes bear the main bulk of costs</td>
<td>Organisations where temporary structures and processes generate revenues and bear the main bulk of costs</td>
</tr>
<tr>
<td>Administrative structures (Fayol, 1949)</td>
<td>Project-based organisations that mainly use projects for internal change and development (Hobday, 2000)</td>
<td>Project-based firms (Lindkvist, 2004)</td>
</tr>
</tbody>
</table>

In addition, Arvidsson (2009) adds as differences between POOs and PBOs:

- **Access to critical resources:** the author mentions that this problem is frequent in POO, due to employee’s responsibilities are divided between projects and permanent functions, being the last activity more important to success in their career paths inside the company. As a result, functional managers need to share its resources with other projects, causing critical problems. In contrast, a PBO
assigns its resources to specific projects, as a result, the functions and responsibilities are clearly defined for everybody, allowing managers access to critical resources.

- **Complexity**: this is related to the relations of the roles and responsibilities with projects. There is more complexity in a POO due to the different roles of projects and line functions at the same time. On the contrary, in a PBO the roles and responsibilities are just focused on achieving the project successfully.

On the other hand, the similarities that can be mentioned between POOs and PBOs are (Arvidsson, 2009):

- **Different organisational logic or principles**: this can happen when an organization has short term interests which are not aligned with the long term interests

- **Identity and the team dimension**: this is due to “project people” have different interests and profiles than the “line people” and this can create conflicts when planning project teams or during interaction inside the company.

- **Learning boundaries or transition**: in this sense the author explains that “organisations have difficulties crossing the learning boundary between projects that create novelty and the line which is to transform novel products and services into profitable business” (Arvidsson, 2009, p.103).

After reading the main characteristics of a project-oriented organization and project-based organization, as well as their similarities and differences, it can be settled that when the main activity of an organization needs to be achieved by projects, the best structure for the company should be project-based organization. However, if the company has its main activities in the traditional structure and just occasional projects, the right structure would be project-oriented organization. Finally, if a company has traditional structures and the projects need to be developed in a certain area or department of the company, the organization’s structure should be hybrid: the company should follow the traditional structure with just the area or department focused on projects as project-based organization.

This thesis will be focused on a project based organization which needs to execute its projects through external suppliers, called contractors. In order to work efficiently with contractors, companies need to make a lot of decisions. In the following section will be presented the aspects related to the contracting area, as well as the control of the administrative cost such as agency cost and transaction cost economy.
2.2 Contracting

Due to the complexity of projects, those can be performed within a firm’s hierarchy or through external suppliers, for that reason, it is crucial for the company to take the “make or buy” decision (Müller and Turner, 2005).

In order to assure the quality of the management processes of projects, Turner (1999) mention the need of a set of defined procedures for managing projects. The author mentions that those procedures should identify how projects should be managed by qualified resources, and should be derived from standards based on historical experience of the company or standard procedures in the industry.

According to Williamson (1985), cited by Müller and Turner (2005), the make or buy decision in a project should be based on the degree of asset specificity as the most influential factor. But also it should consider:

- The uncertainty from: the risk inherent in the project, the lack of communication and confusing signals, as well as human behaviour.
- The frequencies of the transactions, due to some of them need explicit management structures.

Additionally, Williamson (2002, p. 178) examining the “make-or-buy” decision, recommends to make this question: “Should a firm make an input itself, perhaps by acquiring a firm that makes the input, or should it purchase the input from another firm?”. In order to make the best decision, all organizations should evaluate their resources and needs for the specific project.

Once that the project has been analyzed and the “buy decision” has been taken, it is necessary to develop a project contract strategy. Turner (1999) makes clear that because most of the companies do not have enough resources or expertise to execute all the projects, so, it is important to define the contract and procurement strategy from the beginning. Furthermore, the author also explains the main organizational issues that should be taken into account from the earliest stage. Those are: the management structure, the owner involvement in the project and the expected use of contractors and contract strategy.

Turner (1999) proposed the owner/contractor model (Figure 1) which states that in a project; at least two parts must be involved, both having conflicting objectives due to: the owner wants the lowest price and the contractor wants the highest profit possible while satisfying the client. Also, this author defines the owner as the person or group who defines the needs and requirements for the project and at the same time provides the resources to make the project (money, people and/or material; the owner is who is going to operate the outcome of the project. On the other hand, he defines the contractor as that person or group who execute the project consuming the resources and deliver the project’s result to the owner.
In this process, it is through contracts that the owner builds a project organization which hires contractors to execute projects; it is in this situation when the owner should try to encourage the contractors to reach the project’s objectives, in a called win–win game (Turner, 2004). Furthermore, Turner (2004) explains that when the project contract strategy is developed, the chosen contract should motivate a cooperative relationship between owner and contractors, where all the parts involved seek for achieving the project’s goals with the expected risk.

The actions and performance of the parties involved in a project are influenced by the type and characteristics of the contract, which impact on the success of the project (Branconia and Lochc, 2004). In order to achieve project success, the mutual cooperation is important; indeed, the contract should be flexible enough to allow adaptations through mutual agreement, provide a communication structure to identify project progress and problem, provide an incentive for contractor if he delivers the client’s objectives, without the need to solve disputes resorting to the law, which would become a lose–lose scenario in which just one part wins and the other loses (Turner, 2004).

According to Fama (1990), all the contracts face uncertainty in any moment; it could be about future returns, contract renewal, etc. In addition, Williamson (2002) defines the main characteristics of contracts: as complexity and incompleteness; and Turner (2004) agrees with Williamson when he says that project contracts are always incomplete, he further explains that this is due to the uncertainty and the need to respond to unexpected situations. Müller and Turner (2005) agree with the contract’s incompleteness, and indeed, they consider that a flexible farsighted governance structure is required for every project contract. For these authors, there are several types of contracts: starting with fixed price contracts at one side and cost-plus (time and material) contracts on the other and in between they find reameasurement contracts. These authors also explain that the fixed price contracts shift all the risk to the project manager and the supplying organization meanwhile the cost-plus contracts place the risks to the project owner.

Figure 1. The owner/Contract model
(Source: Turner, 1999, p.50)
Finally, Turner and Simister (2001) consider the need for goal alignment as the main important part of the contract, because, it requires that the contract includes all the necessaries incentives and price in order to sign a contract which can be beneficial for all the parties. Furthermore, the authors mentioned that communication is crucial in all the projects, but also expensive and needs to be reduced by adopting an appropriate pricing mechanism. The authors group the communication costs in projects as part of the transactions cost in projects contract management. Thus, Turner and Simister (2001) conclude that a good contract price selection is done seeking a goal alignment, and choosing this way, allows to reduce the transactions cost in projects contract management.

In the next section, there will be explained the different types of contract, as well as the criteria that the authors recommend to apply them, which are based on different perspectives: risk and communication.

2.2.2 Criteria for Differentiation

Turner and Simister (2001, p.458) believe that the main purpose of the project organization should be “to create a cooperative system between client and contractors based on shared objectives”, so the selection of contract type should be determined by the uncertainty of the project’s product and the process to deliver it. For these authors, the selection of contracts should be this way: if the project’s product is well defined but the process can be chosen by the contractor who can make profit on it, the type chosen should be fixed price design and build contracts. On the other hand, when there is low level of uncertainty on project’s product and process, the type chosen should be remeasurement contracts. But, when product and process are uncertain, the selection should be based on an alliance arrangement, preferring cost plus contracts. In this way, both parts work together to achieve the best outcome and share the benefits.

During the development of the contract strategy, Turner (2004) presented a methodology for selecting contract strategy based on the needs of providing incentives for contractors completing project’s goals and governance to manage the contract’s incompleteness, reducing transaction costs. However, the author mentions that at the end, the appropriate form will be based on: the part that controls the risk (client, contractor or both), the nature of the project (if it is simple, large, complex and/or multi-stage) and the part where will be allocate the uncertainty (in the project’s product, method of delivery or both).

When talking about risk, there are different perspectives about the contract selection. For Turner (2004) the owner is the one who can control the risk, the type of contract chosen according to the complexity of the project should be cost plus incentive fee or remeasurement. Furthermore, when the contractor is the one who controls the risk, the type of contract will depend on the specific part where the risk is located: in the process, in the product and process, or neither. Finally, the author mentions that if the risk is shared, then the strategy depends on the complexity.

Project design and an appropriate management can help to handle and reduce those main factors that cannot be avoid in projects, which are risk and uncertainty (Turner, 1999) In order to reduce risks, Turner (1999) recommends these approaches:
Avoidance: after identifying the risk, it is necessary to eliminate it with a new plan.

Deflection: with this action, the one who has the risk, tries to pass on to someone else through a third party (insurance), through a security held against the risk (bonding) or through a contract (here, the risk is passed between owner, contractors and subcontractors).

Contingency: in this case, the action is taken in advance and a contingency plan is developed.

Turner (1999) adds that when the risk is shared between owner, contractors and subcontractors through contracts, the two principles of contracts are:

1. Risks should be assigned to the party than can control it better and is more motivated to do it.

2. Risk is shared with subcontractors just in those cases when they can control it better. When this happens, the clauses in the contracts between owner and contractor are included in that between contractor and subcontractor.

In contrast, Müller and Turner, (2005) were more specific when they declare that the part which controls risk, should establish communication channels. These authors also explain the contract types based on the organization controlling the risk, which are:

- If the risk is in the project delivery phase, the owner can not contribute, so should be the project manager who controls the risk. In this case, the ideal form of contract would be fixed price.

- But when the risk is located in the design phase of the project, the owner should be able to control the risk. In those cases, the type of contract will depend on the complexity: for low complexity projects, remeasurement contracts would be used, and for high complexity projects, cost-plus incentive fee contracts would be recommended.

- Finally, when both parts should be equal partners in the control of risk, the contract selected should be the alliance. In this type of contract, it is crucial that both sides participate in the decision making and remain updated about project’s progress and performance.

Moreover, Müller and Turner (2005) mention that based on the owner–manager communication model, the negative effects of those contracts which shift all the risks to only one of the contractual parties could be:

- Fixed price contracts: Due to the risks are shifted to the project manager, the owner could finds difficult to track the project progress, which can cause lower collaboration and performance due to the decrease of the owner’s involvement and misaligned objectives.

- Cost-plus (time and material) contracts: In this type, the payment is for the work done by the project team and not for the objectives reached which can cause that project manager does not feel compromised with the achievement of objectives of time and budget.
Finally, the authors concluded that risks can be diminished through communication schedules which provide formal reports and regular meetings (Müller and Turner, 2005).

However, Turner and Simister (2001) recommend the alliance option when the product or result of the project is uncertain or the purpose could change during the project execution. Further, these authors add that alliance contracts can be useful too when the owner has important knowledge that could help the contractor to decrease costs, otherwise, if the owner does not have knowledge, the best option is to leave the contractor manage project’s problems.

On the other hand, Fama (1990, p. S76) reveals that according to the Portfolio Theory “forcing a risk adverse agent to bear risks he cannot diversify will cause the agent to charge more for the risk-bearing that would be charged by the capital market, but this can be avoided with fixed-payoff contracts”. Also, the author clarifies the observed regularities in fixed payoff contracts for labour services, are based on time (hourly workers) or tasks (salaried workers); and the renegotiation of fixed payoff contract can help agents to get rid of market risks that they cannot control.

“Different contract types incentivize the contractor in different ways, and therefore we would expect their performance to be different under different payment terms” (Turner and Simister (2001, p.459-460) for that, the importance to choose the best project contract payment terms possible.

Turner and Simister (2001) assume the classification in five standard forms of project contract payment terms, which is shown next:

1. **Cost plus**: when the contractor is repaid all their expenses, plus an agreed profit margin.

2. **Remeasurement based on a schedule of rates**: is when the contractor refund their costs at agreed unit rates.

3. **Remeasurement based on a bill of quantities**: is when the client pays a standard rate based on agreed productivity rates and unit rates. Because the nature of this contract, sometimes, the contractor claims for any delays caused by the client or other third parties.

4. **Remeasurement based on a bill of materials**: is when the client pays a standard rate based on an average size. The author clarifies that this contract would be appropriate when it is not known in advance how many units or area will be worked. In this kind of contract, sometimes, the contractor wants to claim for delays too.

5. **Fixed price**: In this kind of contract the client pays a fixed-price, lump sum, for the entire job to the contractor. To facilitate the correct estimation from the contractor, the client needs to specify in advance its requirements. According to the authors, in this contract the contractor can find the best way to deliver the project, making extra profits during the process.

This classification of standard forms of project contract payment is generally accepted. However, payment terms are vital for contractors in order to keep working, especially in
case of small contractors or projects which require a lot of cash to execute them; those contractors need intermediate payments (Branconia and Lochc, 2004).

About this issue, Turner (2004) analyzed a more specific contract forms based on payment terms, he add that some projects should be executed especially with some kind of the contracts. The classification and description described by Turner is presented in Table 2.

**Table 2.** Specific contract forms based on payment terms (Source: Turner, 2004, p.77-80)

<table>
<thead>
<tr>
<th>Contracts Forms</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost plus contracts:</strong></td>
<td></td>
</tr>
<tr>
<td>I. Cost plus percentage fee (c + %f)</td>
<td>It is adopted on high risk contracts and uncertainty that the contractor can make no contribution to reducing it.</td>
</tr>
<tr>
<td>II. Cost plus fixed fee (c + ff)</td>
<td></td>
</tr>
<tr>
<td>III. Cost plus incentive fee (c + if)</td>
<td></td>
</tr>
<tr>
<td>IV. Alliance contracts, or cost plus gain share (alliance)</td>
<td>It should be adopted when the owner and the contractor can contribute in the reduction of risk and achievement of performance indicators.</td>
</tr>
<tr>
<td><strong>Remeasurement contracts:</strong></td>
<td></td>
</tr>
<tr>
<td>I. Remeasurement based on a schedule of rates (r-sor), effectively cost plus:</td>
<td>In this type of contract, the contractor is rewarded according to the amount of work they do using a pre-agreed formula</td>
</tr>
<tr>
<td>II. Remeasurement based on a bill of quantities (r-boq)</td>
<td>The contractor is rewarded according to the labour and materials used and the agreed hourly and unit rates.</td>
</tr>
<tr>
<td>III. Remeasurement based on a bill of materials (r-bom), effectively fixed price with variations</td>
<td>The contractor is rewarded according to the number of standard work elements completed.</td>
</tr>
<tr>
<td><strong>Fixed price contracts</strong></td>
<td></td>
</tr>
<tr>
<td>I. Fixed price based on a detailed design (fpdd), effectively remeasurement</td>
<td>The client does a detailed design, which is given to a construction contractor for delivery.</td>
</tr>
<tr>
<td>II. Fixed price design and build based on a scope design</td>
<td>The client performs an initial scoping design, and the contractor does the detailed design and construction.</td>
</tr>
<tr>
<td>III. Fixed price design and build based on cardinal points (a functional specification)</td>
<td>The client specifies the functionality and key performance indicators to be delivered, but leaves it to the contractor to find the best solution in terms of the design and method of its delivery.</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
</tr>
<tr>
<td>I. Target cost</td>
<td></td>
</tr>
<tr>
<td>II. Time and materials to budget, or guaranteed maximum price</td>
<td></td>
</tr>
</tbody>
</table>
Turner (2004) concluded that the analysis used to develop a contract selection strategy, should include who is the part controlling the risk (owner or contractor) as well as where the risk is located: method of delivery, the product resulted from the project or on both.

After been analyzed the types of contracts and criteria for selection, it is important to describe the eight key levers (Figure 2) that constitute the economic frame of the project’s business deal identified by Branconia and Loche (2004) in a large number of engineering contracts. The authors consider that these eight key levers should be well defined in the contract in an attempt to cover the most critical aspects of a project, such as the basic content of the deal (specifications with performance guarantees, price-basis, terms of payment and schedule), and at the same time, to give assurances for both sides (securities, warranties, liquidated damages, and limitations of liability. Finally, the authors conclude if something goes wrong in any of these elements, the project success could not be reached.

![Figure 2. The eight key business levers in the contract](Source: Branconia and Lochc, 2004, p.121)

The eight key levers (Figure 2) identified by Branconia and Loche (2004) were described as follows:

I. **Technical specifications**: such as clarity of scope, deadlines, deliverables and consistency between the technical and commercial parts.

II. **Price and Quality of the cost estimates** should be consistent with the technical specifications, including a cost contingency.

III. **Payment terms**: Contractors normally look for payment terms that protect them. The normal is to receive a 5–15% down payment to start the job, then, intermediate payments and a final 5–10% payment after the final completion and passing performance tests.

IV. **Schedule**: Contractor and client should be explicitly aware of these trades-offs, especially when there are delays in the delivery project.
V. **Performance guarantees**: The contractor has to prove that the delivered facility functions in accordance with defined parameters, typically within ranges.

VI. **Warranties**: It means to secure the contracted performance of equipment and services for a limited period. However, to decrease the probability to execute a warranty, the best to do is to monitor continually the suppliers’ design and manufacturing progress.

VII. **Limitations of liability**: It helps to protect the contractor by specifying a maximum level of exposure.

VIII. **Securities**: Clients often require financial securities from the contractor, meanwhile, contractors insist on payment securities from the client, due to the additional financial exposure arising from payments and commitments to his suppliers.

Furthermore, Branconia and Lochc (2004) adds that is crucial that the client incentives the contractors, for that reason, if a client wishes to have its project finished earlier, it should offer incentives to the contractor in order to motivate it; another incentive mention by this authors is about a good design of plans. However, no contract can provide enough flexibility in case of turbulence, when this happens, both parties should share the risks and align objectives (Branconia and Lochc, 2004).

In all contracts, a decisive part is the money involved, which is the price required to buy the product or service needed. This price should be calculated by the contractor with the higher precision possible, and should be estimated too by the project owner in order to quantify the investment needed and select the contractor with the most suitable cost with the reality. Due to its importance during the contract selection, in the next part the estimation process will be explained, including types of estimation and important elements to consider.

### 2.2.3 Estimation Process

The process of estimating it is crucial during the planning phase of the project; an unrealistic estimate can cause lot of problems since small variations in the budget plan until suspension or failure of the project, without mention the bankrupt that have suffered companies due to a bad estimation cost. Even the estimation process can cover schedule time in the project, budget costs, among others; this section will be focused on the estimation cost of projects.

There are lot of reasons of why we do need to estimate costs, Turner (1999) mention that the principal is the measure against which to control expenses on the projects, also known as the baseline. Another reasons mentioned by Turner (1999) are: to determine the viability of the project and obtain the necessary funds (estimating costs and comparing against the returns estimated), to allocate the resources and manage the cash flow once that the budget has been approved, or for prepare tenders.

During the negotiation of the contract between project and business or contractor and owner, it is necessary to include estimates of the resource requirements as exact as
possible (Turner, 2004) About this, Turner (2004) recommend that during the process of planning the resource availability, the time required must be understood by the resource provider and the project manager.

Moreover, when preparing estimates for the tender, Turner (1999) explains that those popular methods used by contractors for estimating are: price calculation by adding a percentage of the cost, forecasting the profit based on the cost from the market price or letting the project’s owner decides the estimation which is the case of the public sector which often demand a cost breakdown. The types of estimate and purpose are shown in Table 3 (Turner, 1999).

<table>
<thead>
<tr>
<th>Type of Estimate</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal</td>
<td>Appraisal viability to start, feasibility study</td>
</tr>
<tr>
<td>Budget</td>
<td>Appraisal viability to start, systems design</td>
</tr>
<tr>
<td>Sanction</td>
<td>Appraisal viability to approve project, obtain funding, allocate resources</td>
</tr>
<tr>
<td>Control</td>
<td>Measure progress, assign resources</td>
</tr>
<tr>
<td>Tender</td>
<td>Prepare tender</td>
</tr>
</tbody>
</table>

According to Turner and Simister (2001), the total estimation cost of a project which is delivered by contractors, should include the out-turn cost of the contract, plus the transaction cost of setting-up and administering the contract. The out-turn cost of setting-up and administering the contract has four elements:

1. The cost of specifying the product in the tender documentation;
2. The cost of specifying the work methods (process) in the tender documentation;
3. The cost of managing variations to the specification of the product during project delivery; and
4. The cost of managing variations in the specification of the process during project delivery.

The authors conclude that the contract payment terms should be chosen to minimize these costs.

On the other hand, Turner (1999) mention that the main cost components in an estimation are: labour, materials, plant and equipment (rented or bought it), subcontracts, management, fees and taxation, inflation and contingency plan. Turner also explain, that in the engineering construction industry, the methods of estimating rely heavily on historical data, and the most used are: step counting methods, exponential methods, parametric methods, detailed estimates computer aided estimating, among others. The methods of estimation are not explained in this section.
For effect of this thesis, I assume that the estimations have been done, so, I do not include a detailed explication of them.

A not viable estimation can be caused by different factors, according to Turner (1999) sometimes preparing the estimates, there is a belief that the owner could not accept them, so they decide to reduce them, this situation could happen during the estimation of projects inside or outside the organization. Another factor that could led to unrealistic estimates is that the historical data in which is based the estimation is incomplete or inappropriate. Indeed, about this last factor, Turner (1999) mention that estimation should be improved not only dedicating more time or efforts, but also estimating with more precise data.

Branconia and Lochc (2004) advice for project owners to estimate the cost of the project before the bidding process, in order to have an idea of the real cost that should be offered by the contractors. Furthermore, the authors recommend not choosing the lowest bid, because the difference could reflect that the contractors did not understand the projects requirements, did not make a plan with the right technology or equipment, or decided to offer the lowest price in order to close the deal and make money through change orders.

Besides, it is important to consider the different currencies involved and the exchange rate expected during the execution of the project, in order to make a good estimation with the less risk possible (Turner, 1999).

Finally, as Turner (1999) implies the estimations are valid just during specified time, place and currency, which is important to make clear in the project’s offer.

As it has been described before, after the “buy decision” of a product or service is taken, some other steps should be done such as: the specification of the project’s requirement, the selection of type of contract as well as the estimation of the project, all these activities have been already explained. However, in order to control tasks and set limits for management action, a governance structure is needed; its definition, applications as well as those institutions responsible of governance for project management are explained in the next section.

### 2.2.4 Projects Governance

Williamson (1998, p.37) citing Commons (1932) explains: “governance is the means by which order is accomplished in a relation in which potential conflict threatens to undo or upset opportunities to realize mutual gains”.

Müller (2009) explains that Governance not only helps to define the organization’s goals and the way to achieve them, but also it distinguishes the ownership and control tasks through the definition of limits for supervision and procedures that should be followed by project managers running their projects. Müller agrees with Williamson (2002) definition mentioning that without a governance structure, an organization can experience conflicts and inconsistencies when trying to achieve organizational goals, processes and resources, which cause costly inefficiencies impacting negatively on profitability.
According to Williamson, (2002) the key dimensions of transactions important for governance are: the asset required, such as human, physical, dedicated, brand name, among others; the troubles that can affect transactions and the frequency of these transactions. As it can be observed, the importance of governance is crucial for the success of the companies, and also of projects, for that, the importance to align the transactions with the suitable governance structures. About this Müller (2009) comments that many failures of projects were caused by a missing governance structure in their operation.

For Williamson (2002) the attributes defining a governance structure include incentive intensity, administrative control and the contract law regime. Additionally, he mentions that the contract/private ordering/governance approach maintains that the governance structure is not always definitive, due to it should be always compared with others options for governance, in order to decide the most suitable structure in each moment.

According to Williamson (2002) the application of the lens of contract/private ordering/governance shows the way into the re-conceptualization of the firm as governance structure. The change from choice to contract is attended by three crucial moves:

1. Persons are illustrated according to their cognitive behaviour and self interestedness.
2. Organization matters. The governance of contractual relations should be dealing with issues of conflict, mutuality and order.
3. Organization is susceptible to analysis, in which the basic unit of analysis are transactions and the way to manage them is through governance structures.

In addition, Müller (2009) mention that Governance regulates the methods and processes of:

a) Defining the objectives of an organization, based on the strategy
b) Providing the means to achieve those objectives (provision of required resources)
c) Controlling progress, it means the need for supervision to control the management of the resources.

However, Müller (2009) makes clear that Governance should be applied to portfolios, programmes, projects and projects management and should include the responsibilities, processes and policies needed in order to achieve the goals. Müller (2009) adds that the organizations apply different governance paradigms in different parts within the organization according to their goals, market demands and preferences of managers, among others.

The objectives of Project Governance described by Müller (2009) are: the creation of an environment for the success of projects, the best utilization of resources through the prioritization of projects, as well as the identification of projects with problems and the following decision about what to do with them.

The Institutions responsible of governance for project management mentioned by Müller (2009) are:
- **Portfolio Management**: the project governance decisions are about: acceptance of projects in the portfolio, prioritization of projects, allocation of resources required and strategies of risk management for the projects included in the portfolio.

- **Sponsors and Steering Groups**: They define the budget, goals, time and criteria for success.

- **Program Management**: They determine the structure and methods for management of the projects within the programs, this include methodologies, quantity and quality of reporting, type of risk management, among others.

- **Strategic Project Management Offices**: These offices set the goals to be achieved in terms of the project management results.

But the governance should be applied also in contracts, about this issue, Turner and Simister (2001) explain that the governance structure for a contract should reach an objective alignment between the client and contractor, at the same time that should decrease any possibility for opportunism by the contractor.

Also, Müller (2009, p.2) clarifies that “Governance theory addresses the overlap in responsibilities between regulating body and regulating member. Meanwhile, in projects, governance implementation is often defined in terms of policies, processes, roles and responsibilities”.

Finally, two theories that have been linked with governance are Transaction Cost Economics (TCE) and Agency Theory (Müller and Turner, 2005), both theories will be explained later in this chapter.

As it has been commented, the Governance applied for programmes, projects and projects management is crucial for the goal alignment of the different parts involved and for achieving the final objectives successfully. Furthermore, governance not only includes a good management of resources and identification of possible problems seeking to avoid them, but also includes the establishment of the adequate environment to success which should be include the appropriate control of all the participants and activities. In the next section, will be explained the function and different ways to execute the controlling process in projects.

### 2.2.5 Control

Nobody can control, what cannot be measured, it is a famous phrase that can be applied to all the aspects of our lives that should be controlled, including different aspects of the company and projects. Müller (2009) described that the governance needs of the project define the level and frequency of control needed during the project execution phase.

In this section there will be mentioned the literature about the controlling progress, first, in the level of how the organization adapts its structures to control and monitoring projects and then, how the progress is monitored in projects.
As it has been explained before, the objectives of the projects is to achieve the organization’s goals and strategy (Müller, 2009). In order to achieve this goal, it is necessary to control the alignment between these strategies and projects, as well as to monitor the project progress through the collection of performance data from the different projects, which according to Müller (2009) could be done through Strategic Project Management Offices. This author goes further explaining that these Project Management Offices (PMOs) are a crucial governance institution in the execution and management of projects because these offices have a good knowledge about the strengths and weaknesses of their projects, which can be used for improvements.

About this, Hobbs and Aubry (2007) after making a survey in 500 PMOs working in companies, they found that their structures and functions can be different from one organization to the other. Besides, they found difference too about the numbers of projects covered, because when some PMOs cover all the organization’s projects, others, just cover a few. Other differences found among the PMOs analyzed were the number of possible roles or functions, the authority and the decision-making power.

The main functions that the PMOs do, according to the research of Hobbs and Aubry (2007) are: Monitoring and Controlling, Project Performance, Development of Project, Management Competencies and Methodologies, Multi-Project Management, Strategic Management, Organizational Learning. However, Hobbs and Aubry (2007) explain the activities that PMOs realize related to the responsibility of monitoring, controlling and reporting project performance of the projects they are responsible are:

- Report project status to upper management
- Monitoring and control of project performance
- Implement and operate a project information system
- Develop and maintain a project scoreboard.
- Monitor and control the performance of the PMO

The last activity was grouped as part of the Organizational Learning and could be seen as part of the learning feedback loop or in response to questioning of the expenses generated by the PMO (Hobbs and Aubry, 2007). In addition, the authors comment that PMO’s can support project managers and their teams through specialized staff, in cases such as risk management and new schedules. Finally, is interesting to mention that these authors found that PMOs are more common in those companies with a higher level of organizational project management maturity.

In order to plan and control the budget, time, quality, and risk among others, suitable systems are required (Turner, 1999). Those recommended by Turner (1999) are:

- **Breakdown structure (PBS):** the plan of the project should be in terms of the results, or deliverables to provide a better control of work definition and scope because the team only do work which delivers result needed to achieve.

- **Milestone Planning:** strategic plan for a project defined in terms of intermediate products, or results, to be achieved. It shows the logical sequence describing what is to be achieved at each state, not how the state is to be achieved.
Responsibility Chart: at the project level, the chart describes the procedures and responsibilities for the management of the project.

Quality Control: is a process of analysis, identification of problems and solutions. The steps described by Turner (1999) are: plan the work required at the beginning of the project, then, during the project execution monitor the outcomes accomplished, if there is any outcome that does not match the desired one, identify the problem and implement the solution.

Schedule for controlling Time: the steps for controlling process of time are: at the beginning, determine the plan, during the execution record the progress, calculate if there is a variance and take actions in case of needed.

Internal and External Risk Control: Internal risk can be technical or not technical, meanwhile, external risks can be predictable or unpredictable. The risk in a contract should be allocated in the part that can control it.

Expenses vs Budget: to control costs, expenses should be monitored and compared against budget, if costs do not remain within the budget, actions must be taken.

Project Audits: should be conducted to check: the quality of the management process, the design followed as well as learn lessons from old mistakes.

On the other hand, Turner (1999) clarified that when the companies are working with contractors, many organizations have their own control procedures that the contractors should adopt and follow. However, these procedures should be reasonable, not bureaucratic, flexible, and supported by the management of the organization.

Moreover, an important element for an effective control is the reporting mechanism, which according with Turner (1999) it is crucial to implement it through friendly control tools, reports reviewed at formal meetings with well-known agenda, established criteria for control which should be compare against the plan with defined intervals of time.

Finally, there are pitfalls in monitoring and control that should be considered, with the intention of avoiding them, these are: the purpose of control is not understood (we need to remember that the purpose is to monitor and compare progress to the plan and to take necessary actions to achieve the project's goal), progress is not monitored against the plan, ineffective Review meeting (Turner mentioned that formal review meetings must be held, fixed agenda, controlled attendance, and fixed criteria for reporting) and finally, responsibility without authority for the project manager which makes difficult to achieve the goals (Turner, 1999).

Controlling and monitoring progress are crucial to achieve the project’s goals and success. The way that these activities are performed during project execution will depend of the type of project, contract selected and communication between owner and contractors, among others factors. However, the selection of the controlling and monitoring system should be done not only looking for the best performance of these activities, but also trying to keep as low as possible the transaction and agency costs for doing this. In the next section will be presented the literature found about agency control and costs, followed by transaction cost economics (TCE).
2.2.6 Agency Control

The objective of this section is to understand what Agency Control is. In order to facilitate the understanding is necessary to start talking about the agency relationship, followed by the agent theory and the agent problem, and at the end, it will be described the agent cost. Those will be the main issues presented in this section.

According to Jensen and Meckling (1976, p.308), the firm is a “black box” whose objectives are to make the most profits possible, with a good management of inputs and outputs. These authors define an agency relationship as “a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent”. If both parties to the relationship are utility maximizers, the agent may not always act in the best interests of the principal, so the principal should establish the appropriate structure in which the agent has enough incentives to make everything according to principal’s interests and can be monitored by the principal about this; however, the principal will be paid the monitoring costs. Furthermore, the agent should protect principal’s interests with resources (bonding costs), ensuring any compensation for the principal in case of harm. However, it is difficult for the principal to ensure that the agent will make optimal decisions at no cost. Further, the authors clarify that most of the agency relationships are positive, so, the monitoring and bonding costs just increase the principal’s wellbeing.

Meanwhile, Eisenhardt (1989) defined Agency theory as concerned with the solution of two problems that can occur in agency relationships: first, the goal’s conflict between the principal and the agent plus the difficulty and expensive cost for the principal to verify the real actions from the agent; and the second could take place if the principal and the agent have different attitudes towards risk, in this case, the decision of sharing risks or who would control it, could be complicated.

Eisenhardt (1989) makes clear that Agency Theory has developed along two complementary lines: Positive theories, which identify various contract alternatives, and principal-agent theory, which specifies the different contracts appropriate according to the levels of outcome uncertainty, information, and risk aversion, among others. Additionally, Eisenhardt (1989) identified two contributions to organizational thinking from Agency theory: the treatment of information as a commodity that has cost and need to be purchased; and the risk implications due to uncertainty viewed in terms of risks/rewards trade off and not just in terms of inability.

It is important to make clear that the Agency Theory applies when a project is executed, which according means that it applies to the post-contract stage (Müller and Turner, 2005). Also, Turner and Müller explain that Agency Theory can be seen as the potential conflict of interest in the project relationship manager – owner (2004a). The authors suggest that all transactions costs are also agency costs, except in the case of the residual loss or reduction of the cost of works (from the contractor), in this case, is an agency cost but not also transaction cost. Besides, the authors explain that Agency theory suggests that the conflicts of interest between the parties can be minimized with the creation of structures and incentives, including contracts.

A different approach to Agency Theory was made from Sharma (1997) who critically appraised Agency Theory in the context of professional services, focusing in highlight
the difficulty in applying the usual agency solutions (behaviour and outcome based contracts) to principal professional agents exchanges. Sharma (1997) explains that agency theory takes for granted the fact that the principal can find the lowest cost for monitoring the agent’s behaviour, as well as the easiest way to measure agent’s outcomes. The author argued that both of these mechanisms are brought into questions in situations involving professional agents; this is because such exchanges are characterized by specialized knowledge based intangible services that are difficult to quantify and measure.

However, about the make-buy decision, Agency theory predicts behaviour of managers according to their feelings towards risk: those risk-neutral managers are likely to choose the "make" option (behaviour based contract), whereas risk adverse managers are likely to choose "buy" decision (outcome based contract) (Eisenhardt, 1989). Furthermore, Agency theory can help in those situations in which contracting problems are complex to solve, for example in those circumstances when: it is complicated to evaluate the agent’s behaviour, there is goal conflict between principals and agents, or there is an uncertainty that could add more risk to the project (Eisenhardt, 1989).

“Agency Theory is related to the shareholders theory of the organization” (Müller, 2009, p.6). In addition, since the unit of analysis governing the relationship between the principal and the agent is the contract, Eisenhardt (1989) explains that the focus on the theory is on determining the most efficient contract governing for the principal agent relationship given assumptions about people (as self-interest), organizations (as the goals conflict among members) and information (information is a commodity which can be purchased).

In a broad perspective, Jensen and Meckling (1976) state that the “essence” of the firm is its contractual relations, due to organization celebrates contract with all the stakeholders, such as suppliers, customers, creditors, among others. The authors explain that the problem of agency costs and monitoring exists for all of these contracts, independent of whether there is joint production in their sense.

About the contract selection, Turner and Müller (2004a) define as transaction and agency cost, as the cost of identifying and selecting contractors followed by the creation and structure of the selected contracts. They describe that this process include the selection of the best contract strategy and the level of detail of the contract, the definition of the product or service to be achieved by the project plus the expected work methods to be adopted for inclusion in the invitation to tender.

The communication is important in all the aspects of the projects, especially in the agent relationship, and the main objective as Turner and Müller (2004b) mention is to ensure the avoidance of surprises such as: unethical project managers who could take decisions that could harm the owner or a product not delivered according to the specific requirements, especially with functionality, quality, time and cost, etc. On the other hand, there are the project managers’ effort understanding client’s requirements and trying to do their best to satisfy the client. In this way, both parts can maintain a good level of collaboration and communication for the success of the project.

Agency Costs are real and all the organizations incur on them in any moment; they were defined by Jensen and Meckling (1976) as the total amount from adding: the monitoring expenditures by the principal, the bonding expenditures by the agent and the residual loss. However, these authors clarify that agency costs can arise in any situation which
involves cooperative effort by two or more people even if it is not a well defined principal-agent relationship and the magnitude of the agency costs will vary from firm to firm. In addition, Müller and Turner (2005) explicate that agency costs in a project could be minimized through appropriate investment in communication structures. They explain that there is a point of communication equilibrium at certain level, which leads to reduction of administrative costs in projects, so, it is crucial for companies to keep a balance between the communications needed to control project progress and the costs that derivate from these.

On the other hand, for those organizations which fix payoff contracts, there are some aspects that should be applied special attention: Fama (1990) found an agency problem in fixed-payoff contracts; the author explain that once the contract has been signed and payment set, the agent has an incentive to evade and otherwise deliver less in the way of goods and services than agreed in the contract. Nevertheless, the author explain the importance to build a cooperative long-term relationship between the agent and the principal that could benefit both parties, about this, Fama (1990) mentions as advantages of the agent’s good performance: the possibility for the agent of getting more contracts from the principal in the future, as well as good recommendations that can help it to win new contracts from other companies; also, since the principal’s perspective, a cooperative relationship can help the principal to decrease monitoring costs but keeping a good quality of the monitoring information.

Turner and Müller (2003) declare that due to higher control means higher agency costs, there is a need for a better control due to the role of the project as “an agency for resource allocation”; they explain that in this relationship, each part has its own objectives: the principal looks for an effective management and allocation of resources to the different projects, meanwhile, the agent tries to look for the most efficient way for executing and delivering the project to the principal. The balance and best utilization of these resources plus a balance communication and control process, will be reflected in the agency and transaction cost of the project.

When a buy decision is taken, the owner of the project, which is the company who hires a contractor to deliver the project, is focused on the project’s requirements in quality, cost and time (Turner, 1999). Meanwhile, the contractor’s objective is to deliver the product or project within the budget in order to have the profits planned as well as deliver it according to the specifications and time (Turner, 1999). During all this process, time, cost and quality, become constraints that need to be monitored and controlled by the owner.

In this section, it was explained the post-contract phase, which is when Agency Theory applies. However, the principal or owner of the project should take crucial decisions to manage efficiently the relationship with the agent or contractor since the pre-contract phase, which it is when the owner selects the best type of contract for the project, as well as develop the governance structure, the cost of these actions are called Transaction Cost Economic (TCE) and it will be explained in the last part (Müller and Turner, 2005).
2.3 Transaction Cost Economics

The concept, importance, and influence in a project of Transaction Cost Economics (TCE) need to be understood especially for those who are working from the client’s side. As Müller and Turner (2005) explain, it applies to that part when the company decides to make or buy a project, as well as the contract strategy that should be followed if the buy decision is chosen. It is in this part, when much of the analytical action resides in order to avoid contracts that cause problems during the project execution (Williamson, 2005). In order to comprehend this concept better, in this section it will be explained what it is, the TCE theory of a firm and then applied in the make or buy decision as well as the differences between agency cost and Transaction Cost Economics.

Transaction cost economics operates at the level where the institutions of governance are located (Williamson, 1998). Furthermore, according to Williamson (1998, p.37) “Transaction cost economics regards the firm not as a production function but as a governance structure and maintains that each generic mode of governance, is supported by a distinctive form of contract law and the pertinent law of contract needs to be addressed”. About this, Müller (2009) explain that organizations need to adapt their governance structures and look for the lowest TCE.

In projects, TCE explains the need for different governance structures for different projects and contracts, whether buying a product in the market or making it in the organization. As a result, contracts should be selected from a TCE perspective, looking for minimize the cost of governing projects (Müller and Turner, 2005).

Additionally, Müller and Turner (2005) recommend to be careful with the decisions taken from a TCE perspective in the pre-contract stage, due to they can have adverse effects during the project implementation, for example, the authors explain that sometimes the company trying to minimize it transaction costs, it chooses fixed-price contract, but if there is a negative collaboration between the owner and the project manager, instead of minimizing cost, these just increase, that is the adverse effect mentioned by the authors during the project implementation.

Among the attributes for describing transactions, the dimensions that have been studied in commercial transactions, and which are based the make or buy decisions are: the regularity of these transactions or how often they will be needed, the uncertainty surrounding these transactions as well as the assets need it to perform them (Williamson, 1998).

Furthermore, Williamson (1998) explains that sometimes it is easy to decide to make or buy if these transactions should be executed many times (economies of scale), or if the company does not have enough resources to perform the transaction; however, there are circumstances when it is not clear which decision to take, in these cases, a comparative transaction cost should be done. It is in this analysis where the author implies that should be considered the attributes of transactions in relation to the cost as well as the competencies of alternative modes of governance on the other.

The pros and cons of make or buy decision are explained by Müller (2009) in Table 4.
**Table 4.** Pros and cons of make or buy decision (Source: Müller, 2009, p.6)

<table>
<thead>
<tr>
<th></th>
<th>Make</th>
<th>Buy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pros</td>
<td>Better control of fit for purpose</td>
<td>Lower prices through economies of scale and price competition in the marketplace</td>
</tr>
<tr>
<td></td>
<td>Maladaptation costs are minimized</td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td>Higher cost</td>
<td>Adaptation cost higher</td>
</tr>
</tbody>
</table>

As Sharma (1997) explains, the transaction cost economics structure as well as the agency theory, suppose that the company owner of the project can execute a good control of the project managers through appropriate information’s systems.

Indeed, the governance theories for projects include Transaction Cost Economics and Agency Theory: TCE where the contract type and governance structure of the project are created, meanwhile Agency Theory where the discrepancy of information can generate the principal-agent problem explained in the previous section (Müller and Turner, 2005).

Finally, some practitioners are still confused between agency costs and transactions costs, in order to clarify the differences, Turner and Müller (2004a) made a comparison which has been very useful to show the differences between them (Table 5). Further, these authors explain that the first two lines of the table, the activities are equivalent; however, the authors consider that bonding costs by the agent go beyond that just performance feedback of transaction costs and for residual loss in the agent, there is no equivalent transaction cost.

**Table 5.** Comparing transaction costs and agency costs (Turner and Müller, 2004a)

<table>
<thead>
<tr>
<th>Agency Costs</th>
<th>Transaction costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating and structuring contracts</td>
<td>Identification, accreditation and selection of suppliers</td>
</tr>
<tr>
<td>Monitoring expenditures by the principal</td>
<td>Performance monitoring Configuration management Processing of variations</td>
</tr>
<tr>
<td>Bonding expenditure by the agent</td>
<td>Performance feedback</td>
</tr>
<tr>
<td>Residual loss</td>
<td>No equivalent</td>
</tr>
</tbody>
</table>
In this chapter, I have given an overview over the main ideas, definition and aspects of the different types of multi-project organizations as well as the Contracting part: how a company takes the decision to use contractors as well as the selection of the appropriate contract for the project; also, it has been explained the varied systems that can be adopted to Control a project, some highlights about the Estimating Process and the definition of the Agency Theory including the importance to minimize the transaction costs in a project. Moreover, it has been highlighted the concept and differences between Agency Costs and Transaction Cost Economics and their risks if those costs are not carefully analyzed. The entire review chapter has presented the results of a research done from different authors in the field, which has been prepared with the objective to provide insights in the project management aspects that will be analyzed in the present research.

In this thesis will be described a case study about a project based organization and how this company applies these aspects during its daily operations. The propositions in which this research is based are:

- All the projects in a PBO’s should be linked with the company’s corporate strategy and should follow the company’s objectives.

- Moreover, when a PBO takes the decision to “buy” and find the right contractor to execute a project, the selection of contract type should be determined by the uncertainty of the project’s product and the process to deliver it as well as an analysis about where the risk is located: method of delivery, the product or on both.

- Additionally, a PBO needs to execute the control of its projects through PMO’s which can help to keep a good level of communication with the contractors and control with the projects, as well as decrease the cost of transport, the misunderstandings, or the opportunism from contractors.

- Finally, the transaction and agency cost can be minimized through the improvement of the process of selection of contractors as well as by creation and structure of the selected contracts and control of the project.

During the last years, experienced consulters and well known academics have published journals and books about these subjects since an academic perspective. However, during the research for the literature review, I could realize that not all of them have described these concepts in a real organization. I considered this as knowledge gap due to for some people it is important to learn how these concepts are applied in a real project based organization, as well as the problems that can be faced and how they have solved them.
CHAPTER III: METHODOLOGY
III. Methodology

This chapter gives the reader a description of the research strategy and methods chosen to conduct the study in order to answer the thesis question.

Bryman and Bell (2007) explain that in the area of management and business research there are different versions of how to study the organizational reality. In order to clarify questions about how this research was carried out, in this part will be explained the ontology and epistemology chosen, the decision made about to generate an inductive study, the research strategy and method including data collected, sampling approach and the research process followed. At the end of this chapter, it will be explained the results expected to find, as well as why this study can be considered with validity and reliability.

3.1 Ontology

Ontology is related to the nature of reality, which it is influenced by the researcher’s perception about how the world operates, and its particular point of views (Saunders et al, 2007). According to Bryman and Bell (2007), the focus on ontology is if social entities should be considered as social constructions created by perceptions or as objective entities with an external reality to social actors.

The importance of the right selection of ontology is due to the high influence on the way that research questions are formulated and the whole research is carried out (Bryman and Bell, 2007, p.25). In this thesis, the ontology selected is Realism, which is the middle point between objectivism and subjectivism.

According to Saunders et al (2007) the view that social entities have a reality external to social actors is objectivism, in contrast with subjectivism, in which the social entities are built from perceptions and actions. Realism ontology recognizes the existence of social entities and its influence from the actions of social actors, but, at the same time, it recognizes that these social actors are not the only influence in the social entities. In the thesis, the organization is analyzed studying how the social actors influence the organization through control of projects, as well as how the procedures and governance influence too.

3.2 Epistemology

In this thesis, the position adopted is Critical Realism. Saunders et al (2007) define that critical realism experience the world since two different perspectives: the first is an action, situation or object with the sensations that we feel about it and the second, is about the mental process generated when that sensations meets our senses. Bhaskar (1989), who was cited in Saunders et al (2007, p.105), arguments that in order to
understand the “whole picture”, we can not only based our research in what we see, we need to go further and understand the structure that create this situation or phenomena. Bhaskar (1989) argues that through the practical and theoretical processes of the social science, it is possible to identify those issues that we don’t see.

I considered the position of Critical Realism as the most appropriate, because a big part of this research is related to those things that cannot be seen as process, criteria and politics, but need to be implemented in all the organizations. As Bhaskar (1989) mentions it is necessary to understand the social structures, in this case, the project based organization, in order to understand how the company deals with its agency and transaction economic costs.

Furthermore, Saunders et al (2007) explains that the critical realism recognize the importance of multi-levels study, due to each of these different levels helps to modify the researcher’s understanding of what is being studied. After all, what is being studied could be a consequence of the existents structures, procedures and processes, and their interaction. (Saunders et al, 2007).

Finally, as Saunders et al (2007) argue, the critical realist’s position which adopts that the social world is continually changing is well adopted in business and management research since these researches are always looking for the fact that caused the phenomena in order to make the right recommendations or solutions.

### 3.3 Decision of an Inductive Study

The decision to make a study inductive or deductive influences the whole research process. For this thesis, it was selected an Inductive approach, which according to Saunders et al (2007) the order that should be followed is: data collection, data analysis and finally, development of theory. It was considered an Inductive approach because the objective of the research is to see how a project based organization creates its governance structure, as well as the problems that face and how to solve them. So, even in the literature review were analyzed different aspects about this subject, it will be during the analysis of data when a conclusion theory will be built.

On the other hand, the research purpose considered appropriate for this thesis is the Explanatory Studies, which focus on explaining the connection between variables in a determined situation or problem (Saunders et al, 2007). In this research it is explained the relationships between the different variables that influence and improve project governance.

Furthermore, “How” and “why” questions are associated with explanatory studies due to these questions need to study operational links over time, instead of frequencies (Yin, 2003). In this thesis, the question ‘How’ needs to be answered with an explanation about the way “the company” execute its control and governance over contractors during their projects.
3.4 Research Strategy

According to Yin (2003), the appropriate research strategy depends on: the type of the research question, the focus on contemporary rather than historical phenomena and the control that an investigator has over the studied events. Yin (2003) also explains that Case Study is an ideal strategy when the research question is “how” or “why”, referring to a contemporary phenomenon focused on real life context and there is no control over events. This thesis contains all those conditions; therefore the research strategy selected was a Case Study, Single Case. In addition, a case study can be used for a deep analysis of a specific organization, community or person (Bryman and Bell, 2007) as in this case, where the case study will be based on a PBO.

Furthermore, a case study was selected because it was considered the best way to present the information resulted of the intense examination of the areas of interest in the project based company, as well as it allows exposing the finding in depth. This decision was supported with Bryman and Bell (2007) explanation, due to according to them, the main attribute of a case study is to focus on those distinctive characteristics and description of the specific case.

On the other hand, as Saunders et al (2007) explain, the case study is commonly used with an explanatory and explicatory research. However, Saunders et al (2007) clarifies that using case study, it is necessary to triangulate sources of data, which consists on collect data with different techniques with the objective to ensure that the information and conclusions reached correspond to the reality (Saunders et al, 2007). Todd et al (2004) give a similar explanation, adding that triangulation can involve the use of two methods which could be data base, interviews, investigators or theories, and these should complement each other. In this study, the triangulation has been done collecting information from inside the company as well as from outside the company through contractors.

Moreover, the decision to use a single case study presents an opportunity for a depth examination and analysis of the organization (Saunders et al, 2007), taking into account its circumstances and conditions and gaining knowledge of the institution’s experiences (Yin, 2003) as in this case, with the project based organization using contractors to make all its projects.

3.5 Type of data to be collected

According to Bryman and Bell (2007), qualitative methods are preferred for those researchers writing a case study; due to these methods allow them to get detailed information of the event or organization studied, since qualitative research is linked with the generation of theory rather than the testing. So, following the suggestion of Bryman and Bell (2007), the information collected in this research has been qualitative data, the strategy followed to collect it, will be explained further in this chapter.

In order to be sure about the decisions taken until now, I found out that “qualitative research can be construed as a research strategy which emphasizes an inductive
approach in which the emphasis is placed in the generation of theories and embodies a view of social reality as a constantly shifting emergent property of individual’s creation” (Bryman and Bell, 2007, p.28). In this case, the thesis has an inductive approach and the view of reality is of constantly change and individual creation as the PBO studied creates its own policies and structure in order to achieve its goals.

3.6 Research Method

The process for collecting data is the research method, which can involve different techniques as observation, structured or semi-structured interview schedule, questionnaire, and secondary data, among others (Bryman and Bell, 2007).

For this thesis, the research method selected was semi-structured interviews. In this research method, the researcher has an interview guide, which is a list of questions about the specific topics that should be covered, but, during the interview those questions do not follow the specific sequence due to more interesting questions can arise as a result of the interviewee’s answers, however, the main topics should be covered at the end of the interview (Bryman and Bell, 2007). Indeed, interviews for case studies should be more as conversation instead of structured questionnaire (Yin, 2003).

In this thesis, there were applied five semi-structured interviews, all from people in Umeå office and projects: the first two interviewees were from inside the project based organization studied and the others three interviewees were contractors that have worked with the company through projects. From inside the company were selected those people who know better the organization: the Project Engineer and the Procurement Manager, both answered questions during 1.30 hours each. They contributed with very good information to this research and the interviews were recorded in their offices at the company. The Project Engineer was interviewed about the estimation process, monitoring and control, agency control and transaction cost economics since he has been involved in these issues since the economic perspective. On the other hand, the Procurement Manager was interviewed about the same areas since its procurement perspective because he is the one who negotiates with the contractors and look after them.

The other three interviews were contractors of the company studied, which allowed making a triangulation of data collected, as well as gaining insights since the contractor’s perspective. The interviews with the contractors took place in their offices, taking approximate 1hr to record from 35min to 40 min each interview. They talked about their experience working with the company and supported the research with the triangulation of data.

All the interviews were made from December 1st to December 11th, 2009.
3.7 Sampling Approach

A sample is the representative part of the total population chosen for analysis during a research (Bryman and Bell, 2007). The importance of the sampling process is crucial. In this thesis, has been transcendental for the case study the access to the interviewees, as well as the cooperation of the organization studied.

The sampling approach chosen is theoretical sampling, which helps “for further development of concepts and categories and to explore relationships between these to develop a theory....Theoretical sampling continues until a situation of theoretical saturation is reached” (Saunders et al, 2003, p.399). According to Strauss and Corbin (1998), a theoretical saturation is reached when all the data needed was founded and there is no possibility to find something else, or when the connections among categories are well validated or the categories are already well developed. In addition, something important to mention about theoretical sampling is that not only refers to people, also to events or objects (Strauss and Corbin, 1998).

During this research I started sampling in the website of the company, as well as official documents. Next, I continue interviewing people from the project office at Umeå, which know the procedures, transactions and policies of the company. Then I interviewed contractors to triangulate the information already analyzed and find new interesting things, but after three interviews, I realized that I would not find something new to add to my analysis, so I stopped with my interviews and finished my analysis.

3.8 Research Process

Yin (2003) explains that a research design is the method or process that has been planned in order to reach the answers and conclusions of the research questions and should be carefully designed if we want to avoid any mistake and finish making a research on something that does not answer the main research question.

Following the recommendations of the different authors and my supervisor, the research process started looking for an organization in Sweden which could meet the characteristics required: a project based organizational structure, making different projects through contractors and that could be available to work with me and give me access to its resources.

With the support of my director, Prof Thomas Blomquist, we could find a company with those characteristics. Then, the next step was to find out more about the organization selected: its financial position, recently news about the company, the different projects and duration working at this moment, among others. After that, when I was sure about the company, with the support of my supervisor, we defined the main question that I wanted to answer: “How do project-based organizations (PBOs) minimize transactions costs in supplier engagements in delivery projects in the Swedish construction industry?” , as well as the others questions that should be answered after the data analysis, which were: how they deal with the governance of its contracts,
considering the estimation cost of the project: how the PBO do the estimation process, how the PBO deal controlling the contractors and their projects, as well as how they minimize the transaction and administrative costs of contractors during the execution of the projects. The list of questions or interviews guide that were follow during the semi-structured interviews to company’s employees and contractors are included in the Appendices section.

After taken these decisions, a literature review of the topics analyzed was done. During this part, there were found views from different authors about the projects oriented or based organizations, the contracting process and its suggested criteria for differentiation, estimation of projects since the financial perspective, the control of projects as well as the agency cost and transaction cost that a company incurs when has multiple contractors and projects at different stages in the same time.

On the other hand, I started working on the methodology that could fit my thesis; the chosen unit of analysis was holistic case because it would be analyzed a project based organization as a “whole”. Furthermore, the research purpose considered appropriate was explanatory studies, because it allows explaining the relationships between the different variables that influence and improve project governance. The research strategy that could help to present the results, as well as helps to expose the findings in depth was case study. Finally, it was decided that company selected could be presented as a single case study representative of a project based organization with its own characteristics.

The methodology chosen for this thesis in order to answer the research question is illustrated in the Figure 3.

According to Bryman and Bell (2007), it is important in these cases to understand not only the behaviour or actions explained by the interviewees, but also, the environment in which they happened. This is a very good advice for the analysis and data collection, because for example, if during this research, the company clarifies that there is no incentive for speedy delivery and one of the contractors mentions that he has had this incentive during the execution of his project, it is important to analyze why was this exception, what happened in that specific case. After all, each project involves its own problems which the company should solve with the contractor’s support and this is part of what has been researched. For this research, it has been adopted an attitude for trying to understand the way of thinking and working of the interviewees during their projects or functions inside the company as well as the way of working of the studied organization and its contractors.

The constraints in this thesis could be time, and the information that could not be mentioned from the interviewees because it was confidential for the company.

Due to ethics values, the name of the project based organization, as well as the names of the contractors, including the interviewees is not mention. In the research, it is just described their positions, influence in projects and situation of the company.
**Semi Structured Interviews**

Data collected from recorded Interviews: Estimation Process, Control, Agency Control, Transaction Cost Economics

**Case description**

In order to understand:
- The organization investigated,
- The decisions taken and their impact.

Figure 3. Methodology chosen
3.9 Expected Results

At the end of this thesis, the findings expected are:

Estimation Process: in this area is expected to understand the criteria used in the estimation of the different contracts that the company has, as well as the improvements that could be made during the process of estimation to different activities, in order to diminish the estimation variance.

Control: about this is expected to find out how a project based organization successful monitoring and controlling its projects performance according to the type of contract, how the company ensure that it’s monitoring and controlling method is the best for contractors, as well as the improvements that have been done as a result of any problems in the past.

Agency Costs: in this area it is expected to know how the company aligns the control structure of the project with the cost of supplier opportunity, and the way that a company minimize the administrative cost for controlling the project.

Transaction Economic Costs: in this subject it is expected to understand which factors led the company to choose the contracts for each project as well as how is executed the bidding process, how long time it takes to negotiate a contract, and other important aspects as incentives, penalties, warranties or securities included in contracts.

It is expected that the case study focused in the project based organization perspective, including the description from the contractor’s side.

Finally, a conclusion will be done according to the findings as well as recommendations for further investigations in this area of knowledge.

3.10 Validity and Reliability

Yin (2003) explains that the development of case studies designs needs to satisfy the requirements of: validity, internal validity (for explanatory or causal case studies only), external validity and reliability. Also, Bryman and Bell (2007) consider that a business and management research should contain these conditions in order to be considered as an evaluation with quality.

In order to increase the credibility of the results in the case, the followed aspects were taken into account:

Validity

This is defined by Bryman and Bell (2007, p.41) as “concerned with the integrity of the conclusions that are generated from a piece of research”. In this part, will be clarified the reasons that support the validity of this research.

Construct Validity: According to Yin (2003) to meet the test of construct validity is necessary to cover two topics: first, the selection of those events or situation that will be analyzed and second, demonstrate that the selected measures clearly identify the main
aspects of the research. Furthermore, the author explains that the tactics used to construct validity are: a chain of evidence or some multiple sources of evidence.

In this thesis, the plan is to study the project governance related to estimation and control process, as well as agency cost and transaction cost in a project based organization. This is a type of organization that has emerged in the last years and its governance structure and characteristics are different from the normal organization. Those differences observed, will be analyzed taking into account those differences that these relations company-contractors have in its own nature. In order to ensure the validity for factual information, it was established that the best kinds of qualitative data collection were through semi structured interviews as well as the use of methods of triangulation: using multiple sources inside and outside the company (Todd et al, 2004) in order to analyse the different perspectives and create the chain of evidence explained by Yin (2003).

**Internal Validity:** this is related to the data analysis phase. Bryman and Bell (2007) explain that internal validity is about if concluding remarks about a causal relationship between two elements of the research is true or not. On the other hand, Yin (2003) explains that in case study is important to consider this aspect for causal or explanatory case studies, as the case of this thesis. Furthermore, the author explains that in case studies, the internal validity is concerned about making an inference of an event that cannot be directly observed.

This thesis presents an explanatory case study, in which the internal validity will be demonstrated during the data analysis. The tactic that will be used is pattern-matching. It means that the findings of the project based organization will be analyzed since the perspective from different authors about similar situations as well as practical experiences illustrated from authors of another companies. The expected result will be to see if the author’s observations match with the theoretical ideas about it.

**External Validity:** this is related to the degree of generalization of the results and findings (Bryman and Bell, 2007). Saunders et al (2007) explains that this aspect is concerned about if the findings and conclusions could be applied to other organization or not.

One of the tactics that it was used to ensure external validity was recommended by Yin (2003), which is the use of a single-case study. This tactic was applied during the research design and analysis in order to understand the connections and special conditions in which the company works, the needs of the research and plan the best possible research design

In this case, a single case study is representative because it allows to achieve the goal, observing and explaining the situation and environment of the project based organization analyzed (Yin, 2003). However, the company studied has specific characteristics, organizational structure as well as economic and social context that are not easy to replicate, for that reason, it is not the purpose of this research design, case results and conclusions to generalize to other cases or to populations beyond the case explained on this thesis.
Reliability

It refers “to the extent to which data collection techniques or analysis procedures will yield consistent findings” (Saunders et al, 2007, p.149). Its goal is to minimize the errors and biases in a study (Yin, 2003).

In order to assess reliability, Saunders et al (2007) suggest questions to analyze if similar observations will be reached by others observers, or if there is transparency on how sense was made about the data collected. In this thesis, the data collected will be triangulated, which means that the results of those interviews from inside the company will be compared with the results from the interviews from contractors; if all the results can reach the same conclusions, or at least similar, it can be said that exist reliability (Todd et al, 2004). However, the deep of the answers or observations will depend of the previous knowledge or experience of the observer or interviewee in this area.

Moreover, the semi structured interviews were planned to contain a high degree of structure to the interview schedule, covering at least the important aspects to be studied, trying to keep a positive attitude towards the research in the interviewees mood, in order to be able to talk about the required subjects with them; according to Saunders et al (2007) these actions minimize the threat to reliability.

Furthermore, Yin (2003) suggests the development of a case study database. About this, it has been developed a database with the videos and records of the interviews, including transcriptions of each of them in word documents. Moreover, this action helps with a better understanding of the data collected during the phase of analysis, as Saunders et al (2007) recommend in order to avoid misunderstanding of the answers.

Finally, it can be concluded that the planned research explained in this section corresponds to the research problem and questions of this study, and that results and findings will be achieved with the appropriate research approach and methods. So, the results in this study will be credible and trustworthy.
CHAPTER IV: ANALYSIS AND FINDINGS
IV. Analysis and Findings

This chapter describes the analysis and finding of the research. It starts with the description of the studied company and interviewees. Followed by the analysis and findings divided by subject: Estimation, Control Process, Agency Control and Transaction Cost Economics.

4.1 Overview

Our Project Based Organization analyzed is a company which was founded in order to carry out a railway project in the north of Sweden, from the bridge over Ångermanälven, north of Kramfors airport, via Örnsköldsvik, Husum, Nordmaling, to Umeå. This railway is planned to be 190 km long, with 143 bridges and 25 km of tunnels. The whole railway has 130 major contracts, where 10 lump sum contracts and 120 unit price contract, some contracts are a mixture between lump sum and unit price (around 20 of the 120 contracts). For example bridges are normally lump sum and earthworks are unit prices.

The construction of this railway has been within the framework and specification required, such as high technological standards, aesthetic attractiveness, safety and work environments requirements as the Environmental code in Sweden.

Looking for a better control during the construction, the company established several project offices along the route, which were responsible of all the activities related to the construction of a specific geographic area. The functions and locations of these offices will be explained in the findings. In addition, this company made the detailed planning, explaining the prospective contractors exactly how the railway needed to be built, as well as making consultation with experts about bridges, tunnels and all the important aspects involved.

This thesis is based in the information given by interviewees from Umeå project office and some of its contractors. The questions asked in the semi-structure interview for the company employees, as well as contractors, are included in the appendices at the end of the thesis. The identities of the company, as well as the interviewees will not be mention, however, in the next part, there will be described their functions and main activities related with the railway. However, in order to avoid confusions, during the next part, the real name of the studied organization will be described as “the company”.

4.2 Field Procedures

The findings were the result of interviews done, as well as organization material, maps and company’s website.
The first interviewee was the Project Engineer at Umeå project office, who is on charge of the coordination of time and economic relations for the Umeå projects, as well as their relation with the others projects of the railway. He has been involved in the selection of contractors since the economic perspective.

Our second interviewee was the Procurement Leader at Umeå project office, who is on charge of the preparation of documents on which the tenders are based, the development of the bidding process, the contract negotiation, as well as disputes and arbitration with contractors. He has been involved mainly in the bidding and negotiation procedure: making the procurement public, preparing the documents, receiving the tender documents and leading the analysis of each of them with the different team members.

Then, there were three contractors interviewed, we have named them by numbers, taking into account the order of the different interviews. The main projects where they participated and which are based their experience as contractors with the studied railway company are:

- **Contractor #1:** It was on charge of building two bridges: a land bridge about 400 meters long and the second, which was nearly 2 km long railway. This contractor had one contract lump sum for the two bridges for about 400 million kr.

- **Contractor #2:** It had one unit price contract to work on the rock fillings of 3 km of rail terrace, as well as lump sum contract for two bridges. This contractor had one of the mixture contracts: unit prices for some activities and lump sum for a bridge. It worked for 20 months in the railway, and at the end, its contract was about 150 millions kr.

- **Contractor #3:** It worked in many different projects during the railway construction. However, the project manager’s interview focused on the latest project which was to rebuild the railway going down from Central Umeå to Holmsund. Its job was to make it stronger and more durable following the new standards for the railway. This was a unit price contract for about 80 million kr.

### 4.3 Analysis and Findings

In order to make it more friendly for the reader, this part has been structured in the following way:

- Estimation Process
  - Criteria for Calculation
    - Lump Sum Contracts
    - Unit Price Contracts
  - Estimation Teams
  - Summary
• Control Process
  o Monitoring and Controlling Project Performance
  o Requesting Progress Information
    ▪ Progress Information documents
    ▪ Control Meetings
  o Changes in the Monitoring and Controlling Efforts
  o Problems with Contractors
  o Summary

• Agency Control
  o Administrative Cost for Supervision
  o Contract Types vs Performance
  o Project Offices
  o Summary

• Transaction Cost Economics
  o Advantages and Disadvantages
    ▪ Lump Sum Contracts
    ▪ Unit Price Contracts
  o The Bidding Process
    ▪ Criteria for Selection
  o The Contract
    ▪ Contract Negotiation
    ▪ Contract Details
    ▪ Contract Problems and Changes
  o Summary

The first part will be about the estimation process, where it will be explained the criteria employed by “the company” and contractors during the estimation process and their estimation teams.
4.4 Estimation Process

4.4.1 Criteria for Calculation

The company used two types of contracts: Lump Sum for bridges and Unit Price for all the rest of the activities.

**Lump Sum Contracts Estimation**

As it was mentioned in the literature review, Turner and Simister (2001) described this type of contract as that in which the client pays a fixed-price, called lump sum, for the entire job to the contractor. The client needs to specify in advance its requirements. Meanwhile, the contractor can find the best way to deliver the project.

This type of contract has been specifically used for “the company” in the building of bridges. The estimation process that it has been followed with this type of contract is that after getting ready the drawings, and is known the exactly amount of cubic meter of concrete, and other material, the project engineer estimates the unit cost of each of the needed elements and multiplied for the quantities. The criterion use for the estimation of this lump sum contracts include manpower, material and machinery.

In the case of the contractor #1, the biggest criteria is getting feedback from sites, so the team gets experience from other projects and just proceeding and developing the estimations for new projects. This contractor system usually gets a feedback from the sites after the work is finished, which allow them to make a better estimation for the next projects and add some jobs, activities or costs where is needed. For the estimation of this particular lump sum contract, it was considered historical information and feedbacks from similar projects plus the cost of the drawings, due to “the company” just specified the requirements and this contractor had to develop the design.

Meanwhile, with contractor #2 the drawings were already developed, so its lump sum contract was just for building, not designing. In its case, the contractor did some calculations within some frames that the bridge should meet and decided the best way to build it.

As it can be observed, the main elements of the estimations process are similar in all the cases: some companies use historical information and feedback, meanwhile others use the actual cost for estimation. However, during the estimation process, it is important to consider the normal inflation, especially in long term contracts.

**Unit Price Contracts Estimation**

This type of contract was mentioned in the literature by Turner and Simister (2001) as a kind of Remeasurement based on a schedule of rates, in this type of contract, the contractor refund their costs at agreed unit rates which include its profits. The description of each activity is based on the Swedish norm “Anlaggning AMA 98”, which code described by “the company” corresponds to a specific activity described in this norm.
In these contracts, the project engineer explained that the unit price estimated by “the company” is calculated including the manpower, material, machinery costs and overhead needed according to the activity. The project engineer also commented that sometimes he takes into account just the machine cost, as for excavations, meanwhile, with others activities as asphalt works; the main cost considered is material.

However, the project engineer also added, that when the unit price offered by the contractor is different, he talks with the contractor in order to find out how it was calculated and see if there was not any mistake in any of the both sides. In general, the normal variation was around 5%.

Furthermore, Contractor #2 explained that “the company” described with detail what needed to be estimated, so the contractor tried to estimate that way, but with low price and profits. The main elements taken into account in the estimation were the costs of transportations, workers, surrounding, traffic, and all the important elements in the specified activity. For instance, this contractor explained that in its work, “it was a big part of the rock that was not used in the contract that became ours and we had to estimate what it was worth, maybe we could sell it on the market and that was a big part in the process with this contract”. On the other hand, Contractor #3 explained that its company has a “sort of experience bank” based on historical information; this cost is then added according to the judgement done by the estimation team about the specified works description for this project.

Finally, the project engineer of “the company” explained that unit price contract budget can be risky mainly because the amount of work can change, and not because the unit price itself. But this disadvantage will be explained in the Transaction Cost Economic part.

Nevertheless, independently if the contract was Lump Sum or Unit Price Contracts, the price was fixed and firm. This contract price is subject to break down into unit prices in a separate document called “schedule of prices”, where it is included all works and materials in the amounts which are estimated by the engineers.

4.4.2 Estimation Team

The estimation in the contractors companies were done by their own estimation team, considering feedback from past projects, and some of them, involving the project manager who will lead the project which is being estimated. On the other hand, “the company” studied make its estimations using the actual cost of the activities and based on the experience of the project engineer with good results.

4.4.3 Summary

One of the questions formulated was about the Estimation Process, how was done and the criteria to do it. About this, it is clear the importance of this process in the allocation of resources inside the PBO, as well as it is transcendental for the contractors in order to
win a project during the bidding process. In this case, the railway construction has a
certain budget which was allocated using internal estimations. These estimations were
based on the activities required to achieve the projects with the actual cost and inflation.
The criterion used for “the company” and contractors was to include manpower,
material, machinery costs and overhead, all the elements needed in each case.

Since contractor’s perspective, those who awarded projects, revealed that historical
information, cost feedback from other sites, and the involvement of the project manager
in the estimation for the tendering allow them to improve the estimation process.

However, the railway company has focused its efforts on reducing possible variations
that its estimations could have with those from the contractors, especially mistakes
resulted from misunderstandings. Trying to avoid it, “the company” has given to
contractors the detail of what needed to be estimated. This action has been appreciated
for all the tenders, at the same time that it has saved time and reworks for all the parts
involved.
4.5 Control Process

4.5.1 Monitoring and Controlling Project Performance

Turner and Müller (2003a) explain that those high performing projects are related to those projects with an efficient performance monitoring as well as formal and informal communication. The communication on projects are considered transaction and agency cost and should be planned in order to keep these cost as low as possible.

According to the project engineer of “the company” studied, the control is managed in two parts: the measurement control and the execution control. And when the supervisors of both parts agree that everything is according to the contract and the drawings, the contractors are allowed to invoice this part of the work. This information was agreed since the contractor perspective, for instance, the contractor #1 who managed a lump sum contract, mentioned that “the company” was mainly interested in the control of the time schedule, that there was no other additional cost for them and that the project was done according to drawings, it means, mainly in the execution. Meanwhile, those contractors with unit price confirmed that the company monitored both measurement and execution.

Besides, there were mentioned mainly three ways that “the company” used for monitoring and controlling the project:

- Monthly meetings which were stipulated in the contract, as well as start or close meetings.
- Supervisors visiting the sites almost every day in order to check projects performance, as well as methods used in those cases where the methods has been specified in the contracts.
- One person of “the company” acting as the contact inside the company for the contractor, which helped to make the communication faster and easier.

Last but not least, those contractors who work as entrepreneur, they were asked in the contract to keep a self control of their own works, measuring up their own work and filling out their self control blankets in order to verify that the work done had been as described in drawings or description.

Finally, the procurement leader from “the company” explained that considering the size of the project in money, the same contract are identical and the monitoring and control is the same too.
4.5.2 Requesting Project Information

There were stipulated in the contracts: time schedules for sending performance information and meetings, which were normally once a month, except with those contractors that were having some kind of problem.

Progress Information Documents
At the beginning of the project, the company requests besides the cost information, a project plan about time schedule, job health and safety, environmental, risk analysis, organization chart, among others.

Also, there are monthly reports in which “the company” doesn’t ask any special format, but it specifies in the contract, the information needed to sent, such as performance, financial information about the project, environmental issues, staff, and machines, among others. Each contractor creates a report that suits with “the company” requirements and the information included in each report should be according to the nature of the project. For example, Contractor #1 commented that his company had to report “how many chemical products we were using on site and which and so on, because our site was in a protected area called nature 2000 area and there were not allowed to use all chemicals, so it was clearly said which were allowed and which not, so we had to report all of these, which we were using and how much and so on”.

In addition, there are two formats requested by “the company”, one of them is for those contractors with unit price contract: which it is an excel file where the contractors used to fill out about the work done monthly. This file is needed in order to prove the work done by the contractors and pay them. As one of the contractors mentioned, everybody wants to be paid for the work achieved during the month. About this, Contractor #3 was more specific and added that its company needed to send a matrix with the specified amounts about the 25th every month, in order to receive the approval for “the company” and send the invoice to get paid at the end of the month. Also, some contractors uses to send a three dimensional measurements printed in a 3-D geometrical volume, in order to make easier the measurement work for “the company”. However, sometimes the contractor and “the company” cannot agree about the work done during the month, in that case, they meet to measure together and achieve an agreement.

The second format requested when a part is finished by the contractor, who needs to fill out a check list that should be approved by “the company” in order to check that it was officially finished and pay the last amount.

Control Meetings
According to the procurement leader, there is a meeting scheduled during the whole contract time, and during these meetings there is a standardized agenda. The project engineer added that during the beginning of the project, it could be some extra meetings for answering contractor’s questions.

All parts agreed that during the monthly meeting was discussed about the contractor’s performance during the last month according to the time plan set up for the project, technical issues, technical problems, economical issues, environmental and quality issues, staff development, suppliers, and subcontractors, among others.
Moreover, the personnel required to assist to these meetings were: production manager, project manager and commercial or account manager from both sides, as well as some specialist in case there is something special to discuss and the measurement manager in the case of those contractors with unit price contract.

As it can be observed, since the contract is signed, all the parts involved know their obligations about progress information and meetings, as well as times required for each in order to avoid “surprises”.

4.5.3 Changes in the Monitoring and Controlling Efforts

According to all the interviewees, the monitoring and controlling efforts have been mainly carry out just as it was presented to the contractors since the contracts were signed, without changes.

However, the contractors mentioned some changes related to themselves:

Contractor #1 explained that in its side, there have been changes in the staff: the project management was changed two times and the site management once.

Contractor #2 explained that even the official monitoring and controlling did not changed, the human side changed due to they know each other more, which helped them to have a better communication and work more as a team.

Finally, “the company” commented that even the monitoring and controlling effort was considered the best way to carry out the project, when the railway finishes, they need to discuss with the staff about the opportunities to improve the process for next time.

4.5.4 Problems with Contractors

Unfortunately, it is common to find that companies have problems with contractor due to different reason. In this case, according to the interviewees, there have been mainly three problems, which are described in Table 6.

However, it is important to mention, that those problems described in Table 6 from the project engineer and procurement leader perspectives, applied to others contractors. During the interviews, Contractors #2 and #3 said they did not have any problem with “the company” or vice versa.
Table 6. Problems with Contractors

<table>
<thead>
<tr>
<th>What was the problem?</th>
<th>Project Engineer</th>
<th>Procurement Leader</th>
<th>Contractor #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankruptcy from one of the contractors</td>
<td>Contractor said that they did more work during the month that they actually did</td>
<td>This was a special case because this project was in a site were the birds pass in specific time of the year, so the construction could disturb them. And due to some changes at that time of the Swedish Environmental Law, “the company” didn’t get the required permissions to build.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How did “the company” realize about this problem?</th>
<th>Project Engineer</th>
<th>Procurement Leader</th>
<th>Contractor #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contractor quit and “the company” needed to find a new contractor who finished the work.</td>
<td>The staff always checks that the performance report matches with the reality. So, when the supervisors see the report and have doubts, they need to go to the site and make a revision.</td>
<td>Not getting the permission to build from the government. “The company” needed to ask the contractor to stop the project.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How did “the company” solve it?</th>
<th>Project Engineer</th>
<th>Procurement Leader</th>
<th>Contractor #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contractor got paid for what it has done: hours and material. And due to the remaining part was a small part of the contract, it was difficult to make a new tender, so, they negotiated with another contractors in order to finish that project.</td>
<td>It depends of the phase of the contract: If it is during the contract time, the difference (not done it) can be deducted from what the contractor said he did. But, if the contract has come to its end, it is necessary to make a claim of the warranty.</td>
<td>From “the company’s side” it was needed to offer good relation, speed up approvals inside “the company” and due to a new time schedule was done, it was needed to finish on time, so an incentive for speedy delivery was offered, plus some help to get permission to work partial time during the birds break. From the contractor’s side, it was needed longer working hours, sometimes working on weekends, more staff and some changes.</td>
<td></td>
</tr>
</tbody>
</table>
4.5.5 Summary

In this area, the initial questions were about the efforts of “the company” for monitoring and controlling its contractors and projects. As Müller (2009) explained “the level and frequency of control should be synchronized with the governance needs of the program”, in this case, with so many contractors working at the same time in different projects, the organization needed to establish a monitoring system that could detect any problem with the enough time to fix it. In this issue, “the company” control system has needed two parts: the measurement control and the execution control. Both activities are taken for unit price contracts and just the last activity for lump sum contracts.

Furthermore, “the company” established an effective monitoring and controlling system through monthly meetings, supervisors visiting the sites almost every day and specified contact inside the company for the contractors. All these activities have contributed to achieve the goals until now and have looked for the lowest transaction cost possible.

An important element for an effective control is the reporting mechanism, which in this case is predetermined in the contract as monthly meetings and time schedules for delivery of progress information documents. The meeting’s fixed agenda and attendance, as well as the progress information document are also predetermined in the contract. In order to avoid any confusion about these requirements, “the company” celebrates meetings with the contractors before the initiation of their projects. The progress information document has been adapted to the needs of the project and contract, which facilitates the controlling. On the other hand, the contractors pay special attention to the progress information document, since this document is taken into consideration for payments.

As it has been seen before, the purpose of monitoring and controlling is to compare the progress against the plan and to take actions when it is required in order to achieve the project’s goal. In this sense, there have not been changes in activities from “the company” perspective. However, after doing these activities effectively, “the company” has been able to face successfully contractor’s problems as bankruptcy, or lies about their performance, with those contractors saying that they did more work during the month that they actually did.

Finally, the answers provided by the interviewees, have demonstrated that the company maintain good communication and control with its contractors, and that each part of the project knows its role, responsibilities and rights.
4.6 Agency Control

According to the project engineer, “the company” aligns the control structure of the project with the cost of supplier opportunity in both, unit price contract or lump sum contract, checking quantities and quality in all the projects.

In this section will be explained how the project offices are organized in this railway construction, as well as how these office supervise the projects and the importance of the right contract type in order to get the contractor’s best performance.

4.6.1 Administrative Cost for Supervision

About this issue, the project engineer commented that “the company” minimizes the administrative cost for controlling the project with the checklist that it has been mentioned before. Furthermore, the procurement leader added that “the company” request in the contract a self control from suppliers as well as the supervisors make an inspection before a contract is approved.

But, how the company supervise the decisions taken by contractors?

From “the company” perspective, the project engineer explained that they supervised the construction projects according to the regulations of the building law. But, respect to the supervision of the contractors, they can accept changes in the way of doing something, if the contractors prove that the quality of the result is the same or even better. This applies not only to the way a contractor does something, but also to the material used. In both cases, the company need to send a notification to “the company” explaining the reason of the intended change and proves, and then after the analysis, “the company” send an answer with the approval or rejection. The project engineer also explained that some contractors are always looking for a cheaper material or method to do something. In case of the contractors find a better or cheaper method, the savings of using it, can be for the contractors. But, if the material was changed for something cheaper, the savings should be divided between both sides.

On the other hand, the procurement leader explained that “the company” makes some test process, during which are checked all the aspects of the project as technical or electrical installation, including the final result from the contract. Excepting the construction of bridges, the most of the contracts in this railway are just for build, which means that the design has already done by “the company” in order to ensure the most benefits possible.

This information was also confirmed by the contractors, who explained that “the company” has supervisors checking that everything is done according to the contracts specifications, and in case of any difference that was not approved, they report it to “the company”, who send a letter to contractors, asking for an explanation. Also “the company” request reports of everything the contractors do in the site. For contractors it has been important the good relationship among them and “the company”, as well as the fact that “the company” involve them in the early stages of the project, so they have been able to work as a team, discussing important issues and developing solutions.
The administrative cost for supervision at Umeå project office includes 8 employees: 3 for measuring and 5 for supervising for 30 contracts which sum around 2 billion kr.

Finally, all the interviewees agree that nothing has changed in the administrative procedures since the beginning of the project.

4.6.2 Contract Types vs. Performance

Different authors mention that the type of contract and payment terms influence the performance and behaviour of the contractors. During the interviews, all the interviewees agree with this affirmation explaining that with another type of contract, of course, the project would have changed more. For instance, Contractor #1 who had a lump sum contract explained that if its company had signed a unit price contract for building the bridges, it would have had lot of work measuring and invoicing the units performed every month. Its performance had been affected by this additional activity. Also, Contractor #2 gave an example that if its company had signed a partnership, it would have been easier to be more creative changing things and moving faster.

Finally, the project engineer added that the decision of choosing the right contract it should be based on the needs and available information of the project. For instance, he mentioned that in some activities as the drawings of bridges, you already knew the design or the required things, so in this case a lump sum contract was the best option. On the other hand, some activities as excavation were not sure about quantities, because even some amount was estimated, in the reality; it could be surprises, so the contract negotiation should be based on unit prices.

4.6.3 Project Offices

In order to have a better control over projects, it is important to create not only a good organizational structure, but also, offices that could work closer with the contractors and supervise the projects. In the case of this railway construction, there were established five offices: Umeå, Nordmaling, Drömme, Arnäsvall, Örnsköldsvik with a headquarter office in Örnsköldsvik.

According to our interviewees inside “the company”, to establish a project office like theirs, could take about three months and the criterion used for the establishment was to divide the railway in space and amount of money and to find a place in the middle of each division with good communication and services. Furthermore, the main functions for these project offices are the control and supervision of the contractors including measuring, planning checks and procurements.

Taking as an example the project office from Umeå, the total investment in this office was about 1.8 billion kr, according to the project engineer of “the company”, this amount was divided by:
As it can be seen, about 11% of the total investment in this project office was the costs for selection, control and supervision of contractors.

In general, the PMO’s in “the company” have been working from 8 to 10 years and each of them is responsible of the construction of the railway in determined area. At the moment of the investigation of the present thesis, there were just open the project office from Umeå and the headquarter office on Ornsköldsvik. The others offices have been already closed due to the projects there have already finished.

4.6.4 Summary

According to Turner and Müller (2004a) Agency Theory suggests that the conflicts of interest between the parties can be minimized with the creation of structures and incentives, including contracts. In this area, the initial question was about how “the company” aligns its control structure of the projects with the cost supplier opportunity; the main activity of alignment is through checking quantities and quality in all the projects and contracts. Additionally, “the company” minimizes the administrative cost for controlling the project with a self control from suppliers requested in the contract and a checklist.

However, it is very common that contractors may be interested in executing the project with the lowest cost possible, in order to do that, they look for cheaper material or methods to execute their work. In these situations, the company’s supervisors are always checking that the material and activities of the contractors are executed according to their contracts. Otherwise, they report the differences to “the company”, which send a letter to contractors, asking for an explanation. It can be seen that “the company” has a full control in these aspects, since no change can be done without its permission. This action has allowed the company to almost finish building a railway meeting the quality standards planned.

Alternatively, the performance of the contractors has been influenced by the contract chosen, in this decision was based on the needs of the project and the available information as it could be observed with the unit price contracts, where “the company” knew which activities were needed and the estimated cost but not the exactly amount of work, so, the contract was selected negotiating just the exactly price unit per activity and not a total sum.

About the Project Offices created for the construction of the railway, the criterion used for the establishment was the physic area for supervision and the amount of money required to invest. These offices were on charge of the monitoring, controlling and reporting project performance of the projects to the headquarters; these functions allowed the upper management to know the real conditions of the railway construction,
the implementation of emergency decisions when it was needed and to perform a detail control of the projects.

Finally, Müller and Turner (2005) explain that agency cost in a project could be minimized through appropriate investments in communication structures, due to there is a point of communication equilibrium at certain levels, that leads to a reduction of administrative costs in projects. According to the findings, “the company” keeps a balance between the communication needed to control project progress with contractors and the cost derivates from these.
4.5 Transaction Cost Economics

Finally, in this part it will be explained the advantages and disadvantages of the chosen contracts, the bidding process followed, as well as the contract negotiation, details and problems which caused changes.

4.5.1 Advantages and Disadvantages

Each contract has its own structure, risk and of course, advantages and disadvantages, which make them suitable for some projects and not for others.

As it has been mentioned before, in this railway construction there were chosen two kinds of contracts: Lump Sum and Unit Price. These contracts were chosen mainly because in some activities such as excavation, piping or digging it was not possible to negotiate exactly quantities at the beginning, so there was necessary to negotiate a unit price with estimated amount of work. In contrast, for other activities as the bridges construction, it was necessary to negotiate a contract including not only to build, but also to design, so in this case, the best option was using lump sum contract.

If it is considered as an example the project office from Umeå, from the total investment done in projects, which was about 1.60 billion kr: a 30% was for lump sum contracts (0.55 billion kr) and a 70% was for unit price contract (1.05 billion kr).

However, in number of contracts, this proportion was so different, for instance considering the total project: a 77% were unit price contracts, 15% were mixed contracts (unit price/lump sum) and 8% were lump sum contracts. These differences are due to the lump sum contracts are the biggest projects which is reflected in the biggest amount of money, meanwhile the unit price contracts can be for small amount of money or consider several activities that represent a small amount of money compared with the big projects.

In order to clarify more, according to their experience, the advantages and disadvantages explained by the employees of “the company” and contractors are described in Tables 7 and 8 respectively.
### Table 7. Advantages of the contracts chosen

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Lump Sum Contract</th>
<th>Unit Price Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easier to handle for both sides: the project office and contractor.</td>
<td></td>
<td>It is useful when the project company does not know the exactly amount of work, so it only negotiates for a unit price.</td>
</tr>
<tr>
<td>When the contract include design and build, the design competence among contractors cause better designs and solutions.</td>
<td>It is easier to do changes when they are related to a unit.</td>
<td></td>
</tr>
<tr>
<td>When the design and total sum is already set, it is easier for the contractor to focus on the execution, looking for a cheap and faster way to do it.</td>
<td>There is a unit price list already negotiated in the contract, so, if the amounts of work increases, the invoice and payment increase without another negotiation process.</td>
<td></td>
</tr>
<tr>
<td>It is easier for the contractors to plan the time schedules for the work and payments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The risk is bigger for the contractor and less for the company who hire them, so, this is an advantage for “the company”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It minimizes the cost for the bidding process because it is only one contract negotiation instead of negotiating one contract per activity.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 8. Disadvantages of the contracts chosen

<table>
<thead>
<tr>
<th>Disadvantages</th>
<th>Lump Sum Contract</th>
<th>Unit Price Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>When a specified work is already negotiated, in case is needed to do something else, it is necessary to negotiate again. There is not a unit price list already settled.</td>
<td>It is very hard to keep track, especially in the case of small changes (or unit changes), it is more difficult to follow up.</td>
<td></td>
</tr>
<tr>
<td>Besides, when the lump sum price is already negotiated, it is difficult for contractors to ask a question for changes, due to “the company” usually doesn’t want any change.</td>
<td>There are special people needed in both sides: the contractor and the project company in order to measure and validate the performance and work done by the contractor.</td>
<td></td>
</tr>
<tr>
<td>The risk is bigger for the contractor, because, if something happens and the contractor cannot work as expected, the cost of this delays or the solution of</td>
<td>Usually, this kind of contract avoid the use of new techniques from contractors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For the contractor’s perspective, a</td>
<td></td>
</tr>
</tbody>
</table>
Finally, a potential disadvantage can exist in the design and build lump sum contracts, if the project company does not explain with detail the requirements.

This problems will be mainly for the contractor. disadvantage is that its gets paid after the work is done.

4.5.2 The Bidding Process

This process has followed the Public Procurement Regulations for motor, energy, transportation, post in the supplying, in the Utility Sector from the European Union, as well as the Swedish Law for Project Procurement.

The bidding process was described by the procurement leader, who explained that the first step is to make the procurement public. The published invitations to tenders are announced in the database “allego.se”, where “the company” includes all the information about the project and all the construction companies subscribed to this database are always looking for new invitations. When construction companies decide to participate, they ask for the tender documents in order to start working on the planning and estimation of the project. These companies send their tender documents on the tender day announced. Depending on the size and complexity of the project, this process from preparation of the tenders until the tender day can take from 12 days (which is almost the minimum by law) to around 6 weeks.

After the tender day, there is a tendering opening which is celebrated in the headquarters office; this meeting is for opening all the offers and it is regulated in the law, how it must done, which protocol is required, as well as it is necessary to make a schedule with all tenders about who is tendering, tenders sums, and all the main aspects of their offers. After this meeting, the next step in the process is the analysis and selection of contractor.

The selection team is integrated by five people: the procurement manager from the headquarters office and the rest from the project office owner of the project. From the project office participate the procurement leader who coordinates the process in the project office, the project engineer to evaluate the price offered as well as the estimations made, and two supervisors who check the drawings, schedules, quality and method planned, as well as the deliverables offered.

After the decision has been made, “the company” needs to make an announcement about the winner contractor. However, if any of the contractors is not satisfied with the decision, this contractor can go to court and ask for a change of “the company’s decision”. For this reason, “the company” does not sign any contract, until is sure that all the contractors are satisfied with its decision.

About this process, Contractor #3 explained that sometimes, it can be some additional requests that need to be added up to the initial request, as it happened with its project. After this contractor was selected, “the company” invited for a meeting in order to
clarify doubts, technical issues and some issues that could be unclear. As Contractor #2 explained, sometimes in this part of the process, some prices can be changed as a result of these clarifications.

Finally, all the contractors described their bidding process as the procurement leader explained it.

**Criteria for Selection**

According to the procurement leader, there are several criterions to select the winner. It depends on the type of contract, the money involved and the different risks or characteristics around the project. For instance, for some projects the price criterion is 100%, meanwhile, for others is 80% and the other 20% is divided among time schedule, organization, quality, environmental factors, etc.

All the main factors needed to consider during the tender evaluation are described in a list which is filled out with the tenders documents received for “the company”. There are several people evaluating these aspects, generally experts in railway construction. When the decision is taken, the next step is start negotiations with the winner contractor.

Other important factor to consider besides the offer for doing the project is about the contractor organization. After the experiences of bankruptcy suffered during the railway construction, for big contracts, “the company” is analyzing deeply the financial information, number of employees, others projects done in the past by the contractor or actually working on, among other information. This is needed in order to know if the contractor has the capacity to manage the project or not.

Finally, it is important to mention that “the company” always compare the estimated price by its project engineer with those prices from the contractors in order to be sure that their price has been calculated correctly. Besides, the procurement leader mentioned that in his experience, the competition among contractors during the tender process makes that contractors cut cost and pricing around 20%.

In order to know what the contractors think about the bidding process that they won, it was asked why did they think their company was selected? Their answers were very interesting:

- Contractor #1 considered that his team won the two bridges contract because “the company” was planning a steel concrete comprised bridge, and this contractor offered concrete bridge and special method to build it.
- Contractor #2 explained that his company won the contract because its offer was one lowest price, plus a good plan schedule and job description.
- Contractor #3 revealed that it was a combination between the lowest price and others aspects such as project organization, earlier references, quality and environmental routines.

After a contractor has won the bidding process, the next part is the negotiation, which it will be commented in the following section.
4.5.3 The Contract

**Contract Negotiation**

The negotiation of the contract in “the company” can last since 20 days to 2 months, depending of the questions from the tendering or because the company does not have all the permissions required.

After an experience of delaying one project due to the missing permissions (Contractor #1), “the company” has decided avoid that situation again, trying to sign the contracts until there are all the permissions ready.

The contractor can decide the best way to achieve the results that the project demands. However, the method should need to be detailed in its offer during the bidding process and then in the project contract.

**Contract Details**

Sometimes, after the contract signed, and the contractor is already working in the project, it can be some additions as happened with the contractor #2, in which project were added sound barriers that had to be negotiated. However, this is not very common and has happened in a very few occasions.

About incentives for contractors, “the company” does not offer any incentive for speedy delivery or lowest cost. The only exception was with Contractor #1, in this case, this contractor was offered a speedy delivery incentive due to the delay of the project caused by the missing permissions to work in the area.

About the penalties, all the contracts include penalties for late delivery which is a percentage of the contract sum; generally it is a 1% of the total sum per week delayed. During the interviews, all the contractors mention these penalties, which they said, it is normal in contract projects. A special case, it was with Contractor #2, which contract had part times and full times penalties. According to this contractor, “the smaller penalties were for some of the part times, about 0.5% of the contract sum per week or per month. And then there is a roof, there can only go as far as 5 million. Full time it can be, I don’t know but it was 1% and the maximum is like 5% maybe, you cannot penalty only way its end”. These penalties are included in the contract because if some contractor finishes late, all the other contractors suffer a delay, since all the activities need to follow a sequence achieving a time schedule.

The contractors needed to secure “the company” about they doing their work, this is made using bank securities and building insurance. Since the contractor perspective, some of them have a special purchasing department who is on charge to ensure that the every customer that they build on, has enough money to finish to pay during the project execution. Others contractors agree that because “the company” is part of a state company in Sweden, there is no risk to get paid.

On the other hand, the warranties offered by the contractors is according to the standards in projects of this type, which is 5 years starting with the taking over, which means, after the final inspection ends.
Contract Problems and Changes

Special situations can occur in any moment, which can cause changes in projects and contracts. About this, the project engineer mentioned mainly two problems: one is the bankruptcy of one of the contractors, which has been mentioned before in this chapter. And the second is the delayed of the start date of a bridge due to the lack of permissions. To solve this last problem, it was necessary to make a new time schedule and offer incentives for speedy delivery. This problem was explained too by Contractor #1, who added that with all the efforts of both sides, this project has been finished one week behind of the original finish date of the contract and five months before the last time schedule.

On the other hand, Contractor #2 explained that the problems that its project had, was due to some roads that originally were through the houses and needed to be changed; so, the price had to be estimated again, as well as the sound barriers added to the contract too.

Finally, the Contractor #3 explained that the changes suffered by its project were required from “the company” as a respond of an increase of the quantity estimated of work on one side, and changes that had to be done in the projects inside the city, where it is possible to affect different interests. In this case, the change of the project was about 30%.

These have been the result of the interviews and information found about “the company”. In the next chapter, it will be presented the conclusion reached from this case.

4.5.4 Summary

It has been already explained that transaction cost economics is related to the pre-contract stage of the project, when the organization takes the make or buy decision, choose the contractors through the bidding process, select the contract details that are suitable for the project and negotiate it. In this subject the questions were related with the bidding process, contract negotiation, problems and changes.

The finding showed that looking for the selection of the best tenders; “the company” makes its bidding process following the law requirements from the sector it belongs and after the decision has been made, “the company” waits to sign the contract with the winner until be sure that all the tenders are satisfied with the decision. With this action, all the tenders can have time to understand the decision taken and improve their offers in the next tendering.

Respect to the contractor selected, this is invited by “the company” for a meeting in order to clarify doubts and technical issues, doing this, the company ensure that the contractor will know exactly what it is expected from him.

In addition, in “the company” there is not criteria defined for selecting contractors, it depends of the type of contract, money involved and risks or characteristics around the project. The criteria decision is transcendental to choose the right contractor for executing the project, adapting the criteria to the characteristics of the project, helps to
avoid mistakes, since not all the projects are the same. Also, an advantage of making a fair and competitive bidding process is that prices are lower through price competition due to the contractors’ efforts to make the best offers, which is what has happened in “the company” during the railway construction.

The negotiation of the contract can last since 20 days to 2 months, and as it was noticed during the interview and findings, “the company” has learnt from mistakes, since it has decided to avoid of signing contracts before that all the permissions are ready.

On the other hand, “the company” has a clearly policy about the contracts details, in this sense, all the contracts are the same: 5 years warranty (with exception of more years or less if applies), bank securities and construction insurance, same penalties for late delivery, as well as no incentive for speedy delivery or lowest cost (with the exception explained in the findings due to causes that didn’t belong to the contractor). In this way, the company ensures a clearly policy for all contractors, and makes easier the negotiation since the contractor knows in advance how should be its expectative.

Ultimately, problems can arise everywhere; projects are not the exception, even the company has tried to avoid them, it is clear that sometimes, there are unexpected problems that the company has faced successfully due to an efficient monitoring and control methods, quick action and negotiations with contractors willing to do their best.
CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS
v. Conclusions and Recommendations

In the last chapter, was explained the findings of the investigation and interviews done. This final chapter provides the reader with concluding remarks and suggestions for further research.

5.1 Conclusions

In this thesis, it has been presented the governance of a project based organization which was created to execute an ambitious multi-million dollar project: the construction of a railway in the north of Sweden. Its operations have lasted more than 10 years, and during this time, it has been negotiated more than 130 projects with contractors from around the world. In this process, the PBO has faced unexpected problems, which after sharing them with its contractors together have found the best solutions for them; this action has enhanced the contractor performances, as well as nurtured the good relation and trust between company and contractors. Some examples of these last actions could be observed in the findings chapter: when Contractor #1 finished the bridge on time in spite of the delay on construction permissions in the birds area or when Contractor #2 mentioned that during the project, the teamwork becomes stronger as a result of the communication and interaction among the team members of both companies.

At the beginning of this thesis were formulated questions, which together can answer the main subject of this thesis: “Minimizing Transaction Costs in Project-Based Organizations: a case study on suppliers’ engagements in delivery projects in the Swedish construction industry”.

The propositions in which this research was based were explained at the end of the literature review.

After the review, it was decided the methodology: trying to answer the initial questions, there were applied five interviews: two to employees of the company and three contractors, as well as was conducted a research on institutional documents, official website of the company and visits to the sites. The analysis and findings were explained in the last chapter.

According to the results found, all the projects were aligned to the company’s objectives, which have been monitored and controlled through the project offices. Due to “the company” was created to build a railway, there was taken the decision to “buy” all the projects needed. Then, it was carried out an analysis about the best suitable contracts for those projects.

The PBO minimized its transaction and agency cost during the project execution due to:

- The only contracts chosen, based on the needs of the project and the information available, were lump sum and unit price. These decisions supported better the execution of projects as well as minimized the transaction and agency costs due to with only two types of contracts, the company could develop economies of scale of existing procedures and processes.
The project offices, which have been on charge of the monitoring, controlling and reporting performance of the projects to the headquarters, have allowed the upper management to know the real conditions of the railway construction and implement emergency decisions on time, which has minimized agency costs.

The Estimation Process has been crucial for the contract selection during the bidding process as well as in the allocation of resources inside the PBO. The railway company has focused its efforts on reducing contractor’s variations in the estimations derived from misunderstandings. Trying to avoid it, “the company” has given to contractors the detail of what needed to be estimated, saving time and reworks for all the parts involved and of course, the costly misunderstanding than could cause higher costs during the project execution.

The monitoring system established by the organization, which could detect any problem with the enough time to fix it. Indeed, “the company” control system has two parts: the measurement control and the execution control.

Also, the effective monitoring and controlling system for performance included monthly meetings, supervisors visiting the sites almost every day and specified contact inside the company for the contractors. Furthermore, due to the progress information document is taken into consideration for payments especially for those with unit price contracts, the contractors pay special attention to do the most activities possible during the month, in order to get paid.

Another factor that has minimized the transaction costs has been the good communication and control that “the company” has with its contractors: each part of the project knows its role, responsibilities and rights.

In addition, “the company” aligns its control structure of the projects with the cost supplier opportunity through checking quantities and quality in all the projects and contracts.

Besides, “the company” minimizes the administrative cost for controlling the project with a self control from suppliers requested in the contract and a checklist.

Further, the company’s supervisors are always checking that the material and activities of the contractors are executed according to their contracts, which has allowed the company to almost finish building a railway meeting the quality standards planned.

The bidding process has helped “the company” in the selection of the right contractors. Indeed, a fair and competitive bidding process has helped to get lower prices due to the price competition.

Finally, the company ensures a clearly policy for all contractors, which makes easier the negotiation.

During this investigation, it has been learnt the importance of choosing the right methods for estimating, monitoring and controlling the projects, and how the right governance structure can help to minimize the agency cost and the transaction economic
costs, which otherwise, could be elevated in an organization with so many different projects and contractors.

Finally, the findings of this research concluded that project based organizations like our example, have proved to be flexible and functional for achieving very specific objectives in the construction area. Furthermore, the railway company studied achieved to minimize its transaction costs on supplier’s investments during the delivery project phase due to: the right selection of types of contracts, as well as those process and systems implemented in all the project offices. These process and systems helped it to detect on time potential problems as well as take decisions; they covered since the selection of suppliers through the bidding process, followed by the negotiation of contracts, the monitoring, controlling and reporting performance and finished with the closure of the project and last payments for contractors. The PBO tried to keep a good communication with contractors and at the same time, it developed a team work feeling in which both parts supported each other. Ultimately, it could be observed that it is possible to achieve successfully the organization’s objectives and minimize the transactions costs during the execution through essential factors as a careful and detailed planning, team work with all the areas involved, communication and hardworking.

5.2 Managerial and Theoretical Implications

The managerial implication resulting of the present research is that in order to minimize transaction and agency costs, each Project organization should align the process of estimating, contracting and controlling with its own circumstance and conditions. Furthermore, this PBO can be an example of others companies which need to adopt a similar structure or which face similar problems.

The theoretical implication of this study is in reference of the system applied by the organization to minimize its transaction costs on projects executions, which was based on the actual theory about TCE and agency costs. Furthermore, the selection of procedures and processes utilized in the case of construction projects, illustrate the connection between the application of governance and the circumstance faced by the company.

The strengths of the present research are mainly two: due to this case illustrates a company which is working in a very well known project; the results of the good management of the company will be seen for all the people (the built railway). In addition, the support of the Swedish company during the research facilitated the opportunity to interview the right people from the company, as well as one contractor of each type of contract, improving the amount and quality of the information analyzed.

This research is limited by the fact that it was only focused on the case of a company operating in the Swedish construction industry with specific characteristics, organizational structure as well as economic and social context that are not easy to replicate. For that reason, it cannot be deducted that the findings in this study are applicable to all project-based organizations. Also, it is important to remember that the findings explained in this thesis were from the interviews made to employees of “the company” and contractors working for the Umeå Project Office, which even are representatives from the organization and contractors, could be any exception.
5.3 Recommendation for further research

Due to the valuable findings of this study, this case helps to understand how a project based organization manage its governance transactions in order to minimize its costs. Besides the limitations that this case study could have, it can be considered as a reference for further analysis and research in the academic field of PBO. The findings can release the way for future research; this area is highly relevant for the understanding of this kind of organization, which if it is well managed, it has proved to be successful for achieving very specific goals.

In order to develop a complete understanding of the administrative and transaction costs in projects, further studies should be carried out to identify more relevant criteria related to project governance, as well as it should be important to document and share other case studies of project based companies around the world since different perspectives: their problems faced and solutions that have help them to overcome the unexpected situations and conflicts achieving success in their areas.

In addition, it could be very interesting the documentation of cases about unsuccessful project based organizations coming from different sectors, and focusing on the analysis of mistakes and failures of these companies.

Moreover, a multiple-case study is also recommended, this would be about not only project based organizations, but also classical organizations in order to make comparisons among them and analyze their differences since different perspectives.

On the other hand, in this type of organization, the project management function has a special significance, and future research could be based on the importance and influence of the collaboration of PM’s in the success of PBO.

At the end of the day, a PBO as any organization needs to achieve its purposes with the less cost possible; A PBO which with the right model of governance and promoting the cooperation and team work in a win-win project relationship with its contractors, can enhance the project performance and decrease its transaction costs.
REFERENCES
References


APPENDICES
Appendix A: Interview for the studied Project Based Organization (PBO)

The interviews selected were semi-structured with open questions, because, some questions came up during the interview.

There were two interviews with the Financial Controller and the Procurement Manager in the studied Project Based Organization (PBO) in Umea. During these interviews, my plan was to get qualitative information about: Estimation Process, Control, Agency Control and Transaction Costs Economic. In these questions presented, the real name of the studied organization was change by “the company”.

The questions for the people of the studied Project Based Organization were:

**Estimation**

1. From the 130 contracts, how many are lump sum and how many unit price?
2. How were estimated the lump sum contracts?
3. Which was the criterion used?
4. Which are those activities with unit price estimated?
5. How were estimated the unit prices?
6. In the unit prices contracts is the material included or just the infrastructure and labour?
7. Was it made any improvement in the estimations after the first differences in contracts?
8. Which improvements were made?
9. What has “the company” done when it has received a very low bid with big differences with the estimates?

**Control**

1. How is the control executed?
2. How does “the company” monitor the projects performance?
3. Is there any difference between the small projects and the big ones?
4. Does “the company” do project audits?
5. Does “the company” request progress project information in a specific way?
6. Which information does “the company” request from its contractors? (environmental, risk control, etc)
7. How often is “the company” meeting with its contractor?
8. Are scheduled formal meetings?

9. How often do the contractors need to send information?

10. Is there any format?

11. If a format is needed, is the same format for all the contractors or change?

12. How did “the company” ensure that this monitoring and control method is the best for contractors?

13. Has something change since the beginning of the project until now?

14. Has “the company” had any problem with any contractor?

15. What was the problem?

16. How did “the company” realize about this problem?

17. How did “the company” solve it?

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**Agency Control**

(Efforts to align BB + supplier) (Efforts)

1. How does “the company” align the control structure of the project with the cost of supplier opportunity?

2. Is there any difference in the involvement of “the company” in the projects between those with Lump sum contract and those with unit price?

3. How does “the company” minimize the administrative cost for controlling the project?

4. How “the company” supervise the decisions taken by the contractors?

5. How many people work in the supervision and control?

6. Has something changed in the administrative procedures since the beginning of the project?

7. One author mentions that “Different contract types incentivize the contractor in different ways, and therefore we would expect their performance to be different under different payment terms”, in your experience, is there any difference between the behaviour and performance of Lump Sum and unit price contractors?

8. How long does it take to create a PMO like this one in Umea?

9. How many PMO were created and where?

10. Which were the criteria to establish a PMO?

11. How long have these PMO been working?
12. Which are the functions of the PMOs?

**Transaction Cost Economics**

1. Why were chosen the Lump Sum and unit price contracts?
2. Which were the advantages that “the company” found in of each of them?
3. Which have been the disadvantages found in each of them?
4. How was the bidding process for each of the two contracts?
5. Which are the criteria for contract selection in each of the type of contract?
6. Has this criteria changed over time?
7. How is “the company” sure that the contract's price is the best?
8. How long does it take to negotiate the contract?
9. In the case of unit price contract, how did “the company” communicate the excavation area?
10. Does “the company” suggest the contractor a specific method to achieve the action or the contractor who decides?
11. Is there any incentive for contractor for speedy delivery or lowest cost?
12. Which are the penalties included in the each type of contracts?
13. How are the securities that “the company” offer to the contractors?
14. How are the warranties that the contractors offer to “the company”?
15. Have you had any situation where the product doesn’t meet the requirements of “the company”?
16. What has “the company” done about it?
17. Have you had any situation where “the company” needs change and you had to change the contract?
18. What changed?
19. How did you do?
Appendix B: Interview for Contractors

The interviews selected were semi-structured with open questions, because, some questions came up during the interview.

There were three interviews with contractors working in the project. From these interviews I got qualitative data about Estimation Process, Control, Agency Control and Transaction Costs Economic, since the contractor’s perspective working with the Project Based Organization (PBO). In these questions presented, the real name of the studied organization was change by “the company”.

The main questions made to them during the semi-structured interviews were:

**Estimation**

1. Which type of contract did you have with “the company”?
2. How did you estimate your cost?
3. Which was the criterion used?
4. What are you including in your estimation?
5. Did you make any change in your price contract during the bidding process?
6. If you did, why?

**Control**

1. How does “the company” monitor your project performance?
2. Has “the company” done any project audit?
3. Does “the company” request progress project information in any specific way?
4. Which information does “the company” request from your project? (environmental, risk control, cost, reports, etc)
5. How often is “the company” meeting with your team?
6. Are scheduled formal meetings?
7. From your project team who participate in the meeting?
8. How often do your project team need to send information?
9. Is there any format?
10. If a format is needed, is the same format since the beginning until the end of the project or change in specific moment?
11. Has something change in the monitoring and control process from “the company” since the beginning of the project until now?
Agency Control

1. How “the company” supervise the decisions taken by your team?

2. One author mentions that “Different contract types incentivize the contractor in different ways, and therefore we would expect their performance to be different under different payment terms”, in your experience, do you think that the performance and behaviour of the project has changed with a different contract?

3. Has “the company” had any problem during the project execution to meet the objectives?

4. What was the problem?

5. How did “the company” realize about this problem?

6. How did your company solve it?

Transaction Cost Economics

1. Which advantages do you think your contract has as Lump Sum/unit price?

2. Do you think that you could have more advantages with a different contract for the same project?

3. If yes, which type of contract and advantages?

4. Which disadvantages do you think your contract has as Lump Sum/unit price?

5. How was the bidding process for your project?

6. Why do you think your company was selected?

7. How long did it take your company to negotiate the contract?

8. Did your company suggest a specific method to achieve the objectives or “the company” decided?

9. Is there any incentive for your company for speedy delivery or lowest cost?

10. Which are the penalties included in your contracts?

11. Which were the securities that “the company” offered to your company for the project?

12. Which are the warranties that your company offered to “the company” for the project?

13. Have you made any changes to the initial contract of the project?

14. Why?