



STRATEGIES FOR AVOIDING ASYMMETRIC INFORMATION IN CONSTRUCTION PROJECT MANAGEMENT

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Abstract. A construction project is characterized by a high number of project participants and a multitude of contract relations. The Principal Agent Theory deals with the design of contracts, especially with respect to asymmetric information. Asymmetric distribution of information in co-operations can have effects before as well as after closing a contract. In construction project management therefore attention has to be paid to where information imbalances occur. Several methods are known with which one can cope with the resulting problems but which in turn cause costs.

Keywords: Principal Agent Theory, asymmetric information, Adverse Selection, Moral Hazard, Hold-up, Agency Costs, Signalling Costs, Signalling, Screening.

1. Introduction

New forms of competition and contracts have been established on the German construction market; the classical scope of work as described in the HOAI and the clearly regulated payments related to it are becoming less and less important. Construction services are already heading towards a strong orientation to the needs of the clients. These normally don't want to be confronted with a multitude of technically highly specialized engineers but rather look for a qualified advisor for the whole life cycle of their buildings. Services have been offered to that effect like risk management, facility management, and construction management. Clients delegate more and more control and supervisory functions. This development is intensified by the necessity to plan and build in a consumer-oriented, cost efficient, and quality-conscious way. The great number of persons involved in the construction has to be organized and led by the project management in such a way that the building can be realized according to the targets of the client.

When it comes to designing the contract relations, the choice of contractual partners, and the construction controlling it is important to consider that besides the target of constructing a building according to the benefit of the client, the respective actors also want to reach individual benefits. If the participants give their own targets priority over the targets of the client, disturbances in the transformation process may be caused which may result in a reduction of the benefit for the client. This problem is addressed and examined by the Agency Theory which deals with target conflicts and information imbalances. I want to describe it in short hereafter.

2. Basic principles

2.1. The Principal Agent Theory within the "newer institutions economics"

In the middle of the last century the discontentment with the neo-classical models of economic science resulted in several new approaches that are summarized under the term „new institutional economics“.

The consideration of institutional circumstances and their explanation within the economic analysis and the design of institutions that build up on this are in the centre of this field of research. This newer institutions economics encompasses especially the Property Rights Approach, the Transaction Costs Theory, and the Agency Theory. In the centre of the present paper there are findings on the basis of the Agency Theory, in the course of which principal-agent-relations of all sorts are dealt with. You talk of an Agency Relation when a principal assigns to an agent certain tasks and the respective decision competence. The agent chooses one action option from a multitude of options which results in possible effects on him as well as on the principal. The principal is not able to watch the actions of the agent, only the result. But this result depends not only on the actions of the agent but also on external environmental factors. Therefore the principal can not deduce from the result to the action of the agent. When analyzing the behaviour of the agent, it is to be assumed that he will act in a self-serving way. The consequences of this self-serving behaviour depend on which restrictions his behaviour is subject to. The efficient design of these restrictions, e.g. by legal and contractual regulations, is in the centre of economic organization problems.

Core problem of the Agency Relation is the asymmetric information distribution, i.e. the informational advantage of the agent.

2.2. Asymmetric information

The situation in which one of the two co-operation partners is better informed than the other one is described as asymmetric information. Problems resulting from this are economic disadvantages for one of the parties, the inefficient use of resources, and the resulting losses of welfare.

The asymmetric information distribution results from hidden action and hidden information. One can act on the assumption that the agent tries to maximize his own benefit even when his individual benefit faces a higher damage on the side of the client (Wenger, Terberger 1988). The information imbalance in co-operations may have effects before as well as after closing a co-operation contract.

The term “asymmetric information” describes three information problems which are based on a certain coordination and motivation problem: Adverse Selection, Moral Hazard, and Hold-up (Linde 2005).

Adverse Selection describes the quality uncertainty of the client with respect to his contractor. The client does

not know the qualities or the exact qualification of the contractor before the contract is closed. The contractor might conceal lacking or negative qualities or a very qualified contractor might not tell about his positive qualities. The result would be the choice of undesired contractual partners.

Contrary to the Adverse Selection, in the case of Moral Hazard there are information asymmetries that develop after client and contractor are closing the contract. If the client cannot completely supervise the contractor or if he is not able to deduce stringently the quality of his service from the work result, an information imbalance in favour of the contractor will result. The danger that the agent will exploit this opportunistically is called Moral Hazard.

If the client makes large investments because of the co-operation relation and if these investments get lost in case that the contractor acts uncooperatively, a one-sided relationship of dependence results from this. The resulting Agency Problem is called Hold-up. The client may afterwards get the information that was held back before but the client then did already make an irreversible investment. This enables the contractor to confront him e.g. with excessive demands.

2.3. Agency costs

In a world of cost-free information all actors would be completely informed and there would be no coordination or motivation problems. Orders could be commissioned and decisions could be delegated in a way that always the most productive structures of the division of labour and specialization could be realized. In reality, though, the knowledge of the economic actors is distributed in an incomplete and in most cases unequal way. In Principal Agent Relations leeways develop which may be exploited to the detriment of the principal. To counteract this, the client will try to reduce the agent's ability to act by means of control mechanisms or by an according design of the contract. This again might foil the advantages in the execution of the order that had been anticipated due to the delegation of decision. This may possibly even cause the effect that the client completely avoids the delegation of decisions fearing adverse behaviour of the contractor. The advantage of division of labour and specialization then might not be used due to control problems.

The Agency Costs are made up of three components:

- The signalling costs of the agent,
- The control costs of the principal,
- The remaining loss of welfare.

Signalling costs are all those efforts which the agent himself undertakes to reduce the information asymmetry between him and the principal. Among these are e.g. certificates that proof his qualification, guarantee offers, or securities.

Control costs are all efforts of the principal to reduce his information disadvantage. These are quality controls, testing of work probes, or testing of references.

If asymmetric information exists, then normally the most efficient distribution of labour possible will not occur. The difference between the productivity in case of optimal information and the actual performance of the agent is called loss of welfare.

2.4. Coping with agency risks

To cope with Agency Risks, basically three instruments are suggested: establishing target congruity, reducing information asymmetries, and allocation of risks. The harmonization of interests may e.g. be created by a new profit sharing of the agent so the agent will in his own interest yield the performance desired by the principle.

The problems of the Principal Agency Relation may be solved by the following mechanisms:

- bureaucratic control;
- information systems;
- incentives, bonuses;
- corporate culture;
- reputation;
- trust.

Corporate culture plays a special role here. Shared values targets, and competences minimize coordination costs. This facilitates mutual coordination and learning. As mostly new project participants work together in projects, a conscious way of dealing with information asymmetries is of special importance.

For the aim of reducing information asymmetries, besides the signalling of the contractor also a monitoring by the client may occur. Formal planning and control systems as well as an integrated reporting can help diminishing information deficits on the side of the client in projects. Another possibility for the client of gaining information is screening. Screening is the term for all activities by which the principal tries to get more exact information on the quality attributes of the agent that are relevant to him. Among these are work probes, references, certificates, credit worthiness. Another possibility to avoid Adverse Selection is to construct the contracts in such a way that only desired

contractors would sign them because only they would have the self-interest to offer the service under these circumstances. Examples for this are guarantees or a possible loss of reputation for the agent.

3. Importance of asymmetrical information in construction project management

3.1. Organization of the construction project

A construction project is an investment project with fixed targets, results, as well as deadlines and costs. The project management has the task to find an optimal solution for meeting costs, deadlines, and quality.

Besides the principal other hierarchically organized groups are involved. During planning, architects, technical suppliers, bearing structure planner, and, depending on the respective project, further specialists, must be coordinated. While executing the project, the different companies from different branches in turn work together with the subcontractors they have chosen. The different states of knowledge and targets lead to misunderstandings and conflicts. A mistake that occurs in one of the sub-steps may lead to a delay and in the worst case to a standstill of the whole project.

To cope with the complex tasks of the principal that encompass the coordination, management, and supervision of the construction process in terms of technology, legal issues, and economy, in major projects the performance of project management is commissioned. The project manager here takes over decisions for the client as a line executive.

A major task is the choice of the project participants. Among these are the planners, the advisors, and the assessors. The project manager hereby has to pursue the project targets of the principals' organization:

- the quality of the building;
- the costs of its construction and use;
- the duration of the different steps of the building development;
- the usage potential;
- the risk level which the principal is ready to accept while realizing his other targets.

According to the weighting the principal gives to the respective targets depending on his project, the project management will set up criteria for the choice of the service providers: expertise, willingness to perform, reliability, degree of popularity, image, price, quality, adherence to delivery dates, company is known positively by past orders.

Comparable reference objects are of special importance; hereby the quality of the performance is checked by the by means of inquiries at the principals' organization or the project management.

The performance of the planners is determined by experience and trust. The quality of their work shows itself only after signing the contract, e.g. by the work equipment used. It is a matter of trust as even after the building is finished the customer cannot really assess to which degree this actually can be attributed to the performance of the individual planner.

Prior to the signing of the contract the principal therefore has a problem of choice. He does not have any information about the skills, knowledge, and capabilities of the planners. A wrong choice, e.g. of the architect, may have severe consequences. In cases of concealed quality the Adverse Selection Problem will lead to the principal having to reckon increasingly with architects that are not suited for him and his tasks (Steiner 2004).

In a construction project there are networks of Principal Agent Relations that are interwoven. The individual project member is an agent in relation to his client and the principal. But he may also have the role of a principal in relation e.g. to the executing subcontractor.

3.2. Effects of asymmetric information on the project

3.2.1. Adverse Selection

Prior to closing the contract the project manager as a representative of the principal is confronted with the problem of Adverse Selection. He cannot be sure whether the chosen planner meets the qualities stated above to a sufficient degree. An approach to the solution of this problem is overcoming the information asymmetry by Signalling. The market party which is better informed, e.g. the contractor, signals its type to the client who is the worse informed market party, by means of certain signals. In case of Signalling the initiative goes out from the better informed market participants who send out their signals first and who only then get contracts offered by the worse informed market party. Thus, the planner can present his qualities and proof them by means of certificates or references. The advantages of Signalling must be higher for desired agents than costs of Signalling. At the same time the advantages of Signalling must be lower for undesired agents than their costs of Signalling.

If the client undertakes efforts to get to know more about the qualities of the contractor by his own initiative, this is called Screening.

In public construction projects therefore VOF-processes are carried out for the choice of construction services. Private principals, too, carry out pre-qualifications. Another possibility to reduce information imbalances are competitions.

Above certain defined thresholds the public commissioning of planning services is often carried out by means of VOF-processes in which the qualification of the applying company and its employees is explicitly checked in advance. This pre-qualification of the company helps the bidding authority to judge the suitability for the project envisaged.

Still further goes the architecture competition. It sends out signals on two levels, as a qualification control and as a behaviour indicator. At first, the principal gets beside the solutions for the task of the competition as the proper target also an insight into the professional abilities and skills of the participating offices, but it also gives information about the creativity and the capability of the architects. As only such offices will participate in the competition which will have the confidence that they will win, there is a selection right from the start. The participation in the competition is associated with the risk of high expenditures for the office; risk adverse offices therefore will avoid participation.

3.2.2. Moral Hazard

One major instrument for reducing the risks of Moral Hazard is the harmonization of interests, e.g. by profit sharing of the contractor. For the participants in the planning contractual incentives must be given so that the targets of the principal may be realized. Among these incentives are the exact prognosis of the costs as well as the meeting of these costs by an according planning performance. A contract which leads to cost optimization without reductions of the quality is highly incentive. If the payment is linked to the overall success, it is no longer attractive for the individual project participants to pursue only their own interests.

In connection with Moral Hazard the frequency of the cooperation of the project participants is of major importance. If the contractual partners repeatedly cooperate with one another this can lead to a reduction of information asymmetries. The mutual trust resulting from long-term cooperation will cause a reduction of risk costs.

Besides the harmonization of interests a reduction of the effects of information asymmetry can also be achieved by Monitoring. Formal planning and control systems create more transparency with regard to the actions of the project participants. Here, the competence of the project management installed plays an important role.

3.2.3. Hold-up

In principle, Hold-up Problems could be solved if it were possible to conclude contracts that are clearly verifiable. But in reality often gaps in the contract remain which allow the contracting parties to behave in an opportunistic way.

Several different forms of cooperation can be differentiated. In this context Spremann speaks of hard and soft designs. Depending on whether the cooperation is linked to clearly formulated, precise regulations, e.g. contractual penalties, profit shares, legal consequences, etc. or whether these conditions are rather formal and subjective such as praise, recognition, reputation, etc.

Hold-up Problems can also be reduced when a one-sided dependence relation turns into a mutual one. Business relations which are meant to be long-term ones cause the harmonization of interests because the agent thus is more interested to act according to the intentions of the client.

3.3. Clarifying the need for information in the project

The need for information that a project participant needs to fulfil his tasks within a certain period of time is defined according to type, quality, and quantity. Here, subjective and objective need for information can be differentiated. The former describes the amount of information that the project participant needs from his subjective point of view on the project while the latter describes the amount of information that is necessary for fulfilling the task. To align these amounts of information and to guarantee the optimal supply of all actually necessary information for the project participants, it is important to define the factors for success of the project in a workshop. Thus, those factors and parameters are identified which are of special importance for the respective participant. Especially in complex and technically challenging projects this will provide each individual project participant with more understanding of those processes that are the most important ones for the success of the project (Picot 1997).

4. Conclusions

A major factor of success in the project management is to identify during the course of the project, prior to and after signing the contract, those phases in which asymmetric information may disturb the success of the project. While designing the project organization, the interaction of the project participants must be analyzed with respect to leeways that may be exploited in

an opportunistic way. Within the scope of the project management a special focus should be on the design of information duties of the involved partners. When the project management has developed awareness about possible information imbalances, this can be addressed better when designing the flow of information. By means of a suitable reporting system the transparency within the project increases. The use of project communication systems may support the project management in the process of managing the information. Advantages of a project communication system are:

- Responsibilities within the project are transparent for all project participants.
- The employee who is responsible in the respective case will be informed automatically by e-mail over the contributions and tasks assigned to him.
- All project contributions are accessible 24 hours a day and thus allow an overview over the current state of the project at any time.
- Information can be recorded, processed and viewed regardless of time.

The more the communication within the project is structured, the easier it is to prevent information asymmetries.

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