

Life cycle cost based procurement decisions A case study of Norwegian Defence Procurement projects

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Abstract

A Norwegian Ministry of Defence publication states that when procurement decisions are made, systems that yield the lowest possible life cycle cost (LCC) for the Norwegian Defence must be procured, even if this means that initial procurement cost becomes higher. However, several projects within the community are still carried out and reviewed based on initial procurement cost alone. This study investigates four hypotheses, based on agency theory and earlier LCC work, in order to help explain why this is happening. A questionnaire was administered to all projects currently running in the defence community. Findings regarding project uncertainty, information symmetry, the project leader's attitude and knowledge about LCC, as well as control variables are discussed both towards theory and in terms of managerial implications.

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1. Introduction and research question

In 1998 General Steinar Jøssund, Head of the Norwegian Army Material Command said:

*The Norwegian Defence's ongoing and future organizational change, demands that the present focus on costs associated with material system procurement is changed from only considering the initial procurement cost to looking at the material systems' total life cycle cost.*¹

Earlier research has presented cases where maintenance and logistics support costs for a system can be cut with up to 50% by using integrated logistic support (ILS)² and life cycle cost (LCC) analysis [1]. The life cycle of a system usu-

ally starts with the initial determination of its need, continues through design and development, production, deployment, operations and concludes with the system's disposal. Life cycle cost may be categorized in many different ways, depending on the type of system and the sensitivities desired in cost-effectiveness measurement [2]. However, the fundamental objective of LCC analysis is to identify the cost drivers that most significantly contribute to LCC, since this allows for trade off considerations with respect to different courses of action [3]. Or as stated by Ferrin and Plank [4]; the concept suggests that managers adopt a long-term perspective, for the accurate valuation of buying situations.

Since approximately 1993³ the Norwegian Defence has used ILS in some projects in order to minimize the total cost of material procurements accounted over the materials'

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¹ From the intranet of the Army Material Command.

² Integrated logistics support (ILS) is a disciplined management approach, affecting both customer and industry, aimed at optimising equipment life cycle costs (LCC). It includes elements for influencing equipment design and determining support requirements to achieve supportable and supported equipment (From the intranet of the Norwegian Army Material Command, 2002).

³ Individuals within the Norwegian Defense has probably been working with Integrated Logistic Support long before 1993, however according to an internal Navy Material Command report from 1995 the first ILS organization was established around 1993 in the Air Force Material Command [18].

total life cycle. In the summer of 2004 the importance of ILS and LCC was highlighted by the Norwegian Ministry of Defense (NoMoD) in their publication. “Konsept for fremskaffelse av materielle kapasiteter i forsvarssektoren” (Norwegian title). In this publication the NoMoD clearly states that when investment decisions are made, solutions/systems that yield the lowest possible life cycle cost, given equal system effectiveness, must be preferred, even if this means that the initial investment cost becomes higher.

However, approximately at the same time Commodore Morten Jacobsen, Chief of Procurement in the Norwegian Defence Logistic Organization (NoDLO), said in a speech that they are still experiencing that procurement in some projects are carried out and reviewed based on initial procurement costs alone. Reports from the United Kingdom are also concluding that the British experience is much the same [5].

Based on the information presented above the main question of this research is “What can explain that some procurement projects are still carried out and reviewed based on initial procurement costs alone when the official policy is to apply the life cycle cost approach?”

2. Theory framework

The concept of LCC, sometimes called Total Cost of Ownership (TCO) has been discussed, and examined empirically but with limited scope [4]. Literature review has not revealed many studies that could help answer the main research question raised in this study. One study was found where the authors looked into the adoption of total cost of ownership for sourcing decisions [6]. The main difference between that study and this study is that in our case it is already decided by the mandate group that LCC should be used. The fact that the mandate group has decided that LCC should be used brings forward what is known as the mandate problem [7]. Organizations, such as the procurement projects of this study, are established by owners. It is the owners (the mandate group) who decide which goals and tasks the organization is going to have [7]. In order to reach any preset goal, the mandate group must implement a governance system that makes sure that the leaders and employees of the organization implement actions to reach the goal. According to Greve [7], one of the main theories that regulates the relationship between the mandate group and the organization leaders, is agency theory.

The main theoretical perspective of this study is therefore agency theory, used in an exploratory fashion. In addition to agency theory, one of the propositions put forward in a paper by Wååk [1] where he discusses why LCC is not more used, namely lack of knowledge, is also examined.

According to Eisenhardt [8], agency theory is directed at the ubiquitous agency relationship, in which one party delegates work to another, which performs that work. Agency theory will describe the relation between the parties (the principal and the agent) with the metaphor of a contract [8]. Most empirical work towards agency relations are

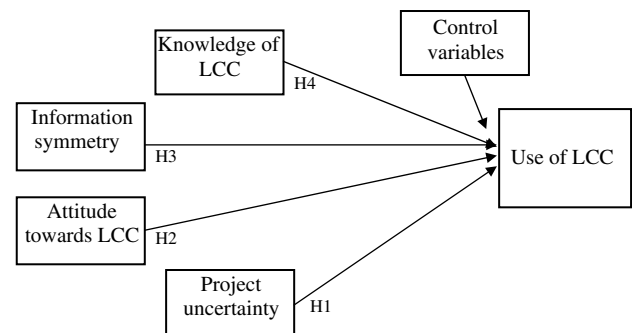


Fig. 1. Research model.

focused on the relationship found between firms, but agency theory can also be used to evaluate relations within the firm/organization, which is the case in this study [9].

According to agency theory two main problems can occur in agency relationships; the first problem is that of conflicting goals between the principal and the agent, and the second problem is that of risk preferences.

The first problem will arise when the goals of the principal and the agent conflict, and it is difficult or expensive for the principal to verify what the agent is actually doing [8]. The second problem, concerning risk preference arises when the principal and the agent have different risk preferences and hence will prefer different actions due to this. The assumption is that the principal will be risk neutral while the agent will be risk adverse.

As mentioned before, agency theory describes the relation between the principal and the agent using the metaphor of a contract; hence the unit of analysis will be the contract governing the relationship between the two parties.

3. Research model and hypothesis

The research model (Fig. 1) is based on the belief that agency theory constructs along with the knowledge construct⁴ to a certain degree can explain why some procurement projects within the Norwegian Defence focus on life cycle costs while others do not.

In the research model the dependent construct is therefore the project leaders' use of life cycle costing in procurement decisions. The independent constructs are project uncertainty, information symmetry, attitude towards LCC and knowledge about LCC. In addition to the independent constructs, some control variables were examined and in the final regression model independent dummy variables of the control variable found to be significant are included.

3.1. Project uncertainty

Uncertainty in the context of agency theory is connected to the basic risk assumptions of the theory. In agency theory the principal is assumed to be risk neutral, whereas the

⁴ From Wååk [1].

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