Outsourcing and Sustained Competitive Advantage

How do Swedish technical production firms in a competitive environment and high technical uncertainty find the right balance between outsourcing and in-house development that enhances their sustainable competitive advantage when they outsource their Research & Development externally?

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2010

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Abstract

The purpose of this thesis is to find out when Research and Development (R&D) becomes a suitable attribute for a production company to outsource. In an environment where innovations are following up quickly up and uncertainty about the type of innovation and customer is a fact, external sourcing can bring a competitive advantage. The empirical evidence shows that when R&D is outsourced the total cost does not increase at a due cause of outsourcing in this given study.

Although a lot of theory explains outsourcing as a cost increasing factor, the internal experience and frequent relation between the technical production company Beta and its R&D vendor company Alfa can decrease costs considerably due to lower communication and governance costs. This was not explicitly expressed in related theory and is therefore a contribution to the academia as well as for managers who seek to find an answer to the question of when to outsource and when not to outsource.

Key Words: Sourcing, Sustainable Competitive Advantage, Transaction Cost Theory (TCT), Resource Based Theory (RBT), Resource Dependency Theory (RDT), Product Leadership (PL), Value Discipline, Research and Development (R&D)
Acknowledgements

This thesis would not have been possible without the support and advice of several individuals and therefore we would like to take this opportunity to express our gratitude towards them.

We would like to thank our supervisor Jonas Rundquist at Halmstad University, for his patience and guidance throughout the process of this master thesis.

Furthermore, we would like to thank the people from Alfa and Beta, for taking time from work to let us interview them. Without them this thesis would not have been possible.

We would also like to thank the people in our seminar group for the support and input to our thesis.

As a final point we would like to thank our families and friends for bearing with us during our years of studies.

Thank you!

Halmstad May, 2010

Sofie Dunert                                      Patrik Westerling
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1. Introduction

1.1 Background
Outsourcing has been a growing trend during the last decade and even further back in time. Companies have outsourced everything from production to research and development. The tendency in multinational companies to outsource R&D has been increasing since the eighties (Lichtenthaler & Lichtenthaler, 2004). The illustration below might give the main interpretation of outsourcing for some:

Still, outsourcing might contribute to the company instead of, as in this picture; take away jobs or opportunities for others. As an article in Svenska Dagbladet states, companies are often disappointed in their outsourcing (“Företag ofta besvikna på outsourcing”) (Edenhall, 2005). The author of the article argues that the reason for this is the bad relationships between their own companies and the company that is being outsources too (Edenhall, 2005). This is, however, not always the case. Outsourcing can actually contribute to the companies’ relation (Quinn & Hilmer, 1994).

1.2 Problem Discussion
According to Chiesa et al (2000) a company can choose between many different types of external sourcing to lower costs or extend resources for
R&D. They discuss a span from xx to yy and describe the differences. In this thesis we will focus on the outsourcing method of external sourcing because as Hoetker (2005) argues, the different theories upon outsourcing do not always reflect the true cost perspective on the procurement of innovations.

“Outsourcing is the procurement of something that was either originally sourced internally (i.e. vertical integration) or could have been sourced internally notwithstanding the decision to go outside” is the description that Gilley and Rasheed (Gilley and Rasheed in Harland et al, 2005, p. 832) gave in 1993 to the process of strategic outsourcing. In 2006, however, Holcomb and Hitt (Holcomb & Hitt, 2006) gave the following definition of strategic outsourcing:

➢ “We define strategic outsourcing as the organizing arrangement that emerges when firms rely on intermediate markets to provide specialized capabilities that supplement existing capabilities deployed along a firm’s value chain. Further, we suggest that strategic outsourcing creates value within firms’ supply chains beyond those achieved through cost economies.”

The term for strategic outsourcing given by Holcomb and Hitt goes beyond the outsourcing term that Gilley and Rasheed described, in the sense that it argues that strategic outsourcing needs to add value and that the value should not only be through cost economies. This argument is linked to the Resource Dependency Theory (RDT), which claims that outsourcing outside the firms is needed if it is to survive in its environment (Pfeffer & Salancik, 1978, pp. 65-69).

The basis of strategic outsourcing given by Holcomb and Hitt is also in line with what Quinn and Hilmer stated already in 1994 about individual skills and management systems:

➢ “Executives need to look beyond the company’s products to the intellectual skills or management systems that actually create a maintainable competitive edge”. (Quinn & Hilmer, 1994, p. 5).

Quinn and Hilmer argued that skills cut across traditional functions and that the firm’s own resources should be focused on the core competences. These core competences should be in-house, while other activities should be outsourced, due to that strategic need and special capabilities are missing in those areas. This will lead to a loss of critical skill, loss of cross-functional skills and loss over a supplier (Quinn & Hilmer, 1994). This is in line with a more recent study, which suggests that the Resource Based Theory (RBT) has become an important factor that together with Transaction Cost Theory (TCT) for research in strategic outsourcing (Madhok, 2002, p. 535). This is
acknowledged also by Rundquist (2008, p. 427), who sees prior research in
the field of outsourcing being largely economical and transactional based,
while recent research focuses more on the intangible resource, and Swink
(1999), who finds that in new product development “The focus has been on
design guidelines, tools and techniques, not on elements of human interactions
in the product development process” (Swink, 1999, p. 692).

The TCT and the RBT together form a more effective understanding of what
is driving a firm to outsource (Madhok, 2002). “Combs and Ketchen even
found evidence that firms often place resource based concerns ahead of
exchange economies when deciding on potential inter-firm cooperation.”
(Holcomb & Hitt, 2006, p. 465) This combination is also acknowledged by
Madhok (Madhok, 2002, pp. 535, 540, 541), who describes the resource and
transactional factors as the answers to the questions: “Why do firms exist
and why do firms differ?” Madhok questions that the TCT is enough to cover
the governance arrangements for resource attributes and governance skills,
and that therefore transaction particulars, resource particulars and
governance structure particulars should form a triangular alignment when
overlooking the inter-firm collaborative relations. This would give a better
understanding of the finances when collaborating as firms (ibid).

The risk of knowledge drain in organizations is evident when overseeing the
research that Harland, Knight, Lamming and Walker conducted. Harland et
al. (2005, pp. 838-839) saw the benefits of outsourcing on a organizational
level as to: “be able to focus on core activities, reduce cost, providing short-
term financial benefits, balance sheets improvement and the increased
flexibility to configure resources to meet changing market needs.” The risks
assessed by Harland et al. were that “mistakes in indentifying core and non-
core activities can lead organizations to outsource their competitive advantage”
and if the organization would fail to manage outsourcing relationships, the
customer service, level of control and contact with customers would be
affected negatively. Madhok (2002) describes the TCT as focusing on costs
while the RBT emphasizes on skills, knowledge and routines. As both the
ability to indentify core/none-core activities and the management of
outsourcing relations are skills, these attributes are important for a firm
when deciding on outsourcing or not. This is contributing to a better
understanding of how to perceive a competitive advantage and prevent a
knowledge drain. In their research of FIAT, Becker and Zirpoli (2003) see
individual skills as the building blocks of the competence and capabilities of
an organization. Quoting Becker and Zirpoli;

“Outsourcing decisions have effects not only on cost, but also on the
knowledge base. They decide on the location of knowledge and
competencies along the supply chain (in-house or outsourced) and on the allocation on learning opportunities” (Becker & Zirpoli, 2003, p. 1034).

The Becker and Zirpoli (2003) describe the `hollowing out´ and dispersion of specialist knowledge and competencies of the companies and the risks when choosing outsourcing as a strategy to make short-term cost advantages. From this point of view and onward, the research question is formulated as can be seen hereunder.

1.3 Purpose
The purpose for this thesis is to find when Research and Development (R&D) becomes a suitable attribute for a production company to source. In an environment where innovations continuously add up and uncertainty about the type of innovation and customer is a fact, current theories and practices often do not consider the right cost factors to the company and do not know how or when to outsource or keep R&D in-house. How a production company achieves sustainable competitive advantage with the help of R&D outsourcing is another purpose that is answered by reading this thesis.

1.4 Research question

| How do Swedish technical production firms in a competitive environment and high technical uncertainty find the right balance between outsourcing and in-house development that enhances their sustainable competitive advantage when they outsource their Research & Development externally? |

1.5 Outline of the thesis
The thesis will be presented according to the following outline:

The first chapter is an introduction of the thesis that guides the reader into the topic of the research question and this is also where the research question is presented along with the purpose of the thesis. The second chapter presents what methods have been used to make the thesis and an explanation of how the interviews were undertaken, as well as how the interviews went. The third chapter explains the different theories that have been used when analyzing the empirical data. Empirical data is found in chapter four, along with a description of the two companies that were interviewed in the thesis. Chapter five compares the empirical data to the theoretical frame of reference. The sixth and final chapter gives answers to the research question. The chapter also explains the model that was constructed by the authors of this thesis, and explains which contributions are made to existing literature and gives managerial implications for the companies that we interviewed and for other companies in comparable situations who are considering outsourcing.
2. Method

In this chapter we will present the methods that have been used, explanations of how the interviews were done as well as how the interviews went.

2.1 Research Approach

This thesis was done as a qualitative study since two companies were chosen to be included in this study, instead of several different types of companies in different sectors. A qualitative study has been done to get an in depth understanding of the topic that was researched, as in this case. Quantitative research, which can be done by gathering information from many different companies, gives an overall picture of the topic. Two companies were contacted to interview, it was decided that these companies would be anonymous in this context. Because of the anonymity the two companies were given other names that are used in this thesis, the companies are referred to as Alfa and Beta. Interviews were done to get an in depth understanding of outsourcing with a person from Alfa as well as a person from Beta. Interviews were done individually at company Alfa.

Both the interviews were conducted in an unstructured way in the beginning and semi-structured at the end. This gave the interview an open and changeable character. The results confirmed some parts, but did also show the need for other theories and different combinations of theories to explain and analyze the empirical data gathered from these interviews. After the interviews, all literature was read again, and some articles were disregarded due to the fact that they did not add anything to the research question and the results. This is also in line with the abductive research, which after the theoretical framework matches the deviating real-life observations (Kovács & Spens, 2005).

The thesis was conducted with an abductive research approach. An abductive approach was chosen because it seeks to find new knowledge (Kovács & Spens, 2005) and that this was the aim of the thesis as well.

Abductive research starts with a real-life observation, just as inductive research does. The main difference is that abductive reasoning has on forehand started with pre-perceptions and theoretical knowledge (ibid). The prior theoretical knowledge was also gathered in this case by searching and analyzing articles about TCT, RBT and RDT. The prior theory was differently interrelated and new theory was added during and after the interview. For instance, the PL theory was added after the manager of company Beta explained that they had to focus on only a few technologies due to the cost
perspective (Treacy & Wiersema, 1992). During the interview, both the managers of company Alfa and Beta talked a lot about core competence, where after the decision was made to use the references that used core competences as a basis of the RBV (Quinn & Hilmer, 1994). These two examples support the abductive research process 1 and 2 showed in the figure below. As Kovács & Spens (2005) explain: “Abductive reasoning starts at the point at which an observation in the empirical research does not match prior theories” (Kovács & Spens, 2005, p. 139). They therefore see the abductive research process as a creative iterative process of theory that is used to get an understanding on beforehand, and that existing theory should be complemented with new theory or a new framework to the already existing phenomena after the empirical findings are undertaken (Kirkeby, p1090) in (Kovács & Spens, 2005). That was also the case in this study, where the empirical data contributed to the fact that some areas in the case were not mentioned in the first theoretical framework. Theory had to be added to understand and explain the findings, and find the given results. As is seen in the figure below, the description given for the process matches the 0, 1 and 2 in the figure (Kovács & Spens, 2005). In the figure below, the letters H/P in number 3 stands for hypothesis/propositions. What the authors of the figure are trying to say is that propositions or hypothesis about new theory are made to be examined at the end of the theory chapter. This is also done in this thesis, where the Hoetker (2005) model connects the rest of the theories and some theories are chosen to be connected to the empirical findings in the analysis part to explain the connection between the theories and the empirical findings. The fourth step in the figure below is not different from the deductive study, and will therefore not be explained (Kovács & Spens, 2005).

![Figure 1: The abductive research process](Kovács & Spens, 2005, p. 139)
2.2 Empirical data Collection

2.2.1 Interview selection
To gather information on the topic interviews were done. There are different ways to do an interview, either by phone, face-to-face, or in a video conference setup. Face-to-face interviews were chosen to get more personal feelings from the interviewees. A face-to-face interview gives the interview more depth and is often easier for the interviewee in case of any uncertainty about questions or such. Physical reactions can be observed as well as body language and the tone of voice gives more depth to the interview. A more in depth understanding can be gathered in face-to-face interviews. (Bryman & Bell, 2007)

The process of choosing companies and persons to interview was done through personal contacts with Alfa, and through Alfa a contact with Beta was established. The interviewee from Alfa was chosen from Alfa’s CEO, and a contact person from Beta was requested and given by the interviewee from Alfa. The interviews were done at Alfa’s office to get a feel of the company, what the atmosphere was like, as well as the location of the office. Even the interview with Beta took place at Alfa’s office. The person from Beta was at Alfa to do business and it was a coincident that we were able to have the interview at Alfa’s office, instead of having to travel to Beta’s office as well.

Two people were chosen for the interviews, each person from a different company. We felt that we wanted to have perspectives from both sides. The two persons who were interviewed have a business relation that has been ongoing for years. The interviews were done sitting down at a conference table in a medium sized office.

One person asked the interview questions, so the person being interviewed would not get confused or distracted in any way. All together there were four interviews, two interviews per person. The first interview was a more broader interview with more general open questions and the second interview was more specific, asking for certain details and facts. Interviews were recorded to be able to go back and listen to them again, so we would not miss anything that was brought up. One person wrote down what was said during the interview in case of malfunction of the recording device, so the information would not be lost.
2.2.2 Interview process

The interview started off with handshakes and a short presentation about us, the interviewers and our background and a short presentation about the interview and what the purpose of the interview was. Both interviews were done in Swedish. We also explained that the interviewee could remain anonymous as well as the company name. That is why there are no company names in the thesis and Alfa and Beta were used instead; this is to keep the persons and companies anonymous. Before the interview started, we asked if it was okay for us to record the interview with a recording device. When the interview started, we asked the interviewee to state his name and position in the company so we could later remember which interviewee it was and from which company he was from.

During the first interview, there was only one disturbance and that was a short telephone call to the interviewee from Alfa. After the short interruption, the interview continued smoothly. The person from Alfa had an easy time answering the questions, and spoke freely and explained vividly about the different topics. He only had a hard time with one of the questions which we tried to explain in other ways to make it easier to comprehend what we were asking for. The interviewee was very open when answering the questions that were asked. When the interview with the person from Alfa was finished, the person from Beta entered the office as the person from Alfa exited the room. We had the same introduction to the interview, we explained who we were and told the person that we would keep their identity anonymous as well as the companies’ name. We also asked the person if it was okay that we recorded the interview. This interview did not get interrupted although there was a time limit to this interview since the person had another meeting to attend afterwards. Even though there was a time limit, the time restraint did not hinder the interview and all the questions were answered. Even this person was very easy to interview and talked freely, fluently and generously when answering.
3. Theoretical Frame of References

In this chapter one can find the explanation of the different theories that have been used when analyzing the empirical data.

3.1 Value Discipline

The value discipline, as explained by the authors Micheal Tracy and Fred Wiersema (1992), is a way for companies to achieve market leadership. To sustain market leadership, one must think about the competitors’ strengths as well as on the capabilities and culture of the company. This also connects to Hoetker’s (2005) theory, which suggests that the characteristics internal vs. external, amount of prior transactions, and capabilities make up the choice of which type of supplier to choose when outsourcing (Hoetker, 2005).

Being champion in one of the disciplines and meeting industry standards on the other two disciplines enables firms to be market leaders in their sector, according to the Value Discipline Theory (Treacy & Wiersema, 1992). The theory of choosing discipline and choosing market is the same, since the focus means that a particular type of customers are chosen to focus upon (Treacy & Wiersema, 1992). Narrowing down a business focus has become important for firms during the last decades; since a firm cannot excel in everything it does, markets are becoming even more unpredictable as well (Treacy & Wiersema, 1992). This is acknowledged by Grant, Quinn and Hilmer, who suggests that serving a wide defined customer base is a difficult thing to do (Grant, 1991; Quinn & Hilmer, 1994). Prahalad and Hamel (1990), the founders of the core competence principle, also confirm with the value discipline, since they argue that only few companies are able to develop world leadership in more than five or six fundamental competences. By narrowing down the business focus, a firm can deliver superior customer value and become and/or maintain market leadership (Treacy & Wiersema, 1992).

- For a firm to be successful when it sources, one has to narrow down the business focus in order to get and sustain market leadership.

The firms narrow down their business by:

- “Redefining value for customers in their specific business”
- “Building powerful, cohesive business systems that could deliver more of that value than competitors”
- “Raising customers’ expectations beyond the competition’s reach” (Treacy & Wiersema, 1992, s. 84).
Three strategies according to the value discipline theory are:

- Operational Excellence
- Customer Intimacy
- Product Leadership

A short description on the three principles:

**Operational Excellence (OE)**
Operational Excellence is providing reliable products or services at competitive prices without making things difficult or inconvenient (Treacy & Wiersema, 1992). The goal is to minimize cost, make things simple, and competing with price and convenience. The strategy inherits a constant search for cost reduction, either by overhead cost cuts, by optimize business processes, etcetera. The organization ought to be lean and efficient (ibid)

**Customer Intimacy (CI)**
The Customer Intimacy strategy is to acquire customer loyalty by focusing their processes toward the segment that it sees as its customer base. Customer Intimacy is achieved by tailoring their processes to segment and target a specific market precisely by being flexible and by having detailed customer knowledge so that they can tailor their product or service to the specific customers’ base needs (Treacy & Wiersema, 1992).

**Product Leadership (PL)**
The Product Leadership strategy is to:

“Offer customers leading-edge products and services that consistently enhance the customer’s use or application of the product, thereby making rivals’ goods obsolete.” (Treacy & Wiersema, 1992, p. 85)

There are three basic rules to outmaneuver competition and to produce a continuous stream of state-of-the-art products and services according to the Product Leadership Theory. These rules will be described as follows:

- “Creativity: Being creative means recognizing and embracing ideas that usually originate outside the company”
- “Commercializing: Being able to commercialize their ideas to the market quickly”
- “Problem solving: Being able to relentlessly pursue new solutions to the problems that their own latest product or service has just solved” (Treacy & Wiersema, 1992, p. 89).

Product leaders often avoid bureaucracy, since it slows down the commercialization of their ideas. The reaction rate to situations, as they
occur, is the leading strength of a market leader, together with their management and infrastructure that can handle risks well (ibid).

**Choosing the right type of theory**

The connection from the value discipline to the rest of the theory presented is obvious, since Product Leadership, Operational Excellence and Customer Intimacy all suggest that a company should narrow down their capacity to what they are good at (Treacy & Wiersema, 1992). Giving that all companies can be placed in one or two value disciplines, they can focus their resources towards a limited amount of customers and capabilities. This supports the resource based view, which states that resources should be used in no more than a few distinctive areas where the company has the capability and resources for. Resource based theory is more a company based view, while the value discipline theory is studied from a market perspective (Barney, 1991; Quinn & Hilmer, 1994; Prahalad & Hamel, 1990; Treacy & Wiersema, 1992).

### 3.2 Transaction Costs

#### 3.2.1 Transaction Cost Theory (TCT)

The TCT is a theory that seeks to find organizational success in minimizing costs. This is achieved by “managing transaction cost more efficiently to lower transaction cost” (Rundquist, 2008, p. 428). The transaction costs are divided into two costs, which are production cost and the transaction cost. The TCT seeks to find an economic balance between the internal economies against the cost of transaction (ibid). Including in the total cost are the costs of producing the component, governing the relationship to avoid potential opportunism, adjusted for quality and the likelihood of successful development, and communicating during the development process (Hoetker, 2005).

According to Williamson, transaction cost increases as a result of the following three factors:

- **Asset specificity**: refers to the uniqueness of the knowledge and the possibility for alternative uses of assets created in the transaction
- **Uncertainty**: the result of, for example, economic trends or unpredictable market/technology
- **Infrequency**: refers to the infrequency of the two parties’ business relation. (Williamson (1985) in Rundquist (2008, p428)
3.2.2 Asset specificity and uncertainty

Asset specificity refers to the uniqueness and alternative use of knowledge. This means that as uncertainty about the knowledge decline, communication and governance costs also decreases and the cost of having technical capabilities make up the largest part of the transaction costs (Hoetker, 2005). This is in line with the findings of Rundquist (2008), which see the more complex routines for monitoring as a factor that increases costs when products become more complex. Outsourcing is therefore a better decision when products are less complex (Rundquist, 2008). More unique knowledge creates higher transaction cost, and specialized knowledge is therefore harder to employ, thus benefitting in-house development (Rundquist, 2008). Outsourcing is preferred when external as well as internal uncertainty is low (ibid). The second conclusion is therefore:

- When the market or technological complexity and thus uncertainty grow, communication and governance costs also increase. When the complexity and uncertainty decreases, the capabilities of a firm are the largest expenditures. The more complex the product or market uncertainty is, the more beneficial to develop in-house.

Making contracts is necessary to guard opportunistic handling of unique knowledge. In R&D outsourcing, scale economies are weak, but property rights of information is nonetheless very important, since this information can be vital for market share (Gooroochurn & Hanley, 2007).

The costs for making contracts and searching for a suitable partner to outsource to can create considerable transaction cost, and favors in-house development. One exception is when strategic outsourcing is conducted over a long period to enhance collaboration and learning.

- When asset specificity increases, so does the cost for contract agreements, except if it is for strategic outsourcing, where it can be beneficial due to collaboration with an external partner.

3.2.3 Infrequency

Repeated interaction between two parties enhances mutual knowledge, inter-firm routines, trust and value between them, and in these firms it serves as a break on opportunism (Hoetker, 2005; Ring and van de Ven, 1994) in (Hoetker, 2005). This is in line with Rundquist (2008), who claims that infrequent business relations increase the transaction cost.

- Transaction costs increase when the relationship is infrequent between an outsourcing firm and a firm that is being outsourced to.
Rundquist further claims that even if the contact is infrequent, the costs can be decreased if one of the firms is commoditized with the technology and market or if the firm has a high frequency or business relationship with other partners (Rundquist, 2008).

- In a situation when there is infrequency in the relationship, the cost still can be lowered if one of the partners is commoditized with the technology and market or if it has a high frequency with other partners.

Hoetker (2005) goes even further by claiming that in an environment with high technological uncertainty, the governance and communication cost that come from infrequency in the relationship contributes more to the total costs than superior technical capability. Hoetker (2005) claims that a supplier with less technical capabilities but a more frequent relationship has a lower total cost when outsourcing, compared to a firm with superior technological capabilities and an infrequent relationship when the technological uncertainty is high. When the uncertainty is low, on the other hand, the opposite is true (ibid).

- When the technological uncertainty is high, transaction costs are more significant for the total cost perspective than the technical capabilities of firms are when outsourcing.

There is one important notion; that the author (Hoetker) goes out from a situation that the level of technological uncertainty is the same for the firm that is outsourcing as for the firm that is outsourced to.

### 3.3 External Resources

**Resource Dependence Theory (RDT)**

RDT concentrates on the conflict and interrelatedness of the external environment and argues that an organization always is dependent on the environment which it is a part of. The ability to find the right resources is then vital for an organization to survive in the environment it is in (Pfeffer & Salancik, 1978).

- A company cannot be successful if it does not gather resources from outside the firm to survive in its environment.

According to Pfeffer and Salancik (1978), there are two relationships among actors that cause conflict, which are interdependence and conflict. Interdependence is causing problems for organizations. This can be explained by the following quote:
“Interconnectedness can result in problems between organizations. This occurs when the processes of two organizations are tightly interconnected. Any disturbance in the environment will affect the elements in both the organizations. If, on the other hand, the organizations are loosely coupled, the disturbances would not affect so much” (Pfeffer & Salancik, 1978)

A conflict is also affecting the results, because a conflict causes the result of a given action to be more uncertain. There are three characteristics of environments that affect the conflict and interdependence. These can be explained as:

Concentration concerns the power division of the environment and how highly influential partners in the environment would make it harder to cooperate with them (Rundquist, 2008).

2. Munificence: “the availability and the scarcity of critical resources” (Pfeffer & Salancik, 1978, p. 68)

“Munificence is referring to the number of available potential suppliers, the cost of switching suppliers, and the importance of the resource” (Rundquist, 2008, p. 432). The munificence can be considered to be the same as the TCT, since switching suppliers can be considered as a transaction cost.

3. Interconnectedness: “the number and patterns of linkages, or connections, among organizations” (Pfeffer & Salancik, 1978, p. 68)

The theory explains that if there are two organizations that are intertwined, they will be more vulnerable to influences from their environment (Pfeffer & Salancik, 1978).

➢ When searching for an outsourcing partner, one should consider the influence that the partner has on the environment, how much effort and cost it will take to switch partner and to what extent the organizations are intertwined.

In figure 2 it is seen how the different characteristics in the end explain uncertainty about the outcome of interactions from the environment on the firms’ ability to achieve results (Pfeffer & Salancik, 1978).
3.4 Internal resources

Resource Based Theory (RBT)

RBT can be explained by implementing strategies that exploit internal resources to gain sustained competitive advantage (Barney, 1991). The theory sees outsourcing as a way to fill the gap between current and desired resources (Rundquist, 2008).

The theory is based on four premises. The first is that internal resources and capabilities provide the basis direction for the firm’s strategy. The second is to build capabilities that customers will value over time, not just now. The third is that these capabilities or core competences should be limited in numbers. The fourth is that the firm should focus on those areas that they can do activities more effective or more efficiently than the competition (ibid). Resources and capabilities are the main sources of profit for the firm (Grant, 1991). The internal resources include all assets, organizational processes, firm attributes, information, knowledge, etc.

The RBT makes a distinction between the firm’s resources and its capabilities. The resources are the inputs into the production process, such as skills of employees, patents, brand names, finance, etc. The capabilities on the other hand are “the capacity for a team or resources to perform some task or activity”. While resources are the source of a firm’s capability, capabilities are the main source of competitive advantage” (Grant, 1991, p. 119).

The RBT sees two ways for a firm to make profit. The first is the attractiveness of the industry it is in, and the other being the capability to establish competitive advantage over its rivals (Grant, 1991). The theory
does not see an external focused orientation as an unsecure foundation for formulating long-term strategy. The internal resources and capabilities are a better foundation for long-term strategies (Grant, 1991).

- According to the RBT, an internal focus towards the capabilities of a firm is a more reliable way to achieve market leadership than the external focus towards the market.

The RBT uses the resources to improve the effectiveness or efficiency of a firm by using them in the strategy that is used in the given firm to achieve competitive advantage (Barney, 1991).

The theory also suggests that a firm should focus to some customer values, but not all, since it cannot build up capabilities in all customer areas. Instead, firms should focus on what capabilities it has and explore them (Grant, 1991). Quinn and Hilmer (1994) even suggest that a company should concentrate on its core competences, where they can deliver unique customer value and strategically outsource all other activities where the firm does not have the special capabilities for or the critical strategic need.

- Firms are more successful if they focus on their core competences and strategically outsource all activities where they do not see the strategically need for or do not have the capability for to build up.

Sustained competitive advantage is further explained as implementing a strategy that is not being implemented by the main competitors or potential competitors simultaneously and when these competitors are unable to duplicate the benefits of this strategy. The strategies can be sustainable when they follow criteria. The criteria for the recourses are:

- Valuability: The resources must be valuable to the firm in exploiting opportunities and neutralizing threats
- Rare: The resources must be rare amongst the firm’s current and potential competition
- Imperfectly imitable: The resources are very hard to imitate
- No strategically equivalent resources: There cannot be other resources that come to the same competitive advantage and that is rare or imperfectly imitable (Barney, 1991)

Hoetker develops this theory (see figure 3) by adding that outsourcing should be done to firms that offer the highest technical capabilities and by adding that when searching for technical able firms to outsource to, a firm should look at their current capabilities, not their future ones. This is because building capabilities takes a lot of time and resources to build up capabilities of a chosen supplier (Hoetker, 2005).
A supplier should be chosen from their current technical capabilities, since capabilities take a lot of time and resources to build up.

According to Rundquist, the more unique the current in-house resource is, the more preferable it is to decide to develop a capability farther in-house and not to outsource (Rundquist, 2008). If, on the other hand, the desired resource is of world-class level, and is not present in the current capabilities, then outsourcing is the preferred choice, since development in-house would require huge economical resources.

The more unique the current capability is, the more preferable it is not to outsource but to develop a technology in-house. If a world-class capability is not existent in the current capabilities, it is preferable to outsource.

3.5 Combining the theories and reflections

In this section, some of the theories are combined to present the model that Hoetker used. This model will be analyses and compared with our empirical data in the analysis part.

In the model of Hoetker, the TCT is compared with the technical capabilities, the prior transactions and internal versus external supplier (Hoetker, 2005). Hoetker describes that as uncertainty increases, the former relationships and supplier being internal take on greater significance relative to the importance of technical capabilities. When levels of uncertainty are very high, the value of internal supply relationships become very high and past relationships lose their significance (Hoetker, 2005). In his model, Hoetker (2005) explains his model as following:

“As uncertainty increases, communication and governance costs comprise an increasing proportion of the total cost. The advantages of prior transactions outweigh differences in technical capabilities and External Supplier 1 offers the lowest total costs. In this range of uncertainty, the buyer will prefer a technically mediocre, long-term supplier to a technically superior supplier with whom it has not dealt extensively.” (Hoetker, 2005, p. 81)
Hoetker (2005) explains here that when risks increase, the frequency of relationship with the firm that is outsourced to be more important than the technical capabilities when overlooking the total costs of the firm. A firm with a frequent relationship as well as moderate technological capability is preferred before a company with highly technical capabilities but with less frequent relationship.

“As uncertainty increases, the advantages of working with an internal supplier become increasingly important. At the highest levels of uncertainty, the extreme right in Figure 2, the internal supplier offers the lowest total cost and will be the preferred supplier. Belonging to the same firm can also reduce communication costs. Frequent, intense communication within the firm leads to the development of communication routines and a common language for describing technical issues (Nelson and Winter, 1982 in Hoetker, 2005, p. 81).

In these quotes, it is argued that, due to that the communication and governance cost make up the largest part of the total costs in a technological uncertain environment, the internal supplier in this case is the most preferable.

“When innovations are expected to have very high uncertainty, acquiring capabilities from any external supplier, even a long-term supplier, is costly. A firm will be better served if it has developed the required capabilities internally” (Hoetker, 2005, p. 81).

This quote only sustain Hoetker’s (2005) belief that an external supplier is more costly that an internal supplier.
According to the combined and simplified theory of Hoetker, the following theoretical conclusion is that:

1. Conclusion: At a low level of technical uncertainty, the supplier with the lowest total cost will be the external one with the highest technological competence.
2. Conclusion: When technological uncertainty increases, and the External Supplier 2 has less technical competence, but a better and more frequent relationship with the internal supplier, this will be the preferable supplier, since the transaction costs will be lower. Still, the total costs will be lower than having competence internally, since the bureaucratic costs are higher within the internal supplier and it cannot take advantage of prior transactions in the same way as external suppliers.
3. Conclusion: When the technological uncertainty is very high, the internal supplier is the most cost-effective option, since the innovation is so new and communication (transaction cost) is the largest part of the total cost. The production cost being only a tiny part of the total costs. Since Hoetker (2005) claims that communication costs are lower internally, and therefore the internal supplier can create a highly innovative product with lower costs than an external supplier.
4. Empirical Data

In this chapter the data that has been gathered in the interviews will be presented.

4.1 Alfa
Alfa does consultancy work for larger sized technical production companies in the automotive sector. Their expertise lies in their technical skills and specialized instruments and in depth knowledge in the technical field. Apart from the consultancy work, they also sell specialized test equipment. Their main office lies in central Europe and their customers are spread throughout the world. They are about 4500 employees in the entire firm and about two-hundred of them are based in Sweden’s two offices. In their main office in central Europe there are about 1500-1700 employees. These employees do not only do work in their country, they are also sent out to different clients to help with the start up face of new projects as well as help when certain knowledge is needed.

4.2 Beta
Beta is a technical production company in the automotive sector. The automotive industry is rapidly moving and the development of new products is a must to stay alive in the industry. Beta outsources to Alfa to do specific technical work in the development section that Beta does not have as a core competence. They need to stay focused on R&D to be able to keep up with the competitors.

4.3 The Project
Beta has outsourced the development of an old product to Alfa. The development takes place at Beta, but is largely carried out by Alfa’s consultants. The project comprehends a development of an old product to reach new environmental regulation without readjusting the existing design of the product, there are three people working at Beta from Alfa. Two of them are engineers and the third is project manager. The project is typical for the business and has lasted one and a half year and is ongoing until autumn 2010.
4.4 Knowledge outside the company

In this section the empirical data on why Beta has to find knowledge outside the company is explained. Also, Alfa gives an indication of why they think that outsourcing companies choose them. This is important, because the acknowledgement and discussion why a company has to have sources from outside the company can then be evaluated and taken into account in the analysis chapter.

Information from Beta:

Beta has in recent years become more and more focused, and have outsourced the area’s where they do not want or cannot have specialized knowledge in.

Alfa’s consultants/ technicians are working at Beta together with the personnel from Beta, so that Beta can learn from the personnel of Alfa at the same time as the research and development project is done. Being able to do so is an advantage for Beta, since they do not have to send their personnel abroad to learn these skills on courses. The personnel learn the complete testing potential of their test equipment from working together with Alfa.

For Beta, the choice to outsource was simple, because they need to continue to develop their products. They do not have enough resources to test and develop themselves. Their personnel also get better competence as a result of the outsourcing.

Information from Alfa:

The personality of the persons working for Alfa have to be problem solvers and have to be interested in their business’. This makes it so much easier working in the business that they are in.

Alfa does always give back 10% of their income to R&D and this information is shared with their customers. Alfa is not afraid to share information and knowledge with their customers, so that both can benefit from it. Alfa is not afraid to lose competence as a due cause of that, because the knowledge is often embedded into our personnel. Alfa has so many new projects and innovations that they are not easily imitated by their customers.

One other core competence of Alfa is that they are good at introducing the right technology at the right time. This is necessary, since a lot of companies have the same knowledge.

The customer (Beta) earns money by outsourcing due to the fact that no one can match up to the competences that Alfa has. Alfa’s knowledge about working with their test equipment and their ability to always have the knowledge to be ahead of competitors when it comes to technology are the qualities that make customers choose them to outsource to.
The reason for outsourcing being so important to the customers is because:

- The customer does not like to work with the same R&D tasks as Alfa does, so they leave it to Alfa to do the job.
- The job cannot become too expensive, and Alfa has the experience and knowledge to work effectively.

Alfa uses both the marketing analyses as well as the experiences from customers to find where to focus the technological development on.

The Alfa has such a broad and deep knowledge that the customer can get all the information needed for this specific sector from this vendor (Alfa)

Alfa is not that bound to its customers. It keeps its own organization and has not that many processes in common with their customers. The higher competence a company has the less vulnerable it is from the declining market. Even in bad times our customers come to us because they want to move forward.

4.5 Internal resources

In this section, the internal resources are explained to give an insight in how Beta manages and thinks about handling the resources within their company. This can give an explanation for why they outsource one of their R&D activities in the analysis part.

**Information from Beta:**

Beta assures that they have adequate knowledge to lead projects and can invest in knowledge if they choose to not outsource it anymore.

The general knowledge about the areas company outsource is also necessary to understand the vendor and to speak on the same terms.

The wide knowledge base assures that Beta is not completely dependent on vendors for their knowledge.

Usually the added value is included in the agreement with the one you are outsourcing to.

The core competence is not lost when outsourcing. This is covered by the contracts and patents that protect the innovation and knowledge; it is also up to Beta to not lose the knowledge that is in-house.

**Information from Alfa:**

The quality of the employees is assured by experience in employing personnel by the ones that are recruiting. Here a lot of focus is on if the solicitant has the problem solving capabilities. This outweighs the technical capabilities by far.
4.6 Strategies & Economies

In this section, it is explained how Beta thinks strategically and how their costs are built up. It is important to gather why companies outsource on a basis of costs, and how the long-term advantage of outsourcing versus R&D in-house is connected to each other in this firm. With this data, the perspective of strategies and economies can be compared with the theories found in the analysis chapter.

Information from Beta:
Beta is more and more specialized, due to that the sector needs more and more development in different areas. That is why Beta focuses on some areas and creates general knowledge in the other areas. The rest is outsourced to companies with core competences in such areas. It is not profitable for companies to have all that knowledge in-house, because they would not use that knowledge all the time and therefore buy in the knowledge when necessary instead.

The communication does not cost more than a few years back, due to the IP telephones and videoconferences, which has taken over the travelling for a large part.

The communication has not become more the recent years, but the number of companies Beta works with has increased.

The resources that are hard to get are acquired through contacts. It is seldom that information or persons that are needed are not to be found. This is perhaps more the case with smaller companies.

Alfa sells both the testing equipment and the outsourcing of personnel, so they do not lose income when Beta acquires more knowledge about testing.

Alfa acquires more and more core competence in the projects they do. Beta deliberately outsources to focus on some areas where they want to be world leader in. The outsourced processes are processes that Beta wants to have moderate knowledge in, but not the specific knowledge.

Information from Alfa:
The customers, like Beta, are always afraid that a part of their competence/business is lost when they outsource. You always have to convince them otherwise.

Alfa learns from outsourcing to other companies, by getting acquainted to their processes and routines and it is important to do projects in-house (at the customer).
Alfa uses their core competences mainly to standardize their processes to be cost-effective and to save on time when doing consultancy jobs. Things such as how much testing, what sequence, how many ways are often the things to look upon. Another thing to use core competence for is for helping the customer out with their test equipment.

Alfa does not get into trouble when they do things for a customer that they already have done for another, because they can go around it. The experience makes the process go faster the second time.

Patents can hinder Alfa from doing the same projects with other parties, because it is stated in the patent or contract. The competence still belongs to Alfa, because the knowledge is imbedded in the persons who have done the projects. This helps to do a similar project the second time.

The number of agreements is not becoming more or less, but the trust is getting less.

Alfa delivers the work at a fixed price, and internally companies that are outsourcing often cannot control time and costs for the particular job in the same way.

4.7 Experience & Relationship
Experience and relationship proved to be important subjects for both companies when working with each other. Combining the empirical data with the theory in the analysis can give a better understanding of how experience and relationships affect the decision to source.

Information from Beta:
Every year Beta goes through their processes and determines what to focus on in-house and what areas should be outsourced.

Even in a financial downturn, Beta still needs development and equipment. Alfa has so much expertise and is so complete in their offering that they manage even when there is a financial downturn.

It is very important for the relation that the key persons know each other for many years; having the same culture makes it easier for relationships and to work with each other. Working together for many years helps communication and makes the job easier and better.

The contact with the vendor is often tight, and the task is often not being left completely to the vendor.

The person from Beta is responsible for the research and development of technical products, and responsible for the relationship between Beta and
Alfa, especially in the initial and at the end of a project. The collaborate projects between Alfa and Beta are often deep and long-lasting.

Agreements and contracts are always written, but working together is built much on trust.

Information from Alfa:
The job is carried out by people with higher education with several years of experience. This is a must to both communicate with the customer in a correct way, as well as to carry out the technical part of the job. Experience is the most important thing when doing consulting projects like these.

In this project, Alfa states that their work for Beta means that Beta has the final say. Alfa tries to do whatever possible to do what is best for the customer.

It is important to have the quality to foresee the future and the core competences that enable Alfa to remain its sustainable advantage in the future. Alfa sees their’ leader as the most important for foreseeing the future and steering the processes towards it. The focus on the long term is one thing that the leader is contributing with. The leaders of Alfa have been in power for a long time as well, which helps this process. Another thing to help this process is by dividing the operations in five key processes to focus upon.

To do a good job is seen as the way for Alfa to keep the customers around. This sells itself. The other thing is to do what the customer asks of you.

At Alfa the knowledge often comes from inside the company, only occasionally from outside the company.

The empirical data will be helpful to get a better understanding of what factors drive a company to outsource a part of its R&D. The empirical data will be compared with the knowledge from the theory chapter in the data analysis, to give a better understanding of what conditions to look upon when outsourcing R&D.
5. Analysis

In the analysis chapter, similarities and differences between the empirical findings and the theories gathered in the theoretical frame of references chapter are defined.

5.1 Product Leadership & Transaction Cost

5.1.1 Product leadership

PL is something that most companies strive for in the higher technical sector, one might not be the leader in all the subcategories and still be one of the top product leaders.

The person representing Beta explained that the market demand is more and more becoming specialized. Since Beta could not become the best in all categories of what they do, they outsource the specific areas in which they do not have core competences, and gather general knowledge in those area’s instead. Both the value discipline and the RBT claim that one cannot be the best in everything it does, and that is purely looking at market demand, that it has not proven itself to be a trustworthy way of determine strategy (Treacy & Wiersema, 1992; Quinn & Hilmer, 1994). Beta is a PL company, since they continuesly bring out new products and need to develop these to keep their leading position.

Beta explained that they go through and look over their processes each year to refocus on what type of knowledge and capabilities they should focus on in-house and what they should outsource. This confirms the PL and the RBT, which both incline that a company should narrow down its core business and processes to the ones that it can bring market leadership/sustained competitive advantage (Grant, 1991; Quinn & Hilmer, 1994; Treacy & Wiersema, 1992).

By having a main focus in the Alfand a knowledge about the strenghts and weaknesses it will be mutch easier to become a PL or stay as a PL. Beta has a good strategy in doing a inventory of knowledge each year, to see where their gaps in their knowledge might be and being able to do something about it before losing their lead position.
5.1.2 Asset specificity and uncertainty

Contracts and agreements are always written with firms that the work will be outsourced to, but relationships are built much on trust, according to Beta. This goes against the TCT, which claims that the contractual agreements take on a considerable amount of costs when outsourcing (Rundquist, 2008; Hoetker, 2005). Beta claims that Alfa acquires more and more competence from working with projects that Beta outsources. This will make the transaction costs lower, since routines and communications will be easier between Alfa and Beta (Hoetker, 2005; Rundquist, 2008).

Alfa and Beta confirmed that their business relation during collaborate projects is often long-lasting and deep. Hoetker (2005) explains in his research that long-term relationships benefit the communication and lowers the governance cost when technical uncertainty is high. Alfa has enough orders and income, even in a financial downturn. They say to believe that this is due to their expertise and offerings to their customers. Another reason is that they have a lot of experienced people with higher education employed. Experience also relates to routines and governance, which are lowered by experience (Hoetker, 2005). This means that Alfa has routines due to their experiences that are lowering the transaction cost.

Alfa says they are learning from working with different types of companies, by getting acquainted to their processes and routines. Working at the customer is also important for the learning ability. There is no theory gathered for this type of learning ability, but still is a contribution to the TCT. Alfa uses their core competencies mainly to standardize their processes to be cost-effective when building new innovations. This brings down the governance and communication costs for Beta, since the governance and communication cost decreases for the given innovation (Hoetker, 2005; Rundquist, 2008)

Patents can be signed, but the capability cannot be captured, because it is imbedded in the persons performing the task. Therefore, Alfa does not see a danger in losing competence by working with R&D for production companies. One of the factors is that experience helps them to do the same type of project next time. This connects to the TCT, which describes that experience can help a company to do a process with less communication and governance costs (Hoetker, 2005; Rundquist, 2008).
5.1.3 Infrequency
The Transaction cost can vary depending on the type of relationship the different companies have. Even if the amount of communication has increased with vendors over the past few years, Beta does not think that the expenditure on communication has become more during the years. This is mainly due to the contribution of improved communication technologies, such as IP telephones and videoconferences, which have decreased the need of travelling for a large part. This goes against the TCT, which claims that in relation to outsourcing, the cost of communication and governance increase significantly (Rundquist, 2008; Hoetker, 2005). Although the TCT still holds, the total cost of the transaction may be much less than the authors foresee in them.

Beta finds that it is very important for the collaboration that the key persons in both firms have worked together for many years. Working with people from the same culture makes it easier to work together. The long experience also helps with communication and makes the job easier. It also becomes better in general and with Alfa. The communication costs are fundamental to the transactional costs, because infrequency related to the frequency of the business relation (Rundquist, 2008). The transaction cost will decrease when there is good communication between the businesses as well as a shared culture or a good understanding of each other’s cultures and standards.

5.2 External Resources
5.2.1 Concentration and interconnectedness
Beta has in recent years become more and more focused, and have outsourced in the area’s were they do not want or cannot have specialized knowledge in since it is not cost effective. This confirms both the RBT and the RDT in that successful companies must narrow down their internal resources to what they are good at and are also dependent on suppliers in their environment for resources (Pfeffer & Salancik, 1978; Grant, 1991; Quinn & Hilmer, 1994; Barney, 1991).

Alfa´s consultants/technicians are working at Beta together with the personnel from Beta, so that Beta can learn from the personnel of Alfa. At the same time the R&D project get carried out. Being able to do so is an advantage for Beta, since they do not have to send their personnel abroad to learn these skills outside the company. The personnel learn the testing and development potential from working together with Alfa. This can be seen as a contribution to the RDT and the TCT. If a vendor does the R&D in-house at the outsourcing company, then the transaction costs (governance and communication costs) are lowered because the processes and routines are known by the consultants working for the R&D vendor. This decreases the
costs for an outsourcing partner, since they can have only slightly higher transaction costs and superior capabilities in a specific area that the outsourcing firm does not focus its internal resources on (Hoetker, 2005; Grant, 1991). The RDT has not yet explored the effect of an external vendor working internally at the outsourcing company. How that affects the resources from outside the company is in this case unexplored.

Alfa has such a broad and deep knowledge that the customers can get all the information needed for this particular type of R&D from this vendor (Alfa). How deep and how wide the knowledge has to be to be chosen as a resource for a company, that is outsourcing the particular niche in the environment, is not explained by the RBT. Here the value discipline and RBT can contribute to the RDT by determining the preconditions on when a company needs resources from outside the company (Rundquist, 2008; Quinn & Hilmer, 1994; Pfeffer & Salancik, 1978).

Alfa is not that bound to its customers. It keeps its own organization and does not have that many processes in common with their customers. The higher competence a company has the less vulnerable it is from the declining market. Even in bad times Alfa’s customers come to them because they want to move forward. This means that the negative effects of interconnectedness between firms in the environment does not apply to this firm, since it keeps its own processes separated from the processes of the firm it sends its consultants to. This could also implicate that superior capability in a particular type of research and development for a vendor means that it has no point for an outsourcing company to develop capabilities in-house. This brings the RBT in a new light, since this could mean that it has no point in building superior knowledge into superior capabilities if the market already can provide superior capabilities. This technical uncertainty, connected to the internal transaction costs, will be too high and unnecessary.

One of the possible reasons for outsourcing being so important to the customers is that the customer does not like to work with the same R&D tasks as Alfa, so they leave it to Alfa to do the job. This undermines the RDT, which explicitly explains that companies need to obtain resources from outside the firm. In this example is explained as no need but choices that determine the reason for outsourcing (Pfeffer & Salancik, 1978).

5.2.2 Munificence
Alfa´s knowledge about working with their test equipment and their ability to always have the knowledge to be ahead of competitors when it comes to technology, these qualities make customers choose Alfa when they outsource. The recognition that routines and technical knowledge are requisites for firms to outsource their processes to a R&D vendor is
connecting the RBT and the TCT to the RDT. This is because technological knowledge is necessary for a company to achieve capabilities (Grant, 1991) and because routines belong to the cost advantages of the TCT (Gooroochurn & Hanley, 2007; Rundquist, 2008).

For Beta, the choice to outsource was simple, since they cannot stop the development of their products. They do not have enough resources to test and develop themselves. Their personnel also get better competence as a result of outsourcing. Outsourcing since the resources are not there affirms the value discipline and the RBT, that both question a firm that want to be best in everything it has to offer the customer, and therefore has to narrow down the knowledge to its capabilities (Barney, 1991; Prahalad & Hamel, 1990). Outsourcing to acquire better internal competences is also explained in the RBT, linking it to the RDT, which explains the munificence as “the availability or scarcity of critical resources” (Barney, 1991; Pfeffer & Salancik, 1978, p. 68). The acquisition of learning from others’ capabilities as well as to develop products by working together in teams at Beta is a way to lower transactional costs and gather competitive advantage in this example (Hoetker, 2005; Grant, 1991).

The customer, in this case Beta, earns money by outsourcing due to the fact that no one can match up to the technical competences that companies such as Alfa have. This exemplifies both the theory of transaction costs due to the fact that uncertainty decreases as well as technical capabilities are positively related to the decision of outsourcing (Rundquist, 2008; Hoetker, 2005). When overlooking the Hoetker model hereunder, it presents a theory that when technical uncertainty or strategical vulnerability is present, a firm is not to outsource, while Beta explains that the technical capabilities of Alfa makes costs lower instead of higher. A possible explanation for this might be that the technical uncertainty expressed by Hoetker is not the same for both firms, since the vendor has better technical capabilities in the specific area therefore the uncertainty becomes lower (Hoetker, 2005). The strategical control of the innovation in the case studied is agreed upon by signing agreements for the owner of the innovation and the fact that the activity is controlled largely by the organization of Beta. The innovation and the most of the capabilities come from Alfa, which does not support the fact that an activity must be processes by an internal supplier to lower cost.
5.3 Internal Resources

The contact with the vendor is often tight, and the task is often not being left completely to the vendor. This supports Rundquist (2008) who claims that it is easier to integrate knowledge in a company when the individuals working for the outsourcing company have an understanding of the subject (Rundquist, 2008).

Alfa always gives back 10% of their income to R&D and this information is shared with their customers. Alfa is not afraid to share information and knowledge with their customers, so that both can benefit from this. Alfa is not afraid to lose competence as a cause of sharing, since the knowledge is often embedded into the personnel. Alfa has so many new projects and innovations that they are not easily imitated by their customers. This confirms the RBT in that core competences and capabilities are imbedded in team and group effort and within organizations, and are not easily imitable by the competition (Grant, 1991; Quinn & Hilmer, 1994; Barney, 1991).

Giving back to R&D also confirms that the Product Leadership Theory is true in this case, that the product leader has to bring new and leading-edge products that enhance customers’ expectations (Treacy & Wiersema, 1992). It also brings to front one of the four terms for Sustainable Competitive Advantage, namely imperfectly imitable capabilities (Barney, 1991).

Alfa uses both the marketing analyses as well as the experiences from customers to find what to focus the technological development on. This is in line with Grant (1991), who defines the strategy to determine the resources
that should be used to achieve rate of profit comes from both from the market as from the internal resources (Grant, 1991)

Beta has in recent years become more and more focused, and have outsourced their area’s where they do not want or cannot have specialized knowledge in. This is very much the same that is suggested by Quinn and Hilmer (1994), who have the opinion that a firm should look into its core competences and this cannot be more than three to five core competences. This focus on the capabilities that can be exploited in the market is also expressed in the value discipline literature (Treacy & Wiersema, 1992)

Alfa’s consultants/technicians are often working at Beta together with the personnel from Beta. Working internally in Beta is an advantage for Alfa, since one of their core competences is knowledge and learning from projects, which brings the development costs down for Beta. The core competence for company is also an advantage for Beta, which otherwise would have had difficulties to determine its costs (Grant, 1991). This core competence also lowers asset specificity and uncertainty, belonging to the TCT (Pfeffer & Salancik, 1978).

For Beta, the choice to outsource was simple, since they cannot stop the development of their products. They do not have enough resources to test and develop on their own. Their personnel also gains competence as a result of the outsourcing. This is in line with the knowledge theory, which explains tacit knowledge as knowledge that has to be obtained by devising or exchanging on an experience basis (Rundquist, 2008). In this thesis, the Knowledge Based Theory is seen as a part of the RBT, because the explanation that Rundquist (2008) gives of explicit and tacit knowledge is comparable with the resources and capabilities explanation of the RBT (Grant, 1991; Rundquist, 2008).
6. Conclusions and Discussion

This final chapter gives answer to the research question that was asked in the introduction chapter. Furthermore, the chapter explains the model that was constructed by the authors of this thesis, and explains which contributions are made to existing literature and gives managerial implications for the companies that we interviewed.

6.1 Contribution to academia

Figure 5 (Hoetker, 2005, developed) can be explained by four reasons for a company to outsource R&D, instead of keep developing products in-house. The first is the differences in technical uncertainty between the outsourcing company (company Beta) and the R&D vendor (company Alfa). The second is the process advantage of the R&D vendor. The third is the company focus on a particular process and its implications. Finally, the fourth reason is the combination of high technical competence with a high frequency relationship.

6.1.1 Difference in technical uncertainty

In Hoetker’s (2005) original model, the premises for the model was that the technical uncertainty is always the same for the R&D vendor and the outsourcing company. In reality, this cannot always be the case, since the experience can differ according to the earlier experience of working with a particular technology. Since the R&D vendor Alfa in this case is specialized in the type of R&D, the technical uncertainty is much lower than for Beta. This is confirmed by both the companies, and undermines the original total cost picture of both Hoetker (2005) model. This is the first reason for the line representing Alfa being much flatter than the one representing external supplier 1 and lowering the total costs in a highly technical uncertainty environment (for the outsourcing company).

6.1.2. Process advantage when outsourcing

Alfa is often outsourcing its personnel to develop products in other companies, and acquire process knowledge from the outsourcing company due to this. It makes the costs for communication and governance costs lower, since they have done the task before or because they have an effective process in governing and communicating technical capabilities into innovations (Rundquist, 2008; Hoetker, 2005). This process can lead to lower costs, since knowledge about an outsourcing company´s internal processes and the long-term relationship enhances the performances and lowers the total costs (ibid). This is the second reason in favor of
outsourcing, lowering the total costs in a highly technical uncertainty environment (for the outsourcing company).

6.1.3. Business focus
Beta explained that they cannot and do not have the resources to be best in everything. This would cost them too much, since they cannot use the particular capabilities all the time. Some parts they do in-house, because their knowledge and especially capabilities are there. For the other resources, they acquire competent outsourcing R&D vendor. Because Beta does not have all knowledge and capabilities in all fields, the technical uncertainty would be too high to do an innovation in that field. With other words, their technical uncertainty and therefore their total costs would never match that of a supplier in this situation. During the interview, there was one aspect of outsourcing that contributed to the knowledge of the RBT. The RBT sees that the important resource should be internal and that the rest of the processes should be outsourced (Quinn & Hilmer, 1994; Hoetker, 2005). This can be true, but as Beta explained, the knowledge level of Beta has to be kept average when they outsource. Otherwise, they are much too dependent on the knowledge of the research and design vendor for development. If the vendor does not work together with them anymore, then they would lose all knowledge of the particular type of technology. This would not be accepted, and that is why average knowledge of a particular type of technology always is needed, even when outsourced. Nor the RBT, nor the transaction cost, nor the RDT takes up this implication of governing the processes between R&D vendor and outsourcing company. This is not a reason for lowering the total costs in the short run, but as Beta explains, most research and development projects with Alfa are projects that lasts a long time. In the long run, risks of losing competence is a very costly consequence if it is to become or already is a core competence. This explains that it is more cost-effectively to keep moderate knowledge in all fields that is outsourced to, because it lowers the total costs. Since the theories are not taking this into account in this figure, the total costs would be lowered due to outsourcing. This is the third reason for why outsourcing would lower total costs in a highly technical uncertainty environment (for the outsourcing company).
6.1.4. Combining high technical competence and high frequency in interactions

When analyzing the figure above, one would expect that when the high frequency communication with high technical competence is combined, the same line would appear as showed as the Alfa line below. The theory of Hoetker (2005) has no reasoning explained holding that this theory does not hold. Still, the empirical data, together with theoretical support, show that other aspects also implicate the full picture costs of outsourcing or in-house R&D. If Hoetker’s (2005) theory that technical capability and high frequency is even more important for the cost perspective, then the three prior explanations for the costs being lower in the premises explained would mean that the line resembling the costs for Alfa should be flatter or even negative.
6.2 Answer to the research question
The original research question was:

How do Swedish technical production firms in a competitive environment and high technical uncertainty find the right balance between outsourcing and in-house development that enhances their sustainable competitive advantage when they outsource their Research & Development externally?

Research Area:
- High technical uncertainty
- High total costs

When is outsourcing R&D more profitable than in-house R&D?

![Graph showing research area with high technical uncertainty and high total costs when outsourcing R&D more profitable than in-house R&D.](image)

In the figure above, the research area is graphically presented as high technical uncertainty for the outsourcing company and the total costs that, according to Hoetker (2005) are higher when outsourcing in this situation.
According to the empirical findings and the theories supporting the reasoning, there are a few factors that are important and not taken into account in the original model that is presented below:

1. Difference in technical uncertainty for outsourcing company and R&D vendor.

   If an R&D vendor has more technical capabilities the technical uncertainty, and therefore costs, decreases.

2. Process advantage for the research and development vendor when outsourcing.

   When a R&D vendor has prior experience from working within the organization of an outsourcing company, the transactional costs decreases because of this. The decreased costs come from the experience of working (process advantage) with a type of technology within the organization of company Beta. This brings experience and knowledge about routines when working for company Beta for company Alfa, and therefore decreases costs for innovation.

3. Narrowing business focus and average, but not explicit knowledge in the field.

   When a company has narrowed down the business focus to the capabilities it can achieve competitive advantage in, then the choice of outsourcing research and development to a vendor with more capabilities can create sustainable competitive advantage, if average knowledge exists within the outsourcing company. This is done through using the vendor´s capabilities and blending it with own capabilities, which together build a product or service that is only imperfectly imitable. Since capabilities are built from knowledge within groups and teams´ interactions, working together in teams of Alfa and Beta´s employees in Beta´s Company gives this type of collaboration a favorable position to attain sustainable competitive advantage and lowering costs as a due cause (Grant, 1991).

4. Combination of high technical competence and a frequent relationship.

   As gathered from empirical data and theory, a high frequency relationship, and therefore a long-term relationship, in combination with high technical capabilities/competences lowers the total costs (Pfeffer & Salancik, 1978; Rundquist, 2008).
6.3 Possibility for Future Research

For future studies, the relation between uncertainty and total costs could be examined in a different way. Hoetker (2005) explained a graph where high technical capabilities in a situation of low technical uncertainty would be beneficial for a company to outsource. This could be a wrong statement, since high technical capabilities also means increased costs if they do not need high technical capabilities, but for instance moderate technological capabilities and high communication and governances process capabilities. A further study into the low uncertainty and moderate uncertainty in a qualitative study could therefore give more knowledge about the cost and knowledge perspective of outsourcing R&D.

6.4 Managerial implications

This thesis contributes to the companies that were interviewed as well as for other companies that seek to find an outsourcing solution. As described earlier in this thesis, this thesis only applies for companies that can be defined as PL companies and in an environment where it is hard to know on forehand in what direction innovation will go, since it moves rapidly.

Hereunder some situations are described where our new model will be helpful to fully comprehend the total costs and to make the right decision when making the consideration to outsource as a manager. All the situations are simplified and the outsourcing R&D does in all cases comprehend a high technical uncertainty.

Prior knowledge:

A company wants an innovation which they can do themselves or outsource to a R&D vendor. The innovation is not yet being developed in-house and the knowledge for the firm for the given innovation is low. This implies that the technological uncertainty is high.

**Situation one** - The manager has a frequent relationship with a vendor which is highly competent in the field that the wanted innovation is in.

The advice for the manager in this case is to outsource the R&D activity to the R&D vendor if the relationship with the vendor is frequent and the R&D vendor has a high technical competence in the field that the innovation is in. Both the theory and our findings indicate that this often is a more cost effective way to acquire the innovation in this case and the frequent relationship ensures a knowledge lift in the outsourcing firm as well if that is needed.
If the R&D vendor is not frequent and the vendor has no high technological competence then the advice for this situation, as well as for the following three, is not to outsource the R&D activity. This will bring too much cost and will not be successful for an innovation with high technical uncertainty.

**Situation two**- The outsourcing firm and the R&D vendor have different knowledge about how high the technical uncertainty is for the innovation in the market or in their own firm.

If the innovation is new for the outsourcing firm, but not for the R&D vendor, the transaction costs and costs for having the capabilities for the R&D vendor are lower than they are for the outsourcing company. Therefore, if the outsourcing company does not have or does not want to pay for competences that they would not want to have as their sustainable advantage in the future, we advice the manager to outsource the innovation. This would bring lower costs, since they do not have to build up the knowledge and capabilities themselves. If the outsourcing firm has more knowledge and capabilities in the field, then we advice the manager not to outsource, since it will bring higher costs due to the communication, which is more frequent in-house.

**Situation three**- A R&D vendor has consultants working in the outsourcing company with a specific type of innovation.

If an innovation is in the field that the consultants are working, and the outsourcing firm has less technical competence, the advice to the manager is to outsource, since the consultants are already used to work within the outsourcing firms’ organization and will therefore will me more cost-effective than to develop an innovation in-house.

**Situation four**- The manager wants to focus its processes more on the core competences and do not want to be world-leading in all fields of businesses.

In this case it is smart to outsource, because it means that costs for maintaining world-leading capabilities in many fields would be too costly. The advice to the manager in this case is to outsource, as long as the average knowledge about the technology is still present in the outsourcing firm. If the average knowledge is not there, then the advice is not to outsource, since that would mean that the outsourcing firm is too dependent upon its vendors for knowledge and competence.
7. Bibliography


Cited internet sites: