

## APPLICATION OF THE PROVIDER PERSPECTIVE: MOTIVES, BENEFITS, AND CHALLENGES

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### ABSTRACT

*The fact that firms engage with different types of inter-organizational relationships for innovation purposes has been widely researched (Faems et al., 2005, Laursen and Salter, 2006, Knudsen, 2007). However, the explicit recognition that these relationships consist of at least two types of partners; a receiver and a provider, of equal relevance has received much less attention. The provider term was conceptualized by Tranekjer and Knudsen (2012) as “firms that produce reciprocal outbound knowledge, solutions, or ideas to other firms’ innovation projects” (p. 986). The main finding was that it is beneficial for firms to provide to other firms’ new product innovation. In particular: the following benefits were suggested; knowledge development, innovation efforts, and a possible learning effect (Tranekjer and Knudsen, 2012). This paper aims to contribute to the literature by applying the concept of ‘provider firms’ to a specific industrial setting by investigating; types of motives, benefits, and challenges. This paper contributes to the literature on innovation as there is limited research on the provider firms, and also to the literature on logistics. The empirical background for this paper is a cross-sectional survey conducted in collaboration with the Danish Transport Innovation Network (TINV) in the spring of 2013 and in-depth interviews. The findings reveal that provider firms are motivated by both internal and external drivers, however the main driver is cost reduction. The results on benefits and challenges show that provider firms benefit from providing. The benefits listed are: cost reduction, keeping the retail customer, and several sustainability benefits.*

**Keywords:** *Provider-firms, motives, benefits, challenges, innovation, quantitative and qualitative data*

## 1. INTRODUCTION

The fact that firms engage in different types of inter-organizational relationships for innovation purposes has been widely researched (Cassiman et al., 2010, Knudsen and Mortensen, 2011, Faems et al., 2005). However, the explicit recognition that these relationships consist of at least two types of partners; a receiver and a provider of equal relevance, has received much less attention.

The provider term was conceptualized by Tranekjer and Knudsen (2012) as “firms that produce reciprocal outbound knowledge, solutions, or ideas to other firms’ innovation projects” (p. 986). The main finding was that it is beneficial for firms to provide to other firms’ new product innovation. In particular, the following benefits were suggested; knowledge development, innovation efforts, and a possible learning effect (Tranekjer and Knudsen, 2012). However, the innovation literature does not have an in-depth understanding of the provider firms’ motives, benefits, and challenges from providing to other firms innovation project. Therefore, this paper applies the concept of the provider to a specific industrial setting, and investigates motives, benefits and challenges.

The research questions:

1. What types of motives drive firms to engage in other firms’ innovation processes?
2. What types of benefits are obtained by the provider firm as a result of providing to other firms’ innovation projects?
3. What types of challenges are experienced by the provider firms as a result of providing to other firms’ innovation projects?

These research questions follow the general conceptualization and the preliminary findings of the paper by Tranekjer and Knudsen (2012) and apply these to a specific industry. The providers are producers who are involved in their distributors (the receiver) innovation projects. The distributors are e.g. haulage companies. In other words, the setting of this paper is the vertical collaboration between a producer and a distributor in an innovation project.

This paper contributes to the innovation literature with a more detailed understanding of the provider firms. Furthermore, this paper advises receiver firms on how to motivate provider firms to join their innovation, by understanding provider firms’ motives, benefits, and challenges. Thus, creating a win-win situation for both firms, the receiver firm receives knowledge and input for their innovation process, and the provider obtains different types of benefits.

This paper also contributes to the logistic literature. Firstly, the concept of innovation in logistic literature is largely ignored, and secondly, there also remains a significant gap in logistic research aimed at understanding the motives and the specific benefits of inter-organizational collaboration in the transportation sector (Flint D.J et al., 2005, Grawe et al., 2009).

In other words, this research is relevant to academics in both innovation and logistics. Finally, as empirical evidence shows that the transport sector has a lower level of innovation compared to other industries (Sandgreen, 2013), proactive practitioners in this sector can benefit from this research (Wagner and Lindemann, 2008).

This paper applies two methods. Firstly, results from a quantitative study on the Danish transportation industry are used to investigate some general properties and secondly, qualitative interviews are conducted on a sample compiled from the firms who participated in the survey.

The paper proceeds as follows: the following section addresses the theoretical framework of motives, benefits, and challenges. The empirical work is presented in section 3. In section 4 the results are presented. Section 5 contains a discussion and conclusion.

## **2. THEORETICAL FRAMEWORK**

Although the logistics literature studying inter-organizational innovation is scarce, the topic has received extensive attention in the innovation management literature. The literature on inter-organizational innovation has mainly been focusing on the effects from different types of providers on the receiver firms' innovative performance (Knudsen, 2007, Tranekjer and Søndergaard, 2013), however the inter-organizational innovation literature is short on studies on the providers.

The theoretical framework for this paper is divided into two parts. The first part is reviewing different streams of literature on motives for participating in innovation projects across firm boundaries. The second part lists the benefits and challenges provider firms may experience caused by collaboration across firm boundaries.

Motives, benefits, and challenges are conceptualized as following. The motives are the drivers for the provider firms to participate in the receiver firms' innovation projects. The benefits are the outcome of the innovation projects, from the perspective of the provider. Last, the challenges are the problems the provider firms may experience during the innovation project.

### **2.1 TYPES OF MOTIVES**

The motivation for a firm to become a provider and provide knowledge, technology or other types of input is not listed in the innovation literature, except the results presented in the paper from Tranekjer and Knudsen (2012). Tranekjer and Knudsen (2012) point to motives for the provider firms as monetary rewards, future earnings, reputation of the partner firm, and the possibility of a longer relationship.

Therefore this paper is obliged to look into different streams of literature to identify different types of motives for provider firms to engage in innovation activities outside firm boundaries. Furthermore, motivation that drives provider firms is described as; 1) internal drivers (inside the organisation), and 2) external drivers (outside the organisation). In general, motives for inter-organizational innovation are mostly studied from the receiver firm's perspective, however, some of them will also be appropriate to address from the perspective of the provider firms.

#### **2.1.1 INTERNAL DRIVERS**

Based on the resource dependency theory the drivers for collaboration across firm boundaries are that firms are not self-sufficient and therefore need to collaborate to get

access to *other firms resources* and the possibility of reduction of *uncertainty* (Pfeffer and Salancik, 1978). The *possibility to facilitate knowledge exchange* between partners is also listed as motivation as motivation for inter-organizational innovation (Argote and Ingram, 2000, Powell et al., 1996, Inkpen and Tsang, 2005). Furthermore, *inter-dependency* between the supplier and customer is also listed as a motivation, thus if the supplier (the provider) trusts the customer (the receiver), and if the supplier gets returns, it will motivate the supplier to join the customers NPD project (Yeniyurt et al., 2014).

The literature on inter-organizational innovation identified provider firms motives as the possibility for monetary rewards and future earnings; reputation of the partner firm and the possibility for a longer relationships (Tranekjer and Knudsen, 2012). First, providers are argued to be motivated to participate in inter-organizational innovation by the expectation of *monetary rewards or future earnings*. Similar cost reduction, waste elimination, and quality improvement have also been shown to be some of the driven forces (Handfield et al., 1997). Second, an inter-organisational innovation project can send a signal that conveys social status and recognition for the participants (Stuart, 2000). Additionally, it has been shown to be an effective method to promote a *strong reputation and brand perception* in an industry (Jepsen et al., 2014) and thus motivates providers to participate. Third, Lager and Storm (2013) argue that future sales and the possibility to create *long-term relationships* are drivers to join other firms innovation projects also may motivate providers to participate in other firms innovation projects. When duration of an inter-organizational relation increases, so does the quality of the relationship. This argument is not well researched; however it has been identified as an underlying principle behind the development of long-term relationships in supply-chains (Stock and Lambert, 2001). Last, individuals feel motivated by ideals linked to sustainability (Lakhani and Von Hippel, 2003), consequently motivating providers to join innovations project with sustainability or social responsibility on the agenda.

### 2.1.2 EXTERNAL DRIVERS

External drivers such as regulation, customers and competitors are seen as driving forces for inter-organizational collaboration in supply chain. (Porter and Van der Linde, 1995) found that *environmental regulation* can be seen as a motivator to innovate and reduce the environmental impact at low cost. They show that firms in order to meet regulation results in more effective material usage, better production creation, or improved product yields. Therefore, it may be argued that providers are motivated to join the receivers' innovation projects to reduce e.g. pollution due to environmental regulation. *Customers* exert pressure (direct or in-direct) on organisations to engage in environmental supply chain projects (New, 1997). Especially, large retailers have been shown to have high power over their producers both in regard to environmental practices but also in regard to timely delivery (Hall, 2001). Research has shown that *competitors* also must be considered as drivers for inter-organizational collaboration. Competitors, as market leaders, set industry norms and thus clearly have the ability to drive supply chain innovation.

## 2.2 TYPES OF BENEFITS AND CHALLENGES

The literature on inter-organizational innovation points to different types of benefits and challenges for firms in general when collaborating on innovation projects across firm boundaries.

Overall, Easterby-Smith, Lyles, and Tsang (2008) points out that both the provider and the receiver firms need to be motivated and able to transfer and receive knowledge. Furthermore, the type of knowledge and the dynamics of the relationship will influence the knowledge transfer process and thereby the potential benefits and challenges of the process.

### 2.2.1 BENEFITS

The benefits from inter-organizational innovation have been shown to be the possibility to cut costs and save time by shortening the innovation process and maybe even find joint new inventions (Knudsen, 2007). Furthermore, reduction of risk, getting access to complementary asset, and the possibility to transfer codified and tacit knowledge (Faems et al., 2005) claim to be benefits from inter-organisational innovation. However, many of these benefits are from the receiver firms' perspective, and not the provider firms. Provider firms are engaged in outbound innovation (Tranekjer & Knudsen, 2012), and the literature on benefits from outbound open innovation are very limited, except for Alexy et al. (2013) and Yang et al. (2010).

Alexy et al. (2013) argue that firms who provide knowledge to other firms will more efficiently and effectively absorb *incoming* knowledge in the future. 'Recursive knowledge flows' (Alexy et al., 2013, Yang et al., 2010) are listed as a possible benefit from providing. Yang, Phelps, and Steensma (2010) p. 317 state that "when an originating firm's spill-over are recombined with complementary knowledge by the recipient firms, a spill-over knowledge pool is formed, containing opportunities for the originator to learn vicariously from recipients", the originator is the 'donor', indicating that the donor firm will benefit via learning. Yenyurt et al. (2014) find that it is beneficial (increasing performance) for both partners (both the receiver and the provider).

More specific benefits for engaging in inter-organizational collaboration in logistics have been identified as the following: customer service (Emerson and Grimm, 1996); reduction of logistic costs (Stock and Lambert, 2001); and environment. Customer service can be timely delivery and reduction of product delivery cycle time (Soosay et al., 2008), increased operational flexibility (Fisher, 1997) improvement of the service quality (Cruijssen et al., 2005). Furthermore, logistic cost reduction, minimization and optimization (e.g. inventory costs), and cost trade-offs have also been identified as important benefits (Stock and Lambert, 2001). Finally, Macro-societal issues such as rising energy prices, non-renewable resources, and the carbon footprint have become global concerns of governments, organizations, and consumers. The moving of goods require significant amounts of energy and result in the creation of large amounts of emissions from transportation equipment (Stock and Boyer, 2009), therefore producers need to be aware of how their activities effect the environment. Grosse (2000) argue that the ultimate goal is to achieve greater profitability by adding value and creating efficiencies, thereby increasing customer satisfaction.

### 2.2.2 CHALLENGES

Easterby-Smith, Lyles, and Tsang (2008) lists the motivation and the ability to transfer and receive knowledge for both the provider and the receiver as important, otherwise the inter-organisational collaboration will experience challenges. The challenges are e.g. that knowledge is often “sticky” and difficult to spread (Szulanski, 1996), the possibility of knowledge spillovers, learning race between partners, conflicting opinions and goals, and lack of flexibility and adaptability (Faems et al., 2005). Furthermore, the Not Invented Here (NIH) syndrome presented by Katz and Allen (1982) and the Not Shared Here (NSH) (Burcharth et al., 2014) may be barriers and challenges in inter-organizational innovation projects. Finally, coordinating, managing, and controlling the different partners in the project (Nieto and Santamaría, 2007) may also create challenges related to inter-organizational innovation projects.

<b>Motives</b>	
<b>Internal:</b> <ul style="list-style-type: none"> <li>- Access to resources</li> <li>- Reduction of uncertainty</li> <li>- Inter-dependency</li> <li>- Monetary rewards &amp; future earnings</li> <li>- Reputation &amp; Branding</li> <li>- Longer relationships</li> </ul>	<b>External:</b> <ul style="list-style-type: none"> <li>- Regulation (e.g. environmental)</li> <li>- Customers</li> <li>- Competitors</li> </ul>
<b>Benefits</b>	<b>Challenges</b>
<ul style="list-style-type: none"> <li>- Recursive knowledge flows</li> <li>- Learning vicariously</li> <li>- Customer satisfaction/service</li> <li>- Reduction of logistic costs</li> <li>- Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>- NIH</li> <li>- NSH</li> <li>- Conflicting goals</li> <li>- Sticky knowledge</li> <li>- lack of flexibility and adaptability</li> <li>- coordination, management and control of different partners</li> </ul>

**Table 1: Overview of identified motives, benefits, and challenges**

### **3. RESEARCH DESIGN AND METHODOLOGY**

This section provides insights on the approach that is utilized in order to answer the three research questions. In order to identify provider firms and investigate general properties, a quantitative analysis of data is required. Data for this study was drawn from a study on the Danish transportation industry (Sandgreen, 2013). From this data, five cases were purposively selected for a qualitative research to investigate the research questions.

#### **3.1 SURVEY ON THE DANISH TRANSPORTATION INDUSTRY**

This cross-sectional survey was conducted in collaboration with the Danish Transport Innovation Network (TINV) in spring 2013. In total 1,461 producers were asked and 221 have provided useful answers.

The sample of firms contains mainly smaller companies, because 66.8% of the producer firms employ fewer than 50 employees. The participating firms mostly produce metals and fabricated metal products (14%), machinery and equipment (12.4%), and food (10.5%). The participating firms produce products with average complexity (42.3%), simple products (30.1%) and complex products (26%).

#### **3.2 MULTIPLE CASE STUDY**

With the data identified from the survey, five producers were selected from the entire sample, as information-rich provider firms, for further qualitative research. In other words, an exploratory multiple case study was employed, which is a powerful way to elaborate on theory because "they permit replication and extension between individual cases" (Eisenhardt, 1989). Semi-structured interviews with the identified logistic or supply chain managers of provider companies as key components were undertaken to advance the understanding about motives, benefits and challenges for provider firms to engage in other firms' innovation processes. The goal of a multiple case study is to investigate patterns that have been gathered and examine how the case relates to theory (Eisenhardt, 1989).

The producers are from the meat, bread, dairy, seafood, and vegetable sector. Due to confidentiality agreements, the names of the firms are excluded. Five interviews with logistic or supply chain managers were undertaken each lasting between 60 and 120 min. The research protocol guiding our interviews included questions on the informants' views of motives of their firms for engaging in other firms' product development projects, and also requested data on the beneficial outcomes and the challenges resulting from their collaboration. We recorded electronically each interview using a digital minidisk recorder and made notes during the interviews to enhance the audio data. The recordings were transcribed soon after the interviews to maximize recall, and facilitate follow-up and filling of gaps in the data (Voss et al., 2002).

## 4. RESULTS

The overall aim of this paper is to deepen the understanding of the provider firms' motives, benefits, and challenges. The theoretical part of the paper listed different theoretical motives, benefits, and challenges, see table 1. The empirical results from the quantitative and the qualitative study are presented in the following sections. First, the provider firms are compared with the non-provider firms. Second, the results from the quantitative and qualitative analysis regarding the provider firms' motives, benefits, and challenges are presented.

### 4.1 THE DIFFERENCES BETWEEN THE PROVIDER AND NON-PROVIDER FIRMS

The empirical results from the quantitative survey identify 18.5 % of the producers as providers (Table 2). From the interviews, we learn that producers only participate as providers in the transport distributors' innovation projects when it involves changes in the delivery set-up. As stated: "We are only engaged with transport distributors if we want to change our delivery set-up. If we require for example new packaging, then we just dictate to the transport supplier what we want" (Company A).

<i>Does your firm participate in transport suppliers' development projects?</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Yes</i>	<i>36</i>	<i>18.5</i>
<i>No</i>	<i>159</i>	<i>81.5</i>
<i>Total</i>	<i>196</i>	<i>100</i>

*Table 2: Distribution of provider firms in the sample*

In table 3 the collaborative transport distributors (the receiver firms) are presented. It shows that the provider firms mainly collaborate with receiver firms as trucking companies (62.9%) and intermediaries (31.4%).

<i>Has your firm collaborated with the following transport distributor types?</i>	<i>Frequency</i>	<i>Percent</i>
<i>Trucking companies</i>	<i>22</i>	<i>62.9</i>
<i>Shipping companies</i>	<i>2</i>	<i>5.7</i>
<i>Intermediaries</i>	<i>11</i>	<i>31.4</i>
<i>Total</i>	<i>35</i>	<i>100</i>

*Table 3: Distribution of the types of firms the providers collaborate with*



The findings further show that 45.7 % of the provider firms have develop their own transportation solution compared with non-provider with only 6.3 % (Table 4). Likewise, the results show that provider firms have a higher degree of technology compared to non-provider firms (Table 5).

<i>Did your firm develop its own transport solutions?</i>		
<i>Yes</i>	<i>16 (45.7 %)</i>	<i>19 (54.3 %)</i>
<i>No</i>	<i>10 (6.3 %)</i>	<i>148 (93.7 %)</i>
<i>Total</i>	<i>26</i>	<i>167</i>

*Table 4: The number of innovative provider firms. Chi-square test is significant at .000*

	<i>Degree of technology</i>	
<i>Provider</i>	<i>Low degree</i>	<i>High degree</i>
<i>Yes</i>	<i>15 (42.9 %)</i>	<i>20 (57.1 %)</i>
<i>No</i>	<i>90 (58.1. %)</i>	<i>65 (41.9 %)</i>

*Table 5: Provider firms' degree of technology. Chi-square test is tentative at .102*

Not presented in any table, provider firms are significantly older than non-providers. At the same time they are larger (in number of employees) compared to non-providing firms. Furthermore, provider firms collaborate with higher number of suppliers compared to non-provider firms, indicating that provider firms operate in more complex networks compared to non-providing firms.

## **4.2 THE MOTIVES FOR THE PROVIDER FIRMS**

In table 6 the identified internal motives from the quantitative survey are shown. However, the results of the multiple case studies provide more in-depth evidence and reveal that external motives to a great extent also influences the providers (producers) behavior in regard to development projects. The extracts from the interviews are reported to provide evidence about the motives.

### **4.2.1 INTERNAL MOTIVES**

The results show that road transport is the main transport mode for all the involved firms and the interviewed managers emphasized the flexibility and speed of trucks compared to other transport modes. These findings match the results from the survey

that identify the possibility to “increase speed” (60.6%) as being the main motive for providers to participate in transport distributors innovation projects.

<i>Motives</i>	<i>Totally agree</i>	<i>Agree</i>	<i>Neither</i>	<i>Disagree</i>	<i>Totally disagree</i>
<i>Challenges related to heavy freight</i>	6 (18.2)	4 (12.1)	5 (15.2)	4 (12.1)	14 (42.4)
<i>Challenges related to big volume</i>	7 (21.2)	5 (15.2)	9 (27.3)	3 (9.1)	9 (27.3)
<i>Challenges related to speed</i>	14 (42.4)	6 (18.2)	8 (24.2)	1 (3.0)	4 (12.1)
<i>Challenges related to dealing with special freight (dangerous goods/refrigerated)</i>	9 (28.1)	3 (9.4)	8 (25.0)	3 (9.4)	9 (28.1)
<i>Challenges related to reduction of transport damage</i>	11 (33.3)	5 (15.2)	5 (15.2)	4 (12.1)	8 (24.2)
<i>Challenges related to change from one transport form to another</i>	5 (15.2)	2 (6.1)	10 (30.3)	5 (15.2)	11 (33.3)

**Table 6: Distribution of provider firms motives. Frequency (per cent)**

The survey identifies the possibility to “reduce damage during transportation” (48.5 %) as the second most important driver. The safety of transportation operations and responsibilities is a high priority for the producers and must be clarified before entering into any inter-organizational collaboration (Company B and D). Especially for food producers, damaged goods are very costly (time and money) (Company D). This topic also relate to “dealing with special freight” which was considered a relevant motive for 37.5% of the provider companies because the correct handling of refrigerated freight is essential for the food producing companies, due to regulation on how to transport and store food products.

Finally, the “big volume” (36.4 %) and “heavy freight” (30.3 %) are also considered important drivers for the providers. From the interviews we learn that this also is related to the producers’ utilization of trucks as transport mode. In other words, the trucks dimension and weight limits are two of the main bottlenecks for the case companies: “Weight is well defined by the guidelines given in advance on how many tons we are allowed to load” (Company A). Some countries allow higher or lower weight limits on their roads. So as the company points out: “It's really the lowest weight limit of the countries the trucks are driving through that decides how many tones we load in the truck and not what can physically be loaded in the container”. This indicates that

different transport destinations have different weight limits, thus providing different drivers for the firms to engage in collaboration.

The layout and design of vehicles should be developed to match the transport assignment (weight, volume, shape, sensibility etc.), which is required to improve the efficiency of transport and better overall efficiency. Company B and E has made several efforts in regard to the optimization of transport solutions. Company A pointed out that the opportunity to influence load carriers to develop tailored vehicles, is an important driver for entering collaboration about an innovation project: *“We need to address specific challenges related to the transport of heavy goods”* (Company A). Therefore, the company considers it very interesting to engage in collaboration: *“If we can influence the carrier to use a lighter truck or trailer concept, so that we can increase the net weight”* (Company A).

Other motives are also identified from the interviews regarding the participation in innovative vertical but also horizontal collaboration. As stated by one of the companies: *“The argument for participating in this kind of collaboration was that this would give (the provider company) the opportunity to sit at the table with the aim to really develop a new setup. It was not the environmental part that was the driving force behind it. It was a combination of monetary benefit and competition – but also to be involved and set an agenda for future transport possibilities.”* (Company A). In other words, the participation in inter-organizational innovation can help companies to establish their reputation and improve the company’s status.

The interviews also indicate that the motives are dynamic; changing during the innovation project. Company D explains, that first they started out with a focus on reduction of costs, however later in the projects, an additional driver was added, the degree of service.

#### 4.2.2 EXTERNAL MOTIVES

The case companies agree that the requirements of the customers are driving many of the innovative initiatives. As pointed out by Company A: *“Our customers put more and more pressure on the transport-related setup, because the shelf life is so extremely important for the large retailers”*. The customers set the agenda: *“They dictate the market”* (Company A). However, the customers do not interfere with the choice of transport mode: *“Customers have demanded new types of packaging. They do not e.g. require transport modes with lower environmental impact”*.

From the interviews we learn that external competitors act as drivers for supply chain projects. As one of them states: *“If we want to maintain our role in the market then we cannot offer a poorer set-up than our largest competitor”* (Company A). In other words, the conditions set by the competitor are a necessary condition.

From the interviews we also find statements about environmental motives. One of the supply chain managers points out: *“With the economic pressures that has been on us over the last 2 years, the environment has not been a priority. The company has only benefited from the gains that were given for free from environmental initiatives. But the environment is becoming more and more of a priority in our system. It gets more and*

more important, and it will also be something I will be measured on in future” (Company A). In other words, environmental factors such as regulations, encourage firms and their employees to be innovate in order to reduce environmental impact.

### 4.3 PROVIDER BENEFITS AND CHALLENGES

The survey finds that 75.6 % of the provider firms evaluate the inter-organizational innovation projects, in which they have participated, as successful (Table 7), indicating that it have been beneficial for both the provider and the receiver firm to collaborate.

<i>Success</i>	<i>Frequency</i>	<i>Percent</i>
<i>Yes</i>	<i>27</i>	<i>75.6%</i>
<i>No</i>	<i>5</i>	<i>24.4%</i>
<i>Total</i>	<i>33</i>	<i>100%</i>

*Table 7: The provider firms’ evaluation of the innovation project*

Due to the limited results on benefits from the survey, the results from the multiple case studies are very relevant, because the data can provide in-depth evidence about the benefits for the providers (producers) when engaging in transport suppliers’ development projects.

The results from the case studies suggest that the following categorization makes sense for the refining and grouping of statements, but also highly relevant for the illustration of patterns and development of propositions for future research regarding provider benefits: Efficiency<sup>1</sup> (logistic costs), Effectiveness (customer service), and Sustainability (Environmental).

#### 4.3.1 EFFICIENCY

Many companies aim to minimize the amount of stock, which means that frequent, flexible, and rapid deliveries are required. This makes it difficult for producers to fill up trucks to all of their destinations.

Company D has made some initiatives towards consolidation of loads on trucks which enable a high level of transport effectiveness and the fewest number of freight movements. This also minimizes freight transports contribution to congestion. The load factor is particularly important because it influences both costs and CO<sub>2</sub> emissions from the transport. At a high load factor, it is possible to carry a higher volume of products with almost unchanged diesel consumptions, and the result is therefore, lower CO<sub>2</sub> emissions per transported kg of food.

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<sup>1</sup> So far, the different actors of the system—transport buyer (provider) and transport suppliers (receiver)—have agreed on transport efficiency as economically and environmentally desirable.

#### 4.3.2 EFFECTIVENESS

Time and delivery performance are essential benefits for producers e.g. avoiding loading errors and unnecessary waiting time, which are examples of non-value creating activities for the customer. It is essential to conform to customer requirements. Customer satisfaction is perceived as a benefit (Stock and Lambert, 2001). Optimal customer satisfaction results in positive customer perception and ultimately will enhance customer loyalty (Stock and Lambert, 2001).

Company A states that the demands from the customer (retail) increases because of pressure on the transportation setup, due to the durability of the product. Therefore the benefit for company A is that they are able to keep the final customer (the customer is not part of the innovation project).

#### 4.3.3 SUSTAINABILITY

Company A has e.g. signed up to the UK's "Climate Change Agreement", which commits the company to reduce energy consumption by 15 per cent by 2020 and Company B's target is a 40 per cent reduction by 2020. These environmental targets have motivated the companies to engage in different development project and resulting in reduced impact on the environment.

Company A, C and D have along with their transport suppliers developed advanced transport planning and scheduling systems. The results of these initiatives were a reduction of unnecessary resource consumption as part of the sustainable development initiatives.

An initiative of company B, in collaboration with a haulage company, was to develop more environmentally friendly truck transport. The result was three new trucks, uniquely designed for transport of Company B's goods. The trucks run on biodiesel (RME). RME is made from rapeseed oil and has lower CO<sub>2</sub> emissions compared to conventional diesel. This innovation is promoted on the company's homepage and documented in the annual report.

Another initiative launched was a test of modular road trains, meaning trucks with an overall higher capacity per truck, thereby making it possible to reduce the number of trucks on particular transportation routes and reducing environmental impact. In order to improve the firms load factor for domestic transportation, Company B joined this inter-organizational collaboration between three producers and a haulage company. The aim of the modular road train was to consolidate freight, which would contribute to improved energy efficiency, lower CO<sub>2</sub> emissions, more efficient transport and logistics and innovative development of the truck industry. However, as pointed out by Company B: "*The use of modular trains is only allowed on a few roads and it has been a complicated and long process (2 years) to get this authorized*". Company D gained monetary rewards, but the benefits were substantial for truck haulages, who promoted this business concept to other producers in other parts of the country.

## 5. DISCUSSION AND CONCLUSION

This paper began by pointing at the importance of a deeper understanding of provider firms, their motives, benefits, and challenges. The results are based on a quantitative survey followed by qualitative interviews. This paper contributes to the literature on innovation by deepening the understanding of provider firms.

The collected data about the producers made it possible to *distinguish between provider firms and non-provider firms*. 18.5 % of the firms can be classified as providers. This is a lower number than presented by Tranekjer and Knudsen (2012) and may be due to the general lower degree of inter-organizational innovation in the investigated industry (Flint D.J et al., 2005, Grawe et al., 2009). Furthermore, 45.7% of the provider firms have developed their own transportation solutions, compared to only 6.3% of the non-providing firms. Indicating that provider firms are more innovative, supporting the results of Tranekjer and Knudsen (2012).

The empirical results for *the first research questions* present both internal and external drivers for provider firms. The identified internal motives for participating in other firms development projects tend to be those that are more transactional, operational, and repetitive such as cost reductions (higher volumes in trucks), improvements in service level speed (e.g. timely delivery, damage avoidance), and delivery of special freight. Furthermore, the results also indicate that the motives are not stable during the projects. The findings support the literature presented in the theoretical frame, however we did not find any support to whether providers are motivated by the receiver firm's reputation or the possibility to establish a long-term relationship by Jepsen et al. (2014) and Lager and Storm (2013). Overall, the internal motives are cost reduction and improvement of service, however this finding is not so surprising, but it may be explained by the fact that the competitive factor/parameter in this industry is the price of the transportation.

The external motives identified are the requirements from the final customers. Because of shorter product life cycle or the demand for new packing, the distributor (the provider) is obligated to create new or adjust the transportations mode. Furthermore, the pressure from the competitors and the pressure to reduce environmental impact are also identified in this study as drivers for providers to participate in other firms' development projects, supporting the theoretical frame. These finding add to the existing limited literature on provider firms, by pointing at external drivers as motivation for provider firms. Due to these results, it may be of interest in future studies to investigate the relationship and priority of internal and external motives for providing. Are firms mainly driven by the internal motives? Are the external pressures overruling the internal drivers? Answers to these questions may be related to the specific industrial context.

The empirical results for *the second research question*, indicates that it is beneficial for the providers (the producers) to participate in other firms innovation projects. Furthermore, the provider firms are more innovative compared to firms not providing, indicating that provider firms learn from providing, however, this needs further research as suggested by Tranekjer and Knudsen (2012). The result shows efficiency benefits for the provider firms as a fewer number of freight movement, and costs reduction. The interviews also identified that participation in inter-organizational innovation may help companies to improve their reputation and the company's status. The results on benefits

from an effectiveness point of view, shows that if the producer (provider) collaborates with the transport distributor (the receiver), it is possible to meet the customer's (retail) demand, and manage to keep the customers. This indicates that vertical collaboration needs to be investigated beyond the dyad perspective in future studies; by adding the customer. This will broaden the vertical collaboration under investigation to the producer – transport distributor – the producer's customer. This study presents sustainability benefits as reduction in consumption of resources, minimization of the impact on the environment, advanced transport planning and scheduling systems, and reduction of the number of trucks (modular road trains). Based on the results of the different types of benefits, there is an overlap between the internal motive: cost reduction and the benefits received; and similarly for the external driven motives and the results on sustainability benefits. The link between motives and benefits needs further research.

The study did not find any results besides the theoretical suggested barriers for *the third research question*. The theoretical part suggests NIH, NSH, conflicting goals, and sticky knowledge as challenges for provider firms. An explanation why no barriers or challenges were identified may be due to the fact that the main focus of the investigated innovation project is driven by cost reduction. Furthermore, the studied innovation projects are not related to the provider's core business. Challenges experienced during inter-organizational innovation from the provider perspective, needs further research.

Based on the theoretical framework and the findings, the following research proposal is suggested:

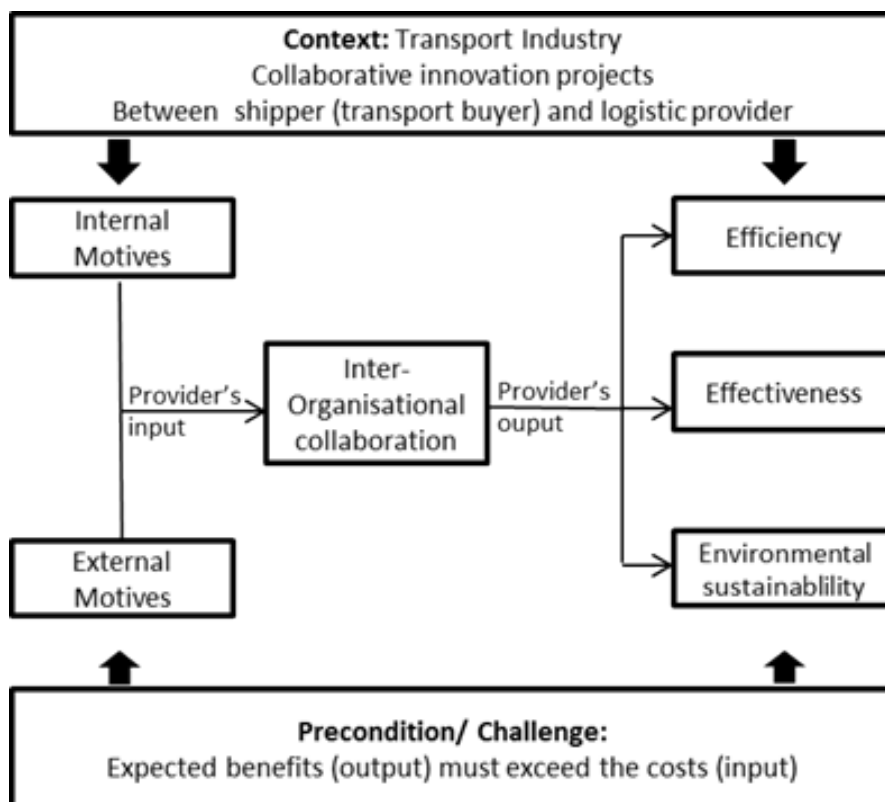


Figure 1: Research proposal

This paper suggests the following *managerial implications*: First, it is possible for a manager of innovation projects to motivate provider firms to join the project by understanding what drives provider firms to join innovation projects across the firms' boundaries. However, the motives for providing is more than 'just' cost reduction, e.g. pressure from customers, competitors, and regulation, which make the understanding of the provider firms and their motives more complex, than maybe expected up front. Secondly, for the manager of provider firms it is possible to identify different types of benefits, hence these benefits will motivate provider firms to join other firms' innovation projects.

Besides the before mentioned suggestions for *future research*, the understanding of the provider firms will also benefit by an understanding of when in the innovation process the provider firms are invited to participate in other firms' innovation projects. This paper investigated the provider firms, but the challenges in inter-organizational collaboration may be linked to the receiver firms, is the receiver firm motivated e.g. as suggested by Easterby-Smith et al. (2008). Therefore future study needs to investigate specific inter-organizational innovation projects from both the provider and the receiver point of view.

The *limitation of this study* is that the data for this paper is entirely from producer collaborating with transport distributors, and therefore it is not possible to generalize the findings to other industries or other national settings without further analysis.



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