Identifying qualitative and quantitative factors affecting the competitiveness of companies on the Swedish road haulage market.

A case study of Wirens Akeri and EA Akeri
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Abstract

Introduction

The road transport in Europe is the dominant means of transportation in the region. The European road haulage market is considerably liberalized and integrated. However, there are big discrepancies between the different regions in the market in regard to the costs the haulage companies have. In Sweden haulage companies have higher fuel and drivers costs compared to other European countries.

Purpose

The purpose of the study is to investigate how Swedish companies are remaining competitive in a highly integrated market which is not favourable for companies established in countries with high costs.

Method

The study will be conducted through a multiple holistic case study. The owners of the companies EA Akeri and Wirens Akeri would be interviewed. The data collection techniques would be a mixture between an interview with open ended questions and a questionnaire. The data processing technique would allow for the use of both qualitative and quantitative data.

Findings

The study has found out that the researched companies rely heavily on utilizing as much of their loading capacity as possible. They do that through using terminal buildings and keeping close contact with customers. In addition to that, companies are also working on minimizing their costs through using HVO fuel, using 25.25 meters modular combinations, paying attention to tire pressure and tire allocation and educating and monitoring the driving style of their drivers. However, the companies are not using extra aerodynamic components than what is preinstalled and they are not considering lowering the drivers’ wages by relocating the company operations in a neighbouring country.

Future Scope

The research can provide useful framework for managers willing to operate their road haulage companies more effectively. In addition to that, the research might provide the foundation for other case studies investigating the same problem or even testing issues like the importance of close customer contact or which are the factors affecting the most the fuel consumption according to managers or drivers.
1. Introduction

On 7th of February 1992, the Maastricht treaty was signed by members of the European Community and Europe was integrated. Since then, the European Union has grown in size and despite the recent Brexit it remains a large politico-economic union. If treated as a single country, the European Union has the second largest economy in the World. In 2016, the European Union generated 16.5 trillion EUR (International Monetary Fund, 2016).

Advantages and disadvantages of the European Union can be debated but one thing is clear - the existence of the European Union is facilitating globalization. The European Union is a largely integrated union. Since its inception in 1990s a major goal of EU “has been the removal or elimination of barriers between Member States’ markets” (European Commission, 2013, p.1)

Through a number of standardized laws in place, the European Union has developed a single internal market which allows for free movement of people, goods, services and capital. This results in trade advantages (European Commission, 2015).

However, this free movement of people, goods and services do not come without a cost. Usually a cost for one country or a company is a gain for another (AECOM & European Commission, 2014).

European Commission argues that this is not the case with the freight transport industry, it warns that the companies in this industry could engage in the so called race for the bottom which could result in lower the haulage rates for all companies in the industry (AECOM & European Commission, 2014).

The road freight industry in EU is relatively big. Nearly, half of the goods transported in 2012 were transported by road. All goods transported in 2012 amounted to 3481 billion tones per kilometer (tkm) (European Commission, 2015). As mentioned earlier, the road freight sector is highly integrated. Nonetheless, important trends between companies operating in different regions can be identified. The sector in lower cost countries has grown tremendously whereas the sector in high cost countries has not experienced such growth (AECOM & European Commission, 2014).
It could be debated why we can see differences in the growth rate of the different markets in the integrated road freight sector in Europe. However, one obvious reason that was also brought up by AECOM & European Commission (2012) is the following “Some of the Eastern European Member States have the lowest operating costs (…) and have the lowest proportion paid to drivers” (AECOM & European Commission, 2014, p.7). Besides this AECOM and European Commission provide even stronger argument for that by arguing that there is a positive correlation between fuel and drivers’ costs – the two main expenses haulage companies have. This means that we can see a tremendous difference in terms of costs between companies operating in this market. Eastern European companies have low costs, whereas Nordic countries tend to have much higher costs.

1.1 Problem

The EU road haulage sector is highly integrated but at the same time there is a lack of harmonization of costs in the European road haulage sector. The problem is that the costs some companies have on the market are substantially higher but the haulage rates the companies get for their services are quite similar given that the market is highly competitive and integrated and that the haulage companies are price takers rather than price setters (AECOM & European Commission, 2014).

This results in a competitive misbalance on the market. Companies based in countries characterized by high costs are in a competitive disadvantage over companies based in lower cost countries. This is a result of the fact that an Eastern European company for example can operate its trucks in a Nordic country like Sweden, for example, and be extremely competitive because of its advantageous cost structure.

One way for a Swedish company to deal with this problem is to flag out operations to another lower cost country. However, such strategy is associated with high expenses which are often unbearable for the small haulage companies which dominate the haulage market in Europe (AECOM & European Commission, 2014). That is why the research aims to find out how are the Swedish companies dealing with the difficult situation of competing with low cost carriers.

The European Union has attempted to partly tackle this problem. There are EU restrictions in the form of cabotage and crosstrade rules, which are in place and aim to control and limit amount of time a foreign company can operate in a domestic market.
However, the European Commission assesses that there are problems with the enforcement of these rules (AECOM & European Commission, 2014). This results in a problem. Road haulage companies operating in disadvantageous regions in this market characterized by higher costs need to be innovative in order to stay competitive and stay in business. For example, haulage companies in Sweden are facing big challenges because of the fact that low cost international competition is allowed to operate on the Swedish market and the fact that the rules which aim to limit the time an international carrier can operate in foreign markets are not enforced (AECOM & European Commission, 2014).

1.2 Purpose

It is of value to find out what Swedish road haulage companies are doing in order to stay in business. What are the qualitative and quantitative factors that influence their competitiveness in the integrated EU market? The research would be conducted using a case study approach.

2. Research method

This chapter will discuss the research strategy and the data collection techniques which will be used to obtain empirical data.

For the sake of pursing reliability and trustworthiness of the findings, the authors will make the research method completely transparent. In addition to that, the authors will discuss in details the approaches they are adopting and the reasons behind their choice.

2.1 Research philosophy

This paper is taking a pragmatic view. It will put the research question at a central place. Regardless of what the authors’ views about epistemology and ontology are, the paper will put the research question at a central place and will adapt the authors’ views in order to best address this question.
2.2 Research Approach

Easterby-Smith, Thorpe, Jackson and Lowe (2008) argue that research approach is important for three major reasons. First, they believe that a structured research approach allows the author to take an informed decision about the research design, including the data collection and the data analysis technique. Second, they believe that a research approach helps the researcher identify what are the most suitable research strategies for the specific research. And finally, the researcher can deal with constraints like limited time or limited access to data when the research approach is known and clearly identified (Easterby-Smith et al., 2008).

Deduction and induction are the two main research approaches which researchers use to draw conclusions. Deduction takes the theory as a starting point and works from there in order to draw conclusions. In other words, it first analyzes the theory, then it builds a hypothesis and finally it tests the hypothesis through empirical research. Deduction is the most commonly used research approach and it is the approach that contributes the most to build theoretical knowledge on a particular area.

Induction on the other hand takes a totally different perspective. Instead of starting with a theory, it starts with the empirical study. Researchers first collect empirical data, then the data is analyzed and the results are a formulation of a new theory. (Saunders, et al., 2009).

Induction or deduction rarely exists in their pure forms. Often, a research contains both – induction or deduction (Eriksson and Kovalainen, 2008). When this is the case and both research approaches are used together – the research approach is called abduction. Abduction allows the researcher to work on theory and empirical simultaneously. According to Eriksson and Kovalainen (2008), abduction is often used when a topic is investigated through a case study.

This master thesis will take an abductive approach in analyzing the research topic. The reason for this is that there is a theoretical base allowing the researcher to start with theory but also the theoretical base is not extensive and working on the theoretical and empirical part simultaneously would allow the research to discuss issues that are not sufficiently covered by literature.
2.3 Research Purpose

The research purpose could be descriptive, explanatory and exploratory (Saunders et al., 2009).

It could be argued that the purpose of this research is a combination of the three types of purposes listed above. According to Saunders et al. (2009) having more than one type of purpose is perfectly acceptable. First, the research will contain traces of descriptive because it will describe the current state of the road haulage market in order to provide the general framework for analysis. Second, the research will engage in explanation of some concepts like rolling resistance, 25.25 meter modular combinations, etc. And finally, the research will explore areas that have not been sufficiently covered by literature, like aerodynamics and the role of contacts in the domestic road haulage market.

2.4 Research Strategy

This subsection will pursue three main goals. First, it will clearly identify what is the research strategy that is going to be used. Then, it will describe and explain the strategy. And finally, it will argue why the chosen research strategy is suitable for the research project.

The research strategy which is going to be used in this project is case study. First, it is important to state that it is an existing and well-known research strategy which has been used by plenty of researchers. According to (Biggam, 2008), using an existing research strategy will strengthen the credibility of the research.

The definition of case study is often debated. The most famous contributor on this topic Robert Yin defines case study in the following way:

“…investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p.13)

Contrary to that, other famous contributors on this topic like Mahnion and Cohen argue that:

“The case study researcher typically observes the characteristics of an individual unit – a child, a class, a school or a community. The purpose of such observation is to probe deeply and to
Even though there are differences in the exact definition of case study, it is evident that most notorious researchers agree that a case study is an in-depth investigation of a specific topic. Moreover, they argue that a case study research is often used when an issue needs to be analyzed in great depth (Biggam, 2008; Cohen & Manion, 1995; Stake, 1995; Yin, 1984). This is exactly what this paper is going to pursue – it will pursue an in depth investigation of the road haulage market in Sweden through the perspective of haulage companies operating in it.

Table 1 below separates case studies on the following four groups based on their type.

<table>
<thead>
<tr>
<th>CASE STUDY DESIGNS</th>
<th>Type</th>
<th>Explanation</th>
<th>Usefulness</th>
<th>Critique</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single</td>
<td>The research is based on a single case (Yin, 2003).</td>
<td>Provides an opportunity to analyze and observe a phenomenon that a few have considered before (Yin, 2003)</td>
<td>Lack of possibility to generalize the findings (Long &amp; Holling, 1993)</td>
</tr>
<tr>
<td></td>
<td>Multiple</td>
<td>The case study strategy incorporates multiple cases (Yin, 2003).</td>
<td>To establish whether the findings in the first case occur in other cases, and ability to generalize to some extent (Yin, 2003)</td>
<td>Risky to generalize because of small sample size (Saunders, Lewis, &amp; Thornhill, 2009).</td>
</tr>
<tr>
<td></td>
<td>Holistic</td>
<td>The case organization is treated and examined as a whole unit (Yin, 2003)</td>
<td>It is advantageous to use when no logical sub-units within the organization can be identified (Yin, 2003).</td>
<td>More difficult to gain detailed insights (Scholz &amp; Binder, 2011).</td>
</tr>
<tr>
<td></td>
<td>Embedded</td>
<td>Different units (departments) within the organization are examined (Yin, 2003)</td>
<td>The use of sub-units allows for a more detailed level of inquiry (Scholz &amp; Binder, 2011).</td>
<td>Often there is too much focus on a single unit and failure to return to the larger unit of analysis (Saunders et al., 2009).</td>
</tr>
</tbody>
</table>

This paper will use a multiple, holistic case study. The paper will probe deeply the problem and investigate how the analysed companies are competing in an unfavourable market.
Regardless of the fact that case study research strategy is a strategy accepted by the research community there are researchers who provide a general critique for case studies. For example, Flyvberg (2006) believes that case studies are not practical because they are too time consuming. In his opinion, it is difficult to code and structure the gathered data. However, in his critique Flyvberg does not take into consideration the fact that the questions used for gathering information and analysing the underlying issue are generated from the theoretical background and the literature review. This means that if a case study research utilizes a carefully planned data collection techniques based on the theoretical framework and the literature findings this problem should not occur. This is exactly what the authors will do. They will design the interview questions based on the previous research on road haulage market and improving operational efficiency.

Another common case study critique is that sometimes case studies might lead to bias (Flyvberg, 2006). This can occur and that is why it is extremely important to consider all important theoretical concepts and not to discuss one or two in great detail and miss on something important.

Yet another critique is that because of the lack of generalization discussed above case studies cannot contribute to the scientific development. The authors do not agree with this statement because even researchers like Miles (1979), who bring forward this critique, agree that a case study research can find issues that need further investigation. The authors think that this is a contribution to the scientific development because it can place the foundation of a new important scientific activity.

As discussed above, the research strategy this paper is going to use is multiple holistic case study. The strategy was chosen because the authors believe that the topic has not been sufficiently investigated in the past and an in-depth analysis of companies in this market is important in order to find interesting areas that need further investigation. In other words, the case study research strategy is the most suitable for the purpose of addressing this problem. Also, the time-frame and the access to the research subjects have influenced the chosen strategy.

2.5 Primary Data Collection

This subsection will clearly state what are the primary data collection techniques used. The research will use a number of data collection techniques. This is referred to as methodological triangulation (Denzin, 1978). This strategy is time consuming but has
two major benefits. First, triangulation can allow different perspectives to be taken into consideration. It can capture different dimensions of the same phenomenon. Second, using triangulation can help achieve credibility of the results through cross-validating the data (Saunders, et al., 2009).

According to Saunders et al. (2009) most case studies utilize interviews as their main data collection technique. The current case study will also utilize interviews as it is main data collection technique and the owner of Wirens Akeri would be interviewed.

The interview questions used will be semi-structured which will allow for flexibility and for probing an interesting issue even deeper. This is possible because semi-structured interviews are characterized by its open nature which allows for new ideas to be discussed. According to Saunders et al. (2009), such interview would allow the researcher to follow new leads as they arise.

Moreover, the prepared interview questions will mostly incorporate open-ended questions. Such questions can result in meaningful responses according to Patton (1990). Furthermore, the open-ended question will align with the investigative nature of the paper.

Besides the advantages of open-ended questions there are also some disadvantages. According to Saunders et al. (2009), using open-ended questions might lead to bias. Generally, interview bias is defined as the situation where the researcher asks questions or interprets responses in a way that confirms its views (Easterby-Smith et al., 2008). Some reasons that can lead to bias can be the willingness of the respondent to just provide a quick response or to show themselves in a good light or please the researcher. (Easterby-Smith et al., 2008).

That is why the data collection for EA Akeri would be different. The same open ended questions would be used but instead of asking them they will be distributed to the owner in the form of questionnaire – such strategy might help reduce bias but has a risk of not receiving meaningful enough responses.

The research subject interviewed in Wirens Akeri is Joakim Wiren – owner of the company. Similarly, the research subject in EA Akeri is Stefan Nyman – owner of the company. Gathering the data from the owners of the haulage companies would help the researchers gain credible and correct data and at the same time would allow them to investigate large number of topics related to the research. The data from Joakim Wiren would be gathered on 28.11.2016 and the data from Stefan Nyman would be gathered
on 29.11.2016. Both, the interview with Joakim Wiren and the responses from Stefan Nyman are included in the Appendix.

The companies have been chosen because of the fact that they are Swedish hauliers doing solely domestic transport operations. The choice of country where the interviews are going to be conducted is also interesting. Sweden is famous for its innovative spirit and regardless of the fact that it is in a disadvantageous position in this market, the haulage companies are still competing on it. This means that the companies are doing something unknown to the current body of literature in order to stay competitive. It is interesting to investigate this issue.

2.6 Primary Data Processing
When the data is collected, it needs to be processed and analyzed. The collected data from both Wirens Akeri and EA Akeri will be compared and contrasted and would be discussed in the context of the literature findings and the theoretical foundation. The structure of the data would incorporate both – quantitative and qualitative elements. The analysis of the data will similarly, discuss quantitative aspects and qualitative aspects. This means that the data processing technique used will be mixed-modal research (Biggam, 2008). Mixed-modal research means that the researchers will not be restricted into using quantitative or qualitative data only and the respective data analysis techniques. Instead, the researchers will be able to use the most appropriate data analysis techniques for the collected data.

2.8 Quality of research
It is not only important to choose the best methods for the problem that is researched. It is also important to state why these methods are valid and reliable. The above chapters touched upon this issue but this section will discuss it in greater detail. First, according to Biggam (2008), a research is valid if it is acceptable to the research community. According to him a research is acceptable to the research community if: 1.) It is based on tried and tested research strategies and data collection techniques and 2.) If it uses data collection and data analysis techniques that are appropriate for the current research. As shown earlier the research is using the case study research strategy – a tried and tested research strategy. In addition to that, it uses data collection and analysis
techniques which allow for incorporation of new ideas and which allow the usage of both qualitative and quantitative data. For these reasons, the research satisfies the conditions set by Biggam and can be considered as a valid research.

Second, according to Biggam (2008), a research must also be reliable. In other words, the results need to be trustworthy. He believes that the results can be reliable if 1.) the research methods are transparent and 2.) if bias is minimized. As seen earlier, the previous subsections discussed the research methods in a great detail. This not only enhances transparency but also allows for the replication of the study. In addition to that, bias is minimized because the research uses not only the methodological triangulation discussed earlier, it also uses theory triangulation which also helps cross-validate the secondary data.

3. Literature Review

3.1 Background information on the road haulage market
The next two subsections will provide information on the European road haulage market. In addition, to that the subsections will also discuss how the specific Swedish road haulage market places in the overall picture in Europe. As mentioned earlier, the road haulage market is highly integrated but some important differences exist that need to be identified.

3.1.1 Regulatory overview
Since 1928 a trend toward heavy regulations in the road haulage market has been observed (OECD, 1997). By 1938, the road haulage market has been heavily regulated and a number of different restrictive measures have been in place (OECD, 1997). Some of these measures included a limited number of companies allowed to enter the market and minimum prices (OECD, 1997). The official reason for the high degree of regulation in the market was to remove the undesirable effects of free competition. However, OECD (1997) believes that the real reason was to protect the rail industry from competition.

After the World War II the road haulage market started to grow. However, it was not until 1970s until people started to realize that there is a need to liberalize the market and ease some of the restrictive measures. In 1985 a progress in this direction was made and
the Council of Transport Ministers decided on a common transport policy OECD (1997). Since then, the trend in the road haulage market has been toward liberalization. Nowadays, there are still restrictions but the market is considerably liberalized (AECOM & European Commission, 2014). For example, the quantitative restrictions that limited the number of companies who were allowed to operate in the market in the past are not in place anymore. Instead, there are qualitative criteria which need to be met. This criterion is in the form of obligatory licenses. Besides that, issues like cabotage are not completely allowed and driving hours and dimensional restrictions of the vehicles are still in place (OECD, 1997).

As seen above, the road haulage market in Europe has undergone a transformation in the last century. Nowadays, it is extremely liberalized even if there are still restrictions. Most of the remaining restrictions are in place for safety reasons. The widely debated cabotage is one of the few restrictions left in the market which is in place in order to try and balance the market. However, AECOM and European Commission assesses that cabotage rules are not followed and that there is a misbalance in the market. This misbalance occurs as a result of lack of harmonization of the different regions in the market. More specifically, fuel prices are not the same in all EU members. In addition to that, enforcement of rules and sanctions varies between the different EU members. But more importantly, drivers’ wages vary substantially and affect the competitiveness of companies and regions (European Commission, 2014).

To sum up, the EU road haulage market is currently liberalized but there are still challenges in terms of harmonizing the market. In the current situation, other factors held constant companies operating in a lower cost country have an advantage over companies operating in high-cost countries (European Commission, 2014).

3.1.2 Characteristics of the EU Road Haulage Market

The road haulage market has experienced tremendous growth in the past decades. In 1994, it generated 1061 billion tkm (OECD 1997), whereas in 2013 it generated close to 1800 billion tkm (European Commission, 2014). The road transport is the most dominant means of transportation. It accounts for 70% of all inland freight transportation in Europe (Eurostat, 2016).

Figure 1 below illustrates that the situation in Sweden is not different and road freight transport dominates the market.
Companies operating in the road haulage market can operate for own account or for hire and reward. Own account is transport performed by different departments within the same company, whereas hire and reward is transport performed by one company for another company (Boylaud & Nicoletti, 2001). According to the European Commission, hire and reward activity dominates the EU market. In Sweden, the situation is similar and as evident from Figure 2 below, 95% of all transport can be characterized as hire and reward.
The statistics discussed above suggest that there is a market demand for hire and reward activity in Europe and more specifically in Sweden. Most companies do not do the transport themselves but instead they use the services of a specialized company.

The higher and reward transport companies can perform two types of transport – domestic or international. Domestic transport is characterized by transport where the vehicle is registered, whereas international transport is activity outside of the country where the vehicle is registered. International transport could take two forms. First, only the loading or the unloading could be in a foreign country – “bilateral international transport”. Second, both loading and unloading can be in two different foreign country – “crosstrade” (European Commission DG for Mobility and Transport, 2011)

In addition to crosstrade and bilateral international transport, companies can also perform “cabotage” which was mentioned earlier. Cabotage is similar to crosstrade. In crosstrade, the loading and unloading are done in two different foreign countries. However, in cabotage, a foreign operator transports goods between two different places in the same country. It is important to state that cabotage is regulated. A foreign operator is allowed to perform cabotage only to a limited extend. More specifically, the
foreign truck needs to go out of the country a week after the initial loading has taken place or immediately after three domestic operations have been performed. In Sweden the penalties for breaking the cabotage rules are substantial and amount to SEK 50 000 (U., Langberg, personal communication, April 20, 2016). However, according to Ulric Langberg from Sveriges Akeriföretag, cabotages rules are not followed because there is no control. In his opinion in 2015, there have been only 86 penalties imposed because only 86 checks have been made (U., Langberg, personal communication, April 20, 2016).

The share of domestic and international transport is different in the different EU countries. Figure 3 below illustrates that Sweden is focused mostly on domestic transport. This is expected because of the fact that the higher costs in Sweden do not provide the hauliers with competitive advantage in an international context. Contrary to that, the figure also illustrates that hauliers in countries like Poland and Bulgaria focus mostly on international transport.

*Figure 3 – Share of domestic vs. international transport in the EU*

Above, we saw that Sweden is focusing on domestic transport. This argument is further strengthened by Table 2 below. It illustrates that national (domestic) transport in Sweden is the dominant transport. Furthermore, the table suggests that the other transport activities are almost negligible. However, given that there is lack of control and no checks are made it is likely that these statistics are not covering the full picture. More specifically, it is likely that the international, cross-trade and cabotage activity is higher than what the statistics are suggesting.

Table 2 – Share of types of transport (million tkm)

<table>
<thead>
<tr>
<th></th>
<th>National</th>
<th>International</th>
<th>Cross-trade</th>
<th>Cabotage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU-28</td>
<td>1,116,870</td>
<td>437,765</td>
<td>145,243</td>
<td>30,362</td>
<td>1,725,240</td>
</tr>
<tr>
<td>BE</td>
<td>19,167</td>
<td>10,266</td>
<td>1,423</td>
<td>953</td>
<td>31,808</td>
</tr>
<tr>
<td>BG</td>
<td>6,826</td>
<td>4,835</td>
<td>9,356</td>
<td>1,536</td>
<td>27,854</td>
</tr>
<tr>
<td>CZ</td>
<td>16,813</td>
<td>27,266</td>
<td>8,622</td>
<td>1,371</td>
<td>54,092</td>
</tr>
<tr>
<td>DK</td>
<td>12,943</td>
<td>2,405</td>
<td>476</td>
<td>361</td>
<td>16,164</td>
</tr>
<tr>
<td>DE</td>
<td>263,032</td>
<td>41,524</td>
<td>3,611</td>
<td>1,775</td>
<td>310,142</td>
</tr>
<tr>
<td>EE</td>
<td>1,541</td>
<td>3,074</td>
<td>1,328</td>
<td>367</td>
<td>6,310</td>
</tr>
<tr>
<td>IE</td>
<td>7,704</td>
<td>1,555</td>
<td>298</td>
<td>97,511</td>
<td></td>
</tr>
<tr>
<td>EL</td>
<td>15,119</td>
<td>4,047</td>
<td>56</td>
<td>19,223</td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>128,157</td>
<td>61,815</td>
<td>3,617</td>
<td>2,177</td>
<td>195,767</td>
</tr>
<tr>
<td>FR</td>
<td>151,112</td>
<td>13,576</td>
<td>239</td>
<td>289</td>
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<tr>
<td>IT</td>
<td>3,931</td>
<td>3,953</td>
<td>1,496</td>
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<td>14,632</td>
<td>379</td>
<td>452</td>
<td>117,183</td>
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<td>12</td>
<td>53</td>
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<td>2,749</td>
<td>6,267</td>
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<td>453</td>
<td>13,670</td>
</tr>
<tr>
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<td>12,485</td>
<td>3,507</td>
<td>506</td>
<td>28,067</td>
</tr>
<tr>
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<td>9,958</td>
<td>11,881</td>
<td>9,945</td>
<td>29,952</td>
</tr>
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<td>5,168</td>
<td>5,693</td>
<td>70,897</td>
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<td>1,982</td>
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</tr>
<tr>
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<td>41,680</td>
<td>8,634</td>
<td>250,311</td>
</tr>
<tr>
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<td>14,022</td>
<td>3,762</td>
<td>307</td>
<td>38,620</td>
</tr>
<tr>
<td>RO</td>
<td>12,136</td>
<td>12,205</td>
<td>3,792</td>
<td>307</td>
<td>38,847</td>
</tr>
<tr>
<td>SI</td>
<td>2,062</td>
<td>5,360</td>
<td>1,940</td>
<td>356</td>
<td></td>
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<tr>
<td>SK</td>
<td>5,094</td>
<td>5,094</td>
<td>1,261</td>
<td>31,586</td>
<td></td>
</tr>
<tr>
<td>FI</td>
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<td>2,520</td>
<td>333</td>
<td>2,401</td>
<td>23,040</td>
</tr>
<tr>
<td>SE</td>
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<tr>
<td>LI</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>19,034</td>
<td>2,523</td>
<td>28</td>
<td>21,594</td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>10,565</td>
<td>1,867</td>
<td>371</td>
<td>344</td>
<td>13,876</td>
</tr>
</tbody>
</table>


3.2 Theoretical foundations

We have already identified that the Swedish road haulage companies are in disadvantageous position in the integrated road haulage market. However, there are still companies operating successfully on this market. So, it is valuable to find out what these companies are doing in order to stay competitive. In other words, if we phrase this
purpose in a theoretical way, it is important to assess what are the factors affecting the operational efficiency of these companies.

Operational efficiency is defined as the capability of a company to deliver its products or services to its customers in the most cost-effective manner without compromising on the quality of these products or services (Yasin, Czuchry, Dorsch, & Small, M., 1999)

It is evident that this is exactly what a Swedish company needs to be doing in order to compete successfully in such market. The reason for this argumentation is that the Swedish companies need to maintain high quality but at the same time they need to be cost-effective because of the fact that international low cost competition is threatening their market share.

If we look into more details in the scientific description of operational efficiency we can see that it is divided on two major parts – inputs and outputs (Yasin et al., 2010). According to the researchers, inputs are the costs the business is incurring. These costs can be related to the effort put in business, to the necessities vital for running the business or to any other factors which result in an increase or decrease of the costs the business is incurring. On the other side of the coin, according to the researchers the outputs the business is generating can be described as the revenue, the cash or the customer loyalty a business is generating (Yasin et al., 2010).

We can see that the above explanation resembles very closely the situation the Swedish road haulage companies are experiencing nowadays. The major costs (or inputs) the Swedish road hauliers have are drivers and fuel expenses. If a Swedish company would like to improve their operational efficiency and be competitive they need either to tackle one of these costs or to look from another perspective and try to also generate more revenue or customer loyalty and thus more business deals (outputs).

As seen above, the European Commission argues that the two major costs a haulage company has are drivers’ wages and fuel expenses. According to the National Academy of Sciences (2010), heavy-duty vehicles can reduce their fuel costs in a number of ways. First, there are power alternatives available on the market which can help reduce the fuel consumption. One example they provide is the use of hybrid vehicles. Second, according to them the heavier load the truck is transporting the lower the overall fuel
consumption is because the truck needs to make fewer trips. Third, according to them fuel consumption can be lowered by utilizing trucks with more aerodynamic designs. And fourth, the types of tires and the resistance they are making, plays an important role in fuel consumption (National Academy of Sciences, 2010). In addition to that, there are other ways not covered by the National Academy of Sciences (2010). For example, Mckinnon, Browne and Whiteing (2010) touch upon the important issue of eco-driving and argue that the eco-driving techniques can result in a more sustainable transportation. Barkenbus (2010) also discusses this issue and argues that it is often an overlooked technique for decreasing the fuel consumption of heavy-duty vehicles. The above two researchers have looked into a cost-cutting techniques related to the fuel savings generated by the drivers. In addition to that, European Commission (2014) has discussed the drivers from another perspective. They have argued that companies might gain access to drivers demanding lower wages through a strategy called flag out – moving operations to another country. To sum up, according to researchers there are six major ways fuel costs can be reduced. In addition to that, companies can also decrease the wages their pay by flagging out operations to another country characterized by lower costs. Section 3.2.2 in the literature review will discuss each of the ways a company can decrease its major costs in more details.

Besides, decreasing costs a Swedish haulier can gain a competitive advantage by increasing the output of the business. As mentioned earlier, according to researchers, companies can do this by generating higher revenue streams. In the road haulage market companies can increase their revenue streams by improving the fill rates, in other words if their trucks are always travelling full or close to full capacity. Output side can be increased not only if there is more loads transported but also if the price is modified. However, companies in this industry cannot increase the price they charge. This is the case because in the road haulage market quality is standard and the hauliers are price takers rather than price setters, so it is not possible to charge more for their services (AECOM & European Commission, 2014). So, it is evident that the higher revenue can only be generated through utilizing the capacity of the trucks in a better way.

Having laid out the important information about the specific industry and having laid out the general theoretical foundations it is important now to get into specifics and to
discuss how a Swedish road haulage company can compete successfully in such market. The short answer suggested by literature is by improving its operational efficiency. However, there are many aspects related to improving the operational efficiency when it is used in a specific road haulage environment. In other words, it is not enough to discuss operational efficiency in a general perspective and then to conclude that the Swedish companies need to increase their output or decrease their input. It is important to break these terms and understand the specific factors that affect costs and revenues in the specific environment. For this reason next sections will discuss how the companies can decrease their costs or increase their revenues by paying close attention to one or more of these factors. However, before doing that we need to be aware of the outputs (revenues) and inputs (costs) in the specific environment. So, the initial step is to further discuss the environment and describe the main costs and revenues a typical Swedish road haulage company is having.

3.2.1 Outputs – Revenues, Profit
A typical long haulage truck generates approximately SEK 2.5 million per year in Sweden. The haulage rate in Sweden varies but it is typically between 95-100 SEK per kilometer when the trip is performed by a Swedish truck. In comparison, Bulgarian or Romanian truck can transport goods in Sweden for 35-70 SEK per kilometer. This again illustrates the disadvantageous position of the Swedish hauliers (U., Langberg, personal communication, April 20, 2016). In general, an international haulier operating in a domestic market usually transports the goods much cheaper. In addition to that, it can be identified that the size of the supply chain also affects what the haulage rates will be. The shorter the supply chain is, the lower the rates usually are (AECOM & European Commission, 2014).

The typical profit margins in the European road haulage industry vary between 0% and 10% (AECOM & European Commission, 2014). Negative margins are also not uncommon in the industry. Usually, the rates for domestic haulage are higher than the rates for international haulage. This is the case, because often in international haulage it is much easier for companies to find backloads, whereas in domestic haulage the rate should incorporate a component allowing them to cover some of their back-trip expenses if a load is not found (AECOM & European Commission, 2014).
Above, we touched upon the supply chain and argued that it also affects the haulage rates. In road haulage the supply chain is complex. At the top of the supply chain sit the customers. They are willing to pay for transportation services. Below them, usually sit intermediaries. These intermediaries could be 3PL, 4PL or freight forwarders. The customers direct their transport requirements to such intermediaries. In turn, the intermediaries direct the transport requirement to the hauliers. In some cases customers might work directly with hauliers but this is not often the case. In addition to that, hauliers might be vertically integrated and work also as intermediaries but this is also not common (AECOM and European Commission, 2014).

Having explained the structure in the market it is now important to look into the general characteristics of European hauliers. First, in Europe the number of road haulage companies is huge and there is a strong competition between them (AECOM & European Commission, 2014). According to AECOM & European Commission (2014) only 2% of the haulage companies have more than 20 employees. In Sweden for example, the average company size is 4 employees. This is illustrated in the figure below.

Figure 4 – Average road haulage company size in Europe

Partly because of the large number of small companies in the market, the haulage companies are price takers rather than price setters. In other words, haulage companies operating in this market cannot control the price they charge. For this reasons, it is safe to assume that the room for improvement through increasing the outputs (revenues) is not big. Similarly to this argument European Commission (2014) argues that “Cost levels are one of the key factors determining competitiveness in the road haulage sector.” (European Commission, 2014, p.10). According to European Commission (2006) companies have attempted different techniques to reduce operational costs. Some of these techniques include reducing empty running, buying cheaper fuel or outsourcing work which is not profitable. It is now important to look into each of these elements and beyond that. The next sections will present what are the major costs (inputs) of haulage companies and how a haulage company can decrease them.

3.2.2 Inputs (Costs)

The major costs a haulier incurs can be divided on three main categories – fuel (consumption and taxes), drivers (salaries, training and social charges), and other (tires, maintenance, etc.) (AECOM & European Commission, 2014).

First, in Europe fuel usually amounts to 26% - 38% of all costs a haulier have (AECOM & European Commission, 2014). However, it is important to identify that the fuel expenses can vary depending on whether the transport is long or short haulage. Usually, long haulage transport consumes less fuel. In Sweden, as of 2016, the fuel costs amount to about 25% of the overall expenses a company has (U., Langberg, personal communication, April 20, 2016).

In Europe usually the fuel prices fluctuate. The risk of price increases of fuel is usually taken by the haulier itself according to AECOM and European Commission (2014). Contrary to that, U. Langberg argues that in Sweden usually the contracts incorporate a fuel clause which allows the hauliers a potential fuel price increase to the intermediaries. This might suggest that hauliers operating in Sweden are in a better position to hauliers operating in Denmark, France, Poland and other countries included in the AECOM and European Commission (2014) study.

The most common type of fuel which is used to power the long haulage trucks in Sweden is diesel. This is illustrated in the table below. It is interesting that the new
As we identified above, diesel trucks dominate the market. According to European Commission (2016) diesel prices have fallen during the last year. In addition to that, they argue that Sweden have the highest diesel price per liter among all EU members. This is illustrated in the figure below.

Table 3 - Types of trucks in Sweden according to the source of power

<table>
<thead>
<tr>
<th>Year</th>
<th>Gasoline</th>
<th>Diesel</th>
<th>Biodiesel</th>
<th>Electric</th>
<th>Hybrids</th>
<th>Ethanol/Ethanol</th>
<th>Gas/Gas Flexi</th>
<th>Fuel</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1587</td>
<td>76750</td>
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<td>0</td>
<td>3</td>
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<td></td>
</tr>
<tr>
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<td>-</td>
<td>1</td>
<td>0</td>
<td>299</td>
<td>89</td>
<td>80165</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>1428</td>
<td>74462</td>
<td>-</td>
<td>0</td>
<td>2</td>
<td>397</td>
<td>81</td>
<td>79312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>1370</td>
<td>76355</td>
<td>-</td>
<td>0</td>
<td>2</td>
<td>403</td>
<td>72</td>
<td>78243</td>
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<td></td>
</tr>
<tr>
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<td>-</td>
<td>0</td>
<td>1</td>
<td>484</td>
<td>61</td>
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</tr>
<tr>
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<td>-</td>
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<tr>
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<td>-</td>
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<td>23</td>
<td>805</td>
<td>30</td>
<td>80346</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Gasoline - Gasolinedriven vehicle which has only one type of fuel.
Diesel - Dieaseldriven vehicle which has only one type of fuel.
Electric - Electricdriven vehicle which has only electricity as source of power.
Hybrids - Vehicles which have electricity in combination with other source of power.
Ethanol - Vehicles which have ethanol as its first or second fuel.
Gas/Gas Flexi Fuel - Vehicles which have natural gas, biogas, or methane gas as its first or second source of power.

Figure 5 – Diesel Prices in Europe as of October 2016


The figure shows that the price per liter in Sweden is EUR 1.36 as of 10.10.2016. The reason for this is that according to Rac Foundation (2014), Sweden has the second highest tax and duties on diesel fuel among all EU members. According to them, these taxes amount to 56% of the pump price. Above, we illustrated that in Sweden the fuel costs represent approximately about 25% of the expenses a long haulage company has. In addition to that, we argued that the dominant type of fuel in Sweden is diesel but that an increase in registration of trucks operating with biodiesel can also be observed.
Besides fuel expenses, the other major expense (input) hauliers have is salaries or drivers wages. In Europe, the road freight sector employed 2.95 million people in 2006 (European Commission 2015).

AECOM and European Commission study argues that “the typical proportion of driver costs as a proportion of overall operating costs is around 33%.” (AECOM & European Commission, 2014, p.64).

Figure 6 below illustrates that the actual percentages do vary depending on the country where the company is registered. However, it clearly shows that there is big discrepancy between country like Poland and country like Denmark. This further strengthens the argument that companies operating in Scandinavia are in disadvantaged position in the market compared to companies based in other European countries. This is clearly stated by AECOM and European Commission: “Hauliers from countries with high labour costs are at a competitive disadvantage in this market” (AECOM & European Commission, 2014a, p.71)

In Sweden specifically, the road haulage market employed about 78000 people (European Commission 2015) or approximately 30% of the employment in all transport modes.

In Sweden the drivers’ costs as a percentage of the overall expenses amount to 41%-43% (U., Langberg, personal communication, April 20, 2016) There is no minimum wage but a typical wage in the industry is SEK 311 832 which is also set as a collective
agreement. In addition to that, the company needs to pay SEK 114 566 in tax on this wage (U., Langberg, personal communication, April 20, 2016). The wage information usually is highly confidential, so it is not easy to make a comparison of how much money a company save if it moves operations to another country characterized by low costs. In addition to that, according to AECOM & European Commission, sometimes the actual salaries paid to drivers in Eastern European countries do not correspond to the wage registered which makes this endeavor even more difficult.

Besides the two major costs – fuel and drivers, there are other costs related to finance, maintenance and tires. The taxation of wages and fuel was discussed in the respective sections. In addition to that, approximately SEK 11000 is the tax per heavy-duty vehicle for using the Swedish road infrastructure (U., Langberg, personal communication, April 20, 2016). Besides that there are other expenses related to maintenance and tires. However, given that the average turnover generated per Swedish truck is SEK 2.5 million these expenses are negligible and are unlikely to provide opportunity for substantial improvement in costs, thus in competitive advantage.

Above, we first identified the output factors in the road haulage industry. Then, we argued that because of the fact that hauliers are price takers and the services provided are standardized the output factor cannot be improved and higher revenue cannot be earned if the load which is transported is not more. Then, we moved on to discuss the major costs a haulier has.

The next section will further look into the major costs and analyze opportunities of how these costs (inputs) can be lowered in order for a Swedish company to improve the input factor of its operational efficiency and stay competitive on the market. The section will look into areas like biodiesel trucks, flexi-fuel trucks, aerodynamic equipment, heavier vehicles, rolling-resistance tires, drivers behavior, flag-out strategy, etc. Overall, the section will focus on identifying opportunities for minimizing the two major costs – fuel and drivers.

### 3.3 Minimizing the major costs (inputs)

One of the ways to improve the operational efficiency and gain competitive advantage is by minimizing the costs. The major costs haulage companies have are fuel and
drivers. So, lowering either of these costs will affect the operational efficiency positively.

When fuel is used to power a vehicle not all of the fuel that is consumed by it goes for the actual moving of the vehicle. All the time different energy losses occur. Figure 7 below illustrates these losses. Minimizing these losses would result in lowering fuel consumption. These losses can be minimized by different players in the supply chain. Some of them are completely optimized by the truck manufacturer thus there is nothing left for the haulier to improve. Others are not fully optimized in the manufacturing process and could be modified and further improved by the hauliers or the drivers.

Figure 7 – Energy Losses


In addition to that, besides areas where the energy losses occur the figure also shows that there are differences between energy losses in urban driving and in interstate (highway driving). Highway driving is characterized by much higher speeds. In Sweden, the speed limit for highway driving for a truck with attached trailer is 80km/h (Swedish Transport Agency, 2015).

As seen from the figure, in interstate or highway driving the major energy losses stem from the engine, the aerodynamics and the rolling resistance tires. This means that these are the three areas which if modified can generate substantial fuel savings.
3.3.1 Power alternatives
As we have shown earlier – 97% of all heavy-duty vehicles in Sweden are equipped with diesel engine (SCB, 2016).
SCB (2016) also estimates that the number of vehicles operating using flexi fuel or gaseous types is extremely small. The major types of gaseous fuel are methane and propane, while flexi fuels are a combination of diesel and methane or propane. However, it is very important to assess whether the usage of these fuel types are going to positively affect the fuel costs of haulage companies.
Propane is a type of gaseous fuel which is a by-product of crude oil refining or the processing of natural gas. The fuel is less energy efficient than diesel (National Research Council, 2014). This means that less of the fuel’s energy is transferred into motion energy. The advantage of this type of fuel is that it is cheaper than diesel and gasoline. However, it is not environmental friendly and in fact when considering the full supply chain it is considered worse for the environment than diesel (National Research Council, 2014). In addition to that, the fuel requires the use of special equipment on the vehicles which has substantial cost. Given the strict environment restrictions imposed in the EU and the Swedish Environmental Agency and the substantial investment required it is unlikely that this type of fuel can be a sustainable solution for companies willing to minimize their costs and the usage of this fuel in future will likely not increase.
Another alternative power type is methane. Unlike propane, it is less energy efficient than diesel. According to Delgado and Muncrief (2015), methane is 10% less energy efficient than diesel. In addition to that, this estimation is based on light weight vehicles. Gibson, Krishnan Polk, Shoemaker and Srinivasan (2011) argue that in heavy duty vehicles the efficiency will further decrease. Despite this disadvantage the fuel is more environmental friendly than propane and its usage will likely not going to be restricted by the environmental agencies. However, “limited fueling station infrastructure, the additional cost and weight of natural gas equipment, and the need for upgraded maintenance facilities” (Delgado & Muncrief, 2015, p.9) results in a very low market penetration of this fuel.
Also, a quick look at the market offerings of such vehicles shows that the truck manufacturers are not incorporating such technology into their vehicles. Volvo FM MethaneDiesel is one example of a recent concept designed by Volvo but there is still no large scale manufacturing of such vehicles.
However, because of the environmental benefits of the fuel and the fact that it is cheaper than diesel, Delgado and Muncrief (2015) estimate that in 2025 the fuel can be used by 10% of all vehicles. We argue that given the lack of infrastructure and the lower efficiency than diesel, this prognosis might be quite optimistic. However, it is clear that regardless of how the usage of methane fuels will develop in future, for companies willing to operate their heavy-duty vehicles with this fuel it is still practically impossible at this point of time.

Alternatively, companies can choose to power their vehicles with biodiesel or ethanol. Table 4 below shows all types of biofuels which are used in Sweden.

Table 4 – Transport Biofuels in Sweden

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Fuel Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>E5, E85, ED95, ETBE</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>B5, B100, RME, FAME, HVO</td>
</tr>
<tr>
<td>CNG</td>
<td>Collective name for methane gases: biogas, natural gas and mixtures thereof</td>
</tr>
<tr>
<td>Liquid biofuels</td>
<td>Biological oils: Rapeseed oil, palm oil, tall oil, waste oils, MFA, LBG</td>
</tr>
<tr>
<td>Other gaseous transport biofuels</td>
<td>DME</td>
</tr>
</tbody>
</table>


Out of these types of fuel HVO is compatible with the current diesel engines and can be used without the need of any modification of the engine. Biodiesel is environmentally friendly and for this reason Sweden promotes the usage of these fuels through a tax relief. All biodiesel fuels are exempt from carbon dioxide tax. The tax reliefs aim to make the fuel prices competitive to diesel (Swedish Energy Agency, 2015). HVO for example has the same energy efficiency to diesel according to Aatola, Larmi, Sarjovaara and Mikkonen (2008).
All this means that biodiesel types like HVO are viable option for hauliers willing to be environmentally friendly. However, currently HVO fuel does not provide any efficiency benefits and its price is slightly higher than the diesel price (Aatola, Larmi, Sarjovaara & Mikkonen, 2008). This means that if companies switch and start using HVO and Sweden stops subsidizing the fuel, the companies will have to pay more and will not be able to decrease their costs.

Another option for hauliers willing to decrease their costs by using different source of power is the electric power. SCB (2016) estimates that there are 23 hybrid vehicles running on electric power and fuel in Sweden. This means that percentagewise these vehicles are 0.028% of all vehicles in Sweden according to SCB (2016). This clearly shows that the technology is still not developed enough to allow hauliers to change their fleet and use hybrid vehicles. In addition to that, according to SCB (2016) fully electric trucks are practically non-existent in Sweden at this point in time. This suggests that technological concerns are preventing these vehicles to penetrate the market. Moreover, even if the technology develops in the near future it is likely that these vehicles would be very expensive in the beginning.

Overall, biodiesel fuels like HVO is a viable power alternative for hauliers at this point of time because no engine modification is necessary. In addition to that, HVO price and efficiency is quite similar to those of diesel. Also, methane is another option which can help hauliers pay less for fuel. However, developing a methane infrastructure is expensive and even more importantly methane is less efficient than diesel.

3.3.2 Swedish types of vehicles

Fuel consumption can be optimized also by transporting more goods at the same time. This means that less trips would need to be made to move the same amount of load. Unfortunately, maximum weight and length limits are set by law. These limits cannot be breached. In other words, carriers cannot overload their trucks (Swedish Road Administration, 2008).

In Sweden and Finland, the weight and length restrictions are different than in the rest of EU 28. Figure 8 below compares the Swedish and Finnish length restrictions to these in the other EU countries.
As seen from the figure, in Sweden and Finland, the maximum length of the load allowed is 7.82 longer than in the other European Countries. The reason for this is that when directive 96/53EC was adopted, the Swedish and the Finnish transport ministers did not agree to the limitations it imposes and did not restrict the use of longer and heavier vehicles on their territories. Longer or modular vehicles are 25.25 meters long, whereas a typical length restriction in EU is 18.75 meters. A modular combination can transport 52 pallets, whereas a typical EU truck can transport only 33 pallets (TFK, 2007).

The fact that modular vehicles are allowed only in Sweden and Finland and that those vehicles are allowed to transport loads in a maximum of one neighboring country means that in that regard Swedish hauliers are in advantageous position. The heavier the vehicle is the more fuel it consumes. However, the heavier the vehicle is, the more goods it can transport and the total fuel consumption per goods transported is lower.

On the other hand, some belief that there is a tradeoff and that this advantage of transporting more goods at the same time does not come without costs. In particular, the European Commission (2014) argues that longer and heavier vehicles might compromise traffic safety. However, a study of Swedish Road Administration (2008) shows that longer vehicles do not seem to compromise traffic safety.

Given that the permitted length in Sweden is higher than in the rest of the EU it is obvious that also the weight restrictions are less strict too. However, these restrictions
are not straightforward and depend on the number of axles, the distance between the axles and on where the load is positioned. Usually, for a regular European composition the load limitation is 40 tonnes, whereas for a modular composition the maximum allowed length is 64 tonnes (H., Cassepiere, personal communication, April 21, 2016).

The paragraphs above discussed dimensional restrictions in Sweden. However, it is important to identify that in some cases exceptions for these restrictions are allowed. One of these cases is when using aerodynamic equipment. Companies can use such equipment but they need to obtain a special permit (H., Cassepiere, personal communication, April 21, 2016). The next section will discuss how using aerodynamic equipment can affect fuel consumption.

### 3.3.3 Aerodynamic Equipment

Aerodynamic equipment can lower the fuel consumption by reducing the drag and streamlining the airflow around the truck and the trailer. According to Platform for Aerodynamic Road Transport (2016) at 80km/h about 40% of the engine power is used to overcome the drag. This means that in high speeds, the potential fuel savings from more aerodynamic compositions are huge.

Figure 7 showed that 15%-22% of all energy losses on a highway driving occur because of the vehicle design. Figure 9 below again shows this issue. In addition to that it illustrates the specific areas for vehicle design improvement.

![Figure 9 – Aerodynamic Improvements](image)


National Academy of Sciences (2010) argues that efficiency benefits from aerodynamic designs increase the higher the speed is. The above figure estimations are based on
104km/h. In Sweden, the speed limit is 80km/h. This means that the aerodynamic losses in Sweden are lower and thus the benefit of improving the aerodynamic design are lower. However, Mohamed-Kassim and Filippone (2010) argue that even in lower highway speeds there are substantial benefits of aerodynamics. So, companies focusing on long haulage and having a lot of heavy-duty trucks operating on highways and not small urban trucks for urban distribution can benefit from improving the aerodynamics of their vehicles.

From the figure above we can see that benefits can be achieved from both – better aerodynamics of the tractor/truck and better aerodynamics of the trailer. Specifically, the figure shows that aerodynamic losses can be minimized if The Trailer Base Faring, Trailer Skirt, Tractor-Trailer Gap, and Tractor Aero Details are improved. In addition to that, National Academy of Sciences (2010) has estimated that the benefits of a better aerodynamic design are additive. This means that companies can benefit from incorporating a number of components improving the design of the vehicle.

Figure 10 below illustrates the opportunities for improving the tractor aerodynamic design.

Figure 10 – Tractor Aerodynamic Components

As seen from the figure, there are seven elements which can be incorporated in a tractor in order to improve the flow of air and reduce the drag. However, it is important to state that nowadays the aerodynamic design of the tractors is optimized by the manufacturer. Companies selling trucks have most of the elements pre-fitted onto their cabins (Platform for Aerodynamic Road Transport, 2016). Roof fairing and cab extenders are two components which are not necessarily preinstalled on the trucks (Mohamed-Kassim & Filippone, 2010). However, most of the manufacturers also install roof fairings on their trucks. The implications of that, is that a haulier cannot improve its fuel consumption by modifying the cab because it is already optimized to a large extend by the truck manufacturers. The only areas which the haulier can improve are the cab extenders and the roof fairing in case they are not preinstalled by the manufacturer of the tractor.

Another, even more crucial area that can reduce the fuel consumption is the trailer design. *While streamlining of the cab is important, around 85 per cent of the potential fuel savings from improved aerodynamics come from the trailer design.*” (McKinnon et. al., 2012, p.241).

Figure 9 showed that the major opportunities for improving the design of the trailer lies in the trailer skirt, the trailer base fairings and the tractor trailer gap. Out of the three areas the tractor trailer gap seems to be the least important one. Unlike the truck manufacturers, the European trailer manufacturers like Kögel, Krone and Shmitz Cargobull have not incorporated any elements improving the aerodynamics of their trailers. The trailers design is still just a rectangular box which creates drag and affects the fuel consumption negatively.

The fact that aerodynamic elements are not preinstalled by the trailer manufacturers creates an opportunity for hauliers to retrofit these elements themselves and gain competitive advantage over hauliers which do not have these elements on their trailers. In order to do that, hauliers need to approach companies producing trailer aerodynamic equipment like Ridge Corporation or STEMCO or other similar companies (Ridge Corporation, 2016; STEMCO, 2016).

These companies offer products that address all three areas where efficiency losses occur - skirt, the trailer base fairings and the tractor trailer gap.
However, according to Mohamed-Kassim and Filippone (2010) these benefits from aerodynamic equipment on the trailers do not come without a cost. The researchers argue that there are practical concerns with these items. In particular, they state that operational and maintenance costs might increase.

Contrary to that, the National Academy of Sciences has estimated that there are no maintenance or operational costs that come from the usage of such equipment. Their findings are summarized in the table below. It can be clearly seen that aerodynamics lead to no increase in the cost per mile according to them.

Table 5 – Incremental Operations and Maintenance - Costs

<table>
<thead>
<tr>
<th>Technology</th>
<th>Cost per Mile ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerodynamics</td>
<td>No increase</td>
</tr>
<tr>
<td>Single wide tires and advanced lubricants</td>
<td>0.0040</td>
</tr>
<tr>
<td>Hybrid power train</td>
<td>0.0060</td>
</tr>
<tr>
<td>Turbocompounding</td>
<td>0.0003-0.0007</td>
</tr>
<tr>
<td>Bottoming cycle</td>
<td>0.0030</td>
</tr>
</tbody>
</table>


In addition to that, it is important to note that trailer aerodynamic equipment is not widely adopted in the EU. There could be different reasons for that but Mohamed-Kassim and Filippone (2010) bring forward three reasons. First, they argue that using aerodynamic equipment can diminish safety. However, they fail to explain how particularly, sideskirts or trailer base fairings will diminish the safety. In fact some of the manufacturers of the equipment like STEMCO argue that the equipment improves safety because it reduces the spray from the tires, improves stability in windy conditions and retracts automatically in case of collision (STEMCO, 2016). Another reason for the slow adoption the researchers bring forward is the traffic regulations. This is a valid argument and as we have discussed earlier companies need to be careful to obtain all the special permits necessary for using trailer aerodynamic equipment which increases the dimensions of the trailer.

In any case, the slow adoption rate of trailer aerodynamic equipment and the fact that the EU trailer manufacturers have not incorporated aerodynamic design of their trailers...
creates an opportunity for hauliers to retrofit such components on their trailers and gain competitive advantage.

### 3.3.4 Rolling Resistance Tires

The tires of the truck and the trailer also affect the fuel consumption. The reason for that is the rolling resistance they create (Hammarström, Eriksson, Karlsson & Yahya, 2012; Schuring, 1994). The figure below illustrates this idea – when a vehicle is moving, the tires resists its movement to some extent.

![Figure 11 – Rolling Resistance](image)


Siltanen (2010) argues that about 25% of the fuel goes to overcome the tires rolling resistance which is created. Also, he argues that the rolling resistance is determined by the weight of the vehicle and not by the speed like the aerodynamic drag. This means that carefully choosing the right tires can result in savings especially in a country like Sweden where heavier vehicles are allowed to operate.

The tire rolling resistance can be lowered if any of the following aspects is considered:

- “use of different materials;
- use of tread patterns and geometries that reduce the deformation of the tire;
- use of wider single tires instead of dual-tire assemblies; and
- keeping tires inflated to the proper pressure, as defined by the tire manufacturer (manually or through automated means).” (M.J. Bradley & Associates LLC, 2012, p.19)
It is evident that the haulier has no control over the first two aspects. They are determined by the tire manufacturer. However, the haulier can choose whether they want to use wider single tires and can control the pressure in the tires.

Wider single tires are considered better for fuel economy but slightly riskier in case an incident with blown tire happens (Robert J. Reeves P.C., 2016)

In addition to using wider single tires, the haulier should monitor the inflation pressure in the tires and make sure they are properly inflated. According to Siltanen (2010), 10% under inflation can lead to a 1% worse fuel economy.

Another option the companies have is to use retreated tires. The retreated tires are cheaper than the new tires and have lower rolling resistance. However, Stilanen (2010) notes that there is a tradeoff between rolling resistance and safety. So, companies should not just choose the tires which have the less rolling resistance. In fact he argues that on the driving axles companies need to have tires with a good grip. In addition to that in his opinion, the trailer should also have tires with good grip on the first, third and fourth axles.

As evident above, hauliers should pay careful attention to the tires they use, to the inflation pressure in the tires and also to the allocation of the tires on the different axles.

The fuel savings generated by the tires are substantial as mentioned earlier. Some companies have tried to estimate these savings but as we have discussed there are different factors influencing the fuel consumption and these estimations vary. One estimation by Oakridge National Laboratory (2008) argues that choosing the right tires, monitoring their pressure and allocating them properly can result in 9% fuel savings.

**3.3.5 Drivers Behavior**

Barkenbus (2010) argues that fuel consumption is affected also by the driving style and not solely by vehicle specifications.

A strategy which has become more popular recently is Eco-driving. Eco-driving is associated with servicing the vehicle regularly; planning to avoid road works and congestion; avoiding unnecessary weight; minimizing the use of air conditioning; minimizing unnecessary engine idling; smooth acceleration; obeying speed limitations; changing gears below 2500rpm; avoiding stop and go driving; using the engine break
and reviewing the driving data to see how the driving style can be improved (Wengraf, 2012).

As seen above, Eco-driving is a large concept which consists of a lot of components. However, according to Barkenbus (2010) companies are still not using the strategy to its full potential. One reason for that in his opinion is “The question of how much energy can be saved realistically through eco-driving is still subject to debate” (Barkenbus, 2010, p.764).

This means that it is not clear for companies how much fuel they can save using this strategy and the same time eco-driving is a strategy that needs to be communicated to the drivers. The drivers need to be educated which is associated with costs. This might explain why the strategy is still not widely adopted. As clearly illustrated by the figure below, the savings estimations range between 2% and 35% depending on the study.

*Figure 12 – Eco-driving Savings Estimations*

<table>
<thead>
<tr>
<th>Study/Project</th>
<th>Savings in Fuel Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barth and Boriboonsma (2009)</td>
<td>10–20%</td>
</tr>
<tr>
<td>Thö (2006)</td>
<td>7% (for petrol), 8% to 10% (for diesel)</td>
</tr>
<tr>
<td>Fiat eco-Drive</td>
<td>6% (top 10% of participants saved 16% or more)</td>
</tr>
<tr>
<td>ECMT/IEA (2005)</td>
<td>5% (for OECD regions, based on literature review)</td>
</tr>
<tr>
<td>Wählberg (2007)</td>
<td>2%</td>
</tr>
<tr>
<td>Zakadoulas et al. (2007)</td>
<td>4.35%</td>
</tr>
<tr>
<td>Beusen et al. (2009)</td>
<td>From 12% savings to a 3% worsening</td>
</tr>
<tr>
<td>Rowson and Young (2011)</td>
<td>20% (peak savings of 45%)</td>
</tr>
<tr>
<td>Greene (1985)</td>
<td>10% or more</td>
</tr>
<tr>
<td>Mississippi State Energy Office</td>
<td>10–15%</td>
</tr>
<tr>
<td>Caltrans</td>
<td>15%</td>
</tr>
<tr>
<td>Maryland High School driver education</td>
<td>10%</td>
</tr>
<tr>
<td>WBG SD – VW and Naturschutzbund Deutschland</td>
<td>13% (peak savings of 25%)</td>
</tr>
<tr>
<td>Mele (2008)</td>
<td>35%</td>
</tr>
<tr>
<td>Bragg/FuelClinic.com (2009)</td>
<td>5.23%</td>
</tr>
<tr>
<td>Beusen and Denys (2008)</td>
<td>From 7.3% savings to 1.7% worsening</td>
</tr>
<tr>
<td>Taniguchi (2007)</td>
<td>20%</td>
</tr>
<tr>
<td>Onoda (2009)</td>
<td>5–15%</td>
</tr>
<tr>
<td>Saynor (Ford Motor Company) (2008)</td>
<td>24%</td>
</tr>
<tr>
<td>Henning (Ford of Europe) (2008)</td>
<td>20.65–26.1%</td>
</tr>
<tr>
<td>Quality Alliance Eco-Drive</td>
<td>11.7–21%</td>
</tr>
<tr>
<td>SAFED, DIY</td>
<td>2–12%</td>
</tr>
<tr>
<td>Driving Standards Agency, UK</td>
<td>8.5%</td>
</tr>
<tr>
<td>Hamburger Wasserwerke, Germany</td>
<td>5.8%</td>
</tr>
<tr>
<td>Dutch Consumer Organisation</td>
<td>7%</td>
</tr>
</tbody>
</table>


### 3.3.6 Moving operations/ Flag out

Besides minimizing the fuel consumption, companies have the possibility to tackle their other major costs – drivers salaries and taxes. As we have identified earlier in Sweden there is a collective agreement on the drivers salaries and companies need to pay it in
order to retain a good image. So, it is not possible for companies willing to lower their drivers wages to do that without trouble in Sweden. However, companies have another option – they can choose a strategy called flag out. Flag out is associated with establishing a subsidiary in another lower cost country (Dieplinger, Furst & Lenzbauer, 2010). According to Dieplinger, Furst and Lenzbauer (2010) this strategy is often used by companies willing to take advantage of salary and tax differences between two countries.

However, AECOM and European Commission (2014) argue that the flag out strategy is not easily accessible to small hauliers which dominate the EU road haulage market because of the fact that it is associated with high costs. According to them, companies owning more than 20 vehicles can afford to undertake this strategy. In addition to that, they argue that other reasons besides utilizing cheaper labour are related to paying less corporate tax, not paying road taxes, cheaper insurance and maintenance.

However, there are important disadvantages of this strategy. Moving operations to another country in order to pursue cheaper labour is considered social dumping. This can damage a reputation of a company pursuing such strategy.

### 3.4 Summary

In this section we identified that companies in the Scandinavian road haulage market are in disadvantageous position because of the high costs they have. The section identified and discussed different methods these companies can use in order to improve their competitiveness. In particular, the section discussed issues like power alternatives, heavier vehicles, aerodynamics, rolling resistance tires, eco-driving and moving operations to another country. In addition to that, the section also identified that Swedish hauliers focus heavily on domestic transport in order to take advantage of the larger vehicles they can use.

### 4. Empirical Findings

This section will summarize the primary data which is gathered from the companies. The section will first discuss the data gathered from Wirens Akeri and then it will move on and discuss the data gathered from EA Akeri.
4.1 Wirens Akeri Findings

Wirens Akeri is a Swedish company working in the road haulage industry. The company is based in Kristinehamn, Sweden and was started in 1946 by Henrik Wiren – grandfather of Joakim Wiren (J., Wiren, personal communication, November 28, 2016). The company started by providing transport services for the farmers in the region. Nowadays, Wirens Akeri’s major customer is DHL. Wirens Akeri have a number of trucks operating for DHL in the middle and southern part of Sweden. Around 60% of Wirens Akeri’s turnover is generated by services to DHL. The company currently has 65-70 vehicles. Most of these vehicles are used for regular non-temperature sensitive long haulage transport. Five of the vehicles have cooling system for temperature transport and five vehicles are smaller used for urban distribution. Another major customer they have is Volvo Construction Equipment and when supplying this customer with the products, Wirens Akeri uses trailers which are custom build for this traffic (J., Wiren, personal communication, November 28, 2016). More specifically, these trailers have double floor and are 18 meters long. Overall, about 55 of the vehicles Wirens Akeri has are regular heavy-duty vehicles of the Swedish type – 25.25 meters (J., Wiren, personal communication, November 28, 2016). The trucking fleet the company owns consists almost completely of Volvo and Scania. The average turnover a truck generates per year is from SEK2million to SEK 2.5million. When asked about the average profit margin in the transport industry in Sweden, Joakim Wiren stated that it is “ridiculously low” and argued that it is around 2% and 4%. He continued by mentioning that his company’s core business is also earning very low profit margin close to this average. The biggest costs the company has are salaries and fuel. They amount to 35%-40% for salaries and more than 30% for fuel according to Joakim Wiren.

Regarding finding loads, Joakim Wiren mentioned that even though the company has some regular big customers they still need to find loads and work with that every day. He specified that they are always working on finding loads from one pallet to full loads. In order to find loads Wirens Akeri works closely with DHL but uses also the services of other smaller logistics companies to search for loads. When asked whether he thinks it is sometimes problematic to find loads, Joakim Wiren mentioned that this can happen quite often. He continued by elaborating that usually in one direction loads can be found but in the other direction after the truck unloads it might be quite difficult. He gave an
example by stating the when working with transport to areas near Stockholm, Göteborg and Malmö there is a lot of demand for transport to these areas but then the demand for transport back to other parts of Sweden is much smaller and the truck might travel without being at full loading capacity. Then, Joakim Wiren continued and stated that finding loads in both directions “... is a big challenge for us” (J., Wiren, personal communication, November 28, 2016). In addition to that, he mentioned that sometimes the company has to take a load that will not be very profitable for them just to have something to transport and not to travel completely empty.

In addition to that, Joakim Wiren mentioned that the company also owns a terminal building where they unload and load and optimize the loads. He stated “As it is for us it (ed. the terminal building) is a must. We should not have been able to maintain the business as we drive it today if we haven’t had the terminal”

Besides being a member of the DHL network and owning a terminal in order to optimize loads, Wirens Akeri also participate in the Sveriges Åkeriföretag but Joakim Wiren mentioned that this does not have any relation to finding loads and that Sveriges Åkeriföretag is a lobbying organization that helps directing the politicians in the right direction. When asked to discuss the political and regulatory perspective and to state whether in his opinion Swedish hauliers are in disadvantageous position on this market Joakim Wiren mentioned that the situation is even worse than what is portrayed by the press and the media. He mentioned that he believes that the differences between hauliers in different countries should not be as substantial as they are currently. But he believes that even if the rules protecting local hauliers get stricter probably the situation will be the same because in his opinion the measures to enforce these rules and make companies follow them are not in place currently. He continued by mentioning that Swedish companies cannot compete with salaries in other countries in Eastern Europe for example because in these countries the salaries are only 1/3 of what Swedish companies are paying. Later during the interview, he elaborated and stated that his company is paying the salaries which are set in the collective agreement of the Swedish transport companies.

Joakim Wiren continued by explaining that they need to accept this and try to compete in other ways like being as effective as they can be with their vehicles and equipment and relying on close customer contact and quality. If they are not trying to work on these factors Joakim Wiren stated “Then, we don’t stand a chance to compete with low-
In addition to that when asked, Joakim Wiren mentioned that most of the contracts they have incorporate fuel clauses allowing them to recover the extra costs. When discussing the power alternatives, Joakim Wiren mentioned that his company uses only diesel engines. When asked about the type of fuel they use, Joakim Wiren mentioned that the fuel they use is mostly diesel but a few months ago they started also using HVO because currently there is a slight price advantage over diesel and not just environmental advantage. The reason for this price advantage in his opinion is the government subsidies which are going to continue until the middle of 2017. In addition to that, Joakim Wiren mentioned that the fuel economy of HVO and diesel is almost exactly the same. In addition to that he argued that HVO does not require any modifications of the standard diesel engines and that this is a big advantage of this fuel. When asked about aerodynamic equipment, Joakim Wiren mentioned that they are not using anything that does not come standard. Specifically, he mentioned that they use rooftop spoilers. He continued by explaining that they do not use any sideskirts or any other components that does not come pre-fitted onto the trucks or trailers. Then, when asked about trailers on the backdoors of the trailer he mentioned that if the right sort of equipment which is easy to operate is found they can use such equipment. When asked about the tires of the truck Joakim Wiren stated that they affect the fuel consumption but specifically he stated the the inflation pressure is even more important: “having the right tire pressure and monitoring the tire pressure so that you can have the right pressure” (J., Wiren, personal communication, November 28, 2016). In addition to that, Joakim Wiren made it clear that the company is considering also the tire allocation. He mentioned that retreated tires are used but not on the steering and the driving axles. Also, regarding the usage of wide single tires or dual tires assembly, Joakim Wiren mentioned “Now, it is mostly single tires but we have both” (J., Wiren, personal communication, November 28, 2016).

When discussing drivers’ training, Joakim Wiren mentioned that the drivers have had external eco-driving training but that the company does not have internal own training methods. He continued by saying that they are planning also to have internal training because he believes that the drivers can affect the fuel consumption substantially. In addition to that, Joakim Wiren mentioned that they can track how the driver is affecting
the fuel consumption through equipment installed in every truck by a supplier called Vehco.

4.2 EA Akeri Findings

EA Akeri has been established in 1951 (EA Akeri, 2016). It currently has 57 trucks and 65 trailers (S., Nyman, personal communication, November 29, 2016). The trucking fleet consists mostly of Volvo FH. In addition to these trucks, the company also owns Scania trucks and one Mercedes truck. A major customer is Arla and the company does temperature transport for it (EA Akeri, 2016). Most of the trailers the company owns are optimized for temperature transport and use Thermo King refrigerator units. All of the vehicles the company owns are heavy-duty vehicles because of the customers the company serves (S., Nyman, personal communication, November 29, 2016). The trucks are mostly used for long distance distribution of food according to Stefan Nyman. The transport the company does is entirely domestic transport. For the last ten years the company has experience big growth. The number of employees has doubled and the number of trucks has increased from 40 to 57 according to Stefan Nyman. The average profit margin of EA Akeri according to Stefan Nyman is 5% which is slightly higher than what Wirens Akeri is earning. The average turnover per truck is SEK 3 million which is also higher than the SEK 2 million – SEK 2.5 million which Wirens Akeri is earning. This is likely a result of the fact that EA Akeri is transporting temperature sensitive goods/food. However, another reason could be that EA Akeri are finding and transporting more loads.

To elaborate regarding finding loads, similarly to what Joakim Wiren has mentioned EA Akeri also have a problem to always find loads. However, Stefan Nyman hinted that his company is working on this by mentioning “we measure the loads and try to find goods in both directions”.

Furthermore, Stefan Nyman stated that they keep a wide contact network with customers and other haulage companies and by collaborating with them they try to fill their trucks as much as they can and not to travel empty. Similarly, to Wirens Akeri, EA Akeri also uses terminal building to group and optimize its loads. In fact, Stefan Nyman, mentioned that the company uses two terminals – one in Skara and one in Helsingborg. However, he did not mention whether the company owns these buildings.
Besides that, Stefan Nyman stated that his company has 3-5 year contracts with some of its customers but most of the contracts are one year. Similarly, to what Joakim Wiren mentioned, the contracts of EA Akeri also have a fuel clause protecting them from fuel price increases. When asked about whether he believes Sweden is in advantageous or disadvantaged position in the road haulage market, the first thing that came up to Stefan Nyman’s mind was weight and length advantage. However, later on he mentioned that he believes some of the rules imposed by the EU are not flexible. In addition to that, he mentioned that he believes that not all rules are followed by all companies.

The engines the trucks use are only diesel engines. However, unlike Wirens Akeri, EA Akeri uses entirely HVO fuel (S., Nyman, personal communication, November 29, 2016). Furthermore, EA Akeri tries to minimize its fuel costs by close cooperation with gas stations and receiving discounts and in addition to that the company owns a 50000 liters fuel tank.

When asked the question “Why diesel engine vehicles? Do you think it is possible and feasible to utilize other types of power?”, Stefan Nyman unequivocally stated “We have not seen a competitive engine that can beat the diesel engine” (S., Nyman, personal communication, November 29, 2016).

When asked about aerodynamics, Stefan Nyman similarly to Joakim Wiren mentioned only roof top deflectors. He did not mention any other aerodynamic equipment.

When answering question about tires, Stefan Nyman clearly stated that they affect the fuel consumption “Pattern and tire pressure affects fuel consumption” (S., Nyman, personal communication, November 29, 2016). He continued by mentioning that that his company uses wider single tires which in theory lower the fuel consumption. However, he did not bring forward anything about tire allocation and hinted that the company does not use retreated tires which have lower rolling resistance for the purpose of pursuing better fuel economy: “… we need better grip in the winter so we choose a tire for the Swedish climate” (S., Nyman, personal communication, November 29, 2016).

In terms of drivers salaries Stefan Nyman has mentioned that they have a bonus system suggesting the importance of drivers’ behavior for the fuel consumption. Moreover, Stefan Nyman has mentioned that about 50% of the salary goes for vacation salary,
social fees and some trips with allowance suggesting that the taxes in Sweden are substantial. According to Stefan Nyman, drivers wages and fuel are the major costs his company has. He estimated the drivers wages to be about 43% of the overall expenses the company has, whereas the fuel to be around 25% of the overall expenses.

In addition to the drivers salaries, he has also mentioned that his company trains its drivers and that there is a yearly education which is conducted in order to educate them to drive in a more economical way. Similarly to Wirens Akeri, EA Akeri also uses the Vehco fleet management system in order to monitor how the drivers affect the fuel consumption.

5. Analysis

Wirens Akeri and EA Akeri operate in the Swedish road haulage industry. The companies do exclusively domestic transport. Operating in a domestic market and not doing international transport partly shields these companies from international competition. Even if companies are not fully protected from international competition because international low cost carriers can enter Sweden and perform cross-trade or cabotage operating entirely in one market provides another benefit for these companies.

The fact that the companies operate only in their domestic market, help them build contacts and partnerships and later leverage on these contacts.

This brings them important benefits like, discounts from fueling stations, more loads, loyal customers, long-term contracts and fuel clauses in the contracts. This suggests that being a domestic company operating in a domestic market might bring important close contacts with stakeholders. It is not clear whether a foreign company can replicate that when operating in the Swedish market but given the regulations imposed by the EU it is unlikely that such company can build close contacts unless it severely breaches the rules and decide to remain in Sweden for longer time than allowed by law.

The literature review discussed that haulage companies are price takers and the quality of transportation in this market is standardized. The empirical analysis showed that this is true. However, the researchers who has analyzed this market has not assessed whether there is any difference between the contacts which can be created by a foreign company and the contacts which can be created by a domestic company. The empirical findings suggest that companies focusing entirely on domestic transport might have the advantage of building useful contracts with different stakeholders. Then, they can use
these contacts in order to find loads or to decrease their expenses. Nowadays, both EA Akeri and Wirens Akeri rely heavily on contracts with big customers like DHL, Volvo and Arla.

The findings also suggest that in Sweden the local haulage companies can benefit greatly from having a terminal building where they can optimize loads. Such building can help the hauliers not only to optimize their loads but also to further strengthen the customer contacts. Having a terminal building brings security and flexibility and customers might be more open to use the services of a haulier which has a terminal building. In addition to that, it is not clear whether foreign hauliers can replicate that and have a place where they can optimize their loads in Sweden. However, as we have seen in the literature review, according to AECOM and European Commission (2014) in domestic transport it is more difficult to find back loads than in international transport. This means that even if foreign companies doing international transport between Sweden and another country do not have a terminal building, finding back loads might be easier for them because they travel longer distances and have exposure to more areas where goods can be loaded.

The empirical findings also showed that the Swedish companies operate in a market which is under constant cost pressure. Specifically, Joakim Wiren mentioned that in Sweden the drivers salaries they pay under the collective agreement are about 66% higher than what is paid to drivers in other European countries. In addition to that, the literature review suggested that in Sweden the fuel is among the most expensive in the European Union. So, having a long exposure to this market and operating entirely on it might allow for better contact creation but it also does not provide opportunity to take advantage of cheaper fuel or labor by operating also in other EU countries. The findings agreed with the AECOM and European Commission that fuel costs and drivers’ costs are the major costs the companies have in this industry. Joakim Wiren mentioned that more than 1/3 of their expenses go for salaries and about 1/3 go for fuel. Stefan Nyman provided similar picture and argued that about 43% of their expenses go for drivers’ wages and about 25% go for fuel. Again, the fuel and the drivers represent the biggest expenses. However, it is evident that EA Akeri pay larger share to drivers and smaller share for fuel. The likely reason for this is the fact that they have a bonus system and pay bonuses to drivers when they drive in more economical way. Nevertheless, it is
evident that both companies can increase their competitiveness and improve their operational efficiency if they lower one of their two major expenses.

The drivers’ wages these companies pay are agreed under the collective agreement in Sweden. Both these companies have access to the flag out strategy if they would like to pursue lower wages. The reason for this is that according to AECOM and European Commission the flag out strategy is accessible to companies with vehicle fleet of more than 20 and both of the companies are beyond this number. However, from the empirical findings it is clear that the companies will not undertake such strategy. Neither of the owners, mentioned that they are planning such strategy in future and given that the companies are focused entirely on the domestic market and do not have any exposure to neighboring low cost markets such strategy can be too risky.

On the other hand Joakim Wiren made it clear that his company is always trying to be as effective as possible with its equipment suggesting that a major goal for his company is to decrease costs as much as they can. Stefan Nyman similarly mentioned that the company is trying to save on fuel and showed that he is aware of all the factors impacting the fuel consumption.

Specifically, both Joakim Wiren and Stefan Nyman discussed that they think the biodiesel type – HVO provide price benefits – unlike what Aatola, Larmi, Sarjovaara and Mikkonen, (2008) has argued. However, it is important to note that Aatola, Larmi, Sarjovaara and Mikkonen’s research was conducted in 2008 and that it does not take into consideration the tax reliefs imposed by the Swedish Energy Agency. So, the reason for this differences in opinion are likely a result of the current subsidizing of HVO in Sweden. In a similar line of thought, Joakim Wiren argued that next year the price of HVO will likely go up because the Swedish government will stop subsidizing it. EA Akeri currently uses extensively HVO in their diesel engines but Wirens Akeri uses mostly diesel. Nevertheless, as mentioned earlier Wirens Akeri are also aware of the current price benefits of HVO but are remaining inactive in their choice of fuel type. This might be another explanation of why the profit margin of Wirens Akeri is slightly lower than the profit margin of EA Akeri.

Both companies are using extensively modular combinations of 25.25 meters truck and trailer. The types of trucks both companies use are mostly Volvo and Scania to transport the goods. The reason for this according to Joakim Wiren is the service network in Sweden of these trucking manufacturers. The modular combinations are a great choice
for both companies given that they are entirely focused on domestic transport. Using modular combinations allow them to transport more goods at the same time economizing on additional trips. This allows them to save fuel costs and be in a better position compared to international hauliers using the regular 18.75 European trucks and trailers.

Both companies made it clear that they are aware of the efficiency benefits of the aerodynamics during long haulage. However, both Stefan Nyman and Joakim Wiren did not discuss it in details and mentioned that their companies are using only the roof top fairing which is installed on the truck cabins by the manufacturers. The interviewees did not mention any other aerodynamic cabin elements. Specifically, they did not make it clear whether their trucks incorporate cabin extensions. However, given the fact that these extensions had become an integral part of the cabin design it is likely that the companies use such items. This means that the trucks the companies use are incorporating aerodynamic elements because the manufacturers of the trucks are prefitting them.

However, surprisingly enough both Joakim Wiren and Stefan Nyman mentioned that their trailers do not have any side skirts or trailer base fairings. Joakim Wiren said that they believe these items can raise operational concerns but said that he is open to consider items which can improve aerodynamics and do not give rise to operational costs. Given the fact that the National Academy of Sciences (2010) has argued that aerodynamic equipment is not associated with operational costs, the companies can safely test and install such items in order to further improve their fuel economy.

Wirens Akeri and EA Akeri stated that they are aware that the tires can influence the fuel consumption of the trucks. Furthermore their opinion on most issues regarding tires coalescent. For example, both interviewees agreed that the inflation pressure and the tire pattern are important. In addition to that, both researchers argued that when choosing tires they do not look solely at fuel consumption and argued that the allocation of the tires should be done so that the grip remains good for the Swedish weather. This means that both companies are aware of the tire effect on fuel consumption but are also taking into consideration safety concerns when choosing and allocating tires on the different axles similarly to what Siltanen (2010) has argued.

Regarding drivers behavior both companies emphasized that it is extremely important and that it can affect the fuel consumption substantially. The companies argued that
their drivers has gone through an Eco-driving course. In addition to that, both companies are using a vehicle fleet management system called Vehco which helps them analyze the driving styles and isolate how each driver is affecting the fuel economy of its truck.

6. Conclusion

The research pursued to find out what are the qualitative and quantitative factors impacting the profitability and competitiveness of Swedish hauliers. The theoretical framework argued that a competitive edge can be achieved if operational efficiency is improved. Furthermore, it argued that the operational efficiency can be improved if outputs (revenues) are increased or if inputs (costs) are decreased.

The analysis of the specific road haulage market found out that in such competitive market road haulage companies are price takers rather than price setters. This meant that companies cannot charge more for their services and that it is difficult to achieve better performance and improved operational efficiency from the price component in the revenue side. However, later the empirical study found out that even if the price cannot be increased, the Swedish hauliers can still optimize the revenue side by transporting more goods or increasing the quantity transported. The empirical results showed that the two researched companies rely heavily on close contacts with customers in order to fill their trucks and transport more goods. However, both companies have argued that finding backloads is often problematic as suggested by AECOM and European Commission (2014).

In other words, companies cannot control the price they charge for their services which is set by the market but they can try to optimize the amount of goods they transport in order to achieve higher revenue. However, often transporting more goods for these companies is difficult done given that backloads in domestic transport are not easily attainable.

On the input side, the research showed that the researched companies are paying close attention to their costs and are trying to minimize them in order to strengthen their competitive position. Similarly to the literature review, the results showed that fuel and drivers’ wages are the major costs haulage companies have.
Regarding fuel costs, the research showed that both companies are aware of the price benefits of the biodiesel type HVO and that they are using it. In addition to that, the research showed that both companies use the 25.25 meters modular combinations in order to decrease their overall fuel consumption. Moreover, the findings suggested that the researched companies are aware of the aerodynamic benefits but are not utilizing them to their full extend and are not using any side skirts or trailer base fairings on their trailers. Also, the research showed that the companies are paying close attention to the inflation pressure in the tires and the tire patterns because they know that these factors affects the fuel consumption. However, similarly to what Siltanen (2010) suggests when choosing tires the companies are optimizing the tire allocation so that a good fuel economy is balanced with a good grip. And finally both companies consider the drivers’ behavior and driving style as one of the most important factors in determining the fuel economy. The drivers in both companies have undergone a course called Eco-driving and in addition to that their driving style is closely monitored through a fleet management system called Vehco.

The other major cost for companies – drivers’ wages is not tackled in anyway. The companies are paying competitive salaries to their drivers based on the market where they operate. In addition to that, EA Akeri are paying an even larger percentage in salaries than the collective agreement in Sweden in order to induce drivers to driver in a more economical way. Both companies are also not considering taking advantage of cheaper labour by moving operations to another country.

Overall, Wirens Akeri and EA Akeri cannot charge higher than the market price for their services but the companies are constantly working on filling their trucks as much as possible through close contacts with customers in order to increase their revenue. In addition to that, the companies are paying close attention to the input side of their business and are constantly trying to minimize their fuel expenses.

Future researchers can focus on investigating whether the close customer contact has a positive correlation with the fill rates of the long haulage trucks. In addition to that, researchers can also investigate each of the cost-cutting methods in more details or ask the perspective of different stakeholders about how Swedish companies can remain competitive on this market.
References


Appendix

Wirens Akeri Data

Length: 34:01
Interviewer: Mario Sulev
Participant: Joakim Wiren
Date: 28.11.2016

Interviewer: Ok. So, the first questions is (...) they are going to be open ended questions so the first one is can you tell me a little bit more about your company? What you do? And since when you are established and stuff like that?
Participant: Yes, of course, I can do that. We are (...) I don’t know, have you looked at our webpage so you have som knowledge whatsoever or should I take it from the beginning?
Interviewer: I guess you can take it from the beginning but the important things – not the small things.
Participant: OK. I can take it and you tell me if it is enough. We started our business back in 1946. So, we have been established quite some time now. Was my grandfather who started the company and started with transports from the farmers and so outside of the town we operate from. And from there we have gone quite different kind of operations. As it is today, our main customer is DHL. So, we have a number of trucks operating for them in the middle and southern Sweden
Interviewer: You mentioned DHL?
Participant: Yes, they are the biggest customer for us – around 60% of our turnaround lies in DHL related traffic. I am starting my car so I need to connect the handsfree.
Interviewer: I am sorry, Joakim the connection is not good. I think the coverage is problematic. Can you try to move the phone or I do not know?
Participant: Can you hear me right now?
Interviewer: Yes.
Participant: Ok. So we try like that. Yes, as I said DHL (...) we have traffic locally here in Varmland and up from Kristianhamn and Karlstad most of our personnel is starting here. But we have traffic to the southern parts of Sweden with some exceptions on the way from here up to Stockholm and the south towns.
Interviewer: Yeah, yeah and you do a temperatured transport or you do a normal transport?
Participant: We have not very much but we have a number of trucks with temperature transport.
Interviewer: Aha, percentagewisely how much do you think you have temperature transport.
Participant: Maybe 5% not more than that.
Interviewer: Aha and how many vehicles do you currently have?
Participant: We have 5-6 trucks I think with cooling capacity.
Interviewer: And totally in your company how many trucks do you have?
Participant: Around 65 – 70.
Interviewer: Aha, and all of your vehicles they are heavy duty vehicles. I mean do you have some smaller vehicles for in-city distribution and for urban transport.
Participant: To say around 5-6 of those are smaller. All others are heavy.
Interviewer: Aha, so about 55 are heavy-duty vehicles and about 5 are temperature and about 5 are distribution in city approximately
Participant: Around that number. Yeah, and DHL are as I said our main customer and we have also quite big business for us is business together with Volvo. But it is Volvo construction equipment. We have the traffic to supply them with goods to assemble the wheel holders. So, we are having 4 or 5 trailers with special trailers which are custom build for this traffic, which are 18 meters long with double floors that you can load both up and down. So, we have heavier goods at the lower part and light goods like cabins and stuff for the wheel holders at the top.
Interviewer: Yeah, yeah I understand and about finding loads. I mean do you just work with these big customers or do you sometimes need to find loads for your trucks?
Participant: Yes, we do work with that all the time. So, we search all from one pallets up to full loads. Not so much full loads because that is not very economy.
**Interviewer:** And do you work through a specific platform or through a specific company to help you find loads or you search for loads by yourself.

**Participant:** Mostly, as I said as we are in the DHL network we get most of the small from there, but we also we work with a number of small logistics companies which know where our trucks operate and call us or mail us when they have goods that needs to be transported and we can say yes or no if we have the capacity or not.

**Interviewer:** Yeah, and does it happen sometimes your trucks not to operate with full loads? I mean do you think there is a problem to fill the full truck when doing domestic transport?

**Participant:** It can be. It is very much depending on where in the country we are looking but in certain... Say to home from Smalands for example where you are in Jonkoping there is not much goods home to where we are but in the other direction it could be more than full. So that is a bit of a problem to even the transport in one direction compared to the other and especially when we work with big cities like Goteborg, Stockholm and Malmo, there are very much goods going in one direction but almost nothing in the other. So, that is a big challenge for us.

**Interviewer:** So, percentagewise how much do you think it happens the truck not to find a backload. I mean every 2nd trip or every 3rd trip? How often do you think it is problematic to fill the truck to full capacity?

**Participant:** I am not sure that I got your question exactly right but that is of course (...). Some days it might be bigger problem than the others. It is not a very big problem for us but sometimes we have to take load that will not give us much payment just to gave something and not to go empty as you say. So, we have quite easy to find something to put on the trucks but not always the right goods if you know what I mean.

**Interviewer:** Yeah, and your goods all of them are 25.25 meters long or ?

**Participant:** Yes, 95% of our trucks if we do not count the ones I just mentioned that are for Volvo and some of the smaller ones but other than that we are 12 meter trucks + the car.

**Interviewer:** Yeah, yeah, and do you participate in any road haulage association like Alwex or like Sveriges Akeriforetag and do you think it is helpful for you or?

**Participant:** As I said we are in the DHL network. We are members of Sveriges Akeriforetag that is correct but that is more like lobying organization that helps pushing the politicians in the right direction. Not very much for our core business.

**Interviewer:** Yeah, yeah, yeah. And about the political side and the regulatory perspective – do you think Swedish hauliers are in disadvantageous position compared to other hauliers from lower cost countries. And do you think that cabotage rules are followed in Sweden or they are not followed by companeis?

**Participant:** I think if you ought to believe everything that is written in the media and the press that are related to our business, then I don’t think everything is as good as it looks. But at the same time I think we are following the same specified rules and regulations. So, I do not think that in that regard is quite even and the differences shouldn’t be that substantial as they seem to be sometimes but I think the real problem is that we don’t have the measures to follow up.

**Interviewer:** Yeah, yeah, I agree and that is actually why we are doing this research because we know that for Swedish companies it is difficult to compete with international hauliers with lower costs and it is interesting to see how Swedish hauliers improve their operations. How they decrease their costs and how they are competitive.

**Participant:** Yes, of course we cannot compete with the salaries in the Eastern European countries and so on. That is impossible. They are almost a third of what we pay our drivers. But we have to compete with other things instead like you say try to be as effective as we can with our equipment and even focus on other segments of the business that they don’t and they I mean the lower cost operators that they are not able to compete with us when it comes to quality and follow up and more demanding customers. And then we can see that this type of customers are willing to pay what we need to to maintain our business.

**Interviewer:** Aha, so you think customer contact is important because for example road haulage companies they are price takers – they take the price they don’t set the price but you think when you are in a good contact with companies in Sweden it is easier to find loads and to fill the trucks – you think it is beneficial?

**Participant:** Yes it is, of course it is. But if we just see like terminal based operations when you just go from A to B without any specific customers or contracts, then we don’t stand a chance to compete with low price operators.

**Interviewer:** But the contracts with your customers they incorporate fuel clauses? I mean if the fuel prices goes up, then who bears the risk of this increase?
Participant: For the very most part of our business we have fuel clauses on everything. So, if the prices go up we get compensation for that.
Interviewer: Yeah, yeah, that is actually normal. With all the companies I talked in Sweden – everybody does that so it is normal for Sweden. And about the fuel what type of engines do you use? Diesel engines? Or?
Participant: Yes, only diesel engines.
Interviewer: Yeah, and what type of fuel. I mean is it diesel? Or HVO? Or any other type of fuel?
Participant: Right now we use mostly diesel but since some months back we are using HVO quite much because right now we have a price advantage also – not just environment. We can buy this fuel a bit cheaper so we try to use that as much as we can right now.
Interviewer: Yeah, and do you work closely with gas stations so that you can get discounts since you are a regular customer for them?
Participant: Yes, we do that. We have quite good discounts on the prices regarding diesel and HVO.
Interviewer: Yeah, yeah, and you mentioned that HVO is currently cheaper than diesel but do you think it is good for the engines and do you think it is efficient like diesel or it is less efficient.
Participant: So far as we can see, we do not see any difference almost at all in the fuel economy – almost a little lower for the part that we have compared so far – almost no difference in fact.
Interviewer: Aha, and you mentioned HVO is cheaper or?
Participant: Yes, yes. As it is right now it is but it is still because of the government taxes that we can buy the fuel cheaper right now. But I think somewhere in the middle of next year we will not have the advantage of lower taxes anymore on the HVO fuel and then the prices will go up. So, then we do not have that advantage anymore.
Interviewer: Aha, and do you need to do any modifications to the diesel engines in order to use HVO or you can simply fuel HVO in the current diesel engines without any modifications.
Participant: Yes, that is the best part with HVO, that the manufacturers Volvo and Scania that we are using, they have said that it is OK to use HVO without any modification whatsoever. We also use RME for quite few trucks but there you have to modify the engines.
Interviewer: Yeah, yeah and also the fuel consumption basically it can reduced by the type of engine and by the fuel and also by installing aerodynamic equipment. Do you have some aerodynamic equipment on your trucks and trailers.
Participant: Nothing more than the regular roof top spoilers. We haven’t used any side skirts or anything other than what comes standard.
Interviewer: Aha, and do you think it is problematic to install sideskirts or to install on the back door spoilers. I mean on the back door of the trailers. I mean do you have anything installed on the backdoor of the trailers that is preventing you from doing that or do you think in future you might have that?
Participant: If you find the right kind of equipment I think it should be possible but I think if you should put things on the trucks, then it could be a little bit problematic because of the lift and you have to open and close so many time each day but if you find an equipment that works and is easy to operate then I think it should not be that much of problem.
Interviewer: Yeah, yeah that is what actually most of the companies said. They are afraid that it requires a lot of operation and maintenance but actually there are some companies. I mean american companies that are entering the market and they are currently fighting legislative battles in order to make the equipment allowed in Europe because currently it increases a little bit the length restrictions and it is not completely allowed but soon I am pretty sure it is going to be allowed.
Participant: Yeah that is interesting.
Interviewer: Yeah, and about the tires of the truck do you think they affect the fuel consumption also. I mean of the truck and the trailer.
Participant: Yes, of course they do and most of all I think having the right tire pressure and monitoring the pressure from time to time so that you always have the right pressure. I think that is more important than the thread pattern but also the pattern of course is useful for the consumption.
Interviewer: Yeah, and what about retreated tires vs. New tires. What tires do you use retreated or new tires?
**Participant:** We use retreated to a certain degree. We never use retreated on the steering and on the driving axle but just on the rolling axles we use it to a certain degree. And you can have the same treat pattern on retreated tires today. So, we do not see that being a big problem.

**Interviewer:** Yeah, yeah, and do you always use dual tires assembly or sometimes you use wide single tires?

**Participant:** Now, it is mostly single tires but we have both?

**Interviewer:** Aha and do you think they are better for fuel consumption or you have not estimated this?

**Participant:** At least both the manufacturers of the vehicles and the tires I think the single tires should be a little bit less demanding than the dual tires but if you get the really wide tires that also see today then, I think they no longer have the advantage.

**Interviewer:** Yeah, and what do you think is the normal profit margin in this industry?

**Participant:** You mean in our business – transportation?

**Interviewer:** Yeah, yeah the normal profit margin. What do you think is the normal one?

**Participant:** Ridiculously low. I think between 3 and 4% is the standard for the whole business and that is not very much to brag about I think.

**Interviewer:** Yeah, and how do you compare to the average. Do you think you are doing better or worst than the average?

**Participant:** Right now we are about average if we just focus on our core business. So, around there somewhere we lie between 3 and 4%

**Interviewer:** Yeah, yeah and about terminal do you use a terminal where you can unload trucks then load trucks, combine loads so that you can fill the truck.

**Participant:** Yes, we have our own terminal where we do the unload and load and optimize the loads regarding to where we are going to send the truck.

**Interviewer:** Aha, but you think it is very helpful to have such facility so that you can combine and always try to operate as full as possible?

**Participant:** As it is for now it is a must. We should not have been able to maintain the business as we drive it today if we haven’t had the terminal. Or at least somewhere where we can have like a wheel holder or like a forklift which we can use to move goods.

**Interviewer:** Yeah, yeah and I have some questions about the drivers. How do you compare to your competitors in terms of drivers’ salaries?

**Participant:** We have what do you call it kolettiv avtal – so we are using the salaries that are set by the organization and we are using this straight over to our staff.

**Interviewer:** Yeah, yeah, I think this agreement was reworked this year in March or in April or something like that. Yes, that is correct. Yeah, and do you train the drivers in some way? I mean do you train them because also the drivers can affect the fuel consumption and it is important that they drive in a good way.

**Participant:** (inaudiable segment 25.35) … like having eco-driving and when you see this eco B they also have the part that is focused toward fuel economy I think. But we do not have any of our own right now but we are planning to have that in the future because we see as you say they are very much to be earned if you are able to train the drivers in the right way and use the equipment that we have in order to drive economically.

**Interviewer:** Yeah, yeah, and do you rotate the drivers between the different trucks so that you can estimate how much the fuel consumption is affected by the driver and then the best drivers to educate the drivers which do not drive so good.

**Participant:** No, we do not rotate like that. We try to have as few drivers as possible on each truck because we see that they are usually taking much better care of the equipment if they have like their own truck as much as possible.

**Interviewer:** Yeah, yeah I understand and do you have any ...

**Participant:** We have installed equipment in the truck on the drivers base level the fuel economy not just the truck but also for each driver and see how well they are performing.

**Interviewer:** Yeah, yeah that is perfect. And it is a separate equipment or it comes directly from the manufacturer?

**Participant:** No, we are using a third party manufacturer of those systems that we use. They are called Vehco.

**Interviewer:** Aha, ok and about the trucks do you use any specific brand of trucks or you have all types?

**Participant:** We are also completely using Volvo and Scania and it is almost 50-50 between them and then we have some smaller trucks which are Mercedes but almost all Volvo and Scania.
Interviewer: Yeah, and why you do that. You think they are the most durable trucks or their fuel consumption is best? What is the reason behind that?
Participant: We have much better control of the after market and the service stations – both brands are having big service operations in our home towns and since we have so much trucks we need to know that we are having a good what do you call it operation between the service part. Mainly because of that reason and we know that they are durable and that good in the long-term as we know it.
Interviewer: Yeah, yeah and we are running a little bit out of time so I am going to ask a few last questions. So basically how much do you think is your revenue per truck approximately.
Participant: I do not think I have any exact figure for that. You just mean if we split everything from what we earn per year on each truck or?
Interviewer: Yeah, yeah, each long haulage truck – because for example I know that in Sweden 2.5 million is the average a long haulage truck is generating in Sweden per year. But since you do not have an exact number it is no problem.
Participant: If you look straight turnaround figures that it is about what you say 2 to 2.5 million per truck but that is different from what we are earning when we are counting those type of figures but if we speak turnaround then it is correct around 2 to 2.5 million.
Interviewer: Yeah, yeah and the costs you have percentagewise how much do you pay for drivers, how much do you pay for fuel and how much do you pay for other costs. What is your cost structure
Participant: The salaries and the fuel are the most and percentagewise I think they area round 35 to 40% for the salaries and 30 or maybe more for the fuel and then services stand for the rest.
Interviewer: Aha services, and you are financing you business with bank loans or?
Participant: We are self-financed. We do not have any external loans or something in our business.
Interviewer: Yeah, yeah ok Joakim I really appreciate your answers. Sorry for taking a little bit more than 30 minutes. Yeah, and thank you very much I really appreciate it you gave some very good information and I think your company is very nice and you are trying to lower costs and to operate and to compete with some companies which is difficult to compete with so I think you are doing a very good job.
Participant: Yes, thank you – we are doing our best.
Interviewer: Yeah, thank you very much I really appreciate your answers and have a great evening!
Participant: Same to you thank you.
Interviewer: Thank you bye bye.
Participant: Goodbye

EA Akeri Data

Type: Questionnaire
Interviewer: Mario Sulev
Participant: Stefan Nyman
Date: 29.11.2016

General questions:
Can you tell me a little more about your company?
Answer: www.eaakeri.se
How many vehicles do you have?
Answer: 57 trucks plus 65 trailer
Are all of your vehicles – heavy-duty? If yes, why focus on heavy-duty vehicles? Why not using smaller vehicles more?
Answer: Yes. Because of heavy loads and client structure.
How has your company developed? In terms of vehicles, procedures, number of employees throughout the years?
Answer: Doubble revenue in 10 years. Trucks got from 40 to 57.
What type of trailers you have? Freezer?
Answer: 4 axels with FRC classed boxes, Themo King refrigeration units
What type of trucks you use? What is their average fuel consumption?
Answer: 9 Scania R500, 1 mercedes Actros 2548, 6 Volvo FE, the rest is Volvo FH
What do you use your vehicles for?
Answer: Longdistans distribution of food
Do you use them for international transport or only domestic?
Answer: Domestic
Do you own all the trailers and trucks? Do you lease some of them?
Answer: All are owned

**Questions about fuel:**
Do your vehicles use diesel engines?
Answer: Yes
What type of fuel do you use?
Answer: HVO
Do you work with with specific gas stations? Do you receive any fuel discounts?
Answer: We have our own tank, 50000 liters. And we use Shell or IDS in Norrland/Borlänge. Of course we have fuel discounts.
Why diesel engine vehicles? Do you think it is possible and feasible to utilize other types of power?
Answer: We have not seen a competitive engine that can beat the diesel engine.
Do you use any trailer aerodynamic equipment or tractor aerodynamic equipment?
Answer: Wind deflector on the roof of the truckcabin
What about the tires you use? Do you think they can affect the fuel consumption? What tyres do you use? Do you use wider single tires or dual tires assembly?
Answer: Bridgestone new tyres. Single. Pattern and tire pressure affects fuel consumption. But we need better grip in the winter so we choose a tire for the swedish climate

**Increase revenue/output:**
Do you think it is problematic to find loads? Do you have your trucks always operating in full capacity?
Answer: Not all the time but we measure the loads and try to find goods in both directions.
How do you search for and find loads? Do you think there are alternative ways you can utilize?
Answer: We have a wide contact network with both clients and other haulage companys.
Do you participate in any association? Why?
Answer: No
Do you have any long-term contract with customers?
Answer: Yes, 3-5 years. But most of them is one-year.
Do you use a terminal to group loads?
Answer: Yes. Here in Skara and one in Helsingborg.
Can you explain me the typical contract structure you have with customers?
Answer: Do not understand question.
Do the contracts incorporate a fuel clauses which can help you decrease the risk of fuel price increase?
Answer: Yes.
Do you think Sweden is in an advantegous or disadvantegous position in the EU road haulage market?
Why? Answer: Length and weight advantage. Are there any important regulations that are imposed by the European Union that you think are not logical and affect your business negatively? Answer: Rules for driving time and drivers rest time... the are not flexible.
Do you think all companies follow the rules and regulations? Answer: No
What haulage rates do you typically get for domestic transport? Answer: Price per kilogram
What haulage rates do you typically get for international transport? Answer: Don’t have int. trp.
What is your average profit margin? 5%

**Drivers questions:**
How do you compare to your competitors in terms of drivers’ salaries? Answer: We have a bonus system.
Are all of your drivers’ Swedish? Answer: Yes.
What are the taxes you have to pay in Sweden? Social taxes on drivers wages? 13% vacation salary and some trips with allowance, plus 32% in social fee, we calculate with taxes up to 50% on the salary.
Do you train them in some way?
salary: Yes we have a yearly education and education for new drivers.
Are there any bonuses that the drivers receive or just a fixed salary? Answer: Yes we have a bonus.

Other costs:
How much vehicles and road tax do you usually pay per year? Is there any tax for the trailers you need to pay? Answer: 11366 per year for a truck, 14305 per year for a trailer. Road tax is 100 000 SEK per year.

Från: Mario Sulev [mailto:suma1600@student.ju.se]
Skickat: den 29 november 2016 16:49
Till: Stefan Nyman <stefan@eaakeri.se>
Ämne: Re: improving operational efficiency in road haulage

Hej Stefan,

Thank you very much for the responses. I have a few additional questions:

1.) What percentage of your overall expenses goes for fuel and for drivers wages respectively?
2.) What is the revenue you generate per truck per year?
3.) Is the training the drivers go through eco-driving? How do you monitor and estimate how the drivers' behavior affect the fuel consumption?

Best regards,
Mario Sulev
Stefan Nyman <stefan@eaakeri.se>

Reply all
Tue 11/29, 9:45 PM
Mario Sulev

1. 25% fuel 43% drivers wages
2. 3 MSEK
3. YEs. Fleet management system called Vehco, www.vehco.se