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Size Matters

A quantitative study about scale of operation and its effects on store performance

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Abstract
For retailing companies the scale of operation of their stores is an important strategic decision. In recent years there has been a trend towards fewer but larger stores. However, this decision has an impact on the performance of the stores, which is often neglected. Therefore, this study analyses the company data of a retailing company in the consumer durables sector and will answer the question how the scale of operation has an impact on the performance of a store.

The regression analyses comparing the scale of operation to ten measurements of performance, show most of the anticipated effects of larger scales of operation do not persist in the consumer durables sector. Larger stores were found to be performing better on market performance. However, these advantages do not prevail for the productivity and efficiency performance measurements. Then, also the financial performance shows that larger stores are not performing better on operating profit per square meter. Therefore the results suggest that size matters, but larger stores are performing worse.

Keywords: Retail, scale of operation, store performance, profitability

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Existent abbreviations

GMROI	Gross Margin Return on Investment
GMROS	Gross Margin Return on selling area
GMROL	Gross Margin Return on Labor

1. Introduction

In this chapter we explain the background of our subject followed by an explanation as to why we are researching this subject. Afterwards the research problem is explained and the research question is raised. Furthermore some vocabulary will be clarified and the expected knowledge contribution is outlined. The chapter closes with the delimitations and an outline of the thesis.

1.1 Background

Swedish consumers spend several hours a week to shop for various kinds of goods. Hence, it is not surprising at all, that one third of the total private consumption in Sweden is spent on retailing goods (HUI Research, 2011). Product range, prices and availability are important for the quality of life. Therefore retailing has become one of the largest and most important sectors of the overall economy. In 2012 the retailing sector in Sweden generated more than 634 billion SEK in sales (HUI, 2013). To determine a store's success in this market it is, of course, profitability that is the most vital measure. Profitability depends, as for any organization, on the interplay between environmental conditions and internal factors. This leads to a situation in which strategic and tactical decisions constantly need to be made by retailing managers. The goal of these decisions is to satisfy consumers' needs and wants and therefore ensure the companies' success (Hernant, 2009). Logically, the success of a retailing chain is determined by the aggregate results of all the single stores. However, these stores are acting in different local market conditions, facing for example different demand structures. Understanding the antecedents of the different performances of the stores is therefore important information for all the companies within the industry (Hernant, 2009). Having this in mind it is noteworthy that there is a noticeable trend in the Swedish retailing industry. During the last decade retailing chains are increasingly concentrating on fewer and larger stores (Handelns utvecklingsråd, 2010). This trend therefore suggests that there is a link

between the scale of operation (the size) of a store and the anticipated economies of scale, which are thought to increase the profitability.

1.2 Why research the scale of operation?

The location and the scale of operation are important strategic decisions that need to be made when establishing a new retailing store. However, nowadays there is a fierce competition of retailing stores and other companies (e.g. restaurants) for the best locations (so called A-locations) within the city center (Affärsvärlden, 2012). As a consequence the rents are increasing and the possibilities for finding a location that also offers the desired scale of operation is decreasing (Svensk Handel, 2010). In other words: The possibility for retailing companies for finding the "perfect" store conditions decreases. This, of course, leads to a situation in which compromises need to be made. One of these factors that are subject to compromise might just be the scale of the operation, as the decision-makers might not think that this makes a big difference. However, this is an important strategic decision as it has an impact on the investment that is needed in order to establish the store in the market. Accordingly the involved financial risk increases with an increasing scale of operation.

Retailing companies are facing many challenges in today's market. After almost twenty years of continues growth, the retailing market is starting to become increasingly saturated (Handelns utvecklingsråd, 2010). This increased competition is also due to a new competitor in the retailing market; e-retailers are putting pressure on the retailing chains with physical stores (Dunne & Lusch, 2005). The cost-advantage is clearly laying on the side of the e-retailers, as their expenses for things such as rents, equipment and personnel are not as high as they are for bricks-and-mortar businesses (Handelns utvecklingsråd, 2010). Hence, it is important for retailing companies with physical stores to diversify from the price-orientated e-retailers. One way of doing so is offering the customers an easily accessible store. The advantage over the e-retailers here is that the retailers with such a store can reduce the time the consumers need to wait until they get their desired product.

Another challenge that arises is a consequence of the second challenge. In order to avoid the competition for real estates and rental stores there is a trend towards external market places (Berthling, 2012). These are located just outside the cities and have mostly a good infrastructural connection to the nearest city (Hernant and Boström, 2010). The benefits for the retailing companies are easily explained; due to the good infrastructure and the high concentration of different stores it is still attractive for customers to travel there in order to go shopping. So the retailers do not lose many, if any, consumers (see also Reilly (1931) in section 2.2). Furthermore the real estate prices and rents are lower due to the location outside of the city, which again reduces the operating costs.

With other words, there are many challenges for retailing managers and many retailing companies seem to counter these challenges with a concentration on fewer but larger stores (Hernant and Boström, 2010). This strategy of larger scales of operation affects the store's conditions and its potential. Furthermore, it also affects the stores other resources (e.g. selling area, inventory and labor) and its operating costs. Considering the importance of the retailing sector, we feel that these effects of the scale of operation are meaningful but are lacking understanding. Therefore we decided to research this topic.

1.3 The research problem

As mentioned above retailing companies are acting in a complex network where profitability (firm performance) is affected by environmental conditions and internal factors (firm behavior). However, it needs to be mentioned that the environmental conditions and internal factors are also affecting each other. Hence, there is interplay of all these factors that can be mapped in the way as in figure 1.1.

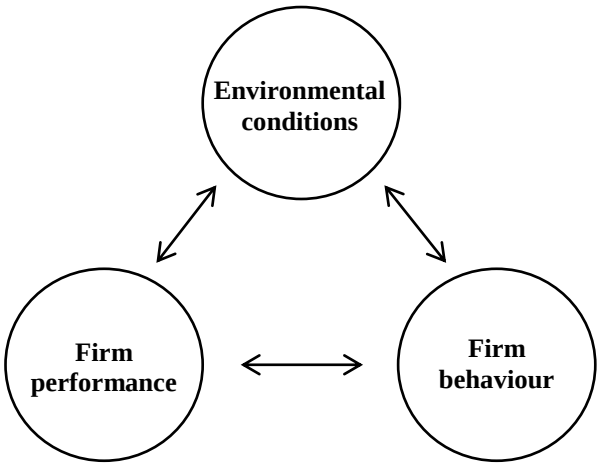

Figure 1.1: Interplay of factors (Hernant, 2009)

Hernant (2009) defines the "firm performance" as the economic results of the retailing company, the "firm behavior" is related to measurements such as the scale of operation and the marketing mix, and the "environmental conditions" are covering factors such as demand, socio-economics and competition. These three categories are however fairly broad as the number of factors and measurements for each category can be broken down to a very large quantity. Furthermore the impact on the profitability of each of these factors may be differently strong.

However, from a companies' point of view the environmental conditions can be seen as an external category. This is due to the reason that once a store location is chosen the decision-making of the store manager will have no direct influence on the factors within this category. The firms' behavior and its performance, on the other hand, are internal and therefore capable of being influenced by the company. In other words, both of these categories depend on how a manager runs a store. Based on this there is a need for more extensive research on internal factors, and its effects on the bottom line performance; store's profitability (operating profit). This study will contribute to this by researching into the companies' performance and how the scale of operation affects it.

Consequently, the overall research question of this study will be formulated as:

"How does the scale of operation of retail stores affect the stores' performance?"

1.4 Definitions and Clarifications

Although the research question appears to be very straightforward this chapter will provide a clearer definition of the used vocabulary of "scale of operation", "output" and "performance".

The Scale of Operation

First of all we want to clarify what the "scale of operation" is. We are defining the term for this work as the *physical size of a store* (floor area) measured in square meters. A possible alternative would be to define it using the net sales. However, this would lead to a serious conflict; as it will be elaborated on below, we are defining the output of a store as the net sales (Ingene, 1984). Hence, this would make a comparison between the scale of operation and output impossible, if both would be defined using net sales.

Output

Output of a store is defined as the *net sales generated within a certain time period* (Douglas, 1962). This is an important clarification because retailing stores do not produce any products themselves. They rather offer the service of making products available at a certain place and time (Achabal et al., 1984).

Performance

In order to define performance we are applying a categorization by Dunne and Lusch (2005). They are suggesting that the statement of goals and objectives of a retailing company should be divided into five categories; (1) the market performance objectives, (2) the financial objectives, (3) the productivity objectives, (4) the societal objectives and the (5) personal objectives. As the latter two are having a rather ethical and not financial perspective we are concentrating on the first three objectives in order to measure the performance. Furthermore we are adding a dimension. We will not only measure the productivity of the stores, but also their efficiency. An elaboration on as to why we are doing this can be found in chapter 2.3. Hence, we are dividing the measurement for performance into the three subcategories of market performance, productivity/ efficiency performance and financial performance (figure 1.2).

The market performance makes it possible to evaluate the companies' performance in its environment and in relation to its competitors. It is therefore measuring the amount of demand a store is attracting in its local market environment. The measurements of productivity and efficiency performance allow a more internal perspective, as it is measuring how good the store is in utilizing its resources. The last category of performance is the financial performance and is measured using the results for the operating profit of the focal stores.

Store performance, defined in three categories	
Category	**Definition**
Market performance	The amount of demand attracted by a store
Productivity/efficiency performance	A store's success in utilizing different resources
Financial performance	Bottom line economic results

Figure 1.2: Categories of measurements of a store's performance

However, even within these subcategories there are different empirical concepts on how one can measure the different performances. The measurements we are using for our research are marked grey in figure 1.3 and will be elaborated on further in chapter 3.5. Summing up, we are intending to research the effects of the scale of operation. This is thought to be having an impact on the performance of a store through the presumed economies of scale (see figure 1.3).

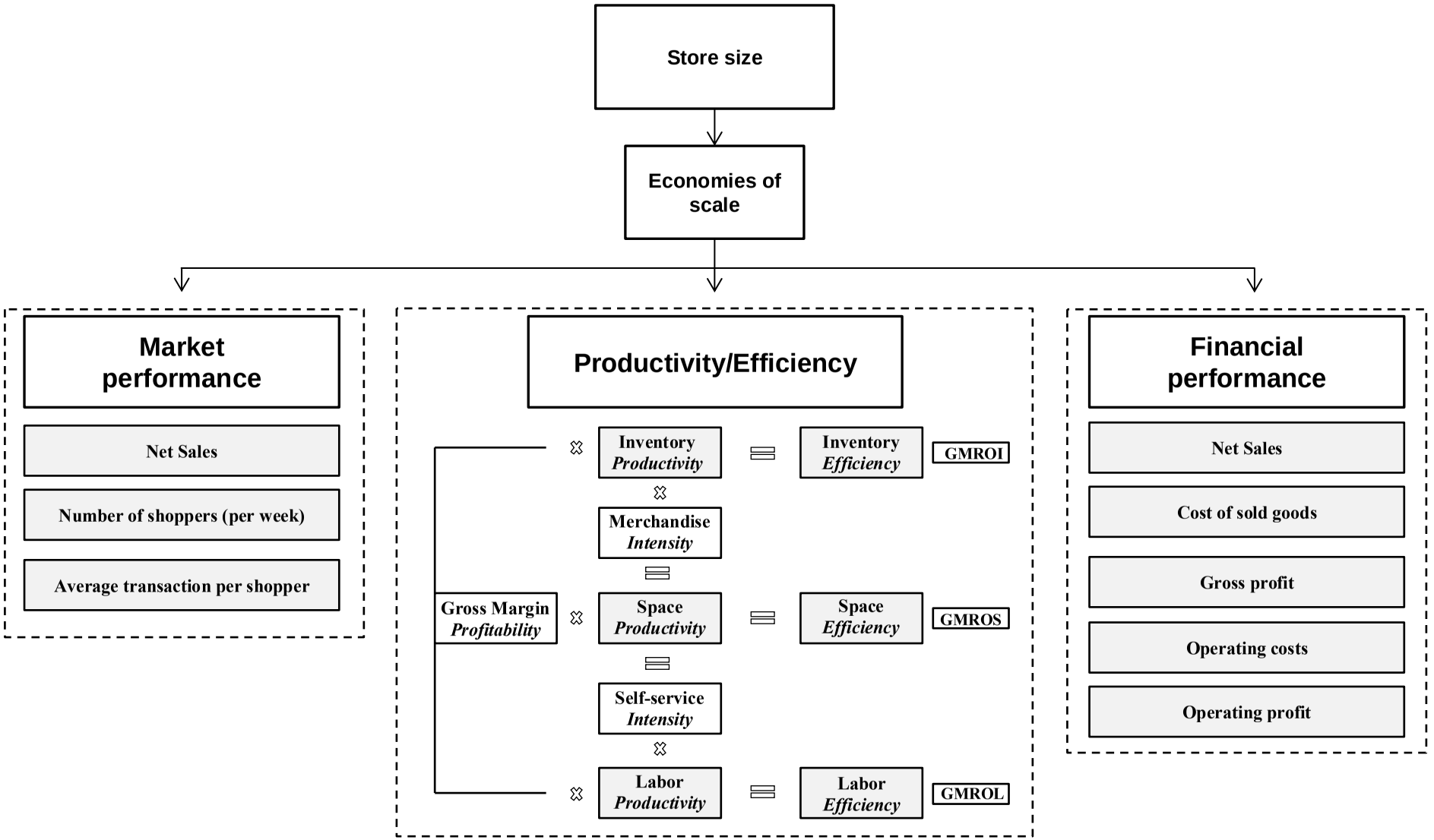

Figure 1.3: Overview of the research area

1.5 Expected knowledge contribution

As stated above, there is a trend in retailing towards running stores with a larger scale of operation. Among the factors explaining this current trend, is the assumption of decreased costs per unit output due to the presumed existence of economies of scale. Indeed, some studies have researched the connection between the scale of operation and economies of scale, as it will further be elaborated on in chapter 2.

Some studies have indicated that an increase of the scale of operation is associated with a decrease in operating costs per unit of output. The relationships that were found are however different. A study by Nooteboom (1982) showed a linear relationship between output and variable costs, others suggested that there is a decrease of variable costs per unit of output (Aalto-Setätä, 1999, 2002). Furthermore Shaw, Nisbet & Dawson (1989) showed that economies of scale are mainly present in labor costs. However, their results suggested that the costs are only decreasing up to a certain level and increase again afterwards. After having looked at these and other studies it becomes clear that there is no further research in the area of the impact of scale of operation on performance, especially when narrowing the focus to financial performance.

Therefore, this study will contribute to the area of scale of operation, and its impact on performance. It is among the first to investigate how retailers (outside fast moving consumer goods) in the sector of consumer durables are affected by the scale of operation and how this again affects the store's market, productivity, efficiency and financial results.

1.6 Delimitations and prerequisites

The world of retailing is a fairly complex one. Hernant (2009) nicely illustrates this in his dissertation about the profitability performance of supermarkets. Hence, it must be noted that this study does not take all of these factors (and their interplay) into account, but focuses on scale of operation, and its impact on store performance.

Furthermore there are some delimitations regarding the focal company of the research. This company is operating in the retailing sector of consumer durables. Logically, the results gathered in this study cannot be transferred to other industry sectors, such as grocery retailing. Furthermore, the studied company is selling products in the high-price segment. It is possible that stores acting in this price range are affected differently than stores offering products in other price segments.

Also, as this study focuses on internal factors, it is beyond the scope of this study to explain the influence of external factors, such as the purchasing power, socio-economics or the competitors.

1.7 Thesis outline

In order to undertake the research there will first be a literature review in the following chapter. Within this chapter we will take a look at the previous research within our research area, starting with a review on the economies of scale. Also, the different categories of performance will be subject to a review. In the path of this chapter we will furthermore develop our hypotheses based on the reviewed literature and logical reasoning.

In chapter three we will present our methodology. Here, we will outline how we approached the research area and which scientific approach we have chosen. Afterwards, the company, which allowed us to use their data, is presented and it is laid out what the data basis is and how it was collected. Then the variables for the performance measurements are presented and the research will be evaluated concerning the reliability and validity.

Afterwards, in chapter four, the collected data will be analyzed. The used empirical method will be a regression analysis. In this way, every raised hypothesis is tested and - after having analyzed the data - either accepted or rejected. Furthermore some additional analyses will be carried out in order to gain a deeper understanding.

In a next step the results from chapter four are discussed and possible explanations for the acceptance or rejection of the hypotheses is given. Afterwards a conclusion is drawn and we

will elaborate on implications of the results. Furthermore we will explain possible critiques of the thesis, before closing the thesis with suggestions for future research.

2. Theory and hypotheses generation

This chapter contains a summary of the theory in the focal area. As the scale of operation is the most dominant factor in this study we reviewed theories that are centering on it. Therefore we will first take a look into the effects of scale of operation on economies of scale followed by reviews on the effects on performance figures. These performance figures are again divided into the formerly mentioned categories of market, productivity, efficiency and financial performance. Furthermore the hypotheses will be developed in this chapter.

2.1 Economies of scale in retailing

One of the most significant trends in the Swedish retail sector during the last decade has been the concentration on fewer and larger shops, as well as the increasing number of retail chains in various industries (Hernant and Boström, 2010). This trend suggests that there is a link between scale of operation and profitability. A potential explanation for this trend towards larger stores could be that there are assumed to be economies of scale, which are decreasing the costs for the store operations. The meaning of economies of scale in the store operations is, in short, that larger stores have lower average cost than small stores. More precise, the definition of economies of scale is that the average costs per unit output drops with increasing volumes of output (Hernant and Boström, 2010).

With having this in mind it is, however, important to emphasize that a larger scale of operation is also accompanied by a larger financial risk. This financial risk is, on the one hand, due to the larger investment necessary in order to get the store running. On the other hand it is also due to the higher operating costs (Nooteboom, 1982; Aalto-Setälä, 1999).

2.1.1 Three dimensions of economies of scale

According to Scherer & Ross (1989) there are three different dimensions to economies of scale. The first one is product-specific economies, the second is plant specific economies and the third one is multi-plant economies.

Product-specific economies of scale are associated with the volume of a single product. This theory describes how specialization can contribute to higher efficiency. By managing higher volumes of output machines and workers can specialize, develop expertise and improve their performance. This leads to a higher efficiency and to a lower average cost per unit. In particular, labor costs decrease due to increases in proficiency as well as fewer errors per unit.

Plant-specific economies of scale are associated with the total output of an entire plant. This theory describes how economies of scope may be embodied as part of a plant economies as the costs of common overheads are spread across multiple products. It also considers the benefit with better economies of massed reserves. This includes lower costs for back up specialized machines; for example it is more efficient to have one back-up machine when having five machines running compared to only one machine running.

Economies of multi-plant operations are associated with total corporate size. This theory describes how economies of scale in larger corporations are minimizing for example transportation costs of raw materials, transfer knowledge between different departments to better serve different geographic markets, economies of scope, specialization, and other things. Costs per unit are lower by having a common central pool of specific departments.

These three dimensions of scale of operation are the basis for this research within retailing and scale of operation on the store level.

2.2 Scale of operation and market performance

A better market performance is associated with being able to increase the net sales of the store. Logically, the net sales depend on two parameters: the number of customers and the

amount of the average transaction per customer. Reilly (1931) acknowledged that with an increasing size of a retailing store its "gravitation" increases as well. Reilly calls this the "law of retail gravitation" and it assumes that with an increasing scale of operation more consumers are willing to travel to the store. Furthermore he assumes that the gravitation decreases when the distance separating it from the consumers increases. This concept can nicely be illustrated by looking at the strategy of outlet centers or malls. Here, comparatively small stores (with a small gravitation) are located in one area, so that consumers do not regard it as one small but rather as a part of a large store (with a large gravitation). Reilly's concept furthermore emphasizes that consumers are trading off the cost for traveling with the attractiveness of possible shopping alternatives. Furthermore in a study by Pan and Zinkhan (2006) product selection showed the highest correlation with store choice. Assuming that larger stores are having a larger set of products than smaller ones, this further strengthens Reilly's concept.

Hernant (2009) conducted a comprehensive study of 168 supermarkets in Sweden. For his analysis he grouped the supermarkets into two groups; one group with the 84 smallest supermarkets and another group consisting of the 84 largest stores in terms of scale of operation. The results of his analysis showed that there are clear differences in the market performance between these groups. Hernant showed that the group of large stores is having nearly twice as many customers as the group of the small stores. Furthermore the average transaction per customer is nearly 20 percent higher for the large stores group. Consequently, the sales volume of the group of large stores was found to be more than double as high as for the group of small stores. So this shows that the larger the store the more customers are attracted and the more money is spent per purchase. Therefore an increased scale of operation increases the sales volume. Due to these findings we are formulating the following hypothesis for the market performance:

$H1_a$: The scale of operation of a store is positively related to net sales of the store.

As stated above, the net sales are determined by the number of customers and the average transaction per customer. In order to get a better understanding of the market performance we will also analyze these two subcategories and therefore formulate the following hypotheses:

H1b: The scale of operation of a store is positively related to the number of shoppers per week of the store.

H1c: The scale of operation of a store is positively related to the average transaction per shopper of the store.

2.3 Scale of operation, productivity- and efficiency performance

The difference between productivity and efficiency is that productivity measures, if one is "doing the right things", whereas the efficiency is measuring whether one is "doing the things right".

Arndt & Olsen (1975) examined the link between 99 Norwegian stores' sizes and gross profit per employee. The results showed that the store size explained about one third of the difference in GMROL (Gross Margin Return of Labor). The relationship became stronger when the logarithm of sales area was used as the independent variable. This means that with increasing store size the efficiency also increased, but at a gradually decreasing speed. The study also broke down the numbers for the larger stores. Remarkably, the results showed that the ratio between the larger stores (named "supermarkets" with a size >300 m^2) and GMROL did not show any increase in GMROL when the size of the stores increased. In conclusion, Arndt & Olsen's study indicates that there are economies of scale in store operations up to a certain scale of operation, but those economies of scale cease when the scale of operation is increased further.

Eliasson & Julander (1991) also found that the economies of scale gradually decreased with increased scale of operation. In their study of Swedish grocery stores they found that large stores performed better in terms of both labor productivity and space productivity. When the store size was bigger than 300 square meters, however, further increase in scale of operation showed a negligible increase in productivity (Hernant and Boström, 2010).

The conclusion of both of these studies is shown in the figure 2.1. Summarizing, these studies show that productivity in stores increases when stores become larger, but only up to a store

size of 300 square meters. When the stores were larger than this there was only a modest observable increase in productivity.

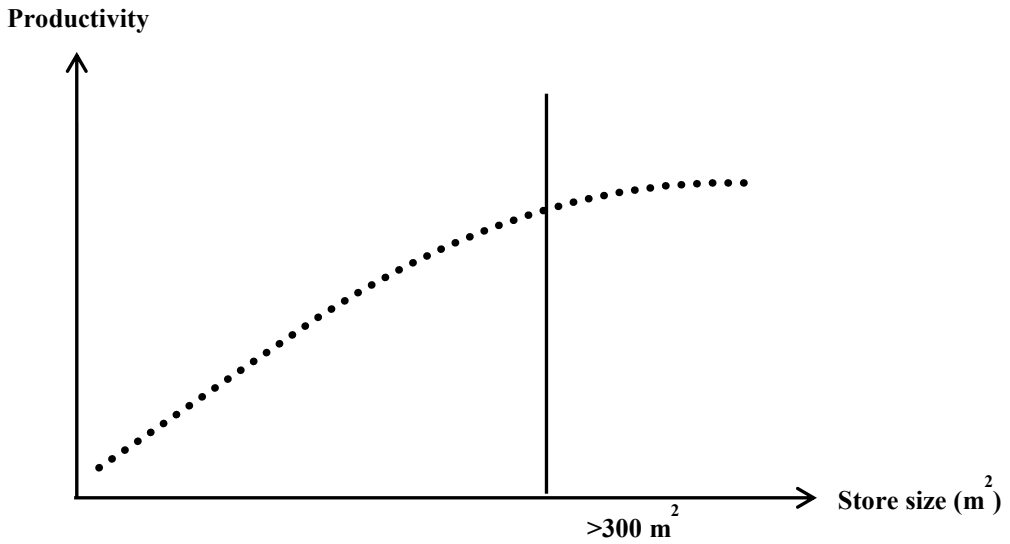

Figure 2.1: Findings from Arndt & Olsen (1975) and Eliasson & Julander (1991) (Hernant and Boström, 2010)

Shaw, Nisbet & Dawson (1989) examined the costs and profit margins in 200 grocery stores from a British retailing chain. The stores' sizes ranged from 40 to 4,000 square meters. As a measure of the stores' average costs they used costs as a percentage of net sales. In their analysis, the researchers studied the relation between the expense ratio and the profit margin on the one hand and the scale of operation and the sales per square meter on the other hand. The method that was used in this study was a regression analysis. Three different analyses were conducted. First, a linear analysis of the links was made. In a second and third step a logarithmic and quadratic transformation of the variables were subject of the analysis.

The results showed that the economies of scale mainly existed in labor costs. In the linear analyses both scale of operation and space productivity (sales per square foot) were significant explanations for labor costs. The quadratic transformation of the variables showed a U-shaped cost curve, where costs dropped up to a store-level size of about 2,200 square meters and then increased.

However, when “other operating costs” were merged with labor costs the results showed that an increasing scale of operation resulted in a lower expense ratio. In this study the researchers also had access to the stores’ financial performance, which is why the analyses could be broken down to the profit margin and space productivity. The study showed that the profit margin of the stores increased with increasing scale of operation and increased space productivity.

Hernant (2009) also included a comparison of the productivity performance, which showed a higher productivity for larger stores, although it needs to be said that only the results for the labor productivity were significant. The differences for inventory productivity and space productivity were not found to be significant.

We will limit the productivity performance measurements to the three factors inventory investment, space and labor. These are the most important ones, according to the Strategic Resource Model (Lusch, 1986). Based on this we are raising the following hypotheses for the relationship between the scale of operation and the productivity performance measurements:

$H2_a$: The scale of operation of a store is positively related to the sales per inventory of the store.

$H2_b$: The scale of operation of a store is positively related to the sales per square meter selling area of the store.

$H2_c$: The scale of operation of a store is positively related to the sales per labor hour of the store.

Furthermore these measurements can be applied in order to not only measure the productivity but also the efficiency. The definition of efficiency is gross profit per unit of resource. By multiplying the productivity measures with the gross margin a store’s efficiency can be measured (Lusch, 1986). Using this additional measurement we add a further dimension. If stores only using sales as a measure of output their focus only be on increasing sales. In fact, it is very easy to increase sales in a store – just cut the prices (Hernant and Boström, 2010). By spreading the focus and also measuring efficiency we are also addressing the profitability

dimension, which is the ultimate measurement of a store's survival. As the studied company, is managing its prices centrally, the gross profit for the products are the same in each store. Based on this we are assuming a close link between the productivity and efficiency measurements. Therefore, we are raising the following hypotheses for the relationship between scale of operation and the efficiency performance measurements:

$H2_d$: The scale of operation of a store is positively related to the gross profit per inventory (GMROI) of a store.

$H2_e$: The scale of operation of a store is positively related to the gross profit per square meter selling area (GMROS) of the store.

$H2_f$: The scale of operation of a store is positively related to the gross profit per labor hour (GMROL) of the store.

A clarification of these relationship and measures are shown in the figure 2.2, below.

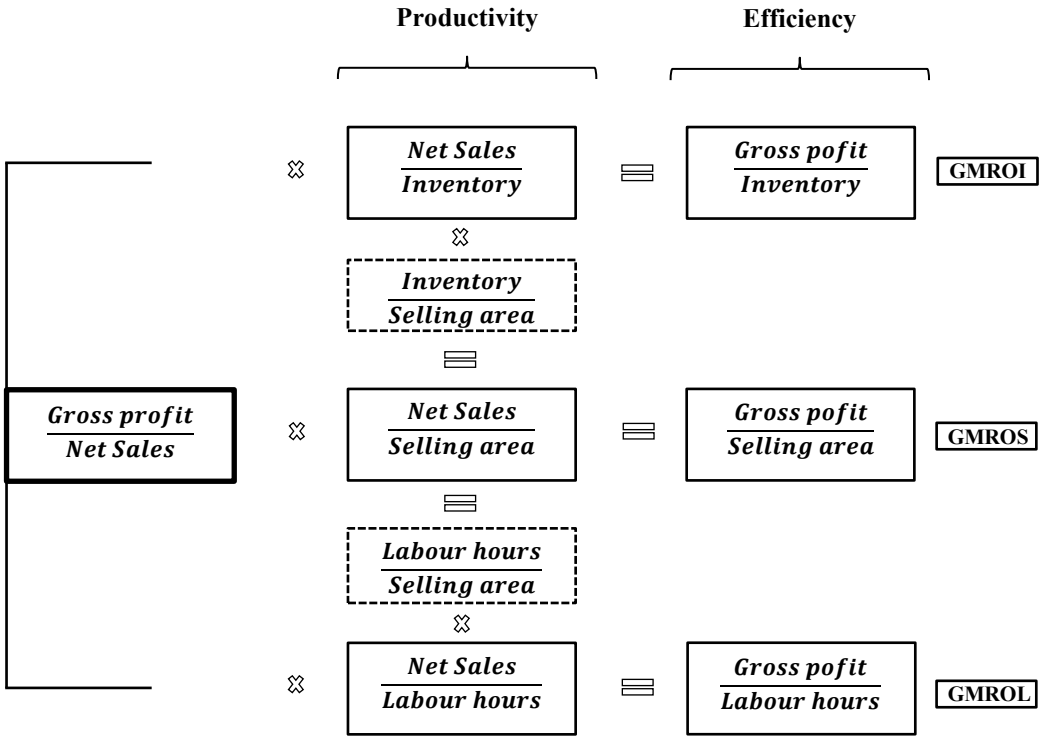

Figure 2.2: Relationship between productivity and efficiency
(Hernant & Boström, 2010)

2.4 Scale of operation and financial performance

The influence that the scale of operation has on the financial performance is hard to anticipate, as the bottom line result of profitability is influenced by many different factors.

The first research studies of scale of operation in stores were written during the sixties and seventies. Both McClelland's (1962) and Tilley & Hicks' (1970) findings showed that operating costs per square meter sales space decreased with increasing total scale of operation.

Nooteboom (1982) researched the cost structure of different store types, which were identical concerning factors such as the assortment composition, the service level, the own production and the mode of supply. The findings showed that the costs of a store are related to net sales; however, the relationship he found was of a linear kind. This suggests that there is a certain amount of fixed costs plus a linear increase in costs with increasing net sales. This study therefore implies that there are no real economies of scale in retailing. This is due to the reason that the variable costs are not decreasing with increasing output (see chapter 2.1.1). However, these results suggest that there are decreasing average costs per unit output due to the opportunity of spreading the fixed costs over a larger amount of output.

Aalto-Setälä (1999) conducted a study which results showed evidence of retail companies having decreasing marginal costs as the output rises. More precisely, his study indicated that the costs of a store are increasing as the output increases, but this happens with a decreasing rate. It must however be mentioned that Aalto-Setälä used the sold quantity of physical goods as the measure for output and not as Nooteboom the net sales. Another study by Aalto-Setälä (2002) replicated the results of decreasing marginal costs for increasing scales of operation. In this study however, Aalto-Setälä also uses the net sales as the measurement for output. These results therefore could lead to the conclusion that larger stores are having a better profitability, presuming that the gross profit is stable.

In contrast to this, Hernant (2009) found that the total operating costs (as a percentage of sales volume) were not lower in large stores, compared to small stores. Nor had the large stores a

higher profit margin than their small counterparts, as the comparison showed. This was due to the reason that the improvements in labor productivity were eaten up by higher costs for marketing. This led to the results showed no significant difference of the operating margin between the small stores and the large stores. As the results of Hernant were not significant, we are raising the following hypothesis relying on the studies of Nooteboom (1982) and Aalto-Setälä (1999, 2002), which proved the existence of decreasing average costs for larger stores.

H3: The scale of operation of a store is positively related to the operating profit per square meter of the store.

We are dividing the operating profit by the square meter floor area of the store in order to create a measurement that allows a better comparison of the stores with each other.

3. Methodology

This chapter contains an explanation of the research method, research design and scientific approach. It gives an introduction to the focal company and furthermore presents the selection of variables and measures. Lastly, a discussion of the validity and reliability of the study is presented.

3.1 Initial work

A retailing store is affected by a variety of factors, which affect its performance. Primarily these are factors such as assortment, price, service, marketing and communications. Mostly these factors are controlled centrally from the head office of the company. Furthermore, factors such as personnel costs, inventory investment and other expenses affect the store's profitability. These factors, on the other hand, are often controlled locally in each store. All of these factors are related to the store's physical conditions, which are the location and size. The debate has often focused on the location of the stores, to optimize the store location for the customer flow, specific target groups and increasing demand. Nowadays, retailing managers are increasingly facing the problem of having to optimize an already established network of retailing stores. This means that the focus has moved from the store's optimal location to learning how to run your business from the top to the bottom based on the store's conditions.

The scale of operation affects assortment, price and communication but also sales, personnel costs, inventories and so on (Hernant, 2009). Therefore the interest of this complex relation between scale of operation and profitability has increased due to the increasing competition in the retailing industry (see chapter 1.2). Store performance and efficiency are important factors in creating profitable stores. Nevertheless, there is a significant gap in academic research in this field. Especially, when reducing the field of interest to retailing in the consumer durables segment. Most of the research in the area of retailing is aimed at grocery stores, but similar

research is also requested by the consumer durables sector to increase the understanding between different retailing industries.

This is an important gap to fill and therefore start-up discussions concerning the choice of topic were held with Mikael Hernant and Joel Ringbo, who are both operating at the marketing and strategy department at Stockholm School of Economics. Further discussions were held with managers at the collaborating company, who are facing these questions on a daily basis. This led us to the problematic link between the scale of operation and profitability. As the area of interest is not well developed in academic research, we continued to review adjacent theories. Further discussions with both practitioners and academics were held and after that the problem area and the purpose of the thesis were decided upon.

3.2 Scientific approach and research method

A deductive research approach has been adopted in this study as the hypotheses are developed based on existing theory and knowledge, and are tested in an authentic environment (Bryman and Bell, 2007). Even though most of the theory is based on grocery retailing it can be transferred to the consumer durables sector. The sectors are authentic, except that different kinds of products are sold.

Furthermore, as we want to examine the relationship between scale of operation and its effects on the store's market, productivity, efficiency and financial performance, the research design follows an analytical-oriented methodology (Arbnor & Bjerke, 1994). Relying on existing theory and then developing hypotheses based on this theory characterizes this approach. In more specific terms, the empirical part of this study is cross-sectional to explain business performance.

The fundamental theoretical underpinning of this study is that the performance of a store is a consequence of its scale of operation. The study has been designed in a way that endorses a close link between the scale of operation and its performance. Further, data have been

collected on the store level, in order to provide prerequisites for reliable tests of the relationships between scale of operation, performance and profitability.

A cross-sectional design is developed for the study by pooling data on market performance, productivity performance, efficiency performance and financial performance. Together with the focal company, a unique database is constructed, containing the performance figures of 54 stores along with a description of their attributes.

As of today, almost no research regarding scale of operation and profitability has been done within the consumer durables sector. Therefore it was decided that this study would focus on this sector, where the results could be compared with previous research within the fast moving consumer goods industry (FMCG) of grocery stores.

According to Bryman and Bell (2007) quantitative research is preferred when the aim is to generate generalizations through statistical analysis. Since the ambition of this study is to achieve generalizable results, a quantitative approach was chosen (n=54).

3.3 The focal company

The company has 54 company-owned stores and a number of franchise stores. The study focuses on their company-owned stores, as these allow a good comparison with each other. Each manager of these stores has guidelines for assortment, pricing and interior design, (e.g. planograms). The store managers control both volume and quantity, which affects each store's inventory. They also control a local marketing budget, although most of the marketing efforts are managed centrally. In other words, the company is a centralized organization with room for local decision and adoptions for each store manager. This results in a situation, where each stores can be evaluated on the store level.

Following some distinguished features of the company are summarized:

1. Purchasing, assortment, marketing and pricing are centrally controlled. Each store consists of an A-assortment and B-assortment, whereas the A-assortment consists of

products that are better selling, compared to the B-assortment. Then, each store manager is able to choose an associated localized assortment, based on the location and size of the store. Also an own, local marketing budget is allocated to each store manager, so they have the opportunity to run their own campaigns. Prices, however, are fully centrally controlled.

2. Each store operates with the same checkout scanning system and the numbers of checkouts depend on the scale of operation.
3. All staff has undergone the same sales training.
4. Decisions to hire or dismiss labor are undertaken on the store level.
5. Decisions relating to the location of new stores are centrally controlled. Decision on alteration of stores, their replacement of fixed assets or changes in the offering strategy, are taken both centrally and on the store level.
6. The stores locations differ between city area and shopping malls outside the city.

3.4 Data sources and data collection procedures

Data on the store's market, productivity, efficiency and financial performance were collected for the company's 54 wholly owned stores for the fiscal year of 2012. The standards for gathering the data are the same for all stores in the sample, which is a requirement for a cross-store comparison. Attributes of the 54 stores were gathered together with the focal company. This provided data for a complete description of performance for each store with everything from sales volume to profitability. A detailed list of collected items is presented in chapter 3.5.

After a first review of the gathered data it became clear that only 51 of the stores had complete data for 2012. The three stores that were removed from the sample were opened during 2012 and therefore could not provide complete information for the whole fiscal year.

3.5 Operationalization of variables

The company's controllers provided the income statements and balance sheets for the fiscal year 2012 for all 51 company-owned stores within the sample. Furthermore they delivered information on the scale of operation, inventory, number of labor hours and the amount of customers and average transaction per customer. These data is the basis for a comprehensive description of the scale of operation and performance measurements; the market performance, productivity performance, efficiency performance and financial performance.

3.5.1 Scale of operation

As stated earlier in chapter 1.4, in this study a store's scale of operation describes its physical capacity, rather than its output in terms of net sales. Therefore the measurement we are applying for the scale of operation is the size of floor area, measured in square meters. This variable will later be used as the independent variable to explain the performance measurements.

Empirical concepts of scale of operation.

Derived concept(s)	Definition	Empirical concept(s)
Scale of operation	The physical size of a store's establishment.	Floor area (square meters)

Figure 3.1: Measurements of market performance (*Hernant, 2009*)

Descriptive statistics of the floor area are presented in table 3.5.1 and show a substantial variation between the 51 stores. The floor area ranges from 175 to 1,160 square meters.

Table 3.5.1 Scale of operation variables. Descriptive statistics.

	Mean	St. dev.	Median	Min	Max
Floor area (square meters)	502	243	450	175	1,160

3.5.2 Store performance

The store performance is divided into the market performance, productivity performance, efficiency performance and financial performance. All of the measurements in these categories are used as dependent variables to see how they are affected by scale of operation.

3.5.2.1 Variables of market based performance

We will measure the market performance by gathering data about the demand of the customers. For this the empirical concepts are the number of customers and the amount of the average transaction per customer that shopped at the store within a given time period. Furthermore the combination of both, the net sales, is being measured here (see figure 3.2).

Empirical concepts of market based performance.

Derived concept(s)	Definition	Empirical concept(s)
Market performance	The amount of demand attracted by a store	Net sales Number of customers per week Average transaction per customer

Figure 3.2: Measurements of market performance (*Hernant, 2009*)

The descriptive statistics of the three market performance measurements are provided in table 3.5.2 and the correlation coefficients between these variables are presented in table 3.5.3. The results show that there is a clear difference between the 51 stores on all measurements. The average annual net sales are 11.8 million SEK. However, the highest number is nearly six times higher than the lowest number. Also the results for the number of customers per week are very different. The highest number is nearly five times higher than the lowest one, at an average of 662. Lastly, the highest number for average transaction per customer is nearly twice as high as the lowest number.

The correlation analyses show that scale of operation correlates positively with both sales volume ($r=0.45$, $p<0.01$) and average transaction per customer ($r=0.67$, $p<0.01$). There is also an almost perfect correlation between number of customers and the sales volume ($r=0.92$,

p<0.01). However, the average transaction per customer also shows to have impact (r=0.40, p<0.01) on net sales. Both of the variables are highly significant.

Table 3.5.2 Market performance variables. Descriptive statistics

	Mean	St. dev.	Median	Min	Max
Net Sales ('000 SEK)	11,812	4,263	11,148	4,744	26,645
Number of customers per week	662	215	619	295	1,487
Average transaction per customer	343	49	324	268	458

Table 3.5.3 Correlation coefficients between variables of market performance ([a]=p<0.01; [b]=p<0.05; [c]=p<0.10).

	X_1	X_2	X_3	X_4
Scale of operation (floor area) (X_1)	1.00			
Net Sales (X_2)	0.45[a]	1.00		
Number of shoppers per week (X_3)	0.19	0.92[a]	1.00	
Average transaction per shopper (X_4)	0.67[a]	0.40[a]	0.03	1.00

3.5.2.2 Variables of productivity performance

When analyzing the productivity performance it is helpful to consider the Strategic Resource Model (Lusch, 1986). This model acknowledges that the merchandise (inventory), the floor area (space) and the labor are the most important resources for a retailing store. Therefore we are dividing each of these three resources by the net sales in order to measure the productivity performance for each store.

The productivity performance can be defined as the rate with which the resources of a store are converted into outputs. Figure 3.3 illustrates this relationship; factors such as the inventories, the space or labor are needed resources to run a retailing store. The store manager decides on how to use these resources, which ultimately leads to a certain amount of output.

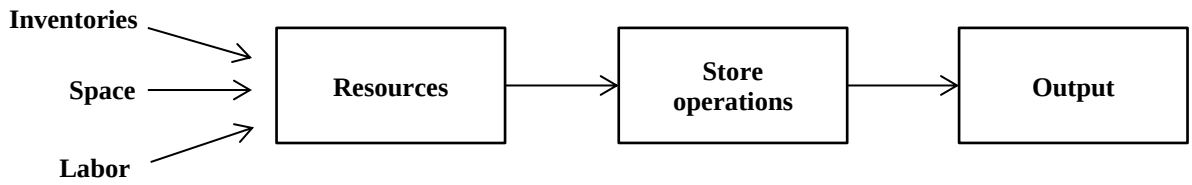

Figure 3.3: Productivity performance flowchart (Hernant and Boström, 2010)

The productivity performance measurements allow a comparison between the used resources and the generated output. The applied measurements - as it can be seen in figure 3.4 - in this work are including the sales per inventory investment (Inventory productivity), the sales per square meter floor area (space productivity) and the sales per labor hour (labor productivity).

Empirical concepts of productivity performance

Derived concept(s)	Definition	Empirical concept(s)
Productivity performance	The rate at which the resources of the store are converted to outputs	Sales per inventory investment Sales per square meter floor area Sales per labor hour

Figure 3.4: Measurements for productivity performance (*Hernant, 2009*)

Table 3.5.4 shows the descriptive statistics for the productivity performance measurements. As well as for the market performance, the figures are showing a clear difference between the stores. While the average sales per square meter were 27,566 SEK, the highest measured result was more than seven times higher than the lowest one. Furthermore the sales per inventory were nearly four times higher for the highest measurement compared to the lowest one and the sales per labor hour showed a ratio of more than two to one.

As table 3.5.5 shows, the correlation coefficients between scale of operation and sales per inventory ($r=-0.35$, $p<0.01$) and sales per square meter ($r=-0.65$, $p<0.01$) are negative. The correlation between scale of operation and sales per labor hour is positive but not significant. However, the correlations between the productivity measurements are showing the highest

correlation between the sales per inventory and sales per square meter (r=0.66, p<0.01). Also the sales per inventory are showing a positive correlation for the sales per labor hour (r=0.43, p<0.01). The correlation between sales per labor hour and sales per square meter is both less high and less significant (r=0.24, p<0.10).

Table 3.5.4 Productivity performance variables. Descriptive statistics

	Mean	St. dev.	Median	Min	Max
Sales per inventory	4.1	1.2	1.1	1.8	7.1
Sales per square meter	27,566	13,324	23,128	8,890	62,486
Sales per labor hour	1,277	211	1,287	875	1,822

Table 3.5.5 Correlation coefficients between productivity performance variables (a=p<0.01; b=p<0.05; c=p<0.10).

	X_1	X_2	X_3	X_4
Scale of operation (floor area) (X_1)	1.00			
Sales per inventory (X_2)	-0.35[a]	1.00		
Sales per square meter (X_3)	-0.65[a]	0.66[a]	1.00	
Sales per labor hour (X_4)	0.20	0.43[a]	0.24[c]	1.00

3.5.2.3 Variables of efficiency performance

The measurements for the efficiency performance were chosen in accordance with the measurements for the productivity performance. Therefore, by applying gross profit as a measurement of output, and dividing it by the amount of each resource utilized the three efficiency measures are defined: GMROI (Gross Margin Return on Inventory), GMROS (Gross Margin Return on Selling Area) and GMROL (Gross Margin Return on Labor).

Empirical concepts of efficiency performance

Derived concept(s)	Definition	Empirical concept(s)
Efficiency performance	The gross profit per unit of resource.	GMROI GMROS GMROL

Figure 3.5: Measurements for efficiency performance

Descriptive statistics of the three variables of efficiency are provided in Table 3.5.6. The results indicate substantial differences between the stores, the largest being a seven to one ratio between the best and worst performing on space efficiency (GMROS). Corresponding ratios are four to one on inventory efficiency (GMROI) and two to one on labor efficiency (GMROL). These results are showing nearly exactly the same proportion for the efficiency as for the productivity between highest and lowest numbers for the stores.

The correlation coefficients between scale of operation and the efficiency measures (Table 3.5.7) show a negative correlation for both GMROI ($r=-0.33$, $p<0.05$) and GMROS ($r=-0.65$, $p<0.01$). There is also a high correlation ($r=0.67$, $p<0.01$) between inventory and space efficiency. Also inventory and labor efficiency are having a positive correlation ($r=0.52$, $p<0.01$). Yet again, these results are showing a huge similarity with the results for productivity performance.

Table 3.5.6 Efficiency performance variables. Descriptive statistics

	Mean	St. dev.	Median	Min	Max
GMROI	1.9	0.6	1.9	0.8	3.3
GMROS	12,387	6,034	10,561	3,984	27,546
GMROL	573	102	579	369	838

Table 3.5.7 Correlation coefficients between efficiency performance variables ([a]=p<0.01; [b]=p<0.05; [c]=p<0.10).

	X_1	X_2	X_3	X_4
Scale of operation (floor area) (X_1)	1.00			
GMROI (X_2)	-0.33[b]	1.00		
GMROS (X_3)	-0.65[a]	0.67[a]	1.00	
GMROL (X_4)	0.16	0.52[a]	0.29[b]	1.00

3.5.2.4 Variables of financial performance

Lastly, performance will be measured in this thesis using the financial results of the stores. For this purpose, income statements at the store level provide the prerequisites for acquiring a detailed description. Here, a total of five measurements were used for the analysis. The gross profit is the amount to which the selling price of a product exceeds the costs for acquiring it. The local costs, labor costs and other operating costs can be grouped and defined as operating costs, which are necessary in order to run the store. Lastly, the operating profit is the result of the formerly mentioned measurements; subtracting the operating costs from the gross profit will lead to the result for operating profit.

Furthermore it is necessary for the comparison of different stores to put the absolute measurements into the relation of scale of operation. This is due to the reason that the absolute numbers are logically biased as stores with a larger scale of operation are also having larger absolute numbers.

Empirical concepts of financial performance

Derived concept(s)	Definition	Empirical concept(s)
Gross profit performance	The degree to which customer payments exceed the cost for acquiring sold products.	Gross profit (per sqm)
Operating cost performance	The costs for the resources acquired for operating a store.	Local costs (per sqm) Labor cost (per sqm) Other operating costs (per sqm)
Operating profit performance	The difference between gross profit and operating costs.	Operating profit (per sqm)

Figure 3.6: Measurements for financial performance (*Hernant, 2009*)

Table 3.5.8 presents the financial performance variables per square meter. As it can be seen the numbers are showing clear differences. The net sales per square meter for example are seven times higher for the highest value compared to the lowest one. Also, the costs of sold goods per square meter and the gross profit per square meter are showing similar results. The highest difference, however, are showing the local costs per square meter, where the ratio is nine to one.

The correlation analysis (table 3.5.9) shows that the scale of operation has a high negative correlation with both sales per square meter ($r=-0.65$, $p<0.01$) and gross profit per square meter ($r=-0.65$, $p<0.01$). The correlation between scale of operation and operating profit is not significant; while sales per square meter and gross profit per square meter are almost perfectly correlated

.

Table 3.5.8 Financial performance (per square meter) variables. Descriptive statistics.

	Mean	St. dev.	Median	Min	Max
Net sales per sqm	27,565	13,324	23,128	8,890	62,486
Cost of sold goods per sqm	15,178	7,317	12,647	4,906	35,954
Gross profit per sqm	12,387	6,034	10,561	3,984	27,545
Labor cost per sqm	5,457	2,630	4,899	1,895	13,129
Local cost per sqm	4,450	2,313	3,740	1,211	11,017
Other operating costs per sqm	1,483	568	1,514	523	2,856
Operating profit per sqm	997	2,143	1,267	-3,918	5,309

Table 3.5.9 Correlation coefficients between scale of operation and financial performance per square meter (a=p<0.01; b=p<0.05; c=p<0.10).

	X_1	X_2	X_3	X_4
Scale of operation (floor area) (X_1)	1.00			
Sales volume per square meter (X_2)	-0.65[a]	1.00		
Gross profit per square meter (X_3)	-0.65[a]	0.99[a]	1.00	
Operating profit per square meter (X_4)	-0.14	0.52[a]	0.65[a]	1.00

3.6 Research instruments

The variables that were operationalized in chapter 3.5 were imported to and analyzed through the statistical computer program PASW. The research instruments applied in this study comprise bivariate and multivariate techniques. In the investigations of relationships between variables, data are analyzed by correlation and regression analysis. These are the most widely applied techniques to examine relationships between variables – as seen in earlier studies.

First, all variables were controlled to see if they followed a normal distribution. Similar patterns were seen for each variable where the frequency showed a normal distribution for each variable. Then correlation analysis was carried out to see if there was an interaction between the independent variable and the dependent variables. The correlation analysis was

conducted by studying Pearson's coefficient. Based on the results we could conclude that there is an internal influence between the dependent variables. However, this does not affect the technique, because a 'simple regression analysis' studies one single relationship at the time and only allows one casual factor (Baker, 2006). Although, awareness should be taken to account that the hypotheses together provide a network of direct and indirect relations. Nevertheless, our study focuses on studying each individual impact between the independent and the dependent variables. This is in order to isolate the effect of scale of operation on the store level (Capon et al., 1990). Our purpose is not to try to explain as much as possible of the respective dependent variable, but to evaluate the individual effect of scale of operation.

Then individual simple regressions were conducted in order to determine what impact the independent variable (scale of operation) had on the dependent variables. For each regression analysis the data were plotted in a scatter, to detect possible outliers. The coefficient of determination used in the simple regression is R2. This shows how much of the variance in the dependent variables is explained by the independent variable. The β-value is also reported to show the slope of the regression line for each variable. The hypotheses were accepted if the difference is significant on a 10 percent significance level, which is an implicit agreement within the academia (Söderlund, 2010).

We also used independent sample T-test to compare smaller (<500 square meter) stores with larger (≥500 square meter) ones. We divided the stores into two groups (small and large), and compared these groups using the dependent variable "operating profit per square meter".

3.7 Reliability and Validity

In order to analyze the quality of the used data reliability and validity are important variables to consider (Bryman and Bell, 2011). "*Reliability refers to the consistency of a measure of a concept*" (Bryman and Bell, 2011, p. 158). This indicates that a high reliability means that the measurement failure is low. Validity, on the other hand, is referring to "*whether or not an indicator (or set of indicators) that is devised to gauge a concept really measures that concept*" (Bryman and Bell, 2011, p. 159). Hence, the validity indicates if a measurement of a

concept actually measures the focal concept. It must be said at this point that Bryman and Bell argue that the reliability is a prerequisite for the validity. This means that if the measurement failure is high it will also mean that the measurements are not measuring the concept.

3.7.1 Reliability

As Bryman and Bell (2011) describe the reliability can be examined using three different factors; the stability, the internal reliability and the inter-observer consistency. However, the latter two factors can be neglected for this study. The internal reliability refers to the question whether the score on one measurement will affect the score for another one. This is not the case in this study, because the "respondent" of our questions was not a person but a database. Also the inter-observer consistency is not playing a role for the reliability. This is due to the use of statistical methods, meaning that the subjective judgment is reduced to a very low level.

This leaves the stability as a criterion for reliability. The stability explains if the measurements are stable over time. For this study, the only reasons why the results could not be replicated in the future are events that are affecting the results (Bryman and Bell, 2011). In the context of this study this could be for example a change in the purchasing power of the consumer. Presuming the conditions are stable the same results could be gathered in the future. Therefore we are confident that the results of this study are highly reliable.

3.7.2 Validity

As mentioned, validity evaluates if the taken measurements are measuring the phenomenon in question. Validity can be divided into internal and external validity (Bryman and Bell, 2011).

Internal validity evaluates if the dependent variables are actually influenced by the independent variable or if another external variable has an effect on the results (Bryman and Bell, 2011). In order to decrease this risk we pursuit a deductive research approach and derived hypotheses from a review of earlier studies. During the literature review phase we detected prominent measurements for performance in multiple studies. Therefore we decided to use these measurements in our analysis as well. However, there is a difference between this

study and most previous studies. In this study we are applying a total of ten performance measurements over all identified performance categories. This contrasts most previous research, which concentrate on one or two of the performance categories (mostly being the market and/ or productivity performance). It should, however, also be mentioned at this point that we are pursuing a cross-sectional approach as the literature review was not limited to studies in the consumer durable sector. We explained earlier that this approach was chosen due to the lack of research within this sector. Nevertheless, we are confident that the data that is analyzed delivers a good internal validity.

On the other hand, external validity points at the question as to the whether results are generalizable beyond the specific research context (Bryman and Bell, 2011). This question concerns the sample of stores and the population they belong to. Regarding this, this study is limited to two factors. First, all of the stores in the sample are selling consumer durables, and second, all of the stores are belonging to the same retailing company. Nevertheless, this also causes advantages, as the sample of stores is experiencing very similar elements, referring to centrally managed factors, such as the assortment, the marketing communication and the personnel training. Furthermore it must be mentioned that the purpose of this study is not to generalize the results to a larger population of stores, much rather this study aims at generalizing the results to a theoretical level. Therefore the question of possible generalizability must be answered positively. This is due to the reason that the hypotheses were developed relying on established theories and logical reasoning.

4. Results and Analysis

This chapter contains the results from the regression analyses and the testing of the hypotheses is presented. In order to do so we will isolate each hypothesis and test it by using a regression analysis. After each set of hypotheses for market, productivity, efficiency and financial performance a short summary will be presented. The results gathered in this chapter will then be discussed in chapter five.

4.1 Hypotheses testing

The results will be presented following the structure in the theory section; first we will go through the results between scale of operation and market performance ($H1_a$, $H1_b$, $H1_c$), then we will present their relation to a store's productivity and its efficiency ($H2_a$, $H2_b$, $H2_c$, $H2_d$, $H2_e$, $H2_f$). Lastly we will present the result for the relation between scale of operation and profitability (H3). After having tested the hypotheses we will also conduct some deeper analyses. This should help to gain a deeper understanding and to gain some additional insights from the data. It must be mentioned at this point that the numbering for the graphs presented in this chapter had to be removed due to confidentiality reasons.

4.1.1 Scale of operations effects on market performance

Hypothesis $H1_a$ states that the scale of operation has a positive effect on the net sales of the store. The regression analysis shows that the scale of operation explains 20 percent of the variance in net sales (R^2=0.20) and the β-value (β=7.85) shows that an increase of 1 square meter floor area generates 7,850 SEK more net sales per year. The regression analysis is statistically significant (p=0.001). Therefore the hypothesis was accepted.

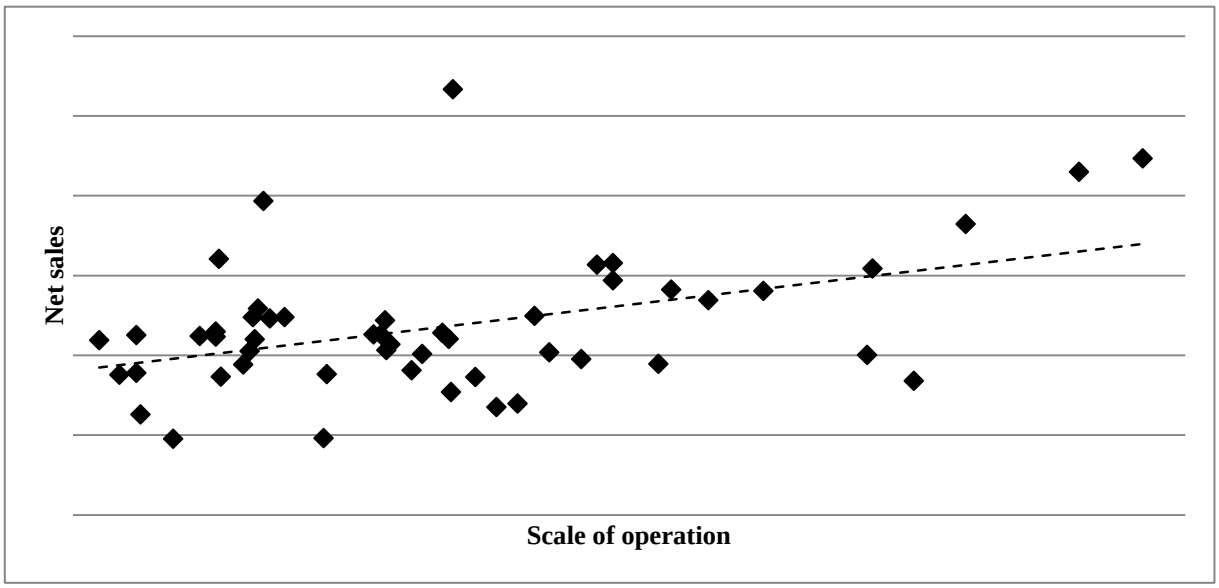

Figure 4.1: Regression analysis, scale of operation and net sales

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$H1_a$) *The scale of operation of a store is positively related to net sales of the store*

ACCEPTED

Hypothesis $H1_b$ states that the scale of operation has a positive effect on the number of customers per week. The scale of operation only explains 4 percent of the variation (R^2=0.04) and the β-value is 0.17. Irrespective to the result the hypothesis cannot be accepted, as it is not significant on a 10%-level (p=0.175).

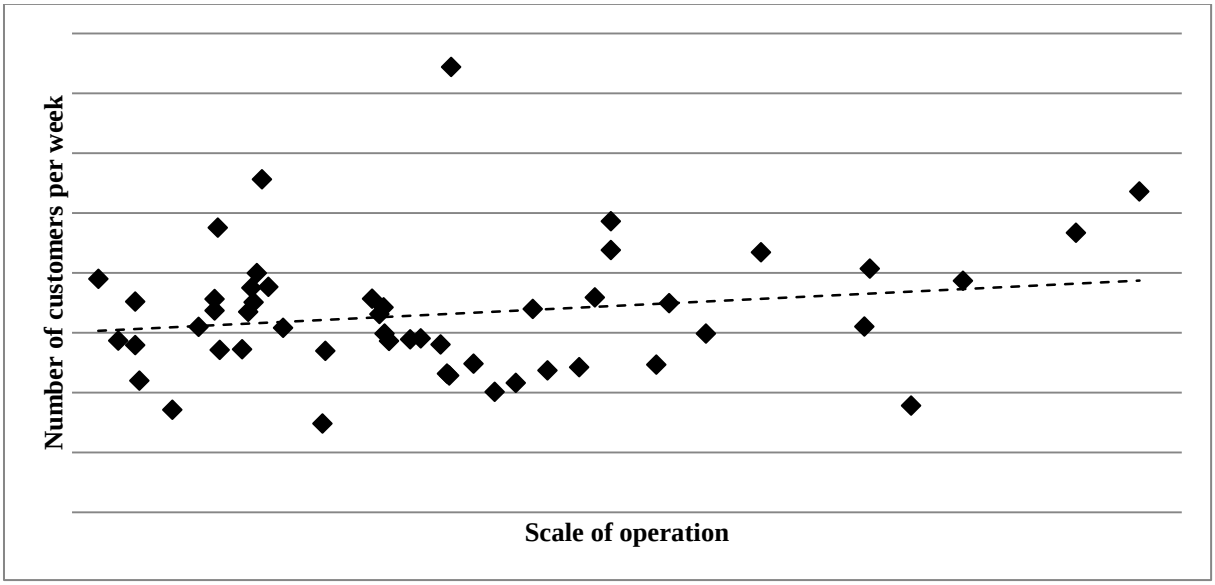

Figure 4.2: Regression analysis, scale of operation and number of shoppers per week

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$H1_b$) *The scale of operation of a store is positively related to the number of shoppers per week of the store.*

REJECTED

Hypothesis $H1_c$ states that the scale of operation has a positive effect on the average transaction per customer. The scale of operation explains 44 percent of the variation (R^2=0.44) and the β-value is 0.14, which means that the slope is slightly positive. The regression analysis is statistically significant (p=0.000). Therefore the hypothesis $H3_c$ was accepted.

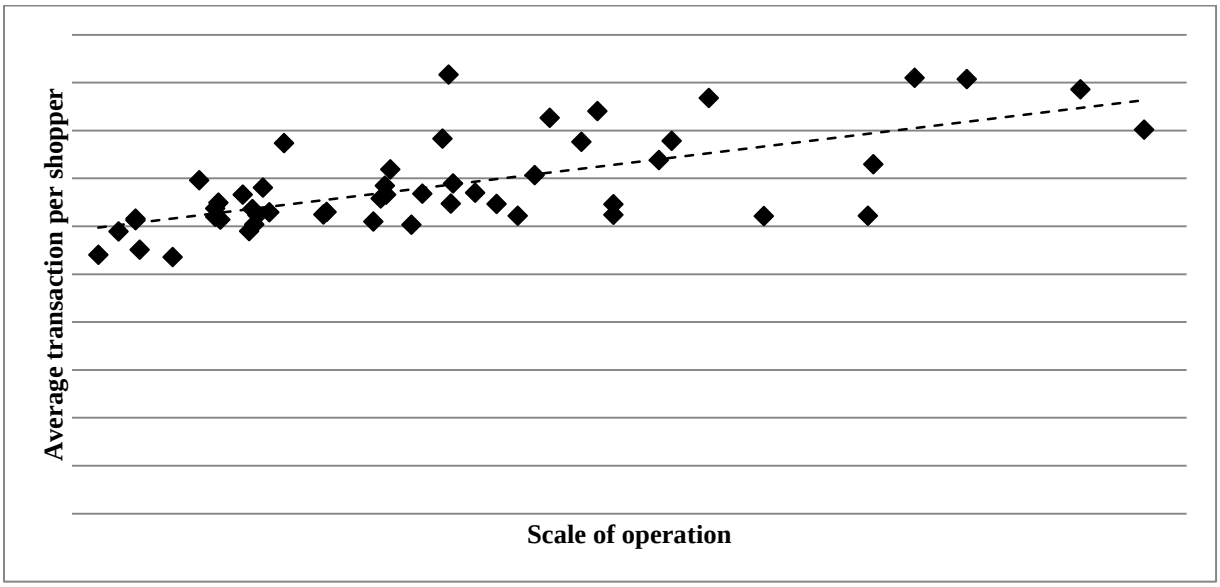

Figure 4.3: Regression analysis, scale of operation and average transaction per shopper

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$H1_c$) *The scale of operation of a store is positively related to the average transaction per shopper of the store.*

ACCEPTED

4.1.1.1 Summary and additional analysis, market performance

Table 4.1.1 Summary regression analysis, market performance

	Net Sales		Numbers of shoppers per week		Average transaction per shopper	
Constant	**β**	**p**	**β**	**p**	**β**	**p**
Scale of operation	7.85	0.001	0.17	0.175	0.14	0.000
R^2	0.20		0.04		0.44	

The scale of operation explains 20 percent of the variance of net sales and even 44 percent of the variance of the average transaction per customer. Eliasson & Julander (1991) found that a larger scale of operation implies more depth and breadth of the assortment, which could be an explanatory factor for a store's ability to attract customers. In particular, a larger scale of operation and a larger assortment have an influence on the customers in the store in the way that they spend more time in the store (Nordfält, 2007). This could be an explanation for the increased average transaction per customer. Furthermore it needs to be said that - although not significant on a 10% level - a weak link between scale of operation and number of customers can be detected (see figure 4.2). However, the number of customers per week correlates almost perfectly with the store's net sales. This could probably indicate that the location of a store is more important when it comes to attracting customers than the scale of operation. With other words, the convenience and availability is more important when it comes to attracting larger numbers of customers.

4.1.2 Scale of operations impact on productivity

Hypothesis $H2_a$ states that the scale of operation has a positive effect on the sales per inventory investment of a store. The regression analysis shows that the scale of operation explains 13 percent of the variance of sales per inventory investment (R^2=0.13). But the β-value (β=-0.002) indicates that an increase in size has only a very impact for the productivity in sales per inventory. Still, the regression analysis is statistically significant (p=0.011). Due to these results the hypothesis is rejected.

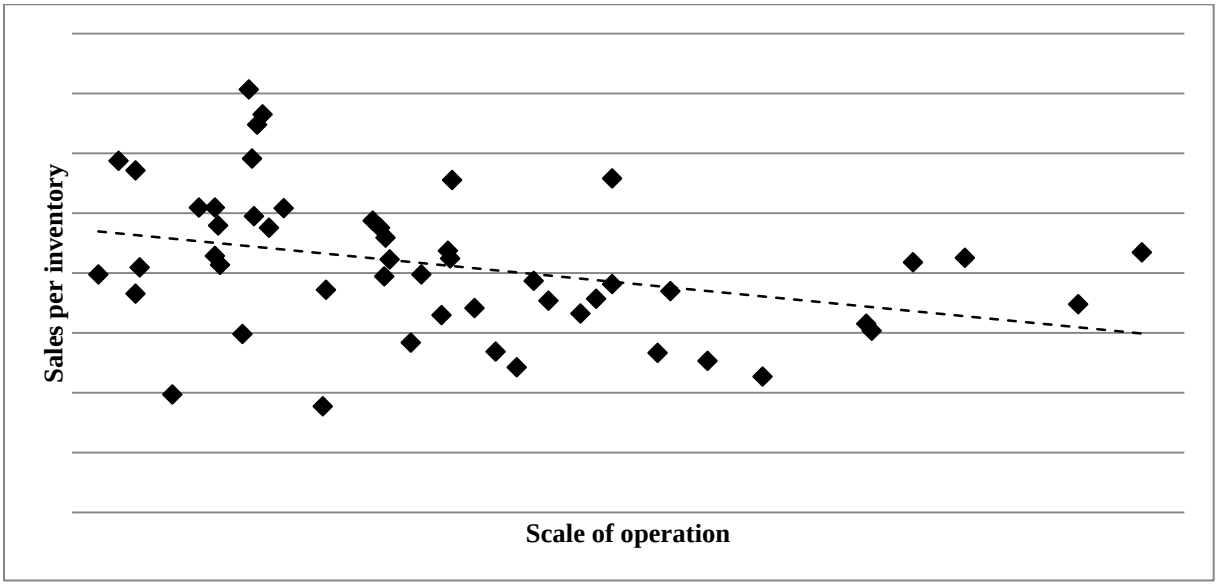

Figure 4.4: Regression analysis, scale of operation and sales per inventory

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$H2_a$: *The scale of operation of a store is positively related to the sales per inventory of the store.*

REJECTED

Hypothesis $H2_b$ states that the scale of operation has a positive effect on the sales per square meter floor area. The regression analysis shows that the scale of operation explains 42 percent of the variance of sales per square meter floor area (R^2=0.42). The β-value (β=-35.42) shows that an increase in size leads to a decreasing productivity of sales per square meter floor area. The regression is statistically significant (p=0.000). But as the analysis reported a negative relationship the hypothesis has to be rejected.

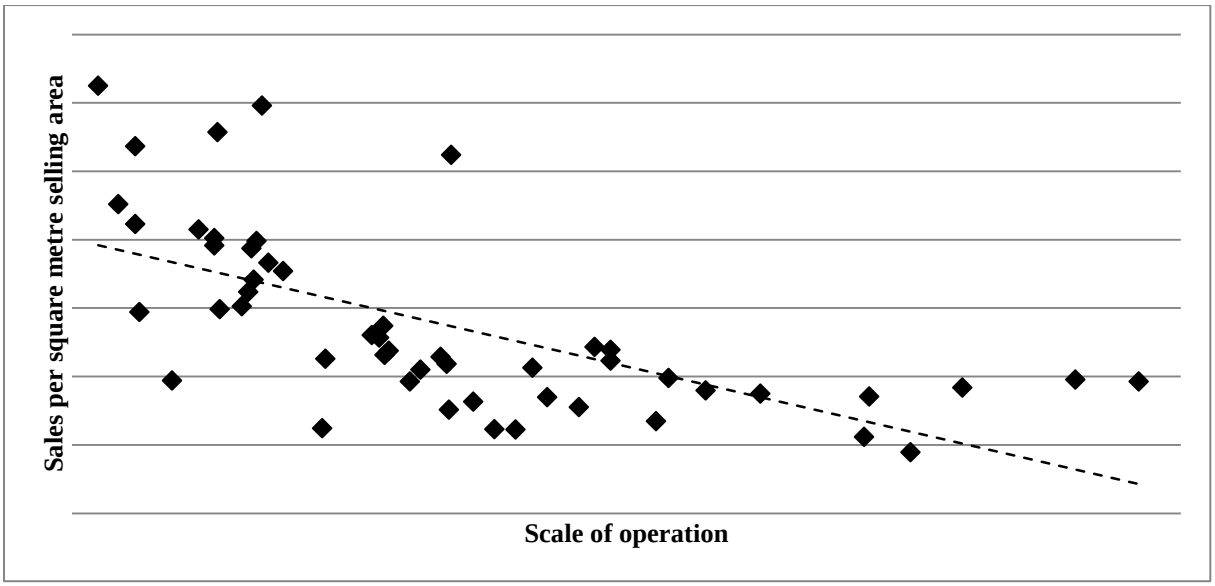

Figure 4.5: Regression analysis, scale of operation and sales per square meter selling area

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$H2_b$: *The scale of operation of a store is positively related to the sales per square meter selling area of the store.*

REJECTED

Hypothesis $H2_c$ states that the scale of operation has a positive effect on sales per labor hour. The regression analysis shows that the scale of operation just explains 4 percent (R^2=0.04) of the variance of sales per labor hour. But the β-value of 0.18 indicates that an increase of the scale of operation leads to an increase of sales per labor hour (see figure 4.6). However, the results showed no satisfying statistical significance (p=0.151). Hence, the hypothesis $H2_c$ has to be rejected.

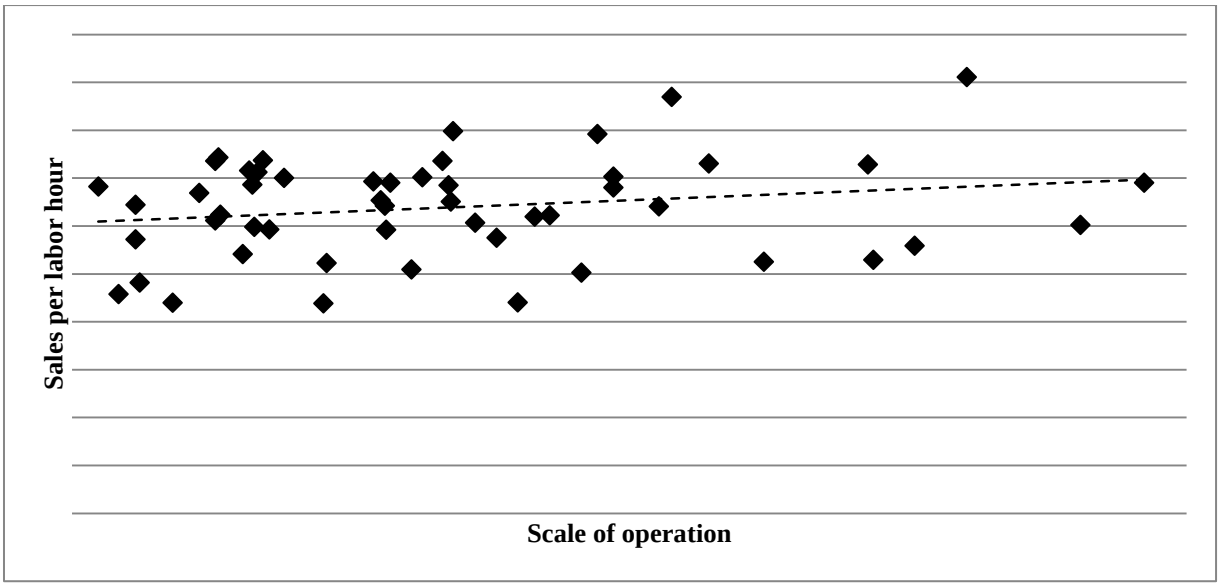

Figure 4.6: Regression analysis, scale of operation and sales per labor hour

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$H2_c$: *The scale of operation of a store is positively related to the sales per labor hour of the store*

REJECTED

4.1.2.1 Summary and additional analysis, productivity performance

Table 4.1.2 Summary regression analysis, productivity performance

	Sales per inventory investment		Sales per square meter floor area		Sales per labor hour	
Constant	**β**	**ρ**	**β**	**ρ**	**β**	**ρ**
Scale of operation	-0.002	0.011	-35.42	0.000	0.18	0.151
R^2	0.13		0.42		0.04	

When measuring productivity one measures if a store is doing the "right things", which can also be seen from the definition; sales per unit of resource (Hernant and Boström, 2010). The results of the analyses do not show the same connection as in previous research. Either the connection was proven to be negative (inventory and space productivity) or only had an unsatisfying significance, as in the case of labor productivity. Therefore all the raised hypotheses had to be rejected.

Especially for the space productivity, the results indicate that larger stores are performing worse in using the resource "floor area" in order to generate output. Remarkably here is that the scale of operation explains 42 percent of the variance for sales per square meter. Furthermore the results suggest that also the inventory productivity is less well for larger stores. Here, the scale of operation explains 13 percent of the variance of sales per inventory investment. Lastly, the labor productivity showed a positive relation with scale of operation (see figure 4.6), however, the hypothesis 2_c had to be rejected due to an insufficient significance. Therefore the results suggest that larger stores are using the resources less well than smaller stores.

4.1.3 Scale of operations impact on efficiency

Hypothesis $H2_d$ states that the scale of operation has a positive effect on gross profit per inventory investment of a store. The regression analysis shows that the scale of operation is explanatory for 11 percent of the variance of gross profit per inventory investment (R^2=0.11). The β-value is β=-0.002 and the analysis is statistically significant (p=0.017). Therefore the hypothesis is rejected, due to the negative β-value.

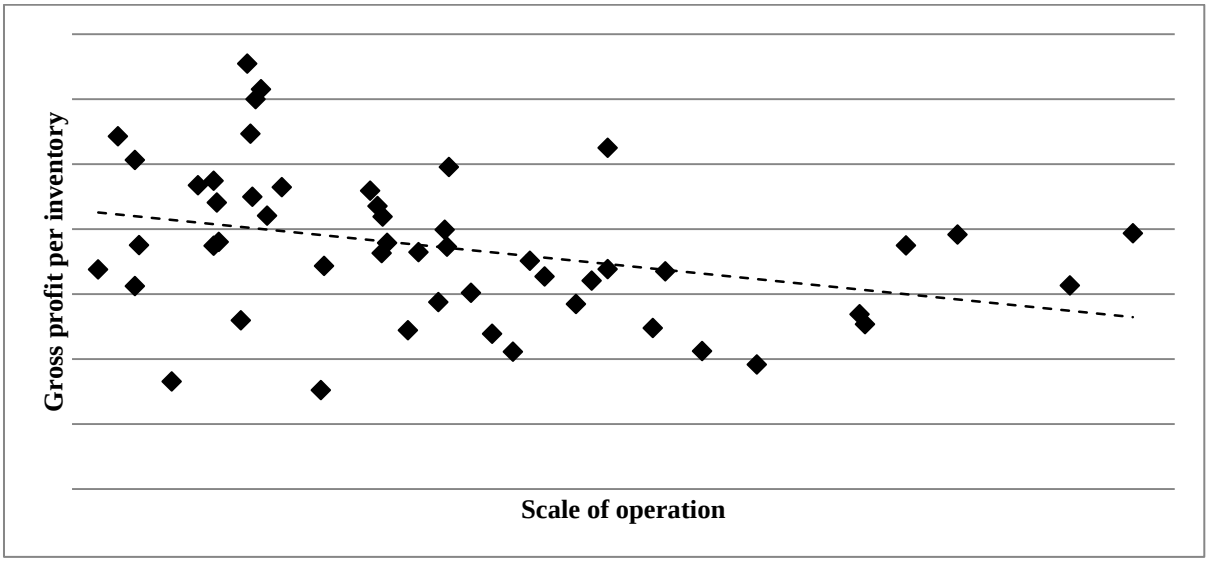

Figure 4.7: Regression analysis, scale of operation and gross profit per inventory

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$H2_d$: *The scale of operation of a store is positively related to the gross profit per inventory (GMROI) of a store.*

REJECTED

Hypothesis $H2_e$ states that the scale of operation has a positive effect on gross profit per square meter floor area. The regression analysis shows that the scale of operation explains 42 percent of the variance of sales per square meter floor area (R^2=0.42). However, the β-value has a value of -16.02, which indicates decreasing gross profit per square meter with increasing scale of operation. Furthermore the analysis shows a high statistical significance (p=0.000). Hence, the hypothesis $H2_e$ has to be rejected.

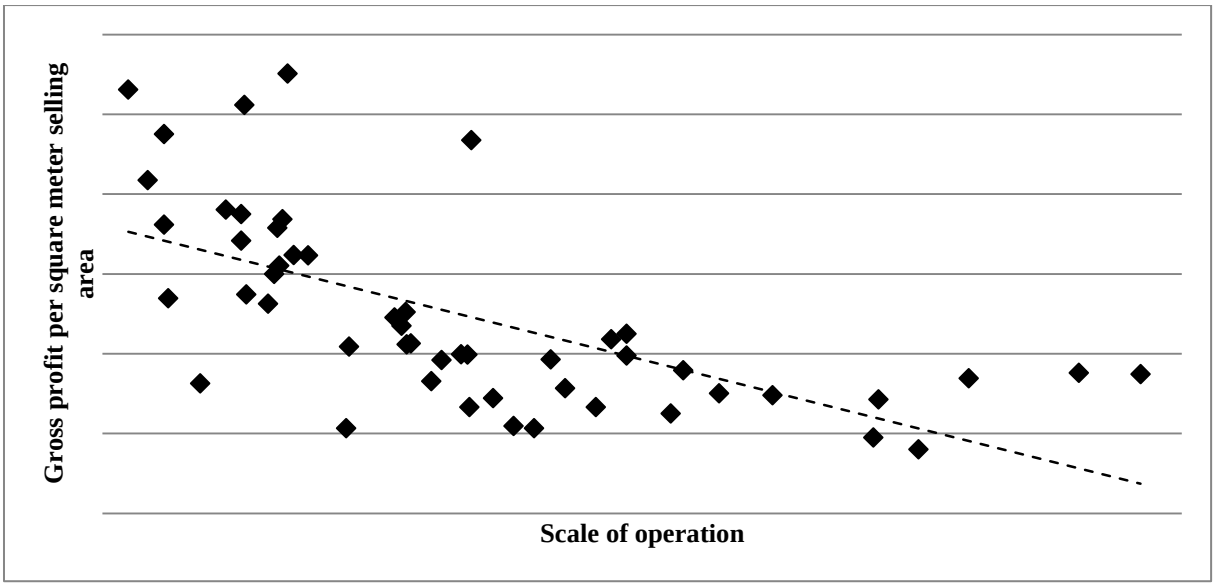

Figure 4.8: Regression analysis, scale of operation and gross profit per square meter selling area

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$H2_e$: *The scale of operation of a store is positively related to the gross profit per square meter selling area (GMROS) of the store.*

REJECTED

Hypothesis $H2_f$ states that the scale of operation has a positive effect on gross profit per labor hour. The regression analysis shows that the scale of operation only explains 3 percent of the variance of sales per inventory investment (R^2=0.03). Still, the β-value is slightly positive with a value of 0.07. However, the hypothesis has to be rejected due to the reason that it is not statistically significant (p=0.250).

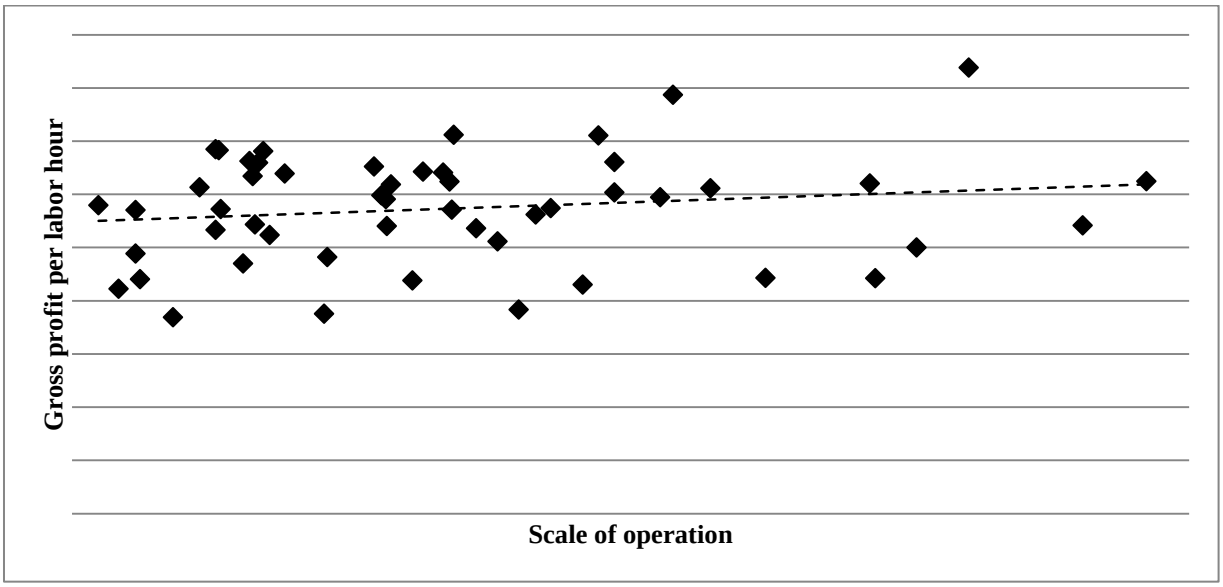

Figure 4.9: Regression analysis, scale of operation and gross profit per labor hour

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$H2_e$: *The scale of operation of a store is positively related to the gross profit per labor hour (GMROL) of the store.*

REJECTED

4.1.3.1 Summary and additional analysis, efficiency performance

Table 4.1.3 Summary regression analysis, efficiency performance

	GMROI		GMROS		GMROL	
Constant	**β**	**ρ**	**β**	**ρ**	**β**	**ρ**
Scale of operation	-0.001	0.017	-16.02	0.000	0.07	0.250
R^2	0.11		0.42		0.03	

Efficiency evaluates if a store "does things right" and it calculates the gross profit per unit of resource. The results here are showing to be very similar to the results for productivity. Again, the measurements for inventory investment and space had to be rejected due to a negative connection to scale of operation. Also the explanatory impact of scale of operation is very similar. The scale of operation explains 42 percent of the variance for GMROS and 11 percent of the variance for GMROI. On the other hand GMROL showed a positive relation, but the significance was not on an acceptable level (p=0.250). Therefore these results show that the larger stores are less efficient in the utilization of their inventory and space resources, while not performing significantly better on labor efficiency.

4.1.4 Scale of operations impact on financial performance

Hypothesis H3 states that the scale of operation has a positive effect on operating profit per square meter selling area. As we discussed in the methodology it is necessary for the comparison of different stores to put the absolute number into the relation of scale of operation. Therefore the regressions are carried out for each financial performance variable divided by the number of square meters for each store. Even though the hypothesis focuses on the operating profit a regression was conducted for each variable in order to explore the relation for the different costs. This will be further elaborated on in the discussion part.

Each regression analysis shows that both the gross profit per square meter, local costs per square meter, labor costs per square meter and other operating costs per square meter have a negative β-value, which is also statically significant (p=0.000). Also the operating profit shows a negative β-value, which would suggest a lower operating profit per square meter for larger stores. However, this relation was not found to be significant (p=0.317). This means that the hypothesis H3 is rejected.

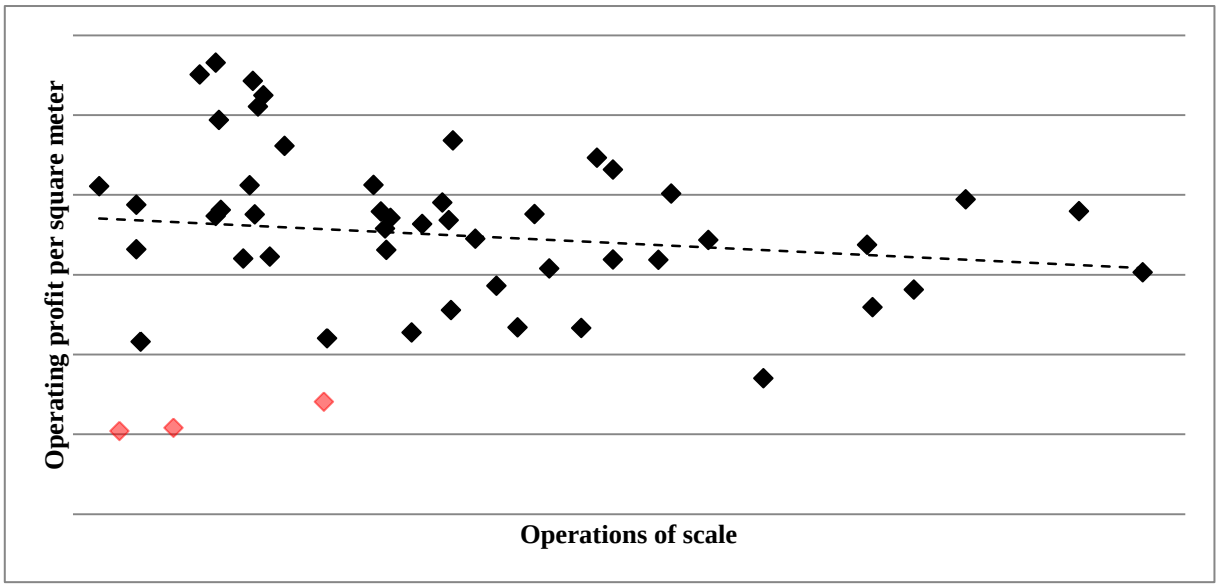

Figure 4.10: Regression analysis, scale of operation and operating profit per square meter selling area

By looking at the figure 4.10 we detect that there are three outliers that abolishes the relationship (these stores are marked red in the figure). After having removed these three outliers we observe that the negative relation between scale of operation and operating profit

per square meter is statistically significant (p=0.018). This relation is presented in the figure 4.11 and the table 4.1.4. The scale of operation is then explaining 12 percent of the variance in operating profit per square meter and the β-value is quite strong, -2.59. So, also after having taken out the outliners the hypothesis has to be rejected.

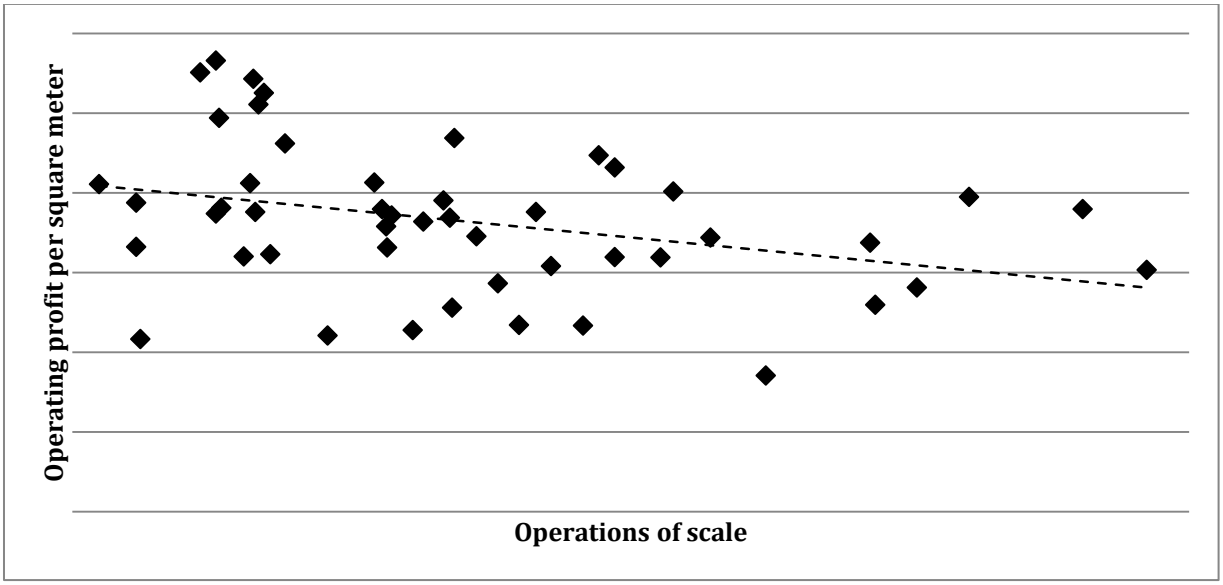

Figure 4.11: Regression analysis, scale of operation and operating profit per square meter (3 stores are removed)

H3: *The scale of operation of a store is positively related to the operating profit per square meter of the store.*

REJECTED

4.1.4.1 Summary and additional analysis, financial performance

Table 4.1.4 Summary regression analysis, financial performance

	Gross profit per sqm		Local costs per sqm		Labor costs per sqm		Other operating costs per sqm		Operating profit per sqm	
Constant	**β**	**p**	**β**	**p**	**β**	**p**	**β**	**p**	**β**	**p**
Scale of operation	-16.02	0.000	-7.81	0.000	-5.07	0.000	-1.87	0.000	-1.26	0.317
									-2.59[3r]	0.018[3r]
R^2	0.42		0.52		0.28		0.64		0.02	
									0.12[3r]	

[3r] = three stores are removed

All the measurements that are needed for calculating the operating profit are showing a high statistical significance and are all showing decreasing values for increasing scales of operation. Hence, these data alone are not allowing a conclusion on the operating profit per square meter. The regression analysis for the impact of scale of operation on the operating profit per square meter is not showing a sufficiently high significance (p= 0.317). The results therefore lead to the conclusion that the hypothesis of an increasing operating profit per square meter must be rejected. However, at a deeper analysis we detected three outliers in the sample. By removing these stores the regression analysis shows a negative relation (β=-2.59) between the scale of operation and operating profit per square meter, which is statistically significant (p=0.018). This result goes in hand with what both the productivity measurements and the efficiency per square meter indicated. With other words, a larger scale of operation leads to a decreased operating profit per square meter. Even though it only explain 12 percent of the variance of the variable.

4.1.5 Comparison between small and large stores

In order to gain a deeper understanding of the results we decided to group the stores in two categories; small stores and large stores. Small stores are defined as stores with a scale of operation that is smaller than 500 square meters. The 29 stores in this group ranged from 175 – 499 square meters. Large stores are therefore defined as all stores that are equal or larger than 500 square meters. Here, 22 stores are grouped with sizes ranging from 505 – 1160 square meter.

Table 4.1.5 shows that there is a big difference of the mean operating profit between the small (1,300 SEK) and large stores (598 SEK). However, it must be noted that the sample for each group is small and that the results are not significant (p=0.251)!

Table 4.1.5 Independent T-test between small and large stores

N=51	**Small stores** <500 sqm	**Large stores** ≥500 sqm		
	Mean	**Mean**	**Mean diff.**	**p**
Operating profit per square meter	1,300	598	702	0.251

In a second step in the T-test we removed again the three stores (all were in the group of small stores) that were defined as outliners. Again this relatively small change made a huge difference and changed the results dramatically (table 4.1.6). The mean operating profit for the small stores increased to 1,870 SEK. Naturally, the mean operating profit for the large stores stayed the same. Now, the results were at a statistically significant level (p=0.016).

Yet again, we want to point out that the results must be analyzed cautiously, as the group sizes are rather small!

Table 4.1.6 Independent T-test between small and large stores (3 stores are removed)

N=48	Small stores <500 sqm	Large stores ≥500 sqm		
	Mean	**Mean**	**Mean diff.**	**p**
Operating profit per square meter	1,870	598	1,272	0.016

5. Discussion

This chapter contains a discussion of the results gathered in chapter four. Furthermore a conclusion is drawn and the implications of the study are presented. The chapter closes with a critique of the study and suggestions for future research.

5.1 The effects of scale of operation on the store level

Out of the ten raised hypotheses only two appeared to the accepted by the empirical analysis. The rest had to be rejected either due to a different relation between the variables or due to an insufficient significance. A possible reason for the fairly huge number of rejected hypothesis might be the cross-sectional approach that was taken in the theory review. It should also be noted that only one variable has been tested to explain the store's performance. As we pointed out earlier there are numerous factors that affect the store's performance, and they all interact in a complex network. However, in this study we focused on one of these factors - the scale of operation - and how it affects the store's performance.

5.1.1 Market performance

The scale of operation of a store showed a positive relation with the net sales. Therefore it is clear that a larger scale of operation positively affects the market performance and will therefore ensure the store a larger market share. Still, this result should be analyzed with caution. This does not mean that a retailer simply has to increase the scale of operation in order to increase its market share. Naturally, there is some sort of limit as there is no endless growth of market performance. There are certainly limits to growth concerning for example the purchasing power of the customers. Therefore increasing the scale of operation can be a strategy for certain regions, where a retailing company intends to put pressure on its competitors. But this strategy should not be adopted for all stores of a company, as the rest of the performance measurements are indicating.

When looking at the two prerequisites for net sales - the number of customers and the average transaction per customer - both showed a positive β-value. But only the average transaction per customer was found to be significant. Here, the insignificance in the relation between the scale of operation and the number of customers is surprising. One could assume, in accordance with existing theory (e.g. Reilly, 1931), that a larger scale of operation will attract more customers. An explanation could be the nature of the sector of consumer durables. Although, more people might be attracted to visit the store this does not necessarily lead to an increase in purchases, as many people are just browsing the store with no intention to buy. Another possible reason for this is the location of the store. A smaller store within the city centre of a large town might be able to attract the same amount of customers per week as a larger store that is located in a more rural area (O'brien and Harris, 1991). Furthermore it can be assumed that the number of customers is an indicator for the attractiveness of the store, which leads to increased net sales. However, our results cannot prove this connection because is not statistically significant. Despite this, one can assume that both the scale of operation and the store's location are important for the number of visitors, which in turn affects the number of customers (Bell and Lattin, 1998).

On the other hand, the number of average transaction per customer increases significantly. The amount of the average transaction can be driven by two factors; the price and/ or the quantity. The focal company is managing its prices for the products centrally. Hence, it can be concluded that either the number of products increases the transaction or the kind of products that the customers are buying in larger stores are more expensive.

A possible explanation for this can be found in previous studies. These have found that the retailing stores with a larger scale of operation are also having a larger merchandise variety (e.g. Eliasson & Julander, 1991; Hernant 2009). Therefore the customers can find more of their desired products in the same store and do not need to change stores, which increase the amount of the average purchase (Kahn and Wansink, 2004).

Another possible reason for the increase in average transactions is that customers who are shopping for more expensive products will demand a larger range of choice. A larger

financial risk for the customer will lead to a more thorough evaluation of the product and of the possible alternatives. Therefore, larger stores are having an advantage of selling these kind of products compared to their smaller counterparts.

5.1.2 Productivity performance

All the results for the analyses of the hypotheses on productivity performance lead to a rejection. A possible explanatory factor for this is the type of assortment the stores are holding. As mentioned earlier, the scale of operation affects the store's assortment. All stores consist of an A-assortment and depending of the scale of operation the store's fills up with a B-assortment which consist of less well selling products compared to the A-assortment.

In order to understand why the sales per inventory investment are decreasing it is good to spill this issue into its parts; net sales and amount of inventory. As the hypothesis 1a has shown the net sales are increasing with increased scale of operation. However, as the results are indicating the net sales are not increasing as fast as the inventory investment. The reason for this might be due to an increase of the B-assortment. The B-assortment products are not converting into output as fast as the A-assortment, and therefore the sales per inventory investment are decreasing, when the amount of B-assortment increases.

The space productivity is revealing a similar relationship towards scale of operation as the inventory productivity. With an increasing scale of operation the sales per square meter floor area are decreasing. Yet, again this can be explained with the differences in the assortment. The larger stores will hold more of the less well selling B-assortment and are therefore struggling in holding up to the productivity figures of smaller stores. Another explanation unfolds when looking again at the market performance. It seems that only a significant increase in transaction per customer is not enough in order to hold up with the productivity figures of smaller stores.

Lastly, there is the labor productivity. Many studies before have shown the positive effects of scale of operation on labor productivity (Eliasson & Julander, 1991; Hernant, 2009). Also in

this study, the β-value is slightly positive, which indicates a positive relation. However, the results of this study did not show a sufficient significance level. An explanation for the positive β-value is that a store needs to employ a certain minimum of labor hours in order to have the store opened. With increasing scales of operation this number of needed labor hours is not increasing a lot, because most customers do not need assistance during their shopping and just require that there is a person sitting at the checkout. However, the results suggest that again the increase in market performance is not big enough in order to generate significant results for an increase in labor productivity.

5.1.3 Efficiency performance

The efficiency measurements are comparing the gross profit with the square meter floor area. The results from the regression analyses show that there are similarities to the results for the productivity performance. This similarity might be due to the centralized pricing policy of the company. As all products are bought centrally, the costs for a certain product is the same for each store, and as the price is also set, the gross profit for the product is the same. Hence, for the focal stores, there is a close link between the net sales and the gross profit. When the sales per inventory, square meter and labor would be increasing, the same must be true for the gross profit. Therefore it is not surprising that the efficiency performance hypotheses were all rejected in the same way as the productivity performance hypotheses.

As all these measures are interrelated with each other the model requires a reasoning to understand the relationship between them. First of all it's important to be aware of that a change in the value of one measure may result in a change of the value of another measure. For example, space efficiency can be increased by either increasing inventory efficiency or increased service intensity. According to Ring et al. (2002) the space efficiency (GMROS) is the ratio that should be given priority. Also Hernant and Boström (2010) suggest that maximum utilization of floor space is the best path to profitability. As this study shows that the space efficiency is negatively related to scale of operation, which therefore indicates that the larger stores are managing their provided space less well as smaller stores.

5.1.4 Financial performance

For the long-term survival of companies the financial performance is the most crucial measurement. When looking at the antecedents for the operating profit per square meter it became clear that the larger stores are having a cost advantage over their smaller counterparts. All cost factors showed a significant, negative relation with the scale of operation. This therefore suggests that there are economies of scale for the costs per square meter, which is in line with existing theories (Nooteboom, 1982; Aalto-Setälä, 1999). Still, also the gross profit per square meter showed a significant negative relation with the scale of operation. These results of declining costs and gross profit lead to no significant results for the operating profit. Therefore the results are coherent with the results of Hernant (2009), who neither found a significant difference for the financial performance of supermarkets (measured as the operating margin).

However, a closer look at the data reveals that there are three stores with a relatively small scale of operation that are performing clearly worse than its peers. Therefore we removed these stores and ran a new analysis. This time the regression showed a significant, negative relation with the scale of operation. Hence, we are concluding that the financial performance is not better for larger stores, but the opposite is the case. There was already an indication for this result when we analyzed the productivity and efficiency performance. However, this is very surprising as there is a trend towards larger retailing stores in Sweden (Handelns utvecklingsråd, 2010). Therefore, this raises the question, why retailing stores are engaging in building larger stores. A possible explanation could be that the retailing companies are more concentrated on improving their market performance (hypothesis 1_a) in order to gain market shares. Still, this can only be a short- or mid-term perspective, as the financial performance is more important in the long run, and this study indicates that smaller stores might be the better strategy for this.

5.1.5 Size Matters

Overall, the smaller stores are performing better than its larger counterparts. Only, the market performance has shown to be better for larger stores. All the other measurements are either showing no significant difference or an advantage for smaller stores.

These results could therefore lead to the conclusion that retailers should keep their stores as small as possible. However, we believe that there is some sort of a minimum size that can be regarded as a hygiene factor. This minimum size would ensure that the retailer is offering a certain minimum of products in order to be attractive for potential customers. Furthermore it would provide to have enough space between the shelves so that the customers are able to have a good look at the products.

It is important to note that this result does not mean that all stores within the retailing industry should be small. The existence of scale of operation is evident, because there are stores at all. If economies of scale would not exist, every individual would produce for their products on their own. But as this study indicates the existence of economies of scale for larger scales of operation is not infinite. This is due to the reason that there is a local market that needs to be taken into account. At some point, the resources do not generate enough output on the market to make the store profitable.

As we know, the retailing industry is very complex and as this study shows scale of operation only explains a part of the store's performance. There are many, both external and internal, factors that are relevant for the store's performance. Still, this study has shown: Size matters!

5.2 Conclusion

The research question of this study was "*How does the scale of operation of retail stores affect the stores' performance*?". Therefore the aim was to provide an as comprehensive picture as possible on the effects of scale of operation on the performance measurements. The research has shown that the scale of operation explains between 11 and 42 percent of the variance of the performance measurement, when the regression was found to be significant.

For other measurements there was no significant relation. Hence, the first conclusion of this study can be that the scale of operation has a different importance for different performance measurements.

Secondly, when looking at the market performance, we can conclude that the scale of operation has a positive effect on market performance. Although, not all hypotheses were accepted the most important one - net sales - showed a positive relation. Therefore a larger scale of operation helps supermarkets to gain more market shares.

The third conclusion is that larger stores are performing worse in respect to productivity performance. Contrasting earlier studies larger stores of the focal company are not better than their smaller counterparts in utilizing their resources to generate net sales. This automatically brings us to our fourth conclusion. Larger stores are also performing worse on efficiency measurements. The results here showed a high similarity to the results on productivity, suggesting a close link between the two.

Fifthly, the scale of operation has a negative effect on the financial performance. The economies of scale that could be observed and significantly reduced the operating costs per square meter of the larger stores were eaten up by a significantly smaller gross profit per square meter. This ultimately led to a significantly smaller operating profit per square meter (after having removed three outliners from the sample).

As we have argued the profitability of a store is the most vital measurement, therefore we are answering the overall research question with a special focus on the financial performance: The scale of operation of a retail store has a negative effect on the stores' performance!

5.3 Managerial implications

The retail industry is facing an increased competition and one of the ways to distinguish themselves seems to have been to build larger and more inspiring stores. The scale of operation has become a competitive weapon in itself in the quest for increased market shares and sales. But retail practitioners need to improve their understanding of the dynamics that

create profitable stores. By broadening the knowledge about the interaction between a store's scale of operation and performance this study can be viewed as a wakeup call for the importance to utilize a store's resources in an efficient way.

This study also highlights an important dimension when establishing new stores. As the floor area is an important resource (and often costly) there might be a tradeoff when establishing a store between location and store size. Today, much focus is placed on the location when opening a new store. But perhaps the scale of operation should have a larger impact on the decision-making. This especially considering that size creates the conditions, and sets limitations for a store's assortment, which also could impact both price levels and service.

Another implication concerns the overall strategy of a company. As shown, larger stores are able to create more demand in terms of sales and therefore there help the retailing chain to gain market shares. However, the smaller stores are better performing on profitability. The strategy of a retailing chain should therefore be to use this knowledge and build larger stores in areas where they want to gain market shares and smaller stores in areas where a good financial performance is the main objective.

Finally, we want to address the trend in retailing towards fewer, but larger stores. Our results indicate that such a concentration is the wrong way. Much more, the results indicate that it would be better for the overall financial performance to build more, but smaller stores, which are all equipped with a well selling assortment. This would not only increase the financial performance, but also decrease the involved financial risk per store.

5.4 Critique to the study

This study has provided new findings to the industry of retailing, as a whole, and specifically to the industry sector of consumer durables. However, there is some possible critique to this study. These possible shortcomings and weaknesses include the focus on scale of operation, the research sample and the research method.

First, a shortcoming of this study must be directed towards focus on scale of operation. As it has been found in earlier studies (Hernant, 2009) the factors affecting the performance of a retailing store are numerous. Logically, the scale of operation is not the only factor influencing the performance of stores. But researching the influences of this network of factors is beyond the scope of this thesis. But it could be questioned to what extent there might be factors negatively influencing the larger stores, such as a higher degree of competition.

Second, the research sample is - due to its homogeneity - not transferable to a larger population. Therefore it is questionable to what extent these results will allow other companies, apart from the focal company, to draw conclusions for their future strategy. Furthermore the company is mostly selling products that are located in the high-price segment, which might affect the results.

Third, the regression analysis is a rather "simplistic" method that will only detect linear relations. Therefore a curved relation – detected for example by Shaw, Nisbet & Dawson (1989) – would not be observed in this study. Another critique is surely the size of the stores in the T-test. The number of stores for each sample was restricted due to the amount of company-owned stores of the company. However, the number is not sufficient for significant results and therefore the results for this must be analyzed with caution.

Another possible critique is the limitation of the provided company data. The data just covered the numbers of the fiscal year 2012. There is the possibility that this fiscal year was subject to unordinary events and is therefore not representable for everyday business. Gathering and adding data from other fiscal years would have been beneficial, but was not possible.

Furthermore the cross-sectional approach in the literature review does not seem to be suitable as only two of the raised hypotheses were accepted. Here, it must be said, that there is a lack of research in the field of consumer durables, therefore a cross-sectional approach was valid.

5.5 Suggestions for future research

This study has added an already tested approach to a new retail sector to raise awareness and understanding of the diversity of different sectors within the retail industry. Since no other study has investigated the interaction between scale of operation and the store's performance in this specific sector, there is still a lot more to be examined.

In this study, we targeted focus on scale of operation but there a lot of factors that affect a store's performance. It can thus be added many perspectives to see what affects a store's performance. It would be very interesting to see how a store's location affect a store's performance and compare it with its scale of operation. As in Hernant (2009) extensive work there would be exciting to add the impact of local demand and supply to define the conditions on the local market in other sectors. But also examine other variables as the assortment, the price level and the communications impact of the store's performance – to gain a deeper understanding between different industries and differences in consumer behavior.

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